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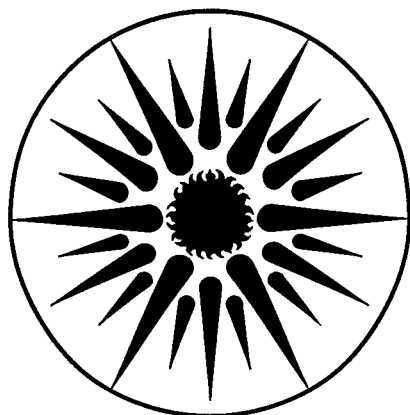
UNIVERSITY OF CALIFORNIA

ENERGY & ENVIRONMENT DIVISION

**Analysis of National Pay-As-You-Drive Insurance
Systems and Other Variable Driving Charges**

T. Wenzel

July 1995



**ENERGY & ENVIRONMENT
DIVISION**

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**ANALYSIS OF NATIONAL PAY-AS-YOU-DRIVE INSURANCE SYSTEMS
AND OTHER VARIABLE DRIVING CHARGES**

Tom Wenzel

July 1995

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Executive Summary

Under Pay as You Drive insurance (PAYD), drivers would pay part of their automobile insurance premium as a per-gallon surcharge every time they filled their gas tank. By transferring a portion of the cost of owning a vehicle from a fixed cost to a variable cost, PAYD would discourage driving. PAYD has been proposed recently in California as a means of reforming how auto insurance is provided. PAYD proponents claim that, by forcing drivers to purchase at least part of their insurance every time they refuel their car, PAYD would reduce or eliminate the need for uninsured motorist coverage. Some versions of PAYD proposed in California have been combined with a no-fault insurance system, with the intention of further reducing premiums for the average driver. Other states have proposed PAYD systems that would base insurance premiums on annual miles driven.

In this report we discuss some of the qualitative issues surrounding adoption of PAYD and other policies that would convert other fixed costs of driving (vehicle registration, safety/emission control system inspection, and driver license renewal) to variable costs. We examine the effects of these policies on two sets of objectives: objectives related to auto insurance reform, and those related to reducing fuel consumption, CO₂ emissions, and vehicle miles traveled. We pay particular attention to the first objective, insurance reform, since this has generated the most interest in PAYD to date, at least at the state level. We review the history of PAYD proposals in California, summarize previous research on the impacts of PAYD, and discuss the elements and design of a PAYD system.

There are two basic types of insurance coverage that pay expenses incurred in an auto accident: first party coverage (e.g. medical payments, personal injury protection, uninsured motorist, etc.), which pays the policyholder's expenses, and third party coverage (i.e. bodily injury and property damage liability coverage), which pays the expenses of the victim of the policyholder. The type of insurance coverage utilized depends on the liability system in a particular state. Third party coverage is necessary in the 26 states with tort liability systems, which rely on determining which driver caused an accident. Only first party coverage is necessary in the 10 states which have adopted a no-fault system, where a policyholder's damages are paid by one's own coverage, regardless of who is at fault.

A true no-fault system would eliminate a victim's right to sue for non-economic damages (for either so-called "pain and suffering" or punitive damages). However, no existing no-fault systems have such a strict restriction. Instead, they only allow liability lawsuits for non-economic damages if the damages exceed a "threshold". This threshold can take the form of a monetary amount (which can be quite low, and therefore pose a negligible restriction), or legislative language that specifies injuries (such as "permanent disability" or "death"). If the injuries exceed the dollar threshold, or meet the legislative language of the verbal threshold, then the victim can sue the at-fault driver for non-economic damages. Only three no-fault states currently have strict verbal thresholds; as a result, the effectiveness of most no-fault systems in restraining liability lawsuits is limited. The remaining 11 states, and the District of Columbia, require insurers to offer first party coverage, but have not adopted restrictions on liability lawsuits; these states are referred to as "add-on" states.¹

Average insurance premiums for all coverages range from \$319 in North Dakota to \$974 in Hawaii. Combined (bodily injury and property damage) liability premiums range from \$171 (North Dakota) to \$753 (Hawaii). Unfortunately, state-level data on premiums for uninsured or underinsured motorist coverage are not available, so it is not possible to determine the potential national savings from forcing all drivers to purchase insurance under a PAYD system. Although

1. Three additional states allow drivers a choice between a tort and a no-fault liability system.

there are no reliable data on the number of uninsured drivers, the insurance industry estimates that as many as 30 percent of all drivers in some states are uninsured. State studies show that over 90 percent of drivers in some urban areas are uninsured.

