

# TxDOT's External Partners Work Group on System Safety

## Recommendations Submitted by Lance D. Hamm

### 1. Overview for First Meeting (May 6, 2019)

- a. Introductions.
- b. Task (Camille Thomason email): Discussion will be focused on External Partner's thoughts about what TxDOT could do to improve system safety. This could include the areas of education, training, project planning, design, construction, maintenance, traffic operations, additional coordination and communication, more opportunities for feedback, etc.  
External partners have unique perspectives and for this first meeting, collecting and discussing the ideas on potential areas for improvement will help provide a basis for coordinating and prioritizing future conversations with this group and TxDOT leadership.

### 2. External Partners Awareness of the Current Situation Regarding TxDOT System Safety

- a. Texas traffic deaths are not decreasing year-over-year. If millions of dollars are spent every year on traffic safety initiatives, why then, has those expenditures not resulted in sustained reductions in fatalities year-over-year? Unfortunately, TxDOT may have relied too heavily on (work group) recommendations stemming from the belief that Texas traffic fatalities decreased significantly between the years of 2008-2011 due to traffic safety improvement projects (projects continued forward from the 2003 Highway Safety Bond Program) and recommendations to continue those projects, with minor improvements. Subsequently, these recommendations were counted on as the cornerstone of policy that hopefully would have resulted in annual road death reduction going forward, similar to what Texas experienced between the years 2008 and 2011. On the contrary, national data suggests that the national economic recession between the years 2008 and 2011 (lost jobs and less money in the pockets of every household) was the major force behind the significant reduction of traffic fatalities in almost every State. Data suggests that many State's traffic deaths are directly proportional to the nation's economy and its resultant unemployment rate for the State (see graph, attached).
- b. Texas does not have a traffic safety system with strong organizational processes in place to effectively manage the state's efforts to decrease traffic fatalities year-over-year.
- c. The External Partners Work Group on System Safety should be aware of earlier TxDOT task forces, for example the Texas Traffic Safety Task Force and its report dated June 30, 2016, "SOLUTIONS FOR SAVING LIVES ON TEXAS ROADS" by Commissioner Jeff Moseley (Texas Transportation Commission). To be deliberate in our External Partners discussions, it is important for all External Partners to understand the recommendations of that task force and the overall effectiveness of those recommendations to reduce Texas traffic fatalities year-over-year.

### 3. Recommendations to Improve TxDOT System Safety

- a. Recommend TxDOT promote strategies already in place that reduce traffic fatalities.
  - i. **Recommend TxDOT promote national policies and strategies** that are data-based and proven to reduce traffic fatalities such as Vision Zero, Sustainable Safety, Safe Systems Approach, Context Sensitive Solutions, Toward Zero Deaths, and Road to Zero.
  - ii. **Recommend TxDOT promote Texas-based strategies that work** to reduce traffic fatalities within the Strategic Highway Safety Plans, Texas Traffic Safety Task Force Report, Highway Safety Improvement Plan, and Highway Safety Plan.

