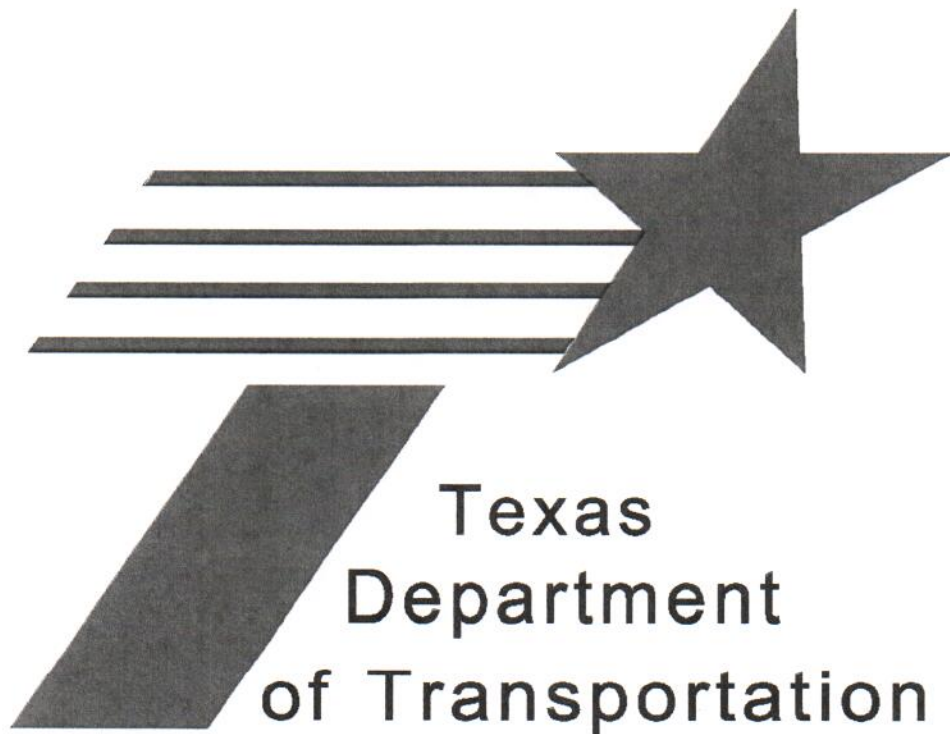


Procedures for Establishing Speed Zones



Revised August 2015

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Manual Notice 2015-1

From: Carol T. Rawson, P.E

Illegally changed this manual. The manual is proof.

Manual: *Procedures for Establishing Speed Zones*

Effective Date: August 01, 2015

Purpose

The purpose of this revision is to update information in Chapter 3 of *Procedures for Establishing Speed Zones* pertaining to the establishment of lower than 85th percentile speeds on sections of highways with crash rates greater than the statewide average for similar roadways. The update specifies criteria and procedures used to make this determination, and is issued as a response to a recent rule change by the Texas Transportation Commission.

Illegal, undemocratic and dangerous!

Contents

The only content change made at this time, described in the paragraph above, appears on pages 3-18 and 3-19 of this manual.

Supersedes

This manual supersedes all prior editions of *Procedures for Establishing Speed Zones*.

Contact

For more information on the changes made to *Procedures for Establishing Speed Zones*, contact Brian Stanford in the Traffic Operations Division, Traffic Engineering Section by email at Brian.Stanford@txdot.gov, or by phone at (512) 416-3122.

Archives

Past manual notices are available in a [PDF archive](#).

long as they are aware of the conditions around them. Speed zone regulations are based on Section 545.351, which states in part: “An operator may not drive at a speed greater than is reasonable or prudent under the circumstances then existing.”

Prima Facie Concept

In Texas, all speed limits are considered *prima facie* limits. *Prima facie* limits are those limits that, “on the face of it,” are reasonable and prudent under normal conditions. To exceed a *prima facie* speed limit does not automatically constitute an infraction of the law, as reasonable and prudent driving behavior is, at times, possible at speeds in excess of the posted limit. However, the burden of proof of reasonable and prudent conduct under the existing conditions rests with the driver. To afford a driver this opportunity to exceed a *prima facie* speed limit recognizes the fact that any posted speed limit cannot adequately reflect the many different road conditions confronting the driver on the same highways at different times.

