THE ADVANTAGES OF CALENDAR-ACCIDENT YEAR EXPERIENCE AND THE NEED FOR APPROPRIATE TREND AND PROJECTION FACTORS IN THE DETERMINATION OF AUTOMOBILE LIABILITY RATES

BY
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The basic principles for automobile liability insurance rate making have been well presented by Mr. Philipp K. Stern in his paper "Current Rate Making Procedures in Automobile Liability Insurance."* The principles and procedures as presented by him are applicable to the utilization of both calendar-accident year and policy year statistics. The purpose of this paper is to outline the advantages to be realized by using calendar-accident year experience instead of policy year experience and to discuss the reasons why trend and projection factors are essential if rate levels are to be proper during the period they are to apply.

At the outset, a distinction needs to be made between policy year and calendar-accident year experience. Experience compiled on a policy year basis compares earned premiums and exposures with incurred losses for all policies written to become effective within a calendar year. For example, policies written on January 1, 1956, are fully earned by the end of the calendar year, but all other policies written in 1956 are not fully earned until the corresponding date in 1957; this makes policies written on December 31, 1956, not fully earned until December 31, 1957. Likewise, losses occurring on policies written to be effective in 1956 must be allocated to policy year 1956 whether the loss occurs in 1956 or 1957. Therefore, the experience is not fully earned until 24 months after the beginning of a given policy year.

Calendar-accident year experience, hereafter referred to as accident year, compares earned premiums and exposures with losses incurred during a calendar or fiscal year period. That is, the accident year 1956 would include all losses occurring between January 1, 1956, and December 31, 1956, (or the fiscal year dates) and would be related to the premiums and exposures earned during the same period of time. Thus, accident year experience is fully earned in 12 months regardless of the effective date of the underlying policies.

The essential difference between these two methods of compiling data is that policy year considers the experience of a specific group of policies that become effective within a given calendar year, while accident year considers a specific group of losses that arise out of accidents that occur during a given 12-month period. Thus, policy year places emphasis on "exposures" and accident year places emphasis on "losses."

Automobile statistics compiled on the policy year basis were quite satisfactory as long as there were no marked changes in loss costs or

* Proceedings of the Casualty Actuarial Society, Vol. XLIII, pp. 112-165.

claim frequencies. However, underwriting losses that occurred subsequent to World War II and the inflationary forces that developed after the Korean outbreak in June of 1950 made it apparent that the automobile liability statistical plan should be revised to show trends more sharply and to reduce the interval between the experience period and the effective date of the rates. In an attempt to find an answer to this problem the Automobile Bodily Injury and Property Damage Liability Statistical Plan of the National Bureau of Casualty Underwriters and Mutual Insurance Rating Bureau was amended effective January 1, 1953, requiring data to be reported so that earned premiums, exposures and losses could be compiled on both a policy and an accident year basis. Under both methods the statistics are reported in exactly the same detail by class and by territory. During 1956 and 1957 these rating organizations tested accident year and policy year statistics for private passenger cars non-fleet to determine the accuracy and credibility of the accident year method. These tests showed that the accident year method was entirely sound and produced more timely and responsive data for rate review purposes, so accident year statistics are now being utilized in the determination of private passenger rates.

ADVANTAGES OF ACCIDENT YEAR STATISTICS

Accident year experience is better than policy year experience for determining automobile liability rate levels in that it:

(1) reduces the lag between the experience period and the effective date of the rates;

(2) shows the trend in loss costs and frequencies more clearly and accurately;

(3) produces a more mature body of loss experience at each reporting date;

(4) makes it possible to give greater credibility to the latest year of the experience period;

(5) eliminates earned factors used to adjust policy year experience when reported as of 12 months;

(6) makes it possible to produce average paid claim costs and claim frequencies for calendar or fiscal year periods from the same basic loss cards used to compile accident year losses;

(7) permits the use of fiscal year experience periods ending other than December 31; and

(8) is more readily understood.

An analysis of each of these factors points up the advantages resulting from the use of accident year experience in determining automobile liability rates.

Reduction of Lag. Accident year experience is fully earned during the first 12 months of each accident year, yet it takes 24 months for the policy year experience to become similarly earned. Both methods require, however, that the losses be valued as of a date three months

subsequent to the termination date of the experience period so that the vast majority of incurred but not reported losses will be included in the first reporting. Since this requirement applies to both methods of reporting, accident year experience on a complete basis becomes available 12 months sooner than policy year experience on a complete basis. This reduction in the time lag between the experience period and the rate review date makes accident year data more indicative of current costs and more responsive to changing conditions.