- b. **Recommend TxDOT improve the following traffic engineering practices** and procedures to decrease road crashes that result in fatalities, injuries, and property damage.
- i. **Clear Zones.** Approximately 35% of Texas traffic fatalities are the result of one-vehicle off-the-road crashes (more than the 27% killed in traffic crashes where a driver was under the influence of alcohol). To reduce fatalities and major injuries, TxDOT should engage in a concerted effort to declutter clear zones to the maximum extent possible and to move fixed objects to the furthest possible distance from the travel lanes.
    1. **Guardrails.** No-flare guardrails should be flared giving drivers more lateral distance to recover from minor (less than 5 feet) off-roadway deviations. Crash cushions on the approach to guardrails should be placed further away from the roadway. Many crash cushions are only 3 feet from the inside (fast) lane of high-speed highways (usually associated with overpasses or creek/river bridges). Most of Texas highways are somewhat flat with flat slopes, so placing flared guardrails in the median/grassy foreslope should be of little concern on the engineering side of the house. Many states use flared guardrails with the approach end displaced 15-20 feet from the roadway (Nebraska/Florida). Guardrails in construction zones seem to be closer to the roadway than normal guardrails, sometimes within inches of the roadway. These close-to-the-roadway guardrails promote crashes in a system that we know drivers are statistically and highly likely to drive off the road (for whatever reason). These close-to-the-roadway, non-flared guardrails are dangerous and unacceptable in our efforts to reduce crashes, injuries, and road death.  
Recommend these guardrails be replaced with safer, flared, and further offset guardrails, like those used in a few other States.
    2. **Median Cable Guardrails.** Recommend median cable guardrails be placed on centerline of the median to give drivers the maximum lateral clear zone distance available to recover from an off-the-road event. Some TxDOT-placed median cable guardrail systems are offset in the median giving some drivers only 5 feet to recover their vehicle after departing the hard shoulder before running into the cable guardrail. If the cable guardrail was placed on centerline of the median, the driver could have an additional 5-20 feet (depending on median width) to recover from an off-the-road event prior to crashing into the cable guardrail usually resulting in major property damage and sometimes injury or death.
    3. **Overpass Concrete Support Pillars.** These pillars have been proven to be deadly in crashes.  
Recommend all pillars be protected with guardrails or crash cushions.
    4. **Utility Poles.** Utility poles near the roadway have been proven to be deadly in Texas vehicular crashes.  
To reduce fatalities, recommend TxDOT declutter clear zones of utility poles that are placed within 34 feet of the roadway if the speed zone is 65 mph or greater, 32 feet for speed zones of 60 mph, 24 feet for 55 mph, 22 feet for 45-50 mph, and 16 feet for 40 mph or less (AASHTO guidelines for flattest slopes, not using ADT, discussed later). Otherwise, guardrails should be used to protect road users from the roadside utility poles.
    5. **Trees and Brush.** Trees and brush near the roadway (at distances greater than 30 feet in some cases) have been proven to be deadly in crashes (even in crashes with vehicle speeds as slow as 45mph).  
To reduce fatalities, recommend TxDOT declutter clear zones of trees and brush that are placed within 34 feet of the roadway if the speed zone is 65 mph or greater, 32 feet for speed zones of 60 mph, 24 feet for 55 mph, 22 feet for 45-50 mph, and 16 feet for 40 mph or less (AASHTO guidelines for flattest slopes, not using ADT, discussed later). Otherwise, guardrails should be used to protect road users from the roadside trees or brush.
    6. **Median Drop-offs at Overpasses, Rivers, etc.** There have been many crashes where the driver entered the median prior to the inside (fast) lane guardrail approaching an overpass or bridge. Using a three-second reaction time, the driver is sometimes too late to brake to prevent the vehicle from plunging off the cliff-like drop-off in the median to the road or river below, resulting sometimes in a major fiery crash with fatalities or serious injuries.  
Recommend TxDOT use the guardrail/barrier systems used by both Nebraska and Florida. They use tapered/flared guardrails or other engineered barriers

(earthen berm) as a last-line-of-defense prior to a vehicle plunging off the center median to a river or road below.