Authority to Set Speed Zones

The provisions of the Transportation Code, Chapter 545, Subchapter H, Section 545.353, give the Texas Transportation Commission the authority to alter maximum speed limits on highway routes both within and outside of cities, provided the *Procedures for Establishing Speed Zones* are followed and the Commission determines that the speed being established on a part of a highway system is a safe and reasonable speed for that part of the highway.

Higher Maximum Speed Limit *Rep. Elkins (and I) passed HB 1353 in 2011.*

The Commission may establish a speed limit of:

- ◆ 75 miles per hour on any portion of the state highway system. *No more 65 night.*
- ◆ 80 miles per hour on parts of Interstate Highway 10 and Interstate Highway 20 in Crockett, Culberson, Hudspeth, Jeff Davis, Kerr, Kimble, Pecos, Reeves, Sutton, and Ward counties, or
- ◆ Up to 85 miles per hour on a highway designed to accommodate travel at the speed being established.

Local Authority and TxDOT

The altering of the general statewide maximum speed limits to fit existing traffic and physical conditions of the highway constitutes the basic principle of speed zoning.

Transportation Code, Chapter 545, Subchapter H, Sections 545.355 and 545.356, give counties and cities the same authority within their respective jurisdictions. Counties with a population of more than 2.8 million and cities have the authority to establish a *prima facie* maximum speed limit of 75 miles per hour. The law also provides that any speed zone on highway routes in cities established

- ◆ It is a two-lane, undivided highway or part of a highway.

If the roadway meets the above criteria, the city may declare a lower speed limit of not less than 25 miles per hour if the governing body determines that the prima facie speed limit on the highway is unreasonable or unsafe.

The authority of regional tollway authorities, regional mobility authorities, and the commanding officer of a United States military reservation to alter speed limits is addressed in Transportation Code, Sections 370.033, 545.354, and 545.358. These decision-making authorities are required to follow the speed zone procedures as adopted by TxDOT when altering, on the basis of an engineering and traffic study, speed limits on off-system turnpikes or on-system highways within the confines of a military reservation.

Value of Speed Zoning

Although comparative “before-and-after” studies indicate that speed limit signs actually have very little influence on the driver’s choice of speed, speed zoning is necessary and does serve a worthwhile purpose. Realistic speed zoning will serve to protect the public and to regulate the unreasonable behavior of an individual. Having recognized that normally careful and competent actions of a reasonable person should be considered (legal), the Texas Legislature has passed legislation concerning speed zoning in order to assure this (protection). If a speed zone is determined by the actions of the majority of drivers on a highway, then it is hoped that speed zoning will facilitate the orderly movement of traffic by increasing driver awareness of a reasonable and prudent speed.

Tx Legislature is suppose to (protect) our (legal) rights to drive a reasonable 85th% safe speed!

Properly applied speed zoning can: *If set to 85th%ile.*

- ◆ help drivers adjust their speed to the conditions
- ◆ make enforcement easier by furnishing police officers with a reasonable indication of what is excessive speed
- ◆ result in more motorists driving within the same speed range at each of the locations along the highway
- ◆ *uniform traffic flow = SAFETY.*

- ◆ reduce the frequency and severity of crashes *when accompanied by enforcement.*

Speed enforcement does NOT improve safety. Often increases crashes (FL, CN, etc.)

The Michigan Department of Transportation made a study entitled “Comparison of Speed Zoning Procedures and Their Effectiveness” dated September 1992. The following are some of the study’s conclusions:

- ◆ *Higher SLs = Less fatal crashes.*
- ◆ Posting speed limits within 5 miles per hour of the 85th percentile speed has a beneficial effect, although small, on reducing total crashes but has a major beneficial effect on providing improved driver compliance. (See Chapter 3, “Speed Zone Studies,” for a discussion on the 85th percentile speed.)
- ◆ Posting speed limits more than 5 miles per hour below the 85th percentile speed does not reduce crashes and has an adverse effect on driver compliance.

Increases crashes -

Lowering more than 5 below 85th is NOT a viable option.

- ◆ Speed zoning should not be used as the only corrective measure at high crash locations in lieu of ~~other~~ ^{real} safety improvements.
- ◆ The use of radar to collect speed data appears to underestimate the 85th percentile speed by approximately 3 miles per hour.

