



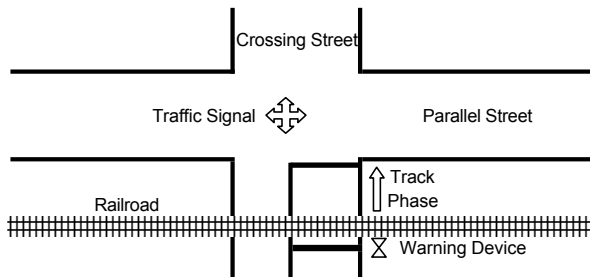
Texas Department of Transportation
GUIDE FOR DETERMINING TIME REQUIREMENTS FOR
TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS

City _____
 County _____
 District _____

Date _____
 Completed by _____
 District Approval _____



Show North Arrow



Parallel Street Name _____
 Crossing Street Name _____

Railroad _____
 Crossing DOT# _____

Railroad Contact _____
 Phone _____

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

- 1. Preempt delay time (seconds) 1.
- 2. Controller response time to preempt (seconds) 2.
- 3. Preempt verification and response time (seconds): add lines 1 and 2 3.

Remarks

 Controller type: _____

Worst-case conflicting vehicle time

- 4. Worst-case conflicting vehicle phase number 4.
- 5. Minimum green time during right-of-way transfer (seconds) 5.
- 6. Other green time during right-of-way transfer (seconds) 6.
- 7. Yellow change time (seconds) 7.
- 8. Red clearance time (seconds) 8.
- 9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8 9.

Remarks

Worst-case conflicting pedestrian time

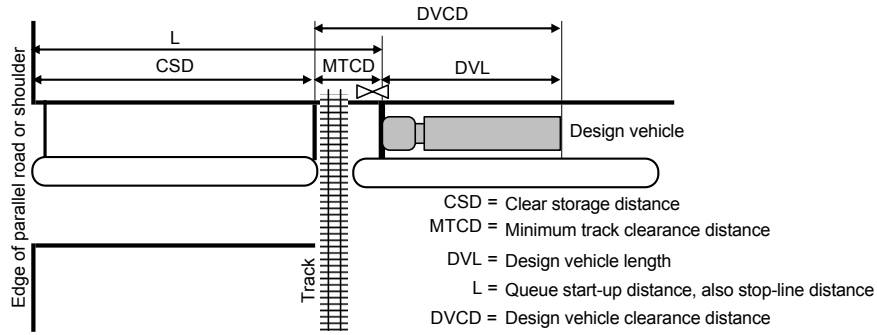
- 10. Worst-case conflicting pedestrian phase number 10.
- 11. Minimum walk time during right-of-way transfer (seconds) 11.
- 12. Pedestrian clearance time during right-of-way transfer (seconds) 12.
- 13. Vehicle yellow change time, if not included on line 12 (seconds) 13.
- 14. Vehicle red clearance time, if not included on line 12 (seconds) 14.
- 15. Worst-case conflicting pedestrian time (seconds): add lines 11 through 14 15.

Remarks

Worst-case conflicting vehicle or pedestrian time

- 16. Worst-case conflicting vehicle or pedestrian time (seconds): maximum of lines 9 and 15 16.
- 17. Right-of-way transfer time (seconds): add lines 3 and 16 17.

SECTION 2: QUEUE CLEARANCE TIME CALCULATION



18. Clear storage distance (CSD, feet)	18.	<input type="text"/>	Remarks _____	
19. Minimum track clearance distance (MTCD, feet)	19.	<input type="text"/>		
20. Design vehicle length (DVL, feet)	20.	<input type="text"/>		
21. Queue start-up distance, L (feet): add lines 18 and 19	21.	<input type="text" value="0"/>	Remarks _____	
22. Time required for design vehicle to start moving (seconds): calculate as $2+(L+20)$	22.	<input type="text" value="0.0"/>		
23. Design vehicle clearance distance, DVCD (feet): add lines 19 and 20	23.	<input type="text" value="0"/>		
24. Time for design vehicle to accelerate through the DVCD (seconds)	24.	<input type="text"/>		Read from Figure 2 in Instructions.
25. Queue clearance time (seconds): add lines 22 and 24	25.	<input type="text" value="0.0"/>		

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

26. Right-of-way transfer time (seconds): line 17	26.	<input type="text" value="0.0"/>	Remarks _____
27. Queue clearance time (seconds): line 25	27.	<input type="text" value="0.0"/>	
28. Desired minimum separation time (seconds)	28.	<input type="text" value="4.0"/>	
29. Maximum preemption time (seconds): add lines 26 through 28	29.	<input type="text" value="4.0"/>	