7. **Roads that have a high probability to flood** or roads that historically flood (water on the roadway or in the clear zone). Texas has many fatalities annually due to drowning-in-vehicle due to drivers having access to flooded roads and either making the poor decision not to stop/turn around or just not comprehending the dangerous situation because of darkness or poor visibility. In Nebraska, preemptive road closures due to hazardous weather (blizzard) conditions is accomplished by using pre-engineered swinging barricades that are stored in a safe manner on the side of the road so that first responders or police officers can deploy them by swinging the barricade from the stored roadside position to the blocking position without assistance from DOT personnel. Recommend TxDOT use a similar system for barricading flooded roads in Texas. They could be a life-saving and preventative engineering tool for TxDOT to use during heavy rain events, tropical depressions, or hurricanes. Recommend TxDOT close and thoroughly barricade all flooded roads and promote a policy that if a vehicle has access to a flooded road, then TxDOT has failed to provide a safe system.
- ii. **Context Sensitive Solutions.** Recommend TxDOT re-energize a Safety Culture at the local level by giving District Engineers the authority to deviate from set policies or guidelines if the deviation errors on the safe side or developing a system to approval context sensitive solutions from higher authority. Example...US-77 / FM-1717 Intersection in Kingsville, Texas (5 fatal crashes over the years).
  1. Speed Limits and the 85<sup>th</sup> Percentile Rule, City Ordinance and County Resolution vs TxDOT refusal to lower speed limit
  2. Gross Violation of Median Left Turn Lane Distance, 145 feet vs 865 feet (17%) at 65 mph.
  3. Speed limit signs increase speed prior to subdivision turn-off and prior to high-speed merge lane (yield sign)
  4. Interstate standard merge lanes vs yield-to-merge lanes disguised as interstate-standard merge lanes (prior traffic fatality in Kingsville)
  5. Stop sign placement on non-perpendicular intersections.
- iii. **75 and 70 mph Work Zones** (Mathis, Sinton, Robstown, Linn). The high-speed road culture in Texas is becoming very dangerous and due to TxDOT's new policy of allowing 70 and 75 mph work zones, those dangerous and aggressive driving habits are being transferred to work zones and to within feet of workers on the ground. With TxDOT 75 and 70 mph regulatory speed limit work zones, drivers are now desensitized to the dangerous aspects of vehicle speed in work zones and driving extremely close to stopped vehicles and people working, separated sometimes by only construction barrels or cones. Many cities and states across the country are adopting vision zero principles and reducing speed limits in urban areas to 20 or 25 mph to protect pedestrians and bicyclists from deadly crashes with vehicle drivers. Why is TxDOT allowing 70 or 75 mph vehicle speeds passing within feet of their workers or contractors in their work zones? Recommend a maximum speed limit of 65 mph in TxDOT work zones with further restrictions listed below in d.i, ii, iii, & iv.
- iv. **School Zones.** In Bishop, Texas, the school board asked TxDOT (Corpus Christi District Office) for a school zone along US-77 as the highway had a regulatory speed limit zone of 65mph at the time that the new high school was built. TxDOT conducted a safety survey and then told the school board that the school zone with reduced speed limits was not warranted. I got involved because my two oldest daughters were attending Bishop High School. Evidently, the school board believed their options to get a school zone were depleted after TxDOT CC told them it was not warranted. I informed the board that if they voted and signed a resolution for a school zone and mailed it to Austin, they probably would be approved for a school zone. I also got the Bishop City Commission to also vote and sign a resolution for the school zone and sent it off to Austin for final

approval. Nine months later the school zone was in place. Does TxDOT have a safety culture?

Recommend TxDOT reinforce, at the local level, the desire to provide maximum safety initiatives to schools and their children (our most vulnerable road users in the system).

Recommend TxDOT be proactive in seeking school areas that can benefit from an implemented school zone or other nearby intersections and streets for improvement, including speed reductions.

- c. **Recommend changes to the TxDOT Roadway Design Manual.** As previously discussed, I believe safety can be greatly improved by decluttering clear zones. **AASHTO's yellow book (4<sup>th</sup> edition, 2011, page 3-1 and 3-2) talks about 30-foot clear zones for high-speed highways. At 30 feet, AASHTO states that about 80% of vehicles will recover from off-the-road crashes prior to hitting fixed objects placed at 30 feet from the roadway. What about the other 20%?** AASHTO also talks about variable clear zone distances (starting in 1977) less than 30 feet based on traffic volume, speeds, and roadside geometry because 30 feet was considered excessive and seldom could be justified for engineering, environmental, or economic reasons. Nowhere in that sentence does AASHTO mention the words "crash survivability" or "blunt force trauma" or "death reduction" as a result of a vehicle with occupants crashing into a fixed object in the clear zone less than 30 feet from the roadway. In relation to death reduction and crash survivability, what does traffic volume have to do with the physics of a vehicle crashing into a fixed object at a certain speed and a certain roadside geometry?
- i. If TxDOT is truly serious about death reduction and crash survivability of their road users, then I recommend the TxDOT Roadway Design Manual be changed regarding Table 2-12: Clear Zones (page 2-46). It should get rid of "Avg. Daily Traffic" restrictions to clear zone distances and also get rid of the "Functional Classification" column that also restricts clear zone distances because those two classifications have nothing to do with the physics of crash survivability and death reduction.
  - ii. Clear zones should use the safest (greatest) distance outlined in the AASHTO guide.  
Recommend the TxDOT table also incorporate clear zone distances of 30-34 feet (like AASHTO) for the highest volume high-speed highways with the flattest slopes. To clarify, the TxDOT Roadway Design Manual should use the greatest distance outlined in the AASHTO guide and based only on speed and slope to determine clear zone distances.
- d. **Recommend changes to the TxDOT system to set speed limits on undivided roadways to be no greater than 65mph.**
- i. Texas is probably the only State that allows 70 or 75mph speed limits on undivided roadways. Why must Texas be a "MAVERICK" State when it comes to speed limits on undivided roadways? Does TxDOT utilize "best practices" when it comes to roadway safety and traffic devices? If so, then the use of speed limits at or lower than 65mph on undivided roadways for 49 States should be a clue as to the best practice regarding speed limits on undivided roadways. TxDOT and the Texas Legislature first adopted speed limits greater than 65mph on undivided roadways in 2011. Since then, NOT ONE OTHER STATE DOT or LEGISLATURE has approved such a dangerous speed limit on the most dangerous system of vehicle transportation, that is, the undivided roadway. For every State except Texas, the best practice for speed limits on undivided roadways is no faster than 65mph.  
To save lives, it is recommended that TxDOT immediately ban speed limits faster than 65mph on undivided roadways and join the other 49 States and utilize the "best practice" of speed limits of 65mph or lower on undivided roadways.

