



# RESEARCH

2007-21A

## Appendices to Evaluating the Effectiveness of the Minnesota Speed Management Program



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## Technical Report Documentation Page

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16. Abstract (Limit: 200 words)  The Minnesota Speed Management Program (MSMP), a cooperative project between the Minnesota Department of Transportation and the Minnesota Department of Public Safety, was developed within the framework of the Minnesota Comprehensive Highway Safety Plan. The overall goal was to reduce the number of fatal and life-changing crashes on Minnesota highways. The MSMP involved a speed limit adjustment—on 850 miles of Minnesota’s 55 mph highways the speed limit was increased to 60 mph. It involved increased speed enforcement—by State Patrol, county sheriffs, and local law enforcement—on selected highways. There were four waves of <i>Enhanced</i> Enforcement (one of six weeks, three of eight weeks) each followed by four weeks of <i>Regular</i> Enforcement. The MSMP involved extensive public education, organized by the Office of Traffic Safety, with approximately 10,000 public service messages presented on the radio.  Two evaluation efforts were conducted. The University of Minnesota compared travel speed data and crash data obtained during the MSMP with historical data. Throughout the MSMP, there were decreases in the number of drivers traveling at least 10 mph above the speed limits—decreases of -28.7% on 2-Lane/2-Way Highways; -28.7% on 4-Lane Divided Highways; -42.9% on Rural Freeways; and -11.2% mph on Urban Freeways. The University’s evaluation also showed there were reductions in the numbers of fatal and life-changing crashes during the MSMP. MarketLine Research conducted the second evaluation, using telephone surveys, and found nine in ten drivers support the speed limit increase from 55 mph to 60 mph in both Metro and Greater Minnesota. The MSMP, in concert with other efforts that are part of the Minnesota Comprehensive Highway Safety Plan, resulted in reductions in the number of speeders on Minnesota Highways and reductions in the number of fatal and life-changing crashes—making Minnesota’s roads safer			
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**Appendices to**  
**Evaluating the Effectiveness of the**  
**Minnesota Speed Management Program**

**Final Report**

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**Appendix 1**  
**Minnesota Speed Management Project: Deliverable #2—**  
**Historical Data**

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## Section 1: Introduction

### 1.1 Background

The Minnesota Speed Management Program (MSMP) is a cooperative project between the Minnesota Department of Transportation (Mn/DOT) and the Minnesota Department of Safety (DPS). The program, which began on 9/26/05 and ends on 8/13/06, involves:

- Raising the speed limit on select roadways in Minnesota from 55 mph to 60 mph in order to align the speed limit more closely with the design speed of the roadways.
- Increasing the presence of enforcement officers along selected areas of these roadways and other high-design roadways for selected periods of time.

The MSMP involves the following four types of roadway—(1) 2-Lane/2-Way Highways, (2) 4-Lane Divided Highways, (3) Rural Freeways, and (4) Urban Freeways.

The University of Minnesota’s involvement in the project was to assess the effectiveness of the MSMP in reducing driver speed and fatal and “A” injury crashes. We analyzed vehicle speed data collected by Mn/DOT in order to determine whether changes in driver speeds occurred as a result of the MSMP. In addition, we analyzed fatal and “A” injury crashes to determine whether the program produced changes in crash rates. We used historical speed data and crash data for comparison purposes. We also obtained citation data—but only for the time period in which the MSMP was conducted.

In our analysis, we used speed data obtained both in periods in which there was *enhanced* enforcement on some roadways and in periods in which there was *normal* enforcement on those same roads. The schedule of the *enhanced* enforcement and *normal* enforcement periods is presented in Table 1.

**Table 1.1: Enforcement Status During the MSMP**

Enforcement status	Time Period
<i>Enhanced</i> Enforcement Period #1	9/26/05 to 11/6/05
<i>Normal</i> Enforcement Period #1	11/7/05 to 12/4/05
<i>Enhanced</i> Enforcement Period #2.	12/5/05 to 1/29/06
<i>Normal</i> Enforcement Period #2	1/30/06 to 2/26/06
<i>Enhanced</i> Enforcement Period #3.	2/27/06 to 4/23/06
<i>Normal</i> Enforcement Period #3	4/24/06 to 5/21/06
<i>Enhanced</i> Enforcement Period #4	5/22/06 to 7/16/06
<i>Normal</i> Enforcement Period #4	7/17/06 to 8/13/06

As the table shows the program began with a six-week period of *enhanced* enforcement. This was followed by a four-week period of *normal* enforcement. The remaining three *enhanced* enforcement periods were all eight weeks in length, and each was followed by a four-week period of *normal* enforcement.

The first step in the analysis process was to analyze historical speed data, in order to provide a baseline against which the data collected in the MSPM could be compared. The historical speed data are presented in the following sections of this report.

In the MSMP, Mn/DOT collected speed data from 21 Automated Traffic Recorders (ATRs) and seven Data-Recording Tubes. The 21 ATRs are listed in Table 1.2. In the table, the ATRs are organized in terms of the type of roadway on which they are located—i.e., whether they are on 2-Lane/2-Way Highways, 4-Lane Divided Highways, Rural Freeways, or Urban Freeways. The table lists their locations, the speed limit at the location—and whether or not the speedlimit was changed for the MSMP—and whether the ATRs were located *Within* or *Outside* an Enhanced Enforcement Zone. As the table shows, seven ATRs were located on 2-Lane/2-Way Highways, five on 4-Lane Divided Highways, five on Rural Freeways, and four on Urban Freeways.

**Table 1.2: ATRs Organized by Road Type**

<b>Type of roadway</b>	<b>ATR</b>	<b>Location</b>	<b>Speed limit</b>	<b><i>Within/ Outside Enforcement Zone</i></b>
2-Lane/2-Way Highway	210	US-71, 1 mile North of Blackduck, Beltrami	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	219	US-2, South East of Warba, Itasca	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	220	US-71, South of CR 89, Hubbard	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	179	USTH 59, South of Garvin, Lyon	Unchanged at 55 mph	<i>Outside</i>
2-Lane/2-Way Highway	198	USTH 212, East of TH 23, Chippewa	Unchanged at 55 mph	<i>Outside</i>
2-Lane/2-Way Highway	199	USTH 75, 0.55 miles N of Co Rd. 69, Pipestone	Unchanged at 55 mph	<i>Outside</i>
2-Lane/2-Way Highway	222	MNTH 65, near Pliny, Aitkin	Unchanged at 55 mph	<i>Outside</i>
4-Lane Divided Highway	197	SR-60, 0.7 miles West of junction with SR-4, (St. James) Watonwan	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	172	US-10, West of Dilworth, Clay	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	187	US-10, 0.8 miles West of Rice, Benton	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	188	US-52, North of Rochester, Olmstead	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	353	TH 169, South of CR 59, North of Jordan, Scott	Unchanged at 65 mph	<i>Outside</i>
Rural Freeway	175	I-94, 0.5 miles South East of Saulk Centre, Stearns	Unchanged at 70 mph	<i>Within</i>
Rural Freeway	191	I-35, North of Wyoming, Chisago	Unchanged at 70 mph	<i>Within</i>
Rural Freeway	208	I-35, North of Owatanna, Steele	Unchanged at 70 mph	<i>Within</i>
Rural Freeway	227	I-90, East of Alden, Freeborn	Unchanged at 70 mph	<i>Within</i>
Rural Freeway	200	I-94, Hasty, Wright	Unchanged at 70 mph	<i>Outside</i>
Urban Freeway	100	Highway 100, near Brooklyn Center, Hennepin	Increased—from 55 mph to 60 mph	<i>Within</i>
Urban Freeway	I94	I-94, South of 57 <sup>th</sup> Street Bridge, Hennepin	Increased—from 55 mph to 60 mph	<i>Within</i>
Urban Freeway	35WC D	I-35W, near Roseville, Ramsey	Increased—from 55 mph to 60 mph	<i>Within</i>
Urban Freeway	335	I-35W at County Road 53, Anoka	Unchanged at 55 mph	<i>Outside</i>



In addition to the ATRs, there were seven locations at which there are Data-Recording Tubes. The seven Tubes are listed in Table 1.3. They are organized in terms of the type of roadway on which they were located. The table gives the locations of the Tubes, whether they collected data from all lanes or from only the lanes in one direction, the speed limit at the location—and whether or not the speed limit was changed for the MSMP—and whether the Tubes were located *Within* or *Outside* the Enhanced Enforcement Zones.

**Table 1.3: Tubes Organized by Road Type**

<b>Type of roadway</b>	<b>Tube Number (Lanes Covered)</b>	<b>Location</b>	<b>Speed limit</b>	<b><i>Within/ Outside Enforcement Zone</i></b>
2-Lane/2-Way Highway	T01 (All)	MN-23, Hanley Falls, Lyon	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	T02 (All)	MN-7, Montevideo, Chippewa	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	T03 (All)	US-71, Willmar, Kandiyohi	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	T04 (Westbound)	MN-7, Silver Lake, McLeod	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	T08 (All)	US-53, Ash Lake, St Louis	Increased—from 55 mph to 60 mph	<i>Outside</i>
4-Lane Divided Highway	T05 (Eastbound)	MN-60, Lake Crystal, Blue Earth	Unchanged at 65 mph	<i>Within</i>
Rural Freeway	T06 (Eastbound)	I-94, Fergus Falls, Otter Tail	Unchanged at 70 mph	<i>Within</i>
Rural Freeway	T07 (All)	I-35, Cloquet, Carlton	Unchanged at 70 mph	<i>Within</i>

### *1.2. Organization of this Report*

Historical speed data from the 21 ATRs and seven Tubes are presented in the next four section of this report—historical speed data from 2-Lane/2-Way Highways, 4-Lane Divided Highways, Rural Freeways, and Urban Freeways are presented in Section 2, Section 3, Section 4, Section and 5, respectively.

The historical data are limited for the seven Tubes and for three the ATRs located on Urban Freeways. For each of the Tubes, the available historical data were collected in a one-week period in August 2005, shortly before the MSMP began. The three ATRs located on Urban Freeways were installed in the summer of 2005—for ATR-100, two

weeks of data were collected in September 2005, while for ATR-I94 and ATR-35WCD four weeks of data were collected in August and September 2005.

For the remaining 18 ATRs, there were historical data from the same time periods that were used in the MSMP. In some cases, three years of historical speed data were available; in others, only one or two years of historical data were available.

Following the four sections that present historical speed data, the fifth and final section of the report presents historical crash data.

## **Section 2: 2-Lane/2-Way Highway Speed Data**

The historical speed data obtained from the seven ATRs and five Tubes that were located on 2-Lane/2-Way Highways are presented in this section of the report.

Three of the seven ATRs were located *Within* Enhanced Enforcement Zones, while the remaining four were located *Outside* Enhanced Enforcement Zones. During the MSMP, at the locations of the three ATRs *Within* the Enhanced Enforcement Zones, the speed limit was increased from 55 mph to 60 mph. In contrast, at the locations of the four ATRs *Outside* the Enhanced Enforcement Zones, the speed limit remained unchanged at 55 mph.

Four of the five Tubes were located *Within* Enhanced Enforcement Zones, while the remaining Tube was located *Outside* the Enhanced Enforcement Zones. However at all five Tube locations—the Tube located *Outside* the Enhanced Enforcement Zones—the speed limit was increased from 55 mph to 60 mph.

### *2.1. Historical Speed Data from ATRs Located Within Enhanced Enforcement Zones*

The three ATRs located *Within* Enhanced Enforcement Zones on 2-Lane/2-Way Highways were as follows: (1) ATR-210, on US-71, near Blackduck in Beltrami County, (2) ATR-219, on US-2, near Warba in Itasca County, and (3) ATR-220, on US-71, South of CR 89 in Hubbard County. For these three ATRs, there were historical data from the same time periods that were used in the MSMP. In some cases, three years of historical speed data were available; in others, one or two years of historical data were available.

**ATR-210**

The historical speed data for ATR-210 are presented in Tables 2.1 through 2.8.

**Table 2.1: ATR-210—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	60.9099284	60.56549	61.40966
Standard deviation (mph)	8.20577853	8.281824	7.58461
Median (mph)	61.3635283	61.17443	61.66768
15 <sup>th</sup> percentile (mph)	55.2005335	55.04355	55.57972
85 <sup>th</sup> percentile (mph)	67.9055718	67.58861	68.09323
90 <sup>th</sup> percentile (mph)	69.3862473	69.12559	69.51765
95 <sup>th</sup> percentile (mph)	72.7496133	72.20098	72.94356
Percent in 10 mph pace	59.48377	60.5921	59.7873
Proportion at 65 mph or more	0.24811643	0.234211	0.258579
Proportion at 70 mph or more	0.07927457	0.071554	0.083068
Proportion at 75 mph or more	0.02604059	0.022589	0.026898
Proportion at 80 mph or more	0.00825477	0.005776	0.007583
Proportion at 85 mph or more	0.00298489	0.00218	0.002741
Vehicle Total	48,578	52,282	54,726

**Table 2.2: ATR-210—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	59.915	60.039	60.932
Standard deviation (mph)	8.7779	8.1524	7.8987
Median (mph)	60.735	60.713	61.397
15 <sup>th</sup> percentile (mph)	53.321	53.797	55.191
85 <sup>th</sup> percentile (mph)	67.343	67.079	67.836
90 <sup>th</sup> percentile (mph)	68.921	68.670	69.242
95 <sup>th</sup> percentile (mph)	71.783	71.016	72.336
Percent in 10 mph pace	58.591	60.749	59.329
Proportion at 65 mph or more	0.22423	0.21533	0.25080
Proportion at 70 mph or more	0.065806	0.058197	0.073069
Proportion at 75 mph or more	0.021478	0.017874	0.023693
Proportion at 80 mph or more	0.0059229	0.0049350	0.0066107
Proportion at 85 mph or more	0.0023380	0.0017754	0.0023986
Vehicle Total	32,079	33,232	34,187

**Table 2.3: ATR-210—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	60.551	59.753	58.48145
Standard deviation (mph)	8.42853	8.615709	9.341494
Median (mph)	61.13686	60.51694	59.44614
15 <sup>th</sup> percentile (mph)	54.51279	53.25793	51.25359
85 <sup>th</sup> percentile (mph)	67.77133	67.12141	66.36898
90 <sup>th</sup> percentile (mph)	69.24329	68.72718	68.25588
95 <sup>th</sup> percentile (mph)	72.49436	71.24467	70.5037
Percent in 10 mph pace	58.5905	58.4992	51.4271
Proportion at 65 mph or more	0.244138	0.216055	0.186276
Proportion at 70 mph or more	0.074296	0.060368	0.053783
Proportion at 75 mph or more	0.025594	0.018719	0.016228
Proportion at 80 mph or more	0.006435	0.004813	0.00395
Proportion at 85 mph or more	0.002595	0.001705	0.001447
Vehicle Total	55,481	56,305	53,920

**Table 2.4: ATR-210—Three Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	60.675	60.833	61.073
Standard deviation (mph)	8.2006	7.7114	7.6273
Median (mph)	61.279	61.194	61.378
15 <sup>th</sup> percentile (mph)	55.104	55.111	55.326
85 <sup>th</sup> percentile (mph)	67.652	67.736	67.849
90 <sup>th</sup> percentile (mph)	69.137	69.199	69.319
95 <sup>th</sup> percentile (mph)	72.158	72.315	72.543
Percent in 10 mph pace	60.308	59.513	59.903
Proportion at 65 mph or more	0.23930	0.24352	0.24693
Proportion at 70 mph or more	0.070921	0.072621	0.076837
Proportion at 75 mph or more	0.022450	0.023760	0.024073
Proportion at 80 mph or more	0.0056678	0.0049929	0.0062711
Proportion at 85 mph or more	0.0021346	0.0017217	0.0025624
Vehicle Total	27,171	29,041	29,660

**Table 2.5: ATR-210—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 2/27/03 to 3/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	60.830	59.9019	61.11259
Standard deviation (mph)	8.0468	8.210992	7.734233
Median (mph)	61.329	60.45495	61.42962
15 <sup>th</sup> percentile (mph)	55.246	53.75037	55.4515
85 <sup>th</sup> percentile (mph)	67.725	66.88127	67.82317
90 <sup>th</sup> percentile (mph)	69.194	68.63977	69.34723
95 <sup>th</sup> percentile (mph)	72.297	71.35655	72.6631
Percent in 10 mph pace	60.396	61.3908	60.799
Proportion at 65 mph or more	0.24272	0.203491	0.24262
Proportion at 70 mph or more	0.072575	0.061324	0.078585
Proportion at 75 mph or more	0.023426	0.019585	0.024917
Proportion at 80 mph or more	0.0063125	0.005203	0.007016
Proportion at 85 mph or more	0.0020433	0.001762	0.002897
Vehicle Total	27,406	59,585	59,719

**Table 2.6: ATR-210—Three Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	60.959	60.275	61.140
Standard deviation (mph)	7.8206	8.2432	7.4880
Median (mph)	61.395	60.802	61.485
15 <sup>th</sup> percentile (mph)	55.466	54.808	55.593
85 <sup>th</sup> percentile (mph)	67.564	67.170	67.649
90 <sup>th</sup> percentile (mph)	69.152	68.888	69.177
95 <sup>th</sup> percentile (mph)	72.344	71.838	72.256
Percent in 10 mph pace	62.276	62.501	62.102
Proportion at 65 mph or more	0.23073	0.21315	0.23665
Proportion at 70 mph or more	0.073311	0.067623	0.073070
Proportion at 75 mph or more	0.023585	0.019679	0.021942
Proportion at 80 mph or more	0.0059262	0.0054145	0.0056605
Proportion at 85 mph or more	0.0023765	0.0024453	0.0020694
Vehicle Total	33,242	34,352	32,859

**Table 2.7: ATR-210—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	61.15629	60.17311	61.5863876
Standard deviation (mph)	7.666349	9.465533	7.2983362
Median (mph)	61.54294	61.17891	61.7492381
15 <sup>th</sup> percentile (mph)	55.52223	54.59599	55.8979156
85 <sup>th</sup> percentile (mph)	67.83211	67.69237	68.0372026
90 <sup>th</sup> percentile (mph)	69.35392	69.29561	69.5101531
95 <sup>th</sup> percentile (mph)	72.57796	72.5974	72.9209815
Percent in 10 mph pace	61.1618	60.5467	61.430736
Proportion at 65 mph or more	0.243051	0.233967	0.25309928
Proportion at 70 mph or more	0.078773	0.078032	0.08337191
Proportion at 75 mph or more	0.022968	0.02407	0.02624743
Proportion at 80 mph or more	0.00605	0.006634	0.00720165
Proportion at 85 mph or more	0.002113	0.002646	0.00264918
Vehicle Total	76,194	77,481	77,760

**Table 2.8: ATR-210—Two Prior Years of Historical Speed Data for Eight-Week Period from 7/17 to 8/13 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	61.493	62.020	
Standard deviation (mph)	7.8967	7.6742	
Median (mph)	61.866	62.171	
15 <sup>th</sup> percentile (mph)	55.732	56.116	
85 <sup>th</sup> percentile (mph)	68.246	68.643	
90 <sup>th</sup> percentile (mph)	69.655	69.962	
95 <sup>th</sup> percentile (mph)	73.075	73.684	
Percent in 10 mph pace	60.034	59.493	
Proportion at 65 mph or more	0.26517	0.28802	
Proportion at 70 mph or more	0.087748	0.098571	
Proportion at 75 mph or more	0.026363	0.032654	
Proportion at 80 mph or more	0.0075602	0.0081573	
Proportion at 85 mph or more	0.0028534	0.0033460	
Vehicle Total	41,004	40,945	

**ATR-219**

The historical speed data for ATR-210 are presented in Tables 2.9 through 2.16.

**Table 2.9: ATR-219—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	61.4545416	62.24973	62.15082
Standard deviation (mph)	5.63946714	5.214479	4.75036
Median (mph)	61.4020475	62.32598	62.21822
15 <sup>th</sup> percentile (mph)	56.3149367	57.75922	57.78839
85 <sup>th</sup> percentile (mph)	66.661964	66.60045	65.94424
90 <sup>th</sup> percentile (mph)	68.4027784	68.24977	67.77809
95 <sup>th</sup> percentile (mph)	70.5075952	69.89908	69.61194
Percent in 10 mph pace	68.524519	73.9637	75.9257
Proportion at 65 mph or more	0.19773524	0.198519	0.175745
Proportion at 70 mph or more	0.0541243	0.046941	0.03942
Proportion at 75 mph or more	0.01349842	0.012237	0.009523
Proportion at 80 mph or more	0.0029387	0.003209	0.002273
Proportion at 85 mph or more	0.00109058	0.000881	0.000656
Vehicle Total	153,129	149,870	147,845

**Table 2.10: ATR-219—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	61.253	61.448	61.780
Standard deviation (mph)	6.0923	6.0942	5.1576
Median (mph)	61.305	61.971	62.064
15 <sup>th</sup> percentile (mph)	56.039	56.847	57.359
85 <sup>th</sup> percentile (mph)	66.796	65.761	65.350
90 <sup>th</sup> percentile (mph)	68.538	67.658	67.383
95 <sup>th</sup> percentile (mph)	70.915	69.554	69.415
Percent in 10 mph pace	67.123	73.522	75.926
Proportion at 65 mph or more	0.20155	0.17006	0.15861
Proportion at 70 mph or more	0.058046	0.038255	0.035618
Proportion at 75 mph or more	0.014079	0.0096481	0.0085830
Proportion at 80 mph or more	0.0029312	0.0026186	0.0024052
Proportion at 85 mph or more	0.0011436	0.00087286	0.00076636
Vehicle Total	90,066	85,924	84,817



**Table 2.11: ATR-219—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/4 to 1/29**

<b>Measure</b>	<b>2002-2003 (All Eight Weeks)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (Four Weeks Only 1/2/05 to 1/29/05)</b>
Mean (mph)	61.44293	61.05499	59.482
Standard deviation (mph)	5.904898	5.702989	6.5452
Median (mph)	61.42483	61.58472	60.342
15 <sup>th</sup> percentile (mph)	56.1638	56.33299	55.004
85 <sup>th</sup> percentile (mph)	66.98552	64.97067	64.465
90 <sup>th</sup> percentile (mph)	68.64187	67.0432	65.277
95 <sup>th</sup> percentile (mph)	71.01288	69.2183	68.275
Percent in 10 mph pace	66.6566	74.1399	71.177
Proportion at 65 mph or more	0.209937	0.146968	0.10462
Proportion at 70 mph or more	0.059002	0.032031	0.021237
Proportion at 75 mph or more	0.014563	0.007056	0.0047164
Proportion at 80 mph or more	0.00304	0.001922	0.0012321
Proportion at 85 mph or more	0.00116	0.000513	0.00051668
Vehicle Total	161,163	159,722	75,482

**Table 2.12: ATR-219—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	
Mean (mph)	61.265	61.165	
Standard deviation (mph)	5.9389	5.3284	
Median (mph)	61.320	61.592	
15 <sup>th</sup> percentile (mph)	56.096	56.475	
85 <sup>th</sup> percentile (mph)	66.778	64.966	
90 <sup>th</sup> percentile (mph)	68.391	66.984	
95 <sup>th</sup> percentile (mph)	70.017	69.120	
Percent in 10 mph pace	67.351	74.711	
Proportion at 65 mph or more	0.20514	0.14643	
Proportion at 70 mph or more	0.050123	0.029397	
Proportion at 75 mph or more	0.012778	0.0065136	
Proportion at 80 mph or more	0.0026532	0.0014994	
Proportion at 85 mph or more	0.00088858	0.00038099	
Vehicle Total	79,903	81,368	

**Table 2.13: ATR-219—Two Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [No Speed Data Available for 2002-2003]**

Measure	2003-2004	2004-2005
Mean (mph)	61.7728	61.7231
Standard deviation (mph)	5.138351	5.491703
Median (mph)	62.00928	61.83082
15 <sup>th</sup> percentile (mph)	57.05134	56.80269
85 <sup>th</sup> percentile (mph)	65.91457	66.4436
90 <sup>th</sup> percentile (mph)	67.74324	68.16081
95 <sup>th</sup> percentile (mph)	69.57192	69.87803
Percent in 10 mph pace	73.5903	71.2422
Proportion at 65 mph or more	0.175006	0.192033
Proportion at 70 mph or more	0.038295	0.046449
Proportion at 75 mph or more	0.009353	0.012055
Proportion at 80 mph or more	0.002294	0.002979
Proportion at 85 mph or more	0.000624	0.000852
Vehicle Total	169,994	167,820

**Table 2.14: ATR-219—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2003-2004]**

Measure	2002-2003	2004-2005
Mean (mph)	61.808	61.772
Standard deviation (mph)	5.5306	5.1589
Median (mph)	61.766	61.979
15 <sup>th</sup> percentile (mph)	56.663	57.312
85 <sup>th</sup> percentile (mph)	67.019	65.382
90 <sup>th</sup> percentile (mph)	68.548	67.405
95 <sup>th</sup> percentile (mph)	70.325	69.428
Percent in 10 mph pace	68.461	75.987
Proportion at 65 mph or more	0.21605	0.15945
Proportion at 70 mph or more	0.052502	0.035848
Proportion at 75 mph or more	0.014054	0.0088816
Proportion at 80 mph or more	0.0031988	0.0025090
Proportion at 85 mph or more	0.0010488	0.00073273
Vehicle Total	95,349	90,074

**Table 2.15: ATR-219—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	61.54402	61.63832	61.35449
Standard deviation (mph)	5.176271	4.916338	5.243593
Median (mph)	61.53452	61.80065	61.63368
15 <sup>th</sup> percentile (mph)	56.49794	56.98479	56.78542
85 <sup>th</sup> percentile (mph)	66.50686	65.37365	64.96722
90 <sup>th</sup> percentile (mph)	68.09288	67.38645	67.03274
95 <sup>th</sup> percentile (mph)	69.6789	69.39924	69.21575
Percent in 10 mph pace	69.8329	74.9598	75.8391
Proportion at 65 mph or more	0.197504	0.159282	0.146558
Proportion at 70 mph or more	0.039877	0.035076	0.032037
Proportion at 75 mph or more	0.0103	0.008684	0.007693
Proportion at 80 mph or more	0.002512	0.002203	0.001921
Proportion at 85 mph or more	0.000901	0.000724	0.000531
Vehicle Total	251,949	231,922	231,635

**Table 2.16: ATR-219—Three Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	61.894	62.010	61.633
Standard deviation (mph)	5.3021	4.9336	5.1362
Median (mph)	61.823	62.072	61.847
15 <sup>th</sup> percentile (mph)	56.685	57.345	57.094
85 <sup>th</sup> percentile (mph)	67.115	66.199	65.168
90 <sup>th</sup> percentile (mph)	68.559	67.955	67.275
95 <sup>th</sup> percentile (mph)	70.016	69.711	69.382
Percent in 10 mph pace	68.028	73.903	75.815
Proportion at 65 mph or more	0.22320	0.18415	0.15398
Proportion at 70 mph or more	0.050119	0.041773	0.035332
Proportion at 75 mph or more	0.013305	0.0099687	0.0089873
Proportion at 80 mph or more	0.0032247	0.0024386	0.0022127
Proportion at 85 mph or more	0.0010552	0.00067517	0.00061732
Vehicle Total	135,517	125,894	124,732

## ATR-220

The historical speed data for ATR-220 are only available for one year prior to the MSMP. These data are presented in Tables 2.17 through 2.24.

**Table 2.17: ATR-220—One Prior Year of Historical Speed Data for Six-Week Period from 9/26/04 to 11/6/04**

Measure	2004-2005
Mean (mph)	61.21816
Standard deviation (mph)	7.089705
Median (mph)	61.66003
15 <sup>th</sup> percentile (mph)	56.42243
85 <sup>th</sup> percentile (mph)	66.49187
90 <sup>th</sup> percentile (mph)	68.3612
95 <sup>th</sup> percentile (mph)	70.7134
Percent in 10 mph pace	70.3863
Proportion at 65 mph or more	0.189904
Proportion at 70 mph or more	0.056166
Proportion at 75 mph or more	0.012948
Proportion at 80 mph or more	0.003965
Proportion at 85 mph or more	0.001287
Vehicle Total	85,496

**Table 2.18: ATR-220—One Prior Year of Historical Speed Data for Four-Week Period from 11/7/04 to 12/4/04**

Measure	2004-2005
Mean (mph)	61.228
Standard deviation (mph)	6.9727
Median (mph)	61.705
15 <sup>th</sup> percentile (mph)	56.343
85 <sup>th</sup> percentile (mph)	66.455
90 <sup>th</sup> percentile (mph)	68.326
95 <sup>th</sup> percentile (mph)	70.620
Percent in 10 mph pace	69.989
Proportion at 65 mph or more	0.18891
Proportion at 70 mph or more	0.055238
Proportion at 75 mph or more	0.012970
Proportion at 80 mph or more	0.0044650
Proportion at 85 mph or more	0.0014033
Vehicle Total	47,033

**Table 2.19: ATR-220—One Prior Year of Historical Speed Data for Eight-Week Period from 12/5/04 to 1/29/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	58.34441
Standard deviation (mph)	8.974211
Median (mph)	59.80818
15 <sup>th</sup> percentile (mph)	52.27617
85 <sup>th</sup> percentile (mph)	64.69889
90 <sup>th</sup> percentile (mph)	66.48917
95 <sup>th</sup> percentile (mph)	69.12041
Percent in 10 mph pace	57.6491
Proportion at 65 mph or more	0.128298
Proportion at 70 mph or more	0.033286
Proportion at 75 mph or more	0.006576
Proportion at 80 mph or more	0.001901
Proportion at 85 mph or more	0.000599
Vehicle Total	76,790

**Table 2.20: ATR-220—One Prior Year of Historical Speed Data for Four-Week Period from 1/30/05 to 2/26/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	61.781
Standard deviation (mph)	6.3000
Median (mph)	61.988
15 <sup>th</sup> percentile (mph)	56.854
85 <sup>th</sup> percentile (mph)	66.871
90 <sup>th</sup> percentile (mph)	68.581
95 <sup>th</sup> percentile (mph)	70.943
Percent in 10 mph pace	70.093
Proportion at 65 mph or more	0.20474
Proportion at 70 mph or more	0.058478
Proportion at 75 mph or more	0.013508
Proportion at 80 mph or more	0.0044707
Proportion at 85 mph or more	0.0013866
Vehicle Total	41,828

**Table 2.21: ATR-220—One Prior Year of Historical Speed Data for Eight-Week Period from 2/27/05 to 4/23/05**

Measure	2004-2005
Mean (mph)	61.90985
Standard deviation (mph)	6.424617
Median (mph)	62.03376
15 <sup>th</sup> percentile (mph)	56.9225
85 <sup>th</sup> percentile (mph)	67.10212
90 <sup>th</sup> percentile (mph)	68.82985
95 <sup>th</sup> percentile (mph)	71.63504
Percent in 10 mph pace	69.506
Proportion at 65 mph or more	0.210834
Proportion at 70 mph or more	0.066136
Proportion at 75 mph or more	0.016791
Proportion at 80 mph or more	0.005475
Proportion at 85 mph or more	0.001947
Vehicle Total	84,749

**Table 2.22: ATR-220—One Prior Year of Historical Speed Data for Four-Week Period from 4/24/05 to 5/21/05**

Measure	2004-2005
Mean (mph)	61.661
Standard deviation (mph)	6.3069
Median (mph)	61.855
15 <sup>th</sup> percentile (mph)	56.813
85 <sup>th</sup> percentile (mph)	66.555
90 <sup>th</sup> percentile (mph)	68.394
95 <sup>th</sup> percentile (mph)	70.750
Percent in 10 mph pace	71.089
Proportion at 65 mph or more	0.19228
Proportion at 70 mph or more	0.056327
Proportion at 75 mph or more	0.014164
Proportion at 80 mph or more	0.0044311
Proportion at 85 mph or more	0.0014512
Vehicle Total	51,680

**Table 2.23: ATR-220—One Prior Year of Historical Speed Data for Eight-Week Period from 5/22/05 to 7/16/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	60.90058
Standard deviation (mph)	6.103531
Median (mph)	61.17799
15 <sup>th</sup> percentile (mph)	56.19502
85 <sup>th</sup> percentile (mph)	65.24252
90 <sup>th</sup> percentile (mph)	67.43965
95 <sup>th</sup> percentile (mph)	69.63678
Percent in 10 mph pace	73.3843
Proportion at 65 mph or more	0.155519
Proportion at 70 mph or more	0.041734
Proportion at 75 mph or more	0.009418
Proportion at 80 mph or more	0.002881
Proportion at 85 mph or more	0.000717
Vehicle Total	158,958

**Table 2.24: ATR-220—One Prior Year of Historical Speed Data for Four-Week Period from 7/17/05 to 8/13/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	61.095
Standard deviation (mph)	6.1132
Median (mph)	61.316
15 <sup>th</sup> percentile (mph)	56.320
85 <sup>th</sup> percentile (mph)	65.726
90 <sup>th</sup> percentile (mph)	67.775
95 <sup>th</sup> percentile (mph)	69.824
Percent in 10 mph pace	72.312
Proportion at 65 mph or more	0.16772
Proportion at 70 mph or more	0.045711
Proportion at 75 mph or more	0.010729
Proportion at 80 mph or more	0.0028296
Proportion at 85 mph or more	0.00079754
Vehicle Total	91,531

2.2. *Historical Speed Data from Tubes Located Within Enhanced Enforcement Zones*

The four Tubes located *Within* Enhanced Enforcement Zones on 2-Lane/2-Way Highways were as follows: (1) T01, on MN-23, near Hanley Falls, in Lyon County, (2) T02, on MN-7, near Montevideo, in Chippewa County, (3) T03, on US-71, near Willmar, in Kandiyohi County, and (4) T04, on MN-7, near Silver Lake, in McLeod County. The speed data from Tube 04 were collected only from the Westbound lane on MN-7; while speed data were collected from all lanes for the other three Tubes. Seven days of Pre-MSMP speed data were collected from all four Tubes during August 2005. These speed data are presented in Tables 2.25 through 2.28.