Guidelines for Selecting Speed Limits

All authorized entities using these procedures should observe the following guidelines when selecting speed limits:

- ◆ Speed limits on all roadways should be set based on spot speed studies and the 85th percentile operating speed (see Chapter 3, “Speed Zone Studies,” of this manual). Legal minimum and maximum speeds should establish the boundaries of the speed limits. If an existing roadway section’s posted speed limit is to be raised, the roadway’s roadside features should be examined to determine if modifications may be necessary to maintain roadside safety.
- ◆ It is appropriate for posted speed limits to be based on the 85th percentile speed, even for those sections of roadway that have an inferred design speed lower than the 85th percentile speed. Posting a roadway’s speed limit based on its 85th percentile speed is considered good and typical engineering practice. This practice remains valid, even where the inferred design speed is lower than the resulting posted speed limit. In such situations, the posted speed limit would not be considered excessive or unsafe.
- ◆ Arbitrarily setting lower speed limits at point locations due to a perceived shorter than desirable stopping sight distance is neither effective nor good engineering practice.
- ◆ If a section of roadway has (or is expected to have) a posted speed in excess of the roadway’s inferred design speed and a safety concern exists at the location, then appropriate warning or informational signs should be installed to warn or inform drivers of the condition. Slightly shorter than desirable stopping sight distances do not present an unsafe operating condition, because of the conservative assumptions made in establishing desirable stopping sight distances. It is important to remember that any sign is a roadside object and that it should be installed only when its need is clearly demonstrated.
- ◆ New or reconstructed roadways (and roadway sections) should be designed to accommodate operating speeds consistent with the roadway’s highest anticipated posted speed limit based on the roadway’s initial or ultimate function.

Section 2 — Determining the 85th Percentile Speed

General Concepts

The maximum speed limits posted as the result of a study should be based primarily on the 85th percentile speed, when adequate speed samples can be secured. The 85th percentile speed is a value that is used by many states and cities for establishing regulatory speed zones.

All states must be in substantial compliance to MUTCD.

Speed checks should be made as quickly as possible, but it is not necessary to check the speed of every car. In many cases, traffic will be much too heavy for the observer to check all cars.

~~Theory~~ Try FACTS.

Use of the 85th percentile speed concept is based on the ~~theory~~ ^{fact} that: **85th is SAFEST limit.**

- ◆ the large majority of drivers: **90%+**
 - are reasonable and prudent ✓
 - do not want to have a crash **< 5% crash annually**
 - desire to reach their destination in the shortest possible time **safe expedition principle**
 - ◆ a speed at or below which 85 percent of people drive at any given location under good weather and visibility conditions may be considered as the maximum safe speed for that location. **(85th + 5mph) (>95%ile)**
- 90thile safe for Interstates.**

Statistical Rationale

The results of (numerous and extensive) "before-and-after" studies substantiates the general propriety and value of the 85th percentile criterion.

Statistical techniques show that a normal probability distribution will occur when a random sample of traffic is measured. From the resulting frequency distribution curves, one finds that a certain percentage of drivers drive too fast for the existing conditions and a certain percentage of drivers travel at an unreasonably slow speed compared to the trend of traffic.

FHWA SLS "the slowest drivers crash the most, not fastest." Solomon, Cirillo, etc.

Most cumulative speed distribution curves "break" at approximately 15 percent and 85 percent of the total number of observations (see Figure 3-1). Consequently, the motorists observed in the lower 15 percent are considered to be traveling unreasonably slow and those observed above the 85th percentile value are assumed to be exceeding a safe and reasonable speed. Because of the steep slope of the distribution curve below the 85th percentile value, it can readily be seen that posting a speed below the critical value would penalize a large percentage of reasonable drivers. **(5mph+)**