A second way to reduce average premiums may be to place restrictions on lawsuits for non-economic damages, through the adoption of a no-fault insurance system. No-fault states tend to have the highest average premiums, followed by add-on and tort states. However, very few states have adopted a no-fault system that puts real restrictions on liability lawsuits. In addition, there are many differences between states, such as minimum coverages (dollar amounts) required, how risky drivers are handled (assigned risk plans), and other state policies (such as drunk driving laws, the legal drinking age, and speed limits) which confound an analysis of what effect the state claim system has on average premiums. A true comparison of alternative systems would require estimating the average premium in a given state if it adopted a different insurance system. Such an analysis, performed by RAND, indicates that the effect of a traditional tort state switching to a no-fault system could range from a 13 percent increase to a 52 percent decrease in the average premium, depending on the level of benefits and the type of threshold adopted.

Some critics of PAYD have argued that annual miles driven, or its proxy gallons of gasoline consumed, are not good predictors of the likelihood a driver will be involved in an accident. Several studies suggest otherwise; in particular, one recent California study indicates that location, miles driven and driving record are the best predictors of accident frequency and severity. Other critics are concerned that a PAYD system would reduce auto safety, by lowering insurance costs for teenagers, and thereby encouraging them to drive more (teens are recognized as one of the riskiest classes of drivers). This would only pose a problem if most teens are not currently driving. However, it is likely that many, if not most, teens *are* currently driving, possibly either uninsured or on their parents' policy. A properly designed PAYD system, which would increase the per-gallon costs of driving, may in fact act to discourage teen driving.

Many researchers have studied the impact of changes of fuel price on driving behavior, and thus fuel consumption and CO₂ emissions. However, none have explicitly analyzed the effect of transferring a portion of fixed insurance costs to variable charges. Existing studies can give some insight into the effect various PAYD systems may have on fuel use and CO₂ emissions, but a detailed analysis of PAYD is needed (the California Energy Commission currently is analyzing this issue).

Several studies have documented the effect of gasoline taxes on various segments of the population. In general, households with higher incomes, of non-caucasian ethnicity, located in the south and west, or located in suburbs and rural areas, purchase more gasoline, and therefore would likely be more affected by a PAYD system. A recent study demonstrates that certain households have a greater ability to mitigate the impact of changes in fuel price in the short term by shifting their travel to a second, more fuel efficient vehicle. The only study of the impact of a specific California PAYD proposal (the Uninsured Motorist Act, or UMA) on low-income households concluded that UMA would benefit low-income drivers, who currently pay much higher premiums than other drivers. Low-income advocacy groups supported UMA in hearings before the California legislature. A simple comparison of national gasoline and mandatory insurance expenditures of different income groups indicates that UMA would shift mandatory insurance expenditures from the poorest households to other households.

It is possible to adjust several features of a particular PAYD system to address local concerns. For example, a system proposed in California² would collect about half of insurance revenue from several annual registration fees. The proposal includes varying fees based on driver age (\$500 for

2. "Pay at the Pump" Auto Insurance: The California Vehicle Injury Plan (VIP) for Better Compensation, Fairer Funding, and Greater Safety, Stephen D. Sugarman, Institute of Governmental Studies, UC Berkeley, 1993.

teenagers) and record (more for drivers with a history of accidents), and vehicle safety features (less for vehicles with air bags and automatic braking systems). This feature allows a certain degree of insurance premium price discrimination among driver classes, in contrast to a system where all insurance is paid by a single per-gallon surcharge. States can adopt a fee schedule that better reflects the projected insurance losses of certain driver classes; for example, an additional registration fee could be based on where most of the miles of a particular vehicle are expected to be driven (urban vs. rural).

