



Maryland Rates

1994-2004

Office of Traffic and Safety
Traffic Analysis Division

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Executive Summary

Accident data drives the highway safety program management function and lets us work in the light of day pursuant to Title 23 of the CFR and the COMAR which states that Maryland State Police is the owner of the accident data. SHA pays MSP for copies of the accident data to do various engineering analysis for pending highway projects. The accident and fatality rates found in this book have been compiled for state legislative, BMC, and MPO customers whom may desire to view the last 11 years of accident rates data from 1994-2004. This book was intended for use in statewide and regional urban / rural transportation decision-making after a briefing with the BMC in 2002. There is no cost benefits nor countermeasure data included herein but these are available in other accident information products upon request. The rates data are offered in three formats which show the trends in rates for 10 year and 5 year periods. The Maryland fatality rate (1.2) is currently slightly below the national fatality rate of 1.5 per million VMT. All rates equations are entered in MS Excel using the following normalization standard formulas:

$$R = O / E * 100 \quad (\text{Vehicle Miles Traveled}) \text{ or}$$

$$R = O / E * 10,000 \quad (\text{Population, Licensed Drivers, Registered Vehicles})$$

Where R = Rate, O = Occurrences, E = Exposure

Summary statistics were generated using Oracle functions for standard deviation, variance, average, maximum, and minimum on various summary tables loaded with rates data. The rates were computed in MS Excel before loading to Oracle tables for online statistical analysis. Confidence intervals were not computed nor was there any hypothesis testing, critical rates, or severity rates used in this data abstract.

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For any comments or questions on the enclosed data please contact:

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Summary Statistics

This section has data and statistics that describe the Exposure data and Fatal Rates from 1990-2004. The statistics were generated from Oracle tables for Exposures and Fatal Rates from 1990-2004. The statistics of central tendency included in this section are mean (average), standard deviations, variances, minimums and maximums. The statistics were loaded into a table for exposure data by county for VMT, population, licensed drivers, and registered vehicles and then computed using Oracle PL/SQL commands. The Fatal Rates were also loaded into an Oracle table and likewise computations performed against the data giving the same statistics using Oracle functions. The limitations in this method are that the Oracle functions are not as inclusive as the MS Excel function set. However, the Oracle data tables are computed much faster than the Excel data once the data is loaded. Neither software product is as specialized as Minitab, SAS, Easytrieve, or SPSS for correlations, ANOVA, Crosstabs, and hypothesis testing with confidence intervals for detailed statistical analysis on datasets. It is hoped that these basic Oracle statistics may be used for comparison purposes of the exposure data and fatal rates on which this booklet is based. The following data element name abbreviation apply for these statistics:

VMT = Vehicle Miles Traveled (SHA)
MPO_POP = Maryland Planning Office Population
MVA_LD = Motor Vehicle Administration Licensed Drivers
MVA_RV = Motor Vehicle Administration Registered Vehicles

County Codes Legend

1 = Allegany
2 = Anne Arundel
3 = Baltimore
4 = Calvert
5 = Caroline
6 = Carroll
7 = Cecil
8 = Charles
9 = Dorchester
10 = Frederick
11 = Garrett
12 = Harford
13 = Howard
14 = Kent
15 = Montgomery
16 = Prince George's
17 = Queen Anne's
18 = St. Mary's
19 = Somerset
20 = Talbot
21 = Washington
22 = Wicomico
23 = Worcester
24 = Baltimore City

Cumulative Exposure Data 1990-2004

YEAR	SUM (VMT)	SUM (MPO_POP)	SUM (MVA_LD)	SUM (MVA_RV)
1990	40537	4797556	3333736	3503391
1991	41348	4356578	3401569	3499450
1992	41809	4904117	3233232	3486900
1993	43339	4944742	3272452	3591298
1994	44201	4988585	3307469	3686286
1995	44918	5033125	3343686	3719253
1996	45945	5057142	3377069	3780523
1997	46992	5092914	3387427	3885226
1998	48434	5130072	3762233	3969290
1999	49135	5171634	3584182	4058961
2000	50297	5296486	3588048	4186971
2001	52019	5375516	3625540	4347733
2002	53760	5417448	3684268	4393916
2003	54678	5508909	3763031	4481302
2004	55119	5558058	3820114	4562428