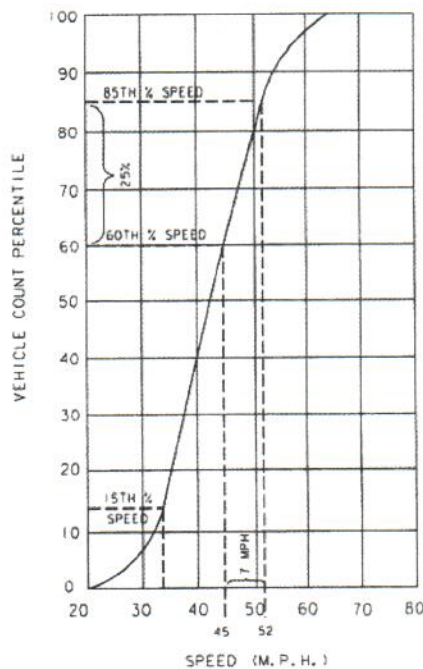


Figure 3-1. Cumulative speed distribution curve

Odessa
I-20 unfairly
12 below 85th (p. 318) punishes >70%.
= 82%

The example illustrated in Figure 3-1 shows that a speed posted for 7 miles per hour below the 85th percentile speed would unfairly penalize (25 percent) of the drivers who would otherwise be considered to be driving at a reasonable and prudent speed. Therefore, for purposes of speed zoning, the maximum posted speed should be as near as possible to the 85th percentile value, and whenever minimum speed zones are used, the minimum posted speed should be within 5 miles per hour of the 15th percentile value. (See Chapter 2, Section 2, for additional information on “Minimum Speed Limits.”)



Experience proves these findings valid and shows that the 85th percentile speed is the one characteristic of traffic speeds that most closely conforms to a speed limit which is considered safe and reasonable.

* 85th %ile IS the SAFEST speed limit. Rounding down

Speed Checks for Existing Highways IS WRONG: causes more crashes, injuries and deaths.

Speed checks are of prime importance, because they:

- ◆ represent the consensus of drivers as to the safe speed at a given location
- ◆ provide the basic data on which the regulatory speed zone is based.

1. Add the tally marks as shown in the “Cumulative Total” column in Figure 3-2. Note that the marks are added from the bottom up.
2. For each “Cumulative Total” column, calculate 85 percent of the total number of vehicles checked.

EXAMPLE: Figure 3-2 shows that 125 cars were counted in the northbound direction. So 85 percent would be 106 ($125 \times 0.85 = 106$). Thus, the 106th car (counting up from the bottom) represents the 85th percentile speed.

3. Determine the speed at which the car representing the 85th percentile was traveling. Again from the northbound example in Figure 3-2, the 106th car was traveling at 48 miles per hour. Thus, 48 miles per hour is the 85th percentile speed.

On the back of the Radar Motor Vehicle Speed Field Tally Sheet there is an “85th Percentile Calculation Table,” which may be used to readily determine the 85th percentile car if the total number is between 80 and 239.

In no case shall the 85th percentile speed be interpolated between two speeds in the M.P.H. column.

After the locations of the speed check stations have been decided upon and the speed checks have been made, the 85th percentile speeds should be calculated immediately in the field. By doing so, it is possible to get an idea of what the speed curve will look like and to determine if more speed check stations are needed.

Recording the Information

Record the speed check data on the strip map as described in Section 3, "Developing Strip Maps" of this Chapter. The blocks shown on the strip map contain the 85th percentile speed, the speed of the fastest car checked, and the number of cars checked (reading from top to bottom in order). Show a block for each speed check location for each direction of travel measured.

mph that flashes on the approach and departure side of the 35-mph school zone (see Figure 3-9). This design promotes better public relations, because people are not encouraged to violate or disrespect the law when driving through permanent transition zones that are in effect 24 hours a day. Other situations may not lend themselves to such transition zones and, therefore, should be left up to engineering judgment. The basic sign design for a school transition speed zone sign is the same as that for a regular school speed limit sign. Where TxDOT is responsible for signing school speed zones and school transition speed zones, the SCHOOL SPEED LIMIT XX WHEN FLASHING sign should be used.

