

TO: Virginia Locality Highway Safety Partners

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RE: Highway Safety Infrastructure Investment Plan – Implementation Criteria
Virginia Highway Safety Improvement Plan (VHSIP) Locality Systemic Initiatives

VHSIP Systemic Initiatives Implementation Criteria

This document summarizes the expectations and implementation criteria for each of the systemic safety countermeasures that are part of [Virginia's Highway Safety Investment Strategy](#). In January 2022, the Commonwealth Transportation Board (CTB) approved the Virginia Highway Safety Investment Strategy that continued deployment of proven systemic and hybrid safety countermeasures across the Commonwealth. The systemic safety initiatives for locally-maintained streets and roads include the following:

- Locally-maintained roads
 - Flashing Yellow Arrow (FYA)
 - High-Visibility Signal Backplates (HVSB)
 - Pedestrian Crossings
 - Curve Signage
 - Unsignalized Intersections
 - Road Reconfiguration (Road Diet)

Localities may submit applications for other systemic initiatives that are not on the list above, but those initiatives that are not on the list must show high return on investment in the application and may not be prioritized over the initiatives that are on the list.

Below is the general technical guidance on these initiatives, including base expectations and requirements, and a list of potential treatments that can be considered for FYA, HVSB, Pedestrian Crossings, Curve Signage, Unsignalized Intersections, and Road Diet initiatives. Localities are expected to evaluate locations and incorporate the most appropriate countermeasures and treatments based on engineering evaluations at identified locations. Additional guidance to support prioritization amongst the many countermeasure treatments as well as decision support to promote consistency and design efficiencies are being developed. In all cases, the Manual on Uniform Traffic Control Devices (MUTCD) is to be applied.

The information herein was assembled with the help of representatives from all nine VDOT Districts and input from several localities. Several notes are general and listed under general information and guidance section below, followed by detailed expectations for each systemic countermeasure.

Virginia Highway Safety Improvement Program (VHSIP) General Information and Guidance

VHSIP Systemic Project Funding Requests

- Localities shall follow the [Virginia Highway Safety Improvement Program \(VHSIP\) Implementation Guidelines](#) when applying for VHSIP funding and selecting locations applicable for implementation of systemic initiatives. The VHSIP Implementation Guidelines document contains additional information on project proposal eligibility and requirements for Localities.
- Localities shall use VDOT's [SmartPortal](#) to submit VHSIP systemic initiative applications.
 - If a project or location is applicable for multiple VHSIP initiatives, VDOT encourages bundling safety projects to combine and reduce the design and construction administration efforts.
- Local projects will be selected and funded based on a variety of criteria, including return on investment (ROI), project's relevance to meeting the goals of [Virginia's Highway Safety Investment Strategy](#), and project scope and feasibility.
- Other improvements, that do not directly improve safety and are ancillary to those identified, are not eligible under these programs unless they impact the ability to implement the identified systemic safety improvement
- Localities submitting multiple applications for funding may not receive funding for all submitted applications.
- Projects with scopes that can be scaled up or down to fit available funding are encouraged.
- Other sources of funding may be used in concurrence with VHSIP funding to complete the overall project implementation as long as the other source of funding is set up as a separate project. Also, VHSIP funding may only be used to implement countermeasures that are in-scope with the approved VHSIP systemic projects.

Project Delivery

- Localities shall follow the locally administered project procedures described in the [LAP Manual](#). The LAP Manual describes the processes, procedures, documents, authorizations, approvals, and certifications that are necessary in order to receive federal aid and/or state funds for many types of local transportation projects. Several highlights of the requirements from the LAP manual are as follows:
 - Each Locality’s project agreement must have an Appendix A to the Project Administration Agreement associated with each Project UPC. Appendix A details each project’s finances and any local matches and contributions.
 - In order to ensure effective communication, each organization is required to assign a full-time local governmental employee to lead their efforts.
 - Localities are responsible for developing and providing a project schedule to include all tasks needed to complete the project to the VDOT District’s Project Coordinator. Localities shall follow VDOT’s [Project Task and Scheduling Guide](#) to develop this schedule.
 - VDOT Project Coordinator will enter in appropriate milestone dates in VDOT’s Project Web Application (PWA) schedule.
 - Localities are responsible for providing timely and accurate itemized estimates to their VDOT Project Coordinator.
 - All invoices shall be submitted within 90 days after any eligible project expenses are incurred.
 - VDOT will utilize Project Pool and VDOT Dashboard to monitor Locality’s VHSIP project task/activity progress.
- All contract work is required to be eligible for federal funding.
- Localities are expected to review and adhere to the policies that are stated in the [Virginia Highway Safety Investment Strategy](#).
- Each Locality should determine the best delivery method to meet the schedule and budget to complete implementation of VHSIP initiatives at the locally-maintained locations.
- If a Locality’s employees are to be used to construct the project, a finding of public interest must be completed since VHSIP funds are Federal funds.