Alternative systems can be designed to fit the needs of individual states. One method to increase the cost of driving without reforming how insurance is provided involves charging annual registration, driver's license renewal, and vehicle safety and emission control system inspection fees on a per-mile basis. States currently charge between \$14 and \$138 per vehicle (about \$0.03 to \$0.29 per gallon) in annual fees; the national median is \$40 per vehicle (roughly \$0.08 per gallon). Alternatively, a state could charge a per-gallon insurance surcharge, and provide a fixed rebate to insurance companies based on the number of policies they write, or directly to drivers. This would in effect transform insurance from a fixed annual cost into a per-gallon fee without refining the existing insurance system.

If insurance reform is desired, a PAYD system can be introduced that does not unduly affect how insurance companies administer accident claims. The state can distribute all revenue collected from insurance surcharges and fees to insurance companies based on the number of policies written. A state-run insurance provider could be established to ensure competition between private insurance companies. Some analysts have proposed that the state auction to insurance companies the right to sell insurance to blocks of randomly selected drivers. This would ensure that all registered drivers receive coverage while retaining the role of insurance companies. The most extreme PAYD system would involve a single state-run insurance system; such a system would dramatically reduce the role of insurance companies, although a market would still exist for optional coverage (first party property damage and comprehensive coverage).

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1. Introduction

Some states are considering adopting Pay as You Drive (PAYD) insurance as a means of reforming how automobile insurance is provided. Under PAYD, insurance premiums would be transferred from annual costs to variable charges, based either on gallons of gasoline purchased (sometimes referred to as “Pay at the Pump Insurance”) or annual vehicle miles driven. Currently a significant number of drivers are driving without insurance, even in states where insurance coverage is required by law. Many drivers purchase additional insurance coverage to pay for damages caused by uninsured drivers. PAYD would make it more difficult for drivers to avoid purchasing insurance, thereby expanding coverage and reducing premiums for drivers currently buying uninsured motorist coverage. In addition, PAYD would base premiums more on a driver’s relative exposure to a potential accident, rather than other proxies for accident frequency, such as sex of the driver. Since the likelihood of an individual driver to be involved in an auto accident is thought to be related to the number of miles he or she drives, or (probably less closely) to the gallons of fuel consumed, PAYD policies are being promoted as measures to reallocate insurance payments more equitably among drivers. PAYD would reallocate premiums more equitably in two ways: by forcing uninsured drivers to purchase insurance, and by basing premiums on a potentially better measure of accident frequency and/or severity.

PAYD could have an additional benefit by reducing fuel consumption, CO₂ emissions, and vehicle miles traveled (VMT). By transferring a portion of insurance costs from fixed to variable costs, PAYD would give an economic disincentive to consumers to drive. To the extent that they reduce gasoline consumption or VMT directly, PAYD policies may also address a host of problems associated with vehicle travel, such as emissions of CO₂ and criteria air pollutants, as well as traffic congestion. Other annual driving costs, such as vehicle registration fees, safety and emission control system inspection fees, and driver license renewals, could also be charged on a per-mile or per-gallon basis, to strengthen the signal to consumers.

Because PAYD can simultaneously address both insurance reform goals at the state level and fuel consumption, CO₂, and VMT reduction objectives, it may be attractive to policy-makers at both the state and federal levels. In this report we examine the effect different PAYD schemes would have on the provision of automobile insurance. We also examine how PAYD or other variable driving charges might achieve the national objectives of lowering fuel consumption, greenhouse gas emissions, and VMT. The next section discusses insurance reform issues, summarizes several PAYD proposals in California and other states, and investigates the impact of PAYD on insurance provision. Section 3 summarizes the few attempts made to forecast the effect of a national PAYD system on fuel consumption and CO₂ emissions. Based on the California experience, we analyze in Section 4 the likely impact of a national PAYD system on several interest groups: certain classes of drivers, the insurance industry, and trial lawyers. A range of possible PAYD systems is discussed in Section 5, and four national PAYD alternatives are presented in Section 6.