Cumulative Exposure Data by County 1990-2004

COUNTY	SUM (VMT)	SUM (MPO_POP)	SUM (MVA_LD)	SUM (MVA_RV)
1	11958	1106710	765869	907066
2	71853	7064250	5092303	6385299
3	107892	10942984	7995912	8889919
4	8691	1032134	697394	967093
5	4887	438065	354747	433241
6	16277	2175954	1582946	2084479
7	15769	1228609	869927	1079079
8	15194	1748521	1207593	1517175
9	5540	453585	323249	419549
10	33737	2759555	1992845	2552959
11	7095	441565	302269	399691
12	29668	3158116	2290530	2735640
13	41234	3443736	2560206	3016581
14	3420	283646	204489	278242
15	98102	12570091	9334395	9425459
16	110860	11677126	7484483	8173916
17	11362	583860	424789	585541
18	9880	1269944	767556	1020045
19	4160	371234	248297	321822
20	7766	492938	375898	500153
21	24492	1934526	1331066	1671509
22	11603	1212222	848280	1051565
23	8961	636777	521182	672981
24	52130	9606734	4907831	4063924

Cumulative Average Exposure Data 1990–2004

YEAR	AVG (VMT)	AVG (MPO_POP)	AVG (MVA_LD)	AVG (MVA_RV)
1990	1689.04167	199898.167	138905.667	145974.625
1991	1722.83333	181524.083	141732.042	145810.417
1992	1742.04167	204338.208	134718	145287.5
1993	1805.79167	206030.917	136352.167	149637.417
1994	1841.70833	207857.708	137811.208	153595.25
1995	1871.58333	209713.542	139320.25	154968.875
1996	1914.375	210714.25	140711.208	157521.792
1997	1958	212204.75	141142.792	161884.417
1998	2018.08333	213753	156759.708	165387.083
1999	2047.29167	215484.75	149340.917	169123.375
2000	2095.70833	220686.917	149502	174457.125
2001	2167.45833	223979.833	151064.167	181155.542
2002	2240	225727	153511.167	183079.833
2003	2278.25	229537.875	156792.958	186720.917
2004	2296.625	231585.75	159171.417	190101.167

Cumulative Average Exposure Data by County 1990–2004

COUNTY	AVG (VMT)	AVG (MPO_POP)	AVG (MVA_LD)	AVG (MVA_RV)
1	797.2	73780.6667	51057.9333	60471.0667
2	4790.2	470950	339486.867	425686.6
3	7192.8	729532.267	533060.8	592661.267
4	579.4	68808.9333	46492.9333	64472.8667
5	325.8	29204.3333	23649.8	28882.7333
6	1085.13333	145063.6	105529.733	138965.267
7	1051.26667	81907.2667	57995.1333	71938.6
8	1012.93333	116568.067	80506.2	101145
9	369.333333	30239	21549.9333	27969.9333
10	2249.13333	183970.333	132856.333	170197.267
11	473	29437.6667	20151.2667	26646.0667
12	1977.86667	210541.067	152702	182376
13	2748.93333	229582.4	170680.4	201105.4
14	228	18909.7333	13632.6	18549.4667
15	6540.13333	838006.067	622293	628363.933
16	7390.66667	778475.067	498965.533	544927.733
17	757.466667	38924	28319.2667	39036.0667
18	658.666667	84662.9333	51170.4	68003
19	277.333333	24748.9333	16553.1333	21454.8
20	517.733333	32862.5333	25059.8667	33343.5333
21	1632.8	128968.4	88737.7333	111433.933
22	773.533333	80814.8	56552	70104.3333
23	597.4	42451.8	34745.4667	44865.4
24	3475.33333	640448.933	327188.733	270928.267

Annual Standard Deviations Exposure Data 1990-2004

YEAR	STDDEV (VMT)	STDDEV (MPO_POP)	STDDEV (MVA_LD)	STDDEV (MVA_RV)
1990	1951.67327	257359.934	177012.72	175899.433
1991	1983.79712	233537.794	180378.158	173732.214
1992	2015.36987	260159.841	168536.798	171771.329
1993	2110.4766	260847.299	169641.004	175594.383
1994	2151.28757	261506.342	170848.622	179662.222
1995	2168.54601	261893.582	172611.747	180876.825
1996	2219.94373	262384.813	173850.816	183044.148
1997	2235.13003	262954.24	174381.783	186613.481
1998	2269.89663	263915.019	195009.123	189442.368
1999	2288.65861	265024.476	182695.402	193013.893
2000	2331.03949	272896.251	184227.486	199186.482
2001	2404.25297	275772.033	186173.493	205866.817
2002	2479.76994	277967.94	189555.278	207226.774
2003	2583.77146	281178.347	190116.903	209641.214
2004	2590.41542	282392.229	192355.145	212293.837

