

SPEED MANAGEMENT USING VERTICAL DEFLECTION

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January 25, 2023



AGENDA

Background of Recommended Practice

Major Content and Changes

Show me the data

Applications

Questions & Answers

ROAD MAP TO AN UPDATE

ITE RECOMMENDED PRACTICE



A Guide to Vertical Deflection Speed Reduction Techniques
Planning and Design of Speed Humps, Speed Tables and Other Related Measures

December 2022

Issues:

- 2011 did not address range of vertical deflection options
 - Cushions not well addressed
 - Speed management is an emerging topic
 - Most data was 2001 and older
 - Questions about impacts
-
- Task Force formed January 2021
 - Refresh completed June 2021
 - Open membership comment period Fall 2021
 - Panel review and staff production December 2022

THINGS THAT STAYED THE SAME

- Basic dimensions of humps and cushions
 - 3" high, 12-14' long
- Application vehicle speed \leq 30 mph or 50 km/h
- Number of lanes – 2 to 3
- Grade \leq 8%
- Curve \leq 200 foot radius (60 m)
- Not for intersection application
- Traffic control (signs, markings) following MUTCD
- Overall policy context – council approval of program
- Process leaning heavily on public engagement
- Construction process and inspection

CHANGES IN THIS RECOMMENDED PRACTICE

- More vertical deflection techniques
- Cushion design, not transverse for humps
- Inclusion of other measures as viable options
- Refined definition of “problem” based on empirical data
- Safety related speed metrics (5+ & 10+ mph over posted)
- Greater transparency in terms of data and impacts
- Review of legal cases involving vertical deflection
- Impact data related to property values, noise and emissions
- Definition on data collection - 2 mph speed bins

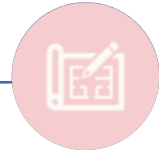
SUITE OF VERTICAL DEFLECTION



SPEED HUMP



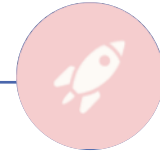
SPEED TABLE



**RAISED
PEDESTRIAN
CROSSING**



**RAISED
INTERSECTION**



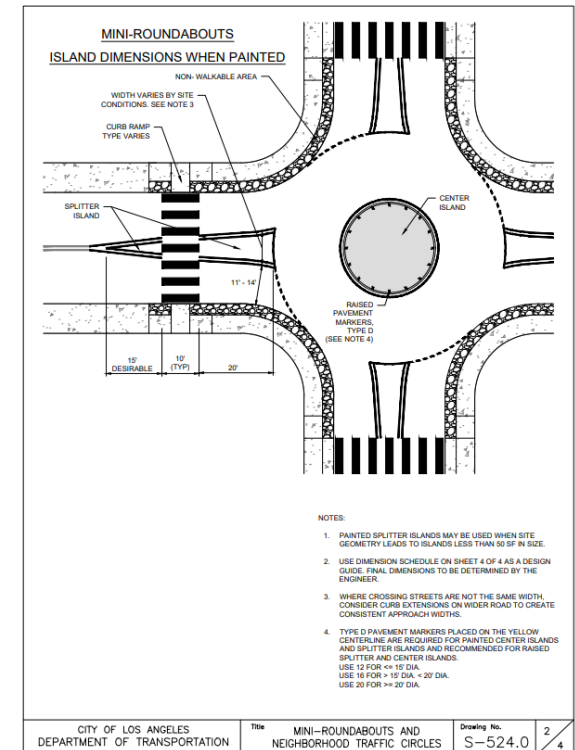
**TRAFFIC
CALMING
ROUNDBOUT**



**Other
Measures
Discussed:**

- Dips
- Higher Speed – Raised Safety Platforms (New Zealand/Australia)
- Vehicle Speed Feedback Signs