Trend Indications. It is essential that year to year trends within the experience period be shown clearly and accurately if past experience is to be utilized to its fullest in the determination of rates to be applied in the future. Accident year experience shows pure premiums and claim frequencies for consecutive calendar or fiscal year periods; so that data for any given year can be compared with data for subsequent years, and any trend that develops is readily apparent. On the other hand, similar data on a policy year basis cover a period of two calendar years and do not reflect the true loss conditions for any given year. Since policy years overlap and each policy year represents the average for two calendar years, the data are of very little value for trend purposes because the averaging minimizes the peaks and the valleys. The following data for private passenger cars illustrate the advantage of the accident year over the policy year:

AUTOMOBILE LIABILITY — PRIVATE PASSENGER CARS*
Countrywide Experience Excluding Massachusetts

Coverage	Year	As Of	Claim Frequency Per 100 Cars Insured		Pure Premiums Basic Limits	
			Accident Year	Policy Year	Accident Year	Policy Year
Bodily Injury	1953	12 Mo.	2.6	2.8	20.17	21.09
	1953	24 Mo.	2.5	2.5	20.20	20.51
	1953	36 Mo.	2.4	2.4	20.01	19.26
	1954	12 Mo.	2.6	2.8	20.15	21.52
	1954	24 Mo.	2.5	2.6	20.06	21.10
	1955	12 Mo.	2.8	2.9	22.31	22.81
Property Damage	1953	12 Mo.	9.4	8.9	12.05	11.71
	1953	24 Mo.	9.2	9.1	11.64	11.53
	1954	12 Mo.	9.2	8.6	11.63	11.26
	1954	24 Mo.	9.0	9.0	11.19	11.56
	1955	12 Mo.	9.2	8.5	12.48	12.00

* For underlying figures see Exhibits I and II.

The accident year pure premiums show that the loss costs were relatively level during 1953 and 1954 and indicate more clearly the adverse experience developing in 1955 than do the policy year figures. The advantage of having experience for consecutive 12-month periods is obvious if trends are to be used to predict the loss experience that may be expected during the period the rates are to be in effect.

Maturity of Losses. Accident year experience not only affords a more current but a more mature body of loss experience since the losses at each reporting date reach a greater degree of statistical maturity than policy year losses. This is true because all losses resulting from accidents occurring within a calendar or fiscal year are assignable to the year in which the accident occurs, while policy year losses occurring over a 24-month period are assignable to the year in which the policy became effective. The following shows the per cent of the incurred losses that have been paid at various reporting dates for both the policy year and the accident year method of collecting data:

AUTOMOBILE LIABILITY — PRIVATE PASSENGER CARS
Texas Experience — 1954 Accident and Policy Years

Coverage	Basis Of Compiling The Statistics	Ratio of Paid to Incurred Losses Reported As Of			Outstanding As Of	
		12 Mos.	24 Mos.	36 Mos.	24 Mos.	36 Mos.
Bodily Injury	Accident Year	.366	.787	.917		.083
	Policy Year	.279	.629	.877		.123
Property Damage	Accident Year	.684	.948		.052	
	Policy Year	.607	.884		.116	

Note: Ratios are losses paid as of December 31 to losses incurred as of March 31.

These figures show that the ratio of paid to incurred losses at the first reporting was 36.6% for bodily injury and 68.4% for property damage under the accident year method as compared with 27.9% for bodily injury and 60.7% for property damage under the policy year method. There is also a substantial difference in favor of the accident year method at the other reporting dates. The greater maturity of the accident year losses at every reporting date, and particularly at the first reporting date, makes accident year experience much more reliable and indicative of the final costs than the policy year experience.

Greater Credibility. Being fully earned when first reported, the latest accident year of experience can be given more credibility or weight than is possible for the incomplete year on the policy year

basis. This makes the rate making process more responsive and indicative of current rate needs. At the present time, the basic experience utilized in the determination of private passenger rates is two accident years with the latest year receiving 70% weight and the previous year 30% weight. Under the policy year method each year receives a weight of 50% since the latest year is an incomplete policy year and has to be adjusted to an ultimate basis by the use of earned factors.*

Earned Factors. As the experience for an accident year is complete when reported, it is not necessary to apply earned factors to determine the earned exposures and premiums as is the case for a policy year experience reported as of 12 months. This not only eliminates the estimates involved in the earned factors but the doubling effect that such factors have on policy year experience in an inflationary period. For example, the ratios of pure premiums at 12 months to those developed at 36 months tend to decline as more adequate reserves and higher settlements are reflected in the later reports of policy year experience. However, the higher claim costs are also reflected in the experience of the year under review as of 12 months to which the earned factors will be applied and the depressed earned factor tends to produce higher pure premiums. In times of deflation, there will be a doubling in the opposite direction.

Calendar or Fiscal Year Average Paid Claim Cost and Claim Frequency. Another important feature of the accident year method of reporting is the different types of data that can be obtained from the same basic loss cards. Since a separate transaction card for each claim is required, average paid claim cost and claim frequency can be produced on a calendar or a fiscal year basis irrespective of the date that the accident occurred. Average paid claim costs are considered to be the most indicative for trend purposes since they show actual payments and are not affected by reserves or the year to year changes that occur in such reserves. While claims generally become more costly the longer they remain outstanding, paid losses accurately reflect the trend as well as current costs as to jury verdicts, surgical, medical, repair and replacement costs, and other items which have their effect on the final costs. Such calendar or fiscal year figures can be utilized to help bridge the gap between the experience period and the effective date of the rates because they can be maintained on practically a current basis. The fact that such data can be developed monthly, quarterly, semi-annually or annually makes it possible to have year to year comparisons at every stage of development and to reasonably predict the prospective loss experience to be expected during the period the rates are to apply.

