WYDOT

PEDESTRIAN AND SCHOOL TRAFFIC CONTROL MANUAL

2003

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CHAPTER II

PEDESTRIAN TRAFFIC CONTROL

GENERAL

The need for pedestrian traffic control increases with the potential for conflicts between crossing pedestrians and vehicles on the roadway. Pedestrian traffic control is largely ineffective when pedestrian and/or traffic volumes are low because the devices tend to lose their integrity in the eyes of the users when the users consistently fail to encounter the conditions to which they are being alerted. Drivers will soon lose respect for pedestrian traffic control devices if they never encounter a pedestrian at the crossing, and pedestrians will become less attentive if they seldom encounter a vehicle when crossing the roadway. Therefore, pedestrian traffic control is normally only provided at locations where there is a significant likelihood of vehicle-pedestrian conflicts, where motorists would not expect pedestrians to be crossing the roadway, or at confusing crossings or signalized intersections where additional guidance may be needed for the pedestrian to follow the safest crossing path.

In general, the type of pedestrian traffic control used at a given location consists of one of the following levels of control:

1. Unmarked pedestrian crossing
2. Advance Pedestrian Warning signs
3. YIELD WHEN OCCUPIED crosswalk
4. Pedestrian signals with symbolic "WALK" / "DON'T WALK" indications
5. Pedestrian overpass/underpass

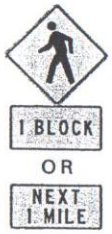
Each level of control may be adapted to the specific conditions at the crossing location by adding appropriate traffic control devices that are found to be warranted by an engineering study. The type of pedestrian traffic control to apply at a given location shall be based on the following warrants.

PEDESTRIAN TRAFFIC CONTROL WARRANTS

Unmarked Pedestrian Crossing

Unmarked pedestrian crossings contain no pedestrian traffic control devices. All pedestrian crossings at locations having fewer than 10 pedestrians crossing per hour during the peak crossing periods will be unmarked.

Advance Pedestrian Warning Sign



An advance pedestrian warning sign shall be used in advance of all YIELD WHEN OCCUPIED crosswalks. It shall be supplemented with a plaque with the legend XX FEET, XX MILE, or XX BLOCK.

Pedestrian crossing locations on high speed roadways (having speeds of 45 mph or greater) and which have at least 10 pedestrians crossing per hour during the peak crossing period, will not be marked with a crosswalk, but may have Advance Pedestrian Warning signs installed in advance of the crossing location.

Advance Pedestrian Warning signs may also be installed at locations adjacent to the beginning of a section of roadway where there are at least 20 pedestrians per hour during the peak crossing period randomly crossing the roadway throughout the section, and it is not practical or possible to consolidate the crossing activity to a single location. In this case a supplemental plaque with the legend NEXT XX FEET or NEXT XX MILES shall be used.

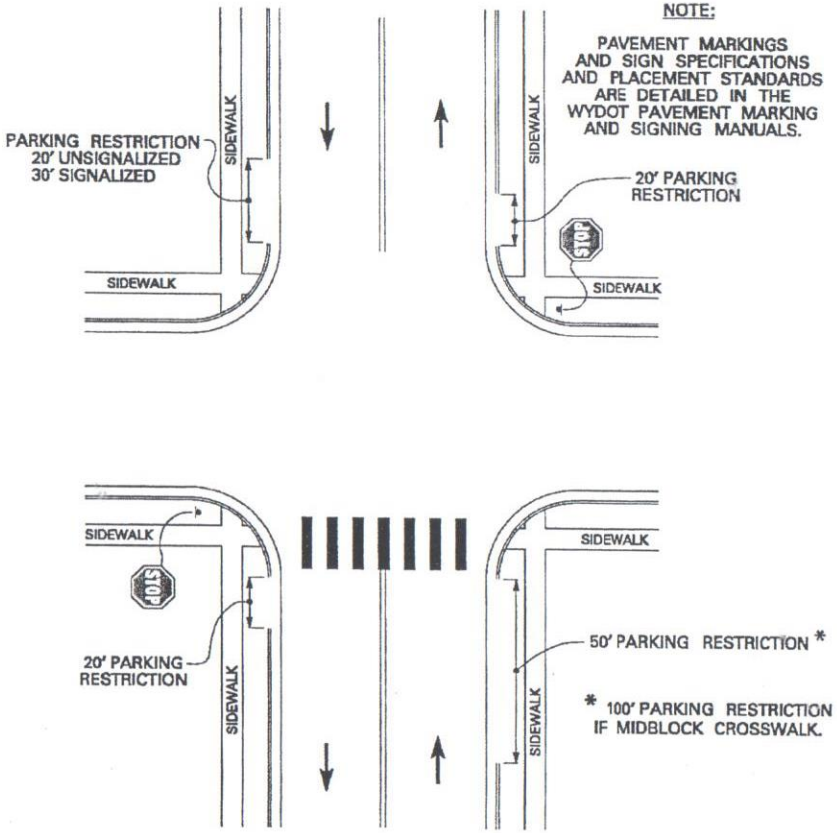
Pedestrian Crossing Sign

The Pedestrian Crossing sign is used to alert road users to locations where unexpected entries into the roadway by pedestrians might occur, and where drivers must yield to pedestrians in the crosswalk. It shall be supplemented with a plaque with the legend YIELD WHEN OCCUPIED. The YIELD WHEN OCCUPIED plaque shall have a black legend with a white background.