**e. Recommend changes to the TxDOT system to set speed limits in work zones (construction speed limits).**

- i. Recommend that construction speed limits be at least 10 mph slower than the posted regulatory speed limit prior to the start of construction, and never to be greater than 65mph.
- ii. Recommend that construction speed limits be a maximum of 45 mph if workers or stopped construction vehicles are present in one lane (or shoulder) and moving traffic is in the adjacent lane and the two lanes are separated only by construction cones or barrels. In this case, a speed limit greater than 45mph would require a hard barrier (concrete) between workers/stopped construction vehicles and the moving vehicles of the road users.
- iii. Exception to ii above. If the work zone has three or more lanes available and if a non-travel lane (a lane width of 8 feet or greater) can be used to separate the workers/construction vehicles from the travel lane(s), then, recommend the non-travel lane must have, within its boundaries, two rows of construction barrels/cones in an effort to give errant vehicle drivers the awareness of the deviation (by hitting barrels/cones in the first row) and the time/distance to correct back to the proper travel lane before hitting the second row of construction barrels/cones. Using a non-travel lane for separation should be the last resort whereas the use of a concrete barrier between fast moving vehicles and workers is the only sure method to EndTheStreakTX and prevent worker fatalities in work zones. If a concrete barrier is not used, but the non-travel lane method is used to separate workers and the travel lanes, recommend the construction speed limit should never be greater than 55 mph.
- iv. Recommend that any request for a deviation from the above three recommendations (d.i ii, and iii) must be presented by a Safety Officer and the project engineer requesting the deviation to the Texas Transportation Commission when the Minute Order for Construction Speed Limits is being considered for approval so that the Commissioners can have a full understanding for the requested deviation, full understanding of the traffic control plan, and have the opportunity to ask questions, if needed.

**f. Recommend statewide transformational changes to the Texas traffic safety system and organizational structure.**

- i. For the Texas Legislature and the Governor: Recommend the creation a Texas Traffic Safety Commission (like the State of Washington, attached)
- ii. For TxDOT: Recommend removal of the Highway Safety Office and Traffic Safety Section from the TxDOT Operations Division (move to the new Safety Division, see iii below)
- iii. For TxDOT: Recommend creation of a new TxDOT Safety Division, headed by a Chief Safety Officer with an equal seat at the table with the three other TxDOT Chiefs (Finance, Engineering, & Administration).
- iv. Recommend TxDOT promote Vision Zero principles, set annual road death goals below 3,000 immediately, below 1500 by the year 2030, and zero by the year 2050.

- g. Recommend TxDOT provide the Texas Legislature a pre-session report.** This report would be presented to the Governor, the House, and the Senate, at the start of each legislative session outlining the department's efforts to reduce road death year over year. Not lobbying, but simply stating what is being done and how it is being done. This report would work as a reminder to all legislators that TxDOT and the Texas legislature are the two largest stakeholders in reducing traffic fatalities and the two must work as a team to effectively achieve the state's goals on traffic safety initiatives and spending. It is not in the best interest for the State, or the taxpayer for that matter, to have TxDOT spending millions of dollars, time, and effort on traffic safety initiatives to only have the Legislature

wipe it clean with a mere vote of its members without fully understanding what time and treasure went into the initiative in the first place (i.e., Red Light Cameras, 2019).

4. **Conclusion: A Call for Action.** Letter to all TxDOT employees and other Texas traffic safety stakeholders (attached).

Respectfully submitted,

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Vision Zero South Texas