Budgets

- Projects selected for this effort will receive 100% funding. VHSIP funding is comprised of 90% Federal-level and 10% State-level funding. Localities do not have to provide any matching funds to apply and receive VHSIP funding.
- Localities should not spend more than allocated for each project. If the Locality has more funds than needed to complete a project, the Locality should advise their VDOT District contact who will notify [Tracy Turpin](#) or [Deepak Koirala](#) in VDOT's Traffic Engineering VHSIP Project Delivery team. Per CTB policy, all surplus safety funds shall be returned to VDOT for redistribution by the Central Office Safety team to fund other systemic safety initiatives at the discretion of the Commissioner and CTB.
- Localities will be responsible for completing all systemic projects for which they receive funding. Also, Localities are expected to meet VDOT's expectations for on-time and on-budget project completion.
 - If there are remaining funds after planned installations are complete, leftover funding can be applied to additional eligible implementation locations, with the preapproval of VDOT. Localities must seek prior approval from VDOT District local liaisons to add additional locations, and the locality seeking approval will be required to provide project location information for project tracking purposes.
- If the Locality experiences budget overruns and shortfalls in implementing the VHSIP systemic initiative, the Locality must justify and request approval for the extra need to complete the implementation. A decision will be made on a case-by-case basis based on review of justification and funding availability. If the Locality cannot obtain approval for additional funding, the project scope must be revised, or another source of funding must be obtained to complete the originally proposed VHSIP systemic project.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.
 - Example: If there are 10 total locations that will be implemented with a systemic improvement with an average budget of \$50,000 per location, it is acceptable to have 5 locations with a cost of \$75,000 each and 5 locations with a cost of \$25,000 each.
- VHSIP funds cannot be used for maintenance but can be used to upgrade pavement markings and signage. Replacement of certain elements in-kind, such as thermoplastic crosswalk pavement markings, may be considered on a case-by-case basis if those

elements are part of a larger package installation of new or upgraded treatments at that site.

Project Tracking Criteria

- The Locality VHSIP project manager will be responsible for entering VHSIP project progress for all systemic projects on a quarterly basis. A SharePoint VHSIP project tracking site will be developed to track Locality's VHSIP project progress. The VHSIP Sharepoint site for Localities is currently in development, and it will be shared with the Localities once it is fully on-line.
- If there are limitations or issues that prevent the installation of a proposed systemic countermeasure at a Locality-identified project location, the reason for the exclusion shall be documented. This exclusion reason should be recorded on the SharePoint VHSIP project tracking site.
- Typical installation location data needed for intersection improvements will include (but may not be limited to) the following: VDOT UPC#, Project Number or ID, District, Jurisdiction (City, Town, or County), Signal ID, GPS Coordinates (Latitude/Longitude), and Major or Minor approach information (Route Number).
- Typical installation location data needed for road segment improvements will include (but may not be limited to) the following: VDOT UPC#, Project Number or ID, District, Jurisdiction (City, Town, or County), Start and End State Milepost Installation Locations, and Route Number.

Public Outreach and General Information

- A public outreach document will be developed by VDOT Communications and Traffic Engineering Divisions to provide general information to the public on each of the systemic countermeasures that are being deployed as part of this effort. Once finalized, the outreach document will be shared with the Localities. Localities are responsible for conducting public involvement in accordance with VDOT's project development process. VDOT's [Public Involvement Manual](#) may be used as a guidance for coordination between VDOT and Localities. It is expected that if the project is funded through VHSIP, the project has enough public support to proceed through construction completion.