* The Texas private passenger liability rates effective 8/1/58 utilized both policy and accident year figures with the latest year receiving 70% weight and the previous year 30%. In prior revisions the experience period included three policy years with the latest, first previous and second previous years receiving weights of 50%, 30% and 20%, respectively.

Fiscal Year. The accident year method of gathering statistics makes it possible to utilize fiscal year experience periods ending other than December 31 which is impractical on a policy year basis. This provides for an orderly review of rates throughout the entire year with approximately the same currentness as to the experience being reviewed since the annual review period for some states will extend from July 1 of one year through June 30 of the following year and for other states from January 1 through December 31 of the same year. It also makes it possible for automobile liability and physical damage revisions to be made concurrently as varying fiscal periods are used in the different states in reviewing physical damage rate needs.

More Readily Understood. Tabulations on accident year basis are more nearly in accord with general accounting practices and are more readily understood. Anything that tends to bring about a better understanding of our business and its attendant problems should be almost as beneficial as the other advantages to be realized by the new method of gathering statistical data.

The rate making organizations, recognizing these advantages, used accident year experience in 1958 for the first time in determining liability rates for private passenger cars non-fleet. For all other types of automobiles, policy year experience was used and will continue to be used until a satisfactory solution can be found for the classes that involve audited exposures.

NEED FOR TREND AND PROJECTION FACTORS

Accident year statistics materially reduce the time lag between the experience period and the effective date of the rates, but this is only a partial solution to the problem of inadequate rate levels that plague the industry. No system of gathering past experience can produce a reasonable rate level unless it is adjusted to reflect current costs and to provide for a reasonable prediction of the losses that may be expected during the period that the rates are to apply.

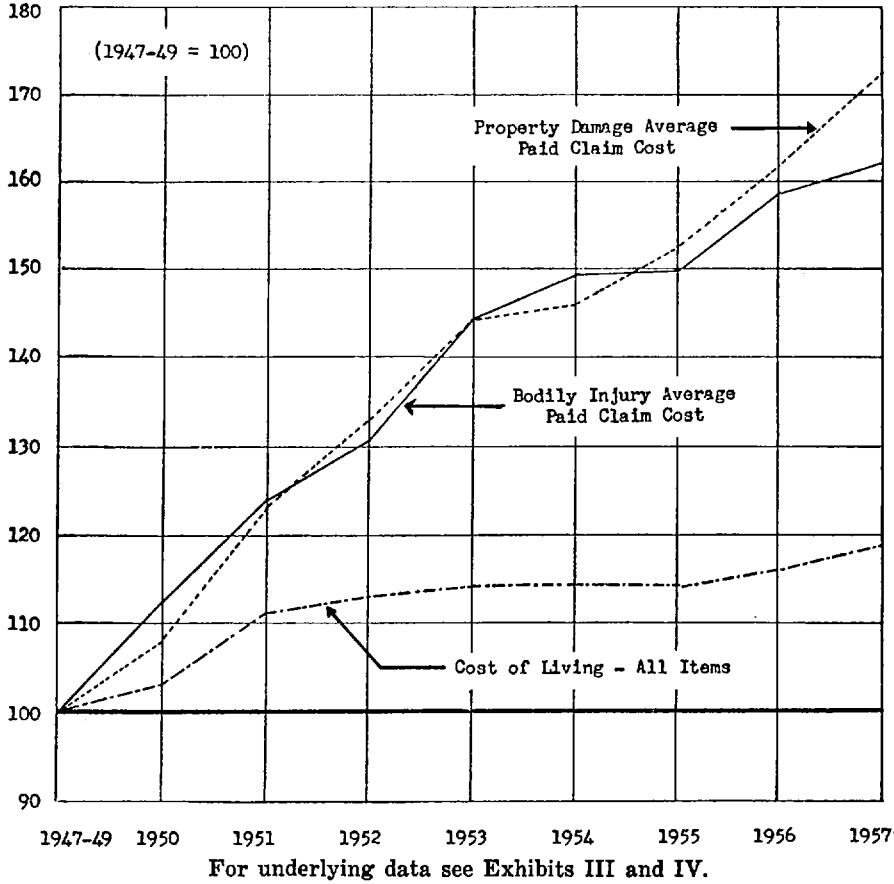
This country has been and is experiencing a long-term inflationary spiral. At today's market place the 1939 dollar will buy less than 48 cents in goods, and government economists state that it will be difficult to confine the average price rise in the future to 2 or 3 per cent a year. Inflation has not been an insurmountable problem to most businesses, as they have simply raised their prices and realized an immediate effect of such increases. Automobile rates, on the other hand, cannot be changed to reflect immediate cost increases because they are set for a relatively long period of time and any changes must be approved by regulatory authorities. Even when changes are made, the effect is not felt immediately since outstanding contracts are not affected until their expiration dates. Consequently, automobile rate levels have not kept pace with the rise in costs, and the underwriting losses since the end of World War II have been substantial.

For the automobile industry, this general inflation has resulted in increases in repair and replacement costs, in hospital rates, in sur-

geon and physician fees, and in nursing and other medical expenses, but the bodily injury and property damage liability losses have increased at a rate all out of proportion to the general increase in costs. The following chart comparing the cost of living index increases with the countrywide automobile liability average paid claim cost index increases shows this variation.

