Speed Regulation Through Engineering Countermeasures

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Engineering Countermeasures

Fighting against trends

• Vehicle engineering
  – Quieter, easier handling vehicles

• Roadway engineering
  – Wide, well maintained roads
  – Disjointed neighborhoods

• Declining enforcement resources
  – More miles and fewer officers

• Human nature
General Approach

- Data collection
- Public education
- Plan development
- Consensus building
- Testing and evaluation
- Final implementation
Engineering Countermeasures

- Notification
  - Driver feedback signs
- Restriction
  - Road striping
  - Road diets
- Deflection
  - Vertical – Speed humps
  - Horizontal – Traffic circles and islands
Notification

Driver Feedback Signs and Radar Trailers

Permanent Radar Signs

Radar Trailers

Theory
Advising driver and surrounding traffic of speed may trigger change in behavior
Notification
Driver Feedback Signs – Thunderbird High School

Project Background
Part of school crossing upgrades
Arterial Street - 34,400 vehicle/day
Cost - $15,000
Project Conclusions
• Signs are very popular with schools and neighborhoods
• Not effective over time
• Maintenance concerns
Notification
Radar Trailer Program

Project Background
Trailers rented by city and deployed by rental company
Trailers typically deployed for one week
Cost - $500/week
Notification Radar Trailer Program

Project Conclusions
• Signs easy to deploy & popular with public
• Effective for short duration
• No maintenance

30 MPH Speed Limit (typ.)
Restriction
Road Striping

Theory
Delineating travel lane and optically narrowing pathway may slow traffic
Restriction
Road Striping

Practice
Add center line stripe
Edge stripe, bike lane or parking lane
Used on collector or arterial streets

Conclusion
• Possible speed reduction
• Often perceived speed reduction
• Buffer created between road and neighborhood
Restriction
Road Diet

Theory
Removing one or more lanes from multi-lane road:
- Sets speed at lead vehicle
- Eliminates passing
- Allows exit from travel lane prior to turning
- Provides room for bike lanes
- Reduces pedestrian exposure

Can be done without reducing intersection or signal efficiency
Volume reductions only possible if alternative routes are available
Restriction
Road Diet

Practice
Used on collector or arterial streets
Remove one travel lane in each direction
Add center two-way-left-turn lane
Add bike or parking lane
Room for add pedestrian islands
Restriction
15th Avenue Road Diet

15th Avenue:
Average Speed reduced by 3 mph
Volume reduced by 25%
No neighborhood cut-through
Reduced crash totals and rate
Reduced road noise levels

Conclusions
• Speed & volume reductions sustained
• Low cost (biggest cost - slurry)
• High neighborhood and biking community acceptance
• Evidence that parallel arterials took displaced volume
Deflection
Vertical or Horizontal

Theory
Creating vertical or horizontal displacement limits vehicle speed

Speed Humps

Traffic Circles and Islands
Deflection
Vertical – Speed Humps

Speed Humps
Asphalt mound 3 ½ inches in height
Used on local streets only
Requires neighborhood petitioning
Requires partial neighborhood funding
Cost - $1900

Conclusions
• Reduces speed at hump up to 5 mph
• Can reduce or shift cut-through traffic
• High neighborhood acceptance
• Reduces emergency response times
Deflection
Horizontal – Traffic Circles and Islands

Traffic Circles
Temporary or permanent islands built at intersections or driveways
Creates single horizontal travel path disruption
Used on local and collector streets
Requires neighborhood petitioning
Cost - $250-350,000

Traffic Islands
Temporary or permanent islands built on road segments
Creates multiple horizontal travel path disruptions
Used on collector streets
Requires neighborhood petitioning
Cost - $300-400,000
Deflection Traffic Circle

Practice
Collector-collector or collector-local intersection
Volume – 2000-10,000 vehicle/day
Local consensus required
Deflection Traffic Circles

Desired Results
Intersection remains safe
Reduced average speed
Reduced percentage of speeders
No shift in traffic patterns to other neighborhood streets
Deflection
36th Street at Rosemonte Drive Traffic Traffic Circle

Pre-installation
Collector – local intersection
Speed limit: 25 mph
Average speed: 34 mph
Speeding (>35 mph): 37%

Post-installation
Average speed: 28 mph
Speeding (>35 mph): 9%

Conclusion
• Traffic circle effectively reduced both average and high end speeds
• Highly divisive within neighborhoods

Temporary Test Circle

Permanent Circle
Conclusions

Engineering countermeasures...

• can be an effective tool to lower speed
• require careful evaluation
• can be expensive with long lead time
• works better with public consent
• drivers can and do compensate over time
Comments
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