

# Instructions for WisDOT Railroad Preemption Inspection Form

WisDOT's Traffic Engineering, Operations and Safety Manual (TEOpS) Chapter 4-2-34 has called for joint annual inspections for all state-owned traffic signals that are interconnected with a nearby railroad grade crossing since 2011. The Office of the Commissioner of Railroad (OCR) has been systematically adding this requirement throughout the state to all traffic signals interconnected with nearby railroad grade crossings. This form was developed by WisDOT as a generic guide to document the findings from the annual inspection. Please note that not all interconnected crossings operate the same and therefore this form is meant as a guide only. ***It is expected that the review team will modify their annual inspection and this form to fit each situation based upon their knowledge and expertise.***

Portions of this form should be completed in advance of the annual test and the information be brought with to the inspection as this information needs to be field verified/confirmed by either the railroad or the operating agency responsible for the traffic signal.

See pages 8 & 9 for exhibit labelling fields to match instructions below.

## Section 1 – Review Team

**Field 1.** Record the name(s) of the representative(s) participating in the inspection on behalf of the owner/operator of the traffic signal.

**Field 2.** Record the date of the inspection.

**Field 3.** Record the name(s) of the representative(s) participating in the inspection on behalf of the railroad.

**Field 4.** Record the date of the previous inspection.

## Section 2 – Location Data

**Field 5.** Record the highway intersection controlled by the traffic signal that is interconnected with the railroad.

**Field 6.** Record the municipality that the traffic signal and railroad crossing are located within.

**Field 7.** Record the county that the traffic signal and railroad crossing are located within.

**Field 8.** Record the agency responsible for operating the traffic signal.

**Field 9.** Record the identification number for the traffic signal (if applicable).

**Field 10.** Record the name of the contact responsible for answering any questions regarding the preemption design on behalf of the traffic signal operating agency.

**Field 11.** Record the phone number for the individual identified on Field 10.

**Field 12.** Record the name of the railroad operating company for the subject crossing.

**Field 13.** Record the railroad crossing ID.

**Field 14.** Record the name of the contact responsible for answering any questions regarding the preemption design on behalf of the railroad.

**Field 15.** Record the phone number for the individual identified on Field 14.

**Field 16.** Record the emergency contact number for the traffic signal operating agency. This number should also be located inside the traffic signal cabinet and the railroad bungalow.

**Field 17.** Record the emergency contact number for the railroad. This number should also be located inside the traffic signal cabinet and the railroad bungalow.

### Section 3 – Railroad Data

**Field 18.** Select the box next to any active warning devices present in the field. This information can also be found on the FRA Inventory Report which can be downloaded from the following website.

<https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/crossing/crossing.aspx>

**Field 19.** Record the maximum train speed. This information can be found on the FRA Inventory Report.

**Field 20.** Record the speed range over the crossing. This information can be found on the FRA Inventory Report.

**Field 21.** Record the number of trains per day. This information can be found on the FRA Inventory Report.

**Field 22.** Record the number of tracks present at the crossing. This information can also be found on the FRA Inventory.

**Field 23.** Select the box next to each type of circuit available within the bungalow. This information can be provided by the railroad representative present during the inspection.

**Field 24.** Select the box next to each type of circuit in use at the bungalow. Not all circuits available within the bungalow (Field 23) may be currently in use.

### Section 4 – Traffic Signal Data

**Field 25.** Select the box next to the cabinet type.

**Field 26.** Record the controller make and model.

**Field 27.** Select the box next to each type of preemption operating within the traffic signal cabinet.

**Field 28.** Are blank out signs present at the intersection? Select yes or no.

**Field 29.** Select the box next to each additional type of preemption that is operational within the traffic signal cabinet.

**Field 30.** Does railroad preemption have priority within the traffic signal cabinet? Select yes or no.

**Field 31.** Is battery back up installed at the signalized intersection? Select yes or no.

**Field 32.** If present, is the battery back up equipped with remote communication to the operating agency to alert them of a power outage? Select yes or no.

**Field 33.** Select the box next to each type of circuit available within the traffic signal cabinet.

**Field 34.** Select the box next to each type of circuit currently in use within the traffic signal cabinet. Not all circuits available within the traffic signal cabinet (Field 34) may currently be in use.

**Field 35.** Select the box next to each vehicular phase present at the signalized intersection.

**Field 36.** Select the box next to each pedestrian phase present at the signalized intersection.

**Field 37.** Record any other phases that are in use at the signalized intersection. (i.e. OL A or phase 9)

## Section 5 – Railroad Equipment Timing

**Field 38.** Record the Equipment Reaction Time for the railroad equipment. This value can be found on the railroad's circuit drawing.

