MUNICIPALITY OF ANCHORAGE
Traffic Department

TRAFFIC DEPARTMENT

MARKED CROSSWALK INSTALLATION BULLETIN

"Painted/Marked Crosswalks"

The Municipality of Anchorage – like most public agencies across the United States – often receives requests to paint crosswalks. These requests may be for a variety of reasons: aiding vulnerable population groups (elderly or school children, the disabled), heighten awareness for workers whose parking spaces may be on the opposite side of the street from the building in which they work, slowing traffic near public and private parks, etc.

These requests may be for locations at intersections, or, at mid-block locations like trail crossings.

The subject of marking crosswalks generates considerable passion on the part of parents, senior citizens, employees, school administrators and pedestrian advocacy groups. There is a belief that marking/painting a crosswalk always represents a safer condition for pedestrians.

As is too common in issues related to traffic and pedestrian safety, the actual situation is very different. There are both positive benefits and unintended – adverse – consequences. This suggests that careful consideration be made before a decision to mark/paint a crosswalk, and that an analysis be done to provide the information that might indicate that there is a net benefit – or a net adverse consequence to the public – of doing this.

Post-installation studies:

A series of studies – dating back to the 1970s – have been done in the United States. Early studies conducted in Southern California found that, after accounting for the volumes of vehicles and pedestrians and the type of right-of-way assignment at intersections, the rate of pedestrian crashes was as much as 3 times higher where the crosswalks had been marked as compared to similar locations where the crosswalks had not been marked.

Subsequent studies around the United States have shown some variation in that increased rate of vehicle-pedestrian crash history.

Several years ago, after studies were completed about the appropriateness of marking crosswalks, the Federal Highway Administration published a table that provided a guide to when crosswalks should – and should not – be marked. This information has been accepted – and incorporated into – the State of Alaska's Traffic Manual Supplement to the nation-wide Manual of Uniform Traffic Control Devices.

Standards on Marked Crosswalks:

The Municipality of Anchorage follows the Alaska Traffic Manual Supplement's requirements. Other than at locations where there is a signal controlling motorized and non-motorized traffic, we will – typically – deny requests for marking a crosswalk. There may be locations: near schools, a few mid-block locations with high numbers of pedestrians, where we will mark a crosswalk – and, secondarily, enhance the crossing location with added signage, flashing beacons overhead flashing lights, or a pedestrian crossing signal.

Traffic volumes on the roadway should be a minimum of 2000 ADT (Average Daily Trips). Almost all streets with volumes below 2000 ADT have adequate gaps for pedestrians, and, many are local residential streets where many types of pavement markings – with the exception of 'Stop bars'/'Limit lines' at STOP-controlled intersections - are not present.

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Table 3B-101. Recommended Practice for Crosswalk Marking on Uncontrolled Approaches or at Midblock Locations

No. of Lanes	Raised Median?	Vehicle AADT (vpd)													
		<9000				>9,000 to 12,000				>12,000 to 15,000			>15,000		
		Speed Limit (MPH)													
		≤30	35	40	≥45	≤30	35	40	≥45	<30	35	40	<30	35	40
2	No	C	C	M	N	C	C	M	N	C	C	N	C	M	N
3	No	C	C	M	N	C	M	M	N	M	M	N	M	N	N
>4	Yes	C	C	M	N	C	M	N	N	M	M	N	N	N	N
>4	No	C	M	N	N	N	M	N	N	N	N	N	N	N	N

Source: FHWA-RD-01-075: Safety and Effectiveness of Marked vs. Marked Crosswalks at Uncontrolled Locations, 2002

C	Candidate locations for marked crosswalks. Before marking a crosswalk, the site should be studied to ensure it is suitable. The study may include a review of pedestrian volumes, available gaps, sight distance (see Note 1), vehicle mix, pedestrian mix, distance to adjacent crossings (see Footnote 2). Crosswalks should not be installed at locations with fewer than 20 pedestrian crossings per peak hour (or 15 for elderly and/or child pedestrians)
M	Marginal candidate sites for marked crosswalks. Pedestrian risk may increase if crosswalks are marked. If pedestrian improvements are necessary, other options should be explored before marking crosswalks
N	Crosswalks should not be installed at these locations

See footnotes below.

Table 4A-101 Grouping of Traffic Control Device Alternatives Based on Conditions at Crossing Locations

Recurring Hourly Pedestrian Volume	Vehicular Traffic Volume and Speed															
			Vehicle AADT (vpd)													
			<4500	>4500 to 9,000				>9,000 to 12,000				>12,000 to 15,000			>15,000		
			Speed Limit (MPH)														
	No. of Lanes	Raised Median or Refuge	All	≤30	35	40	≥45	≤30	35	40	≥45	<30	35	40	<30	35	40
<20/hr	Any	Any	NE See also 2C.01 and 3B.18														
≥20/hr	2, 3	Yes	NE: See also 2C.01 and 3B.18	NE	NE	EW	ER	NE	NE	EW	ER	NE	NE	ER	NE	EW	ER
	2	No		NE	NE	EW	ER	NE	NE	EW	ER	NE	NE	ER	NE	EW	ER
	3	No		NE	NE	EW	ER	NE	EW	EW	ER	EW	EW	ER	EW	ER	ER
	≥4	Yes		NE	NE	EW	ER	NE	EW	EW	ER	EW	EW	ER	ER	ER	ER
	≥4	No		NE	EW	ER	ER	EW	EW	ER	ER	ER	ER	ER	ER	ER	ER
School Crossing	EW = See Part 7 for school routes,beacon systems, and Part 4 for signal warrants															
≥20/hr	ER – See Part 4 for Pedestrian Hybrid Beacon Guidelines and School Crossing Warrants *(Engineering Study Required)*															
≥75/hr	ER – See Part 4 forTraffic Control Warrants *(Engineering Study Required)*															

