

Texas Mileage Study: Relationship Between Annual Mileage and Insurance Losses Progressive Insurance – December, 2005

Purpose

In accordance with the Pay-As-You-Drive Insurance Pilot Program sponsored by the North Central Texas Council of Government (NCTCOG), Progressive Insurance agreed to provide a statistical analysis determining the correlation of vehicle mileage and insurance losses as Phase I of the PAYD study.

Methodology

Progressive provided 700,996 Vehicle Identification Numbers (VIN) of vehicles insured by Progressive from 2002 – 2005 in the North Central Texas nine-county ozone non-attainment area to which the NCTCOG appended odometer readings recorded during vehicle inspections from the NED database.

Annualized vehicle mileage was calculated and the inspection dates were compared to Progressive vehicle effective dates to ensure that the calculated mileages corresponded to Progressive risk exposure periods. A period of 30 days before or after an effective date was permitted provided one odometer reading was contained in the Progressive exposure period. Annual mileage calculations that passed these criteria were then appended to the premium and loss data housed in Progressive's internal data warehouse. 203,941 vehicles remained and were included in this analysis.

Bodily Injury, Property Damage, and Collision coverages were included in the analysis. It is common practice to analyze coverage separately. Bodily Injury indemnifies the insured for injuries to others involved in an accident. Property Damage indemnifies the insured for any property damage to others as a result of an accident. Collision provides coverage for damage done to the insured vehicle.

Frequency is a statistic often used to establish a relationship between characteristics and insurance losses.

$$Frequency = \frac{\# \text{ of Insurance Features}}{\text{Earned Car Year}}$$

where an Earned Car Year = One year of indemnity for one vehicle

Results

Data were separated into twenty annual mileage groups having the same number of earned car years in both. Positive correlation between annual mileage and frequency exists in all three coverage options.

The total earned car years for collision differ for the totals for bodily injury and property damage because vehicles are not required to purchase collision coverage. Because the groups are divided into equal numbers of earned car years, annual mileage break points will also vary between the coverages.

**Texas Mileage Study:
Relationship Between Annual Mileage and Insurance Losses
Progressive Insurance – December, 2005**

Frequency relativities range from approximately .5 to 1.5. The lowest annual mileage groups have nearly half the number of claims as the total sample. The highest annual mileage groups have one and a half as many claims as the total sample.

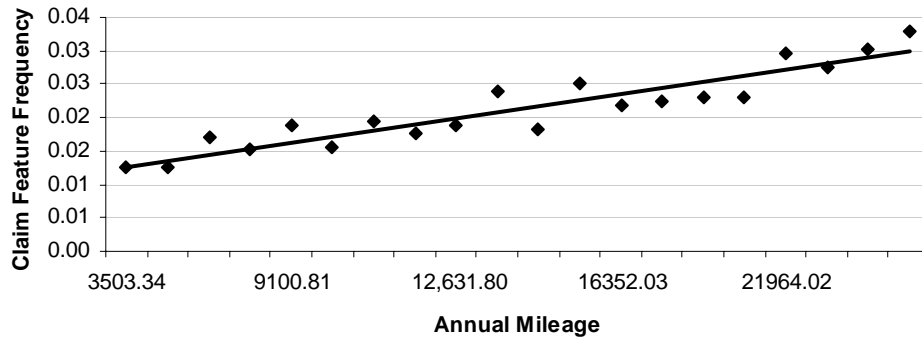
In general, vehicles driven fewer miles have fewer insurance claims than vehicles driven more miles.

“Goodness of fit” statistics are good for all three coverage options ($R^2 > .82$).

Results are provided below.

Texas Mileage Study: Relationship Between Annual Mileage and Insurance Losses Progressive Insurance – December, 2005