**Field 39.** Record any notes regarding Equipment Reaction Time here.

**Field 40.** Record the designed Advanced Pedestrian preemption Time (if applicable). This value can be found on the railroad's circuit drawing.

**Field 41.** If an advanced pedestrian preemption circuit is active at the crossing (Field 40), record the field measured Advanced Pedestrian Preemption time. This value can only be field measured during an inspection if a train is present. If no train present during inspection, leave blank and request an event log (if available for the crossing). The event log will provide information that can be used to report on the max, min and average value.

**Field 42.** Use this space to record any notes regarding the advanced pedestrian preemption circuit operation. If no train was present during the inspection, indicate whether event logs have been or will be analyzed.

**Field 43.** Record the designed Advanced Preemption Time. This value can be found on the railroad's circuit drawing. Leave blank if the crossing is operating simultaneous preemption only.

**Field 44.** If an advanced preemption circuit is active at the crossing (Field 43), record the field measured Advanced Preemption time. This value can only be field measured during an inspection if a train is present. If no train present during inspection, leave blank and request an event log (if available for the crossing). The event log will provide information that can be used to report on the max, min and average value.

**Field 45.** Use this space to record any notes regarding the advanced preemption circuit operation. If no train was present during the inspection, indicate whether event logs have been or will be analyzed.

**Field 46.** Record the Minimum Warning Time. This value can be found on the railroad's circuit drawing. Some railroads use other terms like 'Basic Operating Time' but mean the same thing (minimum amount of time from start of lights to train arrival at the crossing).

**Field 47.** Use this space to record any notes regarding the Minimum Warning Time. If event logs have been collected, you can report out on the actual values here.

**Field 48.** Record Additional Clearance Time (if applicable). This value can be found on the railroad's circuit drawing.

**Field 49.** Use this space to record any notes regarding the Additional Clearance Time.

**Field 50.** Record the Buffer Time. This value can be found on the railroad's circuit drawing.

**Field 51.** Use this space to record any notes regarding the Buffer Time.

**Field 52.** Record the Total Warning Time. This value can be calculated by adding the Minimum Warning Time, Clearance Time, and Buffer Time together.

**Field 53.** Total Warning Time is automatically calculated. Use this space to record any notes regarding the Total Warning Time.

## Section 6 – Railroad Preemption Phasing Sequence

**Field 54.** Record the worst-case conflicting vehicular phase as identified during the initial preemption design. This phase or phases represent the longest total time (min green + yellow + red) of all vehicular phases.

**Field 55.** Record the worst-case conflicting pedestrian phase as identified during the initial preemption design. This phase represents the longest total time for any pedestrian phase (min walk + min flashing don't walk + yellow + red).

**Field 56.** Record the track clearance phase(s) for the signalized intersection.

**Field 57.** Record the preempt dwell phase(s) for the signalized intersection.

**Field 58.** Record the preempt dwell phase(s) for the signalized intersection.

## Section 7 – Traffic Signal Timings

**Field 59.** Record the Preempt Delay, if any, designed for the signalized intersection.

**Field 60.** Record the Preempt Delay, if any, programmed into the traffic signal controller for the preemption operation. May be programmed as delay or sometimes as debounce (EPAC controller).

**Field 61.** Use this space to record any notes regarding the Preempt Delay.

**Field 62.** Record the Entrance Min Green used in the design of the preemption operation.

**Field 63.** Record the Entrance Min Green programmed into the traffic signal controller for the preemption operation.

**Field 64.** Record the value of the Entrance Min Green field measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 65.** Use this space to record any notes regarding the Entrance Min Green.

**Field 66.** Record the sum of the Entrance Walk plus the Ped Clearance used in the design of the preemption operation. Should match phase indicated on Field 55.

**Field 67.** Record the sum of the Entrance Walk plus Ped Clearance programmed into the traffic signal controller for the worst-case pedestrian preemption operation.

**Field 68.** Record the value of the Entrance Walk plus Ped Clearance field measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 69.** Use this space to record any notes regarding the worst-case Entrance Walk and the Ped Clearance.

**Field 70.** Record the Entrance Yellow + Entrance Red used in the design of the preemption operation.

**Field 71.** Review Yellow & All Red times for all programmed phases. Record the largest Entrance Yellow + Entrance Red for any phase programmed into the traffic signal controller possible during preemption operation.

**Field 72.** Record the largest value of the Entrance Yellow + Entrance Red measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 73.** Use this space to record any notes regarding the Entrance Yellow + Entrance Red.

**Field 74.** Record the Maximum Right-of-Way Transfer Time (RWTT) used in the design of the preemption operation. It is the greater of the vehicular movement (delay + min green + yellow + red) or the pedestrian movement (delay + walk + ped clear + yellow + red).