Locality – High-Visibility Signal Backplates (HVSBS)



Expectation and Implementation Criteria

Local agencies are eligible for High-Visibility Signal Backplate (HVSBS) funding as part of this effort. Locations that need pole upgrades are not eligible for this round of HVSBS installation funding.

- Pole upgrades include signal structure replacement or major signal structure modifications.
- Backplate standards:
 - VDOT's Central Office Traffic Signals group has standards and pre-approved list of HVSBS installation and materials. If localities need assistance with HVSBS standards and installation, please contact [Tracy Turpin](#) or [Deepak Koirala](#) in VDOT's Traffic Engineering VHSIP Project Delivery team.

Cost and Funding

- The cost to implement HVSBS is on average \$5,000 to \$15,000 per intersection. This estimate is inclusive of preliminary engineering, materials, labor, and traffic control to complete the work.
- The estimated cost per intersection for a HVSBS survey to determine what type of backplate is needed is approximately \$750 per intersection.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.

Locality – Flashing Yellow Arrow



Expectation and Implementation Criteria

Local agencies are eligible for flashing yellow arrow (FYA) funding for left turns at applicable traffic signals as part of this effort.

- Eligible FYA installations include retrofits of existing permissive left-turn phasing or protected-permissive left-turn phasing only. Protected-only left-turn phasing conversions to FYA are not eligible for funding as part of this initiative.

While locations that need signal equipment or signal structure/pole upgrades are eligible for this round of FYA installations, lower-cost FYA implementation locations will be prioritized for funding under this initiative.

- Signal equipment upgrades include replacement or major modifications to controllers and/or cabinets and installation of flexible backplates.
- Structural upgrades include enhancements to the signal structure to increase structural loading capacity.
- Locations requiring major signal structure modifications, such as full signal rebuild, in order to install FYA are ineligible under this initiative.

Cost and Funding

- The cost to implement FYA is on average, \$15,000 to \$75,000 per intersection, depending on the level of effort needed to install FYA at the intersection. This estimate is inclusive of preliminary engineering, materials, labor, and traffic control to complete the work.
- Lower-cost FYA implementation locations will be prioritized for funding under this initiative. Any project locations with costs over \$100,000 should be noted in the application and may not be funded under this initiative.

- The budget for the FYA projects in locality is all inclusive of preliminary engineering, materials, labor, and traffic control to complete the work.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.

Locality – Pedestrian Crossings



Expectation and Implementation Criteria

The criteria and countermeasures included for pedestrian crossings initiative are as follows:

- VDOT’s latest [PSAP priority corridor and crash cluster map](#) should be used to identify and review potential signalized, unsignalized, and mid-block locations where pedestrian crossing countermeasures can be installed as part of this effort. Any locations identified to be within the PSAP priority corridor is eligible for funding, but locations may be prioritized depending on their top % designation.
- VDOT’s Instructional and Information Memoranda (IIM) on Pedestrian Crossing Accommodations at Signalized Locations (Currently in development - for questions regarding this IIM, please contact [Ritchie Robbins](#) in VDOT Central Office Traffic Control Devices Division) may be used as a guidance when considering countermeasure implementation at signalized locations. VDOT’s IIM-TE-384 on [Pedestrian Crossing Accommodations at Unsignalized Locations](#) may be used as a guidance when considering countermeasure implementation at non-signal locations.
- Pedestrians are at much greater risk of crash when crossing the street as opposed to walking along the street. Therefore, the focus of this initiative is on crossings, not sidewalks or shared use paths.
- Treatments that could be considered for funding include:
 - Signalized intersections:
 - New or retrofit (standard or high visibility) marked crosswalks with highly reflective materials
 - Pedestrian signal heads with pedestrian countdown signals

