# CROSSWALKS - MARKED

This Department is responsible for installing and maintaining crosswalks on City streets as deemed justified by an engineering analysis. On County roadways, the installation and maintenance of crosswalk marking are under the Town's jurisdiction at both signalized and unsignalized locations. This includes locations not at intersections. However, MCDOT must approve their installation across County roadways as deemed justified by an engineering analysis. Markings covered due to any MCDOT paving or resurfacing will be the responsibility of the County.

Crosswalks may be installed at locations where there is significant pedestrian traffic (as specified in subsequent sections of this policy), where it is desirable to identify to pedestrians where they should cross or at intersections where conflicts between vehicles and pedestrians are a concern. Crosswalks may also be installed at designated school crossings with uncontrolled approaches or at school pedestrian concentration points directly adjacent to the school property.

The primary function of crosswalks at traffic control signals and intersection approaches controlled by stop signs is to guide pedestrians into proper crossing paths. As such, uncontrolled marked crossings should not be used when there is a more suitable designated crossing point nearby (within 300 feet), such as at a signalized or guarded crossing.

Crosswalks should be reserved for use at locations with significant pedestrian use (as specified in subsequent sections of this policy); therefore motorists will come to associate crosswalks with pedestrian activity. An engineering study should be done to determine if they are appropriate. There are advantages and disadvantages of marking crosswalks.

Advantages include:

- Helping pedestrians find their way across complex intersections and midblock locations.
- Designating the shortest path.
- Directing pedestrians to the location with best sight distance.

Disadvantages include:

- Possibly creating a "false sense of security" for pedestrians. Normal caution and proper crossing procedures still need to be exercised.
- Generating a greater number of pedestrian collisions at uncontrolled locations on multi-lane streets with high traffic volume.

## Engineering Analysis for Crosswalks

All requests for a marked crosswalk shall proceed with one or more of the following studies.

1. Field Review

   A field review to identify existing signs, traffic controls, and sight distance. Also note alternate available crossing points that are within 300 feet. If the sight distance is within 50 feet of the minimum required stopping sight distance (as per AASHTO) for the vehicular approach speed, a speed study may also be needed to determine if the sight distance is adequate.

2. Vehicular/Pedestrian Traffic Counts and Gap Analysis

   The vehicular count could be the average daily traffic or a peak hour count. A pedestrian count reveals the level of pedestrian activity. A gap analysis determines how many opportunities per minute exist for pedestrians to cross the uncontrolled approach during peak traffic periods. If there is at least one gap per minute, they are considered adequate for pedestrians to cross safely and without excessive delay.

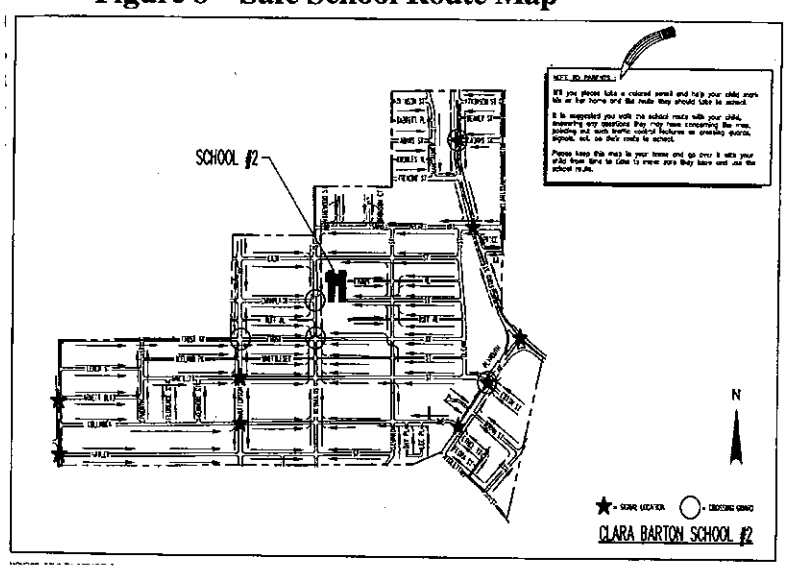
## Criteria for Installation of Crosswalks

**For all types of crosswalks, the location must meet minimum sight distance requirements for the vehicular approach speeds.**

School Crossing

1. If the request is in the city, the Safe School Route Map is consulted to determine if school children are directed to cross at the location. If outside the City, the school district and the town will need to be consulted to identify designated school crossings.

**Figure 8 – Safe School Route Map**



2. Install at all designated school crossings at signalized intersections.

3. Install across approaches controlled by a stop sign if a crossing guard exists or if the intersection is a pedestrian concentration point immediately adjacent to the school.

