

Table 4.1 Summary of Changes in Mean Speed

Site	Work Zone Type	Speed Control Condition	All traffic (mph)			Cars (mph)			Trucks (mph)		
			Sta. 1	Sta. 2	Chng	Sta. 1	Sta. 2	Chng	Sta. 1	Sta. 2	Chng
1A	Left lane closure with cones	No speed control technique	56.9	57.0	+0.1	57.0	57.9	+0.9	56.7	55.2	-1.5
		Drone radar 0.5 mile before beginning of lane closure taper	56.6	55.2	-1.4	57.8	56.8	-1.0	54.9	53.0	-1.9
1B	Right lane closure with cones	No speed control technique	58.1	57.7	-0.3	58.1	58.4	+0.3	58.0	56.7	-1.3
		Drone radar 0.5 mile before beginning of lane closure taper	58.4	55.9	-2.6	58.1	55.4	-2.7	58.8	56.4	-2.4
2	Left shoulder closure with concrete barrier	No speed control technique	57.7	55.6	-2.0	57.6	55.7	-1.9	57.8	55.3	-2.5
		Drone radar 0.1 mile before beginning of barrier	58.0	55.2	-2.8	58.0	54.9	-3.1	58.0	55.6	-2.4
		Police car 0.1 mile before beginning of barrier	57.8	54.9	-2.9	57.8	55.1	-2.8	57.7	54.6	-3.1
	Left shoulder closure with concrete barrier	No speed control technique	60.9	57.6	-3.3	61.5	58.0	-3.5	60.0	57.0	-3.0
		Drone radar 0.6 mile before beginning of barrier	61.1	57.6	-3.5	61.6	58.1	-3.5	60.2	56.8	-3.4
3	Left lane closure with cones	No speed control technique	63.6	62.8	-0.8	64.1	62.8	-1.3	62.9	62.9	0.0
		Drone radar 0.1 mile before beginning of lane closure taper	63.2	60.1	-3.1	63.8	60.3	-3.5	62.2	59.9	-2.3

**Table 4.2 Summary of Statistical Analysis of Mean Speed Changes
for a Given Speed Control Condition**

Site	Work Zone Type	Speed Control Condition	All traffic (mph)			Cars (mph)			Trucks (mph)		
			Chng	<i>t</i> (df)	<i>p</i>	Chng	<i>t</i> (df)	<i>p</i>	Chng	<i>t</i> (df)	<i>p</i>
1A	Left lane closure with cones	No speed control technique	+0.1	0.14(99)	-	+0.9	1.11(66)	-	-1.5	0.68(32)	-
		Drone radar 0.5 mile before beginning of lane closure taper	-1.4	2.86(99)	<0.005	-1.0	1.39(56)	<0.10	-1.9	3.31(42)	<0.005
1B	Right lane closure with cones	No speed control technique	-0.3	0.44(49)	-	+0.3	0.30(30)	-	-1.3	1.18(18)	-
		Drone radar 0.5 mile before beginning of lane closure taper	-2.6	3.91(48)	<0.001	-2.7	3.51(25)	<0.001	-2.4	2.18(22)	<0.025
2	Left shoulder closure with concrete barrier	No speed control technique	-2.0	4.43(76)	<0.001	-1.9	2.46(56)	<0.01	-2.5	2.04(19)	<0.05
		Drone radar 0.1 mile before beginning of barrier	-2.8	4.55(79)	<0.001	-3.1	3.69(50)	<0.001	-2.4	2.63(28)	<0.01
		Police car 0.1 mile before beginning of barrier	-2.9	4.76(77)	<0.001	-2.8	3.89(51)	<0.001	-3.1	2.72(25)	<0.01
	Left shoulder closure with concrete barrier	No speed control technique	-3.3	5.37(79)	<0.001	-3.5	4.07(48)	<0.001	-3.0	3.56(30)	<0.001
		Drone radar 0.6 mile before beginning of barrier	-3.5	5.54(82)	<0.001	-3.5	4.92(52)	<0.001	-3.4	3.78(29)	<0.001
3	Left lane closure with cones	No speed control technique	-0.8	1.20(80)	-	-1.3	1.55(48)	<0.10	0.0	0.02(31)	-
		Drone radar 0.1 mile before beginning of lane closure taper	-3.1	6.29(98)	<0.001	-3.5	8.73(63)	<0.001	-2.3	3.84(34)	<0.001

Table 4.3 Summary of Statistical Analysis of Changes in Mean Speed between Control (No Speed Control Technique) and Treatment (Speed Control Technique) Conditions

