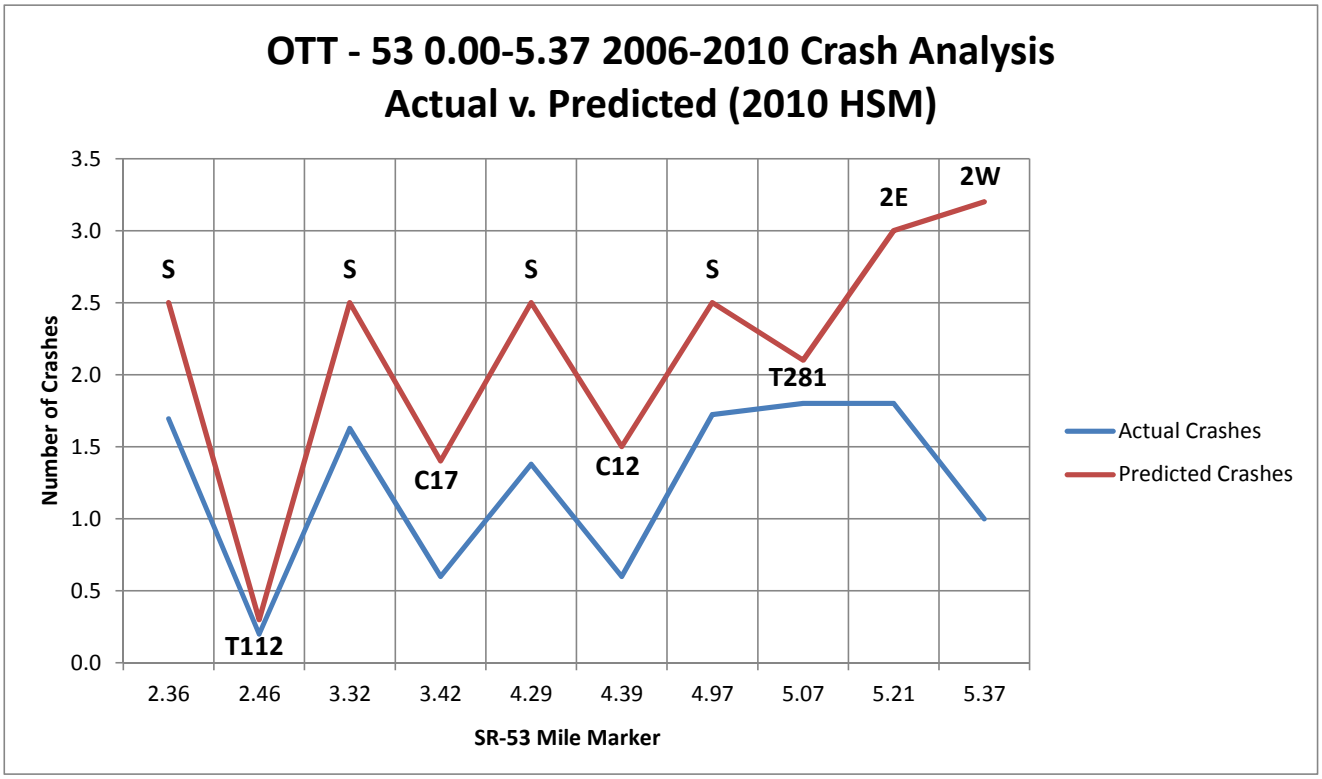
2010 Highway Safety Manual (HSM) Crash Analysis

Code	Location	Segment		Actual*	Actual Per year	Actual Per Location	Predicted	Reference
S	Section	0	2.36	20	4	1.7	2.5	Figure 10-3
T112	Little Portage East	2.36	2.46	1	0.2	0.2	0.3	Figure 10-4
S	Section	2.46	3.32	7	1.4	1.6	2.5	Figure 10-3
C17	Oak Harbor SE	3.32	3.42	3	0.6	0.6	1.4	Figure 10-4
S	Section	3.42	4.29	6	1.2	1.4	2.5	Figure 10-3
C12	Darr-Hopfinger	4.29	4.39	3	0.6	0.6	1.5	Figure 10-4
S	Section	4.39	4.97	5	1	1.7	2.5	Figure 10-3
T281	Wilcox	4.97	5.07	9	1.8	1.8	2.1	Figure 10-4
2 E	SR-2 East	5.06	5.21	9	1.8	1.8	3	Figure 10-4
2 W	SR-2 West	5.21	5.37	5	1	1.0	3.2	Figure 10-4
*2006-2010 crashes			**Total**	**68**				