The Pedestrian Crossing sign shall be used adjacent to the marked crosswalk at all YIELD WHEN OCCUPIED crossings.

Marked Crosswalk

The WYDOT pavement markings for marked crosswalks shall be the longitudinal line crosswalk as shown in Figure 2.



MARKED PEDESTRIAN CROSSWALK

FIGURE 2

Marked pedestrian crosswalks shall be used at the following locations:

1. Designated YIELD WHEN OCCUPIED crossings
2. Signalized intersections which meet the pedestrian volume warrants for traffic signal installation

They may be used at the following locations based upon a traffic engineering study or judgment:

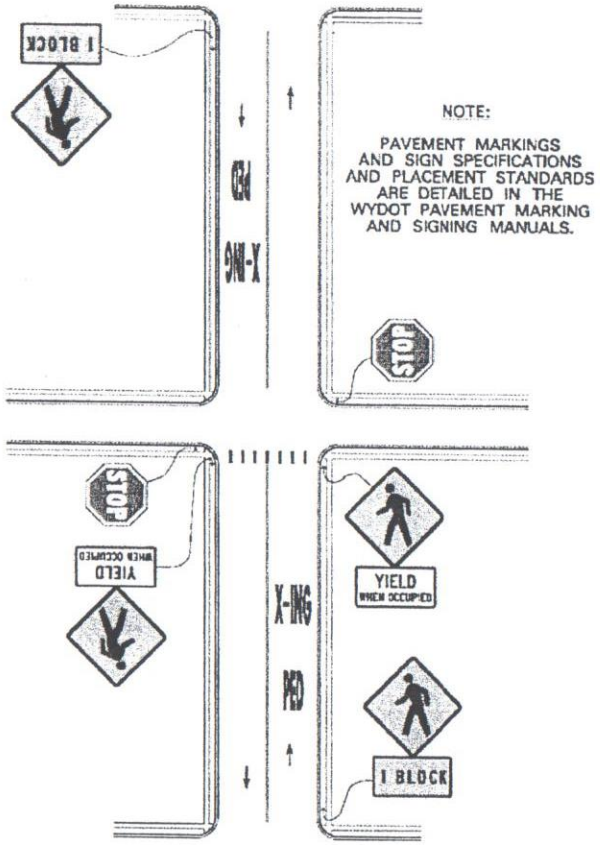
1. Complex or confusing crossing paths such as the crossing location across a free right turn lane
2. Locations where sidewalk does not exist, to define the crossing path
3. Signalized intersections in central business districts to discourage jaywalking

YIELD WHEN OCCUPIED Pedestrian Crosswalk

A YIELD WHEN OCCUPIED pedestrian crosswalk consists of the following pedestrian traffic control devices:

1. Marked crosswalk
2. Pedestrian Crossing signs supplemented with YIELD WHEN OCCUPIED plaques
3. Advance Pedestrian Warning signs supplemented with plaques with the legend XX FEET, XX MILES, or X BLOCK
4. Pavement word markings "PED" / "X-ING" marked in each through approach lane

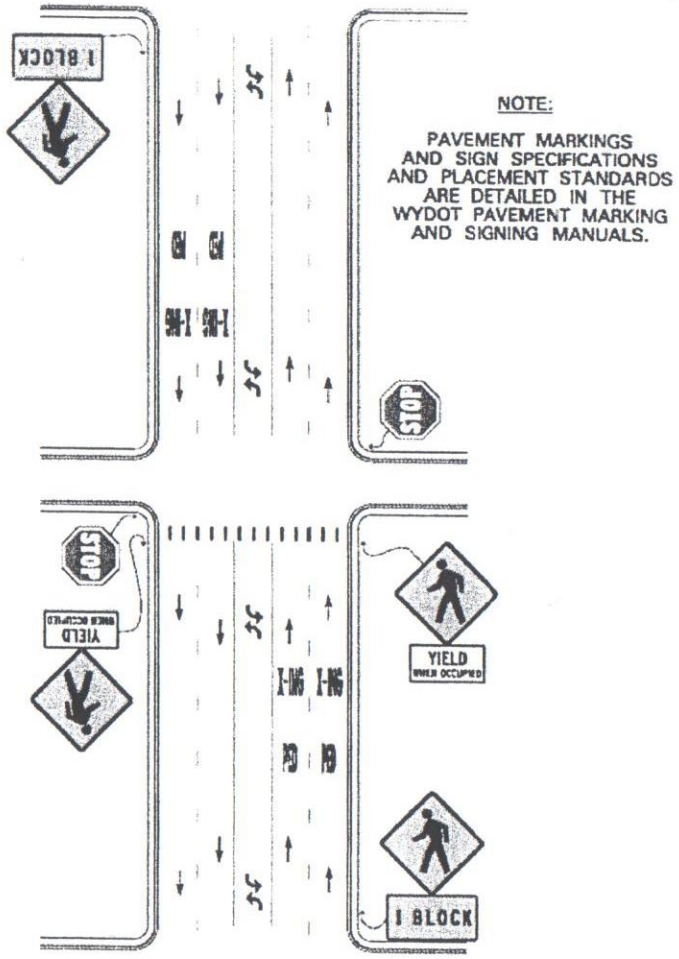
Typical YIELD WHEN OCCUPIED pedestrian crosswalk installations are shown in Figures 3, 4, 5, and 6.



