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AGENDA

WASHINGTON COUNTY BOARD OF COMMISSIONERS

Agenda Category: Action – Land Use and Transportation (CPO All)

Agenda Title: **APPROVE POLICY FOR MID-BLOCK PEDESTRIAN AND TRAIL CROSSINGS**

Presented by: Gregory S. Miller, County Engineer

SUMMARY:

In the past, Washington County has approved improved pedestrian crossings (crosswalks) only at intersections controlled by stop signs or signals. Now, trails are being planned and constructed all over Washington County, and often they intersect roads at locations other than controlled intersections. Ensuring safety at those locations, particularly on wide, high speed arterials, is challenging.

Staff has developed, with a consultant, a formal policy for application, evaluation, and approval of mid-block crossings. Tualatin Hills Park and Recreation District (THPRD) and several consultants have been involved in development of the policy. The policy calls for applying various state of the art techniques to these crossings depending upon traffic, width, speeds, conditions at the proposed location and expected trail use, with approval by the County Engineer.

This policy will ensure a reasonably safe crossing for trail users while minimizing delays and ensuring the safety of all road users.

Attachments: Resolution and Order
Exhibit A

DEPARTMENT'S REQUESTED ACTION:

Approve the Washington County Mid-Block Pedestrian Crossing Approval Process.

GM/jw-b

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COUNTY ADMINISTRATOR'S RECOMMENDATION:

I concur with the requested action.

603005

RO 10-107

Agenda Item No. 3.b.
Date: 11/23/10

Appendix H – Approval Process for New Pedestrian Crossings at Mid-Block and Uncontrolled Intersections

IN THE BOARD OF COUNTY COMMISSIONERS

FOR WASHINGTON COUNTY, OREGON

In the Matter of Adopting a Policy and Procedure for Analysis and Approval of Mid-block Pedestrian Crossings by the County Engineer	))))	RESOLUTION AND ORDER No. 10-107

This matter came before the Board at its regular meeting of November 23, 2010; and

It appearing to the Board that current public plans call for construction of a number of new pedestrian trails, sidewalks, other pedestrian facilities, and other uses that are likely to generate increased travel; that these uses may create increased requests to establish pedestrian crossings of roads under county jurisdiction at locations other than road intersections having either a stop sign or traffic signal; and that such crossings may be referred to as mid-block crossings; and

It appearing to the Board that the "Approval Process for New Mid-block Pedestrian Crossings at Mid-Block Locations and Uncontrolled Intersections", set forth in Exhibit "A" attached hereto, serves as a guide for balancing the competing goals of pedestrian and vehicle mobility; accommodating the needs of a multi-modal transportation system; avoiding conflicts to the greatest extent practicable; and making new mid-block pedestrian road crossings reasonably safe within practicable limits, including costs; now, therefore, it is

RESOLVED AND ORDERED that Exhibit "A" attached hereto is adopted as the procedure to be used to evaluate and approve new pedestrian crossings at mid-block locations and uncontrolled intersections of roads under county jurisdiction to be approved by the County Engineer according to the procedures for a modification or design exception to the County Road Standards, County Code Chapter 15.08; and it is further

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RESOLVED AND ORDERED that the Washington County Mid-block Pedestrian Crossing Approval Process constitutes the policy choice of the Board of County Commissioners, as to accommodation of pedestrian and vehicle mobility and safety needs in regard to the above-described new pedestrian road crossings; and it is further

RESOLVED AND ORDERED that the Department of Land Use and Transportation is directed to implement this program commencing on the date of this Resolution and Order.

Dated this 23rd day of November, 2010.

BOARD OF COUNTY COMMISSIONERS
FOR WASHINGTON COUNTY, OREGON

	AYE	NAY	ABSENT
BRIAN	✓	—	—
SCHOUTEN	✓	—	—
STRADER	✓	—	—
ROGERS	✓	—	—
DUYCK	✓	—	—

CHAIRMAN

Barbara Hejtmanek
RECORDING SECRETARY

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REVISED

Exhibit "A"

Approval Process for New Pedestrian Crossings at Mid-Block Locations and Uncontrolled Intersections

Introduction

The purpose of this Policy is to adopt a procedure to allow new pedestrian crossings to be established at mid-block locations and uncontrolled intersections on roads under county jurisdiction, based upon an engineering study by the applicant, and review and approval by the County Engineer. For purposes of this process, a mid-block location is a location between road intersections; an uncontrolled intersection is an existing road intersection without a stop sign or traffic signal; and pedestrian crossings include crossings by bicyclists.