CONSUMERS' PRICE INDEX
(COST OF LIVING INDEX — ALL ITEMS)
AUTOMOBILE BODILY INJURY AND PROPERTY DAMAGE
AVERAGE PAID CLAIM COST INDEXES

Countrywide Experience Based on all Types of Cars — Total Limits



For underlying data see Exhibits III and IV.

* Year ending 9/30/57.

During the period that the cost of living index increased 19.3%, the countrywide automobile liability loss level index increased 62.3% for bodily injury and 72.4% for property damage. These excessive increases in liability losses are due to several factors. The chief factors are (1) the increased claim consciousness of the public, (2) the liberal jury awards, (3) the effect of such liberal awards on the settlement value of claims that do not go to trial, (4) the failure of juries to hue to the rules of negligence, and (5) the design and power of the present-day automobile which has increased the frequency and the severity of accidents. There is no reason to expect a decline in costs due to these factors because people are becoming more and more claim conscious, high jury verdicts are becoming commonplace, and the public likes the modern automobile's features which are extremely expensive to repair. The problem of expensive repairs will even become more acute as automobiles with the old style body design, divided windshield, etc., are replaced by automobiles with streamlined body construction, wrap-around windshields, dual headlights and taillights, ornamental rather than functional bumpers, fancy radiator grills, chrome trim, etc. This means, therefore, that past experience cannot be used as the sole indicator of future automobile liability rate needs.

Where futurity is involved, every successful business man takes into consideration future costs. In fact, there is no doubt that with the inflationary spiral of the last ten years and the attendant increases in labor and material costs, not a single building contractor would be in business today if he had not taken rising prices into account in bidding contracts for future performance. Since automobile insurance contracts provide for future performance and rates must be made to apply prospectively, it is not only logical but essential that consideration be given to all of the factors which can be expected to have a bearing on the loss experience during the period the rates are to apply. This can be accomplished by the use of trend and projection factors.

Trend and Projection Factors. Trend factors are used to adjust the basic accident or policy year experience to reflect the latest available loss costs, while projection factors are used to further adjust the experience to reflect the costs which are expected to apply during the time the rates are in effect.

Different formulas have been developed and used to determine appropriate trend and projection factors, and as the industry and the regulatory authorities continue to work with this problem, there is no doubt that better formulas for determining and utilizing these factors will be developed. As I am more familiar with the Texas system, I will briefly describe the way in which Texas has used these factors in the promulgation of private passenger automobile liability rates.

Beginning with the 1952 rate revision and for each year through 1957, the Texas State Board of Insurance used trend factors in an earnest attempt to make rates that would reflect the most current loss

experience, but the rate levels so produced proved to be inadequate. In the 1958 revision, both trend and projection factors were used to adjust past experience in promulgating automobile liability rates. The increase in average paid claim costs and claim frequencies as shown in Exhibit V — sheets 1 and 2, the increase in accidents as reported by the Texas Department of Public Safety and other economic factors convinced the Board that past experience, regardless of how recent, could not produce prospective rates that would be fair, reasonable and adequate in an inflationary economy. The following chart shows the increases that have occurred in the loss levels during calendar years 1955, 1956 and 1957.

AUTOMOBILE LIABILITY — PRIVATE PASSENGER CARS

Countrywide (excl. Mass.) Experience for Accident Years 1953, 1954 & 1955

National Bureau Members & Subscribers (a)

Coverage	Acc. Year	As of	Earned No. Cars	Earned Premium(b)	Liability			Medical Payments Incurred Losses(c)	Claim Freq. (d)	Pure Prem. (e)
					Incurred Losses (c)		No. of Claims			
					Basic Limits	Excess				
Bodily Injury	1953	12 Mo.	9,345,894	$380,526,625	$188,540,705	$28,949,012	243,128	$22,699,446	2.6	$20.17
	1953	24 Mo.	9,345,894	380,526,625	188,801,427	36,656,867	229,581	22,240,669	2.5	20.20
	1953	36 Mo.	9,345,894	380,526,625	187,045,783	35,431,334	226,976	22,060,042	2.4	20.01
	1954	12 Mo.	10,758,693	440,815,690	216,739,989	35,391,357	281,228	26,628,237	2.6	20.15
	1954	24 Mo.	10,758,693	440,815,690	215,873,029	41,931,162	266,071	25,936,812	2.5	20.06
	1955	12 Mo.	11,080,886	448,960,926	247,227,647	38,166,036	314,429	33,246,424	2.8	22.31
Property Damage	1953	12 Mo.	9,066,454	172,686,979	109,247,803	25,341	852,624		9.4	12.05
	1953	24 Mo.	9,066,454	172,686,979	105,502,106	13,200	838,371		9.2	11.64
	1954	12 Mo.	10,490,428	212,072,397	122,013,724	16,382	963,543		9.2	11.63
	1954	24 Mo.	10,490,428	212,072,397	117,437,316	18,228	942,257		9.0	11.19
	1955	12 Mo.	10,801,437	213,720,882	134,832,839	12,848	992,993		9.2	12.48

(a) Plus all companies that filed with N.B.C.U. in 18 states—1953 at 36 mos., 1954 at 24 mos., 1955 at 12 mos.
(b) Premiums included charges for excess limits (for B.I. they also included premiums for medical payments coverage).
(c) Including all loss adjustment expenses.
(d) Claim frequency is per 100 cars.
(e) Basic Limits.

