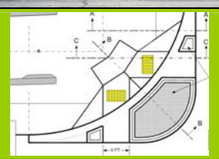
Portland Safer Routes to School **Matching Engineering Tools to Neighborhood Livability Goals** City of Portland, Oregon, Community and Schools Traffic Safety Partnership

Primary Goal	Street Type Permitted On	Tools	Pictures	Speed Reduction	Less Traffic	Emergency Delay	Cost	Notes	Examples
Auto Speed Reduction	All Streets	Enforcement		Varies	No	No	$60-90/hr	Duration of effectiveness unclear. New smart carts are approximately $5,000.	
		Smart Cart					~$100 in personnel time to place on street.		
		Speed Reader Board		Varies	No	No		Placed for 2-week intervals, long term effectiveness unclear. (1-year waiting list.)	
		Medians		Varies	No	Maybe	$40/SF or $15,000-$20,000 per location	Speed reduction greatest on curves. Limits ability of emergency vehicles to cross centerline. Cost is function of length of project and existing right of way use and width.	N Smith, St Louis to Columbia Way
	Local Service	14 ft Speed Bumps		Yes, 85% To 25 mph	Maybe	Yes 1.0-9.4 sec each	$2000	Most effective tool to reduce speeding. Emergency delay varies with desired speed and vehicle.	N/NE Dekum - Vancouver to MLK NW Mill Pond Rd - McDaniel to Engelman SE 111th Avenue - Division to Powell SW 50th - Taylors Fry. Rd to Orchid
	Local Service, Neighborhood Collector	22 ft Speed Table	See above speed bump and add width	Yes, 85% to 30 mph	Maybe	Yes 0.0-9.2 sec each	$2000	Most effective tool to reduce speeding. Emergency delay varies with desired speed and vehicle.	N Vancouver, Columbia to Ainsworth NW Cornell Road - Lovejoy to Tunnel SE 71st Avenue- Division to Powell SW 35th Ave, Vermont to Troy
		Chicanes		Varies	Maybe	Maybe	$10,000-$20,000 per set	Paired curb extensions or roadside islands create a serpentine path for autos. Effectiveness and ER delay is a function of traffic volume.	Not yet used.
	Truck Streets	Corner Truck Apron		Varies	No	Maybe	$10,000 per corner	Dual radii corners: smaller radius to slow autos and is mountable by trucks. Pedestrians wait at larger radius farther back when trucks are turning.	Not yet used. Potential testing in 2009
	Designated Emergency Response Routes	Offset Speed Table		Yes	Maybe	Yes, 2-4 sec each	$3,000	Currently in use in Beaverton on one roadway.	Tested in 1997. Not yet used. Potential new testing in 2009.

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Pedestrian + Bicycle Safety	All Streets	Sidewalks and Paths		No	No	No	$10 per square foot	Cost is function of project size and topography of right of way.	SW Patton at Dosch SW 35th at Maricara
		Refuge Islands		1-3 mph	No	No	$8,000-$15,000	Primarily for crossing safety. For locations where gap study indicates more than a 1-minute wait during peak traffic hours or where pedestrians must cross multiple lanes. Provides pedestrian crossing enhancement with minimal delay to autos on higher classified streets (auto-focused). May impact street parking more than a curb extension.	N Dekum at Durham N Portland at Fenwick NE 15th Avenue - Fremont to Prescott NW 25th at Pettygrove SE Gladstone, 26th to 39th Avenue SW B-H Hwy at 62nd
		Curb Extensions		No	No	No	$10,000-$19,000	Primarily for crossing safety. For locations where gap study indicates more than a 1 minute wait during peak traffic hours. Space behind curb can be used for water quality structure making design a 'Green' curb extension. Provides pedestrian crossing enhancement with minimal delay to autos on higher classified streets (auto-focused).	N Denver at Kilpatrick N Portland at Vancouver SE 21st at Tibbetts SE Gladstone, 26th to 39th Avenue NW 21st at Flanders
		Marked Crosswalks		No	No	No	$1,000-$1,500	Signing adds to cost.	N Bryant at Boston SW Hamilton at 45th Avenue
		Bike Lanes		No	No	No	$5+ per foot	Cost is function of length of project and existing right of way use and width.	SE Gladstone, 26th to 39th Avenue
		Bike Boxes		No	No	No	Total: box, stop bar and symbol = $3,500	Brings cyclists to the front of the line at traffic lights, priority crossing/turning, reduces right-hook conflicts and increases visibility.	Planned
		Ditch to Swale		No	No	No	$150 per foot	Add walking space where a ditch exists.	SW Hamilton to 45th Avenue
		Countdown Pedestrian Signals		No	No	No	$350-750 each	Cost is a function of age of existing pedestrian signal head.	Interstate Avenue
	Local Service, Neighborhood Collector	Raised Crosswalks		Yes	Maybe	Yes 0.0-9.2 sec each	$2000+	22-ft or larger speed bump at crossing with crosswalk markings slow vehicles where needed the most. Emergency delay varies with desired speed and vehicle.	SW Vermont at 13th Avenue N Albina, north of Killingsworth
		Speed Bumps/Tables	See: Auto Speed Reduction Local Service	Yes	Maybe	Yes, varies with size	$2,000	Safety improvement from lower vehicle speeds. Emergency delay varies with desired speed and vehicle.	SE Clinton, 26th to 39th Avenue N Vancouver to N Alberta