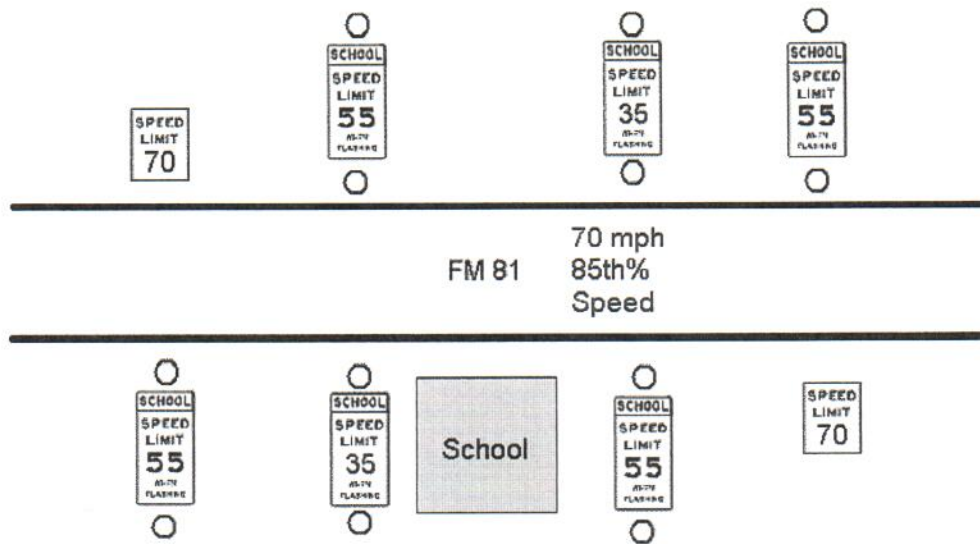


Figure 3-9. Typical school zone with flashing buffer zone

Showing Crashes on Strip Maps

At locations where recommended speed zones will be 5 miles per hour or more below the 85th percentile speed because of high crash experience, the crashes for the most recent calendar year available should be shown on the strip map. RI-1 Sheets will facilitate accurate plotting of crashes, since crash locations are coded from these sheets.

When districts submit strip maps or prints to the Traffic Operations Division (TRF) for review, TRF will obtain the crash rate for the roadway section in question as well as the statewide average crash rate for the appropriate type of roadway section and add these data to the strip map. Crash rates will be considered before lowering the zone. These data will be an important consideration in determining whether the lower zoning is justified.

Crash data need not be plotted on the strip map when proposed speed zones are within 5 miles per hour of the 85th percentile speed checks.

Variation from 85th Percentile

The posted speed selected is the nearest value ending in 5 or 0. The final speed limit may be lowered or raised by as much as 5 miles per hour from the 85th percentile speed or trial-run speed (if 125 cars cannot be checked during the two- or four-hour speed check) determined by the study, based on the professional judgment of the supervising engineer. Only under special conditions would the zone speed vary further from the 85th percentile. Explanations of such conditions follow.

Different Results at Adjacent Speed Check Stations. If the 85th percentile speeds for adjacent speed check stations are approximately the same, they may be averaged to determine the zone speed. Any 85th percentile speed should **not** be included in such averages if it varies more than 7 miles per hour from the speed derived from the average.

Crash Rate Greater Than Average. On a section of highway having a crash rate greater than the statewide average crash rate for the same type roadway section, the zone speed may be as much as 7 miles per hour lower than the 85th percentile speed. NOTE: This should be considered more as an exception than as a rule, and should be done only where enforcement agencies will assure a degree of enforcement that will make the speed zone effective.

Light Traffic Volumes. At locations where traffic volumes are light and 125 cars cannot be checked in the two or four hours that the speed check station is operated, the 85th percentile speed may not be reliable. Trial runs need to be made and documented in the study. ("Trial runs" are defined and explained later in this section.) Trial runs may be documented using the Summary of Trial Run for Speed Zones (TxDOT Form 1929), to supplement a strip map. (The form is available via hyperlink — click on the form number above — or from the Traffic Operations Division.) Figure 3-10, "Example of completed Summary of Trial Run for Speed Zones." shows an example of a completed Summary of Trial Run for Speed Zones.

Legislative or Congressional Action. Notwithstanding the volume of traffic, if legislative or congressional action results in the immediate increase in statewide maximum legal speed limits, then reasonable and prudent speed zones may be established by trial runs and engineering judgment in lieu of other speed check procedures provided in this manual. ("Trial runs" are defined and explained later in this section.) Trial runs may be documented using the Summary of Trial Run for Speed Zones (TxDOT Form 1929) instead of a strip map. (The form is available via hyperlink — click on the form number above — or from the Traffic Operations Division.) Figure 3-10, "Example of completed Summary of Trial Run for Speed Zones." shows an example of a completed Summary of Trial Run for Speed Zones. Speed zones established through this process should be rechecked in accordance with the procedure in Section 5 of this chapter.

Provisional Traffic and Engineering Investigation Requirements. When increasing the speed limit from 70 to 75 miles per hour as authorized by the legislature, the speed zone study may be limited to the determination of the 85th percentile speed at one or more

This was
immorally
(illegally?)
removed in
8/2015 and
replaced with
OK for 12
below despite
6 warnings+
in this manual
NOT to do
it! (2006-15)
See page 1-7
(bottom).

ITE says NO > 8 below for any reason.

to correct engineering malpractice?

Again, speed enforcement does NOT help safety or compliance.