TYPICAL INTERSECTION PEDESTRIAN CROSSING

TWO-LANE ROAD

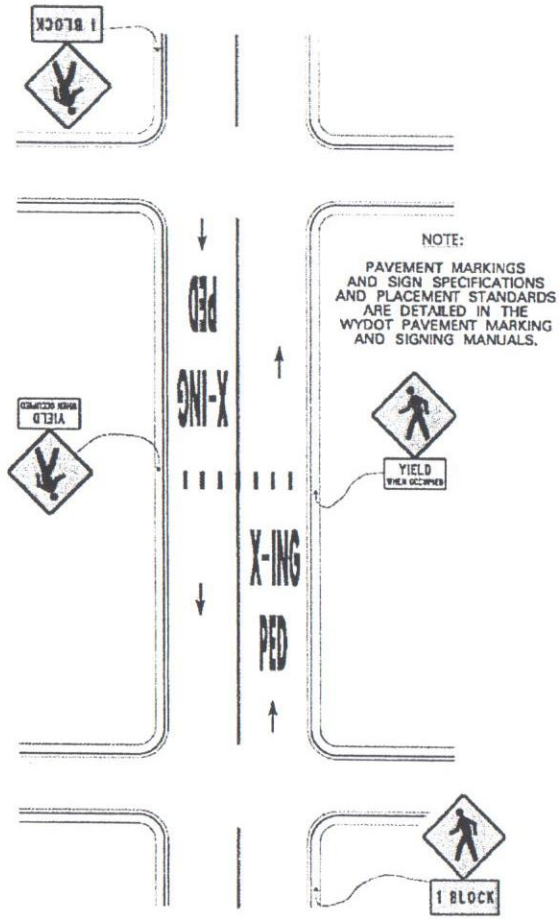
FIGURE 3



TYPICAL INTERSECTION PEDESTRIAN CROSSING

FOUR - LANE ROAD

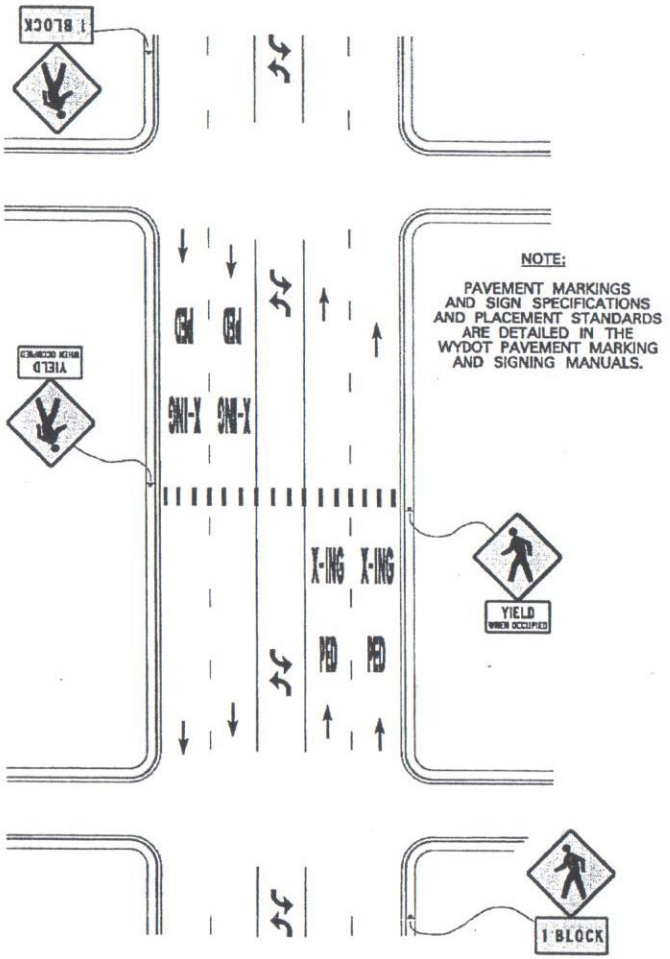
FIGURE 4



TYPICAL MID - BLOCK PEDESTRIAN CROSSING

TWO - LANE ROAD

FIGURE 5



TYPICAL MID-BLOCK PEDESTRIAN CROSSING

FOUR-LANE ROAD

FIGURE 6

A YIELD WHEN OCCUPIED crosswalk shall be justified by an engineering study. Normally the YIELD WHEN OCCUPIED crosswalk should be considered when:

1. There is a minimum of 50 pedestrians crossing per hour for each of any four hours or 80 pedestrians crossing during any one hour, and there is an average of less than 5 adequate gaps in traffic per five minute period during those hours.
2. There is a minimum of 60 pedestrians crossing during any one hour, and there is an average of less than 4 adequate gaps in traffic per five minute period during that hour.
3. There is a minimum of 20 pedestrians crossing per hour for each of any four hours and there is an average of less than 3 adequate gaps in traffic per five minute period during those hours.
4. There is a minimum of 10 pedestrians crossing per hour for each of any four hours and there is an average of less than 2 adequate gaps in traffic per five minute period during those hours.

Mid-block Crosswalks

Mid-block crosswalks are YIELD WHEN OCCUPIED crosswalks that are located at crossing locations other than at intersections. Mid-block crosswalks may be considered based on the following criteria:

1. No traffic controlled crossing location exists within 300 feet of the mid-block location; and
2. The demand by pedestrians to cross within a concentrated mid-block area meets 50% of the pedestrian traffic signal warrant; and
3. A high mid-block pedestrian generator exists nearby.

Typical mid-block pedestrian crosswalk installations are shown in Figures 5 and 6.

Flashing Beacon

A flashing yellow beacon may be located on the advance pedestrian warning sign based upon an engineering study or judgment. Consideration should be given to the following:

1. The pedestrian volume meets 50% of the pedestrian traffic signal warrant criteria and there are less than 60 adequate gaps in traffic per hour in which to cross
2. Numerous traffic violations of the YIELD WHEN OCCUPIED sign
3. Pedestrian crash experience
4. Two or more through approach lanes

Pedestrian Pavement Word Markings

The pavement word marking "PED" / "X-ING" shall be placed in each through approach lane at all YIELD WHEN OCCUPIED crosswalks.

Stop Lines

Stop lines indicate the point at which vehicles are required to stop. They are normally not needed at intersection crosswalks controlled by stop signs or traffic signals. They may be used on all approach lanes on multilane roads. When used, they should be located 4 feet to 30 feet in advance of the crosswalk. If the desired stop location is greater than 4 feet in advance of the crosswalk, a stop line should be installed.

No Parking Restrictions

Curb parking restrictions shall be marked at all marked pedestrian crossings. Their primary purpose is to improve sight distance at the crossing location for both the pedestrian and driver.

For roads with parallel parking, the advance No Parking restriction at a YIELD WHEN OCCUPIED crosswalk at an intersection should begin 50 feet in advance of the crosswalk. At mid-block YIELD WHEN OCCUPIED crossings the restriction shall be a minimum of 100 feet. The NO

PARKING restriction should begin 30 feet in advance of the crosswalk at signalized intersections, and 20 feet in advance of the crosswalk at stop controlled intersections.

Parking should be restricted for 20 feet beyond the crosswalk at all marked and unmarked crossings.

Parking restriction signs shall be used with curb markings in those areas where curb markings are frequently obliterated by snow or ice accumulations, unless the no parking zone is controlled by statute or local ordinance.

Traffic Signal

A traffic signal assigns the right-of-way to vehicular and pedestrian traffic. A traffic signal primarily installed for pedestrian traffic may be considered where the vehicular traffic is so heavy that pedestrians experience excessive delay in crossing a roadway.

The need for a pedestrian traffic signal at an intersection or mid-block location shall be considered if a traffic engineering study finds the following criteria met:

1. The pedestrian volume crossing the road during an average day is 100 or more for each of any four hours or 190 or more during any one hour; and
2. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same time when the pedestrian volume criterion is satisfied. Where there is a divided roadway having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic; and
3. Less restrictive traffic control in the form of a YIELD WHEN OCCUPIED crosswalk and flashing beacon has been shown not to be effective in creating adequate gaps for the pedestrians to cross the road.

The pedestrian volume criteria may be reduced 50% if the average crossing speed of the pedestrians is less than 4 ft/sec.

Where a traffic signal exists within 300 feet of the proposed crossing location, a traffic signal is not warranted by the above criteria unless the proposed traffic signal will not restrict the progressive movement of traffic.