2. Impact on Insurance Provision

Reform of state insurance systems has fueled much of the state-level interest in PAYD to date. In this section we examine how PAYD systems would impact the provision of insurance. We first provide some background on the different insurance systems the states currently have in place, and describe the types of insurance coverage provided under each system. Next, we summarize five PAYD systems that have been proposed in California recently, as well as proposals made in other states. We then present data on the current costs of insurance by state, and look at how PAYD systems might reduce average insurance premiums. Finally, we examine two concerns that critics of PAYD have raised: 1) is annual miles driven, or its proxy, gallons of gasoline consumed, a reliable predictor of accident frequency/severity? and 2) will PAYD reduce overall automotive safety by encouraging teenagers, who tend to be the riskiest drivers, to drive more?

2.1. Background on Insurance Issues

Automotive insurance reform has long been an issue in many states. In most states, medical costs and property damages are paid by the insurance company that covers the driver who is judged to be at fault in an accident. Typically, these systems allow victims to sue to recover damages for “pain and suffering”, or “non-economic losses”, which are in addition to compensation for any property damage, hospitalization, and health care costs. Insurance companies recover any non-economic damages they pay out by raising insurance premiums on all drivers that they cover. For years critics of auto insurance have proposed limiting liability damages as a means of reducing insurance premiums. These proposals generally consisted of replacing current systems with no-fault insurance systems; under no-fault, injured drivers are covered by their own insurance company, rather than the company of the at-fault driver. Although several states have adopted variations of no-fault auto insurance, currently none of these systems cap the amount of damages victims can sue for.

2.1.1. Types of Coverage

There are two broad categories of insurance coverage: “first party” insurance pays the expenses of the policyholder, while “third party” insurance pays the expenses of the other driver if the policyholder is found to be at fault. The insurance company is the second party.

First party coverage:

- Uninsured Motorist (UM) covers bodily injury and property damage inflicted by drivers without insurance; may cover non-economic damages. Provided in all states, compulsory in 29 states (and DC)
- Underinsured Motorist (UIM) covers the difference in medical costs (not property costs) between the policy holder’s UM coverage and the at-fault (other) driver’s third-party bodily injury liability coverage. Provided in 32 states, automatically included in UM coverage in some states.
- Medical Payments (MP) provides coverage for medical expenses as a result of an auto accident (claimant covered as a driver, passenger, and pedestrian). Most medical expenses frequently are covered by separate health insurance coverage. Optional in all states.
- Personal Injury Protection (PIP) covers medical expenses (similar to MP) in states that have no-fault insurance systems; states usually set limits on the benefits. Compulsory in 19 no-fault states, optional in 7 no-fault states (and DC).
- Collision - covers collision damage to policyholder’s vehicle, regardless of fault. Optional in all states
- Comprehensive - covers damage to policyholder’s vehicle from events other than collision, as well as vehicle theft. Optional in all states

Third party coverage:

- Bodily Injury Liability (BI) covers policyholder from bodily injury liability claims against him or her. Compulsory in 39 states (and DC); minimum coverage ranges from \$20,000 to \$50,000 total, and \$10,000 to \$50,000 per person.
- Property Damage Liability (PD) covers policyholder from property damage liability claims against him or her. Compulsory in 39 states (and DC); minimum coverage ranges from \$5,000 to \$25,000.

The basic difference between tort and no fault systems is that, under tort, the at-fault driver pays, regardless of whether or not the other driver has insurance; under no fault, one’s own insurance pays damages, regardless of who is at fault. In general, in states that allow liability claims, drivers can (and in some cases are required to) purchase third party insurance to protect themselves from

damages that they incur on other parties. In theory, true no-fault would eliminate the need for third party coverage, in that all expenses would be paid by one's own insurance company. In practice, however, all no-fault states currently only restrict, rather than eliminate, liability claims; drivers may desire third-party coverage to protect them from liability claims in serious or fatal accidents (Mooney). The restrictions on non-economic claims can take the form of either a dollar threshold or a verbal threshold. A dollar threshold allows unlimited liability lawsuits if the damages exceed a dollar amount; this amount can be quite low (e.g. \$400 in Connecticut or \$500 in Georgia), resulting in very little restriction on liability lawsuits. A verbal threshold requires that bodily injuries meet certain criteria written into the law (e.g. "death" in all states, "significant and permanent loss of an important bodily function" in Florida, "permanent serious disfigurement" in Michigan and Pennsylvania, "dismemberment" in New Jersey, and "permanent consequential limitation of use of a body function or system" in New York); these verbal thresholds tend to restrain liability lawsuits more effectively than dollar thresholds.