- Stop and or Yield to Pedestrians signage and pavement markings in advance of crosswalks across channelized right turn lanes, as described in the VA Supplement to the MUTCD and the Pedestrian Crossing Accommodations at Signalized Locations IIM
- Installation/Retrofit of Accessible Pedestrian Signals (APS) and Accessible Pedestrian Signal Detector (APD)
- ADA-compliant curb ramps
- Leading pedestrian interval (LPI)
- Turning Vehicle Yield to Pedestrians and No-Turn on Red signs
- Curb extensions/bulb-outs
- Left turn hardening
- Parking restrictions within the vicinity of the crosswalk (also known as daylighting)
- Addition of intersection lighting
- Unsignalized intersections:
 - New or retrofit (standard or high visibility) marked crosswalks with highly reflective materials
 - Stop and or Yield to Pedestrians signage and pavement markings in advance of crosswalk as described in the VA Supplement to the MUTCD and IIM-384
 - ADA-compliant curb ramps
 - Pedestrian crossing signage
 - Rectangular rapid flashing beacon (RRFB)
 - Pedestrian hybrid beacon (PHB)
 - Pedestrian refuge island
 - Raised crosswalk
 - Enhanced intersection/crosswalk illumination (street lighting)
 - Curb extensions/bulb-outs
 - Parking restrictions within the vicinity of the crosswalk (also known as daylighting)
- Mid-block locations:
 - New or retrofit (standard or high visibility) marked crosswalks with highly reflective materials
 - ADA-compliant curb ramps

- Pedestrian crossing signage (at and in advance of the crosswalk). This can also include pedestrian gateway treatments.
 - Pedestrian refuge island
 - Stop and or Yield to Pedestrians signage and pavement markings in advance of crosswalk as described in the VA Supplement to the MUTCD and IIM-384
 - Curb extensions/bulb-outs
 - Parking restrictions within the vicinity of the crosswalk (also known as daylighting)
 - In-pavement messages (“SLOW”, “PED XING”)
 - Rectangular rapid flashing beacon (RRFB)
 - Pedestrian hybrid beacon (PHB)
 - Pedestrian refuge island
 - Raised crosswalk
 - Enhanced illumination of crosswalk
- Substitutions: these treatments are not an exhaustive list. Varying materials or new treatments are allowable, pending VDOT review and approval, if they provide the benefit and function in the same or similar way as the treatments listed in this document.
 - Street lighting should only be included if it can be accomplished within the budget and if it is needed to address an identifiable safety need. Refer to [IIM-TE-390](#) for lighting guidance.

Cost and Funding

- The cost to implement pedestrian crossing treatments is on average \$50,000 to \$125,000 per crossing location included in the initiative, depending on the level of treatments being implemented. This estimate is inclusive of preliminary engineering, materials, labor, and traffic control to complete the work. The cost to implement treatments at certain locations may be significantly less than this range.
- VHSIP funds cannot be used for maintenance but can be used to upgrade pavement markings and signage. Replacement of certain elements in-kind, such as thermoplastic crosswalk pavement markings, may be considered on a case-by-case basis if those elements are part of a larger package installation of new or upgraded treatments at that site.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.

Additional Pedestrian Crossing Installation Guidance

- The focus of this VHSIP systemic project is the installation of marked crosswalks, pedestrian signal heads with pedestrian countdown signals, APS and APD, and ADA-compliant curb ramps. In some situations, easements or right-of-way may be necessary to complete the crossing improvements. Locations that do not require right-of-way or easements should be of highest priority for this initiative.
- Limited sidewalk/shared use path connections necessary to connect to existing sidewalk within approximately 25 to 50 feet of the crossing may be considered as part of this effort. However, more extensive sidewalk connections, curb and gutter improvements and road widening are not included in the scope of this VHSIP funding. If desired, these items may be funded by the Locality and delivered concurrently with this project.
- Crosswalk improvements may be provided regardless of whether a sidewalk or pedestrian access route exists on both ends of the crossing. If providing crossing improvements where no pedestrian access route exists, curb ramps must be provided on each end of the crossing in curb and gutter locations while a level landing area is required in shoulder and ditch locations, as detailed in Appendix A1 of VDOT's [Roadway Design Manual](#).
- When installing pedestrian crossings at traffic signals as part of this project, a crossing on all legs of the intersection is the preferred treatment. However, in situations where constraints (based on engineering judgment) make it impractical to install crossings on all legs of the intersection, at least one crossing of the mainline is required. In cases where crossings are not provided on any leg(s) of the intersection, documentation detailing the rationale behind the engineering judgment should be included in the project file and tracking record.
- Decorative/stamped/brick crosswalks are not eligible for funding under this program. Reference VDOT's [IIM-LD-218](#) on Guidelines for the Use of Solid Paver Units for additional information.
- Streetscaping and landscaping elements (trees, brick paver sidewalks, benches, and etc.) are not eligible for funding under the program. However, limited streetscaping elements may be eligible if they are required to tie into existing infrastructure.
- Curb extensions/bulb-outs and left turn hardening treatments may be constructed with pavement markings and physical elements, such as temporary curb, flex post delineators, etc.