In the past, Washington County has approved pedestrian crossings only at road intersections, with few exceptions. This was based on the belief that this was the only safe and practical system for drivers and pedestrians. Now, conditions and public attitudes are changing. New trails are being planned in many locations within Washington County. Pedestrian and bicycle facilities including trails are essential to providing multi-modal access and mobility within the transportation system. More sidewalks and other pedestrian facilities are expected to be constructed, particularly in urban areas. With these changing conditions, a change in County practice and policy is appropriate.

Crossings and uncontrolled intersections present challenges for design considering both safe and efficient travel. Many trails follow utility easements and greenways, which intersect with County roads at pre-determined locations. Ideally, pedestrian and trail crossings would occur at road intersections having traffic signals so that road crossings could be made safely with minimal additional improvements.

However, many proposed trail crossings are in the middle of blocks, between road intersections, and significant crossing improvements may be needed for improved safety. Many existing roads have been designed primarily for vehicle movement and parallel pedestrian travel, but not for substantial pedestrian crossings apart from road intersections. As a result, some of these new pedestrian crossings will require major capital improvements given road width, high speeds, and large volumes of vehicle traffic. Each one is unique.

This policy describes the analysis required, the tools available, and the review process to allow pedestrian road crossings to be installed on Washington County roads. A standard installation cannot be established for these crossings given the unique nature of each possible crossing location. This policy prescribes the requirements for an application, including the scope of an engineering study for each proposed crossing, and a recommendation for the type of facilities to be installed. If approved by the County Engineer, the application will provide a scope of work for detailed design and construction of the crossing facilities.

This policy authorizes the County Engineer to approve a modification or design exception under County Code Chapter 15.08 for the crossing, which would allow it to be constructed through a Right of Way permit or other appropriate permit. This procedure attempts to balance the needs of vehicle and pedestrian travel, to allow new crossings to be established where all listed factors bearing on the safety of the crossing have been analyzed, and where the crossing incorporates all reasonable, practicable and appropriate safety measures.

Washington County – Mid-Block Crossing Evaluation Process

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Washington County – Mid-Block Pedestrian Crossing Evaluation Process

Section 1 Application Requirements

General Introduction

The purpose of the Mid-Block Crossing Evaluation Process is to enable County engineering staff to evaluate the appropriateness and safety of a proposed new pedestrian crossing of a county road or public road under county jurisdiction at a mid-block location or uncontrolled intersection. This Evaluation Process requires the applicant to gather all pertinent information, provide an individual engineering analysis of the site of a proposed crossing, and present that information in writing to County staff, with recommendations as to the location, construction, and safety features of the crossing. County staff will review each individual application, and the County Engineer is authorized to process an approved application as a modification or exception to the County Road Standards. Upon approval, the designed and permitted crossing improvements will be installed by the applicant as part of a road construction project, or independently through issuance of a right of way permit.

In this document, the term "mid-block crossing" generally refers to a proposed new pedestrian crossing of an existing road or at an uncontrolled intersection. An approved mid-block crossing shall mean a designed and permitted pedestrian crossing of a road under county jurisdiction at a location other than the controlled intersection of two roads. "Pedestrian" is defined as per ORS 801.385.

An application for Mid-Block Crossing shall include all the information required in this Section, and address all criteria and guidelines set forth in the document. An application shall be signed by the applicant and stamped by a professional engineer licensed to practice in the State of Oregon.

A. Applicant

- The full legal name of the person applying for the mid-block crossing.
- Include contact information (phone, address, e-mail) for the applicant and the applicant's engineer.

B. Location

- Include name of roadway where crossing is to occur as well as the name of the nearest intersections in either direction of the roadway. Include a site plan showing the crossing location and vicinity.
- Vicinity Map.

C. Request

- The application shall state the specific need for the crossing at the requested location.

D. Roadway Designation and Planned Transportation Improvements

- Roadway functional classification.
- Current and ultimate roadway configuration.
- Truck Route Designation.
- Trail designation.
- On-road bike facilities.
- Planned and pending transportation capital improvements (such as intersection signalization, driveways, roadway widening, trails, and transit improvements.)
- Attach photos of the site.
- Trail approaches should be planned to match the ultimate road improvements.
- Describe any existing ADA features.
- Aerial photos are encouraged.
- Speeds: posted and 85% if appropriate.

F. Existing Transit Service

- Transit service and frequency.
- Location of transit stops.

G. Existing and Proposed Land Use in the area

- Summarize existing land use characteristics including identifying pedestrian/bicyclist generators.
- Summarize proposed or planned development in the study area.

H. Illumination

- Include details of nearest luminaires and quality of lighting (i.e., overhead, pedestrian level).