Site	Work Zone Type	Speed Control Condition	All traffic (mph)			Cars (mph)			Trucks (mph)		
			Chng	<i>t</i> (df)	<i>p</i>	Chng	<i>t</i> (df)	<i>p</i>	Chng	<i>t</i> (df)	<i>p</i>
1A	Left lane closure with cones	Drone radar 0.5 mile before beginning of lane closure taper	-1.5	1.84 (198)	<0.05	-1.9	2.25 (122)	<0.02	-0.4	0.30 (74)	-
1B	Right lane closure with cones	Drone radar 0.5 mile before beginning of lane closure taper	-2.3	2.35 (97)	<0.02	-3.0	2.48 (48)	<0.01	-1.2	0.75 (47)	-
2	Left shoulder closure with concrete barrier	Drone radar 0.1 mile before beginning of barrier	-0.8	0.89 (155)	-	-1.2	0.93 (106)	-	-0.1	0.08 (47)	-
	Left shoulder closure with concrete barrier	Police car 0.1 mile before beginning of barrier	-0.8	1.05 (153)	-	-0.9	0.83 (107)	-	-0.7	0.41 (44)	-
		Drone radar 0.6 mile before beginning of barrier	-0.2	0.17 (161)	-	0.0	0.01 (100)	-	-0.4	0.31 (59)	-
3	Left lane closure with cones	Drone radar 0.1 mile before beginning of lane closure taper	-2.3	2.79 (178)	<0.005	-2.2	1.79 (111)	<0.05	-2.3	1.89 (65)	<0.05

Table 4.4 Summary of Changes in Standard Deviation of Speed

Site	Work Zone Type	Speed Control Condition	All traffic (mph)			Cars (mph)			Trucks (mph)		
			Sta. 1	Sta. 2	Chng	Sta. 1	Sta. 2	Chng	Sta. 1	Sta. 2	Chng
1A	Left lane closure with cones	No speed control technique	5.4	5.8	+0.4	5.3	6.1	+0.8	5.6	5.2	-0.3
		Drone radar 0.5 mile before beginning of lane closure taper	5.3	5.4	+0.1	5.7	6.2	+0.5	4.8	4.3	-0.5
1B	Right lane closure with cones	No speed control technique	4.8	4.9	+0.1	4.4	5.1	+0.7	5.4	4.7	-0.7
		Drone radar 0.5 mile before beginning of lane closure taper	5.9	5.9	0.0	5.9	6.2	+0.3	6.1	5.6	-0.5
2	Left shoulder closure with concrete barrier	No speed control technique	4.3	3.9	-0.4	4.7	4.0	-0.7	3.3	3.8	+0.5
		Drone radar 0.1 mile before beginning of barrier	4.8	4.1	-0.7	5.1	4.1	-1.0	4.3	4.1	-0.3
		Police car 0.1 mile before beginning of barrier	4.7	4.0	-0.7	4.5	4.2	-0.3	5.1	3.8	-1.3
	Left shoulder closure with concrete barrier	No speed control technique	4.4	3.9	-0.5	4.9	3.7	-1.2	3.7	4.3	+0.6
		Drone radar 0.6 mile before beginning of barrier	4.7	3.8	-0.8	4.9	3.8	-1.2	4.2	3.9	-0.2
3	Left lane closure with cones	No speed control technique	5.5	5.2	-0.3	5.9	5.6	-0.2	4.9	4.5	-0.4
		Drone radar 0.1 mile before beginning of lane closure taper	5.4	4.6	-0.8	5.6	5.1	-0.4	5.1	3.6	-1.5

**Table 4.5 Summary of Statistical Analysis of Changes in Standard Deviation of Speed
for a Given Speed Control Condition**

Site	Work Zone Type	Speed Control Condition	All traffic (mph)			Cars (mph)			Trucks (mph)		
			Chng	F (df)	p	Chng	F (df)	p	Chng	F (df)	p
1A	Left lane closure with cones	No speed control technique	+0.4	1.16(99)	-	+0.8	1.31(66)	-	-0.3	1.14(32)	-
		Drone radar 0.5 mile before beginning of lane closure taper	+0.1	1.04(99)	-	+0.5	1.18(56)	-	-0.5	1.26(42)	-
1B	Right lane closure with cones	No speed control technique	+0.1	1.08(49)	-	+0.7	1.36(30)	-	-0.7	1.31(18)	-
		Drone radar 0.5 mile before beginning of lane closure taper	0.0	1.02(48)	-	+0.3	1.12(25)	-	-0.5	1.21(22)	-
2	Left shoulder closure with concrete barrier	No speed control technique	-0.4	1.22(76)	-	-0.7	1.37(56)	-	+0.5	1.35(19)	-
		Drone radar 0.1 mile before beginning of barrier	-0.7	1.39(79)	<0.10	-1.0	1.53(50)	<0.10	-0.3	1.13(28)	-
		Police car 0.1 mile before beginning of barrier	-0.7	1.35(77)	<0.10	-0.3	1.15(51)	-	-1.3	1.84(25)	<0.10
	Left shoulder closure with concrete barrier	No speed control technique	-0.5	1.29(79)	-	-1.2	1.74(48)	<0.05	+0.6	1.33(30)	-
		Drone radar 0.6 mile before beginning of barrier	-0.8	1.49(82)	<0.05	-1.2	1.71(52)	<0.05	-0.2	1.12(29)	-
	3	Left lane closure with cones	No speed control technique	-0.3	1.10(80)	-	-0.2	1.09(48)	-	-0.4	1.17(31)
Drone radar 0.1 mile before beginning of lane closure taper			-0.8	1.35(98)	<0.10	-0.4	1.17(63)	-	-1.5	2.05(34)	<0.05