Pedestrian Signal Indications

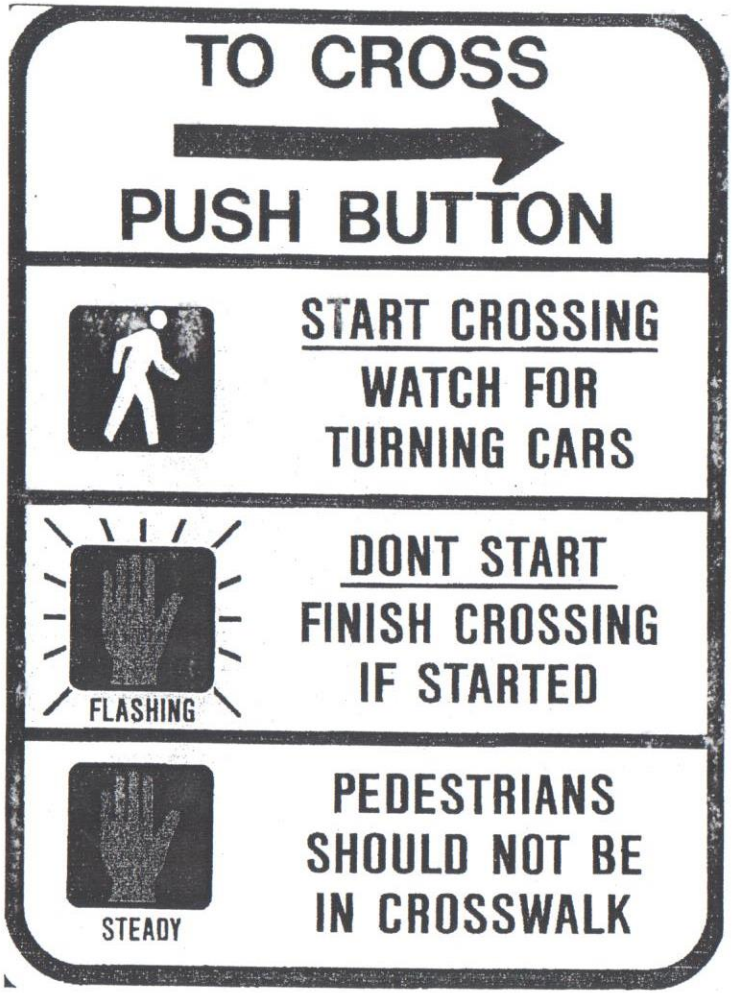
Pedestrian signal indications consist of the illuminated symbols of a WALKING PERSON (Walk) and an UPRAISED HAND (Don't Walk). For the meaning of the pedestrian signal indications, see Page 8.

Pedestrian signal indications should be installed at all signalized locations as follows:

1. If the traffic signal is warranted by a traffic engineering study and meets either the pedestrian or school crossing warrants
2. If an exclusive signal phase is available for a pedestrian movement with all conflicting traffic being stopped

Pedestrian signal indications may be used at other signalized locations based upon engineering judgment.

Many pedestrians do not understand the intended actions required by the pedestrian indications. Therefore, educational plaques shall be mounted at the crossing locations to inform the pedestrians of their proper usage (see Figure 7).



PEDESTRIAN SIGNAL PLAQUE

FIGURE 7

Pedestrian Push Button

Pedestrian push button control shall be installed for all permitted crossing locations at signalized locations that are pedestrian-actuated. An educational plaque shall be mounted next to the push button to inform the pedestrians to use the push button to cross the road, as well as the meaning of the pedestrian signal indications (see Figure 7).

Overpass/Underpass

Overpasses or underpasses may be warranted where there are heavy peak pedestrian movements, such as at central business districts, factories, schools, or athletic fields, in combination with moderate to heavy vehicular traffic or where unusual risk or inconvenience to pedestrians would otherwise result.

Overpasses or underpasses at arterial streets are not likely to be used unless it is obvious to the pedestrian that it is easier to use such a facility than to cross the travel way.

The long term future need for the overpass/underpass, the physical characteristics of the location to make the structure feasible, and an economic comparison between the cost and maintenance of the structure and other controls indicating the structure is justified must be considered.

CURB EXTENSIONS (BUBBLE-OUTS)

Curb extensions are extensions to the curb line that extend to the edge of the parking lane and eliminate one or more parking spaces on the corner of the intersection or at a mid-block crossing (see Figure 8).

Advantages

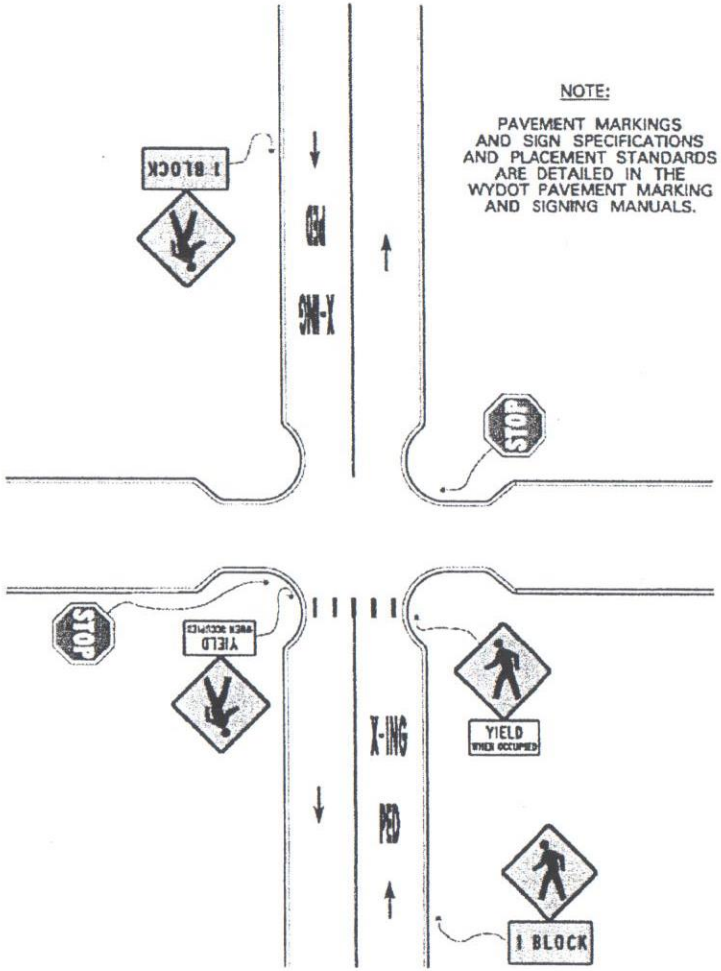
1. They typically reduce the pedestrian crossing distance on the road.