EXHIBIT I

AUTOMOBILE LIABILITY — PRIVATE PASSENGER CARS

Countrywide (excl. Mass.) Experience for Policy Years 1953, 1954 & 1955

National Bureau Members & Subscribers (a)

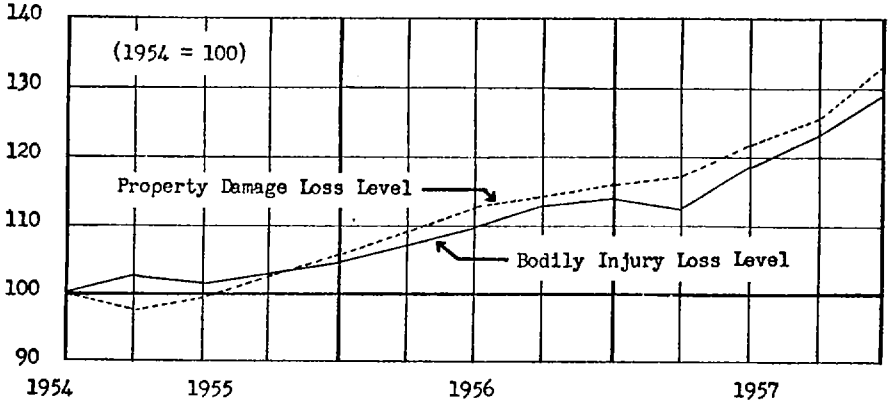
Coverage	Policy Year	As of	Earned No. Cars	Earned Premium(b)	Liability			Medical Payments Incurred Losses(c)	Claim Freq. (d)	Pure Prem. (e)
					Incurred Losses (c)		No. of Claims			
					Basic Limits	Excess				
Bodily Injury	1953	12 Mo.	5,056,707	$211,452,370	$106,627,228	$15,679,977	140,166	$12,778,149	2.8	$21.09
	1953	24 Mo.	9,528,222	404,207,460	195,402,038	37,032,102	240,789	22,824,020	2.5	20.51
	1953	36 Mo.	10,886,796	445,733,298	209,633,344	42,065,484	259,226	25,078,019	2.4	19.26
	1954	12 Mo.	5,193,872	217,801,262	111,797,855	17,463,643	145,881	13,487,589	2.8	21.52
	1954	24 Mo.	10,840,538	443,081,159	228,706,514	40,894,823	283,046	28,439,514	2.6	21.10
	1955	12 Mo.	6,313,155	257,038,373	144,003,723	20,785,997	184,151	19,769,288	2.9	22.81
Property Damage	1953	12 Mo.	5,257,731	106,807,610	61,547,256	25,272	468,667		8.9	11.71
	1953	24 Mo.	9,249,423	188,337,456	106,607,094	7,935	839,543		9.1	11.53
	1954	12 Mo.	5,344,559	113,065,917	60,202,072	12,286	458,500		8.6	11.26
	1954	24 Mo.	10,559,008	212,946,947	122,059,818	24,992	949,711		9.0	11.56
	1955	12 Mo.	6,594,736	128,278,253	79,158,412	3,311	563,832		8.5	12.00

(a) Plus all companies that filed with N.B.C.U. in 18 states—1953 at 36 mos., 1954 at 24 mos., 1955 at 12 mos.
(b) Premiums included charges for excess limits (for B.I. they also included premiums for medical payments coverage).
(c) Including all loss adjustment expenses.
(d) Claim frequency is per 100 cars.
(e) Basic Limits.

EXHIBIT II

AUTOMOBILE BODILY INJURY AND PROPERTY DAMAGE LOSS LEVEL INDEXES

Texas Private Passenger Experience — Total Limits



Note: Each quarter shows the loss level for the year ending on that date. For underlying figures see Exhibit V, Sheet 2.

The factors used in Texas to adjust the basic loss experience in determining private passenger automobile liability rates from 1952 through 1958 are as follows:

Rate Revision Effective	Bodily Injury		Property Damage	
	Trend Factors	Projection Factors	Trend Factors	Projection Factors
5/1/52	1.220		1.056	
5/1/53	1.053		1.109	
5/1/54	.993		1.036	
5/1/55	.993		.987	
5/1/56	1.024		1.016	
5/1/57	1.080		1.101	
8/1/58	1.129	1.046	1.141	1.081

Attention will now be given as to how the Texas Board arrived at the trend and projection factors used in determining liability rates for private passenger cars effective August 1, 1958. This was somewhat complicated in that the Board used both accident year and policy year figures. The basic experience used was accident years 1955 and 1956 including the first 6 months of 1957 for the companies reporting to the National Bureau of Casualty Underwriters and the Mutual Insurance Rating Bureau and policy years 1954, 1955 and 1956 as of December 31, 1956, for companies reporting to the National

Association of Independent Insurers. In addition to the detailed data by class and territory, calendar year average paid claim cost and claim frequency data were used for the years included in the experience period and for the calendar year ending December 31, 1957.