**Field 75.** Record the Maximum Right-of-Way Transfer Time (RWTT) based upon the programming of the controller for the preemption operation. It is the greater of the vehicular movement (delay + min green + yellow + red) or the pedestrian movement (delay + walk + ped clear + yellow + red).

**Field 76.** Use this space to record any notes regarding the Minimum Right-of-Way Transfer Time (RWTT).

**Field 77.** Record the Track Clear Min Green used in the design of the preemption operation.

**Field 78.** Record the Track Clear Min Green programmed into the traffic signal controller for the preemption operation.

**Field 79.** Record the value of the Track Clear Min Green measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 80.** Use this space to record any notes regarding the Track Clear Min Green.

**Field 81.** Record the Track Clear Ext Green used in the design of the preemption operation.

**Field 82.** Record the Track Clear Ext Green programmed into the traffic signal controller for the preemption operation.

**Field 83.** Record the value of the Track Clear Ext Green measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 84.** Use this space to record any notes regarding the Track Clear Ext Green.

**Field 85.** Record the value of the Track Clear Max Green programmed into the traffic signal controller for the preemption operation.

**Field 86.** Use this space to record any notes regarding the Track Clear Max Green.

**Field 87.** Record the value of the Min Dwell programmed into the traffic signal controller for the preemption operation.

**Field 88.** Record the value of the Min Dwell measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 89.** Use this space to record any notes regarding the Min Dwell.

**Field 90.** Record the value of the Dwell Preemption Ext, if used, programmed into the traffic signal controller for the preemption operation.

**Field 91.** Record the value of the Dwell Preemption Ext, if used, measured with a timer or observed timing out in the controller during the test preemption. The test preemption may either involve a real train, or a train movement can be simulated by the railroad.

**Field 92.** Use this space to record any notes regarding the Dwell Preemption Ext.

## Section 8 – Field Testing and Inspection

**Field 93.** Do the railroad flashers operate as expected? During the test preemption sequence, do the flashers begin and end in the sequence expected and as shown on the timeline created during the design of the preemption operation, or as expected (if no timeline exists)? Select yes, or no. Add any notes needed to clarify your selection.

**Field 94.** Do the railroad gates operate as expected? During the test preemption sequence, do the gates lower and raise in the sequence expected and as shown on the timeline created during the design of the preemption operation, or as expected (if no timeline exists)? Select yes or no. Add any notes needed to clarify your selection.

**Field 95.** Are the blank out signs working properly? If blank out signs are installed at the intersection, do they turn on and off at the point in the preemption sequence as expected? Select yes, no or N/A (if no blank out signs present). Add any notes needed to clarify your selection.

**Field 96.** Does a preempt call trigger right of way transfer? When a preemption call is received, does the traffic signal cabinet immediately respond by either ending or shortening the green phase to the min green value set? Select yes or no. Add any notes needed to clarify your selection.

**Field 97.** Does a protected left turn arrow come up for the track clearance phase? A left turn green arrow lets the left turning vehicles know that no opposing through movement has a green light. Select yes or no. Add any notes needed to clarify your selection.

**Field 98.** Does gate down release track clear phase? If a gate down circuit is installed at the crossing, does the traffic signal controller hold the green only until the gate is horizontal at which point it transitions to a dwell phase? Select yes or no if there is a gate down circuit at the crossing. Use N/A if no gate down circuit is present. Add any notes needed to clarify your selection.

**Field 99.** Do the proper dwell & cycle phases operate? After the track clearance phase is served, does the controller move to the appropriate dwell phase and then on to any other cycle phases as programmed? Select yes or no if dwell (and cycle) phases are programmed. Use N/A if the signal transitions to an all red after the track clearance phase is served. Add any notes needed to clarify your response.

**Field 100.** Is the preemption call in the controller released at the beginning of gate descent or after the min dwell ext value is served? Select yes or no. Add any notes needed to clarify your selection.

**Field 101.** Does the signal exit to the proper phase(s) upon release of the preemption call as programmed in the controller? Select yes or no. Add any notes needed to clarify your selection.

**Field 102.** Does preemption reservice activate? If a new preemption call is received immediately after the controller enters into its exit phase, does the controller immediately begin to transfer right-of-way as designed to return to the track clearance phase? Select yes or no. Add any notes needed to clarify your selection.

**Field 103.** Are exempt signs posted at the crossing? Select yes or no. Add any notes needed to clarify your selection.

**Field 104.** Are emergency contact stickers located inside the traffic signal cabinet and the railroad bungalow? Select yes or no. Add any notes needed to clarify your selection.

## Section 9 – Other Information / Notes

**Field 105.** Use this section of the form to document important details regarding the annual test. Summarize any issues that were addressed and any that need to be addressed in the future.