TRAFFIC CALMING ROUNDABOUT

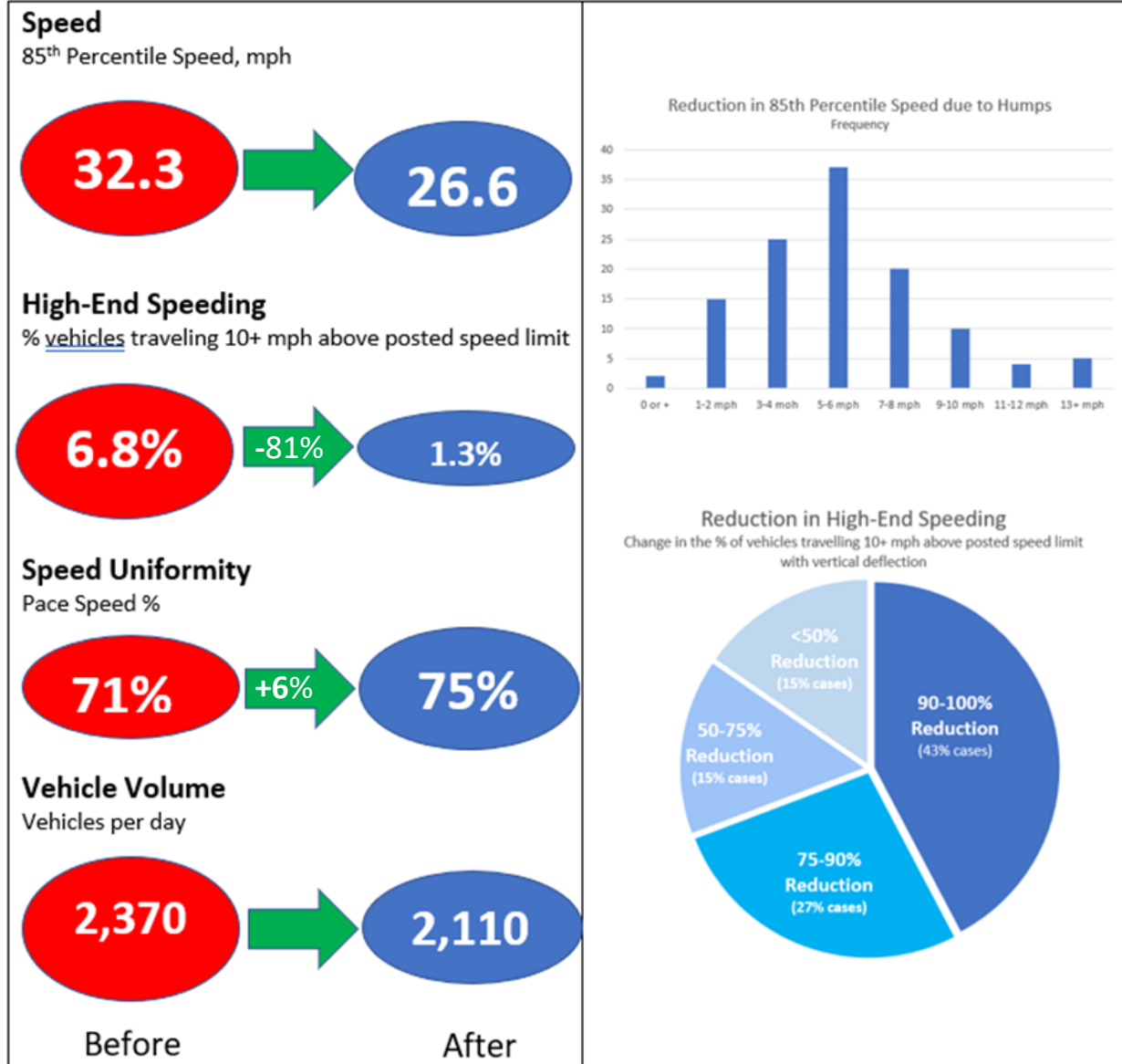


SHOW ME
THE DATA

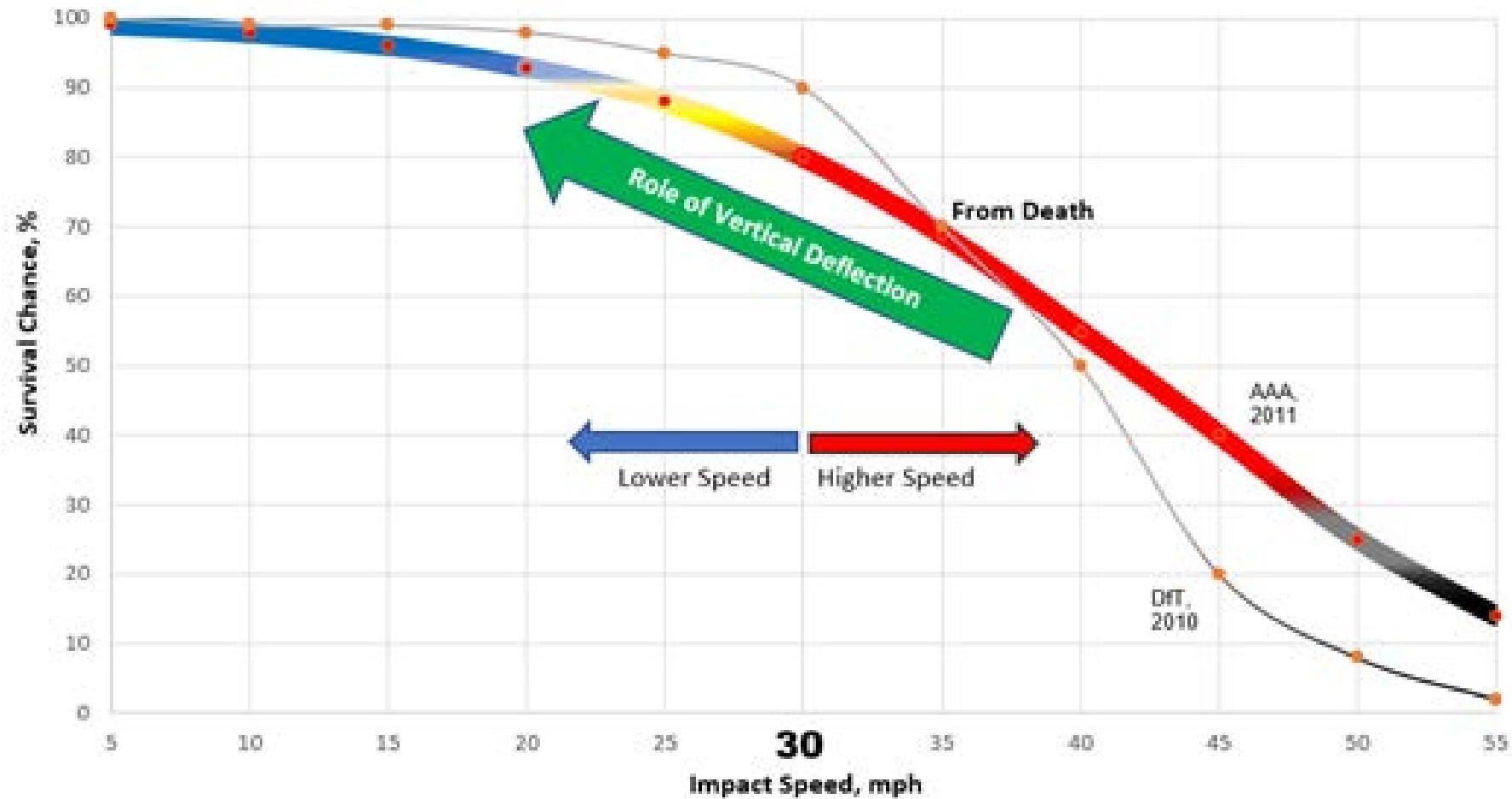
THE DATA'S
GOOD



SPEED MANAGEMENT



WHY SPEED REDUCTION?



RISK MANAGEMENT

1. Bumps
2. Too high
3. Lack of traffic control devices
4. ≤ 30 mph posted speeds
5. Tripping



PROPERTY VALUES

12



ITE Journal, 2000

...it cannot be demonstrated that installing speed humps will affect property values in any predictable way.