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Auto Crash Reduction	All Streets	Raised Pavement Markers		No	No	No	$8 each	Raised pavement markers (RPMs) provide a physical and auditory cue to drivers when they cross centerlines or begin to leave the road. Reflective markers provide guidance on unlit streets and are visible when glare from wet roads obscures striping. RPMs can be a hazard to cyclists.	SW Humphrey Blvd, Scholls to Patton
	Local Service	Traffic Circles		Likely	Maybe	Yes, 1.2-10.7 sec each	$15,000+	Only slows autos within 100 ft.	SE Gladstone, 26th to 39th Avenue
		Speed Bumps	See: Speed Reduction Local Service	Yes	Maybe	Yes 0.0-9.2 sec each	$2000	Safety improvement from lower vehicle speeds. Emergency delay varies with desired speed and vehicle	
	Local Service, Neighborhood Collector	Stop Signs		Unlikely	Maybe	Yes	$200	Used only for specific crash types. Slowing is localized; speeds may increase elsewhere to make up time; possible benefit with neighborhood grid plan. Collector streets not stopped for Local streets. Subject to local & national standards for installation.	
	Neighborhood Collector and above	Speed Tables	See: Speed Reduction Local Service	Yes	Maybe	Yes, varies with size	$2000	Safety improvement from lower vehicle speeds. Emergency delay varies with desired speed and vehicle.	
		Traffic Signal		Unlikely	No	Maybe	$150,000+	Used only for specific crash types. Slowing only on red or with series of signals; faster speeds on green. May attract traffic to side street. Subject to local & national standards for installation.	
		Red Light Photo Enforcement		Maybe	No	No	$35,000	Reduces red signal violations, may increase rear end collisions	Grand at Madison; Grand at Burnside; W Burnside at 19th
		Mini-roundabout		Yes	No	Maybe	$6,000 +	Small and mountable, currently being tested in Portland (2007)	SW 47th Drive at 43rd Avenue
		Roundabouts		Yes	No	Maybe	$200,000+	Only slow autos within 100 ft of intersection and inside intersection. Pedestrian safety also improved.	SW Terwilliger at Palater Airport Long-Term Parking

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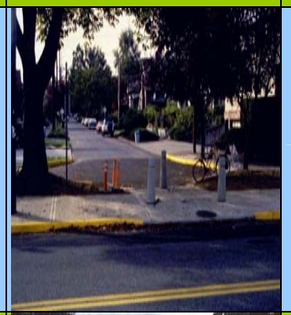
Auto Traffic Reduction	Local Service	Semi-diverter		No	Yes, Direc-tional	Maybe	$10,000+	May pose inconvenience to local road user. Diversion is tool of last resort.	NE 17th and Shaver NE 16th and Tillamook SE Clinton at 39th NE 28th at Weidler
		Full Diversion		No	Yes	Usually	$15,000+	May pose inconvenience to local road user. Residence nearest closure will have greatest auto trip length after project is complete. Diversion is tool of last resort.	NE 28th and Wasco
		Pinch Points		Localized	Maybe	Maybe	$10,000+	Paired curb extensions or roadside islands create a single auto lane. Effectiveness and ER delay is a function of traffic volume.	Not yet used
	Neighborhood Collector and above	Intentional Reduction/Diversion Not Allowed							

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