2010 Highway Safety Manual (HSM)

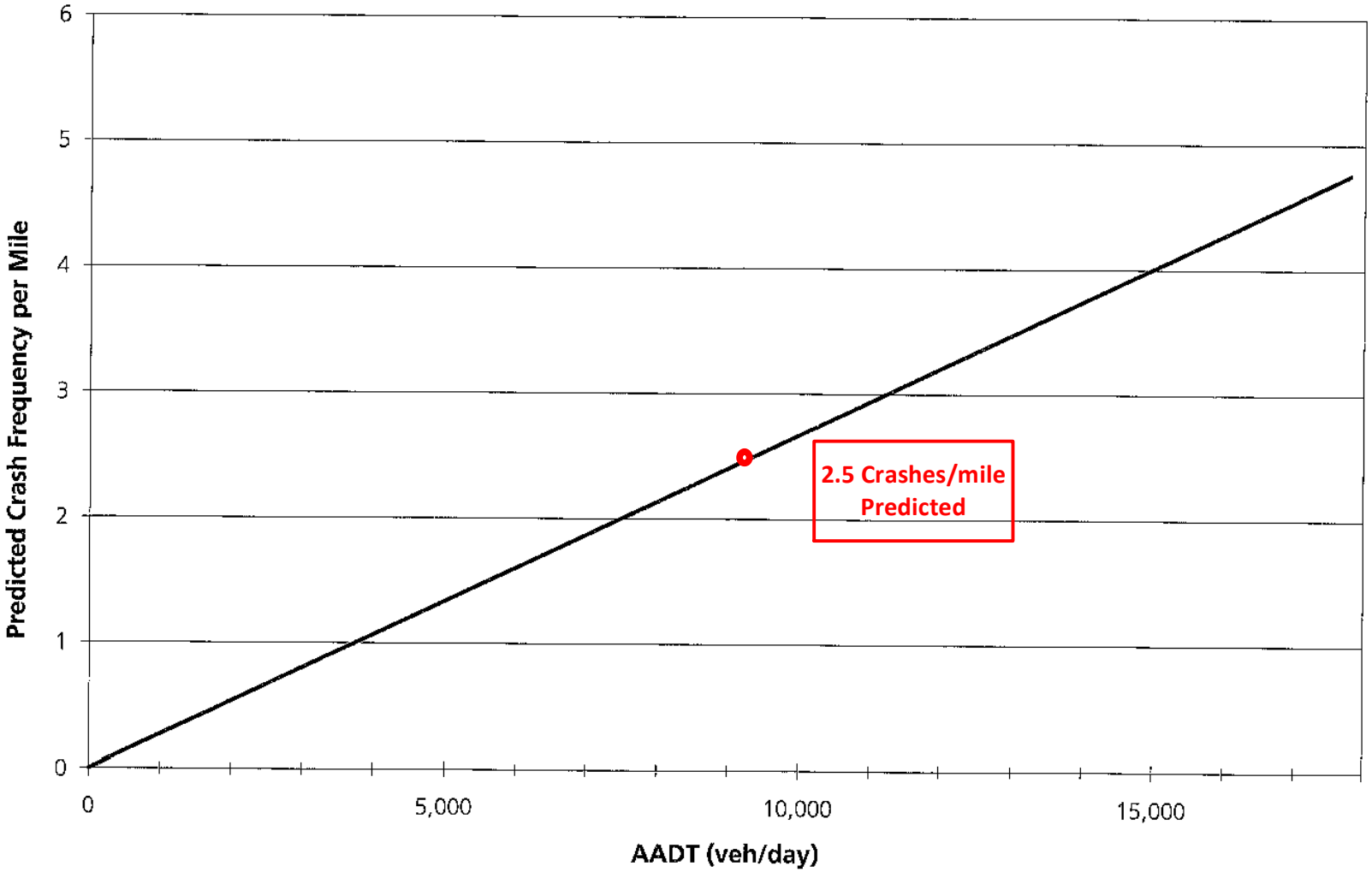


Figure 10-3. Graphical Form of SPF for Rural Two-Lane, Two-Way Roadway Segments (Equation 10-6)

9,200 AADT for SR-53 (Traffic Counter 5/5/2011-5/15/2011)