**Table 2.25: Tube 01—Pre-MSMP Speed Data for One-Week Period from 8/22/05 to 8/29/05**

Measure	2004-2005
Mean (mph)	60.325683
Standard deviation (mph)	4.5581581
Median (mph)	60.231135
15 <sup>th</sup> percentile (mph)	56.077671
85 <sup>th</sup> percentile (mph)	64.258253
90 <sup>th</sup> percentile (mph)	64.833556
95 <sup>th</sup> percentile (mph)	67.86099
Percent in 10 mph pace	83.17615
Proportion at 65 mph or more	0.0855342
Proportion at 70 mph or more	0.023433
Proportion at 75 mph or more	0.0075403
Proportion at 80 mph or more	0.0022041
Proportion at 85 mph or more	0.0008507
Vehicle Total	25,861



**Table 2.26: Tube 02—Pre-MSMP Speed Data for One-Week Period from 8/17/05 to 8/24/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	59.787326
Standard deviation (mph)	5.8148385
Median (mph)	60.445471
15 <sup>th</sup> percentile (mph)	55.373666
85 <sup>th</sup> percentile (mph)	64.439017
90 <sup>th</sup> percentile (mph)	65.05137
95 <sup>th</sup> percentile (mph)	68.128805
Percent in 10 mph pace	75.88031
Proportion at 65 mph or more	0.1008346
Proportion at 70 mph or more	0.0195981
Proportion at 75 mph or more	0.0051932
Proportion at 80 mph or more	0.0018547
Proportion at 85 mph or more	0.0005564
Vehicle Total	16,175

**Table 2.27: Tube 03—Pre-MSMP Speed Data for One-Week Period from 8/17/05 to 8/24/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	59.65661
Standard deviation (mph)	5.008484
Median (mph)	59.8266
15 <sup>th</sup> percentile (mph)	55.63927
85 <sup>th</sup> percentile (mph)	64.01664
90 <sup>th</sup> percentile (mph)	64.61524
95 <sup>th</sup> percentile (mph)	66.61665
Percent in 10 mph pace	81.2349
Proportion at 65 mph or more	0.067861
Proportion at 70 mph or more	0.01262
Proportion at 75 mph or more	0.003521
Proportion at 80 mph or more	0.001127
Proportion at 85 mph or more	0.000535
Vehicle Total	35,499

**Table 2.28: Tube 04—Pre-MSMP Speed Data (Westbound Only) for One-Week Period from 8/17/05 to 8/24/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	58.30134
Standard deviation (mph)	4.720248
Median (mph)	58.34843
15 <sup>th</sup> percentile (mph)	54.70932
85 <sup>th</sup> percentile (mph)	63.01153
90 <sup>th</sup> percentile (mph)	63.84266
95 <sup>th</sup> percentile (mph)	64.67379
Percent in 10 mph pace	75.4785
Proportion at 65 mph or more	0.030376
Proportion at 70 mph or more	0.00474
Proportion at 75 mph or more	0.001279
Proportion at 80 mph or more	0.000312
Proportion at 85 mph or more	0.000187
Vehicle Total	32,065

2.3. *Historical Speed Data from Tube Located Outside Enhanced Enforcement Zones but in Zone with Change in Speed Limit*

The speed limit was changed from 55 mph to 60 mph at the location of the single Tube that was on a 2-Lane/2-Way Highway *Outside* the Enhanced Enforcement Zones. It was Tube 08 located on US-53, near Ash Lake, in St Louis County. Seven days of Pre-MSMP speed data were collected from this Tube during August 2005. These speed data are presented in Table 2.29.

**Table 2.29: Tube 08—Pre-MSMP Speed Data for One-Week Period from 8/19/05 to 8/26/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	61.59381
Standard deviation (mph)	4.933043
Median (mph)	61.55207
15 <sup>th</sup> percentile (mph)	56.65734
85 <sup>th</sup> percentile (mph)	65.95533
90 <sup>th</sup> percentile (mph)	67.83777
95 <sup>th</sup> percentile (mph)	69.72022
Percent in 10 mph pace	72.0833
Proportion at 65 mph or more	0.175375
Proportion at 70 mph or more	0.042569
Proportion at 75 mph or more	0.011449
Proportion at 80 mph or more	0.00281
Proportion at 85 mph or more	0.00118
Vehicle Total	28,824

#### *2.4. Historical Speed Data from ATRs Located Outside Enhanced Enforcement Zones and Outside Speed Limit Change Zones*

There were four ATRs located *Outside* Enhanced Enforcement Zones on 2-Lane/2-Way Highways. And, at these locations, the speed limits remained unchanged—at 55 mph. The ATRs were—(1) ATR-179, on USTH 59, near Garvin, in Lyon County, (2) ATR-198, on USTH 212, East of TH 23, in Chippewa County, (3) ATR-199, on USTH 75, North of CR 69, in Pipestone County, and (4) ATR-222, on MNTH 65, near Pliny, in Aitkin County. For these four ATRs, there were historical data from the same time periods that were used in the MSMP. In some cases, three years of historical speed data were available; in others, one or two years of historical data are available.

**ATR-179**

The historical speed data for ATR-179 are presented in Tables 2.30 through 2.37.

**Table 2.30: ATR-179—One Prior Year of Historical Speed Data for Six-Week Period from 9/26 to 11/6 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		55.741693
Standard deviation (mph)		6.9966738
Median (mph)		56.567861
15 <sup>th</sup> percentile (mph)		50.822847
85 <sup>th</sup> percentile (mph)		61.749015
90 <sup>th</sup> percentile (mph)		63.027159
95 <sup>th</sup> percentile (mph)		64.305302
Percent in 10 mph pace		66.48951
Proportion at 65 mph or more		0.022824
Proportion at 70 mph or more		0.0040704
Proportion at 75 mph or more		0.0007934
Proportion at 80 mph or more		0.000253
Proportion at 85 mph or more		0.0001265
Vehicle Total		86,970

**Table 2.31: ATR-179—One Prior Year of Historical Speed Data for Four-Week Period from 11/7 to 12/4 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		54.69628
Standard deviation (mph)		8.992427
Median (mph)		56.32824
15 <sup>th</sup> percentile (mph)		50.31469
85 <sup>th</sup> percentile (mph)		61.56748
90 <sup>th</sup> percentile (mph)		62.88902
95 <sup>th</sup> percentile (mph)		64.21055
Percent in 10 mph pace		63.7405
Proportion at 65 mph or more		0.020132
Proportion at 70 mph or more		0.00349
Proportion at 75 mph or more		0.00079
Proportion at 80 mph or more		0.000239
Proportion at 85 mph or more		0.000091841
Vehicle Total		54,442

**Table 2.32: ATR-179—One Prior Year of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		55.04436
Standard deviation (mph)		7.401341
Median (mph)		56.03896
15 <sup>th</sup> percentile (mph)		50.28002
85 <sup>th</sup> percentile (mph)		61.1992
90 <sup>th</sup> percentile (mph)		62.63677
95 <sup>th</sup> percentile (mph)		64.07434
Percent in 10 mph pace		67.3271
Proportion at 65 mph or more		0.017805
Proportion at 70 mph or more		0.003445
Proportion at 75 mph or more		0.000767
Proportion at 80 mph or more		0.000368
Proportion at 85 mph or more		0.000099579
Vehicle Total		100,423

**Table 2.33: ATR-179—One Prior Year of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		55.27112
Standard deviation (mph)		7.367681
Median (mph)		56.31544
15 <sup>th</sup> percentile (mph)		50.46751
85 <sup>th</sup> percentile (mph)		61.3854
90 <sup>th</sup> percentile (mph)		62.75119
95 <sup>th</sup> percentile (mph)		64.11698
Percent in 10 mph pace		66.9743
Proportion at 65 mph or more		0.017674
Proportion at 70 mph or more		0.002716
Proportion at 75 mph or more		0.000601
Proportion at 80 mph or more		0.000369
Proportion at 85 mph or more		0.000116
Vehicle Total		51,545

**Table 2.34: ATR-179—One Prior Year of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		55.67051
Standard deviation (mph)		7.036101
Median (mph)		56.56034
15 <sup>th</sup> percentile (mph)		50.80554
85 <sup>th</sup> percentile (mph)		61.66784
90 <sup>th</sup> percentile (mph)		62.93526
95 <sup>th</sup> percentile (mph)		64.20269
Percent in 10 mph pace		66.7772
Proportion at 65 mph or more		0.018546
Proportion at 70 mph or more		0.003231
Proportion at 75 mph or more		0.000792
Proportion at 80 mph or more		0.000315
Proportion at 85 mph or more		0.000089986
Vehicle Total		111,128

**Table 2.35: ATR-179—One Prior Year of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		55.84842
Standard deviation (mph)		6.720427
Median (mph)		56.65173
15 <sup>th</sup> percentile (mph)		50.97122
85 <sup>th</sup> percentile (mph)		61.66319
90 <sup>th</sup> percentile (mph)		62.9242
95 <sup>th</sup> percentile (mph)		64.18522
Percent in 10 mph pace		67.4091
Proportion at 65 mph or more		0.017693
Proportion at 70 mph or more		0.002763
Proportion at 75 mph or more		0.00083
Proportion at 80 mph or more		0.000287
Proportion at 85 mph or more		0.000112
Vehicle Total		62,622

**Table 2.36: ATR-179—One Prior Year of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		54.84319
Standard deviation (mph)		7.167139
Median (mph)		55.66912
15 <sup>th</sup> percentile (mph)		50.15618
85 <sup>th</sup> percentile (mph)		60.86442
90 <sup>th</sup> percentile (mph)		62.4025
95 <sup>th</sup> percentile (mph)		63.94059
Percent in 10 mph pace		67.2956
Proportion at 65 mph or more		0.015561
Proportion at 70 mph or more		0.00294
Proportion at 75 mph or more		0.000687
Proportion at 80 mph or more		0.000322
Proportion at 85 mph or more		0.000122
Vehicle Total		139,775

**Table 2.37: ATR-179—One Prior Year of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2002-2003 and 2003-2004]**

Measure		2004-2005
Mean (mph)		55.33988
Standard deviation (mph)		7.220464
Median (mph)		56.2596
15 <sup>th</sup> percentile (mph)		50.50438
85 <sup>th</sup> percentile (mph)		61.4757
90 <sup>th</sup> percentile (mph)		62.82215
95 <sup>th</sup> percentile (mph)		64.1686
Percent in 10 mph pace		66.6991
Proportion at 65 mph or more		0.019126
Proportion at 70 mph or more		0.00342
Proportion at 75 mph or more		0.000805
Proportion at 80 mph or more		0.000216
Proportion at 85 mph or more		0.00001437
Vehicle Total		69,590



**ATR-198**

The historical speed data for ATR-198 are presented in Tables 2.38 through 2.45.

**Table 2.38: ATR-198—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

<b>Measure</b>	<b>2002-2003 (One Week Only 31/10/02 to 11/6/02)</b>	<b>2003-2004 (Five Weeks Only 9/29/03 to 10/30/03)</b>	<b>2004-2005 (Three Weeks Only 9/30/05 to 10/13/04 plus 10/31/04 to 11/06/04)</b>
Mean (mph)	58.91761344	58.49095122	58.6158626
Standard deviation (mph)	7.492985471	8.125954867	7.61981099
Median (mph)	59.99234381	59.78125385	59.8458075
15 <sup>th</sup> percentile (mph)	54.08116414	53.65650578	53.6982272
85 <sup>th</sup> percentile (mph)	64.42934127	64.29795222	64.2092175
90 <sup>th</sup> percentile (mph)	65.30560201	64.93932163	64.8288305
95 <sup>th</sup> percentile (mph)	68.37813545	68.06013782	67.6949438
Percent in 10 mph pace	66.2700605	63.9978702	65.371357
Proportion at 65 mph or more	0.104973127	0.095269624	0.08618739
Proportion at 70 mph or more	0.023607048	0.021302982	0.01904798
Proportion at 75 mph or more	0.004694197	0.003993652	0.00379074
Proportion at 80 mph or more	0.001224573	0.001408288	0.00107498
Proportion at 85 mph or more	0.000408191	0.000483442	0.00033947
Vehicle Total	14,699	95,151	53,024

**Table 2.39: ATR-198—Two Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4 [Speed Data for 2003-2004 Unreliable]**

<b>Measure</b>	<b>2002-2003</b>	<b>2004-2005</b>
Mean (mph)	58.73466677	58.15362
Standard deviation (mph)	7.394136493	8.082772
Median (mph)	59.76492232	59.42716
15 <sup>th</sup> percentile (mph)	54.30724532	53.20819
85 <sup>th</sup> percentile (mph)	64.22057804	64.05839
90 <sup>th</sup> percentile (mph)	64.85365456	64.71456
95 <sup>th</sup> percentile (mph)	67.78646441	67.29031
Percent in 10 mph pace	67.1774954	63.2124
Proportion at 65 mph or more	0.088441726	0.078249
Proportion at 70 mph or more	0.019462331	0.016578
Proportion at 75 mph or more	0.00333226	0.003385
Proportion at 80 mph or more	0.000965873	0.000884
Proportion at 85 mph or more	0.00030586	0.00024
Vehicle Total	62,120	66,774

**Table 2.40: ATR-198—Two Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [Speed Data for 2003-2004 Unreliable]**

Measure	2002-2003	2004-2005
Mean (mph)	58.6992883	57.4728433
Standard deviation (mph)	7.297558202	8.23003797
Median (mph)	59.78589609	58.7904634
15 <sup>th</sup> percentile (mph)	54.04348032	51.9819271
85 <sup>th</sup> percentile (mph)	64.17703561	63.7476402
90 <sup>th</sup> percentile (mph)	64.80024203	64.4659895
95 <sup>th</sup> percentile (mph)	67.55449094	66.2758461
Percent in 10 mph pace	66.7962812	59.978157
Proportion at 65 mph or more	0.08397337	0.06283073
Proportion at 70 mph or more	0.017476031	0.01254752
Proportion at 75 mph or more	0.003302762	0.00240452
Proportion at 80 mph or more	0.001048909	0.00075353
Proportion at 85 mph or more	0.000364084	0.00024553
Vehicle Total	115,358	118,111

**Table 2.41: ATR-198—Three Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	56.06043203	55.93995	58.12176
Standard deviation (mph)	9.786298431	8.969012	7.603815
Median (mph)	58.06396028	57.69161	59.26312
15 <sup>th</sup> percentile (mph)	49.37385639	48.20833	53.2071
85 <sup>th</sup> percentile (mph)	63.58956994	63.40821	63.90403
90 <sup>th</sup> percentile (mph)	64.39791524	64.24839	64.56369
95 <sup>th</sup> percentile (mph)	66.28379953	65.58503	66.5545
Percent in 10 mph pace	50.5412131	48.2584	64.2472
Proportion at 65 mph or more	0.062758195	0.055271	0.066929
Proportion at 70 mph or more	0.013068993	0.010225	0.012477
Proportion at 75 mph or more	0.0022586	0.001508	0.002195
Proportion at 80 mph or more	0.000791475	0.00041	0.000625
Proportion at 85 mph or more	0.000308868	0.000115	0.000169
Vehicle Total	51,802	61,027	59,227

**Table 2.42: ATR-198—One Prior Year of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [Speed Data for 2002-2003 & 2003-2004 Unreliable]**

Measure		2004-2005
Mean (mph)		57.9862091
Standard deviation (mph)		7.88307417
Median (mph)		59.1778739
15 <sup>th</sup> percentile (mph)		52.8903799
85 <sup>th</sup> percentile (mph)		63.8950872
90 <sup>th</sup> percentile (mph)		64.5666929
95 <sup>th</sup> percentile (mph)		66.6551495
Percent in 10 mph pace		63.0291
Proportion at 65 mph or more		0.06774096
Proportion at 70 mph or more		0.01414773
Proportion at 75 mph or more		0.00348142
Proportion at 80 mph or more		0.00157021
Proportion at 85 mph or more		0.00027756
Vehicle Total		126,098

**Table 2.43: ATR-198—Three Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21**

Measure	2002-2003 (Two Weeks Only 4/24/03 to 5/7/03)	2003-2004 All Four Weeks	2004-2005 All Four Weeks
Mean (mph)	58.3566585	58.36815	57.66925
Standard deviation (mph)	7.974875457	7.113351	8.341811
Median (mph)	59.68617252	59.15368	59.09028
15 <sup>th</sup> percentile (mph)	53.50215018	54.12425	52.30496
85 <sup>th</sup> percentile (mph)	64.14596062	63.88717	63.86841
90 <sup>th</sup> percentile (mph)	64.77724975	64.57631	64.54546
95 <sup>th</sup> percentile (mph)	67.47531993	66.76706	66.55329
Percent in 10 mph pace	64.0112577	67.6515	60.3224
Proportion at 65 mph or more	0.08235751	0.069259	0.066433
Proportion at 70 mph or more	0.016997252	0.014764	0.013537
Proportion at 75 mph or more	0.00334568	0.002848	0.002616
Proportion at 80 mph or more	0.00125463	0.000762	0.000626
Proportion at 85 mph or more	0.000179233	0.000241	0.000156
Vehicle Total	33,476	74,777	70,327

**Table 2.44: ATR-198—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	58.53615019	58.52112	57.9589045
Standard deviation (mph)	7.455832262	7.049374	7.67596764
Median (mph)	59.62564398	59.22241	59.1035783
15 <sup>th</sup> percentile (mph)	53.52068533	54.15645	52.5418122
85 <sup>th</sup> percentile (mph)	64.15801023	64.00661	63.9018442
90 <sup>th</sup> percentile (mph)	64.79958945	64.70073	64.584433
95 <sup>th</sup> percentile (mph)	67.60801339	67.33518	66.7554296
Percent in 10 mph pace	65.1230543	67.7559	62.139929
Proportion at 65 mph or more	0.084381465	0.078443	0.06955949
Proportion at 70 mph or more	0.018466418	0.017542	0.01384808
Proportion at 75 mph or more	0.003565026	0.002812	0.00259277
Proportion at 80 mph or more	0.001068818	0.000956	0.0007047
Proportion at 85 mph or more	0.00033099	0.000329	0.00021939
Vehicle Total	145,020	161,098	150,418

**Table 2.45: ATR-198—Three Prior Years of Historical Speed Data for Eight-Week Period from 7/17 to 8/13**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	58.72196906	58.84599	57.57122
Standard deviation (mph)	7.408588582	7.251626	8.179326
Median (mph)	59.8428351	59.97714	58.84284
15 <sup>th</sup> percentile (mph)	53.73452111	54.10525	51.80835
85 <sup>th</sup> percentile (mph)	64.27663522	64.25896	63.86309
90 <sup>th</sup> percentile (mph)	64.90663824	64.87006	64.58224
95 <sup>th</sup> percentile (mph)	67.93737364	67.80652	66.87191
Percent in 10 mph pace	65.6215174	67.1105	59.1148
Proportion at 65 mph or more	0.092590372	0.089368	0.070955
Proportion at 70 mph or more	0.020093003	0.019231	0.014983
Proportion at 75 mph or more	0.003570905	0.003674	0.003221
Proportion at 80 mph or more	0.000919375	0.000956	0.000987
Proportion at 85 mph or more	0.000359755	0.000246	0.000343
Vehicle Total	75,051	73,214	72,948

**ATR-199**

The historical speed data for ATR-199 are presented in Tables 2.46 through 2.53.

**Table 2.46: ATR-199—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

<b>Measure</b>	<b>2002-2003 (All Six Weeks)</b>	<b>2003-2004 (All Six Weeks)</b>	<b>2004-2005 (Three Weeks Only 09/26/04 to 10/02/04, 10/10/04 to 10/16/04, and 10/31/04 to 11/06/04)</b>
Mean (mph)	58.90707979	58.13940301	59.4470086
Standard deviation (mph)	6.784359505	7.077248323	6.1425485
Median (mph)	58.91393031	58.29614369	59.4674055
15 <sup>th</sup> percentile (mph)	53.88343199	53.05802181	55.2215039
85 <sup>th</sup> percentile (mph)	64.37905983	63.81268059	64.2939658
90 <sup>th</sup> percentile (mph)	65.78481894	64.76808933	64.995372
95 <sup>th</sup> percentile (mph)	68.81013729	68.11770428	68.5377316
Percent in 10 mph pace	67.1223367	66.2296013	74.016409
Proportion at 65 mph or more	0.112970849	0.087863275	0.09967009
Proportion at 70 mph or more	0.030334917	0.027140269	0.02946961
Proportion at 75 mph or more	0.010424031	0.009372293	0.00758153
Proportion at 80 mph or more	0.003123921	0.003024336	0.00342596
Proportion at 85 mph or more	0.001233127	0.001417658	0.00126887
Vehicle Total	60,821	63,485	31,524

**Table 2.47: ATR-199—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	58.34077	57.71552	59.24235
Standard deviation (mph)	6.648154	7.166249	6.207461
Median (mph)	58.32031	57.94842	59.32768
15 <sup>th</sup> percentile (mph)	53.41253	52.5116	55.16947
85 <sup>th</sup> percentile (mph)	63.83174	63.50504	64.16109
90 <sup>th</sup> percentile (mph)	64.80081	64.56496	64.87018
95 <sup>th</sup> percentile (mph)	68.1432	67.68802	68.12581
Percent in 10 mph pace	67.6881	65.5821	73.5328
Proportion at 65 mph or more	0.089723	0.079478	0.090846
Proportion at 70 mph or more	0.026534	0.024646	0.025509
Proportion at 75 mph or more	0.008768	0.009188	0.00665
Proportion at 80 mph or more	0.00288	0.003135	0.00273
Proportion at 85 mph or more	0.001198	0.001459	0.001117
Vehicle Total	39,232	37,004	40,299

**Table 2.48: ATR-199—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/4 to 1/29**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	58.33950019	57.61727342	59.41032
Standard deviation (mph)	6.307339225	6.668731173	5.874511
Median (mph)	58.24452435	57.810578	60.18853
15 <sup>th</sup> percentile (mph)	53.18106752	52.34908752	55.09233
85 <sup>th</sup> percentile (mph)	63.77177169	63.30608223	64.07568
90 <sup>th</sup> percentile (mph)	64.75244787	64.39467683	64.63098
95 <sup>th</sup> percentile (mph)	68.0962053	67.20751488	66.75363
Percent in 10 mph pace	67.2861364	65.868738	74.8637
Proportion at 65 mph or more	0.087378498	0.072197034	0.066773
Proportion at 70 mph or more	0.027016709	0.021920965	0.018949
Proportion at 75 mph or more	0.008633601	0.006718439	0.004356
Proportion at 80 mph or more	0.002863184	0.001990094	0.001712
Proportion at 85 mph or more	0.001365518	0.000897787	0.000683
Vehicle Total	68,106	66,831	80,586

**Table 2.49: ATR-199—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [Speed Data for 2004-2005 Unreliable]**

Measure	2002-2003	2003-2004	
Mean (mph)	58.03336	57.32942	
Standard deviation (mph)	6.688672	6.84888	
Median (mph)	58.1001	57.63049	
15 <sup>th</sup> percentile (mph)	52.74322	52.0179	
85 <sup>th</sup> percentile (mph)	63.65757	63.11884	
90 <sup>th</sup> percentile (mph)	64.66677	64.26351	
95 <sup>th</sup> percentile (mph)	67.96081	66.92082	
Percent in 10 mph pace	65.9485	65.3745	
Proportion at 65 mph or more	0.08349	0.06783	
Proportion at 70 mph or more	0.026934	0.021418	
Proportion at 75 mph or more	0.009019	0.006287	
Proportion at 80 mph or more	0.002718	0.001911	
Proportion at 85 mph or more	0.001112	0.000801	
Vehicle Total	32,375	32,449	

**Table 2.50: ATR-199—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 42/27/03 to 3/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	58.77478774	58.30062	59.27763
Standard deviation (mph)	6.123310608	6.49931	6.158254
Median (mph)	58.57185914	58.3121	59.40541
15 <sup>th</sup> percentile (mph)	54.2857065	53.62205	55.17936
85 <sup>th</sup> percentile (mph)	63.90565392	63.64845	64.17134
90 <sup>th</sup> percentile (mph)	64.80245547	64.59909	64.86482
95 <sup>th</sup> percentile (mph)	68.26698671	67.66648	68.09728
Percent in 10 mph pace	70.6470721	69.098	73.7224
Proportion at 65 mph or more	0.088986163	0.078913	0.090253
Proportion at 70 mph or more	0.02931931	0.024697	0.025272
Proportion at 75 mph or more	0.009459737	0.008955	0.006332
Proportion at 80 mph or more	0.002937807	0.00256	0.002399
Proportion at 85 mph or more	0.001410147	0.001219	0.000795
Vehicle Total	34,039	73,815	70,435

**Table 2.51: ATR-199—Three Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	58.6780023	58.39212	58.64458
Standard deviation (mph)	6.389134495	6.806118	7.322761
Median (mph)	58.54099217	58.45958	59.0854
15 <sup>th</sup> percentile (mph)	54.09076348	53.82069	55.01729
85 <sup>th</sup> percentile (mph)	63.9413775	63.81217	63.98065
90 <sup>th</sup> percentile (mph)	64.85418857	64.72642	64.71425
95 <sup>th</sup> percentile (mph)	68.27214953	67.93139	67.68437
Percent in 10 mph pace	69.6705709	68.872	70.684
Proportion at 65 mph or more	0.092013056	0.085038	0.080524
Proportion at 70 mph or more	0.02781511	0.025274	0.023669
Proportion at 75 mph or more	0.010055678	0.008653	0.006086
Proportion at 80 mph or more	0.003359892	0.002958	0.002198
Proportion at 85 mph or more	0.001487952	0.001418	0.000773
Vehicle Total	41,668	40,911	41,404

**Table 2.52: ATR-199—Two Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [Speed Data for 2004-2005 Unreliable]**

Measure	2002-2003 (All Eight Weeks)	2003-2004 (Four Weeks Only 6/18/04- to 7/15/04)	
Mean (mph)	58.67879668	59.34205	
Standard deviation (mph)	6.07859794	5.761595	
Median (mph)	58.54558136	59.31992	
15 <sup>th</sup> percentile (mph)	54.20022569	55.19872	
85 <sup>th</sup> percentile (mph)	63.85398291	64.13725	
90 <sup>th</sup> percentile (mph)	64.74917929	64.84509	
95 <sup>th</sup> percentile (mph)	67.93492164	68.08156	
Percent in 10 mph pace	70.4251221	74.4878	
Proportion at 65 mph or more	0.085990744	0.089058	
Proportion at 70 mph or more	0.024676085	0.025685	
Proportion at 75 mph or more	0.007886627	0.006642	
Proportion at 80 mph or more	0.002485282	0.002317	
Proportion at 85 mph or more	0.001215027	0.000794	
Vehicle Total	90,533	45,319	

**Table 2.53: ATR-199—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	58.82344193	59.49479	
Standard deviation (mph)	6.032315854	5.715408	
Median (mph)	58.64039441	59.4708	
15 <sup>th</sup> percentile (mph)	54.41565315	55.2594	
85 <sup>th</sup> percentile (mph)	63.97358378	64.23362	
90 <sup>th</sup> percentile (mph)	64.85641762	64.92534	
95 <sup>th</sup> percentile (mph)	68.18085267	68.27571	
Percent in 10 mph pace	70.7138272	75.0628	
Proportion at 65 mph or more	0.091868097	0.094603	
Proportion at 70 mph or more	0.026055402	0.026521	
Proportion at 75 mph or more	0.008070433	0.006754	
Proportion at 80 mph or more	0.002399318	0.002364	
Proportion at 85 mph or more	0.001050941	0.000878	
Vehicle Total	50,431	44,417	



**ATR-222**

The historical speed data for ATR-222 are presented in Tables 2.54 through 2.61.

**Table 2.54: ATR-222—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	62.38842361	62.38487803	61.88683
Standard deviation (mph)	6.752688486	6.903481823	6.471429
Median (mph)	62.34049097	62.44529338	61.91299
15 <sup>th</sup> percentile (mph)	56.87386281	56.92256101	56.54965
85 <sup>th</sup> percentile (mph)	68.29882291	68.28026384	67.61303
90 <sup>th</sup> percentile (mph)	69.59491273	69.48608956	69.07918
95 <sup>th</sup> percentile (mph)	72.96675284	72.6820967	71.93456
Percent in 10 mph pace	63.9534127	64.1062155	65.683
Proportion at 65 mph or more	0.277260583	0.286017328	0.239111
Proportion at 70 mph or more	0.084372716	0.078690517	0.068598
Proportion at 75 mph or more	0.026442855	0.025205277	0.020531
Proportion at 80 mph or more	0.006745504	0.007281524	0.004948
Proportion at 85 mph or more	0.002767693	0.002657578	0.001887
Vehicle Total	83,463	83,911	82,656

**Table 2.55: ATR-222—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

Measure	2002-2003 (All Four Weeks)	2003-2004 (Two Weeks Only 11/7/03 to 11/20/03)	2004-2005 (All Four Weeks)
Mean (mph)	62.43874	62.40633587	62.17078
Standard deviation (mph)	6.488777	6.704449738	7.000129
Median (mph)	62.37249	62.35696756	62.19346
15 <sup>th</sup> percentile (mph)	56.90373	56.92298843	56.57778
85 <sup>th</sup> percentile (mph)	68.27121	68.26481082	68.24501
90 <sup>th</sup> percentile (mph)	69.52955	69.54820777	69.59943
95 <sup>th</sup> percentile (mph)	72.76834	72.77477852	73.0288
Percent in 10 mph pace	64.0773	64.2786419	63.0872
Proportion at 65 mph or more	0.279981	0.277194117	0.269793
Proportion at 70 mph or more	0.081307	0.082398578	0.085212
Proportion at 75 mph or more	0.024762	0.024018102	0.027083
Proportion at 80 mph or more	0.006223	0.006982382	0.007014
Proportion at 85 mph or more	0.002148	0.002909326	0.002903
Vehicle Total	53,993	30,935	47,188

**Table 2.56: ATR-222—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	62.17346819	61.71381	60.22043
Standard deviation (mph)	7.165836242	7.444674	8.327492
Median (mph)	62.21499094	61.89128	60.76857
15 <sup>th</sup> percentile (mph)	56.49026902	56.06548	54.85187
85 <sup>th</sup> percentile (mph)	68.46862308	68.13353	67.14027
90 <sup>th</sup> percentile (mph)	69.82097635	69.57967	68.9243
95 <sup>th</sup> percentile (mph)	73.3094115	73.02907	72.00958
Percent in 10 mph pace	61.8315895	61.7467	63.0452
Proportion at 65 mph or more	0.278243971	0.258341	0.209984
Proportion at 70 mph or more	0.093381032	0.085467	0.069852
Proportion at 75 mph or more	0.027839119	0.026923	0.020459
Proportion at 80 mph or more	0.006521803	0.007049	0.005316
Proportion at 85 mph or more	0.002384948	0.002911	0.002206
Vehicle Total	67,926	65,967	60,757

**Table 2.57: ATR-222—Three Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	61.87020728	60.50981	61.45784
Standard deviation (mph)	7.402840911	8.227774	7.65441
Median (mph)	62.02945743	61.12903	61.70776
15 <sup>th</sup> percentile (mph)	56.16333956	55.16492	55.87966
85 <sup>th</sup> percentile (mph)	68.31956603	67.35421	67.99588
90 <sup>th</sup> percentile (mph)	69.71009499	69.02619	69.50457
95 <sup>th</sup> percentile (mph)	73.13155803	72.07189	72.86562
Percent in 10 mph pace	61.2431173	62.5695	61.8164
Proportion at 65 mph or more	0.269363426	0.220402	0.249287
Proportion at 70 mph or more	0.089575729	0.070878	0.083581
Proportion at 75 mph or more	0.026387168	0.020493	0.024988
Proportion at 80 mph or more	0.00679771	0.005123	0.006596
Proportion at 85 mph or more	0.00241101	0.001991	0.003001
Vehicle Total	29,863	30,644	33,656

**Table 2.58: ATR-222—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 2/27/03 to 3/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	61.7767266	61.84384	61.52307
Standard deviation (mph)	7.39740459	7.086399	7.207842
Median (mph)	61.9434643	62.00804	61.76726
15 <sup>th</sup> percentile (mph)	56.2390053	56.29909	56.16089
85 <sup>th</sup> percentile (mph)	68.1086675	67.99889	67.6366
90 <sup>th</sup> percentile (mph)	69.5590464	69.31803	69.07725
95 <sup>th</sup> percentile (mph)	72.9381388	72.39525	71.95932
Percent in 10 mph pace	62.611779	62.8049	64.1666
Proportion at 65 mph or more	0.25716743	0.263668	0.241507
Proportion at 70 mph or more	0.08479867	0.074151	0.067975
Proportion at 75 mph or more	0.02557977	0.023737	0.022105
Proportion at 80 mph or more	0.00640291	0.006525	0.005987
Proportion at 85 mph or more	0.00245285	0.002519	0.002072
Vehicle Total	31,392	63,910	65,642

**Table 2.59: ATR-222—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2002-2003]**

<b>Measure</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	62.31703	62.07343
Standard deviation (mph)	6.577262	6.454391
Median (mph)	62.37226	62.14766
15 <sup>th</sup> percentile (mph)	56.97333	56.81538
85 <sup>th</sup> percentile (mph)	68.00445	67.71138
90 <sup>th</sup> percentile (mph)	69.22121	69.05431
95 <sup>th</sup> percentile (mph)	71.98748	71.65522
Percent in 10 mph pace	65.5231	66.3082
Proportion at 65 mph or more	0.273461	0.250951
Proportion at 70 mph or more	0.067997	0.06479
Proportion at 75 mph or more	0.02272	0.020113
Proportion at 80 mph or more	0.006027	0.00471
Proportion at 85 mph or more	0.00235	0.001707
Vehicle Total	48,943	46,288

**Table 2.60: ATR-222—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	62.20504	61.94813	61.68342
Standard deviation (mph)	6.540487	6.51917	6.637649
Median (mph)	62.25911	62.02968	61.79083
15 <sup>th</sup> percentile (mph)	56.89566	56.6364	56.50265
85 <sup>th</sup> percentile (mph)	67.89203	67.67527	67.33793
90 <sup>th</sup> percentile (mph)	69.17836	69.04878	68.87944
95 <sup>th</sup> percentile (mph)	71.91917	71.69074	71.51689
Percent in 10 mph pace	65.7931	65.709	66.8588
Proportion at 65 mph or more	0.262415	0.247388	0.225832
Proportion at 70 mph or more	0.068062	0.065373	0.063654
Proportion at 75 mph or more	0.021005	0.019912	0.018648
Proportion at 80 mph or more	0.005557	0.004989	0.004858
Proportion at 85 mph or more	0.002156	0.001775	0.001954
Vehicle Total	141,444	134,093	131,540

**Table 2.61: ATR-222—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	62.40169935	61.99021	
Standard deviation (mph)	6.747885391	6.572807	
Median (mph)	62.41339453	62.04654	
15 <sup>th</sup> percentile (mph)	56.99910791	56.6807	
85 <sup>th</sup> percentile (mph)	68.1949605	67.685	
90 <sup>th</sup> percentile (mph)	69.44638678	69.08158	
95 <sup>th</sup> percentile (mph)	72.65161201	71.87392	
Percent in 10 mph pace	64.9182654	65.8893	
Proportion at 65 mph or more	0.277652766	0.246128	
Proportion at 70 mph or more	0.07788071	0.067119	
Proportion at 75 mph or more	0.025307578	0.021442	
Proportion at 80 mph or more	0.006779859	0.005807	
Proportion at 85 mph or more	0.002337882	0.002267	
Vehicle Total	68,438	68,371	

### Section 3: 4-Lane Divided Highway Speed Data

The historical speed data obtained from the five ATRs and one Tube that were located on 4-Lane Divided Highways are presented in this section of the report. Four of the five ATRs and the Tube were located *Within* Enhanced Enforcement Zones, while the remaining ATR was located *Outside* the Enhanced Enforcement Zones. The speed limit remained unchanged—at 65 mph—at all these locations throughout the MSMP.