Variation from 85th Percentile

The posted speed selected is the nearest value ending in 5 or 0. The final speed limit may be lowered or raised by as much as 5 miles per hour from the 85th percentile speed or trial-run speed (if 125 cars cannot be checked during the two- or four-hour speed check) determined by the study, based on the professional judgment of the supervising engineer. Only under special conditions would the zone speed vary further from the 85th percentile. Explanations of such conditions ^{paraphrased} follow.

** Unethically removed "should not go > 7 below 85th %ile (2006-15)"*

Different Results at Adjacent Speed Check Stations. If the 85th percentile speeds for adjacent speed check stations are approximately the same, they may be averaged to determine the zone speed. Any 85th percentile speed should **not** be included in such averages if it varies more than 7 miles per hour from the speed derived from the average.

Does NOT apply to Interstates.

Crash Rate Greater than the Statewide Average Crash Rate for Similar Types of Roadways.

When establishing a speed within an existing zone on the (state highway system) the speed limit may be reduced by up to 12 miles per hour below the 85th percentile speed if the crash rate in the section of the roadway is greater than the statewide average crash

Odessa 2012 85th = 77

SL 70 → 75 2016 Illegally lowered to 65

rate for similar roadways. The latest speed study that has been performed on the roadway should be evaluated to determine if the information is still relevant based on the roadway traffic and characteristics. If so, then this can be used as the basis for lowering the speed limit. If the existing speed study is not valid, the district has three options:

- ◆ perform a full 85th percentile speed study
- ◆ perform an 85th percentile study at one or more locations within the segment
- ◆ perform a trial run speed study within the segment.

After determination of the 85th percentile speed, the following factors should also be considered to determine the total speed limit reduction up to 12 mph:

Does NOT apply to Interstates

- ◆ narrow roadway pavement
- ◆ horizontal and vertical curves
- ◆ high driveway density
- ◆ lack of striped, improved shoulders
- ◆ crash history within the speed zone.

NPA, DWI, F to Yield cause crashes NOT speed of vehicle.

This is (Illegal) dangerous malpractice. ITE FHWA MUTCD Parker Mauz

*Lower SLs = more fatalities
Higher SLs = Less fatalities*

Going 12 below goes against decades of proper engineering judgement and this manual.

The final decision on the amount of variation should be based on the engineering judgment of the supervising engineer. Under this process, a strip map is not required. All other speed zoning rules within this manual apply for this section. *There are numerous warnings in this manual against going below 85th. And some in Tx DOT Brochure.* TRF will routinely provide information to the districts for roadways that meet the criteria for using this process.

Light Traffic Volumes. At locations where traffic volumes are light and 125 cars cannot be checked in the two or four hours that the speed check station is operated, the 85th percentile speed may not be reliable. Trial runs need to be made and documented in the study. (“Trial runs” are defined and explained later in this section.) Trial runs may be documented using the Summary of Trial Run for Speed Zones (TxDOT Form 1929), to supplement a strip map. (The form is available via hyperlink — click on the form number above — or from the Traffic Operations Division.) Figure 3-10, “Example of completed Summary of Trial Run for Speed Zones.” shows an example of a completed Summary of Trial Run for Speed Zones.

Legislative or Congressional Action. Notwithstanding the volume of traffic, if legislative or congressional action results in the immediate increase in statewide maximum legal speed limits, then reasonable and prudent speed zones may be established by trial runs and engineering judgment in lieu of other speed check procedures provided in this manual. (“Trial runs” are defined and explained later in this section.) Trial runs may be documented using the Summary of Trial Run for Speed Zones (TxDOT Form 1929) instead of a strip map. (The form is available via hyperlink — click on the form number above — or from the Traffic Operations Division.) Figure 3-10, “Example of completed Summary of Trial Run for Speed Zones.” shows an example of a completed Summary of Trial Run for Speed Zones. Speed zones established through this process should be rechecked in accordance with the procedure in Section 5 of this chapter.

Provisional Traffic and Engineering Investigation Requirements. When increasing the speed limit from 70 to 75 miles per hour as authorized by the legislature, the speed zone study may be limited to the determination of the 85th percentile speed at one or more speed check locations within the established speed zone. Because the boundaries of the speed zone have been established for the 70 mile per hour zone, a strip map is not required for the increase. All other speed zoning rules within this manual apply to the provisional traffic and engineering investigations.