4. Install midblock across the major street where no controls exist and students are designated to cross, and either adequate gaps exist or an adult crossing guard is present.

For marked crosswalks installed based on items 2 and 4 above, the chosen treatment will be as per the table titled "Table of Possible Marked Crosswalk Treatments . . ." except that Fluorescent Yellow Green signs will be used exclusively.

Multi-use Paths

Crossing locations where a multi-use path crosses a roadway should automatically be considered for crossing treatments regardless of pedestrian volumes. This is to promote the use of multi-use paths recognizing that roadway crossings often create barriers for pedestrians and bicyclists and may contribute to lack of use.

Other Pedestrian Crossings

The following guidelines are based on *Development of Guidelines for the Installation of Marked Crosswalks*, Virginia Transportation Research Council, Virginia DOT and University of Virginia, December 2004 and our own experience and expertise.

1. Controlled Locations

Engineering judgment should be applied with regard to controlled intersections when considering:

- The effectiveness of a marked crosswalk.
- Alternative treatments to be used in conjunction with crosswalk markings
- Adequate sight distance of pedestrians relative to vehicular speed
- Parking prohibitions near a crosswalk. Per NYS V & T Law, there is to be no parking within 20 feet of the crosswalk.
- Alternate crossing locations

Basic justification for marking a crosswalk at a controlled location includes:

- Marked crosswalks should be considered on all approaches near pedestrian generators. Pedestrian generators include retail, parking lots, parks, churches, restaurants, theaters, etc.
- To guide pedestrians as to the correct legs to cross at signalized intersections (i.e. – where there are pedestrian signals, fewest conflicts, etc.).
- Exceptions include locations that have heavy conflicting right or left turn volumes.
- At locations where vehicular traffic might block pedestrian traffic when stopping for a stop sign or red signal.
- To guide pedestrians crossing at an uncontrolled midblock location nearby to cross instead at the controlled location to take advantage of the gaps created by the control.

## 2. Uncontrolled Locations

Crosswalks at uncontrolled crossing locations should be considered only where engineering judgment dictates that the number of vehicular travel lanes, pedestrian volume, average daily traffic, gap availability, eighty-fifth percentile approach speed, and geometry of the location would make its use desirable for pedestrian safety and mobility.

Crossings at uncontrolled locations should be marked where all of the following are the case.

1. Sufficient demand exists to justify the installation of a crosswalk.

    a. The crosswalk would serve a number of pedestrians (ideally at least 20 pedestrians) per hour during the peak hour (15 if pedestrians are elderly or children) or 60 pedestrians total for the highest consecutive four hour period, OR
    b. The crossing is a direct route to/from a pedestrian generator and serves at least some pedestrians.

    Use engineering judgment when evaluating the above criteria.

2. The location is at least 300 feet from another crossing location or a controlled crossing location, or, if less than 300 feet, the pedestrian volume is at least two times the minimum.

3. The location has sufficient sight distance that exceeds the minimum stopping sight distance as defined by AASHTO.

4. Safety considerations do not preclude a crosswalk.

Once it is determined that all of the criteria above are met, the next step is to determine the appropriate level of treatment using the table on the next page. The table specifies progressive levels of treatment for locations with higher average daily traffic, more vehicular travel lanes to cross, and higher approach speeds. Gap availability (more or less than one gap per minute) and approach speeds (eighty-fifth percentile speed more or less than 40 MPH) are used as the basic benchmarks for the level of treatment.

Where there are crosswalk markings, suitable access to the crosswalk for handicapped and visually impaired pedestrians has to be facilitated by installation of sidewalk curb ramps per ADA requirements. The ramps are to be designed in compliance with MCDOT construction specifications and details.

Table of Possible Marked Crosswalk Treatments for Signalized and Unsignalized Locations

| Gaps[1] | 85th % Speeds[1] | # Lanes[1] | Crosswalk[3] | Minimum Signing | Geometric Features[6] (to consider) | Additional Control (to consider) |
|---|---|---|---|---|---|---|
| Adequate[2] | Under 40 MPH | 3 or less | Double piano Keys (DPK) | Standard Yellow advance/crossing; Fluorescent Yellow Green at a school crossing | | |
| | | 4 or more | DPK | Enhanced[4] Yellow advance/crossing; Enhanced Fluorescent Yellow Green at a school crossing | | |
| | 40 MPH + | 3 or less | DPK or Continental | Standard Fluorescent Yellow Green advance/crossing | | |
| | | 4 or more | DPK or Continental | Enhanced[4] Fluorescent Yellow Green advance/crossing | | |
| Inadequate[2] | Under 40 MPH | 3 or less | DPK | Standard Fluorescent Yellow Green advance/crossing | Edgeline, bump-outs or islands | |
| | | 4 or more | DPK or Continental | Enhanced[4] Fluorescent Yellow Green advance/crossing | Edgeline, bump-outs or islands | Flasher[5] or Signal (if warranted) |
| | 40 MPH + | 3 or less | DPK or Continental | Enhanced[4] Fluorescent Yellow Green advance/crossing | Edgeline, bump-outs or islands | Flasher[5] or Signal (if warranted) |
| | | 4 or more | DPK or Continental | Not needed at a Signal | Not needed at a Signal | Signal (if warranted) |