#### 3.1. Historical Speed Data from ATRs Located Within Enhanced Enforcement Zones

The four ATRs located *Within* Enhanced Enforcement Zones on 4-Lane Divided Highways were as follows; (1) ATR-172, on US-10, near Dilworth, in Clay County, (2) ATR-187, on US-10, near Rice, in Benton County, (3) ATR-188, on US-52, North of Rochester, in Olmstead County, and (4) ATR-197, on SR-60, West of SR-4, in Watonwan County. For these four ATRs, there were historical data from the same time periods that were used in the MSMP. In some cases, three years of historical speed data were available; in others, one or two years of historical data were available.

#### ATR-172

For ATR-172, historical speed data is available from only one prior year (2004-2005). These data are presented in Tables 3.1 through 3.8.

**Table 3.1: ATR-172—Historical Speed Data for Six-Week Period from 9/26/04 to 11/6/04**

Measure	2004-2005
Mean (mph)	66.49387
Standard deviation (mph)	5.713767
Median (mph)	67.00688
15 <sup>th</sup> percentile (mph)	61.56234
85 <sup>th</sup> percentile (mph)	71.67014
90 <sup>th</sup> percentile (mph)	72.95295
95 <sup>th</sup> percentile (mph)	74.23575
Percent in 10 mph pace	69.6296
Proportion at 65 mph or more	0.691027
Proportion at 70 mph or more	0.215098
Proportion at 75 mph or more	0.020212
Proportion at 80 mph or more	0.003642
Proportion at 85 mph or more	0.00106598
Vehicle Total	649,180

**Table 3.2: ATR-172—Historical Speed Data for Four-Week Period from 11/7//04 to 12/4/04**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	66.560
Standard deviation (mph)	5.7826
Median (mph)	67.072
15 <sup>th</sup> percentile (mph)	61.600
85 <sup>th</sup> percentile (mph)	71.817
90 <sup>th</sup> percentile (mph)	73.047
95 <sup>th</sup> percentile (mph)	74.276
Percent in 10 mph pace	69.136
Proportion at 65 mph or more	0.69543
Proportion at 70 mph or more	0.22390
Proportion at 75 mph or more	0.020579
Proportion at 80 mph or more	0.0040054
Proportion at 85 mph or more	0.0011892
Vehicle Total	395,218

**Table 3.3: ATR-172— Historical Speed Data for Data for Eight-Week Period from 12/5/04 to 01/29/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	63.97516
Standard deviation (mph)	7.696323
Median (mph)	65.25155
15 <sup>th</sup> percentile (mph)	57.87969
85 <sup>th</sup> percentile (mph)	69.95869
90 <sup>th</sup> percentile (mph)	71.75658
95 <sup>th</sup> percentile (mph)	73.62814
Percent in 10 mph pace	60.3059
Proportion at 65 mph or more	0.518704
Proportion at 70 mph or more	0.146928
Proportion at 75 mph or more	0.01335
Proportion at 80 mph or more	0.002585
Proportion at 85 mph or more	0.00093148
Vehicle Total	682,782

**Table 3.4: ATR-172—Historical Speed Data for Data for Four-Week Period from 01/30/05 to 2/26/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	65.908
Standard deviation (mph)	6.0748
Median (mph)	66.552
15 <sup>th</sup> percentile (mph)	60.983
85 <sup>th</sup> percentile (mph)	71.262
90 <sup>th</sup> percentile (mph)	72.669
95 <sup>th</sup> percentile (mph)	74.075
Percent in 10 mph pace	69.138
Proportion at 65 mph or more	0.63731
Proportion at 70 mph or more	0.19487
Proportion at 75 mph or more	0.017116
Proportion at 80 mph or more	0.0028115
Proportion at 85 mph or more	0.00070081
Vehicle Total	363,866

**Table 3.5: ATR-172—Historical Speed Data for Data for Eight-Week Period from 2/27/05 to 4/23/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	66.00667
Standard deviation (mph)	6.061606
Median (mph)	66.71468
15 <sup>th</sup> percentile (mph)	61.04258
85 <sup>th</sup> percentile (mph)	71.28844
90 <sup>th</sup> percentile (mph)	72.6851
95 <sup>th</sup> percentile (mph)	74.08175
Percent in 10 mph pace	69.165
Proportion at 65 mph or more	0.658598
Proportion at 70 mph or more	0.196126
Proportion at 75 mph or more	0.017127
Proportion at 80 mph or more	0.003298
Proportion at 85 mph or more	0.001002
Vehicle Total	762,541

**Table 3.6: ATR-172—Historical Speed Data for Data for Four-Week Period from 4/24 to 5/21**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	66.532
Standard deviation (mph)	5.5059
Median (mph)	66.974
15 <sup>th</sup> percentile (mph)	61.703
85 <sup>th</sup> percentile (mph)	71.473
90 <sup>th</sup> percentile (mph)	72.823
95 <sup>th</sup> percentile (mph)	74.174
Percent in 10 mph pace	71.034
Proportion at 65 mph or more	0.69274
Proportion at 70 mph or more	0.20455
Proportion at 75 mph or more	0.019402
Proportion at 80 mph or more	0.0036614
Proportion at 85 mph or more	0.0012265
Vehicle Total	440,270

**Table 3.7: ATR-172—Historical Speed Data for Data for Eight-Week Period from 5/22/05 to 7/16**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	66.60365
Standard deviation (mph)	5.424971
Median (mph)	67.01931
15 <sup>th</sup> percentile (mph)	61.72764
85 <sup>th</sup> percentile (mph)	71.59686
90 <sup>th</sup> percentile (mph)	72.90745
95 <sup>th</sup> percentile (mph)	74.21804
Percent in 10 mph pace	70.6100
Proportion at 65 mph or more	0.69584
Proportion at 70 mph or more	0.210921
Proportion at 75 mph or more	0.020168
Proportion at 80 mph or more	0.00375
Proportion at 85 mph or more	0.001072
Vehicle Total	989,403



**Table 3.8: ATR-172—Historical Speed Data for Data for Four-Week Period from 7/17/05 to 8/13/05**

<b>Measure</b>	<b>2004-2005</b>
Mean (mph)	66.815
Standard deviation (mph)	5.3188
Median (mph)	67.171
15 <sup>th</sup> percentile (mph)	61.928
85 <sup>th</sup> percentile (mph)	71.844
90 <sup>th</sup> percentile (mph)	73.081
95 <sup>th</sup> percentile (mph)	74.318
Percent in 10 mph pace	70.392
Proportion at 65 mph or more	0.71140
Proportion at 70 mph or more	0.22451
Proportion at 75 mph or more	0.022457
Proportion at 80 mph or more	0.0040965
Proportion at 85 mph or more	0.0011490
Vehicle Total	512,630

**ATR-187**

The historical speed data for ATR-187 are presented in Tables 3.9 through 3.16.

**Table 3.9: ATR-187—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

<b>Measure</b>	<b>2002-2003 (All Six Weeks)</b>	<b>2003-2004 (All Six Weeks)</b>	<b>2004-2005 (Two Weeks Only 9/26/04 to 10/9/04)</b>
Mean (mph)	68.89784244	69.38757	69.67999
Standard deviation (mph)	6.459888708	5.690815	5.415989
Median (mph)	68.84969889	69.74804	69.99632
15 <sup>th</sup> percentile (mph)	63.60343227	64.49782	65.06719
85 <sup>th</sup> percentile (mph)	74.36491221	74.32189	74.38976
90 <sup>th</sup> percentile (mph)	75.78160814	74.9726	75.0851
95 <sup>th</sup> percentile (mph)	78.88907431	78.07134	78.16595
Percent in 10 mph pace	66.4158041	70.7798	73.547
Proportion at 65 mph or more	0.810537789	0.83747	0.854771
Proportion at 70 mph or more	0.407210415	0.482092	0.499739
Proportion at 75 mph or more	0.112576294	0.097894	0.101381
Proportion at 80 mph or more	0.032124895	0.019924	0.020235
Proportion at 85 mph or more	0.005291823	0.003194	0.002942
Vehicle Total	815,598	844,339	302,502

**Table 3.10: ATR-187—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	69.251	69.180	69.487
Standard deviation (mph)	5.6327	5.5710	5.7139
Median (mph)	69.176	69.525	69.981
15 <sup>th</sup> percentile (mph)	63.665	64.154	64.853
85 <sup>th</sup> percentile (mph)	74.479	74.209	74.357
90 <sup>th</sup> percentile (mph)	75.904	74.876	74.982
95 <sup>th</sup> percentile (mph)	78.671	77.715	77.966
Percent in 10 mph pace	66.695	69.718	71.905
Proportion at 65 mph or more	0.80817	0.82785	0.84655
Proportion at 70 mph or more	0.43923	0.46557	0.49866
Proportion at 75 mph or more	0.11633	0.090675	0.098541
Proportion at 80 mph or more	0.025996	0.015779	0.016705
Proportion at 85 mph or more	0.0040175	0.0021701	0.0023389
Vehicle Total	517,738	511,960	495,957

**Table 3.11: ATR-187—Two Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [No Speed Data Available for 2002-2003]**

Measure	2003-2004	2004-2005
	(All Eight Weeks)	(Four Weeks Only 12/5/04 to 1/1/05)
Mean (mph)	70.81684	69.074
Standard deviation (mph)	5.929378	5.7423
Median (mph)	71.20714	69.462
15 <sup>th</sup> percentile (mph)	65.36807	63.974
85 <sup>th</sup> percentile (mph)	76.58958	74.163
90 <sup>th</sup> percentile (mph)	78.09773	74.832
95 <sup>th</sup> percentile (mph)	79.60589	77.597
Percent in 10 mph pace	64.9639	69.066
Proportion at 65 mph or more	0.870294	0.82240
Proportion at 70 mph or more	0.59462	0.46117
Proportion at 75 mph or more	0.2027	0.087435
Proportion at 80 mph or more	0.036934	0.015362
Proportion at 85 mph or more	0.004365	0.0021885
Vehicle Total	925,059	479,315

**Table 3.12: ATR-187—One Prior Year of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [No Speed Data Available for 2003-2004 or 2004-2005]**

Measure	2002-2003		
Mean (mph)	68.698		
Standard deviation (mph)	6.0222		
Median (mph)	68.744		
15 <sup>th</sup> percentile (mph)	63.028		
85 <sup>th</sup> percentile (mph)	74.200		
90 <sup>th</sup> percentile (mph)	75.101		
95 <sup>th</sup> percentile (mph)	78.295		
Percent in 10 mph pace	64.747		
Proportion at 65 mph or more	0.78496		
Proportion at 70 mph or more	0.40436		
Proportion at 75 mph or more	0.10158		
Proportion at 80 mph or more	0.023302		
Proportion at 85 mph or more	0.0036578		
Vehicle Total	425,936		

**Table 3.13: ATR-187—Two Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 1/30/03 to 2/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>
Mean (mph)	69.277	69.58608
Standard deviation (mph)	5.7534	5.180375
Median (mph)	69.139	69.87404
15 <sup>th</sup> percentile (mph)	64.164	65.05337
85 <sup>th</sup> percentile (mph)	74.466	74.29877
90 <sup>th</sup> percentile (mph)	75.917	74.92936
95 <sup>th</sup> percentile (mph)	78.727	77.85833
Percent in 10 mph pace	68.495	73.6396
Proportion at 65 mph or more	0.82707	0.853875
Proportion at 70 mph or more	0.43198	0.490855
Proportion at 75 mph or more	0.11632	0.094399
Proportion at 80 mph or more	0.027353	0.016733
Proportion at 85 mph or more	0.0043404	0.002248
Vehicle Total	449,493	975,193

**Table 3.14: ATR-187—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>
Mean (mph)	69.323	69.577
Standard deviation (mph)	5.5630	5.1448
Median (mph)	69.596	69.822
15 <sup>th</sup> percentile (mph)	64.423	65.033
85 <sup>th</sup> percentile (mph)	74.248	74.282
90 <sup>th</sup> percentile (mph)	74.910	74.917
95 <sup>th</sup> percentile (mph)	77.919	77.850
Percent in 10 mph pace	70.825	73.578
Proportion at 65 mph or more	0.8352	0.85238
Proportion at 70 mph or more	0.47051	0.48697
Proportion at 75 mph or more	0.093233	0.093504
Proportion at 80 mph or more	0.019170	0.017187
Proportion at 85 mph or more	0.0032075	0.0025364
Vehicle Total	577,401	570,497

**Table 3.15: ATR-187—Two Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 5/22/03 to 6/19/03)</b>	<b>2003-2004 (Four Weeks Only 5/22/03 to 6/19/03)</b>	
Mean (mph)	69.127	68.943	
Standard deviation (mph)	5.2523	5.2891	
Median (mph)	69.264	69.116	
15 <sup>th</sup> percentile (mph)	64.129	63.807	
85 <sup>th</sup> percentile (mph)	74.050	73.980	
90 <sup>th</sup> percentile (mph)	74.739	74.684	
95 <sup>th</sup> percentile (mph)	77.394	77.179	
Percent in 10 mph pace	70.566	69.34	
Proportion at 65 mph or more	0.82532	0.81461	
Proportion at 70 mph or more	0.44388	0.43242	
Proportion at 75 mph or more	0.081071	0.077579	
Proportion at 80 mph or more	0.016169	0.014296	
Proportion at 85 mph or more	0.0030748	0.0020744	
Vehicle Total	661,184	639,210	

**Table 3.16: ATR-187—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	
Mean (mph)	69.839	69.65963	
Standard deviation (mph)	5.3649	5.550044	
Median (mph)	70.017	69.87186	
15 <sup>th</sup> percentile (mph)	65.049	65.04295	
85 <sup>th</sup> percentile (mph)	74.515	74.45091	
90 <sup>th</sup> percentile (mph)	75.709	75.45432	
95 <sup>th</sup> percentile (mph)	78.592	78.30527	
Percent in 10 mph pace	73.251	72.7288	
Proportion at 65 mph or more	0.85344	0.853113	
Proportion at 70 mph or more	0.50129	0.490712	
Proportion at 75 mph or more	0.11230	0.107968	
Proportion at 80 mph or more	0.025578	0.020278	
Proportion at 85 mph or more	0.0054495	0.003819	
Vehicle Total	721,713	505,873	

## ATR-188

The historical speed data for ATR-188 are presented in Tables 3.17 to 3.24.

**Table 3.17: ATR-188—Two Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6 [No Speed Data Available for 2003-2004]**

Measure	2002-2003	2004-2005
	(Two Weeks Only 9/26/02 to 10/9/02)	(All Six Weeks)
Mean (mph)	65.88014	64.55029
Standard deviation (mph)	7.760541	9.741072
Median (mph)	66.44702	65.99876
15 <sup>th</sup> percentile (mph)	59.95179	56.81517
85 <sup>th</sup> percentile (mph)	72.51142	72.98474
90 <sup>th</sup> percentile (mph)	73.85515	74.19811
95 <sup>th</sup> percentile (mph)	76.00429	76.43537
Percent in 10 mph pace	59.5308	49.8121
Proportion at 65 mph or more	0.604485	0.556664
Proportion at 70 mph or more	0.243449	0.272994
Proportion at 75 mph or more	0.0574	0.066956
Proportion at 80 mph or more	0.020556	0.007891
Proportion at 85 mph or more	0.007364	0.001872
Vehicle Total	383,098	1,238,782

**Table 3.18: ATR-188—Two Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4 [No Speed Data Available for 2003-2004]**

Measure	2002-2003	2004-2005
	(Two Weeks Only 11/14/02 to 11/27/02)	(All Four Weeks)
Mean (mph)	65.51142322	65.9493
Standard deviation (mph)	7.640590142	8.634053
Median (mph)	66.14375301	66.89048
15 <sup>th</sup> percentile (mph)	59.90497604	60.21132
85 <sup>th</sup> percentile (mph)	71.83980367	73.31618
90 <sup>th</sup> percentile (mph)	73.36773696	74.41351
95 <sup>th</sup> percentile (mph)	74.89567024	76.79549
Percent in 10 mph pace	62.7859531	55.6849
Proportion at 65 mph or more	0.585952271	0.620923
Proportion at 70 mph or more	0.210205628	0.301103
Proportion at 75 mph or more	0.046585919	0.073276
Proportion at 80 mph or more	0.016508429	0.008457
Proportion at 85 mph or more	0.00696569	0.001816
Vehicle Total	391,921	802,496

**Table 3.19: ATR-188—Two Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [No Speed Data Available for 2003-2004]**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only (12/5/02 to 1/1/03))</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	66.39996	66.13985
Standard deviation (mph)	9.697007	8.311737
Median (mph)	67.2555	67.10001
15 <sup>th</sup> percentile (mph)	58.03573	60.35876
85 <sup>th</sup> percentile (mph)	74.48654	73.26395
90 <sup>th</sup> percentile (mph)	76.4609	74.36379
95 <sup>th</sup> percentile (mph)	79.27585	76.68531
Percent in 10 mph pace	46.0245	56.9103
Proportion at 65 mph or more	0.614927	0.645999
Proportion at 70 mph or more	0.360157	0.298384
Proportion at 75 mph or more	0.125949	0.071077
Proportion at 80 mph or more	0.037137	0.008546
Proportion at 85 mph or more	0.013582	0.001832
Vehicle Total	758,292	1,457,212

**Table 3.20: ATR-188—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [No Speed Data Available for 2003-2004]**

<b>Measure</b>	<b>2002-2003</b>	<b>2004-2005</b>
Mean (mph)	65.703	67.000
Standard deviation (mph)	9.5075	8.0276
Median (mph)	66.502	67.769
15 <sup>th</sup> percentile (mph)	57.375	61.170
85 <sup>th</sup> percentile (mph)	73.994	73.782
90 <sup>th</sup> percentile (mph)	75.565	74.751
95 <sup>th</sup> percentile (mph)	78.768	77.412
Percent in 10 mph pace	47.558	57.386
Proportion at 65 mph or more	0.58013	0.69222
Proportion at 70 mph or more	0.31344	0.34516
Proportion at 75 mph or more	0.10883	0.087166
Proportion at 80 mph or more	0.030765	0.010112
Proportion at 85 mph or more	0.010554	0.0021072
Vehicle Total	733,945	748,849

**Table 3.21: ATR-188—Two Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [No Speed Data Available for 2003-2004]**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 2/27/03 to 3/26/03)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	66.576	67.41025
Standard deviation (mph)	9.0085	7.964623
Median (mph)	67.213	68.07361
15 <sup>th</sup> percentile (mph)	59.077	61.58938
85 <sup>th</sup> percentile (mph)	74.222	74.02384
90 <sup>th</sup> percentile (mph)	75.911	74.94875
95 <sup>th</sup> percentile (mph)	78.960	77.76501
Percent in 10 mph pace	49.802	57.9403
Proportion at 65 mph or more	0.62699	0.711364
Proportion at 70 mph or more	0.34013	0.367527
Proportion at 75 mph or more	0.11495	0.09723
Proportion at 80 mph or more	0.032941	0.011824
Proportion at 85 mph or more	0.010801	0.002287
Vehicle Total	778,838	1,554,599

**Table 3.22: ATR-188—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2003-2004]**

<b>Measure</b>	<b>2002-2003</b>	<b>2004-2005</b>
Mean (mph)	66.842	67.304
Standard deviation (mph)	8.9142	7.1709
Median (mph)	67.395	67.723
15 <sup>th</sup> percentile (mph)	59.826	61.349
85 <sup>th</sup> percentile (mph)	74.305	73.817
90 <sup>th</sup> percentile (mph)	76.090	74.785
95 <sup>th</sup> percentile (mph)	79.092	77.468
Percent in 10 mph pace	50.778	57.824
Proportion at 65 mph or more	0.64028	0.68299
Proportion at 70 mph or more	0.34739	0.34701
Proportion at 75 mph or more	0.11814	0.088919
Proportion at 80 mph or more	0.034888	0.010088
Proportion at 85 mph or more	0.011294	0.0019536
Vehicle Total	873,448	847,660



**Table 3.23: ATR-188—Two Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [Speed Data Unreliable for 2002-2003]**

Measure	2003-2004	2004-2005
Mean (mph)	66.52114	67.22246
Standard deviation (mph)	7.098353	6.894435
Median (mph)	66.93512	67.58046
15 <sup>th</sup> percentile (mph)	60.77017	61.3919
85 <sup>th</sup> percentile (mph)	73.17391	73.59516
90 <sup>th</sup> percentile (mph)	74.26936	74.61235
95 <sup>th</sup> percentile (mph)	76.4021	77.14375
Percent in 10 mph pace	58.5418	59.4499
Proportion at 65 mph or more	0.629519	0.684806
Proportion at 70 mph or more	0.294867	0.32672
Proportion at 75 mph or more	0.066652	0.080945
Proportion at 80 mph or more	0.007271	0.00877
Proportion at 85 mph or more	0.001754	0.001713
Vehicle Total	1,700,876	1,764,460

**Table 3.24: ATR-188—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2002-2003]**

Measure	2003-2004	2004-2005
Mean (mph)	66.941	67.415
Standard deviation (mph)	6.9640	6.8332
Median (mph)	67.329	67.753
15 <sup>th</sup> percentile (mph)	61.167	61.549
85 <sup>th</sup> percentile (mph)	73.398	73.734
90 <sup>th</sup> percentile (mph)	74.439	74.735
95 <sup>th</sup> percentile (mph)	76.765	77.381
Percent in 10 mph pace	59.222	59.656
Proportion at 65 mph or more	0.66280	0.70035
Proportion at 70 mph or more	0.31324	0.33652
Proportion at 75 mph or more	0.073030	0.086779
Proportion at 80 mph or more	0.0077847	0.0095296
Proportion at 85 mph or more	0.0017183	0.0017330
Vehicle Total	879,926	879,997

**ATR-197**

The historical speed data for ATR-197 are presented in Tables 3.25 through 3.31.

**Table 3.25: ATR-197—Two Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6 [No Speed Data Available for 2002-2003]**

<b>Measure</b>	<b>2003-2004 (Two Weeks Only 9/26/03 to 10/9/03)</b>	<b>2004-2005 (All Six Weeks)</b>
Mean (mph)	65.23869121	66.07991
Standard deviation (mph)	7.959496729	6.563683
Median (mph)	66.21726011	66.65845
15 <sup>th</sup> percentile (mph)	60.09906516	60.97361
85 <sup>th</sup> percentile (mph)	71.83967149	71.88694
90 <sup>th</sup> percentile (mph)	73.18925479	73.17294
95 <sup>th</sup> percentile (mph)	74.53883809	74.45894
Percent in 10 mph pace	63.3298615	66.3007
Proportion at 65 mph or more	0.590695165	0.637298
Proportion at 70 mph or more	0.218157019	0.223364
Proportion at 75 mph or more	0.032914656	0.028964
Proportion at 80 mph or more	0.009157948	0.006798
Proportion at 85 mph or more	0.002772865	0.001537
Vehicle Total	66,718	205,637

**ATR-197—11/7 to 12/4 Time Period**

Please note, no speed data were available for ATR-197 during the 11/7 to 12/4 time period in any of the three years prior to the MSMP.

**Table 3.26: ATR-197—One Prior Year of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [No Speed Data Available for 2003-2004 and 2004-2005]**

Measure	2002-2003		
Mean (mph)	65.27284		
Standard deviation (mph)	7.547038		
Median (mph)	66.05917		
15 <sup>th</sup> percentile (mph)	60.2842		
85 <sup>th</sup> percentile (mph)	71.59681		
90 <sup>th</sup> percentile (mph)	72.9742		
95 <sup>th</sup> percentile (mph)	74.3516		
Percent in 10 mph pace	65.2593		
Proportion at 65 mph or more	0.57849		
Proportion at 70 mph or more	0.207965		
Proportion at 75 mph or more	0.026463		
Proportion at 80 mph or more	0.006769		
Proportion at 85 mph or more	0.002202		
Vehicle Total	228,851		

**Table 3.27: ATR-197—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	64.383	62.989	
Standard deviation (mph)	7.0457	9.4362	
Median (mph)	65.182	64.550	
15 <sup>th</sup> percentile (mph)	58.468	56.315	
85 <sup>th</sup> percentile (mph)	70.312	70.349	
90 <sup>th</sup> percentile (mph)	72.094	72.119	
95 <sup>th</sup> percentile (mph)	73.876	73.889	
Percent in 10 mph pace	62.495	52.398	
Proportion at 65 mph or more	0.51289	0.47408	
Proportion at 70 mph or more	0.15876	0.15985	
Proportion at 75 mph or more	0.018478	0.018612	
Proportion at 80 mph or more	0.0040890	0.0042929	
Proportion at 85 mph or more	0.0013496	0.0013820	
Vehicle Total	100,771	102,029	

**Table 3.28: ATR-197—Two Prior Years of Historical Speed Data for Four-Week Period from 2/27 to 4/23 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 2/27/03 to 3/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>	
Mean (mph)	65.614	65.8514	
Standard deviation (mph)	5.6698	6.780287	
Median (mph)	65.559	66.50259	
15 <sup>th</sup> percentile (mph)	60.914	60.59989	
85 <sup>th</sup> percentile (mph)	71.087	71.91613	
90 <sup>th</sup> percentile (mph)	72.646	73.19168	
95 <sup>th</sup> percentile (mph)	74.205	74.46722	
Percent in 10 mph pace	70.764	64.5008	
Proportion at 65 mph or more	0.53964	0.618101	
Proportion at 70 mph or more	0.18487	0.22511	
Proportion at 75 mph or more	0.024498	0.029116	
Proportion at 80 mph or more	0.0057580	0.007034	
Proportion at 85 mph or more	0.0012898	0.002141	
Vehicle Total	106,990	245,675	

**Table 3.29: ATR-197—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	
Mean (mph)	66.050	66.072	
Standard deviation (mph)	6.5474	6.5299	
Median (mph)	66.596	66.646	
15 <sup>th</sup> percentile (mph)	60.718	60.655	
85 <sup>th</sup> percentile (mph)	72.089	72.101	
90 <sup>th</sup> percentile (mph)	73.332	73.334	
95 <sup>th</sup> percentile (mph)	74.575	74.567	
Percent in 10 mph pace	64.075	63.714	
Proportion at 65 mph or more	0.62475	0.62990	
Proportion at 70 mph or more	0.23400	0.23520	
Proportion at 75 mph or more	0.032909	0.032460	
Proportion at 80 mph or more	0.0073590	0.0078464	
Proportion at 85 mph or more	0.0020916	0.0024453	
Vehicle Total	130,998	131,271	

**Table 3.30: ATR-197—Two Prior Years of Historical Speed Data for Four-Week Period from 5/22 to 7/16 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	65.5938	66.30204	
Standard deviation (mph)	6.617139	6.307486	
Median (mph)	66.21317	66.86082	
15 <sup>th</sup> percentile (mph)	60.23512	60.75739	
85 <sup>th</sup> percentile (mph)	71.8639	72.29424	
90 <sup>th</sup> percentile (mph)	73.20325	73.4536	
95 <sup>th</sup> percentile (mph)	74.54259	74.61295	
Percent in 10 mph pace	63.3001	63.1382	
Proportion at 65 mph or more	0.589836	0.648818	
Proportion at 70 mph or more	0.219582	0.248945	
Proportion at 75 mph or more	0.032924	0.033308	
Proportion at 80 mph or more	0.007806	0.007455	
Proportion at 85 mph or more	0.001952	0.001854	
Vehicle Total	319,643	284,770	

**Table 3.31: ATR-197—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	65.878	66.600	
Standard deviation (mph)	6.8932	6.3537	
Median (mph)	66.569	67.153	
15 <sup>th</sup> percentile (mph)	60.296	61.053	
85 <sup>th</sup> percentile (mph)	72.309	72.528	
90 <sup>th</sup> percentile (mph)	73.527	73.626	
95 <sup>th</sup> percentile (mph)	74.744	74.723	
Percent in 10 mph pace	61.239	63.383	
Proportion at 65 mph or more	0.61669	0.67753	
Proportion at 70 mph or more	0.24480	0.26517	
Proportion at 75 mph or more	0.039498	0.037393	
Proportion at 80 mph or more	0.0095326	0.0085147	
Proportion at 85 mph or more	0.0023270	0.0021700	
Vehicle Total	146,969	151,150	

### 3.2. Historical Speed Data from Tube Located Within an Enhanced Enforcement Zone

There was one Tube located *Within* an Enhanced Enforcement Zones on a 4-Lane Divided Highway. It was Tube 05, on MN-60, near Lake Crystal, in Blue Earth County. Tube 05 only collected speed data from the eastbound lanes of MN-60. Seven days of Pre-MSMP speed data were collected from this Tube during August 2005. These speed data are presented in Table 3.32.

**Table 3.32: Tube 05—Pre-MSMP Speed Data (Eastbound Only) for One-Week Period from 8/22/05 to 8/29/05**

Measure	2004-2005
Mean (mph)	76.875096
Standard deviation (mph)	6.0283774
Median (mph)	76.901206
15 <sup>th</sup> percentile (mph)	71.34584
85 <sup>th</sup> percentile (mph)	82.159221
90 <sup>th</sup> percentile (mph)	83.61137
95 <sup>th</sup> percentile (mph)	90.209539
Percent in 10 mph pace	66.40194
Proportion at 65 mph or more	0.9729355
Proportion at 70 mph or more	0.9166179
Proportion at 75 mph or more	0.6691224
Proportion at 80 mph or more	0.2243457
Proportion at 85 mph or more	0.052187
Vehicle Total	32,441

### 3.3. Historical Speed Data from ATR Located Outside Enhanced Enforcement Zones

There was one ATR located on a 4-Lane Divide Highway *Outside* the Enhanced Enforcement Zones. It was ATR-353, on MNTH-169 near Jordan in Scott County. The historical speed data for this ATR are presented in Tables 4.33 through 4.40.