Exhibits VI and VII set out the calendar year average paid claim cost and claim frequency data used in determining the factors shown in column (5) of both of these exhibits. These factors were used to adjust the appropriate accident year and policy year data to reflect the loss level for the calendar year ending December 31, 1957. The net effect of these various factors produced an overall trend factor of 1.129 for bodily injury and 1.141 for property damage.

Exhibit VIII shows calendar year average paid claim cost data and the derived factors that were applied to both the accident year and the policy year experience to reflect prospective costs. This resulted in a projection factor of 1.046 for bodily injury and 1.081 for property damage. These factors are very conservative since no attempt was made to predict increases in claim frequencies which may be expected during the period the rates are to apply. They are for a period of 13 months since the Texas Board projected the loss experience to August 1, 1958, the effective date of the rates, rather than to August 1, 1959, the mid-point of the period during which the rates would be in effect. This projection period was based on the fact that the trend factors reflected the loss conditions existing at the middle rather than the end of the 1957 calendar year since claim costs and claim frequencies had increased gradually throughout the year. (See Exhibit V, Sheets 1 and 2.)

The Texas Board in promulgating automobile liability rates has realistically faced the problem by using both trend and projection factors in an attempt to make the rates adequate at the time they become effective. These rates will prove to be inadequate, however, if claim costs and claim frequencies continue to increase during the two-year period they will be in effect.

Prospective Consideration Authorized. While the wording differs somewhat, the statutes in all of the states provide that consideration *shall* be given to past and prospective experience except for the states of Kansas, Massachusetts, New Hampshire, North Carolina and Texas. The statutes in Kansas and Texas provide that due consideration *may* be given to past and prospective experience. The Massachusetts statute provides for the consideration of past and prospective experience except for compulsory motor vehicle liability. New Hampshire and North Carolina are the only states whose statutes make no reference to the use of either past or prospective experience in establishing automobile liability rates since they set out no standards to be considered in the determination of rates. Thus, for the most part, the state regulatory officials are not only authorized but instructed to take into consideration all factors that can be reasonably expected to have a bearing on the prospective experience during the period the rates are to apply.

The courts, too, have held that in the making of utility rates, which must be made prospectively, a reasonable prediction of future expenses is as important as an examination of the expenses incurred in the past. Since insurance rates must be made to apply prospectively also, it is not sufficient for the regulatory bodies to approve rates that would have been proper for some period in the past because the rates are not operative in the past. The rates represent premiums which are to be collected tomorrow and should reflect a reasonable prediction of claim costs, claim frequencies and other economic factors which will have a bearing on the loss experience for the period the rates will be in effect.

The specific directions in the statutes and the court decisions justify regulatory authorities taking into consideration reasonable predictions of prospective costs in establishing rates that must apply in the future.

CONCLUSION

The advantages to be realized in using accident year experience and the need for applying trend and projection factors in the determination of automobile liability rates have been set out in the foregoing discussion. It has been established that rates based on accident year experience adjusted to show current conditions and probable future loss expectations will be more nearly correct than would be the case if the rates were based entirely upon past experience. However, it must be recognized that it is hardly possible to develop a formula to produce rates that will be exactly correct for the period they are to apply. This is true because past experience or past trends are seldom duplicated during future experience periods. Formulas and established procedures are desirable, but the element of judgment cannot be eliminated since there are many economic factors that must be considered as well as the credibility of the data to which the formulas are to be applied. To the extent possible, formulas and fixed rating procedures should be established; but when the existing conditions show that such formulas and procedures will not produce appropriate rates, there should be no hesitancy on the part of those responsible to take the necessary steps so that rate levels will not be excessive, inadequate or unfairly discriminatory.

AUTOMOBILE LIABILITY INSURANCE
Index Countrywide Average Paid Claim Costs
Based on All Types of Cars—Total Limits

Calendar Year	Base Year: 1941=100		Base: 1947-1949=100	
	B. I.	P. D.	B. I.	P. D.
1941	100.0	100.0		
1942	120.1	112.0		
1943	127.8	132.5		
1944	127.4	157.1		
1945	117.1	166.9		
1946	119.7	178.9		
1947	127.8	195.8)		
1948	140.1	210.1)	100.0	100.0
1949	146.8	216.2)		
1950	155.9	225.0	112.8	108.5
1951	171.2	256.5	123.9	123.7
1952	180.6	275.6	130.7	132.9
1953	199.7	299.7	144.5	144.5
1954	206.3	302.7	149.2	146.0
1955	207.1	317.7	149.8	153.2
1956	218.5	336.1	158.1	162.1
Ended 9/30/57	224.3	357.4	162.3	172.4

Based on Total Limits, All Types of Cars. The indexes for 1941-1953 were computed from experience gathered under a special call for a comparable group of companies. After 1953 this special call was discontinued. The indexes subsequent to 1953 are not strictly comparable because they were calculated by applying the per cent change in claim costs to the index of the preceding year. These indexes are based on the combined experience of the members and subscribers of the National Bureau of Casualty Underwriters and the Mutual Insurance Rating Bureau.