SECTION 4: SUFFICIENT WARNING TIME CHECK

30. Required minimum time, MT (seconds): per regulations	30.	<input type="text" value="20.0"/>	Remarks _____
31. Clearance time, CT (seconds): get from railroad	31.	<input type="text"/>	
32. Minimum warning time, MWT (seconds): add lines 30 and 31	32.	<input type="text" value="20.0"/>	
33. Advance preemption time, APT, if provided (seconds): get from railroad ..	33.	<input type="text"/>	
34. Warning time provided by the railroad (seconds): add lines 32 and 33	34.	<input type="text" value="20.0"/>	
35. Additional warning time required from railroad (seconds): subtract line 34 from line 29, round up to nearest full second, enter 0 if less than 0	35.	<input type="text" value="0"/>	

If the additional warning time required (line 35) is greater than zero, additional warning time has to be requested from the railroad. Alternatively, the maximum preemption time (line 29) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 1, 5, 6, 7, 8, 11, 12, 13 and 14.

Remarks: _____

SECTION 5: TRACK CLEARANCE GREEN TIME CALCULATION (OPTIONAL)

Preempt Trap Check

36. Advance preemption time (APT) provided (seconds):	36.	<input type="text"/>	Line 33 only valid if line 35 is zero.
37. Multiplier for maximum APT due to train handling	37.	<input type="text"/>	See Instructions for details.
38. Maximum APT (seconds): multiply line 36 and 37	38.	<input type="text" value="0.0"/>	Remarks
39. Minimum duration for the track clearance green interval (seconds)	39.	<input type="text" value="15.0"/>	<u>For zero advance preemption time</u>
40. Gates down after start of preemption (seconds): add lines 38 and 39	40.	<input type="text" value="15.0"/>	
41. Preempt verification and response time (seconds): line 3	41.	<input type="text" value="0.0"/>	Remarks
42. Best-case conflicting vehicle or pedestrian time (seconds): usually 0.....	42.	<input type="text"/>	_____
43. Minimum right-of-way transfer time (seconds): add lines 41 and 42	43.	<input type="text" value="0.0"/>	
44. Minimum track clearance green time (seconds): subtract line 43 from line 40	44.	<input type="text" value="15.0"/>	

Clearing of Clear Storage Distance

45. Time required for design vehicle to start moving (seconds), line 22	45.	<input type="text" value="0.0"/>	
46. Design vehicle clearance distance (DVCD, feet), line 23	46.	<input type="text" value="0"/>	Remarks
47. Portion of CSD to clear during track clearance phase (feet) ...	47.	<input type="text"/>	<u>CSD* in Figure 3 in Instructions.</u>
48. Design vehicle relocation distance (DVRD, feet): add lines 46 and 47	48.	<input type="text" value="0"/>	
49. Time required for design vehicle to accelerate through DVRD (seconds)	49.	<input type="text"/>	Read from Figure 2 in Instructions.
50. Time to clear portion of clear storage distance (seconds): add lines 45 and 49	50.	<input type="text" value="0.0"/>	
51. Track clearance green interval (seconds): maximum of lines 44 and 50, round up to nearest full second	51.	<input type="text" value="15"/>	

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

52. Right-of-way transfer time (seconds): line 17	52.	<input type="text" value="0.0"/>	
53. Time required for design vehicle to start moving (seconds), line 22	53.	<input type="text" value="0.0"/>	
54. Time required for design vehicle to accelerate through DVL (on line 20, seconds)	54.	<input type="text"/>	Read from Table 3 in Instructions.
55. Time required for design vehicle to clear descending gate (seconds): add lines 52 though 54	55.	<input type="text" value="0.0"/>	Remarks
56. Duration of flashing lights before gate descent start (seconds): get from railroad	56.	<input type="text"/>	_____
57. Full gate descent time (seconds): get from railroad	57.	<input type="text"/>	Remarks
58. Proportion of non-interaction gate descent time	58.	<input type="text"/>	Read from Figure 5 in Instructions.
59. Non-interaction gate descent time (seconds): multiply lines 57 and 58	59.	<input type="text" value="0.0"/>	
60. Time available for design vehicle to clear descending gate (seconds): add lines 56 and 59	60.	<input type="text" value="0.0"/>	
61. Advance preemption time (APT) required to avoid design vehicle-gate interaction (seconds): subtract line 60 from line 55, round up to nearest full second, enter 0 if less than 0	61.	<input type="text" value="0"/>	