**Table 3.33: ATR-353—Two Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6 [No Speed Data Available for 2002-2003]**

Measure	2003-2004	2004-2005
Mean (mph)	68.0053066	67.9698
Standard deviation (mph)	6.27768366	6.518586
Median (mph)	68.4754547	68.49053
15 <sup>th</sup> percentile (mph)	62.8751564	63.00731
85 <sup>th</sup> percentile (mph)	73.4612406	73.44904
90 <sup>th</sup> percentile (mph)	74.2190849	74.20816
95 <sup>th</sup> percentile (mph)	74.9769292	74.96728
Percent in 10 mph pace	66.546581	66.9676
Proportion at 65 mph or more	0.77729648	0.784025
Proportion at 70 mph or more	0.37836094	0.377174
Proportion at 75 mph or more	0.04847787	0.047845
Proportion at 80 mph or more	0.00695509	0.006555
Proportion at 85 mph or more	0.0011228	0.000978
Vehicle Total	952,971	980,861

**Table 3.34: ATR-353—Two Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4 [No Speed Data Available for 2002-2003]**

Measure	2003-2004	2004-2005
Mean (mph)	67.637996	68.36073
Standard deviation (mph)	6.2076053	5.711711
Median (mph)	68.172187	68.72126
15 <sup>th</sup> percentile (mph)	62.34425	63.42388
85 <sup>th</sup> percentile (mph)	73.258212	73.5402
90 <sup>th</sup> percentile (mph)	74.056755	74.25617
95 <sup>th</sup> percentile (mph)	74.855298	74.97214
Percent in 10 mph pace	65.04774	68.9507
Proportion at 65 mph or more	0.7533673	0.799065
Proportion at 70 mph or more	0.3540098	0.397232
Proportion at 75 mph or more	0.0409396	0.048055
Proportion at 80 mph or more	0.0052716	0.006255
Proportion at 85 mph or more	0.0007842	0.000945
Vehicle Total	578,950	619,067

**Table 3.35: ATR-353—Two Prior Years of Historical Speed Data for Eight-Week Period from 12/05 to 1/29 [No Speed Data Available for 2002-2003]**

<b>Measure</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	67.446269	67.68885
Standard deviation (mph)	6.3592905	6.330969
Median (mph)	68.064262	68.27701
15 <sup>th</sup> percentile (mph)	62.164986	62.42994
85 <sup>th</sup> percentile (mph)	73.158928	73.31483
90 <sup>th</sup> percentile (mph)	73.974156	74.09088
95 <sup>th</sup> percentile (mph)	74.789384	74.86692
Percent in 10 mph pace	64.61062	65.0549
Proportion at 65 mph or more	0.7473505	0.759477
Proportion at 70 mph or more	0.3437451	0.363572
Proportion at 75 mph or more	0.0370824	0.041426
Proportion at 80 mph or more	0.00466	0.005271
Proportion at 85 mph or more	0.0007342	0.000817
Vehicle Total	1,066,517	1,091,536

**Table 3.36: ATR-353—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [No Speed Data Available for 2002-2003]**

<b>Measure</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	66.91672	68.18838
Standard deviation (mph)	6.961625	6.168288
Median (mph)	67.79227	68.71178
15 <sup>th</sup> percentile (mph)	61.37391	63.23826
85 <sup>th</sup> percentile (mph)	73.06803	73.54424
90 <sup>th</sup> percentile (mph)	73.92134	74.25987
95 <sup>th</sup> percentile (mph)	74.77465	74.9755
Percent in 10 mph pace	61.2374	67.6695
Proportion at 65 mph or more	0.715297	0.79496
Proportion at 70 mph or more	0.329773	0.39763
Proportion at 75 mph or more	0.036795	0.048289
Proportion at 80 mph or more	0.004662	0.006074
Proportion at 85 mph or more	0.000679	0.000944
Vehicle Total	519,524	565,973



**Table 3.37: ATR-353—Two Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [No Speed Data Available for 2002-2003]**

Measure	2003-2004	2004-2005
Mean (mph)	68.31456	68.30579
Standard deviation (mph)	5.990657	5.956492
Median (mph)	68.74261	68.76101
15 <sup>th</sup> percentile (mph)	63.47233	63.40898
85 <sup>th</sup> percentile (mph)	73.55015	73.55403
90 <sup>th</sup> percentile (mph)	74.26443	74.26196
95 <sup>th</sup> percentile (mph)	74.97872	74.96988
Percent in 10 mph pace	68.8457	68.5679
Proportion at 65 mph or more	0.802084	0.800468
Proportion at 70 mph or more	0.398511	0.401017
Proportion at 75 mph or more	0.04851	0.047873
Proportion at 80 mph or more	0.006085	0.005946
Proportion at 85 mph or more	0.000868	0.00088
Vehicle Total	1,161,608	1,180,206

**Table 3.38: ATR-353—Three Prior Years of Historical Speed Data for Eight-Week Period from 4/24 to 5/21**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	68.16125952	68.24015	68.29125
Standard deviation (mph)	6.2361249	6.103669	6.032863
Median (mph)	68.60777283	68.69873	68.73218
15 <sup>th</sup> percentile (mph)	63.22461616	63.29941	63.37672
85 <sup>th</sup> percentile (mph)	73.51785427	73.54261	73.55047
90 <sup>th</sup> percentile (mph)	74.25951716	74.26286	74.26419
95 <sup>th</sup> percentile (mph)	75.00919383	74.98311	74.9779
Percent in 10 mph pace	67.8014943	68.0891	68.4572
Proportion at 65 mph or more	0.792410157	0.795809	0.798115
Proportion at 70 mph or more	0.387159923	0.39593	0.398731
Proportion at 75 mph or more	0.050079554	0.048828	0.048452
Proportion at 80 mph or more	0.006814685	0.006337	0.00614
Proportion at 85 mph or more	0.000974701	0.000945	0.000935
Vehicle Total	608,392	627,432	636,670

**Table 3.39: ATR-353—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	68.0544364	68.02412	68.13813
Standard deviation (mph)	6.18923791	5.871711	6.100104
Median (mph)	68.5009207	68.40487	68.58462
15 <sup>th</sup> percentile (mph)	63.0897329	63.07749	63.17304
85 <sup>th</sup> percentile (mph)	73.4265865	73.32338	73.46749
90 <sup>th</sup> percentile (mph)	74.1797033	74.08995	74.20357
95 <sup>th</sup> percentile (mph)	74.9328202	74.85652	74.93965
Percent in 10 mph pace	67.647339	68.2302	67.8776
Proportion at 65 mph or more	0.78609888	0.784385	0.78989
Proportion at 70 mph or more	0.37749368	0.36677	0.385538
Proportion at 75 mph or more	0.04553988	0.040641	0.045901
Proportion at 80 mph or more	0.00607598	0.005266	0.006005
Proportion at 85 mph or more	0.0009459	0.000839	0.000938
Vehicle Total	1,250,662	1,100,110	1,293,813

**Table 3.40: ATR-353—Three Prior Years of Historical Speed Data for Four-Week Period from 7/17to 8/13**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	68.21131707	68.1104	68.25739
Standard deviation (mph)	6.451063945	6.327548	6.285461
Median (mph)	68.71099927	68.59878	68.73941
15 <sup>th</sup> percentile (mph)	63.30946373	63.24189	63.38244
85 <sup>th</sup> percentile (mph)	73.58240327	73.466	73.57493
90 <sup>th</sup> percentile (mph)	74.30698018	74.20009	74.29233
95 <sup>th</sup> percentile (mph)	75.24230113	74.93419	75.07734
Percent in 10 mph pace	67.7531462	68.0073	68.1801
Proportion at 65 mph or more	0.795939627	0.792601	0.799138
Proportion at 70 mph or more	0.397206556	0.386072	0.399158
Proportion at 75 mph or more	0.052177622	0.045518	0.050679
Proportion at 80 mph or more	0.007241352	0.005854	0.006805
Proportion at 85 mph or more	0.001087737	0.000931	0.001041
Vehicle Total	651,812	678,857	682,852

## **Section 4: Rural Freeway Speed Data**

The historical speed data obtained from the five ATRs and two Tubes that were located on Rural Freeways are presented in this section of the report.

The two Tubes and four of the five ATRs were located *Within* Enhanced Enforcement Zones, while the remaining ATR was located *Outside* the Enhanced Enforcement Zones. During the MSMP, the speed limit remained unchanged at 70 mph at the locations of the five ATRs and the two Tubes.

### *4.1. Historical Speed Data from ATRs Located Within Enhanced Enforcement Zones*

The four ATRs located *Within* Enhanced Enforcement Zones on Rural Freeways were as follows: (1) ATR-175, on I-94, near Saulk Centre in Stearns County, (2) ATR-191, on I-35, near Wyoming, in Chisago County, (3) ATR-208, on I-35, near Owatanna in Steele County, and (4) ATR-227, on I-90, near Alden in Freeborn County. For these four ATRs, there are historical data from the same time periods that were used in the MSMP. In some cases, three years of historical speed data are available; in others, one or two years of historical data are available.

**ATR-175**

The available historical speed data for ATR-175 are presented in Tables 4.1 through 4.8.

**Table 4.1.: ATR-175—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

<b>Measure</b>	<b>2002-2003 (Two Weeks Only 9/26/02 to 11/6/02)</b>	<b>2003-2004 (Four Weeks Only 10/10/03 to 11/6/02)</b>	<b>2004-2005 (All Six Weeks)</b>
Mean (mph)	70.86291744	73.0090375	73.32701
Standard deviation (mph)	7.307424416	6.82435646	6.070776
Median (mph)	71.09150749	73.5373508	73.5641
15 <sup>th</sup> percentile (mph)	63.8019649	66.6722916	67.50634
85 <sup>th</sup> percentile (mph)	77.97733399	79.0351616	78.9164
90 <sup>th</sup> percentile (mph)	79.34718723	79.8639499	79.7367
95 <sup>th</sup> percentile (mph)	82.22883352	82.6746643	82.34786
Percent in 10 mph pace	55.0334616	60.10246	63.9794
Proportion at 65 mph or more	0.821337852	0.89637559	0.924156
Proportion at 70 mph or more	0.567394198	0.75771678	0.77622
Proportion at 75 mph or more	0.258673466	0.39343741	0.388717
Proportion at 80 mph or more	0.076172164	0.09179223	0.083951
Proportion at 85 mph or more	0.01745947	0.01366611	0.011649
Vehicle Total	311,006	616,708	925,398

**Table 4.2.: ATR-175—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

<b>Measure</b>	<b>2002-2003 (Three Weeks Only 11/07/02 to 20/11/02)</b>	<b>2003-2004 (All Four Weeks)</b>	<b>2004-2005 (All Four Weeks)</b>
Mean (mph)	71.00726993	72.6634	73.125
Standard deviation (mph)	7.52713863	6.704558	6.0863
Median (mph)	71.24309458	73.19956	73.417
15 <sup>th</sup> percentile (mph)	63.81030756	66.42695	67.218
85 <sup>th</sup> percentile (mph)	78.17668892	78.73264	78.797
90 <sup>th</sup> percentile (mph)	79.51959937	79.60608	79.632
95 <sup>th</sup> percentile (mph)	82.63114067	82.02744	82.065
Percent in 10 mph pace	54.1668513	60.1508	63.204
Proportion at 65 mph or more	0.821829163	0.893027	0.91787
Proportion at 70 mph or more	0.576673345	0.742261	0.76491
Proportion at 75 mph or more	0.268276276	0.363676	0.37729
Proportion at 80 mph or more	0.082113453	0.07745	0.078001
Proportion at 85 mph or more	0.021087729	0.009754	0.010190
Vehicle Total	273,524	552,888	571,648

**Table 4.3: ATR-175—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	71.07513416	72.64084	72.14705
Standard deviation (mph)	8.129937673	6.256236	6.5463
Median (mph)	71.29723079	73.06038	72.71506
15 <sup>th</sup> percentile (mph)	63.27889215	66.68527	65.96347
85 <sup>th</sup> percentile (mph)	78.64813741	78.53514	78.35168
90 <sup>th</sup> percentile (mph)	80.02597825	79.43884	79.31423
95 <sup>th</sup> percentile (mph)	83.51245174	81.55615	81.26161
Percent in 10 mph pace	51.4202134	61.9854	59.6083
Proportion at 65 mph or more	0.808775691	0.904083	0.883653
Proportion at 70 mph or more	0.575699991	0.743626	0.709007
Proportion at 75 mph or more	0.283924653	0.345593	0.324105
Proportion at 80 mph or more	0.100372558	0.068952	0.064377
Proportion at 85 mph or more	0.028666864	0.008058	0.007397
Vehicle Total	986,156	982,973	964,438

**Table 4.4: ATR-175—Three Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	70.607	71.491	72.974
Standard deviation (mph)	8.4528	7.3845	5.7627
Median (mph)	70.965	72.411	73.205
15 <sup>th</sup> percentile (mph)	62.586	65.195	67.163
85 <sup>th</sup> percentile (mph)	78.442	78.161	78.619
90 <sup>th</sup> percentile (mph)	79.866	79.180	79.495
95 <sup>th</sup> percentile (mph)	83.319	80.926	81.679
Percent in 10 mph pace	51.189	57.258	63.628
Proportion at 65 mph or more	0.78996	0.85686	0.92169
Proportion at 70 mph or more	0.55482	0.68148	0.75596
Proportion at 75 mph or more	0.27084	0.30517	0.35662
Proportion at 80 mph or more	0.095313	0.059724	0.071188
Proportion at 85 mph or more	0.027046	0.0072406	0.0080839
Vehicle Total	458,028	463,495	489,987

**Table 4.5: ATR-175—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 2/27/03 to 3/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	70.875	73.30657	73.17625
Standard deviation (mph)	8.0720	6.21204	6.245244
Median (mph)	71.257	73.57907	73.49373
15 <sup>th</sup> percentile (mph)	62.979	67.42856	67.39057
85 <sup>th</sup> percentile (mph)	78.433	78.9435	78.84544
90 <sup>th</sup> percentile (mph)	79.694	79.76189	79.67057
95 <sup>th</sup> percentile (mph)	82.985	82.42839	82.153
Percent in 10 mph pace	50.75	63.5385	63.5764
Proportion at 65 mph or more	0.79863	0.92109	0.922068
Proportion at 70 mph or more	0.57185	0.774728	0.771334
Proportion at 75 mph or more	0.28614	0.39093	0.383018
Proportion at 80 mph or more	0.087872	0.085452	0.080038
Proportion at 85 mph or more	0.024438	0.012457	0.010279
Vehicle Total	495,780	1,093,228	1,077,686

**Table 4.6: ATR-175—Three Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	70.770	73.363	73.246
Standard deviation (mph)	7.3632	6.1670	6.1052
Median (mph)	71.134	73.615	73.495
15 <sup>th</sup> percentile (mph)	63.259	67.493	67.452
85 <sup>th</sup> percentile (mph)	78.026	78.981	78.857
90 <sup>th</sup> percentile (mph)	79.308	79.798	79.688
95 <sup>th</sup> percentile (mph)	82.029	82.500	82.228
Percent in 10 mph pace	53.001	63.687	63.955
Proportion at 65 mph or more	0.80439	0.92241	0.92322
Proportion at 70 mph or more	0.56803	0.77717	0.77391
Proportion at 75 mph or more	0.26800	0.39380	0.38204
Proportion at 80 mph or more	0.073032	0.087627	0.081198
Proportion at 85 mph or more	0.016279	0.012388	0.011196
Vehicle Total	599,377	602,442	607,204

**Table 4.7: ATR-175—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	71.03253438	73.248	73.17893
Standard deviation (mph)	7.574996755	6.097405	6.262706
Median (mph)	71.38147628	73.53069	73.50612
15 <sup>th</sup> percentile (mph)	63.44542544	67.50286	67.43798
85 <sup>th</sup> percentile (mph)	78.3508079	78.85757	78.85745
90 <sup>th</sup> percentile (mph)	79.57007074	79.68241	79.6914
95 <sup>th</sup> percentile (mph)	82.5670998	82.18781	82.21141
Percent in 10 mph pace	51.8378513	64.1904	63.8684
Proportion at 65 mph or more	0.810886967	0.921026	0.917898
Proportion at 70 mph or more	0.581161926	0.779137	0.778648
Proportion at 75 mph or more	0.287411221	0.383836	0.381275
Proportion at 80 mph or more	0.082369295	0.080749	0.081498
Proportion at 85 mph or more	0.019322866	0.010476	0.010281
Vehicle Total	1,409,263	1,388,157	1,429,654

**Table 4.8: ATR-175—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [No Speed Data Available for 2004-2005]**

Measure	2002-2003	2003-2004	
Mean (mph)	71.510	73.682	
Standard deviation (mph)	7.7886	6.1192	
Median (mph)	71.726	73.932	
15 <sup>th</sup> percentile (mph)	63.642	68.058	
85 <sup>th</sup> percentile (mph)	78.908	79.178	
90 <sup>th</sup> percentile (mph)	80.236	79.956	
95 <sup>th</sup> percentile (mph)	83.525	82.795	
Percent in 10 mph pace	49.879	65.215	
Proportion at 65 mph or more	0.81719	0.92833	
Proportion at 70 mph or more	0.59697	0.80026	
Proportion at 75 mph or more	0.31607	0.41846	
Proportion at 80 mph or more	0.10358	0.097193	
Proportion at 85 mph or more	0.027574	0.012779	
Vehicle Total	750,013	747,885	

**ATR-191**

The available historical speed data for ATR-191 are presented in Tables 4.9 through 4.16.

**Table 4.9: ATR-191—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	72.0640404	71.70128	72.64986
Standard deviation (mph)	7.913532134	8.98837	7.407856
Median (mph)	72.4156467	71.93021	73.30518
15 <sup>th</sup> percentile (mph)	64.59562802	62.94585	65.54779
85 <sup>th</sup> percentile (mph)	79.5203852	80.30585	79.30017
90 <sup>th</sup> percentile (mph)	81.32576175	82.36178	80.40926
95 <sup>th</sup> percentile (mph)	83.63626004	84.4177	83.16568
Percent in 10 mph pace	49.8710765	44.9507	51.5731
Proportion at 65 mph or more	84.1112046	79.9712	87.1855
Proportion at 70 mph or more	0.639415457	0.597311	0.672368
Proportion at 75 mph or more	0.350847892	0.345237	0.411614
Proportion at 80 mph or more	0.128689953	0.157438	0.107424
Proportion at 85 mph or more	0.020488185	0.035838	0.016726
Vehicle Total	1,863,269	1,943,586	1,905,909

**Table 4.10: ATR-191—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

<b>Measure</b>	<b>2002-2003 (All Four Weeks)</b>	<b>2003-2004 (All Four Weeks)</b>	<b>2004-2005 (Two Weeks Only 11/21/04 to 12/4/04)</b>
Mean (mph)	72.432	71.591	73.70661
Standard deviation (mph)	7.4922	9.1824	7.628708
Median (mph)	72.585	71.893	74.10812
15 <sup>th</sup> percentile (mph)	65.348	62.692	66.04571
85 <sup>th</sup> percentile (mph)	79.579	80.232	79.89723
90 <sup>th</sup> percentile (mph)	81.404	82.365	82.13405
95 <sup>th</sup> percentile (mph)	83.650	84.497	84.58293
Percent in 10 mph pace	51.756	44.605	52.5467
Proportion at 65 mph or more	0.86451	0.79441	0.889325
Proportion at 70 mph or more	0.65629	0.59439	0.701296
Proportion at 75 mph or more	0.35402	0.34506	0.456298
Proportion at 80 mph or more	0.13127	0.15544	0.143572
Proportion at 85 mph or more	0.019930	0.038213	0.041484
Vehicle Total	1,180,191	1,179,953	575251



**Table 4.11: ATR-191—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29**

<b>Measure</b>	<b>2002-2003 (All Eight Weeks)</b>	<b>2003-2004 (Four Weeks Only 12/05/03 to 1/01/04)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	71.84316	71.18233	71.61241
Standard deviation (mph)	7.764156	8.912604	7.996446
Median (mph)	72.21538	71.53843	72.3749
15 <sup>th</sup> percentile (mph)	64.09216	62.65855	63.97789
85 <sup>th</sup> percentile (mph)	79.33346	79.41716	78.90369
90 <sup>th</sup> percentile (mph)	81.01331	81.46582	79.77624
95 <sup>th</sup> percentile (mph)	83.42204	84.10677	82.57971
Percent in 10 mph pace	49.6223	46.973	47.621
Proportion at 65 mph or more	0.827904	0.793566	0.825689
Proportion at 70 mph or more	0.628629	0.580614	0.614266
Proportion at 75 mph or more	0.33832	0.318613	0.373696
Proportion at 80 mph or more	0.121034	0.127752	0.087178
Proportion at 85 mph or more	0.017245	0.033089	0.01512
Vehicle Total	2,139,130	1,126,214	2,086,191

**Table 4.12: ATR-191—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [Speed Data for 2003-2004 Unreliable & Incomplete]**

<b>Measure</b>	<b>2002-2003</b>	<b>2004-2005</b>
Mean (mph)	71.586	73.133
Standard deviation (mph)	8.2532	7.4018
Median (mph)	71.997	73.614
15 <sup>th</sup> percentile (mph)	64.115	65.745
85 <sup>th</sup> percentile (mph)	79.293	79.655
90 <sup>th</sup> percentile (mph)	81.032	81.409
95 <sup>th</sup> percentile (mph)	83.484	83.834
Percent in 10 mph pace	50.116	50.957
Proportion at 65 mph or more	0.82986	0.88054
Proportion at 70 mph or more	0.61585	0.67546
Proportion at 75 mph or more	0.32575	0.43274
Proportion at 80 mph or more	0.12103	0.12907
Proportion at 85 mph or more	0.019102	0.025940
Vehicle Total	1,031,371	1,096,259

**Table 4.13: ATR-191—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 1/30/03 to 3/26/03)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (All Eight Weeks)s</b>
Mean (mph)	71.932	72.34571	73.91781
Standard deviation (mph)	8.5533	6.847429	6.672205
Median (mph)	72.281	72.6428	74.22176
15 <sup>th</sup> percentile (mph)	63.391	66.10553	67.34264
85 <sup>th</sup> percentile (mph)	79.994	78.5966	79.68112
90 <sup>th</sup> percentile (mph)	82.074	79.56561	81.36453
95 <sup>th</sup> percentile (mph)	84.158	82.24624	83.68286
Percent in 10 mph pace	46.04	58.2702	59.7701
Proportion at 65 mph or more	0.81116	0.897026	0.928908
Proportion at 70 mph or more	0.61998	0.68434	0.760491
Proportion at 75 mph or more	0.35694	0.335581	0.451981
Proportion at 80 mph or more	0.14977	0.077586	0.129429
Proportion at 85 mph or more	0.029783	0.016181	0.021593
Vehicle Total	1,067,581	2,279,562	2,324,100

**Table 4.14: ATR-191—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [No Speed Data Available for 2004-2005]**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	
Mean (mph)	71.791	72.900	
Standard deviation (mph)	8.5502	7.0470	
Median (mph)	72.116	73.005	
15 <sup>th</sup> percentile (mph)	62.985	66.576	
85 <sup>th</sup> percentile (mph)	79.913	78.833	
90 <sup>th</sup> percentile (mph)	82.016	79.749	
95 <sup>th</sup> percentile (mph)	84.187	82.920	
Percent in 10 mph pace	45.232	59.563	
Proportion at 65 mph or more	0.79780	0.91356	
Proportion at 70 mph or more	0.60914	0.71190	
Proportion at 75 mph or more	0.35128	0.35929	
Proportion at 80 mph or more	0.14642	0.086314	
Proportion at 85 mph or more	0.031272	0.024124	
Vehicle Total	1,245,084	1,097,578	

**Table 4.15: ATR-191—Two Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [Speed Data for 2004-2005 Unreliable]**

Measure	2002-2003	2003-2004	
Mean (mph)	70.92633	73.1274	
Standard deviation (mph)	10.02696	7.470621	
Median (mph)	71.69512	73.83552	
15 <sup>th</sup> percentile (mph)	62.15574	66.93009	
85 <sup>th</sup> percentile (mph)	79.84951	79.221	
90 <sup>th</sup> percentile (mph)	81.94522	79.99237	
95 <sup>th</sup> percentile (mph)	84.14229	82.89671	
Percent in 10 mph pace	44.3155	59.0748	
Proportion at 65 mph or more	0.778458	0.911846	
Proportion at 70 mph or more	0.584783	0.751631	
Proportion at 75 mph or more	0.334702	0.423604	
Proportion at 80 mph or more	0.144268	0.099505	
Proportion at 85 mph or more	0.030481	0.014054	
Vehicle Total	2,720,508	2,722,002	

**Table 4.16: ATR-191—Two Prior Years of Historical Speed Data for Eight-Week Period from 7/17 to 8/13 [No Speed Data Available for 2003-2004]**

Measure	2002-2003		2004-2005
Mean (mph)	71.575		72.595
Standard deviation (mph)	9.4146		8.0554
Median (mph)	71.966		73.363
15 <sup>th</sup> percentile (mph)	62.802		66.609
85 <sup>th</sup> percentile (mph)	80.472		79.172
90 <sup>th</sup> percentile (mph)	82.422		80.112
95 <sup>th</sup> percentile (mph)	84.371		82.937
Percent in 10 mph pace	44.221		57.138
Proportion at 65 mph or more	0.79578		0.91067
Proportion at 70 mph or more	0.59705		0.72209
Proportion at 75 mph or more	0.35023		0.39185
Proportion at 80 mph or more	0.16211		0.10198
Proportion at 85 mph or more	0.033878		0.013480
Vehicle Total	1,472,176		1,588,824

**ATR-208**

The available historical speed data for ATR-208 are presented in Tables 4.17 through 4.24.

**Table 4.17: ATR-208—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	71.8120783	72.5803	72.67636
Standard deviation (mph)	6.71241412	6.143445	5.552448
Median (mph)	71.9428504	72.76767	72.72781
15 <sup>th</sup> percentile (mph)	65.3972139	66.70285	67.08902
85 <sup>th</sup> percentile (mph)	78.5007204	78.48087	78.18797
90 <sup>th</sup> percentile (mph)	79.7637883	79.54416	79.27938
95 <sup>th</sup> percentile (mph)	82.6334117	82.07988	81.49568
Percent in 10 mph pace	56.686679	62.5982	65.5346
Proportion at 65 mph or more	0.86860946	0.911461	0.925461
Proportion at 70 mph or more	0.63435957	0.730997	0.744847
Proportion at 75 mph or more	0.28858006	0.313684	0.296049
Proportion at 80 mph or more	0.09064929	0.078565	0.066986
Proportion at 85 mph or more	0.0134694	0.009896	0.010202
Vehicle Total	1,137,913	1,364,634	1,244,416

**Table 4.18: ATR-208—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	72.009	72.605	72.777
Standard deviation (mph)	6.4348	5.8604	5.6361
Median (mph)	72.130	72.925	72.868
15 <sup>th</sup> percentile (mph)	65.706	68.508	67.109
85 <sup>th</sup> percentile (mph)	78.492	77.853	78.356
90 <sup>th</sup> percentile (mph)	79.702	79.004	79.368
95 <sup>th</sup> percentile (mph)	82.473	80.682	81.592
Percent in 10 mph pace	57.879	70.825	64.776
Proportion at 65 mph or more	0.88242	0.92392	0.92455
Proportion at 70 mph or more	0.65264	0.81855	0.74777
Proportion at 75 mph or more	0.29436	0.27395	0.31580
Proportion at 80 mph or more	0.087662	0.056722	0.068802
Proportion at 85 mph or more	0.011525	0.0074715	0.0097651
Vehicle Total	816,131	774,274	867,067

**Table 4.19: ATR-208—Two Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [No Speed Data Available for 2003-2004]**

Measure	2002-2003 (All Eight Weeks)	2004-2005 (Four Weeks Only 1/2 to 1/29)
Mean (mph)	71.27247	70.733
Standard deviation (mph)	6.781088	6.5235
Median (mph)	71.60967	71.469
15 <sup>th</sup> percentile (mph)	65.10137	65.066
85 <sup>th</sup> percentile (mph)	77.92265	76.753
90 <sup>th</sup> percentile (mph)	79.21243	78.216
95 <sup>th</sup> percentile (mph)	81.64721	79.678
Percent in 10 mph pace	57.9222	63.413
Proportion at 65 mph or more	0.854917	0.85306
Proportion at 70 mph or more	0.612381	0.62072
Proportion at 75 mph or more	0.2633	0.20992
Proportion at 80 mph or more	0.069469	0.039005
Proportion at 85 mph or more	0.010372	0.0047875
Vehicle Total	1,474,945	684,497

**Table 4.20: ATR-208—Three Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	70.552	70.805	71.841
Standard deviation (mph)	7.1277	7.352	6.4247
Median (mph)	71.119	71.800	72.334
15 <sup>th</sup> percentile (mph)	63.546	64.383	66.169
85 <sup>th</sup> percentile (mph)	77.520	77.482	77.757
90 <sup>th</sup> percentile (mph)	78.859	78.768	78.932
95 <sup>th</sup> percentile (mph)	80.773	80.234	80.482
Percent in 10 mph pace	56.348	59.175	63.539
Proportion at 65 mph or more	0.81348	0.83849	0.89463
Proportion at 70 mph or more	0.57377	0.64264	0.70374
Proportion at 75 mph or more	0.24415	0.24651	0.26726
Proportion at 80 mph or more	0.057375	0.052106	0.054585
Proportion at 85 mph or more	0.0096749	0.0070348	0.0070647
Vehicle Total	677,731	695,120	750,204

**Table 4.21: ATR-208—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

<b>Measure</b>	<b>2002-2003 (Four Weeks Only 2/27/02 to 3/26/02)</b>	<b>2003-2004 (Four Weeks Only 2/27/02 to 3/26/02)</b>	<b>2004-2005 (All Eight Weeks)</b>
Mean (mph)	71.481	72.462	72.131949
Standard deviation (mph)	6.4840	6.4087	6.6168477
Median (mph)	71.748	72.828	72.581636
15 <sup>th</sup> percentile (mph)	65.201	66.719	66.622398
85 <sup>th</sup> percentile (mph)	77.995	78.316	77.980555
90 <sup>th</sup> percentile (mph)	79.208	79.308	79.080095
95 <sup>th</sup> percentile (mph)	81.537	81.351	80.812645
Percent in 10 mph pace	57.672	63.166	64.3148
Proportion at 65 mph or more	0.85957	0.90859	0.9081487
Proportion at 70 mph or more	0.62178	0.73814	0.7289428
Proportion at 75 mph or more	0.27347	0.31704	0.2855365
Proportion at 80 mph or more	0.067358	0.065141	0.0581686
Proportion at 85 mph or more	0.010895	0.0091125	0.0079092
Vehicle Total	756,018	814,484	1,653,400

**Table 4.22: ATR-208—Three Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	72.604	72.700	72.490
Standard deviation (mph)	5.6704	5.8686	5.6419
Median (mph)	72.755	72.861	72.637
15 <sup>th</sup> percentile (mph)	66.828	66.789	66.853
85 <sup>th</sup> percentile (mph)	78.256	78.450	78.064
90 <sup>th</sup> percentile (mph)	79.300	79.463	79.166
95 <sup>th</sup> percentile (mph)	81.446	81.874	81.131
Percent in 10 mph pace	64.15	63.196	65.074
Proportion at 65 mph or more	0.91441	0.91103	0.91757
Proportion at 70 mph or more	0.73827	0.74050	0.73530
Proportion at 75 mph or more	0.30579	0.32017	0.28907
Proportion at 80 mph or more	0.066520	0.073534	0.062131
Proportion at 85 mph or more	0.0094010	0.010734	0.0085217
Vehicle Total	834,925	875,336	858,281

**Table 4.23: ATR-208—Two Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [Speed Data for 2004-2005 Unreliable]**

Measure	2002-2003	2003-2004	
Mean (mph)	71.24607	72.45278	
Standard deviation (mph)	7.953791	5.99313	
Median (mph)	72.53984	72.68982	
15 <sup>th</sup> percentile (mph)	64.72107	66.6997	
85 <sup>th</sup> percentile (mph)	78.30026	78.19688	
90 <sup>th</sup> percentile (mph)	79.34539	79.26357	
95 <sup>th</sup> percentile (mph)	81.58856	81.37428	
Percent in 10 mph pace	56.1673	63.8433	
Proportion at 65 mph or more	0.846996	0.910235	
Proportion at 70 mph or more	0.698335	0.733042	
Proportion at 75 mph or more	0.307888	0.29985	
Proportion at 80 mph or more	0.068683	0.065481	
Proportion at 85 mph or more	0.009878	0.009158	
Vehicle Total	1,866,139	1,906,622	

**Table 4.24: ATR-208—Two Prior Years of Historical Speed Data for Eight-Week Period from 7/17 to 8/13 [Speed Data for 2004-2005 Unreliable]**

Measure	2002-2003	2003-2004	
Mean (mph)	72.900	72.942	
Standard deviation (mph)	5.9449	5.6034	
Median (mph)	73.025	72.986	
15 <sup>th</sup> percentile (mph)	67.144	67.442	
85 <sup>th</sup> percentile (mph)	78.578	78.430	
90 <sup>th</sup> percentile (mph)	79.557	79.438	
95 <sup>th</sup> percentile (mph)	82.070	81.789	
Percent in 10 mph pace	64.06	65.953	
Proportion at 65 mph or more	0.92031	0.92953	
Proportion at 70 mph or more	0.75632	0.76671	
Proportion at 75 mph or more	0.33268	0.32010	
Proportion at 80 mph or more	0.077361	0.072124	
Proportion at 85 mph or more	0.011275	0.010282	
Vehicle Total	1,034,903	987,998	

**ATR-227**

The available historical speed data for ATR-227 are presented in Tables 4.25 through 4.32.