Bretherton, Edwards, Miao, Gwinnett County, Georgia

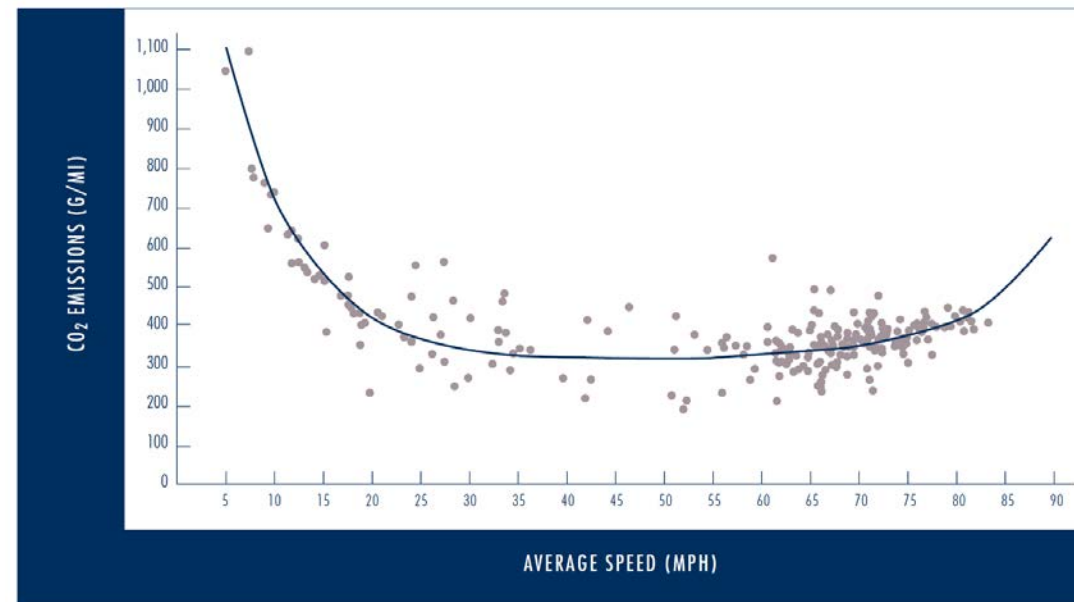
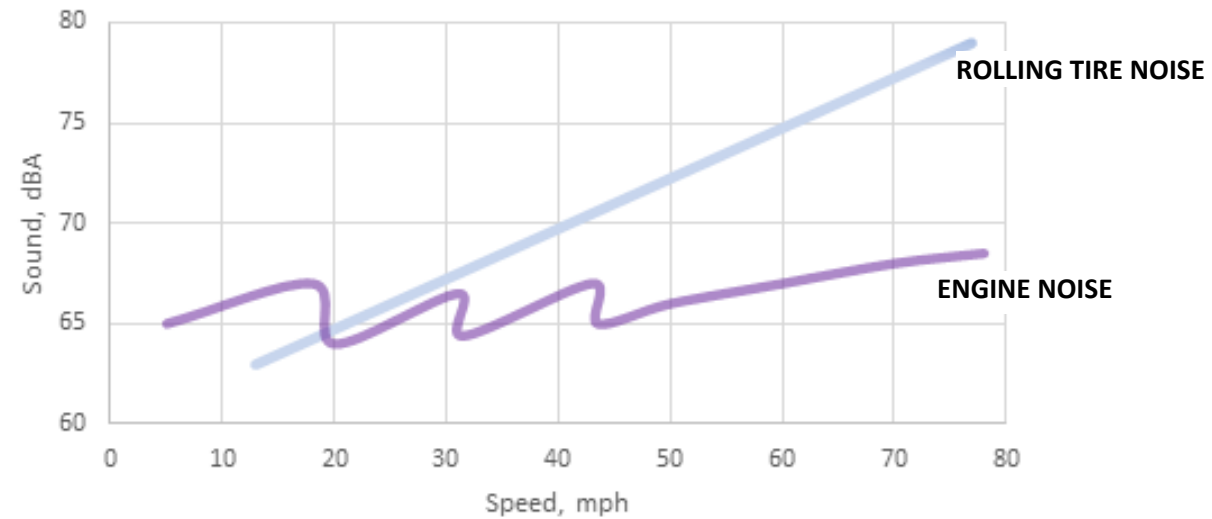
Zillow Analysis - Beaverton, OR, LaHabra CA, Lafayette, LA; 2021