# WisDOT RAILROAD PREEMPTION INSPECTION FORM

## 1. REVIEW TEAM

TRAFFIC SIGNAL INSPECTION COMPLETED BY:	1	INSPECTION DATE:	2
RAILROAD INSPECTION COMPLETED BY:	3	DATE OF LAST INSPECTION:	4

## 2. LOCATION DATA

HIGHWAY INTERSECTION:	MUNICIPALITY:	COUNTY:	
5	6	7	
TRAFFIC SIGNAL OPERATING AGENCY:	SIGNAL ID: (ex. S1056)	SIGNAL CONTACT:	SIGNAL CONTACT PHONE:
8	9	10	11
RAILROAD OPERATING COMPANY:	RR CROSSING ID: (ex. 391768X)	RR CONTACT:	RR CONTACT PHONE:
12	13	14	15
TRAFFIC SIGNAL EMERGENCY CONTACT NUMBER:	RAILROAD EMERGENCY CONTACT NUMBER:		
16	17		

## 3. RAILROAD DATA

## 4. TRAFFIC SIGNAL DATA

ACTIVE WARNING DEVICES: 18 <input type="checkbox"/> 3 or 4-Quadrant Gates <input type="checkbox"/> 2-Quadrant Gates <input type="checkbox"/> Flashers	CABINET TYPE: 25 <input type="checkbox"/> TS1 <input type="checkbox"/> TS2	CONTROLLER MAKE & MODEL: 26
MAXIMUM TRAIN SPEED (MPH): 19	SPEED RANGE OVER XING (MPH): 20	TYPE OF SIGNAL PREEMPTION: 27 <input type="checkbox"/> Advanced <input type="checkbox"/> Simultaneous
NUMBER OF TRAINS PER DAY: 21	NUMBER OF TRACKS: 22	OTHER TYPES OF PREEMPTION: 29 <input type="checkbox"/> Emergency Vehicle <input type="checkbox"/> Bus/Transit
AVAILABLE CIRCUITS: 23 <input type="checkbox"/> APPT <input type="checkbox"/> APT <input type="checkbox"/> GD <input type="checkbox"/> HC <input type="checkbox"/> Sup <input type="checkbox"/> XR	BATTERY BACKUP PRESENT? 31 <input type="checkbox"/> Yes <input type="checkbox"/> No	BLANKOUT SIGNS PRESENT? 28 <input type="checkbox"/> Yes <input type="checkbox"/> No
USED CIRCUITS: 24 <input type="checkbox"/> APPT <input type="checkbox"/> APT <input type="checkbox"/> GD <input type="checkbox"/> HC <input type="checkbox"/> Sup <input type="checkbox"/> XR	BATTERY BACKUP COMMUNICATION? 32 <input type="checkbox"/> Yes <input type="checkbox"/> No	DOES RR PREEMPT HAVE PRIORITY? 30 <input type="checkbox"/> Yes <input type="checkbox"/> No
CIRCUIT NOTES: APPT = Advanced Pedestrian Preemption      XR = Island Circuit APT = Advance Preemption GD = Gate Down HC = Health Circuit Sup = Supervisor	AVAILABLE CIRCUITS: 33 <input type="checkbox"/> APPT <input type="checkbox"/> APT <input type="checkbox"/> GD <input type="checkbox"/> HC <input type="checkbox"/> Sup <input type="checkbox"/> XR	USED CIRCUITS: 34 <input type="checkbox"/> APPT <input type="checkbox"/> APT <input type="checkbox"/> GD <input type="checkbox"/> HC <input type="checkbox"/> Sup <input type="checkbox"/> XR
	VEHICULAR PHASES PRESENT: 35 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8	OTHER PHASES PRESENT: 37 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8
	PEDESTRIAN PHASES PRESENT: 36 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8	

## 5. RAILROAD EQUIPMENT TIMING

RAILROAD SETTINGS	DESIGNED	MEASURED	NOTES
Equipment Reaction Time (ERT):	38 sec.		39
Advanced Pedestrian Preemption Time (APPT):	40 sec.	41 sec.	42
Advanced Preemption Time (APT):	43 sec.	44 sec.	45
Minimum Warning Time (MWT):	46 sec.		47
Additional Clearance Time (CT): (overspeed tolerance, wide/angled crossings)	48 sec.		49
Buffer Time (BT):	50 sec.		51
Total Warning Time (MWT + CT + BT):	52 sec.		53

## 6. RAILROAD PREEMPTION PHASING SEQUENCE

WORST CASE CONFLICTING PHASES	TRACK CLEARANCE PHASE(S)	PREEMPT DWELL PHASES	PREEMPT CYCLE PHASES
Vehicle: 54      Pedestrian: 55	56	57	58