**Table 4.25: ATR-227—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

Measure	2002-2003 (Four Weeks Only 10/10/02 to 11/6/02)	2003-2004 (All Six Weeks)	2004-2005 (All Six Weeks)
Mean (mph)	67.487	69.73678	71.66066
Standard deviation (mph)	9.4726	8.848341	6.464617
Median (mph)	68.852	70.90413	72.36121
15 <sup>th</sup> percentile (mph)	57.450	63.32649	65.36898
85 <sup>th</sup> percentile (mph)	75.645	77.10943	77.91033
90 <sup>th</sup> percentile (mph)	77.827	78.40747	78.87429
95 <sup>th</sup> percentile (mph)	80.025	79.70551	79.83825
Percent in 10 mph pace	45.700	56.9775	58.7236
Proportion at 65 mph or more	0.69893	0.812384	0.863696
Proportion at 70 mph or more	0.44071	0.559323	0.678105
Proportion at 75 mph or more	0.16477	0.231254	0.300957
Proportion at 80 mph or more	0.050208	0.038656	0.04161
Proportion at 85 mph or more	0.0080683	0.007183	0.00719
Mean (mph)	272,425	426,578	403,340

**Table 4.26: ATR-227—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	66.765	71.808	71.926
Standard deviation (mph)	13.176	6.2760	6.4510
Median (mph)	69.509	72.376	72.567
15 <sup>th</sup> percentile (mph)	58.426	66.050	66.083
85 <sup>th</sup> percentile (mph)	76.485	77.767	77.883
90 <sup>th</sup> percentile (mph)	78.373	78.786	78.829
95 <sup>th</sup> percentile (mph)	80.749	79.805	79.776
Percent in 10 mph pace	42.137	62.298	61.903
Proportion at 65 mph or more	0.72511	0.89146	0.88908
Proportion at 70 mph or more	0.47549	0.69397	0.70862
Proportion at 75 mph or more	0.18932	0.28578	0.30229
Proportion at 80 mph or more	0.056910	0.040439	0.038144
Proportion at 85 mph or more	0.010801	0.0064916	0.0064624
Mean (mph)	257,564	253,865	263,370



**Table 4.27: ATR-227—Two Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29 [Speed Data for 2002-2003 Unreliable]**

<b>Measure</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (Four Weeks Only 1/2/05 to 1/29/05)</b>
Mean (mph)	71.49464	69.949
Standard deviation (mph)	6.618762	7.3312
Median (mph)	72.19077	70.886
15 <sup>th</sup> percentile (mph)	65.86762	64.404
85 <sup>th</sup> percentile (mph)	77.5866	76.206
90 <sup>th</sup> percentile (mph)	78.65471	77.692
95 <sup>th</sup> percentile (mph)	79.72281	79.178
Percent in 10 mph pace	62.2864	64.380
Proportion at 65 mph or more	0.886004	0.83711
Proportion at 70 mph or more	0.67852	0.56667
Proportion at 75 mph or more	0.271084	0.19059
Proportion at 80 mph or more	0.037024	0.022342
Proportion at 85 mph or more	0.005983	0.0032767
Mean (mph)	442,926	196,845

**Table 4.28: ATR-227—Two Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26 [Speed Data for 2002-2003 Unreliable]**

<b>Measure</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	70.340	71.230
Standard deviation (mph)	7.3174	6.4345
Median (mph)	71.386	71.909
15 <sup>th</sup> percentile (mph)	64.059	65.921
85 <sup>th</sup> percentile (mph)	77.003	77.045
90 <sup>th</sup> percentile (mph)	78.268	78.239
95 <sup>th</sup> percentile (mph)	79.533	79.434
Percent in 10 mph pace	60.029	65.175
Proportion at 65 mph or more	0.83149	0.89214
Proportion at 70 mph or more	0.60386	0.66330
Proportion at 75 mph or more	0.22916	0.23558
Proportion at 80 mph or more	0.031526	0.026302
Proportion at 85 mph or more	0.0055309	0.0040567
Mean (mph)	204,308	216,677

**Table 4.29: ATR-227—Two Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23 [Speed Data for 2002-2003 Unreliable]**

Measure	2003-2004	2004-2005
Mean (mph)	71.69621	71.29863
Standard deviation (mph)	6.461195	6.769576
Median (mph)	72.36373	72.03413
15 <sup>th</sup> percentile (mph)	65.69619	65.70197
85 <sup>th</sup> percentile (mph)	77.8005	77.35623
90 <sup>th</sup> percentile (mph)	78.78714	78.46593
95 <sup>th</sup> percentile (mph)	79.77378	79.57562
Percent in 10 mph pace	60.6064	62.6975
Proportion at 65 mph or more	0.876437	0.87985
Proportion at 70 mph or more	0.686568	0.667233
Proportion at 75 mph or more	0.29192	0.256165
Proportion at 80 mph or more	0.038536	0.030879
Proportion at 85 mph or more	0.006444	0.005069
Vehicle Total	499,040	475,798

**Table 4.30: ATR-227—Three Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	66.119	71.733	71.187
Standard deviation (mph)	8.3981	6.1970	6.4384
Median (mph)	67.252	72.354	71.872
15 <sup>th</sup> percentile (mph)	57.120	65.458	65.248
85 <sup>th</sup> percentile (mph)	73.784	77.896	77.332
90 <sup>th</sup> percentile (mph)	74.878	78.866	78.464
95 <sup>th</sup> percentile (mph)	77.964	79.835	79.596
Percent in 10 mph pace	50.323	59.193	60.946
Proportion at 65 mph or more	0.64510	0.86728	0.86055
Proportion at 70 mph or more	0.32297	0.67855	0.64776
Proportion at 75 mph or more	0.094423	0.29926	0.25300
Proportion at 80 mph or more	0.019493	0.041520	0.032148
Proportion at 85 mph or more	0.0039563	0.0071887	0.0053480
Vehicle Total	266,662	256,095	257,096

**Table 4.31: ATR-227—Three Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 6/18**

<b>Measure</b>	<b>2002-2003 (All Eight Weeks)</b>	<b>2003-2004 (All Eight Weeks)</b>	<b>2004-2005 (Four Weeks Only 6/18/05 to 7/16/05)</b>
Mean (mph)	66.79183691	72.07203	72.119
Standard deviation (mph)	8.190822179	5.997542	6.1103
Median (mph)	67.76366285	72.59549	72.576
15 <sup>th</sup> percentile (mph)	57.79169692	65.9678	66.426
85 <sup>th</sup> percentile (mph)	74.33269458	78.03363	77.892
90 <sup>th</sup> percentile (mph)	75.9547767	78.96099	78.867
95 <sup>th</sup> percentile (mph)	78.67827492	79.88836	79.842
Percent in 10 mph pace	49.1191052	0.607417	63.405
Proportion at 65 mph or more	0.671984095	0.885704	0.90413
Proportion at 70 mph or more	0.360831642	0.701245	0.71428
Proportion at 75 mph or more	0.117528499	0.313563	0.29829
Proportion at 80 mph or more	0.025734791	0.043981	0.041886
Proportion at 85 mph or more	0.004710997	0.007213	0.0068519
Vehicle Total	657,398	631,893	339,613

**Table 4.32: ATR-227—Three Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Mean (mph)	64.943	72.283	72.084
Standard deviation (mph)	13.119	6.0573	6.2918
Median (mph)	67.856	72.792	72.575
15 <sup>th</sup> percentile (mph)	56.174	66.134	66.269
85 <sup>th</sup> percentile (mph)	74.368	78.220	77.969
90 <sup>th</sup> percentile (mph)	75.956	79.108	78.940
95 <sup>th</sup> percentile (mph)	78.624	79.996	79.911
Percent in 10 mph pace	43.439	60.658	62.371
Proportion at 65 mph or more	0.67085	0.89010	0.89782
Proportion at 70 mph or more	0.37177	0.71330	0.70934
Proportion at 75 mph or more	0.11792	0.33137	0.30284
Proportion at 80 mph or more	0.024206	0.049753	0.045420
Proportion at 85 mph or more	0.0046297	0.0078707	0.0077773
Vehicle Total	380,153	355,495	363,495

#### 4.2. Historical Speed Data from Tube Located Within an Enhanced Enforcement Zones

There were two Tube locations *Within* Enhanced Enforcement Zones on Rural Freeways. They were: (1) Tube 06, located on I-94, near Fergus Falls in Otter Tail County, and Tube 07, located on I-35, near Cloquet in Carlton County. Tube 06 only collected speed data from the Eastbound lanes of I-94; while Tube collected speed data from all lanes on I-35. Seven days of Pre-MSMP speed data were collected from each Tube during August 2005. These speed data are presented in Tables 4.33 and 4.34.

**Table 4.33: Tube 06—Pre-MSMP Speed Data (Eastbound Only) for One-Week Period from 8/11/05 to 8/17/05**

Measure	2004-2005
Mean (mph)	68.18467
Standard deviation (mph)	5.640114
Median (mph)	68.61222
15 <sup>th</sup> percentile (mph)	62.20573
85 <sup>th</sup> percentile (mph)	73.74139
90 <sup>th</sup> percentile (mph)	74.47931
95 <sup>th</sup> percentile (mph)	76.27703
Percent in 10 mph pace	62.7645
Proportion at 65 mph or more	0.751147
Proportion at 70 mph or more	0.403512
Proportion at 75 mph or more	0.064719
Proportion at 80 mph or more	0.00709
Proportion at 85 mph or more	0.003202
Vehicle Total	62,764

**Table 4.34: Tube 07—Pre-MSMP Speed Data (All Lanes) for One-Week Period from 8/19/05 to 8/26/05**

Measure	2004-2005
Mean (mph)	72.2806461
Standard deviation (mph)	5.50184194
Median (mph)	72.4209476
15 <sup>th</sup> percentile (mph)	66.6242513
85 <sup>th</sup> percentile (mph)	77.8410966
90 <sup>th</sup> percentile (mph)	78.902847
95 <sup>th</sup> percentile (mph)	79.9645973
Percent in 10 mph pace	64.501474
Proportion at 65 mph or more	0.92075223
Proportion at 70 mph or more	0.70295271
Proportion at 75 mph or more	0.28379307
Proportion at 80 mph or more	0.04833281
Proportion at 85 mph or more	0.0108185
Vehicle Total	144,105

#### 4.3. Historical Speed Data from ATR Located Outside the Enhanced Enforcement Zones

There was one ATR located on a Rural Freeway *Outside* the Enhanced Enforcement Zones. It was ATR-200, on I-94, near Hasty, in Wright County. Unfortunately, only limited historical data were available for this ATR—these data were from the last three time periods in 2005. [In 2002-2003, there were no available data for five time periods and the data from the remaining three time periods were unreliable; in 2003-2004, the data from all eight time periods were unreliable; and in 2004-2005, there were no available data for one time period and the data from the four others were unreliable]

The speed data from the last three time periods in 2005 are presented in Tables 4.35 through 4.37.

**Table 4.35: ATR-200—One Year of Historical Speed Data for Four-Week Period from 24/4/05 to 5/21/05**

Measure		2004-2005
Mean (mph)		73.3104
Standard deviation (mph)		8.638339
Median (mph)		73.46584
15 <sup>th</sup> percentile (mph)		65.93416
85 <sup>th</sup> percentile (mph)		80.04184
90 <sup>th</sup> percentile (mph)		82.54562
95 <sup>th</sup> percentile (mph)		90.09961
Percent in 10 mph pace		52.6945
Proportion at 65 mph or more		0.883362
Proportion at 70 mph or more		0.704796
Proportion at 75 mph or more		0.409347
Proportion at 80 mph or more		0.150836
Proportion at 85 mph or more		0.050987
Vehicle Total		1,206,904

**Table 4.36: ATR-200—One Year of Historical Speed Data for Eight-Week Period from 5/22/05 to 7/16/05**

Measure		2004-2005
Mean (mph)		73.48489
Standard deviation (mph)		8.050421
Median (mph)		73.44316
15 <sup>th</sup> percentile (mph)		66.42025
85 <sup>th</sup> percentile (mph)		79.90216
90 <sup>th</sup> percentile (mph)		82.30838
95 <sup>th</sup> percentile (mph)		84.87587
Percent in 10 mph pace		54.8998
Proportion at 65 mph or more		0.903593
Proportion at 70 mph or more		0.71492
Proportion at 75 mph or more		0.402823
Proportion at 80 mph or more		0.144954
Proportion at 85 mph or more		0.047583
Vehicle Total		2,646,530

**Table 4.37: ATR-200—One Year of Historical Speed Data for Four-Week Period from 7/16/05 to 8/13/05**

Measure		2004-2005
Mean (mph)		72.96212
Standard deviation (mph)		7.520329
Median (mph)		73.57437
15 <sup>th</sup> percentile (mph)		66.36785
85 <sup>th</sup> percentile (mph)		79.14676
90 <sup>th</sup> percentile (mph)		79.95082
95 <sup>th</sup> percentile (mph)		83.16228
Percent in 10 mph pace		57.4103
Proportion at 65 mph or more		0.894813
Proportion at 70 mph or more		0.731006
Proportion at 75 mph or more		0.407864
Proportion at 80 mph or more		0.096942
Proportion at 85 mph or more		0.02272
Vehicle Total		1,297,731

## Section 5: Urban Freeway Speed Data

The historical speed data obtained from the four ATRs located on Urban Freeways are presented in this section of the report. There were no Tubes located on Urban Freeways.

Three of the four ATRs were located *Within* Enhanced Enforcement Zones—during the MSMP, the speed limit increased from 55 mph to 60 mph at these three ATR locations. The remaining ATR was located *Outside* the Enhanced Enforcement Zones—the speed limit remained unchanged at 55 mph at the location of this ATR during the MSMP.

### 5.1. Historical Speed Data from ATRs Located Within Enhanced Enforcement Zones

Three of the four ATRs located on Urban Freeways were located *Within* Enhanced Enforcement Zones. They were: (1) ATR 100, on Highway 100 near Brooklyn Center in Hennepin County, (2) ATR I94, on I-94 South of the 57<sup>th</sup> Street Bridge in Hennepin County, and (3) ATR-35WCD, on I-35W, near Roseville in Ramsey County.

The historical speed data for these three ATRs were limited. All three ATRs were installed in the summer of 2005. For ATR-100, two weeks of speed data were collected in September 2005, immediately before the beginning of the MSMP. For ATR-I94 and ATR-35WCD, four weeks of data were collected in August and September 2005, also immediately before the beginning of the MSMP. The speed data for these three ATRs are presented in Tables 5.1, 5.2, and 5.3.

**Table 5.1: ATR-100—Pre-MSP Historical Speed Data: Two Weeks from September 12 to 25**

Measure	Pre-Test Period
Mean (mph)	60.5705781
Standard deviation (mph)	10.27909416
Median (mph)	61.79236416
15 <sup>th</sup> percentile (mph)	55.29713709
85 <sup>th</sup> percentile (mph)	68.48691619
90 <sup>th</sup> percentile (mph)	69.7953862
95 <sup>th</sup> percentile (mph)	73.14991021
Percent in 10 (mph) pace	57.5251283
Proportion at 65 mph or more	0.283244024
Proportion at 70 mph or more	0.092181181
Proportion at 75 mph or more	0.025225017
Proportion at 80 mph or more	0.006480191
Proportion at 85 mph or more	0.001751304
Vehicle Total	1,089,474

**Table 5.2: ATR-I94—Pre-MSP Historical Speed Data: Four Weeks from August 29 to September 25**

Measure	Pre-Test Period
Mean (mph)	63.54484784
Standard deviation (mph)	8.793828179
Median (mph)	63.63568058
15 <sup>th</sup> percentile (mph)	56.92105641
85 <sup>th</sup> percentile (mph)	70.35334784
90 <sup>th</sup> percentile (mph)	72.90581413
95 <sup>th</sup> percentile (mph)	76.15878048
Percent in 10 (mph) pace	55.6580246
Proportion at 65 mph or more	0.412797053
Proportion at 70 mph or more	0.156921694
Proportion at 75 mph or more	0.058977208
Proportion at 80 mph or more	0.020241622
Proportion at 85 mph or more	0.008568478
Vehicle Total	3,409,707

**Table 5.3: ATR-35WCD—Pre-MSP Historical Speed Data: Four Weeks from August 29 to September 25**

Measure	Pre-Test Period
Mean (mph)	60.00777635
Standard deviation (mph)	12.65931618
Median (mph)	62.55400024
15 <sup>th</sup> percentile (mph)	53.76069938
85 <sup>th</sup> percentile (mph)	69.30574595
90 <sup>th</sup> percentile (mph)	70.9577538
95 <sup>th</sup> percentile (mph)	73.70137875
Percent in 10 (mph) pace	48.2874093
Proportion at 65 mph or more	0.351848424
Proportion at 70 mph or more	0.117454168
Proportion at 75 mph or more	0.026333842
Proportion at 80 mph or more	0.005193913
Proportion at 85 mph or more	0.001188849
Vehicle Total	3,030,663



5.2. Historical Speed Data from ATR Located Outside the Enhanced Enforcement Zones

There was a single ATR located on an Urban Freeways *Outside* the Enhanced Enforcement Zones. It was ATR 335, on I-35W at County Road 53 in Anoka. For this ATR, there were historical data from the same time periods that were used in the MSMP. In some cases, three years of historical speed data were available; in others, one or two years of historical data were available. The historical speed data for ATR-335 are presented in Tables 5.4 through 5.11.

**Table 5.4: ATR-335—Three Prior Years of Historical Speed Data for Six-Week Period from 9/26 to 11/6**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	73.87656	69.81129	70.64652
Standard deviation (mph)	6.880343	7.318132	8.154031
Median (mph)	73.93007	70.09963	71.17619
15 <sup>th</sup> percentile (mph)	67.45805	62.98241	64.23983
85 <sup>th</sup> percentile (mph)	79.81834	76.73458	77.66896
90 <sup>th</sup> percentile (mph)	81.71504	78.30872	79.19338
95 <sup>th</sup> percentile (mph)	83.88752	79.88287	82.04418
Percent in 10 mph pace	59.5129	57.749	58.3516
Proportion at 65 mph or more	0.937144	0.788158	0.832392
Proportion at 70 mph or more	0.759882	0.505996	0.580732
Proportion at 75 mph or more	0.429249	0.205096	0.23754
Proportion at 80 mph or more	0.139472	0.04628	0.073544
Proportion at 85 mph or more	0.024396	0.010089	0.015957
Vehicle Total	1,582,511	1,925,901	1,940,361

**Table 5.5: ATR-335—Three Prior Years of Historical Speed Data for Four-Week Period from 11/7 to 12/4**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	74.13842	69.45118	70.67486
Standard deviation (mph)	6.490825	8.037613	7.73537
Median (mph)	74.13723	69.98128	71.07201
15 <sup>th</sup> percentile (mph)	68.0747	62.43936	63.77391
85 <sup>th</sup> percentile (mph)	79.75187	76.77974	77.76509
90 <sup>th</sup> percentile (mph)	81.54689	78.441	79.25671
95 <sup>th</sup> percentile (mph)	83.76643	80.35199	82.14168
Percent in 10 mph pace	62.7613	56.0891	56.5569
Proportion at 65 mph or more	0.950947	0.782387	0.819246
Proportion at 70 mph or more	0.78679	0.498939	0.570224
Proportion at 75 mph or more	0.440193	0.203566	0.242688
Proportion at 80 mph or more	0.134847	0.053078	0.075084
Proportion at 85 mph or more	0.022211	0.009356	0.016522
Vehicle Total	999,999	1,143,282	1,175,639

**Table 5.6: ATR-335—Three Prior Years of Historical Speed Data for Eight-Week Period from 12/5 to 1/29**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	73.57165	68.93586	69.70895
Standard deviation (mph)	6.665367	9.266489	8.859521
Median (mph)	73.66256	69.89191	70.50998
15 <sup>th</sup> percentile (mph)	67.36859	61.31296	62.227
85 <sup>th</sup> percentile (mph)	79.44065	77.1273	77.52456
90 <sup>th</sup> percentile (mph)	80.90804	78.70838	79.09448
95 <sup>th</sup> percentile (mph)	83.4655	80.93603	81.90345
Percent in 10 mph pace	60.7561	50.2002	53.4088
Proportion at 65 mph or more	0.933359	0.749178	0.77399
Proportion at 70 mph or more	0.757391	0.494494	0.530621
Proportion at 75 mph or more	0.40601	0.217274	0.230404
Proportion at 80 mph or more	0.117753	0.059154	0.07116
Proportion at 85 mph or more	0.020000	0.010257	0.015576
Vehicle Total	2,089,039	2,161,836	2,179,324

**Table 5.7: ATR-335—Three Prior Years of Historical Speed Data for Four-Week Period from 1/30 to 2/26**

Measure	2002-2003	2003-2004	2004-2005
Mean (mph)	72.77792	68.02224	71.05396
Standard deviation (mph)	8.274691	9.565674	7.945000
Median (mph)	73.40447	69.23108	71.48346
15 <sup>th</sup> percentile (mph)	66.58345	59.77593	63.9078
85 <sup>th</sup> percentile (mph)	79.32067	76.68801	78.33647
90 <sup>th</sup> percentile (mph)	80.64951	78.33515	79.73863
95 <sup>th</sup> percentile (mph)	83.37069	79.98228	82.88503
Percent in 10 mph pace	57.1677	44.961	54.5458
Proportion at 65 mph or more	0.905513	0.695203	0.824764
Proportion at 70 mph or more	0.730222	0.464525	0.597458
Proportion at 75 mph or more	0.392105	0.201241	0.268976
Proportion at 80 mph or more	0.111934	0.049462	0.09068
Proportion at 85 mph or more	0.020062	0.009223	0.020178
Vehicle Total	1,036,473	1,081,635	1,133,251

**Table 5.8: ATR-335—Three Prior Years of Historical Speed Data for Eight-Week Period from 2/27 to 4/23**

Measure	2002-2003 (All Eight Weeks)	2003-2004 (Two Weeks Only 2/27/04 to???)	2004-2005 (All Eight Weeks)
Mean (mph)	74.20185	69.51292795	71.3637
Standard deviation (mph)	7.061336	8.336244446	7.49006
Median (mph)	74.34384	70.56082393	71.64489
15 <sup>th</sup> percentile (mph)	67.79224	62.10735805	64.96469
85 <sup>th</sup> percentile (mph)	79.98286	77.04899934	78.23534
90 <sup>th</sup> percentile (mph)	82.05975	78.41809206	79.60637
95 <sup>th</sup> percentile (mph)	84.16402	79.78718479	82.67246
Percent in 10 mph pace	60.8184	52.1413914	56.6753
Proportion at 65 mph or more	0.936417	0.761541491	0.849237
Proportion at 70 mph or more	0.781672	0.53476357	0.613747
Proportion at 75 mph or more	0.457452	0.224830554	0.267989
Proportion at 80 mph or more	0.148942	0.042227874	0.085645
Proportion at 85 mph or more	0.030136	0.009348445	0.018956
Vehicle Total	2,135,087	553,568	2,384,645

**Table 5.9: ATR-335—Two Prior Years of Historical Speed Data for Four-Week Period from 4/24 to 5/21 [Speed Data Unavailable for 2003-2004]**

Measure	2002-2003		2004-2005
Mean (mph)	74.48518		71.24093
Standard deviation (mph)	7.225434		7.564555
Median (mph)	74.50987		71.53518
15 <sup>th</sup> percentile (mph)	67.68538		64.77101
85 <sup>th</sup> percentile (mph)	80.74401		78.15533
90 <sup>th</sup> percentile (mph)	82.67967		79.54703
95 <sup>th</sup> percentile (mph)	84.61533		82.58977
Percent in 10 mph pace	59.0845		56.6534
Proportion at 65 mph or more	0.93795		0.844887
Proportion at 70 mph or more	0.774193		0.604849
Proportion at 75 mph or more	0.470201		0.263363
Proportion at 80 mph or more	0.169219		0.083726
Proportion at 85 mph or more	0.040064		0.018612
Vehicle Total	1,216,267		1,262,150

**Table 5.10: ATR-335—Two Prior Years of Historical Speed Data for Eight-Week Period from 5/22 to 7/16 [Speed Data Unreliable for 2004-2005]**

<b>Measure</b>	<b>2002-2003 (All Eight Weeks)</b>	<b>2003-2004 (Four Weeks Only 6/18/04 to 7/15/04)</b>	
Mean (mph)	71.86285	70.74779	
Standard deviation (mph)	7.869484	7.972139	
Median (mph)	71.87548	71.26448	
15 <sup>th</sup> percentile (mph)	64.46737	65.00586	
85 <sup>th</sup> percentile (mph)	78.97982	77.33915	
90 <sup>th</sup> percentile (mph)	80.96459	79.04475	
95 <sup>th</sup> percentile (mph)	84.15356	81.9518	
Percent in 10 mph pace	53.7819	61.5505	
Proportion at 65 mph or more	0.838437	0.850299	
Proportion at 70 mph or more	0.628419	0.595263	
Proportion at 75 mph or more	0.286055	0.218573	
Proportion at 80 mph or more	0.115124	0.071997	
Proportion at 85 mph or more	0.036729	0.015647	
Vehicle Total	2,571,918	1,515,990	

**Table 5.11: ATR-335—Two Prior Years of Historical Speed Data for Four-Week Period from 7/17 to 8/13 [Speed Data Unreliable for 2004-2005]**

<b>Measure</b>	<b>2002-2003</b>	<b>2003-2004</b>	
Mean (mph)	71.208	71.40808	
Standard deviation (mph)	7.516993	7.693574	
Median (mph)	71.32988	71.73898	
15 <sup>th</sup> percentile (mph)	64.38727	65.43436	
85 <sup>th</sup> percentile (mph)	77.89204	78.08574	
90 <sup>th</sup> percentile (mph)	79.38801	79.51266	
95 <sup>th</sup> percentile (mph)	82.82779	82.49922	
Percent in 10 mph pace	56.9973	59.4077	
Proportion at 65 mph or more	0.835021	0.871027	
Proportion at 70 mph or more	0.591799	0.628983	
Proportion at 75 mph or more	0.246661	0.258126	
Proportion at 80 mph or more	0.079545	0.082923	
Proportion at 85 mph or more	0.027304	0.017056	
Vehicle Total	1,335,728	1,470,983	

## 6. Historical Crash Data

Historical crash data were available for *all* Minnesota trunk highways—including 2-Lane/2-Way Highways, 4-Lane Highways, Rural Freeways, and Urban Highways. Some of these highways had changes in speed limits during the MSMP, some had enhanced enforcement during the MSMP, and speed data were available from some of them. In all, there were twelve combinations of Road Type, Speed Limits, and Enforcement Status. Table 6.1 lists the twelve combinations—along with the availability of speed data and the total length of roadway for each combination.

**Table 6.1: Combinations of Trunk Highway Type, Speed Limits During the MSMP, and Enforcement Status (with Availability of Speed Data and Total Length of Roadway)**

Type of Roadway	Speed Limits	Enforcement Status ( <i>Within/Outside</i> Enhanced Enforcement Zone)	Availability of Speed Data <i>Available/ Unavailable</i>	Total Length of Roadways (in Miles)
2-Lane/2-Way Highway	Increased—from 55 mph to 60 mph	<i>Within</i>	<i>Available</i> (ATR)	316.790
2-Lane/2-Way Highway	Unchanged at 55 mph	<i>Outside</i>	<i>Available</i> (ATR & Tube)	7,593.783
2-Lane/2-Way Highway	Increased—from 55 mph to 60 mph	<i>Outside</i>	<i>Available</i> (Tube)	474.511
4-Lane Divided Highway	Unchanged at 65 mph	<i>Within</i>	<i>Available</i> (ATR & Tube)	52.219
4-Lane Divided Highway	Unchanged at 65 mph	<i>Outside</i>	<i>Available</i> (ATR)	550.525
Rural Freeway	Unchanged at 70 mph	<i>Within</i>	<i>Available</i> (ATR & Tube)	265.246
Rural Freeway	Unchanged at 70 mph	<i>Outside</i>	<i>Available</i> (ATR)	459.835
Urban Freeway	Increased—from 55 mph to 60 mph	<i>Within</i>	<i>Available</i> (ATR)	27.337
Urban Freeway	Unchanged at 55 mph	<i>Outside</i>	<i>Available</i> (ATR)	89.397
Urban Freeway	Unchanged at 60 mph	<i>Within</i>	<i>Unavailable</i>	4.052
Urban Freeway	Unchanged at 60 mph	<i>Outside</i>	<i>Unavailable</i>	73.377
Urban Freeway	Unchanged at 55 mph	<i>Within</i>	<i>Unavailable</i>	11.234

Table 6.1 shows that crash data were available from all the combinations for which speed data were available, as well as from three combinations for which we did not have speed data. The table also shows that there were great differences in the total length of roadway for each combination—the range was from 7,593 miles (of 2-Lane/2-Way Highway, with unchanged speed limits, that were *outside* the enhanced enforcement zones) to 4 miles (of Urban Freeway, with unchanged speed limits, that were *within* the enhanced enforcement zones).

While an enormous amount of speed data was available for analysis purposes, in contrast there were orders of magnitude less crash data. Since crash data becomes more stable as the sample size increases, we combined the crash data in several ways. First, instead of examining the crash data obtained in any *individual* road segment, we combined the data for each of the twelve combinations listed in Table 6.1. Second, we combined the crash data for the five years prior to the MSMP.

The historical crash data are presented below in Tables 6.2 through 6.13. Each table has three columns. In the first column we present the crash data obtained in the five years prior to the MSMP during the First MSMP Test Period—i.e., in the ten weeks between 9/26 and 12/4. In the second column, we present the crash data obtained in the five years prior to the MSMP during the First and Second MSMP Test Periods—i.e., in the 22 weeks between 9/26 and 2/26. Then, in the third column, we present the crash data obtained throughout the five years prior to the MSMP.

Please note that in the tables, the Crash Rate, the Severity Rate and the Fatal Crash Rate are defined as follows.

- Crash Rate is the number of crashes per million vehicle miles traveled—i.e., (the total number of crashes *multiplied by* 1,000,000) *divided by* (the average daily traffic *multiplied by* the number of days in the time period *multiplied by* the length of roadway).
- Severity Rate is [(the number of fatal crashes *multiplied by* 5) *plus* (the number of A injury crashes *multiplied by* 4) *plus* (the number of B injury crashes *multiplied by* 3) *plus* (the number of C injury crashes *multiplied by* 2) *plus* (the number of property damage crashes *multiplied by* 1)] *divided by* (the average daily traffic *multiplied by* the number of days in the time period *multiplied by* the length of roadway).
- Fatal Crash Rate is the number of fatal crashes per 100,000,000 vehicle miles traveled—i.e., (the number of fatal crashes *multiplied by* 1,000,000,000) *divided by* (the average daily traffic *multiplied by* the number of days in the time period *multiplied by* the length of roadway).

**Table 6.2: Five-Year Historical Crash Data for 2-Lane/2-Way Highways for which the Speed Limit Was Increased, from 55 mph to 60 mph, and that Were *Within* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length of Roadway (miles)</b>	316.790	316.790	316.790
<b>Average Daily Traffic</b>	3,861.809	3,876.057	3,890.059
<b>Number of Fatal Crashes</b>	7	15	33
<b>Number of A Injury Crashes</b>	10	30	59
<b>Number of B Injury Crashes</b>	34	79	170
<b>Number of C Injury Crashes and Unknowns</b>	40	97	224
<b>Number of Property Damage Crashes</b>	279	545	937
<b>Total Crashes</b>	370	766	1,423
<b>Crash Rate</b>	<b>0.8641</b>	<b>0.8102</b>	<b>0.6320</b>
<b>Severity Rate</b>	<b>1.2518</b>	<b>1.2385</b>	<b>1.01978</b>
<b>Fatal Crash Rate</b>	<b>1.6348</b>	<b>1.5865</b>	<b>1.4657</b>

**Table 6.3: Five-Year Historical Crash Data for 2-Lane/2-Way Highways for which the Speed Limit Was Unchanged, at 55 mph, and that Were *Outside* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	7,593.783	7,593.783	7,593.783
<b>Average Daily Traffic</b>	2,454.703	2,468.993	2,483.091
<b>Number of Fatal Crashes</b>	117	257	537
<b>Number of A Injury Crashes</b>	172	370	887
<b>Number of B Injury Crashes</b>	871	1801	4,124
<b>Number of C Injury Crashes and Unknowns</b>	1,161	2,532	5,418
<b>Number of Property Damage Crashes</b>	5,025	10,548	19,564
<b>Total Number of Crashes</b>	7,346	15,508	30,530
<b>Crash Rate</b>	<b>1.1260</b>	<b>1.0742</b>	<b>0.8862</b>
<b>Severity Rate</b>	<b>1.7218</b>	<b>1.6472</b>	<b>1.4225</b>
<b>Fatal Crash Rate</b>	<b>1.7933</b>	<b>1.7802</b>	<b>1.5588</b>

**Table 6.4: Five-Year Historical Crash Data for 2-Lane/2-Way Highways for which the Speed Limit Was Increased, from 55 mph to 60 mph, and that Were *Outside* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	474.511	474.511	474.511
<b>Average Daily Traffic</b>	2,700.2422	2,709.713	2,719.078
<b>Number of Fatal Crashes</b>	7	11	29
<b>Number of A Injury Crashes</b>	7	21	46
<b>Number of B Injury Crashes</b>	27	78	186
<b>Number of C Injury Crashes and Unknowns</b>	45	109	209
<b>Number of Property Damage Crashes</b>	201	401	441
<b>Total Crashes</b>	287	620	1,200
<b>Crash Rate</b>	<b>0.6400</b>	<b>0.6262</b>	<b>0.5090</b>
<b>Severity Rate</b>	<b>0.9700</b>	<b>1.0020</b>	<b>0.8632</b>
<b>Fatal Crash Rate</b>	<b>1.5096</b>	<b>1.1110</b>	<b>1.2301</b>

**Table 6.5: Five-Year Historical Crash Data for 4-Lane Divided Highways for which the Speed Limit Was Unchanged, at 65 mph, and that Were *Within* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	52.219	52.219	52.219
<b>Average Daily Traffic</b>	15,802.3379	15,951.606	16,098.850
<b>Number of Fatal Crashes</b>	3	4	18
<b>Number of A Injury Crashes</b>	3	12	27
<b>Number of B Injury Crashes</b>	25	51	108
<b>Number of C Injury Crashes and Unknowns</b>	53	130	239
<b>Number of Property Damage Crashes</b>	193	421	710
<b>Total Crashes</b>	277	618	1,102
<b>Crash Rate</b>	<b>0.9591</b>	<b>0.9635</b>	<b>0.7175</b>
<b>Severity Rate</b>	<b>1.3884</b>	<b>1.4063</b>	<b>1.1134</b>
<b>Fatal Crash Rate</b>	<b>1.0387</b>	<b>0.6236</b>	<b>1.1720</b>



**Table 6.6: Five-Year Historical Crash Data for 4-Lane Divided Highways for which the Speed Limit Was Unchanged, at 65 mph, and that Were *Outside* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	550.525	550.525	550.525
<b>Average Daily Traffic</b>	11,655.9877	11,745.3069	11,823.397
<b>Number of Fatal Crashes</b>	14	38	102
<b>Number of A Injury Crashes</b>	42	86	179
<b>Number of B Injury Crashes</b>	205	512	1,051
<b>Number of C Injury Crashes and Unknowns</b>	327	822	1,601
<b>Number of Property Damage Crashes</b>	1,456	3,326	5,748
<b>Total Crashes</b>	2,044	4,694	8,681
<b>Crash Rate</b>	<b>0.9093</b>	<b>0.9428</b>	<b>0.7300</b>
<b>Severity Rate</b>	<b>1.3182</b>	<b>1.3959</b>	<b>1.1208</b>
<b>Fatal Crash Rate</b>	<b>0.6228</b>	<b>0.7632</b>	<b>0.8577</b>

**Table 6.7: Five-Year Historical Crash Data for Rural Freeways for which the Speed Limit Was Unchanged, at 70 mph, and that Were *Within* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	265.246	265.246	265.246
<b>Average Daily Traffic</b>	19,867.3712	20,068.640	20,267.145
<b>Number of Fatal Crashes</b>	14	37	66
<b>Number of A Injury Crashes</b>	23	60	102
<b>Number of B Injury Crashes</b>	85	287	561
<b>Number of C Injury Crashes and Unknowns</b>	179	522	906
<b>Number of Property Damage Crashes</b>	929	2,553	4,436
<b>Total Crashes</b>	1,230	3,459	6,071
<b>Crash Rate</b>	<b>0.6669</b>	<b>0.8439</b>	<b>0.6181</b>
<b>Severity Rate</b>	<b>0.9239</b>	<b>1.1913</b>	<b>0.8827</b>
<b>Fatal Crash Rate</b>	<b>0.7591</b>	<b>0.9027</b>	<b>0.6720</b>