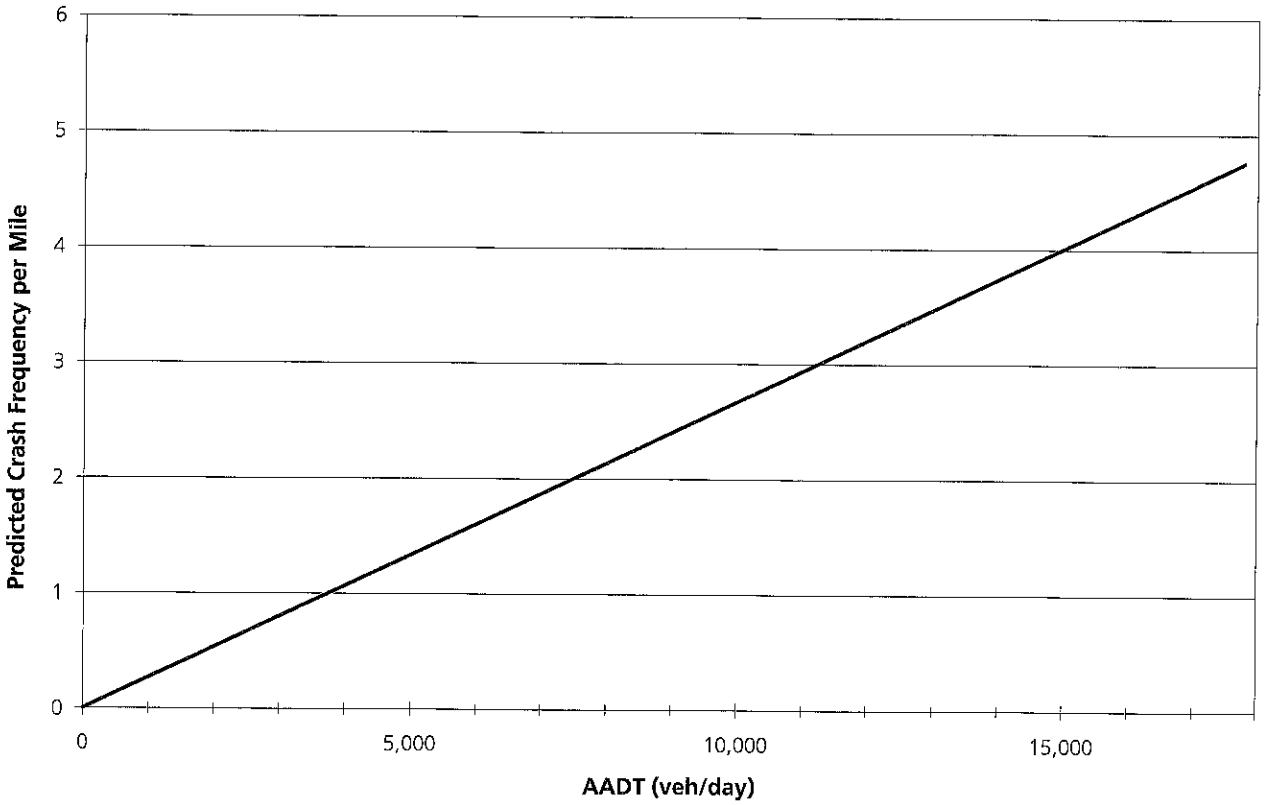


Figure 10-3. Graphical Form of SPF for Rural Two-Lane, Two-Way Roadway Segments (Equation 10-6)

The value of the overdispersion parameter associated with the SPF for rural two-lane, two-way roadway segments is determined as a function of the roadway segment length using Equation 10-7. The closer the overdispersion parameter is to zero, the more statistically reliable the SPF. The value is determined as:

$$k = \frac{0.236}{L} \tag{10-7}$$

Where:

k = overdispersion parameter; and

L = length of roadway segment (miles).

Tables 10-3 and 10-4 provide the default proportions for crash severity and for collision type by crash severity level, respectively. These tables may be used to separate the crash frequencies from Equation 10-6 into components by crash severity level and collision type. Tables 10-3 and 10-4 are applied sequentially. First, Table 10-3 is used to estimate crash frequencies by crash severity level, and then Table 10-4 is used to estimate crash frequencies by collision type for a particular crash severity level. The default proportions for severity levels and collision types shown in Tables 10-3 and 10-4 may be updated based on local data for a particular jurisdiction as part of the calibration process described in Appendix A to Part C.