2. By tightening up the corner radius of an intersection they can slow the speed of turning vehicles.
3. They improve the visibility of pedestrians by placing them where drivers can see them as well as improving the pedestrians' visibility of approaching vehicles.
4. They make it difficult for drivers to park illegally at the crosswalk which assures better sight distance at the intersection.
5. They may slow down through traffic.

Disadvantages

1. They constitute a fixed object in the roadway that drivers may run into at night or in inclement weather conditions unless on-street parking is present immediately adjacent to the curb extension.
2. There is less buffer between the pedestrian waiting at the curb and the passing vehicle.
3. They pose obstacles to road sweepers and snowplows.
4. They can complicate storm water runoff drainage.

Due to their disadvantages and cost, curb extensions should only be considered at heavy pedestrian and vehicle volume crossings where their advantages are warranted. Types of vehicles, road drainage, and other physical roadway features must be considered before a decision to install curb extensions is made.



TYPICAL CURB EXTENSION

FIGURE 8

HANDICAPPED PEDESTRIANS

Special pedestrian traffic control for handicapped pedestrians may be warranted. The engineering study should determine the use of the crossing by handicapped pedestrians, and the number and type of handicapped pedestrians. Special traffic control may be needed due to pedestrians being blind (audible pedestrian signals), or elderly, or wheelchair-bound. Pedestrians with slower walking speed or longer crossing times require longer gaps in traffic (longer pedestrian signal timings or pedestrian traffic control). The location of pedestrian-activated controls may also need to be modified in order to provide access to the controls by handicapped pedestrians.