**Table 6.8: Five-Year Historical Crash Data for Rural Freeways for which the Speed Limit Was Unchanged, at 70 mph, and that Were *Outside* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	459.835	459.835	459.835
<b>Average Daily Traffic</b>	21,511.1002	21,699.037	21,824.690
<b>Number of Fatal Crashes</b>	18	45	93
<b>Number of A Injury Crashes</b>	25	48	113
<b>Number of B Injury Crashes</b>	183	513	1,015
<b>Number of C Injury Crashes and Unknowns</b>	329	895	1,743
<b>Number of Property Damage Crashes</b>	1,667	4,200	7,682
<b>Total Crashes</b>	2,222	5,701	10,646
<b>Crash Rate</b>	<b>0.6418</b>	<b>0.7431</b>	<b>0.5806</b>
<b>Severity Rate</b>	<b>0.8850</b>	<b>1.0357</b>	<b>0.8252</b>
<b>Fatal Crash Rate</b>	<b>0.5199</b>	<b>0.5865</b>	<b>0.5072</b>

**Table 6.9: Five-Year Historical Crash Data for Urban Freeways for which the Speed Limit Was Increased, from 55 mph to 60 mph, and that Were *Within* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	27.337	27.337	27.337
<b>Average Daily Traffic</b>	100,670.8394	100,988.341	101,300.921
<b>Number of Fatal Crashes</b>	4	6	22
<b>Number of A Injury Crashes</b>	12	28	50
<b>Number of B Injury Crashes</b>	71	151	332
<b>Number of C Injury Crashes and Unknowns</b>	180	435	938
<b>Number of Property Damage Crashes</b>	771	1,883	3,698
<b>Total Crashes</b>	1,038	2,503	5,040
<b>Crash Rate</b>	<b>1.0776</b>	<b>1.1775</b>	<b>0.9962</b>
<b>Severity Rate</b>	<b>1.4659</b>	<b>1.5750</b>	<b>1.3598</b>
<b>Fatal Crash Rate</b>	<b>0.4153</b>	<b>0.2823</b>	<b>0.4348</b>

**Table 6.10: Five-Year Historical Crash Data for Urban freeways for which the Speed Limit Was Unchanged, at 55 mph, and that Were *Outside* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	89.397	89.397	89.397
<b>Average Daily Traffic</b>	89,555.6964	89,755.688	89,952.253
<b>Number of Fatal Crashes</b>	10	15	50
<b>Number of A Injury Crashes</b>	23	47	107
<b>Number of B Injury Crashes</b>	230	492	1,070
<b>Number of C Injury Crashes and Unknowns</b>	749	1,803	3,995
<b>Number of Property Damage Crashes</b>	3,690	8,844	17,745
<b>Total Crashes</b>	4,702	11,201	22,967
<b>Crash Rate</b>	<b>1.6780</b>	<b>1.18129</b>	<b>1.5632</b>
<b>Severity Rate</b>	<b>2.1484</b>	<b>2.2966</b>	<b>2.0163</b>
<b>Fatal Crash Rate</b>	<b>0.3569</b>	<b>0.2428</b>	<b>0.3403</b>

**Table 6.11: Five-Year Historical Crash Data for Urban Freeways for which the Speed Limit Was Unchanged, at 60 mph, and that Were *Within* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	4.052	4.052	4.052
<b>Average Daily Traffic</b>	96,190.5994	96,395.489	96,597.226
<b>Number of Fatal Crashes</b>	1	4	4
<b>Number of A Injury Crashes</b>	3	3	4
<b>Number of B Injury Crashes</b>	8	18	56
<b>Number of C Injury Crashes and Unknowns</b>	17	46	129
<b>Number of Property Damage Crashes</b>	109	262	588
<b>Total Crashes</b>	138	333	781
<b>Crash Rate</b>	<b>1.0116</b>	<b>1.1072</b>	<b>1.0921</b>
<b>Severity Rate</b>	<b>1.3488</b>	<b>1.4630</b>	<b>1.4683</b>
<b>Fatal Crash Rate</b>	<b>0.7330</b>	<b>1.3300</b>	<b>0.5594</b>

**Table 6.12: Five-Year Historical Crash Data for Urban Freeways for which the Speed Limit Was Unchanged, at 60 mph, and that Were *Outside* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	73.377	73.377	73.377
<b>Average Daily Traffic</b>	93,679.0849	93,431.901	93,187.430
<b>Number of Fatal Crashes</b>	7	12	30
<b>Number of A Injury Crashes</b>	8	22	56
<b>Number of B Injury Crashes</b>	140	299	720
<b>Number of C Injury Crashes and Unknowns</b>	390	961	2,169
<b>Number of Property Damage Crashes</b>	1,845	4,515	9,413
<b>Total Crashes</b>	2,390	5,809	12,388
<b>Crash Rate</b>	<b>0.9934</b>	<b>1.1004</b>	<b>0.9916</b>
<b>Severity Rate</b>	<b>1.2935</b>	<b>1.4173</b>	<b>1.3036</b>
<b>Fatal Crash Rate</b>	<b>0.2910</b>	<b>0.2273</b>	<b>0.2401</b>

**Table 6.13: Five-Year Historical Crash Data for Urban Freeways for which the Speed Limit Was Unchanged, at 55 mph, and that Were *Within* the Enhanced Enforcement Zones during the MSMP**

	<b>Period #1</b>	<b>Periods #1 &amp; 2</b>	<b>Complete Year</b>
<b>Length (miles)</b>	11.234	11.234	11.234
<b>Average Daily Traffic</b>	125,574.6946	126,003.032	126,424.976
<b>Number of Fatal Crashes</b>	3	5	14
<b>Number of A Injury Crashes</b>	0	3	16
<b>Number of B Injury Crashes</b>	28	83	205
<b>Number of C Injury Crashes and Unknowns</b>	152	382	828
<b>Number of Property Damage Crashes</b>	618	1,530	3,022
<b>Total Crashes</b>	801	2,003	4,085
<b>Crash Rate</b>	<b>1.6223</b>	<b>1.8377</b>	<b>1.5743</b>
<b>Severity Rate</b>	<b>2.0679</b>	<b>2.3671</b>	<b>2.0915</b>
<b>Fatal Crash Rate</b>	<b>0.6076</b>	<b>0.4587</b>	<b>0.5395</b>

**Appendix 2**  
**Minnesota Speed Management Project: Deliverable #4—**  
**Data Analysis for the First Test Period**

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## Section 1. Introduction

### 1.1 Background

This report contains the results of the analysis of data obtained during the first testing period of the Minnesota Speed Management Program (MSMP). The Minnesota Speed Management Program (MSMP) is a cooperative project between the Minnesota Department of Transportation (Mn/DOT) and the Minnesota Department of Safety (DPS). The program, which began on 9/26/05 and ends on 8/13/06, involves:

- Raising the speed limit on select roadways in Minnesota from 55 mph to 60 mph in order to align the speed limit more closely with the design speed of the roadways.
- Increasing the presence of enforcement officers along selected areas of these roadways and other high-design roadways for selected periods of time.

The MSMP involves the following four types of roadway—(1) 2-Lane/2-Way Highways, (2) 4-Lane Divided Highways, (3) Rural Freeways, and (4) Urban Freeways.

This report presents the University of Minnesota’s assessment of effectiveness of the MSMP during its first test period, between 9/26/05 and 12/04/05. The test period had two phases. In the first phase, lasting six weeks between 9/26/05 and 11/06/05, there was *Enhanced* Enforcement on some roadways; while in the second phase, lasting four weeks between 11/07/05 and 12/04/05 there was *Regular* Enforcement on those same roads. Table 1.1 shows Enforcement status throughout the MSMP.

**Table 1.1: Enforcement Status During the MSMP**

<b>Enforcement status</b>	<b>Time Period</b>
<i>Enhanced</i> Enforcement Period #1	9/26/05 to 11/6/05
<i>Regular</i> Enforcement Period #1	11/7/05 to 12/4/05
<i>Enhanced</i> Enforcement Period #2.	12/5/05 to 1/29/06
<i>Regular</i> Enforcement Period #2	1/30/06 to 2/26/06
<i>Enhanced</i> Enforcement Period #3.	2/27/06 to 4/23/06
<i>Regular</i> Enforcement Period #3	4/24/06 to 5/21/06
<i>Enhanced</i> Enforcement Period #4	5/22/06 to 7/16/06
<i>Regular</i> Enforcement Period #4	7/17/06 to 8/13/06

In the two phases of the first test period, we analyzed speed data collected by Mn/DOT to determine the effect of the MSMP on traffic speeds. The speed data provided by Mn/DOT for the First *Enhanced* Enforcement Period and the First *Regular* Enforcement Period were collected from a number of Automated Traffic Recorders (ATRs). Details of the ATRs are given in Table 1.2.

**Table 1.2: ATRs Organized by Road Type**

<b>Type of roadway</b>	<b>ATR</b>	<b>Location</b>	<b>Speed limit</b>	<b>Within/ Outside Enforcement Zone</b>
2-Lane/2-Way Highway	210	US-71, 1 m. North of Blackduck, Beltrami Co.	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	219	US-2, South East of Warba, Itasca Co.	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	220	US-71, South of CR 89, Hubbard Co.	Increased—from 55 mph to 60 mph	<i>Within</i>
2-Lane/2-Way Highway	179	USTH 59, South of Garvin, Lyon Co.	Unchanged at 55 mph	<i>Outside</i>
2-Lane/2-Way Highway	198	USTH 212, East of TH 23, Chippewa Co.	Unchanged at 55 mph	<i>Outside</i>
2-Lane/2-Way Highway	199	USTH 75, 0.55 m. N of Co Rd. 69, Pipestone Co.	Unchanged at 55 mph	<i>Outside</i>
2-Lane/2-Way Highway	222	MNTH 65, near Pliny, Aitkin Co.	Unchanged at 55 mph	<i>Outside</i>
4-Lane Divided Highway	197	SR-60, 0.7 miles West of junction with SR-4, (St. James) Watonwan Co.	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	172	US-10, West of Dilworth, Clay Co.	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	187	US-10, 0.8 miles West of Rice, Benton Co.	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	188	US-52, North of Rochester, Olmstead Co.	Unchanged at 65 mph	<i>Within</i>
4-Lane Divided Highway	353	TH 169, South of CR 59, North of Jordan, Scott Co.	Unchanged at 65 mph	<i>Outside</i>
Rural freeway	175	I-94, 0.5 miles South East of Saulk Centre, Stearns Co.	Unchanged at 70 mph	<i>Within</i>
Rural freeway	191	I-35, North of Wyoming, Chisago Co.	Unchanged at 70 mph	<i>Within</i>
Rural freeway	208	I-35, North of Owatanna, Steele Co.	Unchanged at 70 mph	<i>Within</i>
Rural freeway	227	I-90, East of Alden, Freeborn Co.	Unchanged at 70 mph	<i>Within</i>
Rural freeway	200	I-94, Hasty, Wright Co.	Unchanged at 70 mph	<i>Outside</i>
Urban freeway	100	Highway 100, near Brooklyn Center, Hennepin Co.	Increased—from 55 mph to 60 mph	<i>Within</i>
Urban freeway	I94	I-94, South of 57 <sup>th</sup> Street Bridge, Hennepin Co.	Increased—from 55 mph to 60 mph	<i>Within</i>
Urban freeway	35WC D	I-35W, near Roseville, Ramsey Co.	Increased—from 55 mph to 60 mph	<i>Within</i>
Urban freeway	335	I-35W at County Road 53, Anoka Co.	Unchanged at 55 mph	<i>Outside</i>



In Table 1.2, the ATRs are organized in terms of the type of roadway on which they are located—i.e., whether they are on 2-Lane/2-Way Highways, 4-Lane Divided Highways, Rural Freeways, or Urban Freeways. The table lists their locations, the speed limit (and whether or not it changed for the MSMP), and whether the ATRs were located *Within* or *Outside* an Enhanced Enforcement Zone. [Note the ATR data will be augmented by tube data in the fourth and final test period.]

From the speed data obtained with the ATRs, we derived several speed measures for the First *Enhanced* Enforcement Period and the First *Regular* Enforcement Period. The same measures were also derived from historical speed data that were obtained during the same calendar time periods. Where possible, we used historical speed data from the three years prior to the MSMP. In order to compare the MSMP speed data with the historical data, we conducted a series of statistical tests in which the following measures were compared—(1) the mean speed, (2) the percentage of vehicles in the 10 mph pace, (3) the proportion of vehicles traveling at 65 mph or more, (4) the proportion of vehicles traveling at 70 mph or more, (5) the proportion of vehicles traveling at 75 mph or more, (6) the proportion of vehicles traveling at 80 mph or more, and (7) the proportion of vehicles traveling at 85 mph or more. [Please note that in addition, we derived the following measures—(8) median speed, (9) 15<sup>th</sup> percentile, (10) 85<sup>th</sup> percentile, (11) 90<sup>th</sup> percentile (12) 95<sup>th</sup> percentile, and (13) the total number of vehicles—though we did not conduct statistical comparisons for the median speed or the percentile measures. We did not conduct statistical analyses for these measures because the comparisons are not valid. The speed data from which they are derived are collected in one 40-mph bin (from 0.01 mph to 40.00 mph), nine 5-mph bins (40.01 mph to 45.00 mph, 45.01 mph to 50.00 mph; 50.01 mph to 55.00 mph; 55.01 mph to 60.00 mph; 60.01 mph to 65.00 mph; 65.01 mph to 70.00 mph; 70.01 mph to 75.00 mph; 75.01 mph to 80.00 mph; and 80.01 mph to 85.00 mph), and one 15-mph bin (from 85.01 mph to 100.00 mph) and no differentiation within the bins is possible, which makes a statistical analysis invalid.]

To test for differences in the mean speeds we used the procedure for comparing population means outlined by Kitchens (1987, p 369-373). For the comparisons involving the percentage of vehicles in the 10 mph pace and proportions of vehicle traveling at various speeds, we treated each distribution of speeds as a Bernoulli population—i.e., a population in which each element is one of two possibilities, in this case, (1) in or out of the 10 mph pace, or (2) above or below a selected speed (e.g., 75 mph). We then used the procedure for comparing population proportions described by Kitchens (1987, pages 400-404). The statistical tests were conducted in two ways. First, we conducted the tests in the traditional way, using *n*-values that were equal to the number of vehicles that traveled by each ATRs in the test periods under consideration. In the second, we used an extremely conservative correction, with *n*-values that were equal to the number of hours in each test period—because it is likely that, when traffic is congested, individual vehicles may travel at speeds which are not independent of each other.

In addition, we analyzed crash data to determine whether there were changes in crash rates during the MSMP. For comparison purposes, we combined the crash data from the

First *Enhanced* Enforcement Period and the First *Regular* Enforcement Period and compared that combined data with crash data obtained in the same calendar time period during the five years prior to the MSMP.

We also examined the citation data that were obtained during the First *Enhanced* Enforcement Period—in this case however, there no historical citation data were available for comparison purposes.

### *1.2. Organization of this Report*

The next section of this report, Section 2, presents summary data. Then, detailed analyses are presented in subsequent sections of the report. Sections 3 through 6 present speed data comparisons for each of the four road types, with individual comparisons for each of the ATRs listed in Table 1.2. Section 7 presents the crash data comparisons. And Section 8 presents the citation data.

## Section 2: Summary of Findings during the First MSMP Test Period

In the MSMP, we obtained speed data from 21 ATRs located throughout Minnesota. Fourteen of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining seven were located *Outside* Enhanced Enforcement Zones. Seven ATRs were located on 2-Lane/2-Way Highways, five were located on 4-Lane Divided Highways, five on Rural Freeways, and four on Urban Freeways. The effect of the MSMP on the speed data obtained at these ATRs is summarized in this section of the report.

### 2.1. Overall Effect of the MSMP during the First Enhanced and First Regular Enforcement Periods

To provide a brief overall summary of the initial effect of the MSMP on driving speeds, we focused on vehicles traveling at least 10 mph above the speed limit at the locations of the ATRs *Within* the Enhanced Enforcement Zones *during the MSMP*. [It should be noted that, on the 2-Lane/2-Way Highways and the Urban Freeways, at the locations *Within* the Enhanced Enforcement Zones the speed limits were increased from 55 mph to 60 mph, while at the locations *Outside* the Enhanced Enforcement Zones the speed limits were unchanged at 55mph. Also, the speed limits remained unchanged at 65 mph on 4-Lane Divided Highways and at 70 mph on Rural Freeways.]

Table 2.1 shows the decrease or increase in the percentage of the vehicles traveling at least 10 mph above the speed limit *during the MSMP* as compared with the percentages traveling at those speeds before the MSMP was implemented. This means that, for the ATRs located on the 2-Lane/2-Way Highways and the Urban freeways, the percentages shown are for vehicles traveling at 70 mph or more—10 mph above the *new* speed limit and 15 mph above the pre-MSMP speed limit. [Also it should also be noted that in Table 2.1, the decrease or increase in percentages are relative to one year earlier, with the exceptions noted in the table.]

**Table 2.1: Summary of the Effect of the MSMP on the Percentage of Vehicles Traveling at Least 10 mph Above the Speed Limits during the MSMP**

Road type	Within the Enhanced Enforcement Zones		Outside the Enhanced Enforcement Zones	
	Increase/Decrease during First <i>Enhanced</i> Enforcement Period	Increase/Decrease during First <i>Regular</i> Enforcement Period	Increase/Decrease during First <i>Enhanced</i> Enforcement Period	Increase/Decrease during First <i>Regular</i> Enforcement Period
<b>2-Lane/2-Way Highways</b>	-39.35%	-41.08%	+19.17%	+26.97%
<b>4-Lane Divided Highways</b>	-10.36%	-13.76%	-26.77%*	-46.15%*
<b>Rural Freeways</b>	-13.08%	-38.99%	-71.42%*	-68.97%*
<b>Urban Freeways</b>	-9.00%**	-15.71%**	-6.34%*	-14.05%*

\*Speed data from one ATR located close to *Enhanced* Enforcement Zones.

\*\*Historical speed data obtained one month before the start of the MSMP.

Table 2.1 shows that, for all four road types, *Within* the Enhanced Enforcement Zones there were overall decreases in the percentage of vehicles traveling at least 10 mph above the speed limits. The table also shows that, for the 2-Lane/2-Way Highways *Outside* the Enhanced Enforcement Zones there were *increases* in the percentage of vehicles traveling at least 10 mph above the speed limits *Within* the Enhanced Enforcement Zones. In contrast, for the other three road types *Outside* the Enhanced Enforcement Zones, there were decreases in the percentage of vehicles traveling at least 10 mph above the speed limits *Within* the Enhanced Enforcement Zones. It is of note that for these three road types, in each case there was a single ATR *Outside* the Enhanced Enforcement Zones that was located relatively close to one or two *Enhanced* Enforcement Zones.

Table 2.1 also shows that, with one exception, *Within* the Enhanced Enforcement Zones the decreases in the percentages were greater in the *Regular* Enforcement Period—probably because the effect of the MSMP was increasing though the *Enhanced* Enforcement Period. If this suggestion is correct there may be still greater decreases when the data from the Second Test Period is examined.

The data from which Table 2.1 was derived for each of the four road types is presented in more detail in the remainder of the section of the report.

## 2.2. Effect of the MSMP on 2-Lane/2-Way Highways

In the MSMP, we obtained speed data from seven ATRs located on 2-Lane/2-Way Highways—three of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining four were located *Outside* Enhanced Enforcement Zones. The speed limit was increased from 55 mph to 60 mph at the locations of the three ATRs *Within*

Enhanced Enforcement Zones, while the speed limit remained unchanged at 55 mph at the locations of the four ATRs *Outside* Enhanced Enforcement Zones.

In order to provide a brief overall summary of the effect of the MSMP, speed data from the three ATRs *Within* Enhanced Enforcement Zones were combined. For this summary, we focused on drivers traveling at least 10 mph above the *new* speed limit. Then, we compared speed data from the Test Year with data from the previous year, when the speed limit at the locations of the three ATRs was still 55 mph. Table 2.2 shows the results of this comparison for the First *Enhanced* Enforcement Period.

**Table 2.2: Effect of MSMP on 2-Lane/2-Way Highways during the First *Enhanced* Enforcement Period at Three ATRs *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
288,067	15,176	5.26
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
275,520	8,787	3.19
<b>Result: 39.35% Decrease in Drivers Traveling Over 70 mph</b>		

Table 2.2 indicates that, for the three ATRs *Within* Enhanced Enforcement Zones on 2-Lane/2-Way Highways, during the First *Enhanced* Enforcement Period, there was a 39.35% decrease in the number of drivers traveling over 70 mph—i.e., 10 mph over the *new* speed limit.

A similar comparison was conducted for the First *Regular* Enforcement Period. However, in this case, we were only able to combine data from two of the ATRs—as no speed data were available from ATR-210 for this time period. The results of this comparison using speed data from ATR-219 and ATR-220 are shown in Table 2.3.

**Table 2.3: Effect of MSMP on 2-Lane/2-Way Highways during the First *Regular* Enforcement Period at Two ATRs (ATR-219 and ATR-220) *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
131,850	5,619	4.26
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
120,639	3,034	2.51
<b>Result: 41.08% Decrease in Drivers Traveling Over 70 mph</b>		

Table 2.3 shows that, for two ATRs *Within* Enhanced Enforcement Zones on 2-Lane/2-Way Highways, during the First *Regular* Enforcement Period, there was a 41.08% reduction in the number of drivers traveling over 70 mph—i.e., 10 mph over the speed limit.

We also combined the speed data obtained during the Test Periods from the four ATRs *Outside* Enhanced Enforcement Zones, where there was *no change* in the level of enforcement during the MSMP and *no change* in the speed limit. Then, we compared the speed data from the Test Periods with the speed data from the previous year. In the comparison, we focused on drivers traveling at 70 mph or more—while this is 10 mph above the *new* speed limit *Within* Enhanced Enforcement Zones, it is 15 mph above the *actual* speed limit at the locations of the four ATRs *Outside* Enhanced Enforcement Zones. The results of this comparison for speed data obtained during the First *Enhanced* Enforcement Period are shown in Table 2.4.

**Table 2.4: Effect of MSMP on 2-Lane/2-Way Highways during the First *Enhanced* Enforcement Period at Four ATRs *Outside* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
338,722**	9,902**	2.92**
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
352,459*	12,279*	3.48*
<b>Result: 19.17% Increase in Drivers Traveling Over 70 mph</b>		

\*Numbers adjusted to account for limited availability of data from ATR-198 and ATR-199 during the time period

\*\*Numbers adjusted to account for limited availability of data from ATR-199 during the time period

Table 2.4 shows that, for the four ATRs located *Outside* Enhanced Enforcement Zones on 2-Lane/2-Way Highways, during the First *Enhanced* Enforcement Period, there was a 19.17% *increase* in the number of drivers traveling over 70 mph—i.e., 10 mph above the *new* speed limit *Within* Enhanced Enforcement Zones (and 15 mph above the *current* speed limit *Outside* the Enhanced Enforcement Zones).

A similar comparison was conducted for the first *Regular* Enforcement Period. The results of this comparison using speed data from the four ATRs located *Outside* Enhanced Enforcement Zones are shown in Table 2.5.

**Table 2.5: Effect of MSMP on 2-Lane/2-Way Highways during the First *Regular* Enforcement Period at Four ATRs *Outside* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
208,703	6,346	3.04
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
296,578*	7,978*	3.86*
<b>Result—26.97% Increase in Drivers over 70 mph</b>		

\*Numbers adjusted to account for limited availability of data from ATR-199 and ATR-222 during the time period

Table 2.5 shows that, for the four ATRs located *Outside* Enhanced Enforcement Zones on the 2-Lane/2-Way Highways, during the First *Regular* Enforcement Period there was a 26.97% increase in the number of drivers traveling over 70 mph—i.e., at 10 mph over the *new* speed limit *Within* Enhanced Enforcement Zones (and 15 mph above the *current* speed limit *Outside* Enhanced Enforcement Zones).

Comparisons between speed data from the ATRs located *Within* Enhanced Enforcement Zones and the ATRs located *Outside* Enhanced Enforcement Zones should be treated with caution. For example, it should be noted that the three ATRs located *Within* Enhanced Enforcement Zones are all in Northern Minnesota, and that the proportion of vehicles traveling at 70 mph or more varies between 0.021 and 0.052 for these ATRs. In contrast, the four ATRs located *Outside* Enhanced Enforcement Zones are more widely spread, with three in South Western Minnesota and one in East Central Minnesota. For these four ATRs, there is a much greater range in the proportion of vehicles traveling at 70 mph or more—the proportion varies between 0.003, for ATR-179—one of the three ATRs in South Western Minnesota—and 0.110 for ATR-222—which is located in East Central Minnesota.

### 2.3. Effect of the MSMP on 4-Lane Divided Highways

In the MSMP, we obtained speed data from five ATRs located on 4-Lane Divided Highways. Four of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining ATR was located *Outside* the Enhanced Enforcement Zones. At the locations of the four ATRs *Within* the Enhanced Enforcement Zones and the ATRs *Outside* the Enhanced Enforcement Zones, the speed limit was unchanged—at 65mph—during the MSMP.

In order to provide a brief overall summary of the effect of the MSMP, speed data from the four ATRs *Within* Enhanced Enforcement Zones were combined. Then, we compared speed data from the Test Year with data from the previous year. In this comparison, we focused on drivers traveling at least 10 mph above the speed limit—i.e.,

on drivers traveling at 75 mph or more. . Table 2.6 shows the results of this comparison for the First *Enhanced* Enforcement Period.

**Table 2.6: Effect of MSMP on 4-Lane Divided Highways during the First *Enhanced* Enforcement Period at Four ATRs *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 75 mph	% Over 75 mph
3,001,105*	194,025*	6.47*
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 75 mph	% Over 75 mph
2,932,050	170,020	5.80
<b>Result: 10.36% Decrease in Drivers Traveling Over 75 mph</b>		

\*Numbers adjusted to account for limited availability of data from ATR-187

Table 2.6 indicates that, for the four ATRs located *Within* Enhanced Enforcement Zones on 4-Way Divided Highways, during the First *Enhanced* Enforcement Period, there was a 10.36% decrease in the number of drivers traveling over 75 mph—i.e., 10 mph over the speed limit.

A similar comparison was conducted for the First *Regular* Enforcement Period. The results of this comparison are shown in Table 2.7.

**Table 2.7: Effect of MSMP on 4-Lane Divided Highways during the First *Regular* Enforcement Period at Four ATRs *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 75 mph	% Over 75 mph
1,830,762*	119,779*	6.54*
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 75 mph	% Over 75 mph
1,763,196	99,515	5.64
<b>Result—13.76% Decrease in Drivers Traveling Over 75 mph</b>		

\*Numbers adjusted because, for ATR-197, comparison data were from a 6-week time period.

Table 2.7 shows that, for the ATRs *Within* Enhanced Enforcement Zones on 4-Way Divided Highways, during the First *Regular* Enforcement Period there was a 13.76% reduction in the number of drivers traveling over 75 mph—i.e., 10 mph or more above the speed limit.

We also examined the speed data obtained during the Test Periods from the single ATR *Outside* the Enhanced Enforcement Zones, and compared the speed data from the Test Year with data from the previous year. In this comparison, we again focused on drivers traveling at 75 mph or more—10 mph above the speed limit. The results of this



comparison for speed data obtained during the First *Enhanced* Enforcement Period are shown in Table 2.8.

**Table 2.8: Effect of MSMP at one ATR *Outside* the Enhanced Enforcement Zones on a 4-Way Divided Highway During the First *Enhanced* Enforcement Period**

<b>One Year Before MSMP</b>		
Sample Total	# Over 75 mph	% Over 75 mph
980,861	46,929	4.78
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 75 mph	% Over 75 mph
958,013	33,543	3.50
<b>Result: 26.77% Decrease in Drivers Traveling Over 75 mph</b>		

Table 2.8 shows that, for the single ATR located *Outside* the Enhanced Enforcement Zones on a 4-Way Divided Highway, during the First *Enhanced* Enforcement Period, there was a 26.77% decrease in the number of drivers traveling over 75 mph—i.e., 10 mph or more above the speed limit.

A similar comparison was conducted for the First *Regular* Enforcement Period. The results of this comparison are shown in Table 2.9

**Table 2.9: Effect of MSMP at one ATR *Outside* the Enhanced Enforcement Zones on a 4-Way Divided Highway During the First *Regular* Enforcement Period**

<b>One Year Before MSMP</b>		
Sample Total	# Over 75 mph	% Over 75 mph
619,067	29,749	4.81
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 75 mph	% Over 75 mph
589,028	15,247	2.59
<b>Result—46.15% Decrease in Drivers over 75 mph</b>		

Table 2.9 shows that, for the ATR located *Outside* the Enhanced Enforcement Zones on a 4-Way Divided Highway, during the First *Regular* Enforcement Period there was a 46.15% decrease in the number of drivers traveling over 75 mph—i.e., at 10 mph over the speed limit.

Comparisons between speed data from the ATRs located *Within* Enhanced Enforcement Zones and the ATR located *Outside* the Enhanced Enforcement Zones should be treated with caution. The four ATRs located *Within* Enhanced Enforcement Zones are scattered throughout Minnesota; while the single ATR *Outside* the Enhanced Enforcement Zones is located a few miles to the South-West of the Twin Cities—many of the drivers

traveling past this ATR may have traveled through Enhanced Enforcement Zones in the Cities.

#### 2.4. Effect of the MSMP on Rural Freeways

In the MSMP, we obtained speed data from five ATRs located on Rural Freeways—four of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining ATR was located *Outside* the Enhanced Enforcement Zones. At the locations of all five ATRs the speed limit remained unchanged at 70 mph.

In order to provide a brief overall summary of the effect of the MSMP, speed data from the ATRs *Within* Enhanced Enforcement Zones were combined. We were able to combine speed data from ATR-175, ATR-191, and ATR-227—speed data were not available from ATR-208 for this period. The combined speed data from the Test Periods were compared with similar data from the previous year. In the comparison, we focused on drivers traveling at least 10 mph above the speed limit—i.e., those traveling at 80 mph or more. Table 2.10 shows the results of this comparison for the First *Enhanced* Enforcement Period.

**Table 2.10: Effect of MSMP on Rural Freeways during the First *Enhanced* Enforcement Period at Three ATRs (ATR-175, ATR-191, and ATR-227) *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 80 mph	% Over 80 mph
3,234,647	299,211	9.25
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 80 mph	% Over 80 mph
3,144,439*	252,726*	8.04*
<b>Result: 13.08% Reduction in Drivers over 80 mph</b>		

\*Numbers adjusted to account for limited availability of data from ATR-175 and ATR-227 during the time period

Table 2.10 indicates that, for three of the four ATRs *Within* Enhanced Enforcement Zones on Rural Freeways, during the First *Enhanced* Enforcement Period, there was a 13.08% decrease in the number of drivers traveling at over 80 mph—i.e., 10 mph over the speed limit—as compared to the month before the MSMP was implemented.

A similar comparison was conducted for the First *Regular* Enforcement Period. However, in this case we were only able to use speed data from two ATRs (ATR-175 and ATR-227)—this speed data for ATR-191 and ATR-208 were not reliable for this time period. The results of this comparison using speed data from the three ATRs are shown in Table 2.11.

**Table 2.11: Effect of MSMP on Rural Freeways During the First Regular Enforcement Period at Two ATRs (ATR-175 and ATR-227) Within Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 80 mph	% Over 80 mph
835,018	54,635	6.54
<b>First Regular Enforcement Period</b>		
Sample Total	# Over 80 mph	% Over 80 mph
806,314*	20,562*	2.55*
<b>Result: 38.99% Reduction in Drivers over 80 mph</b>		

\*Numbers adjusted to account for limited availability of data from ATR-175, ATR-208, and ATR-227 during the time period

Table 2.11 indicates that, for three of the four ATRs located *Within* Enhanced Enforcement Zones on Rural Freeways, during the First *Regular* Enforcement Period, there was a 38.99% decrease in the number of drivers traveling over 80 mph—i.e., 10 mph over the speed limit.

We also examined the speed data obtained during the Test Periods from the ATR that was located *Outside* the Enhanced Enforcement Zones, and compared it with similar data from the previous year. We focused on drivers traveling at 80 mph or more—10 mph above the speed limit. The results of this comparison for speed data obtained during the First *Enhanced* Enforcement Period are shown in Table 2.12.

**Table 2.12: Effect of the MSMP on One ATR Outside the Enhanced Enforcement Zones on a Rural Freeway During the First Enhanced Enforcement Period**

<b>Pre-MSMP Speed Data from 4/24/05 to 5/21/05</b>		
Sample Total	# Over 80 mph	% Over 80 mph
1,206,904	182,044	15.08
<b>First Enhanced Enforcement Period</b>		
Sample Total	# Over 80 mph	% Over 80 mph
1,714,696	73,819	4.31
<b>Result: 71.42% Decrease in Drivers Traveling over 80 mph</b>		

Table 2.12 shows that, for the ATR located *Outside* Enhanced Enforcement Zones on a Rural Freeway, during the First *Enhanced* Enforcement Period, there was a 71.42% decrease in the number of drivers traveling over 80 mph.

A similar comparison was conducted for the First *Regular* Enforcement Period. The results of this comparison using speed data from the ATR located *Outside* the Enhanced Enforcement Zones are shown in Table 2.13.

**Table 2.13: Effect of MSMP at One ATR *Outside* the Enhanced Enforcement Zones on a Rural Freeway During the First *Regular* Enforcement Period**

<b>Pre-MSMP Speed Data from 4/24/05 to 5/21/05</b>		
Sample Total	# Over 80 mph	% Over 80 mph
1,206,904	182,044	15.08
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 80 mph	% Over 80 mph
1,050,413	49,128	4.68
<b>Result: 68.97% Decrease in Drivers Traveling over 80 mph</b>		

Table 2.13 shows that, for the ATR located *Outside* the Enhanced Enforcement Zones on a Rural Freeway, during the First *Regular* Enforcement Period there was a 68.97% decrease in the number of drivers traveling over 80 mph.