Annual Variances of Exposure Data 1990-2004

YEAR	VARIANCE (VMT)	VARIANCE (MPO_POP)	VARIANCE (MVA_LD)	VARIANCE (MVA_RV)
1990	3809028.56	6.6234E+10	3.1334E+10	3.0941E+10
1991	3935451.01	5.4540E+10	3.2536E+10	3.0183E+10
1992	4061715.69	6.7683E+10	2.8405E+10	2.9505E+10
1993	4454111.48	6.8041E+10	2.8778E+10	3.0833E+10
1994	4628038.22	6.8386E+10	2.9189E+10	3.2279E+10
1995	4702591.82	6.8588E+10	2.9795E+10	3.2716E+10
1996	4928150.16	6.8846E+10	3.0224E+10	3.3505E+10
1997	4995806.26	6.9145E+10	3.0409E+10	3.4825E+10
1998	5152430.69	6.9651E+10	3.8029E+10	3.5888E+10
1999	5237958.22	7.0238E+10	3.3378E+10	3.7254E+10
2000	5433745.09	7.4472E+10	3.3940E+10	3.9675E+10
2001	5780432.35	7.6050E+10	3.4661E+10	4.2381E+10
2002	6149258.96	7.7266E+10	3.5931E+10	4.2943E+10
2003	6675874.98	7.9061E+10	3.6144E+10	4.3949E+10
2004	6710252.07	7.9745E+10	3.7001E+10	4.5069E+10

Annual Minimums and Maximum Exposure Data 1990-2004

YEAR	Veh Miles Trav		Population		Licensed Drivers		Registered Vehicles	
	MIN (VMT)	MAX (VMT)	MIN (MPO_POP)	MAX (MPO_POP)	MIN (MVA_LD)	MAX (MVA_LD)	MIN (MVA_RV)	MAX (MVA_RV)
1990	225	6451	17864	764551	12795	569608	15531	569191
1991	230	6555	18120	773284	13177	589602	16223	564886
1992	227	6681	18436	783399	12991	566997	15502	561784
1993	209	6826	18480	793980	13115	576356	16206	576892
1994	206	6939	18645	801680	13180	584791	16566	593307
1995	203	6981	18765	810065	13330	594211	17006	598020
1996	205	7162	18848	818753	13483	599853	17127	605950
1997	226	7249	18982	828617	13467	603109	17702	618953
1998	238	7306	19002	839158	14015	669185	18255	629888
1999	248	7513	19089	852174	13607	626787	18541	643979
2000	240	7724	19197	873341	13705	653409	19088	664280
2001	246	8030	19532	891347	13748	662433	19663	687494
2002	256	8241	19424	899171	13785	677965	18925	699411
2003	228	8631	19680	918881	13959	675740	19251	705969
2004	233	8658	19582	921690	13982	684349	19532	713721

Annual Average Fatal Rates by Year 1990–2004

YEAR	AVG (VMT_RATE)	AVG (POP_RATE)	AVG (LD_RATE)	AVG (RV_RATE)
1990	2.183333333	2.241666667	3.216666667	2.7625
1991	2.258333333	2.5	3.391666667	2.9125
1992	1.87826087	1.95217391	2.83478261	2.35652174
1993	1.95	2.02916667	2.970833333	2.4625
1994	1.995833333	2.1625	3.108333333	2.55
1995	2	2.075	3.066666667	2.4875
1996	1.875	2.10416667	3.0125	2.470833333
1997	1.6875	1.883333333	2.6875	2.125
1998	1.4625	1.658333333	2.375	1.92916667
1999	1.508333333	1.683333333	2.37916667	1.870833333
2000	1.441666667	1.691666667	2.395833333	1.845833333
2001	1.5875	1.908333333	2.758333333	2.045833333
2002	1.3375	1.591666667	2.2875	1.67916667
2003	1.466666667	1.683333333	2.366666667	1.775
2004	1.4	1.620833333	2.275	1.695833333

Annual Average Fatal Rates by County 1990–2004

COUNTY	AVG (VMT_RATE)	AVG (POP_RATE)	AVG (LD_RATE)	AVG (RV_RATE)
1	1.273333333	1.346666667	1.94	1.653333333
2	1.2	1.21428571	1.68571429	1.35
3	1.1	1.08	1.466666667	1.313333333
4	1.76	1.486666667	2.26	1.586666667
5	2.993333333	3.266666667	4.326666667	3.38
6	2.066666667	1.513333333	2.1	1.613333333
7	2.16	2.74	3.853333333	3.14
8	2.526666667	2.173333333	3.16	2.553333333
9	1.92	2.36	3.306666667	2.546666667
10	1.326666667	1.58	2.186666667	1.74
11	2.12	3.333333333	4.866666667	3.806666667
12	1.406666667	1.326666667	1.833333333	1.533333333
13	.886666667	1.026666667	1.393333333	1.186666667
14	1.753333333	2.1	2.926666667	2.16
15	.94	.74	.9933333333	.9733333333
16	1.54	1.446666667	2.26	2.073333333
17	1.646666667	3.133333333	4.32	3.173333333
18	2.473333333	1.88	3.28	2.526666667
19	2.04	2.233333333	3.906666667	3.053333333
20	1.86	2.84	3.746666667	2.86
21	1.28	1.606666667	2.326666667	1.86
22	1.68	1.606666667	2.273333333	1.86
23	2.166666667	3.066666667	3.726666667	2.906666667
24	1.486666667	.906666667	1.586666667	1.833333333