I. Topography

- Describe slope of roadway and terrain at the proposed crossing location.

J. Vegetation

- Describe nature of vegetation within and immediately adjacent to sight lines.

K. Sight Distance

- Provide analysis in accordance with Washington County Road Design and Construction Standards and Community Development Code.
- Sight lines outside of the road right-of-way will require easements.

L. Traffic Control and Signage

- Describe nearest controlled intersections, including distance from proposed crossing location.
- Existing roadway signage in area including guide signage.

M. Other Risk Factors

- Include queuing on adjacent roadways, view obstructions, etc.
- Conflicting demands on road and trail user's attention.

N. Pedestrian Volume

- Provide existing and anticipated future volume with improvement (may use similar locations as reference to estimate volumes).
- Include both hourly and daily volumes.
- Consider estimating Pedestrian Adult Equivalent Units (PAEUs) by completing the following chart:

Population	Total Volume	% of Total Volume	Number of Crossings	Factor	PAEUs
Disabled				2.0	
Children(under 18)				2.0	
Seniors (over 65)				1.5	
Adults				1.0	
Total				Total	

It is assumed that all bicyclists walk their bike at the crossing, and are included as pedestrians in this table. For disabled seniors, use the disabled category.

- Determine composition of volumes (as % of study period or per day): Wheelchairs/Strollers, Percent elderly, Unaccompanied young children, Severe mobility difficulties, Visually impaired, Crossing cyclists, Equestrians.
- Future volume shall include current volume, together with volume reasonably anticipated to occur assuming development allowed under existing land use districts is fully constructed (built out) and occupied. Future volume shall also include volume reasonably anticipated to occur within three years of completion of a proposed trail or multi-use path.
- An estimated volume for a 20-year planning period will also be provided.
- Explain the basis for your estimates.

O. Vehicular Volume, Heavy Vehicles Present, and Speed

- Provide existing peak-hour two-way volumes (for both vehicle and pedestrian peak).
- Posted speed and 85th percentile.
- Vehicle classification, presence of heavy trucks.
- Future volume shall include current volume, together with volume reasonably anticipated to occur assuming development allowed under existing land use districts is fully constructed (built out) and occupied. Explain the basis for your estimate.
- Future volume shall estimate volume for a 20-year planning period.

P. Gap Analysis : An analysis of gaps in traffic available for crossing, per the ITE manual.

Section 2 Required Analysis

A. Applicant shall identify and evaluate the characteristics of all generators of pedestrians expected to have an impact on the proposed crossing. Pedestrian generators include, but are not limited to, Institutions (schools, libraries, city halls, and other civic buildings), shopping and employment centers, park and recreational areas, trails, athletic facilities, and transit facilities. Engineering judgment should be used in determining whether there are other safe and convenient routes to link the destinations with the generators.

B. If an existing crosswalk or controlled road intersection is less than 300 feet from the proposed location, the applicant shall reroute pedestrians and crossing cyclists to that location or relocate the generator if feasible, demonstrate the viability of the proposed location, or propose a grade separation of the crossing. If pedestrians are rerouted, evaluate the proposed crossing. Relocating the generator can include items such as locating building access points closer to an existing crossing location, locating transit facilities near signalized intersections, and locating a trail crossing at an existing pedestrian crossing.

C. The applicant shall evaluate other site condition concerns. Site conditions may require additional documentation, such as site drawings. For example: analysis of sight triangles for vehicular and pedestrian traffic to ensure that vegetation will not obstruct these triangles during the warmer months.

D. Examine proposed crossing improvements and make a recommendation. Provide alternative crossing treatments and improvements to address issues identified. Compare advantages and disadvantages of alternatives. Follow Tiered Mid-block Treatments in Section 3, the ADT Speed Guide in Section 4, and the list of potential applications in Section 6. Provide a recommended list of improvements and crossing treatments. Explain how the recommended

improvements address mobility and safety issues generally, as well as any issues specific to the crossing location. Provide a sketch or diagram of the proposed crossing improvements.