For Rural Freeways, comparisons between speed data from the ATRs located *Within* Enhanced Enforcement Zones and the ATR located *Outside* the Enhanced Enforcement Zones should be treated with caution. It should be noted that the location of ATR that was located *Outside* the Enhanced Enforcement Zones is between Enhanced Enforcement Zones to both the North-West and the South-East. It is likely that most drivers passing this ATR will have traveled through one or other of the Enhanced Enforcement Zones. [It should also be noted that there are no other ATRs *Outside* the Enhanced Enforcement Zones on Rural Freeways that could have been considered for comparison purposes for this study.]

### 2.5. *Effect of MSMP on Urban Freeways*

In the MSMP, we obtained speed data from four ATRs located on Urban Freeways—three of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining ATR was located *Outside* the Enhanced Enforcement Zones. The speed limit was increased from 55 mph to 60 mph at the locations of the three ATRs *Within* Enhanced Enforcement Zones, while the speed limit remained unchanged at 55 mph at location of the ATR *Outside* the Enhanced Enforcement Zones

In order to provide a brief overall summary of the effect of the MSMP, speed data from the three ATRs *Within* Enhanced Enforcement Zones were combined. For this summary, we focused on drivers traveling at least 10 mph above the *new* speed limit. Then, we compared speed data collected during the *Enhanced* Enforcement Period with pre-MSMP speed data that were collected just before the *Enhanced* Enforcement began—this data was collected two weeks during September 2005 for ATR-100, and four weeks during August and September 2005 for ATR-I94 and ATR-35WCD. When the pre-MSMP data were collected the speed limit at the locations of the three ATRs was still 55 mph. Table 2.14 shows the results of this comparison for the First *Enhanced* Enforcement Period.

**Table 2.14: Effect of MSMP on Urban Freeways during the First *Enhanced* Enforcement Period at Three ATRs *Within* Enhanced Enforcement Zones**

<b>Before MSMP—Aug/Sept 05</b>		
Sample Total	# Over 70 mph	% Over 70 mph
8,619,318*	1,091,879*	12.67*
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
12,988,307	1,497,191	11.53
<b>Result: 9.00% Reduction in Drivers over 70 mph</b>		

Table 2.14 indicates that, for the three ATRs *Within* Enhanced Enforcement Zones on Urban Freeways, during the First *Enhanced* Enforcement Period, there was a 9.00% decrease in the number of drivers traveling over 70 mph—i.e., 10 mph over the *new* speed limit—as compared to the month before the MSMP was implemented.

A similar comparison was conducted for the First *Regular* Enforcement Period. The results of this comparison using speed data from the three ATRs are shown in Table 2.15.

**Table 2.15: Effect of MSMP on Urban Freeways during the First *Regular* Enforcement Period at Three ATRs *Within* Enhanced Enforcement Zones**

<b>Before MSMP—Aug/Sept 05</b>		
Sample Total	# Over 70 mph	% Over 70 mph
8,619,318*	1,091,879*	12.67*
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
8,239,216	880,238	10.68
<b>Result: 15.71% Reduction in Drivers over 70 mph</b>		

Table 2.15 indicates that, for the three ATRs located *Within* Enhanced Enforcement Zones on Urban Freeways, during the First *Regular* Enforcement Period, there was a 15.71% decrease in the number of drivers traveling over 70 mph—i.e., 10 mph over the *new* speed limit—as compared to the month before the MSMP was implemented.

We also examined the speed data obtained during the Test Periods from the ATR that was located *Outside* the Enhanced Enforcement Zones. For this ATR location there was *no change* in the level of enforcement during the MSMP and *no change* in the speed limit. We compared the speed data from the Test Period with speed data from the previous year. Again, we focused on drivers traveling at 70 mph or more—while this is 10 mph above the *new* speed limit *Within* Enhanced Enforcement Zones, it is 15 mph above the *actual* speed limit at the location of the ATR *Outside* Enhanced Enforcement

Zones. The results of this comparison for speed data obtained during the First *Enhanced* Enforcement Period are shown in Table 2.16.

**Table 2.16: Effect of MSMP at One ATR *Outside* the Enhanced Enforcement Zones on an Urban Freeway during the First *Enhanced* Enforcement Period**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
1,940,361	1,126,829	58.07
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
1,868,362	1,016,165	54.39
<b>Result: 6.34% Decrease in Drivers Traveling over 70 mph</b>		

Table 2.16 shows that, for the ATR located *Outside* Enhanced Enforcement Zones on an Urban freeway, during the First *Enhanced* Enforcement Period, there was a 6.34% decrease in the number of drivers traveling over 70 mph—i.e., 10 mph above the *new* speed limit *Within* Enhanced Enforcement Zones (and 15 mph above the *current* speed limit *Outside* the Enhanced Enforcement Zones).

A similar comparison was conducted for the First *Regular* Enforcement Period. The results of this comparison using speed data from the ATR located *Outside* the Enhanced Enforcement Zones are shown in Table 2.17.

**Table 2.17: Effect of MSMP at One ATR *Outside* the Enhanced Enforcement Zones on an Urban Freeway during the First *Regular* Enforcement Period**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
1,175,639	670,378	57.02
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
1,115,042	546,428	49.01
<b>Result: 14.05% Decrease in Drivers Traveling over 70 mph</b>		

Table 2.17 shows that, for the ATR located *Outside* the Enhanced Enforcement Zones on an Urban Freeway, during the First *Regular* Enforcement Period there was a 14.05% decrease in the number of drivers traveling over 70 mph—i.e., at 10 mph or more above the *new* speed limit *Within* Enhanced Enforcement Zones (and 15 mph or more above the *current* speed limit *Outside* Enhanced Enforcement Zones).

For Urban Freeways, comparisons between speed data from the ATRs located *Within* Enhanced Enforcement Zones and the ATR located *Outside* the Enhanced Enforcement

Zones should be treated with caution. It should be noted that the location of ATR that was located *Outside* the Enhanced Enforcement Zones is only a few miles to the North of an Enforced Enforcement Zone. And, most of the drivers traveling North past this ATR will have traveled through that Enhanced Enforcement Zone. [It should also be noted that, the locations of all the other ATRs *Outside* the Enhanced Enforcement Zones on Urban Freeways that might have been considered for comparison purposes for this study are also very close to Enhanced Enforcement Zones.]

## 2.6. Crash Rates During the First MSMP Period

During the First MSMP Test Period, crash data were available for all Minnesota trunk highways. These trunk highways included 2-Lane/2-Way Highways, 4-Lane Highways, Rural Freeways, and Urban Highways. Some of these highways had changes in speed limits during the MSMP, some had enhanced enforcement during the MSMP, and speed data were available from some of them. In all, there were twelve combinations of Road Type, Speed Limits, and Enforcement Status. Table 2.18 lists the Crash Rate, the Severity Rate, and the Fatal Crash Rate for each of these combinations during the first ten weeks of the MSMP.

**Table 2.18: Crash Rate, Severity Rate, and Fatal Crash Rate for Each Combination of Trunk Highway Type, Speed Limits During the MSMP, and Enforcement Zone During the First Ten-Week MSMP Period**

Road Type And Speed Limit Condition	<i>Within</i> Enforcement Zone			<i>Outside</i> Enforcement Zone		
	Crash Rate	Severity Rate	Fatal Crash Rate	Crash Rate	Severity Rate	Fatal Crash Rate
<b>2 Lane/2-Way Highway Increase—55 to 60 mph</b>	0.9910	1.5947	2.2781	0.5703	0.8116	1.0967
<b>2 Lane/2-Way Highway No Change—55 mph</b>	—	—	—	1.0503	1.5628	1.3332
<b>4 Lane/Divided Highway No Change—65 mph</b>	0.5847	0.7996	1.6241	0.8094	1.1623	1.0566
<b>Rural Freeway Unchanged—70 mph</b>	0.7418	1.0168	1.0093	0.6868	0.9513	0.4112
<b>Urban Freeway Increase—55 to 60 mph</b>	0.9767	1.3276	1.0173	—	—	—
<b>Urban Freeway No Change—55 mph</b>	1.4349	1.8505	0.0000	1.6390	2.0924	0.3528
<b>Urban Freeway No Change—60 mph</b>	0.7922	1.1163	0.0000	1.0008	1.3195	0.2125

2.7. Citation Data During the First Enhanced Enforcement Period

During the First MSMP *Enhanced* Enforcement Period citation data were collected for all the highways on which there was Enhanced Enforcement. These data are summarized in Table 2.19. The table presents, for each of the four highway types in the MSMP, the Number of Speed Citations and the Number of Speed Warnings that were given during the First *Enhanced* Enforcement Period, as well as the Number of Vehicles that were Stopped and the Number of Hours of Enforcement.

**Table 2.19: Citation Data for the Four Types of Highways on Which ATRs Were Located**

Type of Highway	Number of Speed Citations	Number of Speed Warnings	Number of Vehicles Stopped	Hours of Enforcement
<b>2-Lane/2-Way Highway</b>	677	2,416	3,330	1,312
<b>4-Lane Divided Highway</b>	893	1,225	2,248*	979
<b>Rural Freeway</b>	997	1,101	2,205	852*
<b>Urban Freeway</b>	1,388	923	2,671	918
<b>Total</b>	3,955	4,742	10,454*	4,061*

\*Probably underestimates.



### Section 3. Speed Data Obtained on 2-Lane/2-Way Highways

We obtained speed data from seven ATRs that were located on 2-Lane/2-Way Highways. Three of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining four were located *Outside* Enhanced Enforcement Zones. During the MSMP, at the locations of the three ATRs *Within* the Enhanced Enforcement Zones, the speed limit was increased from 55 mph to 60 mph and there was *Enhanced* Enforcement at various times. In contrast, at the locations of the four ATRs *Outside* the Enhanced Enforcement Zones, the speed limit remained unchanged at 55 mph and there was no change in the enforcement level during the MSMP.

In this section of the report, for the ATRs located *Within* Enhanced Enforcement Zones and the ATRs located *Outside* Enhanced Enforcement Zones, we present comparisons of the speed data obtained during the Test Year with the speed data obtained at those same ATRs in the three years prior to the MSMP. Comparisons using the speed data from the ATRs located *Within* Enhanced Enforcement Zones are presented first. Then, we present comparisons using the speed data from the ATRs located *Outside* Enhanced Enforcement Zones.

In making the comparisons between the speed data obtained during the Test Year and the speed data obtained prior to the MSMP, we used two statistical tests. The first test was used to examine differences in the mean speeds—for this we used the procedure for comparing population means outlined by Kitchens (1987, p 369-373). The second test was used to explore differences in the percentage of vehicles in the 10 mph pace and in the differences in the proportions of vehicle traveling at various speeds. For this test, we treated the distribution of speeds as a Bernoulli population—i.e., a population in which each element is one of two possibilities, in this case, (1) in or out of the 10 mph pace, or (2) above or below a selected speed (e.g., 75 mph). We then used the procedure for comparing population proportions described by Kitchens (1987, pages 400-404).

Both statistical tests were conducted in two ways. First, the tests were conducted in the traditional way, using  $n$ -values equal to the number of vehicles that traveled past each ATR in the time periods under consideration. Second, the tests were conducted using an extremely conservative correction, with  $n$ -values equal to the number of hours in each test period—the rationale for this was that it is possible, when traffic is congested, that individual vehicles may travel at speeds which are not independent of each other.

#### 3.1. Speed Data from ATRs located *Within* Enhanced Enforcement Zones

The three ATRs located *Within* Enhanced Enforcement Zones on 2-Lane/2-Way Highways were as follows: (1) ATR-210, on US-71, near Blackduck in Beltrami County, (2) ATR-219, on US-2, near Warba in Itasca County, and (3) ATR-220, on US-71, South of CR 89 in Hubbard County. At the locations of all three of these ATRs, the speed limit was increased from 55 mph to 60 mph during the MSMP. The effect of the MSMP on

the speed data at each of these three ATRs is reported in this section. It is reported ATR by ATR—with the effect of the MSMP in the First *Enhanced* Enforcement Period followed by its effect in the First *Regular* Enforcement Period.

For each of the three ATRs *Within* Enhanced Enforcement Zones, two tables are presented for each time period. In the first of these tables speed data from the Test Year are compared with the available historical speed data. Where possible speed data from the three years prior to the MSMP are included in this table—however, in some cases data are only available from one or two of the prior years. Also in some cases, speed data are not available from the whole of the First *Enhanced* Enforcement Period or the whole of the First *Regular* Enforcement Period—in these cases the dates from which the data are available are noted in the table. In the second of the two tables for each ATR, the focus is on drivers traveling at least 5 mph and at least 10 mph above the *new* speed limit adopted for the MSMP—i.e., on drivers traveling at 65 mph or more and at 70 mph or more. In this second table, we present the number (and proportion) of vehicles traveling above these speeds throughout the six-week *Enhanced* Enforcement Period or the four-week *Regular* Enforcement Period. We also present the average number of vehicles traveling above these speeds every day. Then, the table presents the decrease in the number of vehicles relative to the number that were traveling at these speeds before the MSMP. It should be noted that, in each of three years before the MSMP was adopted, these speeds (of 65 mph or more and 70 mph or more) were 10 mph and 15 mph above the pre-MSMP speed limit.

ATR-210—*Enhanced* Enforcement Period #1

**Table 3.1 (a): ATR-210—Speed Data from *Enhanced* Enforcement Period #1 Compared with Speed Data from Three Previous Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/ Increase as Compared to One Year Earlier	Decrease/ Increase as Compared to Two Years Earlier	Decrease/ Increase as Compared to Three Years Earlier
Mean (mph)	60.30066	-1.10899**	-0.26483**	-0.60926**
Percent in 10 mph pace	67.8035	+8.0162**	+7.2113**	+8.3197**
Proportion at 65 mph or more	0.182621	-0.07596**	-0.05159**	-0.0655**
Proportion at 70 mph or more	0.051927	-0.03114**	-0.01963*	-0.02735**
Proportion at 75 mph or more	0.014639	-0.01226*	-0.00795*	-0.0114*
Proportion at 80 mph or more	0.003684	-0.0039*	-0.00209*	-0.00457*
Proportion at 85 mph or more	0.001325	-0.00142*	-0.00086*	-0.00166*
Vehicle Total	51,303	54,726	52,282	48,578

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.1 (b): ATR-210—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	7.52737*
Median (mph)	60.85877
15 <sup>th</sup> percentile (mph)	55.34646
85 <sup>th</sup> percentile (mph)	66.24799
90 <sup>th</sup> percentile (mph)	68.16085
95 <sup>th</sup> percentile (mph)	70.25836

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.2 (a): ATR-210—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Number of vehicles at 65 mph or more	9,369	223	-93	-63	-80
Number of vehicles at 70 mph or more	2,664	63	-38	-24	-33
Vehicle Total	51,303	1,222	—	—	—

**Table 3.2 (b): ATR-210—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Proportion of vehicles at 65 mph or more	0.182621	0.182621	-0.0760	-0.0516	-0.0655
Proportion of vehicles at 70 mph or more	0.051927	0.051927	-0.0311	-0.0196	-0.0274
Vehicle Total	51,303	1,222	—	—	—

ATR-210—*Regular* Enforcement Period #1

Unfortunately, for ATR-210 during the first *Regular* Enforcement Period—i.e., between 11/07/05 and 12/05/05—speed data were only available for the first two days of the period, and for part of the third day. This is insufficient data on which to base reliable inferences. Therefore no data are reported for ATR-210 in this time period.

ATR-219—*Enhanced* Enforcement Period #1

**Table 3.3: ATR-219 (a)—Speed Data from *Enhanced* Enforcement Period #1 Compared with Speed Data from Three Previous Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/ Increase as Compared to One Year Earlier	Decrease/ Increase as Compared to Two Years Earlier	Decrease/ Increase as Compared to Three Years Earlier
Mean (mph)	61.82446	-0.326354**	-0.42527**	+0.369921**
Percent in 10 mph pace	82.2806	+6.3549**	+8.3169**	+13.7561**
Proportion at 65 mph or more	0.111612	-0.064133**	-0.086907**	-0.086123**
Proportion at 70 mph or more	0.022052	-0.017367**	-0.024888**	-0.032072**
Proportion at 75 mph or more	0.006554	+0.002969*	-0.005683*	-0.006944*
Proportion at 80 mph or more	0.002563	<i>ns</i>	-0.000647*	-0.000376*
Proportion at 85 mph or more	0.001335	+0.000679*	+0.000454*	<i>ns</i>
Vehicle Total	139,304	147,845	149,870	153,129

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.3: ATR-219 (b)—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	4.62501*
Median (mph)	62.08943
15 <sup>th</sup> percentile (mph)	58.16104
85 <sup>th</sup> percentile (mph)	64.71232
90 <sup>th</sup> percentile (mph)	65.64828
95 <sup>th</sup> percentile (mph)	68.43972

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.4 (a): ATR-219—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (9/26/05 to 10/09/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 65 mph or more	15,548	370	-212	-288	-286
Number of vehicles at 70 mph or more	3,072	73	-58	-83	-106
Vehicle Total	139,304	3,317	—	—	—

**Table 3.4 (b): ATR-219—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (9/26/05 to 10/09/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 65 mph or more	0.11161	0.11161	-0.06413	-0.086907	-0.086123
Proportion of vehicles at 70 mph or more	0.02205	0.02205	-0.01737	-0.024888	0.032072
Vehicle Total	139,304	3,317	—	—	—

ATR-219—Regular Enforcement Period #1

**Table 3.5 (a): ATR-219—Comparison of Speed Data from Regular Enforcement Period #1 Compared with Speed Data from Three Previous Years**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/ Increase as Compared to One Year Earlier	Decrease/ Increase as Compared to Two Years Earlier	Decrease/ Increase as Compared to Three Years Earlier
Mean (mph)	60.91249	-0.86799**	-0.53562**	-0.34023**
Percent in 10 mph pace	79.597	+3.6708**	+6.0751**	+12.4735**
Proportion at 65 mph or more	0.100317	-0.0583**	-0.06974**	-0.10124**
Proportion at 70 mph or more	0.020669	-0.01495*	-0.01759*	-0.03738**
Proportion at 75 mph or more	0.006067	-0.00252*	-0.00358*	-0.00801*
Proportion at 80 mph or more	0.002364	<i>ns</i>	<i>ns</i>	-0.00057*
Proportion at 85 mph or more	0.001143	+0.000377*	<i>ns</i>	<i>ns</i>
Vehicle Total	76,976	84,817	85,924	90,066

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.5 (b): ATR-219—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	5.67263*
Median (mph)	61.66298
15 <sup>th</sup> percentile (mph)	56.62335
85 <sup>th</sup> percentile (mph)	64.58519
90 <sup>th</sup> percentile (mph)	65.0199
95 <sup>th</sup> percentile (mph)	68.1587

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.6 (a): ATR-219—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 65 mph or more	7,722	278	-160	-192	-278
Number of vehicles at 70 mph or more	1,591	57	-41	-48	-103
Vehicle Total	76,976	2,749	—	—	—

**Table 3.6 (b): ATR-219—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 65 mph or more	0.100317	0.100317	-0.0583	-0.06974	-0.10124
Proportion of vehicles at 70 mph or more	0.020669	0.020669	-0.01495	-0.01759	-0.03738
Vehicle Total	76,976	2,749	—	—	—



ATR-220—*Enhanced* Enforcement Period #1

**Table 3.7 (a): ATR-220—Speed Data from *Enhanced* Enforcement Period #1 Compared with Speed Data from One Year Earlier**

Measure	Test Period (9/26/05 to 10/09/05)	Decrease/Increase as Compared to One Year Earlier
Mean (mph)	60.77744	-0.44071**
Percent in 10 mph pace	75.7831	+5.3968**
Proportion at 65 mph or more	0.141875	-0.04803**
Proportion at 70 mph or more	0.035931	-0.02024**
Proportion at 75 mph or more	0.00782	-0.00513*
Proportion at 80 mph or more	0.002402	-0.00156*
Proportion at 85 mph or more	0.000707	-0.00058*
Vehicle Total	84,913	85,496

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.7 (b): ATR-220—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.47458*
Median (mph)	61.30253
15 <sup>th</sup> percentile (mph)	56.3233
85 <sup>th</sup> percentile (mph)	64.91611
90 <sup>th</sup> percentile (mph)	66.97627
95 <sup>th</sup> percentile (mph)	69.33601

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.8 (a): ATR-220—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced Enforcement Period #1* and One Year Earlier**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 65 mph or more	12,047	287	-97
Number of vehicles at 70 mph or more	3,051	73	-41
Vehicle Total	84,913	2,022	—

**Table 3.8 (b): ATR-220—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced Enforcement Period #1* and One Year Earlier**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 65 mph or more	0.141875	0.141875	-0.04803
Proportion of vehicles at 70 mph or more	0.035931	0.035931	-0.02024
Vehicle Total	84,913	2,022	—

ATR-220—Regular Enforcement Period #1

**Table 3.9 (a): ATR-220—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/Increase as Compared to One Year Earlier
Mean (mph)	58.25533	-2.97232**
Percent in 10 mph pace	56.2803	-0.13709**
Proportion at 65 mph or more	0.128851	-0.06006**
Proportion at 70 mph or more	0.033049	-0.02219**
Proportion at 75 mph or more	0.0071	-0.00587*
Proportion at 80 mph or more	0.00229	-0.00217*
Proportion at 85 mph or more	0.00071	-0.00069*
Vehicle Total	43,663	47,033

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.9 (b): ATR-220—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	9.76298*
Median (mph)	60.351
15 <sup>th</sup> percentile (mph)	52.20626
85 <sup>th</sup> percentile (mph)	64.73508
90 <sup>th</sup> percentile (mph)	66.50574
95 <sup>th</sup> percentile (mph)	69.11529

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.10 (a): ATR-220—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular* Enforcement Period #1 and One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 65 mph or more	5,626	201	-97
Number of vehicles at 70 mph or more	1,443	52	-35
Vehicle Total	43,663	1,559	—

**Table 3.10 (b): ATR-220—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular* Enforcement Period #1 and One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 65 mph or more	0.128851	0.128851	-0.06006
Proportion of vehicles at 70 mph or more	0.033049	0.033049	-0.02219
Vehicle Total	43,663	1,559	—

### 3.2. Speed Data from ATRs located Outside Enhanced Enforcement Zones

There were four ATRs located *Outside* Enhanced Enforcement Zones on 2-Lane/2-Way Highways. These ATRs were as follows—(1) ATR-179, on USTH 59, near Garvin, in Lyon County, (2) ATR-198, on USTH 212, East of TH 23, in Chippewa County, (3) ATR-199, on USTH 75, North of CR 69, in Pipestone County, and ATR-222, on MNTH 65, near Pliny, in Aitkin County. During the MSMP, at the locations of the ATRs located *Outside* Enhanced Enforcement Zones, speed limits remained unchanged—at 55 mph—and there were *no changes* in enforcement. For each of these ATRs, the speed data obtained during 2005, when the MSMP occurred, was compared with the historical speed data. These comparisons are reported site by site, first for the six-week time period between 9/26 and 11/6, when the First *Enhanced* Enforcement Period occurred during the MSMP, and then for the four-week time period between 11/7 and 12/4, when the First *Regular* Enhancement Period occurred during the MSMP.

For each of the four ATRs located *Outside* Enhanced Enforcement Zones (as for the ATRs located *Within* Enhanced Enforcement Zones), two tables are presented for each time period. In the first table, speed data from the Test Year is compared with the historical speed data. We include speed data from the three years prior to the MSMP in the table, whenever possible—it should be noted that in some cases data are only

available from one or two prior years. Also in some cases, speed data are not available from the whole of the six-week *Enhanced* Enforcement Period or the four-week *Regular* Enforcement Period—in these cases the dates from which the data are available are noted in the table. In the second of the tables for each of the ATRs located *Outside* Enhanced Enforcement Zones, the focus is on drivers traveling at least 5 mph and at least 10 mph above the *new* speed limit adopted for the MSMP—i.e., drivers traveling at least 65 mph and at least 70 mph). It should be noted that during the MSMP, as well as during the three years before it was adopted, these speeds (of at least 65 mph and at least 70 mph) were 10 mph and 15 mph above the *actual* speed limit at the locations of the four ATRs located *Outside* Enhanced Enforcement Zones. In this second table, we present the number and proportion of vehicles traveling above these speeds throughout the First *Enhanced* Enforcement Period or the First *Regular* Enforcement Period. We also present the average number of vehicles traveling above these speeds every day. Then, the table presents the decrease in the number of vehicles relative to the number that were traveling at these speeds before the Test Year.

ATR-179—*Enhanced* Enforcement Period #1

**Table 3.11 (a): ATR-179—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from One Year Earlier**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/Increase as Compared to One Year Earlier
Mean (mph)	55.44772491	-0.29397**
Percent in 10 mph pace	68.9757435	+2.4862*
Proportion at 65 mph or more	0.016226424	-0.0065975*
Proportion at 70 mph or more	0.003392284	-0.0006781*
Proportion at 75 mph or more	0.000949839	<i>ns</i>
Proportion at 80 mph or more	0.00047492	+0.000222*
Proportion at 85 mph or more	0.000180922	<i>ns</i>
Vehicle Total	88,436	86,970

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.11 (b): ATR-179—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.71379*
Median (mph)	56.21200011
15 <sup>th</sup> percentile (mph)	50.67960067
85 <sup>th</sup> percentile (mph)	61.13259235
90 <sup>th</sup> percentile (mph)	62.57809742
95 <sup>th</sup> percentile (mph)	64.02360248

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.12 (a): ATR-179—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and One Year Earlier**

Measure	Test Period (9/26/05 to 11/06/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 65 mph or more	1,435	34	-14
Number of vehicles at 70 mph or more	300	7	-1
Vehicle Total	88,436	2,106	—

**Table 3.12 (b): ATR-179—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and One Year Earlier**

Measure	Test Period (9/26/05 to 11/06/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 65 mph or more	0.016226	0.016226	-0.006598
Proportion of vehicles at 70 mph or more	0.003392	0.003392	-0.000678
Vehicle Total	88,436	2,106	—

ATR-179—Regular Enforcement Period #1

**Table 3.13 (a): ATR-179—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/Increase as Compared to One Year Earlier
Mean (mph)	53.339618	-1.35666434**
Percent in 10 mph pace	57.35894	-6.381603**
Proportion at 65 mph or more	0.0127862	-0.00734536*
Proportion at 70 mph or more	0.0028329	<i>ns</i>
Proportion at 75 mph or more	0.00084220	<i>ns</i>
Proportion at 80 mph or more	0.00047852	+0.000239738*
Proportion at 85 mph or more	0.00026797	+0.000176132*
Vehicle Total	52,244	54,442

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.13 (b): ATR-179—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	8.99339*
Median (mph)	54.989826
15 <sup>th</sup> percentile (mph)	47.754419
85 <sup>th</sup> percentile (mph)	59.946185
90 <sup>th</sup> percentile (mph)	61.73142
95 <sup>th</sup> percentile (mph)	63.605308

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]



**Table 3.14 (a): ATR-179—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 65 mph or more	668	24	-14
Number of vehicles at 70 mph or more	148	5	-1
Vehicle Total	52,244	1,866	—

**Table 3.14 (b): ATR-179—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 65 mph or more	0.012786	0.012786	-0.007345
Proportion of vehicles at 70 mph or more	0.002833	0.002833	-0.000657
Vehicle Total	52,244	1,866	—

ATR-198—Enhanced Enforcement Period #1

**Table 3.15 (a): ATR-198—Comparison of Speed Data from Enhanced Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (Three Weeks Only 10/17/05 to 11/06/05)	Decrease/Increase as Compared to One Year Earlier (Three Weeks Only—9/30 to 10/13 & 10/31 to 11/6)	Decrease/Increase as Compared to Two Years Earlier (Five Weeks Only 9/26/03 to 10/30/03)	Decrease/Increase as Compared to Three Years Earlier (One Week Only 10/31/02 to 11/6/02)
Mean (mph)	57.40773211	-1.20813**	-1.08322**	-1.50988**
Percent in 10 mph pace	57.794813	-7.577**	-6.203**	-8.475*
Proportion at 65 mph or more	0.072748526	-0.01344*	-0.02252*	-0.03222*
Proportion at 70 mph or more	0.014130267	-0.00492*	-0.00717*	-0.00948*
Proportion at 75 mph or more	0.002303474	-0.00149*	-0.00169*	-0.00239*
Proportion at 80 mph or more	0.000636034	-0.00044*	-0.00077*	-0.00059*
Proportion at 85 mph or more	0.000189091	<i>ns</i>	-0.00029*	<i>ns</i>
Vehicle Total	58,173	53,024	95,151	14,699

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.15 (b): ATR-198—Additional Speed Data from Enhanced Enforcement Period #1**

Measure	Test Period (Three Weeks Only 10/17/05 to 11/06/05)
Standard deviation (mph)	9.20567*
Median (mph)	59.18387353
15 <sup>th</sup> percentile (mph)	52.06105237
85 <sup>th</sup> percentile (mph)	63.95809376
90 <sup>th</sup> percentile (mph)	64.63245386
95 <sup>th</sup> percentile (mph)	66.94039589

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.16 (a): ATR-198—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (Three Weeks Only 10/17/05 to 11/06/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 65 mph or more	4,232	206	-37	-62	-89
Number of vehicles at 70 mph or more	822	39	-14	-20	-26
Vehicle Total	58,173	2,770	—	—	—

**Table 3.16 (b): ATR-198—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (Three Weeks Only 10/17/05 to 11/06/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 65 mph or more	0.072749	0.072749	-0.01344	-0.02252	-0.03222
Proportion of vehicles at 70 mph or more	0.014130	0.014130	-0.00492	-0.00717	-0.00948
Vehicle Total	58,173	2,770	—	—	—

ATR-198—Regular Enforcement Period #1

**Table 3.17 (a): ATR-198—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from One and Three Years Earlier**

Measure	Test Period (11/7/05 to12/4/05)	Decrease/Increase as Compared to One Year Earlier	Decrease/Increase as Compared to Three Years Earlier
Mean (mph)	55.70841	-2.44521**	-3.026258**
Percent in 10 mph pace	50.3509	-0.12862**	+16.827**
Proportion at 65 mph or more	0.054625	-0.023624*	-0.0338216**
Proportion at 70 mph or more	0.010191	-0.006387*	-0.0092712**
Proportion at 75 mph or more	0.001729	-0.001656*	-0.0016034*
Proportion at 80 mph or more	0.000637	<i>ns</i>	-0.0003289*
Proportion at 85 mph or more	0.000258	<i>ns</i>	<i>ns</i>
Vehicle Total	65,940	66,774	62,120

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.17 (b): ATR-198—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/7/05 to12/4/05)
Standard deviation (mph)	10.37143*
Median (mph)	58.02387
15 <sup>th</sup> percentile (mph)	49.56881
85 <sup>th</sup> percentile (mph)	63.46692
90 <sup>th</sup> percentile (mph)	64.27064
95 <sup>th</sup> percentile (mph)	65.52048

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.18 (a): ATR-198—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and One and Three Years Earlier**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 65 mph or more	3,602	129	-56	-80
Number of vehicles at 70 mph or more	672	24	-15	-22
Vehicle Total	65,940	2,355	—	—

**Table 3.18 (b): ATR-198—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and One and Three Years Earlier**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 65 mph or more	3,602	129	-56	-80
Proportion of vehicles at 70 mph or more	672	24	-15	-22
Vehicle Total	65,940	2,355	—	—

ATR-199—*Enhanced* Enforcement Period #1

**Table 3.19 (a): ATR-199—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/Increase as compared to One Year Earlier (Three Weeks Only 9/29/04 to 10/2/04, & 10/10/04 to 10/16/04, & 10/31/04 to 11/6/04)	Decrease/ Increase as Compared to Two Years Earlier (All Six Weeks)	Decrease/ Increase as Compared to Three Years Earlier (All Six Weeks)
Mean (mph)	58.851926	-0.595083**	0.712523**	-0.055154**
Percent in 10 mph pace	73.6447361	<i>ns</i> (-0.3717)	7.4151**	0.065224**
Proportion at 65 mph or more	0.076170966	-0.023499*	-0.011692*	-0.0368**
Proportion at 70 mph or more	0.023931465	-0.005538*	-0.003209*	-0.006403*
Proportion at 75 mph or more	0.006797653	<i>ns</i> (-0.000784)	-0.002575*	-0.003626*
Proportion at 80 mph or more	0.002824596	<i>ns</i>	<i>ns</i>	<i>ns</i>
Proportion at 85 mph or more	0.000900146	<i>ns</i>	-0.000518*	<i>ns</i>
Vehicle Total	64,434	31,524	63,485	60,821

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.19 (b): ATR-199—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.249016
Median (mph)	58.8633878
15 <sup>th</sup> percentile (mph)	55.1262884
85 <sup>th</sup> percentile (mph)	63.83689487
90 <sup>th</sup> percentile (mph)	64.62459658
95 <sup>th</sup> percentile (mph)	67.50490196

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.20 (a): ATR-199—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Number of vehicles at 65 mph or more	4,908	117	-36	-18	-56
Number of vehicles at 70 mph or more	1,542	37	-8	-5	-10
Vehicle Total	64,434	1,534	—	—	—

**Table 3.20 (b): ATR-199—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Proportion of vehicles at 65 mph or more	0.076171	0.076171	-0.023499	-0.011692	-0.036800
Proportion of vehicles at 70 mph or more	0.023931	0.023931	-0.005538	-0.003209	-0.006403
Vehicle Total	64,434	1,534	—	—	—

ATR-199—Regular Enforcement Period #1

**Table 3.21 (a): ATR-199—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (Three Weeks Only 11/7/05 to 11/12/05 & 11/20/05 to 12/4/05)	Decrease/ Increase as Compared to One Year Earlier (All Four Weeks)	Decrease/ Increase as Compared to Two Years Earlier (All Four Weeks)	Decrease/ Increase as Compared to Three Years Earlier (All Four Weeks)
Mean (mph)	57.55179463	-1.690556**	-0.163723**	-0.788973**
Percent in 10 mph pace	63.0479575	-10.4849**	-0.025341*	-0.046401*
Proportion at 65 mph or more	0.064355073	-0.026491*	-0.015123*	-0.025368*
Proportion at 70 mph or more	0.016275504	-0.009234*	-0.00837*	-0.010259*
Proportion at 75 mph or more	0.004796163	-0.001854*	-0.004392*	-0.003972*
Proportion at 80 mph or more	0.001965641	<i>ns</i>	-0.001169*	-0.000915*
Proportion at 85 mph or more	0.000746943	<i>ns</i>	-0.000712*	<i>ns</i>
Vehicle Total	25,437	40,299	37,004	39,232