Annual Standard Deviation Fatal Rates by Year 1990–2004

YEAR	STDDEV (VMT_RATE)	STDDEV (POP_RATE)	STDDEV (LD_RATE)	STDDEV (RV_RATE)
1990	.937928646	1.02487185	1.61774579	1.34352311
1991	.957767634	1.23675592	1.77932979	1.34400844
1992	.753148858	.855925637	1.16992956	.944758789
1993	.970880371	1.21493574	1.73292393	1.3341053
1994	.782681659	1.20823713	1.66705068	1.22367941
1995	.907936025	.997932646	1.56223548	1.15807655
1996	1.32345069	1.79987419	2.53331069	2.03501504
1997	.78258907	1.0457644	1.38479711	.998368234
1998	.51652055	.763240612	1.29824296	.88929829
1999	.862713952	1.05528346	1.4249269	1.05602996
2000	.618495135	.908374883	1.20703704	.841313242
2001	.626454829	1.02910542	1.52826035	1.01637855
2002	.533904812	.738927935	1.00230712	.700918135
2003	.710582533	1.03867251	1.41840899	.942821851
2004	.593442426	.873264324	1.15051973	.75899199

Annual Maximum Fatal Rates by Year 1990–2004

YEAR	MAX (VMT_RATE)	MAX (POP_RATE)	MAX (LD_RATE)	MAX (RV_RATE)
1990	5	5.1	8.8	7.7
1991	4.4	5.5	7.6	5.7
1992	3.5	3.7	5.2	4.3
1993	4.6	5.4	7.3	5.8
1994	3.9	5	6.9	5.1
1995	4	4.1	6.7	5.1
1996	5.8	7.8	11.4	9.5
1997	3.5	4.3	5.7	4.3
1998	2.6	3.3	5.5	4.2
1999	3.4	4	5.6	4.4
2000	2.8	3.4	4.5	3.3
2001	3	3.9	6.5	4.6
2002	2.3	3.1	4.3	3.2
2003	3.3	5.3	7.4	5.1
2004	3.1	4	5.5	3.8

Annual Minimum Fatal Rates by Year 1990–2004

YEAR	MIN (VMT_RATE)	MIN (POP_RATE)	MIN (LD_RATE)	MIN (RV_RATE)
1990	.8	.7	1.1	1.1
1991	1.2	.9	1.2	1.2
1992	.8	.8	1.1	1.1
1993	.8	.7	.9	.8
1994	.8	.8	1.1	1
1995	.6	.7	1	.8
1996	.4	.3	.4	.3
1997	.8	.7	.9	.9
1998	.7	.5	.7	.6
1999	0	0	0	0
2000	0	0	0	0
2001	.6	.7	.9	.9
2002	.6	.5	.9	.6
2003	.4	.5	.7	.5
2004	.5	.4	.6	.4

Annual Variances of Fatal Rates by Year 1990-2004

YEAR	VARIANCE (VMT_RATE)	VARIANCE (POP_RATE)	VARIANCE (LD_RATE)	VARIANCE (RV_RATE)
1990	.879710145	1.05036232	2.61710145	1.80505435
1991	.917318841	1.52956522	3.16601449	1.8063587
1992	.567233202	.732608696	1.36873518	.89256917
1993	.942608696	1.47606884	3.00302536	1.77983696
1994	.61259058	1.45983696	2.77905797	1.4973913
1995	.824347826	.995869565	2.44057971	1.3411413
1996	1.75152174	3.2395471	6.41766304	4.14128623
1997	.612445652	1.09362319	1.91766304	.99673913
1998	.266793478	.582536232	1.68543478	.790851449
1999	.744275362	1.11362319	2.03041667	1.11519928
2000	.382536232	.825144928	1.45693841	.707807971
2001	.392445652	1.05905797	2.33557971	1.03302536
2002	.285054348	.546014493	1.00461957	.491286232
2003	.504927536	1.07884058	2.01188406	.888913043
2004	.352173913	.76259058	1.32369565	.576068841