Transferring annual insurance premiums to per-gallon or per-mile surcharges will have a different impact in tort liability and no-fault states. A driver in an accident can be classified in one of four ways: A) uninsured, not at fault; B) uninsured, at fault; C) insured, not at fault; and D) insured, at fault. Table 1 shows what coverage pays the claims of each type of driver, under a traditional tort liability system, a pure no-fault system, and the limited no-fault and add-on systems many states have adopted. The italics designate which coverages pay claims if the other driver is uninsured.

Table 1: Coverages for Four Types of Drivers under Three Insurance Systems

Who pays the claims of:	Tort Liability System	Pure No Fault System	Limited No-Fault System or Add-on System
A) Uninsured driver, not at fault <i>Other driver is uninsured</i>	other driver's BI/PD coverage <i>not covered</i>	not covered <i>not covered</i>	if threshold not exceeded, other driver's PD coverage only (BI claims not covered); if threshold exceeded, other driver's BI coverage <i>not covered</i>
B) Uninsured driver, at fault	not covered	not covered	not covered
C) Insured driver, not at fault <i>Other driver is uninsured</i>	other driver's BI/PD coverage <i>own UM/UIM coverage</i>	own PIP/Collision coverage <i>own PIP/Collision coverage</i>	own PIP, other driver's PD coverage; if threshold exceeded, other driver's BI coverage <i>if threshold exceeded, own UM /UIM coverage</i>
D) Insured driver, at fault	own MP/Collision coverage	own PIP/Collision coverage	own PIP/Collision coverage

BI: Bodily Injury (3rd party)

PD: Property Damage (3rd party)

UM/UIM: Uninsured/Underinsured Motorist (1st party)

MP: Medical Payments (1st party)

PIP: Personal Injury Protection (1st party)

Uninsured drivers who are not at fault can still recover damages in tort liability states, if the at-fault driver has coverage. Under a no-fault system, claims for medical economic losses below a specified threshold are first paid by the claimant's own PIP coverage. Medical losses above a specified threshold, and non-economic losses, are covered by the other (at-fault) driver's BI coverage. If the other driver is uninsured, the claimant's UM coverage pays these additional claims. Claims for property economic losses are paid just as they are under the traditional tort system (by the other driver's PD coverage, or, if the claimant is at fault, by the claimant's collision and comprehensive coverage). A no-fault system reduces the ability of uninsured drivers to collect damages for medical losses below the threshold, even if the other driver is at fault and fully

insured. Therefore, a switch from tort liability to a no-fault system, with no measures to reduce premiums, will have a negative impact on currently uninsured low-income drivers.

Any policy, such as PAYD, that seeks to eliminate uninsured drivers would convert all A drivers in the table to C drivers, and all B drivers to D drivers; in addition, since all drivers are now insured, the scenarios in italics (and the need for UM/UIM coverage) would no longer exist. A PAYD system that transferred the entire insurance premium to a per gallon surcharge would automatically insure all drivers. However, most PAYD proposals would transfer only a portion of the premium to a per gallon surcharge; drivers would have to register their vehicles, and pay additional registration surcharges, in order to be covered. Undoubtedly, some drivers would continue to avoid vehicle registration, and remain uninsured. Uninsured drivers in a tort liability or add-on system would lose their minimal coverage if they were required to pay a registration surcharge. These drivers would have an incentive to register and pay the additional surcharge since they already would be paying for about half of the cost of coverage through the per gallon surcharge (and not receiving any coverage).