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.21 (b): ATR-199—Additional Speed Data from Enhanced Enforcement Period #1**

Measure	Test Period (Three Weeks Only 11/7/05 to 11/12/05 & 11/20/05 to 12/4/05)
Standard deviation (mph)	7.55009*
Median (mph)	58.29160637
15 <sup>th</sup> percentile (mph)	52.20954106
85 <sup>th</sup> percentile (mph)	63.5553382
90 <sup>th</sup> percentile (mph)	64.39874005
95 <sup>th</sup> percentile (mph)	66.49284546

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]



**Table 3.22 (a): ATR-199—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (Three Weeks Only 11/7/05 to 11/12/05 &amp; 11/20/05 to 12/4/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 65 mph or more	1,637	78	-32	-18	-31
Number of vehicles at 70 mph or more	414	20	-11	-10	-12
Vehicle Total	25,437	1,211	—	—	—

**Table 3.20 (b): ATR-199—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (Three Weeks Only 11/7/05 to 11/12/05 &amp; 11/20/05 to 12/4/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 65 mph or more	0.064355	0.064355	-0.026491	-0.015123	-0.025368
Proportion of vehicles at 70 mph or more	0.016276	0.016276	-0.009234	-0.00837	-0.010259
Vehicle Total	25,437	1,211	—	—	—

ATR-222—*Enhanced* Enforcement Period #1

**Table 3.23 (a): ATR-222—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/ Increase as Compared to One Year Earlier	Decrease/ Increase as Compared to Two Years Earlier	Decrease/ Increase as Compared to Three Years Earlier
Mean (mph)	60.71465469	-1.17217**	-1.67022**	-1.67377**
Percent in 10 mph pace	57.2264985	-8.457**	-6.8797**	-6.727**
Proportion at 65 mph or more	0.28266641	+0.043555**	<i>ns</i> (-0.00335)	+0.005406*
Proportion at 70 mph or more	0.105630503	+0.037033**	+0.02694**	+0.021258*
Proportion at 75 mph or more	0.037636798	+0.017106**	+0.012432*	+0.011194*
Proportion at 80 mph or more	0.0120851	+0.007137*	+0.004804*	+0.00534*
Proportion at 85 mph or more	0.005501964	+0.003615*	+0.002844*	+0.002734*
Vehicle Total	83,243	82,656	83,911	83,463

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.23 (b): ATR-222—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	10.65382*
Median (mph)	61.63626729
15 <sup>th</sup> percentile (mph)	55.32474594
85 <sup>th</sup> percentile (mph)	68.7468786
90 <sup>th</sup> percentile (mph)	70.41404594
95 <sup>th</sup> percentile (mph)	74.09085689

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.24 (a): ATR-222—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Number of vehicles at 65 mph or more	23,530	560	+86	-7	+11
Number of vehicles at 70 mph or more	8,793	209	+73	+53	+42
Vehicle Total	83,243	1,982	—	—	—

**Table 3.24 (b): ATR-222—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Proportion of vehicles at 65 mph or more	0.282666	0.282666	+0.043555	-0.00335	+0.005406
Proportion of vehicles at 70 mph or more	0.105631	0.105631	+73 +0.037033	+0.02694	+0.021258
Vehicle Total	83,243	1,982	—	—	—

ATR-222—Regular Enforcement Period #1

**Table 3.25 (a): ATR-222—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (Two Weeks Only 11/7/05 to 11/20/05)	Decrease/ Increase as Compared to One Year Earlier (All Four Weeks)	Decrease/ Increase as Compared to Two Years Earlier (Two Weeks Only 11/7/03 to 11/20/03)	Decrease/ Increase as Compared to Three Years Earlier (All Four Weeks)
Mean (mph)	61.80513235	-0.36565**	-0.6012	-0.63361**
Percent in 10 mph pace	56.8505	-0.06237*	-0.07428*	-0.07227**
Proportion at 65 mph or more	0.32288	+0.053089*	+0.045689*	+0.042902*
Proportion at 70 mph or more	0.12126	+0.036048*	+0.038861*	+0.039953**
Proportion at 75 mph or more	0.046845	+0.019761*	+0.022826*	+0.022082*
Proportion at 80 mph or more	0.015346	+0.008331*	+0.008363*	+0.009123*
Proportion at 85 mph or more	0.0070120	+0.004109*	+0.004103*	+0.004864*
Vehicle Total	27,239	47,188	30,935	53,993

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 3.25 (b): ATR-222—Additional Speed Data from Enhanced Enforcement Period #1**

Measure	Test Period (Two Weeks Only 11/7/05 to 11/20/05)
Standard deviation (mph)	10.19422*
Median (mph)	62.4581138
15 <sup>th</sup> percentile (mph)	56.12408439
85 <sup>th</sup> percentile (mph)	69.2872815
90 <sup>th</sup> percentile (mph)	71.42846571
95 <sup>th</sup> percentile (mph)	74.78798717

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 3.26 (a): ATR-222—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

Measure	Test Period (Two Weeks Only 11/7/05 to 11/20/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Number of vehicles at 65 mph or more	8,795	628	+103	+89	+83
Number of vehicles at 70 mph or more	3,303	236	+70	+76	+78
Vehicle Total	27,239	1,946	—	—	—

**Table 3.26 (b): ATR-222—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 60 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

Measure	Test Period (Two Weeks Only 11/7/05 to 11/20/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Proportion of vehicles at 65 mph or more	0.32288	0.32288	+0.053089	+0.045689	+0.042902
Proportion of vehicles at 70 mph or more	0.12126	0.12126	+0.036048	+0.038861	+0.039953
Vehicle Total	27,239	1,946	—	—	—

### 3.3. Overall Effect of the MSMP on 2-Lane/2-Way Highways

In the MSMP, we obtained speed data from seven ATRs located on 2-Lane/2-Way Highways—three of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining four were located *Outside* Enhanced Enforcement Zones. The speed limit was increased from 55 mph to 60 mph at the locations of the three ATRs *Within* Enhanced Enforcement Zones, while the speed limit remained unchanged at 55 mph at the locations of the four ATRs *Outside* Enhanced Enforcement Zones.

In order to provide a brief overall summary of the effect of the MSMP, speed data from the three ATRs *Within* Enhanced Enforcement Zones were combined. For this summary, we focused on drivers traveling at least 10 mph above the *new* speed limit. Then, we compared speed data from the Test Year with data from the previous year, when the

speed limit at the locations of the three ATRs was still 55 mph. Table 3.27 shows the results of this comparison for the First *Enhanced* Enforcement Period.

**Table 3.27: Effect of MSMP on 2-Lane/2-Way Highways during the First *Enhanced* Enforcement Period at Three ATRs *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
288,067	15,176	5.26
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
275,520	8,787	3.19
<b>Result: 39.35% Decrease in Drivers Traveling Over 70 mph</b>		

Table 3.27 indicates that, for the three ATRs located on 2-Lane/2-Way Highways *Within* Enhanced Enforcement Zones, during the First *Enhanced* Enforcement Period, there was a 39.35% decrease in the number of drivers traveling over 70 mph—i.e., 10 mph over the *new* speed limit.

A similar comparison was conducted for the First *Regular* Enforcement Period. However, in this case, we were only able to combine data from two of the ATRs—as no speed data were available from ATR-210 for this time period. The results of this comparison using speed data from ATR-219 and ATR-220 are shown in Table 3.28.

**Table 3.28: Effect of MSMP on 2-Lane/2-Way Highways during First *Regular* Enforcement Period at Two ATRs (ATR-219 and ATR-220) *Within* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
131,850	5,619	4.26
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
120,639	3,034	2.51
<b>Result: 41.08% Decrease in Drivers Traveling Over 70 mph</b>		

Table 3.28 shows that, for two ATRs located on 2-Lane/2-Way Highways *Within* Enhanced Enforcement Zones, during the First *Regular* Enforcement Period, there was a 41.08% reduction in the number of drivers traveling over 70 mph—i.e., 10 mph over the speed limit.

We also examined the difference between the speed data obtained during the Test Periods from the four ATRs *Outside* Enhanced Enforcement Zones, where there was *no change*

in the level of enforcement during the MSMP and *no change* in the speed limit. For comparison purposes, we focused on drivers traveling at 70 mph or more—while this is 10 mph above the *new* speed limit *Within* Enhanced Enforcement Zones, it is 15 mph above the *actual* speed limit at the locations of the four ATRs *Outside* Enhanced Enforcement Zones. The results of this comparison for speed data obtained during the First *Enhanced* Enforcement Period are shown in Table 3.29.

**Table 3.29: Effect of MSMP on 2-Lane/2-Way Highways during the First *Enhanced* Enforcement Period at Four ATRs *Outside* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
338,722**	9,902**	2.92**
<b>First <i>Enhanced</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
352,459*	12,279*	3.48*
<b>Result: 19.17 % Increase in Drivers Traveling Over 70 mph</b>		

\*\*Numbers adjusted to account for limited availability of data from ATR-198 and ATR-199 during the time period

\*Numbers adjusted to account for limited availability of data from ATR-198 during the time period

Table 3.29 shows that, for the four ATRs located *Outside* Enhanced Enforcement Zones on 2-Lane/2-Way Highways, during the First *Enhanced* Enforcement Period, there was a 19.17% *increase* in the number of drivers traveling over 70 mph—i.e., 10 mph above the *new* speed limit *Within* Enhanced Enforcement Zones (and 15 mph above the *current* speed limit *Outside* the Enhanced Enforcement Zones).

A similar comparison was conducted for the First *Regular* Enforcement Period. The results of this comparison using speed data from the four ATRs located *Outside* Enhanced Enforcement Zones are shown in Table 3.30.

**Table 3.30: Effect of MSMP on 2-Lane/2-Way Highways during First *Regular* Enforcement Period at Four ATRs *Outside* Enhanced Enforcement Zones**

<b>One Year Before MSMP</b>		
Sample Total	# Over 70 mph	% Over 70 mph
208,703	6,346	3.04
<b>First <i>Regular</i> Enforcement Period</b>		
Sample Total	# Over 70 mph	% Over 70 mph
206,578*	7,978*	3.86*
<b>Result—26.97% Decrease in Drivers over 70 mph</b>		

\*Numbers adjusted to account for limited availability of data from ATR-199 and ATR-222 during the time period

Table 3.30 shows that, for the four ATRs located *Outside* Enhanced Enforcement Zones on the 2-Lane/2-Way Highways, during the first *Regular* Enforcement Period there was virtually a 26.97% increase in the number of drivers traveling over 70 mph—i.e., at 10 mph over the *new* speed limit *Within* Enhanced Enforcement Zones (and 15 mph above the *current* speed limit *Outside* Enhanced Enforcement Zones).

Comparisons between speed data from the ATRs located *Within* Enhanced Enforcement Zones and the ATRs located *Outside* Enhanced Enforcement Zones should be treated with caution. For example, it should be noted that the three ATRs located *Within* Enhanced Enforcement Zones are all in Northern Minnesota, and that the proportion of vehicles traveling at 70 mph or more ranges between 0.021 and 0.052 for these ATRs. In contrast, the four ATRs located *Outside* Enhanced Enforcement Zones are more widely spread, with three in South Western Minnesota and one in East Central Minnesota. For these four ATRs, there is a much greater range in the proportion of vehicles traveling at 70 mph or more—the proportion varies between 0.0028, for ATR-179—one of the three ATRs in South Western Minnesota—and 0.1213 for ATR-222—which is located in East Central Minnesota.



## Section 4. Speed Data Obtained on 4-Lane Divided Highways

We obtained speed data from five ATRs that were located on 4-Lane Divided Highways. Four of these ATRs were located *Within* Enhanced Enforcement Zones, while the remaining ATR was located *Outside* the Enhanced Enforcement Zones. At the locations of the four ATRs *Within* the Enhanced Enforcement Zones and the ATRs *Outside* the Enhanced Enforcement Zones, the speed limit was unchanged—remaining at 65mph—during the MSMP.

For the ATRs located *Within* Enhanced Enforcement Zones and the ATR located *Outside* Enhanced Enforcement Zones on 4-Lane Divided Highways, we present comparisons of the speed data obtained during the Test Year with the speed data obtained at those same ATRs in the three years prior to the MSMP. Comparisons using the speed data from the ATRs located *Within* Enhanced Enforcement Zones are presented first. Then, we present comparisons using the speed data from the ATR located *Outside* the Enhanced Enforcement Zones.

In making the comparisons between the speed data obtained during the Test Year and the speed data obtained prior to the MSMP, we used two statistical tests. The first test was used to examine differences in the mean speeds—for this we used the procedure for comparing population means outlined by Kitchens (1987, p 369-373). The second test was used to explore differences in the percentage of vehicles in the 10 mph pace and in the differences in the proportions of vehicle traveling at various speeds. For this test, we treated the distribution of speeds as a Bernoulli population—i.e., a population in which each element is one of two possibilities, in this case, (1) in or out of the 10 mph pace, or (2) above or below a selected speed (e.g., 75 mph). We then used the procedure for comparing population proportions described by Kitchens (1987, pages 400-404).

Both statistical tests were conducted in two ways. First, the tests were conducted in the traditional way, using  $n$ -values equal to the number of vehicles that traveled past each ATR in the time periods under consideration. Second, the tests were conducted using an extremely conservative correction, with  $n$ -values equal to the number of hours in each test period—the rationale for this was that it is possible, when traffic is congested, that individual vehicles may travel at speeds which are not independent of each other.

### 4.1. Speed Data from the ATRs located *Within* Enhanced Enforcement Zones

The four ATRs located *Within* Enhanced Enforcement Zones on 4-Lane Divided Highways were as follows; (1) ATR-172, on US-10, near Dilworth, in Clay County, (2) ATR-187, on US-10, near Rice, in Benton County, (3) ATR-188, on US-52, North of Rochester, in Olmstead County, and (4) ATR-197, on SR-60, West of SR-4, in Watonwan County. At these four sites, the speed limit remained unchanged at 65 mph. The effect of the MSMP on the speed data at each of these four ATRs is reported in this

section. It is reported ATR by ATR—with the effect of the MSMP in the first *Enhanced* Enforcement Period followed by its effect in the first *Regular* Enhancement Period.

For each of the four ATRs *Within* Enhanced Enforcement Zones, two tables are presented for each time period. In the first of these tables speed data from the Test Year is compared with the available historical speed data. Where possible speed data from the three years prior to the MSMP are included in this table—however, in some cases data are only available from one or two of the prior years. Also in some cases, speed data are not available from the whole of the First *Enhanced* Enforcement Period or the First *Regular* Enhancement Period—in these cases the dates from which the data are available are noted in the table. In the second of the tables for each ATR, the focus is on drivers traveling at least 5 mph and at least 10 mph above the speed limit adopted for the MSMP—i.e., on drivers traveling at 70 mph or more and at 75 mph or more. In this second table, we present the number (and proportion) of vehicles traveling above these speeds throughout the First *Enhanced* Enforcement Period or the First *Regular* Enhancement Period. We also present the average number of vehicles traveling above these speeds every day. Then, the table presents the decrease in the number of vehicles relative to the number that were traveling at these speeds before the MSMP.

**Table 4.1 (a): ATR-172—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from One Year Earlier**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/ Increase Compared to One Year Earlier
Mean (mph)	65.84339	-0.65048**
Standard deviation (mph)	6.444001	—
Median (mph)	66.56657	—
15 <sup>th</sup> percentile (mph)	61.16661	—
85 <sup>th</sup> percentile (mph)	70.89026	—
90 <sup>th</sup> percentile (mph)	72.42022	—
95 <sup>th</sup> percentile (mph)	73.95017	—
Percent in 10 mph pace	71.5634	+1.9338*
Proportion at 65 mph or more	0.646419	-0.04461**
Proportion at 70 mph or more	0.179094	-0.03600**
Proportion at 75 mph or more	0.015691	-0.00452*
Proportion at 80 mph or more	0.003266	-0.00038*
Proportion at 85 mph or more	0.001180	0.000121*
Vehicle Total	631,126	649,180

**Table 4.1 (b): ATR-172—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.44400*
Median (mph)	66.56657
15 <sup>th</sup> percentile (mph)	61.16661
85 <sup>th</sup> percentile (mph)	70.89026
90 <sup>th</sup> percentile (mph)	72.42022
95 <sup>th</sup> percentile (mph)	73.95017

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.2 (a): ATR-172—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and One Year Earlier**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 70 mph or more	113,031	2,691	-541
Number of vehicles at 75 mph or more	9,903	236	-68
Vehicle Total	631,126	15,027	—

**Table 4.2 (b): ATR-172—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and One Year Earlier**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 70 mph or more	0.179094	0.179094	-0.03600)
Proportion of vehicles at 75 mph or more	0.015691	0.015691	-0.00452
Vehicle Total	631,126	15,027	—

ATR-172—Regular Enforcement Period #1

**Table 4.3 (a): ATR-172—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/Increase Compared to One Year Earlier
Mean (mph)	64.24307	-2.31666**
Percent in 10 mph pace	63.5323	-5.604**
Proportion at 65 mph or more	0.544463	-0.15096**
Proportion at 70 mph or more	0.143322	-0.08057**
Proportion at 75 mph or more	0.01191	-0.00867*
Proportion at 80 mph or more	0.002174	-0.00183*
Proportion at 85 mph or more	0.0006834	-0.00051*
Vehicle Total	357,014	395,218

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.3 (b): ATR-172—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	7.51102*
Median (mph)	65.55421
15 <sup>th</sup> percentile (mph)	58.70125
85 <sup>th</sup> percentile (mph)	69.91676
90 <sup>th</sup> percentile (mph)	71.64833
95 <sup>th</sup> percentile (mph)	73.55074

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.4 (a): ATR-172—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular Enforcement Period #1* and One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 70 mph or more	51,168	1,827	-1,027
Number of vehicles at 75 mph or more	4,252	152	-111
Vehicle Total	357,014	12,751	—

**Table 4.4 (b): ATR-172—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular Enforcement Period #1* and One Year Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 70 mph or more	0.143322	0.143322	-0.08057
Proportion of vehicles at 75 mph or more	0.011910	0.011910	-0.00867
Vehicle Total	357,014	12,751	—

ATR-187—*Enhanced* Enforcement Period #1

**Table 4.5 (a): ATR-187—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/ Increase Compared to One Year Earlier (Two Weeks Only) (9/26/04 to 10/9/04)	Decrease/ Increase Compared to Two Years Earlier (All Six Weeks)	Decrease/ Increase Compared to Three Years Earlier (All Six Weeks)
Mean (mph)	66.85712	-2.82288**	-2.53045**	-2.04073**
Percent in 10 mph pace	61.1284	-12.419**	-9.651**	-5.2874**
Proportion at 65 mph or more	0.718382	-0.13639**	-0.11909**	-0.09216**
Proportion at 70 mph or more	0.320276	-0.17946**	-0.16182**	-0.08693**
Proportion at 75 mph or more	0.064743	-0.03664**	-0.03315**	-0.04783**
Proportion at 80 mph or more	0.015448	-0.00479*	-0.00448*	-0.01668**
Proportion at 85 mph or more	0.002619	-0.000323*	-0.00057*	-0.00267*
Vehicle Total	867,738	302,502	844,339	815,598

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.5 (b): ATR-187—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	8.31172*
Median (mph)	67.74276
15 <sup>th</sup> percentile (mph)	61.50232
85 <sup>th</sup> percentile (mph)	73.33178
90 <sup>th</sup> percentile (mph)	74.31013
95 <sup>th</sup> percentile (mph)	76.49539

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.6 (a): ATR-187—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Number of vehicles at 70 mph or more	277,916	6,617	-3,708	-3,343	-1,796
Number of vehicles at 75 mph or more	56,180	1,338	-757	-685	-988
Vehicle Total	867,738	20,660	—	—	—

**Table 4.6 (b): ATR-187—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and During the Previous Three Years**

Measure	Test Period (9/26/05 to 10/09/05)	Daily Average in Test Period	Decrease/ Increase Compared to One Year Earlier	Decrease/ Increase Compared to Two Years Earlier	Decrease/ Increase Compared to Three Years Earlier
Proportion of vehicles at 70 mph or more	0.320276	0.320276	-0.17946	-0.16182	-0.08693
Proportion of vehicles at 75 mph or more	0.064743	0.064743	-0.03664	-0.03315	-0.04783
Vehicle Total	867,738	20,660	—	—	—



ATR-187—Regular Enforcement Period #1

**Table 4.7 (a): ATR-187—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from Three Previous Years**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/Increase Compared to One Year Earlier	Decrease/Increase Compared to Two Years Earlier	Decrease/Increase Compared to Three Years Earlier
Mean (mph)	67.33856	-2.14892**	-1.84169**	-1.91284**
Percent in 10 mph pace	60.4759	-11.429**	-9.243**	-0.06219**
Proportion at 65 mph or more	0.714927	-0.13162**	-0.11292**	-0.09324**
Proportion at 70 mph or more	0.339603	-0.15905*	-0.12597**	-0.09963**
Proportion at 75 mph or more	0.075616	-0.02292*	-0.01506*	-0.04071**
Proportion at 80 mph or more	0.016371	<i>ns</i>	+0.000592*	-0.00962*
Proportion at 85 mph or more	0.003088	+0.00074*	+0.000918*	-0.00093*
Vehicle Total	499,669	495,957	511,960	517,738

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.7 (b): ATR-187—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	7.44965*
Median (mph)	67.86322
15 <sup>th</sup> percentile (mph)	61.60747
85 <sup>th</sup> percentile (mph)	73.59114
90 <sup>th</sup> percentile (mph)	74.53816
95 <sup>th</sup> percentile (mph)	77.16187

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.8 (a): ATR-187—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 70 mph or more	169,689	7,409	-2,838	-2,248	-1,778
Number of vehicles at 75 mph or more	37,783	1,349	-409	-269	-458
Vehicle Total	499,669	17,845	—	—	—

**Table 4.8 (b): ATR-187—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular Enforcement Period #1* and During the Previous Three Years**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 70 mph or more	0.339603	0.339603	-0.15905	-0.12597	-0.09963
Proportion of vehicles at 75 mph or more	0.075616	0.075616	-0.02292	-0.01506	-0.04071
Vehicle Total	499,669	17,845	—	—	—

**Table 4.9 (a): ATR-188—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from One and Three Years Earlier**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/ Increase Compared to One Year Earlier (All Six Weeks)	Decrease/Increase Compared to Three Years Earlier (Two Weeks Only 9/26/02 to 10/9/02)
Mean (mph)	67.25068	+2.7003864**	+1.370540192**
Percent in 10 mph pace	59.5264	+9.7142241**	<i>ns</i>
Proportion at 65 mph or more	0.686093	+0.129429184**	+0.081607893**
Proportion at 70 mph or more	0.331422	+0.058427762**	+0.087972263**
Proportion at 75 mph or more	0.080797	+0.013840974*	+0.023396608*
Proportion at 80 mph or more	0.008973	+0.001081868*	-0.011583414*
Proportion at 85 mph or more	0.001895	<i>ns</i>	-0.005468*
Vehicle Total	1,235,082	1,238,782	383,098

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.9 (b): ATR-188—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.99324*
Median (mph)	67.62346
15 <sup>th</sup> percentile (mph)	61.47329
85 <sup>th</sup> percentile (mph)	73.61939
90 <sup>th</sup> percentile (mph)	74.6169
95 <sup>th</sup> percentile (mph)	77.14391

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.10 (a): ATR-188—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and One and Three Years Earlier**

<b>Measure</b>	<b>Test Period (9/26/05 to 10/09/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 70 mph or more	409,333	9,746	+1,718	+2587
Number of vehicles at 75 mph or more	99,791	2,376	+407	+688
Vehicle Total	1,235,082	29,407	—	—

**Table 4.10 (b): ATR-188—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and One and Three Years Earlier**

<b>Measure</b>	<b>Test Period (9/26/05 to 10/09/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 70 mph or more	0.331422	0.331422	+0.058428	+0.087972
Proportion of vehicles at 75 mph or more	0.080797	0.080797	+0.013841	+0.023397
Vehicle Total	1,235,082	29,407	—	—

**Table 4.11 (a): ATR-188—Comparison of Speed Data from Regular Enforcement Period #1 with Speed Data from One and Three Years Earlier**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/Increase Compared to One Year Earlier (All Four Weeks)	Decrease/Increase Compared to Three Years Earlier (Two Weeks Only 11/14/02 to 11/27/02)
Mean (mph)	66.33459	+0.385291**	+0.823166**
Percent in 10 mph pace	57.1597	+1.4748*	-5.626*
Proportion at 65 mph or more	0.640717	+0.019794*	+0.054764*
Proportion at 70 mph or more	0.299467	-0.00164*	+0.089262**
Proportion at 75 mph or more	0.070606	-0.00267*	+0.02402*
Proportion at 80 mph or more	0.007879	-0.00058*	-0.00863*
Proportion at 85 mph or more	0.001716	<i>ns</i>	-0.00525*
Vehicle Total	783,067	802,496	391,921

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.11 (b): ATR-188—Additional Speed Data from Regular Enforcement Period #1**

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	7.70161*
Median (mph)	67.06179
15 <sup>th</sup> percentile (mph)	60.46789
85 <sup>th</sup> percentile (mph)	73.26545
90 <sup>th</sup> percentile (mph)	74.35782
95 <sup>th</sup> percentile (mph)	76.64251

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.12 (a): ATR-188—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular Enforcement Period #1* and One and Three Years Earlier**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Number of vehicles at 70 mph or more	234,503	8,375	-46	+2,496
Number of vehicles at 75 mph or more	55,289	1,975	-75	+672
Vehicle Total	783,067	27,967	—	—

**Table 4.12 (b): ATR-188—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular Enforcement Period #1* and One and Three Years Earlier**

<b>Measure</b>	<b>Test Period (11/07/05 to 12/04/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Three Years Earlier</b>
Proportion of vehicles at 70 mph or more	0.299467	(0.299467)	-0.00164	+0.089262
Proportion of vehicles at 75 mph or more	0.07061	0.07061	-0.00267	+0.02402
Vehicle Total	783,067	27,967	—	—

**Table 4.13: ATR-197—Comparison of Speed Data from *Enhanced* Enforcement Period #1 with Speed Data from the Previous Two Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/Increase Compared to One Year Earlier (All Six Weeks)	Decrease/Increase Compared to Two Years Earlier (Two Weeks Only) (9/26/04 to 10/9/04)
Mean (mph)	65.08723	-0.99269**	-0.15146**
Percent in 10 mph pace	67.5675	+1.2668*	+0.042377*
Proportion at 65 mph or more	0.564961	-0.07234**	-0.02573*
Proportion at 70 mph or more	0.180133	-0.04323**	-0.03802*
Proportion at 75 mph or more	0.020928	-0.00804*	-0.01199*
Proportion at 80 mph or more	0.004972	-0.00183*	-0.00419*
Proportion at 85 mph or more	0.001363	<i>ns</i>	-0.00141*
Vehicle Total	198,104	205,637	66,718

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.13 (b): ATR-197—Additional Speed Data from *Enhanced* Enforcement Period #1**

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.90683*
Median (mph)	65.84402
15 <sup>th</sup> percentile (mph)	60.13891
85 <sup>th</sup> percentile (mph)	70.94635
90 <sup>th</sup> percentile (mph)	72.51666
95 <sup>th</sup> percentile (mph)	74.08697

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.14 (a): ATR-197—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and During the Previous Two Years**

<b>Measure</b>	<b>Test Period (9/26/05 to 10/09/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>
Number of vehicles at 70 mph or more	35,685	850	-204	179
Number of vehicles at 75 mph or more	4,146	99	-38	-57
Vehicle Total	198,104	4,717	—	—

**Table 4.14 (b): ATR-197—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Enhanced* Enforcement Period #1 and During the Previous Two Years**

<b>Measure</b>	<b>Test Period (9/26/05 to 10/09/05)</b>	<b>Daily Average in Test Period</b>	<b>Decrease/ Increase Compared to One Year Earlier</b>	<b>Decrease/ Increase Compared to Two Years Earlier</b>
Proportion of vehicles at 70 mph or more	0.18013	0.18013	-0.04323	-0.03802
Proportion of vehicles at 75 mph or more	0.02093	0.02093	-0.00804	-0.01199
Vehicle Total	198,104	4,717	—	—



ATR-197—Regular Enforcement Period #1

**Table 4.15 (a): ATR-197—Comparison of Speed Data from *Regular Enforcement Period #1* with Speed Data from the One Year Earlier (for the 9/26/04 to 11/6/04 Time Period)**

Measure	Test Period (11/07/05 to 12/04/05)	Decrease/Increase Compared to One Year Earlier (9/26/04 to 11/6/04)
Mean (mph)	64.33675	-1.74316**
Percent in 10 mph pace	63.1549	-3.1458*
Proportion at 65 mph or more	0.518121	-0.119177**
Proportion at 70 mph or more	0.161334	-0.06203**
Proportion at 75 mph or more	0.017749	-0.011215*
Proportion at 80 mph or more	0.003921	-0.002877*
Proportion at 85 mph or more	0.000948	-0.000589*
Vehicle Total	123,446	205,637

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.15 (b): ATR-197—Additional Speed Data from *Enhanced Enforcement Period #1***

Measure	Test Period (11/07/05 to 12/04/05)
Standard deviation (mph)	7.41892*
Median (mph)	65.25395
15 <sup>th</sup> percentile (mph)	58.86595
85 <sup>th</sup> percentile (mph)	70.39467
90 <sup>th</sup> percentile (mph)	72.1358
95 <sup>th</sup> percentile (mph)	73.87693

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]

**Table 4.16 (a): ATR-197—Comparison of the Daily Average Number of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular* Enforcement Period #1 with Speed Data from One Year Earlier (for the 9/26/04 to 11/6/04 Time Period)**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Number of vehicles at 70 mph or more	19,916	711	-273
Number of vehicles at 75 mph or more	2,191	78	-49
Vehicle Total	123,446	4,409	

**Table 4.16 (b): ATR-197—Comparison of the Proportion of Vehicles Traveling at Least 5 mph and at Least 10 mph Above the New Speed Limit (of 65 mph) During *Regular* Enforcement Period #1 with Speed Data from One Year Earlier (for the 9/26/04 to 11/6/04 Time Period)**

Measure	Test Period (11/07/05 to 12/04/05)	Daily Average in Test Period	Decrease/Increase Compared to One Year Earlier
Proportion of vehicles at 70 mph or more	0.16133	0.16133	-0.06203
Proportion of vehicles at 75 mph or more	0.01775	0.01775	-0.011215
Vehicle Total	123,446	4,409	

#### 4.2. Speed Data from One ATR located Outside Enhanced Enforcement Zones

There was one ATR located on a 4-Lane Divide Highway *Outside* the Enhanced Enforcement Zones. It was ATR-353, on MNTH-169 near Jordan in Scott County. There were *no changes* in enforcement at this location. For this ATR, the speed data obtained during 2005, when the MSMP occurred, was compared with historical speed data. Comparisons are presented for the six-week time period between 9/26 and 11/6, when the First *Enhanced* Enforcement Period occurred during the MSMP, and then for the four-week time period between 11/7 and 12/4, when the First *Regular* Enhancement Period occurred.

Two tables are presented for each of these time periods. In the first table, speed data from the Test Year is compared with historical speed data. Speed data was only available for the two years prior to the MSMP for ATR-353. In the second of the two tables, the focus is on drivers who were traveling at least 5 mph and at least 10 mph above the speed limit—i.e., drivers traveling at 70 mph or more and at 75 mph or more. In this second table, we present the number (and proportion) of vehicles traveling above these speeds throughout the First *Enhanced* Enforcement Period or the First *Regular* Enhancement

Period. We also present the average number of vehicles traveling above these speeds every day. Then, the table presents the decrease in the number of vehicles relative to the number that were traveling at these speeds in the two years prior to the implementation of the MSMP.

ATR-353—Enhanced Enforcement Period #1

**Table 4.17 (a): ATR-353—Comparison of Speed Data from *Enhanced Enforcement Period #1* with Speed Data from the Two Prior Years**

Measure	Test Period (9/26/05 to 11/6/05)	Decrease/Increase Compared to One Year Earlier	Decrease/Increase Compared to Two Years Earlier
Mean (mph)	67.387564	-0.58224**	-0.61774**
Percent in 10 mph pace	66.00213	-0.9655*	-0.54445*
Proportion at 65 mph or more	0.7416016	-0.04242**	-0.03569*
Proportion at 70 mph or more	0.3216334	-0.05554**	-0.05673**
Proportion at 75 mph or more	0.0350131	-0.01283*	-0.01346*
Proportion at 80 mph or more	0.0044905	-0.00206*	-0.00246*
Proportion at 85 mph or more	0.00072128	-0.00026*	-0.0004*
Vehicle Total	958,013	980,861	952,971

\*\*Statistically significant using the highly conservative correction.

\*Statistically significant using the statistical tests in the traditional way.

**Table 4.17 (b): ATR-353—Additional Speed Data from *Enhanced Enforcement Period #1***

Measure	Test Period (9/26/05 to 11/6/05)
Standard deviation (mph)	6.27442*
Median (mph)	67.876428
15 <sup>th</sup> percentile (mph)	62.255657
85 <sup>th</sup> percentile (mph)	72.99409
90 <sup>th</sup> percentile (mph)	73.866324
95 <sup>th</sup> percentile (mph)	74.738558

\*Statistical comparisons of standard deviations are rarely performed—such a comparison was not necessary for this project.

[Please Note: Statistical comparisons are inherently unreliable for the other measures in this Table because the speed data are collected in 5-mph and 15-mph bins and no differentiation within bins is possible.]







































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