- Tracking nearly 100 houses on hump streets and 100 on control streets there appears to be no differences in value (\$/SF)
- If a difference does appear, it seems possible that values increase for lower valued neighborhoods

Speed Hump Guide Refresh Task Force

City	Average Year of Original Construction		Average Zestimate		Average Square Footage (sq. ft.)	
	Control	Hump	Control	Hump	Control	Hump
Beaverton, OR	1960	1971	\$639,538	\$626,572	2,250	2,276
La Habra, CA	1950	1959	\$698,680	\$734,073	1,305	1,368
Lafayette, LA	1948	1930	\$96,318	\$118,115	1,396	1,531
City	Average Lot Size (sq. ft.)		Average Number of Bedrooms		Average Number of Bathrooms	
	Control	Hump	Control	Hump	Control	Hump
Beaverton, OR	18,800	14,444	3.2	3.6	2.2	2.5
La Habra, CA	5,640	6,332	2.8	3.7	1.6	2.0
Lafayette, LA	7,180	10,431	2.4	2.3	1.0	1.0
City	School Ratings (Elementary/Middle/High)		Walks Score		Transit Score	
	Control	Hump	Control	Hump	Control	Hump
Beaverton, OR	5/4/3	5/7/3	58	61	56	59
La Habra, CA	4/4/8	4/4/8	74	68	31	31

NOISE/EMISSION



Source: Barth, Boriboonsomsin,
Traffic Congestion and
Greenhouse Gases, University of
California Access Magazine,
Number 35, Fall 2009,
University of California,
Riverside, page 5.

Applications



WHAT DO THESE
HAVE IN COMMON?

Speed



VERTICAL DEFLECTION APPLICATIONS



- Consider neighborhood needs, concerns and issues
 - Volume impacts to other streets can be important
- Posted speed ≤ 30 mph
- Local and neighborhood streets
 - If on Collector and Arterials – 2 to 3 lane applications
- Spacing 250 to 500 feet
 - Consider traffic signals, stop signs, dips, roundabouts, other traffic calming measures in a system – not one isolated treatment
- Humps, Tables, Raised Pedestrian Crossings – **non-intersection**
- Raised Pedestrian Crossings, Raised Intersections, Traffic Calming Roundabouts – **intersections**
- Consider vulnerable users – particularly at raised intersections
- Most effective for conditions where % of vehicles traveling 10+ mph is greater than 10 percent, pace is below 70%, and volume is 2,000 vpd or greater, street widths > 32 feet and limited on-street parking

WHAT ARE THE COMMON MISTAKES



POOR DESIGN

- Too tall
- Lack of traffic control
- Bumps
- Too close to driveways

HIGH SPEEDS

Being above the posted 30 mph – this application is not well vetted

BIG STREETS

Primarily for two and three lane (up to 3 lane one-way)

POOR CONSTRUCTION

Lack of inspection rigor and templates

NOT SYSTEMATIC

Consider spacing of all measures and traffic control together or thinking one hump alone will do the job.
“500-foot guide”
Most importantly not involving the public.

NOT ONE SIZE FITS ALL



What 50 years of application evolved minimizes impacts:

- Noise
- Emissions
- Speed up to slow down,
- Wear/tear
- Risk management
- Property values
- First responder opposition

Jurisdictions that have adopted the International Fire Code should be aware that they need to seek the approval of the fire code official when installing traffic calming measures (2021)



ARTERIALS

- Common users:
 - First responders, transit, freight, motorcycles
- Large number of lanes and volume
 - Conflicts with lane changes
- Better solutions exist
 - Roundabouts
 - Medians
 - Feedback Signs
 - Signal coordination
 - Narrower lanes (10-11 foot)
 - Sidewalks and landscaping

QUESTIONS

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Portland, OR



A Community of Transportation Professionals