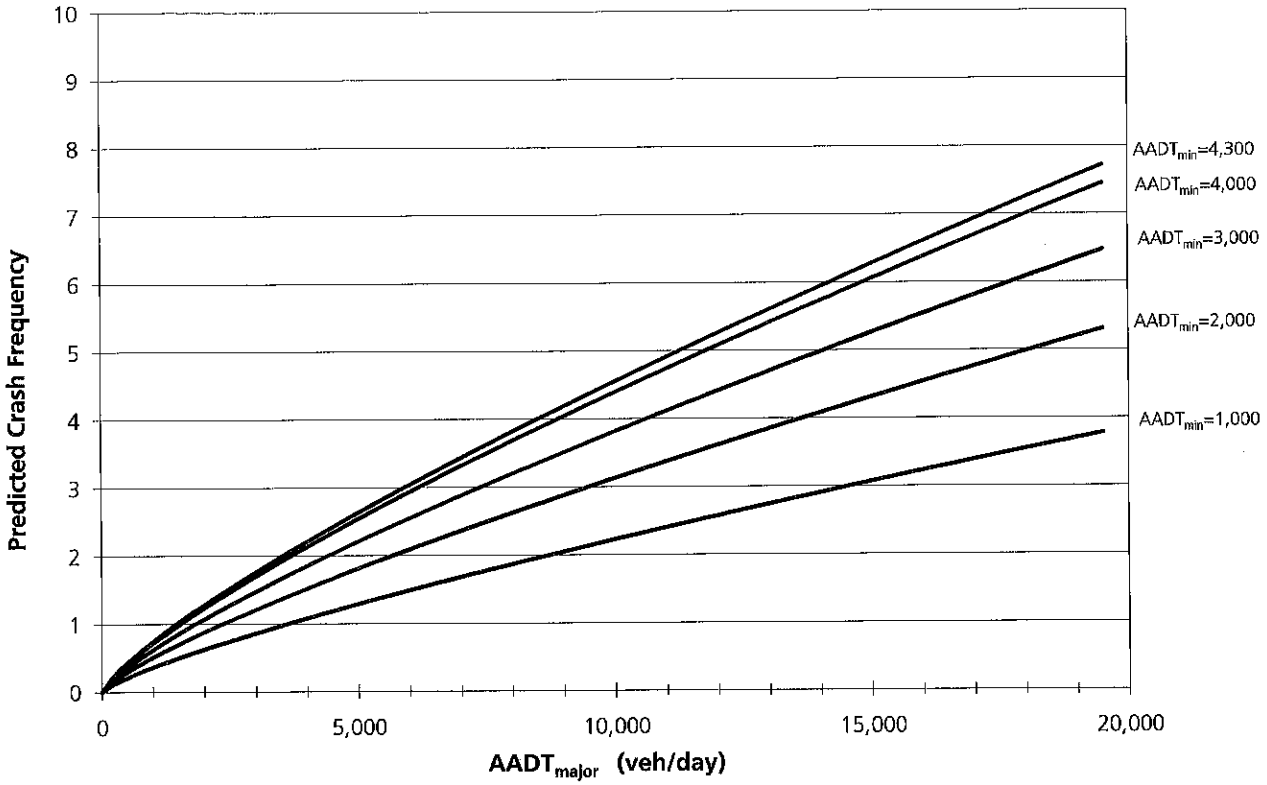


Figure 10-4. Graphical Representation of the SPF for Three-leg Stop-controlled (3ST) Intersections (Equation 10-8)

Four-Leg Stop-Controlled Intersections

The SPF for four-leg stop controlled intersections is shown in Equation 10-9 and presented graphically in Figure 10-5.

$$N_{spf\,4ST} = exp[-8.56 + 0.60 \times ln(AADT_{maj}) + 0.61 \times ln(AADT_{mtn})] \quad (10\text{-}9)$$

Where:

$N_{spf\,4ST}$ = estimate of intersection-related predicted average crash frequency for base conditions for four-leg stop controlled intersections;

$AADT_{maj}$ = AADT (vehicles per day) on the major road; and

$AADT_{mtn}$ = AADT (vehicles per day) on the minor road.

The overdispersion parameter (k) for this SPF is 0.24. This SPF is applicable to an $AADT_{maj}$ range from zero to 14,700 vehicles per day and $AADT_{min}$ range from zero to 3,500 vehicles per day. Application to sites with AADTs substantially outside these ranges may not provide accurate results.

