

Speed Reduction Primer

Speeding on roadways is a driver behavioral issue. When trying to influence/change driver behavior there are three primary strategies that are utilized. All have limitations.

Education: Education is a passive form of behavior modification. Compliance is voluntary, and often times requires frequent messaging, or a negative experience for a behavior change to occur.

Examples	Description	Typical Costs	Pros	Cons
Public Service Campaigns	These are radio, television, podcast, or social media posts designed to target speed reduction messages	Variable depending on medium, but fairly inexpensive.	- Fairly inexpensive - Message and frequency can be controlled	- Behavior change is typically short lived - Audience can be limited based on mediums
Radar Feedback Signs	These are portable, or permanent installations that provide drivers with direct feedback on how fast they are traveling.	A portable trailer is approximately \$10,000 A permanent installation is approximately \$7,500	- Fairly inexpensive - Direct and consistent feedback message to all drivers on roadway	- Behavior change is short lived as documented in national studies - Deployment of portable signs is labor intensive

Enforcement: Enforcement is a direct form of modification. It utilizes a negative consequence (tickets/fines) to try an influence behavioral modification.

Examples	Description	Typical Costs	Pros	Cons
Patrol Officers	This is officers on the street that utilize radar to document travel speeds and requires active traffic stops to write tickets.	Costs are fairly negligible with the use of existing police resources	- Longer lasting than education - Monetary fines are good at behavioral changes	- Takes away from other policing needs - Resources are limited to be effective on all roadways
Automated Radar & Photo Enforcement	This utilizes radar to capture speed violations and photo evidence to capture license plate information.	Typical installations of equipment are handled by a third party at no initial cost. Cost are typically covered by a portion of each fine.	- Consistent presence - Higher rate of violation capture - Devices are mobile and can move around to problem areas	- Requires police verification of violation (time) - Public perceptions problems: most drivers view these as a means to generate revenue with the guise of trying to improve safety

Engineering: This involves physical modifications to the roadway environment to force driver behavior. It is the most active form of speed reduction. Stop signs, and traffic signals are not forms of engineering treatments implemented to control speeds. These can have negative secondary consequences, which is why engineering evaluations are required to support their installations.

Examples	Description	Typical Costs	Pros	Cons
Speed Humps or Cushions	These are physical humps placed in the vehicle travel path that slow vehicle speeds. Speed cushions have cut outs in the center that match the width of the wheel base on fire apparatus so they don't have to slow as much.	A typical speed cushion / speed hump is about \$6,000 per location installed	- Have been effective in Castle Rock at slowing vehicle speeds on local neighborhood streets - Generally a lower cost solution	- Impacts emergency response time - Impacts snow plow operations
Road diet (road width narrowing / lane narrowing / curb bump outs / delineators and markings)	This is a physical narrowing of the travel lane or roadway with the use of medians, curb bump outs, and / or the reduction in the number or width of travel lanes	Lane / road narrowing costs about \$100,000 per mile. Curb bump outs cost about \$20,000 per location installed.	- Have been effective at slowing vehicle speeds in some cases - Road diets & narrowing lanes can occur with the PMP - Bump outs can slow speeds and improve pedestrian safety/visibility	Can have impacts on snow plow and other roadway maintenance

Roundabouts	Intersection traffic control option that uses a circulating road around a center island	Costs can vary depending on the constraints of a given location but a typical two lane roundabout in Castle Rock currently costs about \$2.5 million to design, purchase right-of-way and construct.	• Help to control speeds by slowing vehicles • Improved safety by eliminating higher speed t-bone type collisions • Conserves gas and improves air quality by reducing idling and amount of acceleration	• Costlier to construct than other options • Usually requires more space / right-of-way than standard intersection
Chicanes / Lateral shift	Shifting of travel lanes from left to right or right to left over a distance	These type of improvement usually cost \$45,000 - \$60,000	• Have been moderately effective in urban areas with moderate to lower volume traffic	• Can increase risk of crash for distracted, unfamiliar, or inexperienced drivers
Speed table	Long speed hump, typically length of intersection or crosswalk area, flat in mid-portion with ramps on ends designed for target speed	A typical raised crosswalk / speed table is about \$40,000 - \$150,000	• Have been very effective in rural and urban areas with moderate to higher volume traffic • Ramps are designed for target speed • Less costly than a roundabout using available ROW	• Impacts emergency response time • If designed or built poorly, the impact will be more or less severe than intended • Drainage impacts need to be considered