2.1.2. Restrictions on liability claims

As described above, the liability system in each state can be classified as either tort or no-fault; some states offer drivers a choice between tort and no-fault liability. Table 2 shows the type of liability system in each state as of 1993.

Twenty-seven states rely on the traditional tort system to settle claims resulting from auto accidents. The remaining 23 states and the District of Columbia have instituted some form of first party coverage. Only 12 of these states actually put restrictions on liability lawsuits; nine states have dollar thresholds, while three states have verbal thresholds. Two states have recently repealed their no-fault liability systems: Georgia in 1991 and Connecticut in 1993. The 9 states (and DC) that have first party coverage without any restrictions on liability lawsuits are referred to as "add-on" states, in that they require insurance companies to provide (but not necessarily drivers to purchase) first party liability insurance without placing any limits on the right to sue for non-economic damages.³ New Hampshire and Wisconsin became add-on states before 1989. The remaining three states allow drivers to choose between a tort and a no-fault liability system; drivers can voluntarily limit their right to sue for non-economic damages. Most drivers in Kentucky opt for no-fault liability coverage.

Even true no-fault by itself would not eliminate uninsured motorist coverage; only a system that requires all drivers to participate, through per gallon insurance fees, for example, would ensure that all drivers are covered.

Several studies have been conducted to examine the relative merits of no-fault versus tort liability systems. One branch of research has found limited evidence that no-fault systems with restrictions on non-economic lawsuits have reduced the frequency and severity of accidents and/or claims.⁴ Other studies have found that no-fault systems with strong tort limitations and/or modest PIP coverage limits can reduce insurance premiums.⁵ Recent research has looked at what factors have influenced states' decisions to adopt no-fault liability system.⁶

3. *Summary of Selected State Laws and Regulations Relating to Automobile Insurance*, American Insurance Association, Washington, DC, 1994.

4. See Landes, 1982; Zador and Lund, 1986; and Cummins and Weiss, 1989.

5. A summary of the results of a 1987 study conducted by IRC and a 1991 study conducted by RAND are included in Section

3. See also Witt and Urrutia, 1984; US Department of Transportation, 1985; Smith, 1989; and Cummins and Weiss, 1991; and Johnson, Flanigan and Winkler, 1992.