EXHIBIT III

CONSUMERS' PRICE INDEX
(COST OF LIVING INDEX — ALL ITEMS)
U. S. BUREAU OF LABOR STATISTICS

NEW: 100 = 1947-49

Calendar Year	Cost of Living Index All Items
1947)	
1948)	100.0
1949)	
1950	102.8
1951	111.0
1952	113.5
1953	114.4
1954	114.8
1955	114.5
1956	116.2
Ended 9/30/57	119.3

EXHIBIT IV

AUTOMOBILE LIABILITY — PRIVATE PASSENGER CARS

Texas Experience — Total Limits

AVERAGE PAID CLAIM COST AND AVERAGE PAID CLAIM COST INDEX

Calendar Year Ending	Bodily Injury		Property Damage	
	Average Paid Claim Cost*	Avg. Paid Claim Cost Indexes	Average Paid Claim Cost*	Avg. Paid Claim Cost Indexes
12/31/54	$591	100.0	$106	100.0
3/31/55	602	101.9	106	100.0
6/30/55	591	100.0	109	102.8
9/30/55	587	99.3	111	104.7
12/31/55	586	99.2	114	107.5
3/31/56	588	99.5	116	109.4
6/30/56	583	98.6	117	110.4
9/30/56	594	100.5	118	111.3
12/31/56	601	101.7	120	113.2
3/31/57	594	100.5	123	116.0
6/30/57	611	103.4	126	118.9
9/30/57	617	104.4	129	121.7
12/31/57	625	105.8	132	124.5

CLAIM FREQUENCY PER 100 CARS INSURED AND CLAIM FREQUENCY INDEX

Calendar Year Ending	Bodily Injury		Property Damage	
	Claim Frequency Per 100 Cars Insured	Claim Frequency Indexes	Claim Frequency Per 100 Cars Insured	Claim Frequency Indexes
12/31/54	1.46	100.0	6.60	100.0
3/31/55	1.47	100.7	6.49	98.3
6/30/55	1.48	101.4	6.41	97.1
9/30/55	1.51	103.4	6.45	97.7
12/31/55	1.53	104.8	6.46	97.9
3/31/56	1.57	107.5	6.62	100.3
6/30/56	1.63	111.6	6.77	102.6
9/30/56	1.65	113.0	6.77	102.6
12/31/56	1.65	113.0	6.78	102.7
3/31/57	1.64	112.3	6.71	101.7
6/30/57	1.68	115.1	6.75	102.3
9/30/57	1.73	118.5	6.86	103.9
12/31/57	1.79	122.6	7.07	107.1

* Bodily Injury is for indemnity only—medical payments are not included. All loss adjustment expenses are excluded.

Companies reporting to: National Bureau of Casualty Underwriters and Mutual Insurance Rating Bureau.

EXHIBIT V

Sheet 1

AUTOMOBILE LIABILITY — PRIVATE PASSENGER CARS

Texas Experience

LOSS LEVEL INDEX*

Calendar Year Ending	Bodily Injury Total Limits	Property Damage Total Limits
12/31/54	100.0	100.0
3/31/55	102.6	98.3
6/30/55	101.4	99.8
9/30/55	102.7	102.3
12/31/55	104.0	105.2
3/31/56	107.0	109.7
6/30/56	110.0	113.3
9/30/56	113.6	114.2
12/31/56	114.9	116.3
3/31/57	112.9	118.0
6/30/57	119.0	121.6
9/30/57	123.7	126.4
12/31/57	129.7	133.3

* Average paid claim cost indexes times claim frequency indexes—Exhibit V, Sheet 1.

Companies reporting to: National Bureau of Casualty Underwriters and Mutual Insurance Rating Bureau.

EXHIBIT V

Sheet 2

TEXAS AUTOMOBILE LIABILITY

PRIVATE PASSENGER - ACCIDENT YEAR

AVERAGE PAID CLAIM COST

	Bodily Injury - Basic Limits			Property Damage - Total Limits		
Year Ended	Paid Losses	No. of Claims	Average Paid Claim Cost	Paid Losses	No. of Claims	Average Paid Claim Cost
12/31/55	$ 8,938,764	16,551	$540	$ 7,714,238	67,963	$114
6/30/57 *	15,933,223	28,658	556	14,193,895	114,942	123
12/31/57	12,487,223	21,921	570	11,321,003	85,830	132

* 18 Months ending 6/30/57 (1/1/56 to 6/30/57)

CLAIM FREQUENCY

	Bodily Injury			Property Damage		
	No. of Cars	No. of Claims	Claim Frequency	No. of Cars	No. of Claims	Claim Frequency
12/31/54	1,094,386	15,930	1.46	1,095,304	72,274	6.60
12/31/55	1,140,408	17,396	1.53	1,137,041	73,424	6.46
12/31/56	1,154,265	19,069	1.65	1,152,001	78,127	6.78
6/30/57 *	1,743,319	29,385	1.69	1,739,962	119,711	6.88
12/31/57	1,206,742	21,625	1.79	1,204,273	85,118	7.07

* 18 Months ending 6/30/57 (1/1/56 to 6/30/57)