Section 3 Tiered Mid-Block Crossing Treatments

Mid-block crossing treatments have been organized into a progressive tier system. As we move from Tier One to Four, the nature of treatments proposed are designed to address locations with greater potential for conflict between all users. The applicant may propose and the County Engineer has the ability to require improvements at a higher tier than stated below provided that these address special circumstances at the mid-block crossing location. Examples can include locations experiencing a higher than usual collision rate or where an exceptional number of pedestrian crossings are anticipated on a regular basis (such as a regional trail experiencing more than 400 crossings per hour). The following four tier system is to be applied at mid-block crossing locations:

Tier	Standard	Additional Treatments Considered
Tier One	Crosses a 2-lane street with or without an Island/ refuge—install high visibility mounted signs and markings	Refuge islands, curb Extensions, staggered pedestrian refuges
Tier Two	Crosses a 3-lane street with Island/ refuge —install high visibility signs and markings	Flashing Beacons, Pedestrian Actuated Signal/Beacon
Tier Three	Crosses a 3-lane street without Island/ refuge or 4-lane street with Island/ refuge —install high visibility signs and markings or pedestrian actuated signal	Pedestrian Actuated Signal/Beacon
Tier Four	Crosses a 4-lane or greater street without an Island/ refuge —install pedestrian actuated signal or beacon	Pedestrian Actuated Signal, Pedestrian over or undercrossing

Section 4 Table 1 – ADT/ Speed Guide

The following table provides Federal Highway Administration's recommendations for installing pedestrian improvements at uncontrolled locations, and serves as a general guideline for road and vehicle conditions and considerations for appropriate pedestrian crossing treatments.

Table 1. Recommendations for installing marked crosswalks and other needed pedestrian improvements at uncontrolled locations.*

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤ 9,000			Vehicle ADT >9000 to 12,000			Vehicle ADT >12,000 - 15,000			Vehicle ADT > 15,000		
	Speed Limit**											
	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h
2 Lanes	C	C	P	C	C	P	C	C	N	C	P	N
3 Lanes	C	C	P	C	P	P	P	P	N	P	N	N
Multi-Lane (4 or More Lanes) With Raised Median***	C	C	P	C	P	N	P	P	N	N	N	N
Multi-Lane (4 or More Lanes) Without Raised Median	C	P	N	P	P	N	N	N	N	N	N	N

These guidelines include intersection and midblock locations with no traffic signals or stop signs on the approach to the crossing. They do not apply to school crossings. A two-way center turn lane is not considered a median. Crosswalks should not be installed at locations that could prevent an increased safety risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalks alone will not make crossing safer, nor will they necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding where to install crosswalks.

** Where the speed limit exceeds 40 m/h (64.4 km/h) marked crosswalks alone should not be used at unsignalized locations.

C= Candidate sites for marked crosswalks. Marked crosswalks must be installed carefully and selectively. Before installing new marked crosswalks, an engineering study is needed to determine whether the location is suitable for a marked crosswalk. For an engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc, may be needed at other sites. It is recommended that a minimum of 20 pedestrian crossings per peak hour (or 15 or more elderly and/or child pedestrians) exist at a location before placing a high priority on the installation of a marked crosswalk alone.

P= Possible increase in pedestrian crash risk may occur if crosswalks are added without other pedestrian facility enhancements. These locations should be closely monitored and enhanced with other pedestrian crossing improvements, if necessary, before adding a marked crosswalk.

N= Marked crosswalks alone are insufficient, since pedestrian crash risk may be increased due to providing marked crosswalks alone. Consider using other treatments, such as traffic-calming treatments, traffic signals with pedestrian signals where warranted, or other substantial crossing improvement to improve crossing safety for pedestrians.

Source: Zegeer, Steward, Huang, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines", FHWA, 2002.

Section 5
Pedestrian Crossing Treatments

Mid-block crossing treatments can be grouped into three general categories: signalized, unsignalized, and grade separated. Each treatment type has a number of options governing how the crossing treatment can be applied. Typically, mid-block crossings include a combination of several treatment types, which provides a maximum safety benefit for both pedestrians and motorists. For those treatments with MUTCD warrants, those warrants must be met or projected to be met within 3 years of when they are installed.

Table 2 provides a description, objective for each treatment type, and lists some of the advantages and disadvantages. Over seventy known intersection treatment types have been used in the United States and Europe, creative and innovative treatments will be considered by staff on a case by case basis.

The applicant for a mid-block crossing shall evaluate the available treatment types and recommend one or more treatments for the proposed crossing, with an explanation of why the recommended measures were chosen.

Table 2 Summary of Pedestrian Crossing Treatment Types

The following are appropriate for use in Washington County Crossings:

Crosswalk Treatment Type	Description	Objective
A. Roadway Signing	Passive signs are placed in the roadway right of way within or near the crosswalk.	To remind drivers to obey the law and yield to pedestrians while in the crosswalk.
B. High-Visibility Markings	Uses a ladder or "Zebra" style crosswalk pavement markings.	To provide drivers with information at uncontrolled crosswalks where pedestrians may not be expected to cross the street, such as a mid-block crossing.
C. Double-posted pedestrian crossing signs	Standard pedestrian crossing signs are installed on both sides of the approaching roadway at a mid-block pedestrian crossing.	To provide additional notice to drivers that are approaching a pedestrian crossing.