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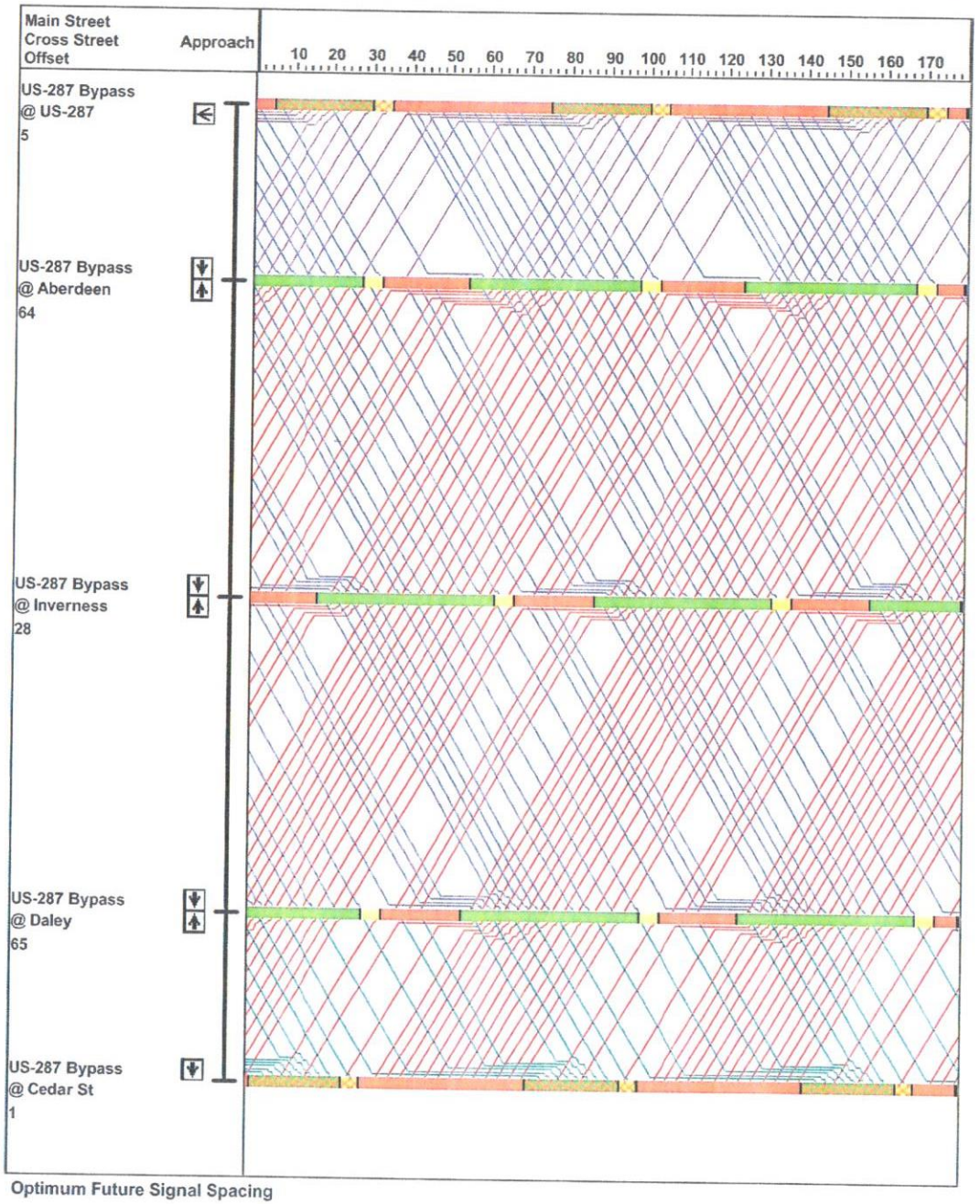
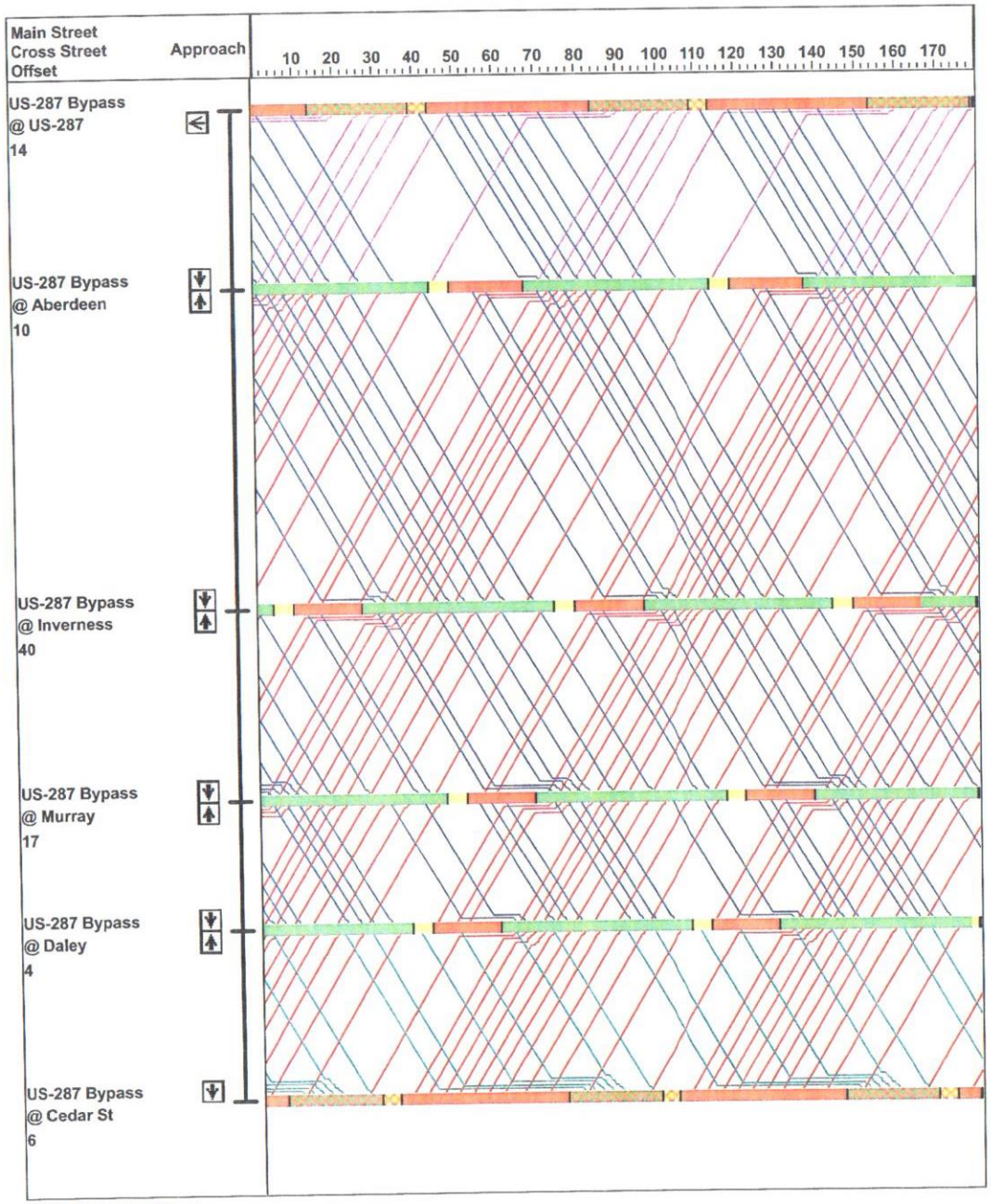
Rawlins, 287 Bypass