Development of Factors to Adjust Losses to Loss Level for Year Ended 12/31/57

	Average Paid Claim Cost (Basic Limits)		Claim Frequency	
	Bodily Injury	Property Damage	Bodily Injury	Property Damage
12/31/55	$540	$114	1.53	6.46
6/30/57 *	556	123	1.69	6.88
12/31/57	570	132	1.79	7.07

* 18 Months ending 6/30/57 (1/1/56 to 6/30/57)

	(1) Claim Cost	(2) Average Claim Cost Factor $570÷(1)	(3) Claim Frequency	(4) Claim Frequency Factor 1.79÷(3)	(5) Combined Frequency & Severity Factor (2) x (4)
BODILY INJURY					
(a) Accident Year 1955	$540	1.056	1.53	1.170	1.236
(b) Accident Period 1956-7*	556	1.025	1.69	1.059	1.085
	(1)	(2) $132÷(1)	(3)	(4) 7.07÷(3)	(5)
PROPERTY DAMAGE					
(a) Accident Year 1955	114	1.158	6.46	1.094	1.267
(b) Accident Period 1956-7*	123	1.073	6.88	1.028	1.103

*Accident Year 1956 plus 1st 6 months 1957.

EXHIBIT VI

TEXAS AUTOMOBILE LIABILITY

PRIVATE PASSENGER - POLICY YEAR

AVERAGE PAID CLAIM COST

	Bodily Injury - Total Limits			Property Damage - Total Limits		
Year Ended	Paid Losses	No. of Claims	Average Paid Claim Cost	Paid Losses	No. of Claims	Average Paid Claim Cost
12/31/54	$2,926,379	5,257	$557	$2,425,929	22,321	$109
12/31/55	3,503,707	6,739	520	3,105,974	26,806	116
12/31/56	5,085,818	8,654	588	4,013,029	32,478	124
12/31/57	5,870,146	9,874	595	4,939,647	37,827	131

CLAIM FREQUENCY

	Bodily Injury			Property Damage		
	No. of Cars	No. of Claims	Claim Frequency	No. of Cars	No. of Claims	Claim Frequency
6/30/57	555,637	8,892	1.60	555,954	34,874	6.27
12/31/57	581,290	9,874	1.70	581,190	37,827	6.51

Development of Factors to Adjust Losses to Loss Level for Year Ended 12/31/57

	Claim Costs (1) Claim Cost	(2) Average Claim Cost Factor $595÷(1)	Claim Frequency (3) Claim Frequency	(4) Claim Frequency Factor 1.70÷(3)	(5) Combined Frequency & Severity Factor (2) x (4)
BODILY INJURY					
(a) Policy Year 1954 = 1/2 Cal. Yr. 1954 +1/2 Cal. Yr. 1955	$539	1.104	1.60	1.063	1.174
(b) Policy Year 1955 = 1/2 Cal. Yr. 1955 +1/2 Cal. Yr. 1956	554	1.074	1.60	1.063	1.142
(c) Policy Year 1956 as of 12/31/56 = Cal. Year 1956	588	1.012	1.60	1.063	1.076
PROPERTY DAMAGE	(1)	(2) $131÷(1)	(3)	(4) 6.51÷(3)	(5)
(a) Policy Year 1954 = 1/2 Cal. Yr. 1954 +1/2 Cal. Yr. 1955	$113	1.159	6.27	1.038	1.203
(b) Policy Year 1955 = 1/2 Cal. Yr. 1955 +1/2 Cal. Yr. 1956	120	1.092	6.27	1.038	1.133
(c) Policy Year 1956 as of 12/31/56 = Cal. Year 1956	124	1.056	6.27	1.038	1.096

EXHIBIT VII

TEXAS

AUTOMOBILE LIABILITY INSURANCE — PRIVATE PASSENGER REVISION

(Revision Effective August 1, 1958)

Development of Factors to Adjust Accident Years 1955 and 1956-57 (a) and Policy Years 1955 and 1956 for Trend of Average Paid Claim Costs for 13 Months Subsequent to 6/30/57

(Based Upon Calendar Year Average Paid Claim Cost Data)

		Texas		
Coverage	Year Ended	Paid Losses (b)	Number of Paid Claims	Average Paid Claim Cost
Bodily Injury	12/31/55	$13,202,717	23,290	$567
(Total Limits)	12/31/57	19,566,979	31,795	615
Property Damage	12/31/55	10,820,212	94,769	114
(Total Limits)	12/31/57	16,260,650	123,657	131

	Bodily Injury	Property Damage
(1) Average Annual Change in Paid Claim Costs $\frac{12/31/57-12/31/55}{12/31/55} \div 2$ =	+ 4.3%	+ 7.5%
(2) 13 Month Average Change in Paid Claim Costs (Line I x 1.08) =	+ 4.6	+ 8.1
(3) Factor to Adjust Average Loss Experience for Accident Years 1955 and 1956-57(a) and Policy Years 1955 and 1956 for Trend of Average Paid Claim Costs for 13 Months Subsequent to 6/30/57		
1.00 + (2) =	1.046	1.081

(a) Accident Year 1956 Plus 1st Six Months of 1957.
(b) Excluding All Loss Adjustment Expense.

EXHIBIT VIII