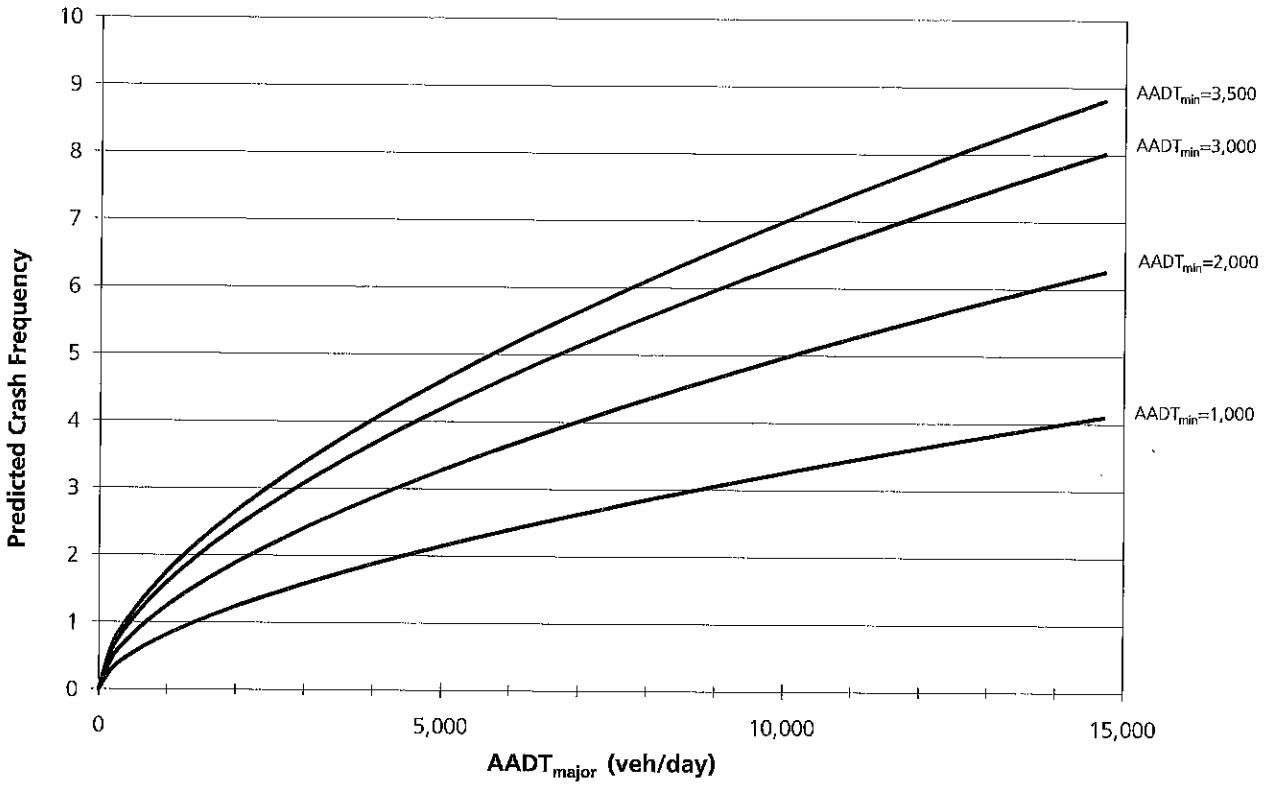


Figure 10-5. Graphical Representation of the SPF for Four-leg, Stop-controlled (4ST) Intersections (Equation 10-9)

Four-Leg Signalized Intersections

The SPF for four-leg signalized intersections is shown in Equation 10-10 and presented graphically in Figure 10-6.

$$N_{spf\,4SG} = exp[-5.13 + 0.60 \times In(AADT_{maj}) + 0.20 \times In(AADT_{min})] \quad (10\text{-}10)$$

Where:

$N_{spf\,4SG}$ = SPF estimate of intersection-related predicted average crash frequency for base conditions;

$AADT_{maj}$ = AADT (vehicles per day) on the major road; and

$AADT_{min}$ = AADT (vehicles per day) on the minor road.

The overdispersion parameter (k) for this SPF is 0.11. This SPF is applicable to an $AADT_{maj}$ range from zero to 25,200 vehicles per day and $AADT_{min}$ range from zero to 12,500 vehicles per day. For instances when application is made to sites with AADT substantially outside these ranges, the reliability is unknown.