PM Flow Diagram



Optimum Future Signal Spacing



With Signal At Murray

EXHIBIT 1

EXCERPT FROM WYDOT STANDARD DETAILS,

ROADWAY WIDTH

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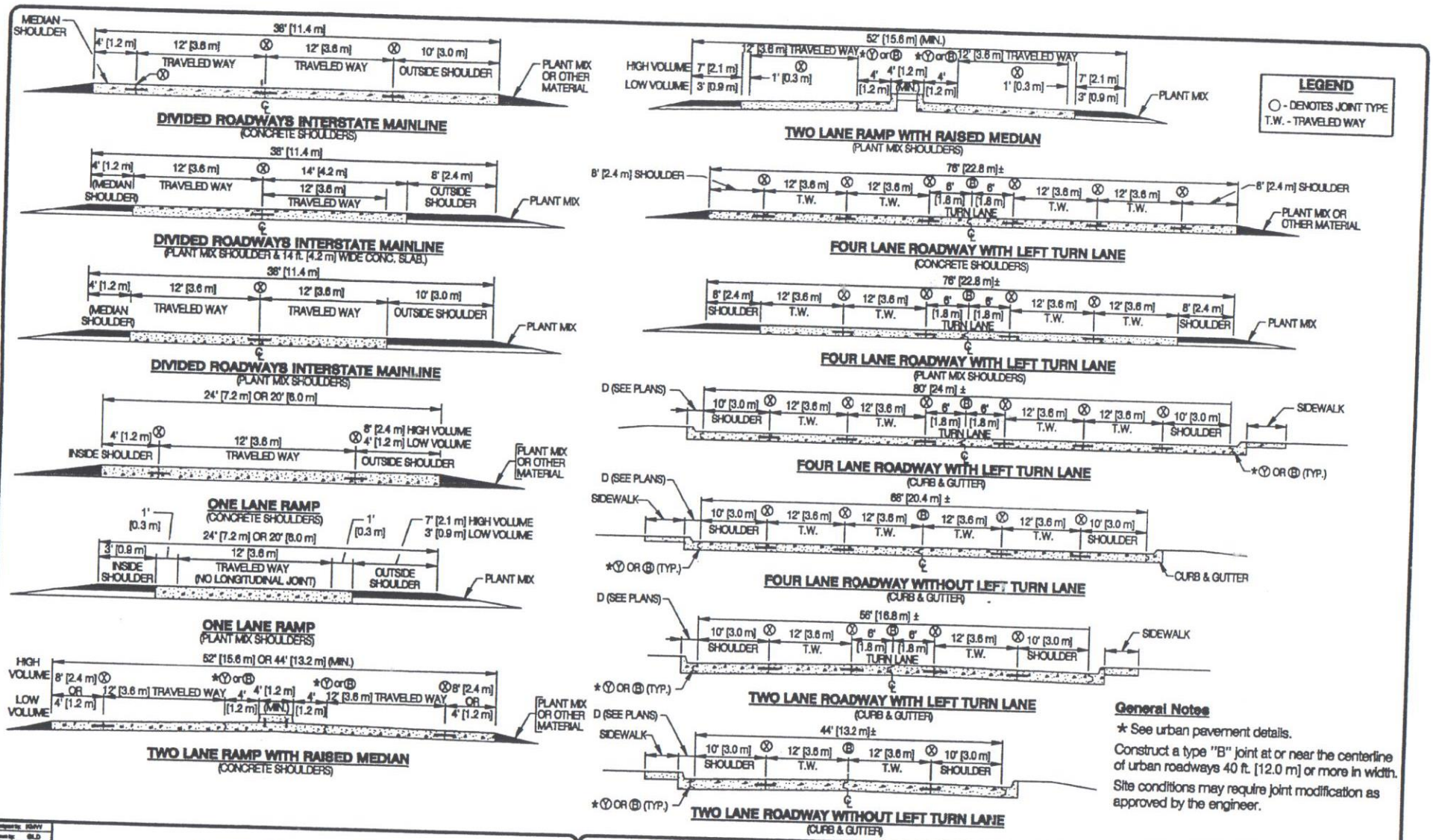

Designed by: KMW Drawn by: BLD Checked by: WBW Project No. & Id.: 414-01B	TYPICAL LONGITUDINAL JOINTS Non-motorized Rail Yard Crossing Note: Units shown in brackets [ ] are metric and are in millimeters (mm) unless other units are shown.	WYOMING DEPARTMENT OF TRANSPORTATION Page 10F	CONCRETE PAVEMENT STANDARD PLAN	STANDARD PLAN NUMBER 414-1 SHEET 6 of 6 Approved: ENGINEERING SERVICES Date Issued: NOVEMBER, 2004 FILE: 414-1

June 201
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