1. If a median usable as a pedestrian shelter exists, each direction of traffic is treated separately. The direction with the more unfavorable traffic conditions (fewer gaps, higher speeds, or more lanes) determines the level of devices installed in both directions.
2. Gaps are considered to be adequate if there are at least 60 gaps in traffic available during the peak hour long enough to cross the street at the proposed crosswalk location. If gaps are inadequate, a crosswalk is still marked but the level of treatment is higher.
3. Crosswalks from standard to highest visibility (see next page for figures) – Standard, Double piano keys, Continental. A Standard crosswalk is used instead of double piano keys on surface treated or micro-paved surfaces. An existing standard crosswalk is adequate where double piano keys are required until the next resurfacing/restriping opportunity. Where a textured crosswalk is used, standard crosswalk markings are also used.
4. Enhanced signs are defined as either oversized (i.e. – "D" sized where "C" is standard) or double posted. The choice is based on engineering judgment.
5. "Flasher" represents either flashing beacons mounted on signs (lower speeds/widths), or overhead mounted flashing beacons at the crosswalk (higher speeds/widths). Flashers can be used instead of or in conjunction with enhanced strong yellow green signs. The choice is based on engineering judgment.
6. Bump-outs or islands are installed only if feasible and if a construction opportunity presents itself. White edgeline is installed as a linear treatment eight feet off the curb or edge of pavement if the criteria is met (City) or if minimum lane widths can be maintained (County). The edgeline reduces the effective pavement width the pedestrian must cross and thus creates gaps.

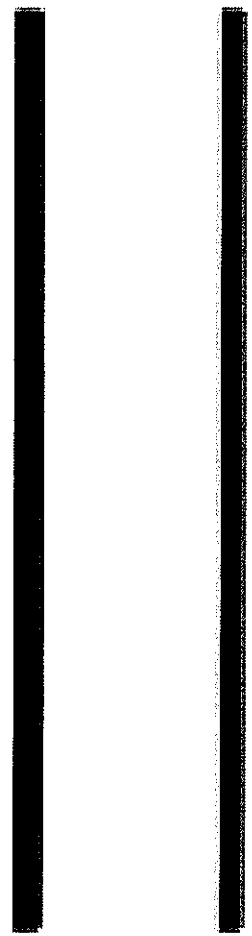
Other possible treatments that could be used in conjunction with treatments summarized above include:

- Advance yield lines plus "Yield Here to Pedestrians" signs
- In-Street "State Law - Yield to Pedestrians Within Crosswalk" signs (installed/maintained by private entities who have been granted a permit by MCDOT)

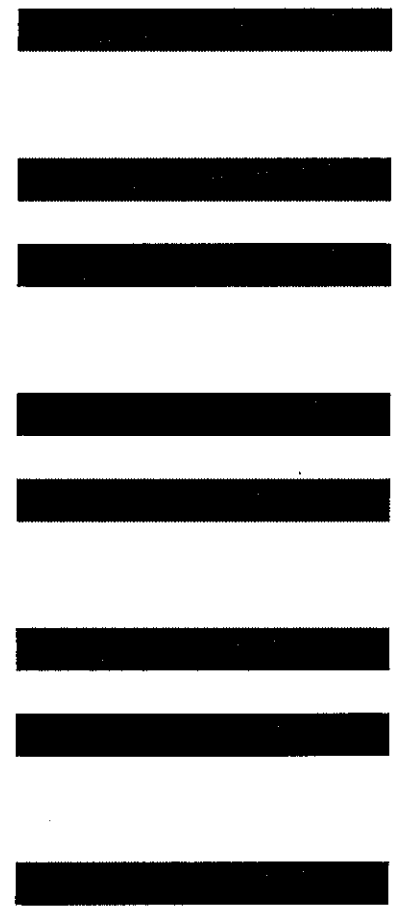
# Crosswalk Types Used by MCDOT

**Double Piano Keys**

**Standard***



**Continental**



* Standard crosswalk also applicable when a textured crossing is installed