Source: Alaska Traffic Manual Supplement, 2015

DEVICE GROUPING
- NE Non-electrical devices (sight distance improvements, signs, striping, medians, etc.)
- EW Electrical Warning Devices (beacons, lighting, sign borders, in pavement lights, etc.)
- ER Electric Regulatory Devices (hybrid beacons, signals)

Abbreviations
- vpd: Vehicles per day
- AADT: Annual Average Daily Traffic Volumes
- MPH: Miles per hour

Notes:

1. Marked crosswalks should not be installed on uncontrolled approaches or midblock locations where visibility distance of pedestrians or the crosswalk would be less than the Stopping Sight Distance for Design" given in the latest version of the AASHTO A Policy on the Geometric Design of Highways and Streets. Desirably, crosswalks would only be installed where there is sufficient sight distance to allow pedestrians to cross the road without conflicting with vehicles continuing at the 85 %ile speed, assuming the pedestrian starts walking at the moment the vehicle comes into sight. Pedestrian crossing time should be computed in accordance with the procedure for determining adequate gaps given in the Institute of Transportation Engineers Traffic Engineering Handbook, (page 78 in the 4th Edition)

2. Crosswalks should not be installed on uncontrolled approaches or at midblock locations where they will encourage pedestrians to divert from nearby signalized or grade-separated pedestrian crossings.

Progression to a higher-level treatment – beyond simply marking the crosswalk – will need to follow the flowchart in Table 4A-102

Table 4A-102 Order of Selection for Traffic Control Devices or Strategies at Crossing Locations

	One or more factors for consideration After Table 4A-101						
DEVICE GROUPING	**GAPS**	**SIGHT DISTANCE**	**SAFETY RISK**	**PED VOLUME**	**TRAFFIC CONTROL STRATEGIES FOR A CROSSING LOCATION**	**ORDER OF DEVICE SELECTION**	OPTIONAL
NE – NON-ELECTRICAL[1]	≥1/minute average or ≥1/signal cycle	Above Minimum	<75%ile	<20/hour	Devices not provided for sites with adequate gaps, good visibility, low pedestrian volume, or low crash history	None	
	<1/min avg, or </signal cycle	Below Minimum	>75%ile		Locate or provide alternate crossing location (primarily to resolve sight distance)	Increasing - Command of Attention ↓	
					Median refuge island or divided/split highway lanes (primarily to achieve gaps)[2]		
					Standard retro-reflective signs (primarily for warning or drawing attention)		
					High visibility signs, markings, delineators, or post reflectors (primarily for warning or drawing attention)		
					Portable In-Street Signs[3]		
					Flag carry		
EW-ELECTRICAL WARNING	<1/min avg, or </signal cycle	Below Minimum	≥95 %ile crash history or crash prediction	>20/hour or <MUTCD Guidelines and Warrants	Pedestrian street light electrolier(s)[4]	Increasing Command of Attention ↓	
					Ped Activated Rectangular Rapid Flashing Beacons RRFB (when ≥ 40mph > 2 lanes, or roundabout exits[2]		
					Overhead active alternating LED beacon w/ped detection[5]		
					Continuous single roundel LED beacons above sign[6]		
					Continuous single Overhead LED beacon		
					LED bollards for walkways (primarily used in transit areas		
					Continuous LED flashing borders in sign		
					Ped activated LED flashing borders in sign		
					Combined side mount and Overhead ped activated beacons		
					In pavement crosswalk lights[7]		
					Other electrical warning devices		
ER-ELECTRICAL REGULATORY	Less than 1 per minute or 1 per Signal cycle	Below Minimum	≥95 %ile crash history or crash prediction	≥20/hr	Ped Hybrid Beacon (Engineering Study Required)	Increasing Command of Attention ↓	
				≥75/hr	Signal, Midblock Signal, or Half-Signal (Engineering Study Required)		

Source: Alaska Traffic Manual Supplement, 2015

FOOTNOTES

1. NE – non-electrical project solutions are acceptable until an electrical project can be determined as being needed
2. Median refuge may be used to convert undesirable gaps into adequate two-stage gap
3. Consider portable in-street signs primarily for special events and school control. These require active on-site oversight
4. Provide overhead lighting at marked crosswalks when feasible
5. Active flashing beacon systems are preferable to passive beacon systems
6. Flashing beacon systems may be used to mark zones not identifiable as a single crossing, or areas without overhead lighting
7. In-pavement lights should only be considered in a low risk environment for damage, where there is extensive maintenance capability
8. Should be ¼ mile or more from existing signals on arterial 2-way roadways, unless coordinated with existing signals