- Overhead lighting that provides illumination of the crosswalk area is eligible for funding under this program, however post-top decorative lights are not eligible.

Locality – Curve Delineation



Expectation and Implementation Criteria

- Review and install curve delineation initiative countermeasures on Locality-maintained roads in each Locality to meet MUTCD criteria as outlined in MUTCD Section 2C.06 and Table 2C-5.
- Other curve delineation enhancement countermeasures may be installed if necessary per engineering judgment.

Other Installation Criteria

- Curve warning signs and advisory speed limits shall be as per the MUTCD. Advisory speed limits for curves may be calculated using ball bank methodology as per the VA Supplement to the MUTCD. Contact the [Tracy Turpin](#) in VDOT VHSIP Delivery Team for information about potential alternative methods.
- Roadways with more than 1,000 AADT that are functionally classified as arterial or collectors, should be based upon speed difference (Advisory vs Statutory).

Cost and Funding

- The cost to implement curve delineation devices is on average \$20,000 to \$35,000 per curve location included in the project. This estimate is inclusive of preliminary engineering, materials, labor, and traffic control to complete the work.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.

Locality – Unsignalized Intersection



Expectation and Implementation Criteria

- The goal of this initiative is to implement low-cost countermeasures widespread at sites with similar characteristics and risks to proactively reduce fatalities and injuries at unsignalized intersections.
- A VTRC report on [Systemic Low-cost Countermeasures for Unsignalized Intersection](#) is available as a resource when considering countermeasure implementation at unsignalized locations.
- The unsignalized intersection treatments below are not an exhaustive list. Varying materials or new treatments are allowable, pending VDOT review and approval, if they provide the benefit and function in the same or similar way as the treatments listed.

Potential unsignalized intersection treatments include the following:

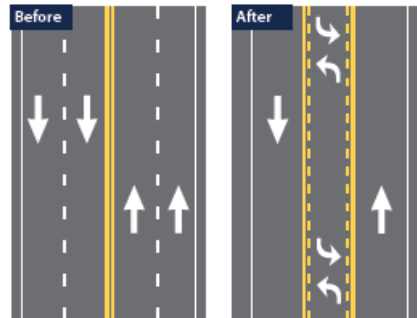
- Standard Stop signs (R1-1) on stop-controlled approaches
- Advance “Stop Ahead” warning signs (W3-1) on stop-controlled approaches
- Properly placed Stop Bars (unless the approach is on a gravel road)
- Double-yellow centerlines (up to 50 ft) on stop-controlled approaches
- Installation of a minimum 6-ft-wide raised splitter island on the stop-controlled approaches (if no pavement widening is required)
- Advance warning signs and/or guide signs, such as advance Intersection Ahead warning signs (W2-1 through W2-8), Advisory Speed Limit plaques (W13-1P), and/or advanced Route Shield signs (M1-4, M1-V1, or M1-V2) on the mainline approaches
- Additional “Watch for Turning Vehicles” advance warning sign (W11-V3) stacked with the advance Intersection Ahead warning signs (W2-1 through W2-8)
- For T-intersections, Two-Direction Large Arrow warning sign (W1-7) opposite the T-stem approach

- Yellow retroreflective strip on advance intersection warning and “Stop Ahead” warning sign posts
- Red retroreflective strip on the Stop sign posts
- Transverse rumble strips across the stop-controlled approach lanes (use only “Stop Ahead” pavement markings if noise is a concern)
- Removal of any foliage or parking that limits sight distance (where right-of-way is available)

Cost and Funding

- The estimated cost to implement unsignalized intersection treatments is on average \$6,000 to \$37,000 per location, depending on the level of treatments implemented. This estimate is inclusive of preliminary engineering, materials, labor, and traffic control to complete the work.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.