Farm to Market Roads NOT Highways **Additional Roadway Factors.** The posted speed limit may be reduced by as much as 10 miles per hour (12 miles per hour for locations with crash rates higher than the statewide average) below the 85th percentile speed or trial-run speed (if 125 cars cannot be checked during the two- or four-hour speed check), based on sound and generally accepted engineering judgment that includes consideration of the following factors:

- ◆ narrow roadway pavement widths (20 feet or less, for example)
- ◆ horizontal and vertical curves (possible limited sight distance)

NA
to
Interstates

- ◆ hidden driveways and other developments (possible limited sight distance)
- ◆ high driveway density (the higher the number of driveways, the higher the potential for encountering entering and turning vehicles)
- ◆ crash history along the location
- ◆ rural residential or developed areas (higher potential for pedestrian and bicycle traffic)
- ◆ lack of striped, improved shoulders (constricted lateral movement).

Local public opinion may also be considered on farm-to-market and ranch-to-market roads without improved shoulders (Transportation Code, Section 545.3535(b)).

The final decision on the amount of variation from the 85th percentile speed for a specific roadway should be based on the engineering judgment of the supervising engineer. If additional roadway factors are used to reduce the speed limit, include the factor or factors on the speed zone strip map.

Speed limits should not be posted more than 10 miles per hour (12 miles per hour for locations with crash rates higher than the statewide average) below the 85th percentile or trial-run speed (if 125 cars cannot be checked during the two- or four-hour speed check), since unreasonably low speed limits have (not) been shown to be an effective way to control speeding. Allowing too great a variation would risk losing motorist respect for speed limits and traffic control devices.

Blanket Lowering of Maximum Speed Limits

Did we learn nothing from 55 NMSL?
(1974-1995) RIP
never

A blanket lowering of maximum speed limits may be justified:

- ◆ during either state or national emergencies or disasters, such as war or energy crisis, where an authoritative study indicates that a reduction of speeds will result in a significant reduction in the consumption of fuel and energy and will promote fuel and energy conservation
- ◆ to avoid non-compliance with direct requests from the federal government to lower the state-wide maximum speed limit to a speed equal to or below the national speed limit.

Lower SLs do NOT slow down traffic (FHWA SLs).

Trial Runs

A “trial run” is a drive through the speed zoned section of roadway at the chosen speed(s) to determine if the speeds are appropriate for the area.

After the 85th percentile speeds and zone lengths have been selected, several trial runs should be made through the area in both directions driving at the selected speeds. This should show any irregularities in the zoning which need correction.

Documentation. Trial runs may be documented using the Summary of Trial Run for Speed Zones (TxDOT Form 1929) to supplement a strip map. (The form is available via hyperlink — click on the form number above — or from the Traffic Operations Division.) Figure 3-10 “Example of com-

Section 6 — Environmental Speed Limits Like 55, do NOT work.

Introduction

EPA (TCEQ) or whoever has NO right to set speed limits.

An environmental speed limit is a speed limit created by the Texas Transportation Commission at the request of the Texas Commission on Environmental Quality (TCEQ) for the purpose of meeting federal air-quality standards. The TCEQ is the state air-pollution control agency and is the principal authority in the state on matters relating to the quality of the state's air resources.

There are many ways to improve air quality. Lowering SLs is NOT one of them.

Existing Environmental Speed Limits

Existing environmental speed limits created at the request of the TCEQ may be retained on the state highway system until such time as the TCEQ advises the department in writing that the speed limit is unnecessary and a speed study performed for the area finds that the existing environmental speed zone is not reflective of the 85th percentile speed as determined by procedures detailed in this manual.

Any SL posted below the 85th is wrong and increase crashes.
ALL environment speed limits need to corrected to the 85th for safety and compliance.

New Environmental Speed Limits Prohibited

As per Transportation Code, §545.353(j), no new environmental speed limits may be created on the state highway system.

Abolish this TCEQ SL malpractice, now. And ALL SL malpractice!
 Burn less fuel? Easy solution. Get the unethically mandated Ethanol out of OUR gas! Even 10% ethanol can reduce mpg by about 12-15%. Is there any agency (or part) of OUR government NOT corrupted by special interests?

ALL Speed Limits need to be set to the 85th %ile for SAFETY.

No ifs, ands or buts! Any deviation is dishonest and dangerous.
 Engineers should know this. This manual concurs (except the illegal
 (Carol Rawson) 12 below 85th LIES on page 3-18). Strike that LIE (Fraud) from the manual!

SL research author (positive peer reviews) 85 publishings Greg Mauz