TR-143416

Hunter, Kathy (UTC)

From: Fakler, Scott <Scott.Fakler@clark.wa.gov>
Sent: Tuesday, October 21, 2014 8:09 AM
To: Hunter, Kathy (UTC)
Subject: FW: 47th/78th Draft Petition to Construct for WUTC
Attachments: Petition to Construct 852-429-T Form 10-20-2014.pdf

Kathy,

Attached should be the completed traffic pre-emption worksheet, as this is what I received from our consultant. Please let me know if you need additional information.

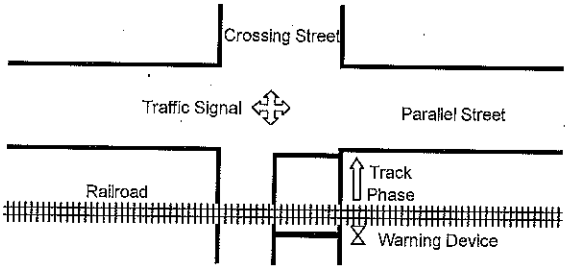
Scott

GUIDE FOR DETERMINING TIME REQUIREMENTS FOR
TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS

City NA
County Clark County
District WSDOT SW Region

Date 09/05/13
Completed by DKS Associates
District Approval

Show North Arrow



Parallel Street Name
NE 47th Avenue

Crossing Street Name
NE 78th Street

Railroad Chelatchie Prairie Railroad
Crossing DOT# 852-429-T

Railroad Contact Eric Temple
Phone

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

			Remarks
1. Preempt delay time (seconds)	1.	0.0	
2. Controller response time to preempt (seconds)	2.	1.0	Controller type: Naztec 2070E
3. Preempt verification and response time (seconds): add lines 1 and 2	3.	1.0	

Worst-case conflicting vehicle time

			Remarks
4. Worst-case conflicting vehicle phase number	4.	6	
5. Minimum green time during right-of-way transfer (seconds)	5.	6.00	Eastbound
6. Other green time during right-of-way transfer (seconds)	6.	0.00	
7. Yellow change time (seconds)	7.	4.00	Eastbound
8. Red clearance time (seconds)	8.	1.00	Eastbound
9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8	9.	11.0	

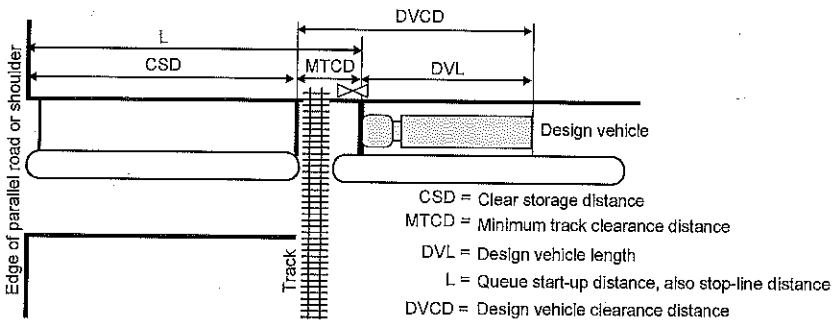
Worst-case conflicting pedestrian time

			Remarks
10. Worst-case conflicting pedestrian phase number	10.		
11. Minimum walk time during right-of-way transfer (seconds)	11.		At his intersections Ped phases
12. Pedestrian clearance time during right-of-way transfer (seconds)	12.		can time independent from
13. Vehicle yellow change time, if not included on line 12 (seconds)	13.		vehicle and (RR preempt)
14. Vehicle red clearance time, if not included on line 12 (seconds)	14.		timing sequences.
15. Worst-case conflicting pedestrian time (seconds): add lines 11 through 14	15.	0.0	

Worst-case conflicting vehicle or pedestrian time

16. Worst-case conflicting vehicle or pedestrian time (seconds): maximum of lines 9 and 15	16.	11.0
17. Right-of-way transfer time (seconds): add lines 3 and 16	17.	12.0

SECTION 2: QUEUE CLEARANCE TIME CALCULATION



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

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

			Remarks
26. Right-of-way transfer time (seconds): line 17	26.	12.0	
27. Queue clearance time (seconds): line 25	27.	0.0	
28. Desired minimum separation time (seconds)	28.	4.0	
29. Maximum preemption time (seconds): add lines 26 through 28	**29.**	16.0	

SECTION 4: SUFFICIENT WARNING TIME CHECK

			Remarks
30. Required minimum time, MT (seconds): per regulations	30.	20.0	
31. Clearance time, CT (seconds): get from railroad	31.	10.0	Eastbound
32. Minimum warning time, MWT (seconds): add lines	32.	30.0	Excludes buffer time (BT)
33. Advance preemption time, APT, if provided (seconds): get from railroad	33.		
34. Warning time provided by the railroad (seconds): add lines 32 and 33	34.	30.0	
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.**	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.** [ ] Line 33 only valid if line 35 is zero.

37. Multiplier for maximum APT due to train handling ..... **37.** [ ] See Instructions for details.

38. Maximum APT (seconds): multiply line 36 and 37 ..... **38.** [0.0]

39. Minimum duration for the track clearance green interval (seconds) ..... **39.** [15.0]

Remarks

For zero advance preemption time

40. Gates down after start of preemption (seconds): add lines 38 and 39 ..... **40.** [15.0]

41. Preempt verification and response time (seconds): line 3 ..... **41.** [1.0]

42. Best-case conflicting vehicle or pedestrian time (seconds): usually 0..... **42.** [ ]

Remarks

43. Minimum right-of-way transfer time (seconds): add lines 41 and 42 ..... **43.** [1.0]

44. Minimum track clearance green time (seconds): subtract line 43 from line 40 ..... **44.** [14.0]

Clearing of Clear Storage Distance

45. Time required for design vehicle to start moving (seconds), line 22 ..... **45.** [0.0]

46. Design vehicle clearance distance (DVCD, feet), line 23 ..... **46.** [0]

47. Portion of CSD to clear during track clearance phase (feet) ... **47.** [ ]

Remarks

CSD* in Figure 3 in Instructions.

48. Design vehicle relocation distance (DVRD, feet): add lines 46 and 47 ..... **48.** [0]

49. Time required for design vehicle to accelerate through DVRD (seconds) ..... **49.** [ ] Read from Figure 2 in Instructions.

50. Time to clear portion of clear storage distance (seconds): add lines 45 and 49 ..... **50.** [0.0]

51. **Track clearance green interval (seconds): maximum of lines 44 and 50, round up to nearest full second .....** **51.** [14]

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

52. Right-of-way transfer time (seconds): line 17 ..... **52.** [12.0]

53. Time required for design vehicle to start moving (seconds), line 22 ..... **53.** [0.0]

54. Time required for design vehicle to accelerate through DVL (on line 20, seconds) ..... **54.** [ ] Read from Table 3 in Instructions.

55. Time required for design vehicle to clear descending gate (seconds): add lines 52 though 54 ..... **55.** [12.0]

Remarks

56. Duration of flashing lights before gate descent start (seconds): get from railroad ..... **56.** [ ]

Remarks

57. Full gate descent time (seconds): get from railroad ..... **57.** [ ]

58. Proportion of non-interaction gate descent time ..... **58.** [ ] Read from Figure 5 in Instructions.

59. Non-interaction gate descent time (seconds): multiply lines 57 and 58 ..... **59.** [0.0]

60. Time available for design vehicle to clear descending gate (seconds): add lines 56 and 59 ..... **60.** [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.** [12]