SPEED ZONING
A FUZZY GRAY AREA
OF TRAFFIC ENGINEERING

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“There is no single ‘right’ answer in setting appropriate speed limits or conducting enforcement activities because policy makers in different communities may legitimately disagree on the priority given to the factors – safety, travel time, enforcement expenditures, community concerns – that affect decisions about speed limits. The primary focus of speed management must remain on safety.”

Why is it a Fuzzy Gray Issue?

- Speed zoning can be a lightning rod for safety issues.
  - Some believe that . . .
    - Lowering the speed limit will make people slow down.
    - Raising the speed limit will make people drive faster.
  - Some believe that a speed limit is too high based on . . .
    - Series of crashes
    - Road alignment
    - Densely developed areas adjacent to the road
    - Concentrations of pedestrian / bicyclist activity
  - Most are not familiar with . . .
    - The concept of the 85th percentile operating speed and why it’s important.
    - The extensive list of tools available to effectively address safety issues.

... but some things are . . .
Universally Accepted Absolute Truths of Speed Zoning

• The guy in front of me is driving too slow.
• The guy behind me is driving too fast.
• The speed limit on the road I’m driving is too low.
• The speed limit in my neighborhood is too high.
Types of Speed Zones

- School zones
- Urban streets
- Rural roads
- Work zones
- Variable speed zones
Field review of the location
  - determine limits
  - roadway conditions
  - segments for study
  - existing and adjoining speed zones
  - intersections
  - adjacent development
  - urban/rural
The Process

- Analyze crash data
- Record operating speeds
- Take lots of photos
- Analysis
  - 85\textsuperscript{th} percentile
  - 50\textsuperscript{th} percentile
  - Average speed
  - % of vehicles in the Pace
  - Comparison of crash rate with similar roadways
- NDOT uses “US SPEED” software for the initial recommended speed
  
  http://safety.fhwa.dot.gov/USLIMITS/
Basic Project Information
- User Name - Bob Overat Endott
- Project Name - US 50 MP DO 4.0 to MP DO 4.3
- Project Number - US 50 (Zephyr)
- Project Date - 08-17-2012
- State - Nevada
- County - Douglas County
- City - Zephyr Cove-Round Hill Village CDP
- Route Type - Road Section in Undeveloped Area
- Route Name - US 50
- Termini From - DO 4.0
- Termini To - DO 5.0
- Route Status - Existing
- Description - This is Segment 1 of 2
Roadway Information

- 85th Percentile Speed - 48 mph
- 50th Percentile Speed - 44 mph
- Section Length - .30 mile(s)
- Statutory Speed Limit - 45 mile(s)
- AADT - 15,000
- Adverse Alignment - No
- Divided/Undivided - Undivided
- Number of Lanes - 4
- Roadside Hazard Rating - 4
Crash Data Information
- Crash Data Years/Months - 3/0
- Crash AADT - 15000
- Total Number of Crashes - 18
- Total Number of Injury Crashes - 7
- Section Crash Rate - 365 *
- Section Injury Rate - 142 *
- Crash Rate Average for Similar Sections - 508 *
- Injury Rate Average for Similar Sections - 168 *

Recommended Speed Limit: 45

* 100MVM
The Manual on Uniform Traffic Control Devices (MUTCD), Section 2B.13, states:

- “When a speed limit within a speed zone is posted, it should be within 5 mph of the 85th-percentile speed of free-flowing traffic.”

- It also identifies factors that may be considered when establishing speed limits:
  - Road characteristics, shoulder condition, grade, alignment, and sight distance;
  - The pace;
  - Roadside development and environment;
  - Parking practices and pedestrian activity; and
  - Reported crash experience for at least a 12-month period.

NRS 484A.430 1. The Department of Transportation shall adopt a manual and specifications for a uniform system of official traffic-control devices . . .
Speed Distribution Curve

- 15% of drivers (the guy in front of you)
- 70% of drivers; reasonable and prudent (me and you)
- 15% of drivers (the guy behind you)

85th Percentile Speed

Recorded Speed, mph

Number of Observations, n
Speed zones are normally posted at the 85th percentile operating speed.

Under normal conditions, at least 85 percent of drivers... are reasonable and prudent people.

Intuitively select a safe operating speed for perceived traffic and roadway conditions.

Posting a speed limit lower than the 85th percentile will not reduce operating speeds.

Raising a posted speed limit to the 85th percentile speed will not increase operating speeds.
Start with the 85\textsuperscript{th} percentile operating speed

Identify special conditions that could adversely affect safety. Remember the MUTCD factors to consider?

- Road characteristics, shoulder condition, grade, alignment, and sight distance;
- The pace;
- Roadside development and environment;
- Parking practices and pedestrian activity; and
- Reported crash experience for at least a 12-month period.
Post the 85th percentile speed
- Posting a speed lower than the 85th won’t reduce speeds
- The “problem” has not been addressed

To effectively address speed-related issues
- Identify permanent, effective, self-sustaining solutions; that is
  - Solutions that specifically address the issue and
  - That don’t require inordinate amounts of speed enforcement resources
Example

- Existing conditions
  - Ninety degree “curve”
  - Two-lane roadway
  - Residential area
  - Statutory speed zone = 25 mph
  - Presumed design speed ≈ 15 mph

- Issue: Drivers exceeding safe speed, failing to stay on curved road, and crashing into residences

- Citizens demanding posting of reduced speed limits

- Solution
  - Install double yellow centerline with raised reflective markers
  - Large arrow sign opposite the approach (optional)

- Result
  - Drivers voluntarily slow down before curve
  - No further run-off-the-road crashes
As a last resort after all other alternatives have proven to be ineffective, consider a speed reduction treatment.

- Traffic calming improvements in urban environments
- Variable speed limits
  - Strictly limited to periods of specific concern
  - Only with a commitment from law enforcement officials to target the area with speed enforcement activities
- Current research investigating speed limit reductions for rural communities
Per National standards, the posted speed limit should be within 5 mph of the 85\textsuperscript{th} percentile operating speed.

Posted speed limits do not affect the 85\textsuperscript{th} percentile operating speed.

Implementing permanent, self-sustaining solutions that specifically address the underlying speed-related issue have the greatest potential for success.
Questions?