Crosswalk Treatment Type	Description	Objective
D. Advance Placement of Yield Lines	Standard yield lines are placed in advance of marked, uncontrolled crosswalks.	To encourage drivers to stop a greater distance from the marked crosswalk.
E. Pavement Legends	Word legends are placed on the pavements at the ends of the crosswalk.	To encourage pedestrians to look in each direction before proceeding to cross the street.
F. Fluorescent Yellow-Green Signs [School Zones Only]	Pedestrian signs made of fluorescent yellow-green color are posted at school crossings.	To improve pedestrian safety at crossings by enabling drivers to detect signs from a greater distance.
G. Refuge Islands	Raised median islands are placed in the center of the roadway separating opposing lanes of traffic and are slotted along the pedestrian path.	To provide a sheltering place in the median where pedestrians can wait for adequate crossing gaps in the traffic stream.
H. Staggered Pedestrian Refuge Islands	Raised islands are laid out in a staggered configuration that requires pedestrians to walk towards traffic before crossing.	To provide a better view of oncoming traffic.
I. Pedestrian Railings	Railings are placed along the top of the curb.	To effectively channelize pedestrians to the safest designated crossing points.
J. Street and Trail Lighting	Lights are installed on both sides of the street and on the trail. Comply with Washington County Illumination Standards for the roadway.	To provide levels of lighting that is oriented toward pedestrian trail activity at the crossing and not exclusively for traffic.
K. Flashing Beacons	Flashing amber lights are installed on signs, in advance of the crosswalk, or on signs located at the entry of the crosswalk.	To increase driver attentiveness when approaching marked crosswalks at uncontrolled locations.

Crosswalk Treatment Type	Description	Objective
L. Rectangular-Shaped Rapid Flashing LED Crosswalk Beacon (supplemental) RRFB	Special traffic signal installed to the bottom of the crosswalk sign at marked crosswalks. Pedestrian actuated.	To improve visibility of pedestrian crossing locations and increase driver recognition of changing conditions.
M. Rumble Strips and Rumble Stripes	Raised or grooved patterns on the roadway that provide both an audible warning (rumbling sound) and a physical vibration.	To alert drives of an up-coming change in the roadway environment.
N. Grade Separated Crossings	A bridge or tunnel that carries nonmotorized traffic over or under a motorized corridor.	To physically separate the crossing of nonmotorized and motorized vehicles.
O. Mid-block Signal-Controlled Crossing	Traffic signals are used to control traffic at mid-block crosswalks. Signals remain green until pedestrians activate the push button. May include passive detection such as video.	To provide pedestrians an opportunity to cross mid-block at a controlled crosswalk.
P. Two-stage Signal controlled crossing	Traffic signal with median island, staggered crossings, coordinated with signals on corridor.	To provide safe crossing opportunities with minimum disruption to traffic.

The following treatment types are <u>not</u> appropriate for use in Washington County Mid-Block Crossings:

- Crosswalk Flags
- Anti-Skid Surfacing
- In-Pavement Raised Markers
- Textured Surfaces within road travel lanes
- High-intensity Activated Crosswalk (HAWK)

In addition to treatments and structures within road right of way, the applicant shall evaluate and the County Engineer may require off-right of way treatments and structures, including but not limited to the following:

- Pedestrian signs
- Fence, railing, or chicane designed to guide or slow pedestrian speed approaching a road crossing
- Control or removal of vegetation approaching a crossing to improve pedestrian and vehicle visibility

Section 6

Application Review and County Engineer's Decision

Upon receipt of a complete pedestrian crossing application, the County Engineer shall cause the application to be reviewed and evaluated. The County Engineer may request additional information from the applicant as needed to review the application. The County Engineer may approve a crossing application under this Policy if he concludes that the applicant has properly analyzed all relevant factors pertaining to the specific site, has proposed crossing treatments that follow the guidelines and requirements herein, and that such crossing treatments address and mitigate all identified safety issues to the greatest extent practicable. The County Engineer has the authority to deny a request for a crossing if he concludes otherwise, or determines, based on his engineering judgment, that the crossing in the proposed location can not be made reasonably safe for pedestrians. In this case, the applicant may request reconsideration by the County Engineer, and the parties will consider changes to the proposal and attempt to negotiate an acceptable crossing location and treatments. If agreement cannot be reached, the requestor may appeal the County Engineer's decision in the manner provided for such appeals in the road standards, County Code chapter 15.08."