Table 4.6 Summary of Changes in Percent of Traffic Exceeding Threshold Speeds

Site	Work Zone Configuration	Speed Control Condition	% exceeding 65 mph			% exceeding 55 mph		
			Sta. 1	Sta. 2	Chng	Sta. 1	Sta. 2	Chng
1A	Left lane closure with cones (Speed limit = 55 mph)	No speed control technique	7.0	6.0	-1.0	62.0	58.0	-4.0
		Drone radar 0.5 mile before beginning of lane closure taper	8.0	5.0	-3.0	55.0	45.0	-10.0
1B	Right lane closure with cones (Speed limit = 55 mph)	No speed control technique	12.0	4.0	-8.0	64.0	62.0	-2.0
		Drone radar 0.5 mile before beginning of lane closure taper	14.3	6.1	-8.2	73.5	51.0	-22.5
2	Left shoulder closure with concrete barrier (Speed limit = 55 mph)	No speed control technique	5.2	2.6	-2.6	67.5	51.9	-15.5
		Drone radar 0.1 mile before beginning of barrier	10.0	1.3	-8.7	74.0	53.8	-21.2
		Police car 0.1 mile before beginning of barrier	7.7	0.0	-7.7	67.9	51.3	-16.6
	Left shoulder closure with concrete barrier (Speed limit reduced from 65 mph to 55 mph at Sta. 2)	No speed control technique	22.5	2.5	-20.0	91.3	73.8	-17.5
		Drone radar 0.6 mile before beginning of barrier	24.1	4.8	-19.3	92.8	78.3	-14.5
3	Left lane closure with cones (Speed limit = 65 mph)	No speed control technique	43.2	32.1	-11.1	91.4	91.4	0.0
		Drone radar 0.1 mile before beginning of lane closure taper	38.4	11.1	-27.3	89.9	82.8	-7.1

Table 4.7 Summary of Statistical Analysis of Changes in Percent of Traffic Exceeding Threshold Speeds for a Given Speed Control Condition

Site	Work Zone Configuration	Speed Control Condition	% exceeding 65 mph			% exceeding 55 mph		
			Chng	z	p	Chng	z	p
1A	Left lane closure with cones (Speed limit = 55 mph)	No speed control technique	-1.0	0.29	-	-4.0	0.58	-
		Drone radar 0.5 mile before beginning of lane closure taper	-3.0	0.86	-	-10.0	1.42	0.08
1B	Right lane closure with cones (Speed limit = 55 mph)	No speed control technique	-8.0	1.49	0.07	-2.0	0.21	-
		Drone radar 0.5 mile before beginning of lane closure taper	-8.2	1.35	0.09	-22.5	2.36	0.009
2	Left shoulder closure with concrete barrier (Speed limit = 55 mph)	No speed control technique	-2.6	0.84	-	-15.5	1.99	0.02
		Drone radar 0.1 mile before beginning of barrier	-8.7	2.43	0.007	-21.2	2.86	0.002
		Police car 0.1 mile before beginning of barrier	-7.7	2.55	0.005	-16.6	2.14	0.02
	Left shoulder closure with concrete barrier (Speed limit reduced from 65 mph to 55 mph at Sta. 2)	No speed control technique	-20.0	4.01	<0.001	-17.5	2.99	0.002
		Drone radar 0.6 mile before beginning of barrier	-19.3	3.68	<0.001	-14.5	2.72	0.003
3	Left lane closure with cones (Speed limit = 65 mph)	No speed control technique	-11.1	1.47	0.07	0.0	-	-
		Drone radar 0.1 mile before beginning of lane closure taper	-27.3	4.67	<0.001	-7.1	1.46	0.07

Table 4.8 Summary of Changes in Eighty-fifth Percentile Speeds

Site	Work Zone Configuration	Speed Control Condition	85th percentile speed		
			Sta. 1	Sta. 2	Change
1A	Left lane closure with cones	No speed control technique	63.0	63.2	+0.2
		Drone radar 0.5 mile before beginning of lane closure taper	62.3	61.4	-0.9
1B	Right lane closure with cones	No speed control technique	63.8	62.9	-0.9
		Drone radar 0.5 mile before beginning of lane closure taper	64.8	61.4	-3.4
2	Left shoulder closure with concrete barrier	No speed control technique	61.7	59.7	-2.0
		Drone radar 0.1 mile before beginning of barrier	63.4	58.4	-5.0
		Police car 0.1 mile before beginning of barrier	62.7	58.0	-4.7
		No speed control technique	65.6	61.5	-4.1
		Drone radar 0.6 mile before beginning of barrier	66.1	61.6	-4.6
3	Left lane closure with cones	No speed control technique	68.8	68.2	-0.6
		Drone radar 0.1 mile before beginning of lane closure taper	69.1	64.6	-4.5