Locality – Road Reconfiguration (Road Diet)



Expectation and Implementation Criteria

- The goal of this initiative is to improve safety, mobility, and access for all travel modes by making updates to pavement marking and signing on existing streets and roads.
- Extensive asphalt/paving work and streetscaping are ineligible under this initiative. Wherever possible, road diet should be implemented in coordination with resurfacing. Microsurfacing can be considered if it can be quantified/justified through the B/C ratio. VDOT’s [Roadway Reconfiguration Guidance](#) may be used as a guidance when considering road diet implementation.
- FHWA’s [Road Diet Informational Guide](#) contains useful information on road diet implementation along with roadway factors that support road diet. Engineering judgment should be used to determine if the candidate roadway is suitable for a road diet.
- An assessment by a professional engineer licensed in the Commonwealth is required for all proposed roadway reconfigurations, including those required by the Code of Virginia for certain conversions.
- The Code of Virginia [§ 32.2-319](#) allows Localities to convert existing moving-lane to bicycle-only lanes with no loss of state maintenance funding provided that:
 - The number of moving-lane-miles converted is not more than 50 moving-lane-miles or 3 percent of the locality’s total number of moving-lane-miles, whichever is less, and;
 - Prior to any such conversion, the locality certifies that the conversion design has been assessed by a professional engineer licensed in the and that the assessment has demonstrated that the level of service of the street to be converted will not be reduced or if it will be reduced that the associated roadway network will retain adequate capacity to meet current and future mobility needs of all users and the

conversion has been designed in accordance with the National Association of City Transportation Officials' Urban Bikeway Design Guide.

- For locations that are candidates for both the pedestrian crossing initiative and road diet, the Locality should consider reviewing the list of pedestrian crossing countermeasures as the location may be eligible for funding from both initiatives.
- If there are pedestrian facilities along the route, Localities should identify appropriate pedestrian crossing locations. Similarly, if bicycle facilities are in close proximity to the study area, Localities may want to consider the addition of bike lanes and crossing facilities.
- Road diet include converting roads with four or more lanes and reconfiguring space to include the following treatments:
 - Pedestrian refuge island
 - Center area that is used for left turns, pedestrian refuge islands, or median space
 - Pedestrian crossing enhancements (e.g., Pedestrian crossing treatments at intersections, including ADA-compliant curb ramps)
 - Curb extensions/bulb-outs
 - Crosswalk visibility enhancements (e.g., high-visibility crosswalk marking patterns, signage, and daylighting)
 - On-street parking (if on-street parking is utilized, be familiar with funding implications associated with it)
 - Bicycle lanes and/or transit lanes
 - Rectangular Rapid Flashing Beacon (RRFB)*
 - Pedestrian Hybrid Beacons (PHB)*
 - Eradication of existing pavement markings
 - Lane narrowing

* Indicates treatments that may be eligible through the pedestrian crossing initiative. Refer to the pedestrian crossing initiative to determine eligibility.

- The following items are not included as a part the road diet initiative:
 - Extensive asphalt work or repaving
 - Extensive curb and gutter work beyond what is necessary for curb ramps or pedestrian refuge islands
 - Decorative/stamped/brick crosswalks are not eligible for funding under this program
 - Other items may not be included depending on in the intent and cost

Cost and Funding

- The estimated cost to implement this initiative is on average \$50,000 - \$100,000 per mile on average depending on the scope. For example, restriping 3 lanes plus adding a bike line would be on the lower end of the budget, but adding geometric features (e.g., curb extensions or medians) would be on the higher end of the budget.
- The budget estimate per location/mile for each type of systemic project is an average cost and not a maximum cost. Localities are allowed to have higher-than-average costs to implement the systemic countermeasures at certain locations.

Additional Pedestrian Crossing Installation Guidance

- Curb extensions/bulb-outs treatments may be constructed with pavement markings and physical elements, such as temporary curb, flex post delineators, etc.