North Central Texas Vehicle Annual Mileage Data
Bodily Injury Coverage

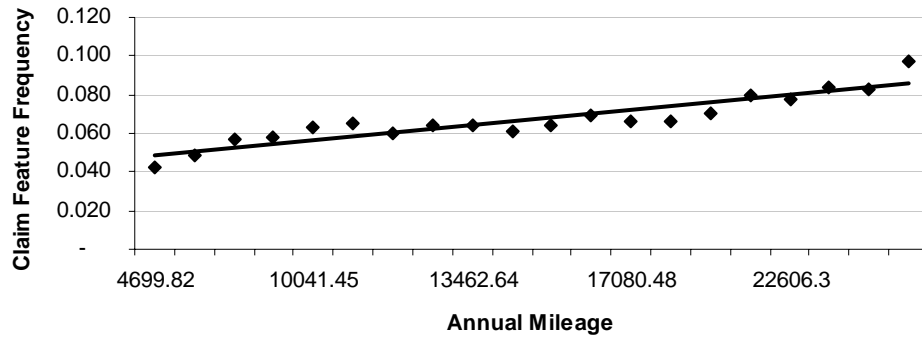


Bodily Injury

Annual Mileage	ECY	Loss#	Claims Frequency	Frequency Relativity
<=3,503	8,071	102	0.013	0.59
5,505	8,072	102	0.013	0.59
6,922	8,071	137	0.017	0.80
8,093	8,072	123	0.015	0.72
9,101	8,071	151	0.019	0.88
10,031	8,072	126	0.016	0.73
10,911	8,071	157	0.019	0.91
11,772	8,071	142	0.018	0.83
12,632	8,071	152	0.019	0.88
13,509	8,071	193	0.024	1.12
14,412	8,070	147	0.018	0.86
15,346	8,070	202	0.025	1.18
16,352	8,073	177	0.022	1.03
17,443	8,071	181	0.022	1.05
18,687	8,071	185	0.023	1.08
20,134	8,072	187	0.023	1.09
21,964	8,071	238	0.029	1.39
24,515	8,070	222	0.028	1.29
28,981	8,072	245	0.030	1.43
>28,981	8,071	266	0.033	1.55
Total	161,424	3,435	0.021	1.00

Texas Mileage Study: Relationship Between Annual Mileage and Insurance Losses Progressive Insurance – December, 2005

North Central Texas Vehicle Annual Mileage Data
Collision Coverage

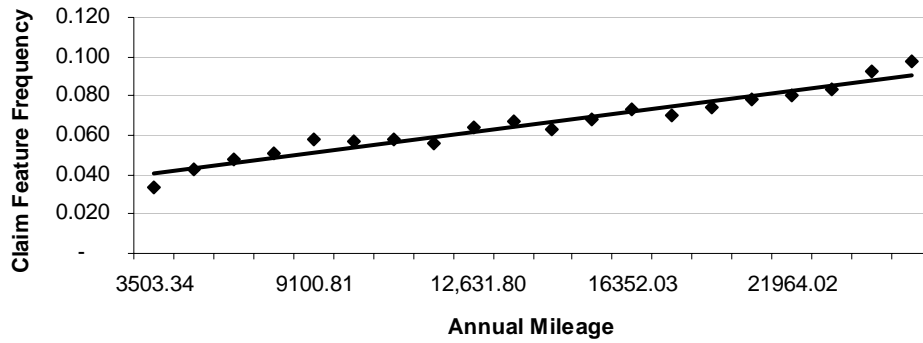


Collision

Annual Mileage	ECY	Loss#	Claims Frequency	Frequency Relativity
<=4,700	6,011	257	0.043	0.64
6,623	6,011	292	0.049	0.72
7,975	6,011	344	0.057	0.85
9,073	6,011	351	0.058	0.87
10,041	6,010	378	0.063	0.94
10,926	6,011	393	0.065	0.98
11,781	6,011	358	0.060	0.89
12,618	6,010	386	0.064	0.96
13,463	6,013	383	0.064	0.95
14,314	6,009	368	0.061	0.91
15,184	6,010	387	0.064	0.96
16,102	6,011	419	0.070	1.04
17,080	6,010	397	0.066	0.99
18,150	6,012	395	0.066	0.98
19,374	6,012	423	0.070	1.05
20,803	6,009	478	0.080	1.19
22,606	6,012	467	0.078	1.16
25,082	6,010	502	0.084	1.25
29,445	6,012	496	0.082	1.23
>29,445	6,009	586	0.098	1.45
Total	120,217	8,060	0.067	1.00

Texas Mileage Study: Relationship Between Annual Mileage and Insurance Losses Progressive Insurance – December, 2005

North Central Texas Vehicle Annual Mileage Data
Property Damage Coverage



Property Damage				
Annual Mileage	ECY	Loss#	Claims Frequency	Frequency Relativity
<3,503	8,071	274	0.034	0.52
5,505	8,072	342	0.042	0.65
6,922	8,071	386	0.048	0.73
8,093	8,072	408	0.051	0.77
9,101	8,071	467	0.058	0.88
10,031	8,072	456	0.056	0.86
10,911	8,071	467	0.058	0.88
11,772	8,071	450	0.056	0.85
12,632	8,071	515	0.064	0.97
13,509	8,071	540	0.067	1.02
14,412	8,070	507	0.063	0.96
15,346	8,070	549	0.068	1.04
16,352	8,073	587	0.073	1.11
17,443	8,071	570	0.071	1.08
18,687	8,071	596	0.074	1.12
20,134	8,072	628	0.078	1.19
21,964	8,071	648	0.080	1.22
24,515	8,070	669	0.083	1.26
28,981	8,072	751	0.093	1.42
>28,981	8,071	788	0.098	1.49
Total	161,423	10,598	0.066	1.00