6. See Harrington, 1994.

Table 2: Features of State Insurance Systems

State	Liability System (1)			Compulsory Insurance?	Minimum Coverages (\$000s)		
	1987 (2)	1992 (3)	1993 (4)		BI (per person)	BI (total)	FD
Alabama	Tort	Tort	Tort	No	20	40	10
Alaska	Tort	Tort	Tort	Yes	50	100	25
Arizona	Tort	Tort	Tort	No	15	30	10
Arkansas	Add on	Add on	Add on	Yes	25	50	15
California	Tort	Tort	Tort	No	15	30	5
Colorado	NF-D	NF-D	NF-D	Yes	25	50	15
Connecticut	NF-D	NF-D	Tort	Yes	20	40	10
Delaware	Add on	Add on	Add on	Yes	15	30	10
District of Columbia	Add on	Add on	Add on	Yes	25	50	10
Florida	NF-V	NF-V	NF-V	No	10	20	5
Georgia	NF-D	Tort	Tort	Yes	15	30	10
Hawaii	NF-D	NF-D	NF-D	Yes	15	35	10
Idaho	Tort	Tort	Tort	Yes	25	50	15
Illinois	Tort	Tort	Tort	Yes	20	40	15
Indiana	Tort	Tort	Tort	Yes	25	50	10
Iowa	Tort	Tort	Tort	No	20	40	15
Kansas	NF-D	NF-D	NF-D	Yes	25	50	10
Kentucky	Choice-D	Choice-D	Choice-D	Yes	25	50	10
Louisiana	Tort	Tort	Tort	Yes	10	20	10
Maine	Tort	Tort	Tort	Yes	20	40	10
Maryland	Add on	Add on	Add on	Yes	20	40	10
Massachusetts	NF-D	NF-D	NF-D	Yes	10	20	5
Michigan	NF-V	NF-V	NF-V	Yes	20	40	10
Minnesota	NF-D	NF-D	NF-D	Yes	30	60	10
Mississippi	Tort	Tort	Tort	No	10	20	5
Missouri	Tort	Tort	Tort	Yes	25	50	10
Montana	Tort	Tort	Tort	Yes	25	50	5
Nebraska	Tort	Tort	Tort	Yes	25	50	25
Nevada	Tort	Tort	Tort	Yes	15	30	10
New Hampshire	Tort	Add on	Add on	No	25	50	25
New Jersey	Choice-V	Choice-V	Choice-V	Yes	15	30	5
New Mexico	Tort	Tort	Tort	Yes	25	50	10
New York	NF-V	NF-V	NF-V	Yes	10	20	5
North Carolina	Tort	Tort	Tort	Yes	25	50	10
North Dakota	NF-D	NF-D	NF-D	Yes	25	50	25
Ohio	Tort	Tort	Tort	Yes	12.5	25	7.5
Oklahoma	Tort	Tort	Tort	Yes	10	20	10
Oregon	Add on	Add on	Add on	Yes	25	50	10
Pennsylvania	Add on	Choice-V	Choice-V	Yes	15	30	5
Rhode Island	Tort	Tort	Tort	Yes	25	50	25
South Carolina	Add on	Add on	Add on	Yes	15	30	5
South Dakota	Add on	Add on	Add on	Yes	25	50	25
Tennessee	Tort	Tort	Tort	No	20	50	10
Texas	Add on	Add on	Add on	Yes	20	40	15
Utah	NF-D	NF-D	NF-D	No	20	40	10
Vermont	Tort	Tort	Tort	Yes	20	40	10
Virginia	Add on	Add on	Add on	Yes	25	50	20
Washington	Add on	Add on	Add on	Yes	25	50	10
West Virginia	Tort	Tort	Tort	Yes	20	40	10
Wisconsin	Tort	Add on	Add on	No	25	50	10
Wyoming	Tort	Tort	Tort	Yes	25	50	20
No-Fault, verbal threshold states	3	3	3				
No-Fault, dollar threshold states	9	8	7				
Choice states	2	3	3				
Add-On states	11	12	12				
Tort States	26	25	26				

Notes:

(1) NF-V = no-fault with verbal threshold; NF-D = no-fault with dollar threshold; Choice = choice between tort or no-fault liability; Add on = no restrictions on lawsuits. Most insureds in Kentucky opt for the dollar-threshold liability system.

(2) Source: All Industry Research Council, 1989.

(3) Source: American Insurance Association, 1992.

(4) Source: American Insurance Association, 1993.

2.2. Proposed PAYD Systems

PAYD was first proposed in Maryland in the early 1970s. Since then, several proposals have been made in various states, although most of the activity has occurred in California. This section describes the history of PAYD proposals in California, as well as PAYD systems proposed in other states (a timeline of the history of PAYD proposals is included as Appendix A).

In 1975, a pay-at-the-pump proposal that did not include no-fault insurance was introduced in the California Assembly and failed. California's interest in PAYD was revived in part by efforts in the 1980's to reform the automobile insurance industry. During the mid 1980's, many pointed to the large increase in the number of liability lawsuits, and the amount of damages awarded, as an indication that the liability insurance system was out of control. The increase in liability suits resulted in quite large increases in insurance premiums in many parts of the country. To slow these increases, the insurance industry proposed several reforms designed to restrict the ability to sue for unlimited damages. Some consumer advocates and lawyers objected to these restrictions as unnecessary limitations on victims' rights, and sought to slow the rise in premiums by imposing additional price regulation on the insurance industry.

The situation came to a head in California in 1988, when four competing insurance reform initiatives, including several forms of no-fault insurance sponsored by the insurance industry, were placed on the November ballot. Only one of the initiatives, Proposition 103, passed, carrying 51 percent of the vote. Proposition 103 called for four major changes to the state's insurance system: rolling back premiums to 20 percent less than those charged in November, 1987; requiring State Department of Insurance approval for any proposed rate increases; limiting pricing variables to driving record, annual mileage, and years of driving experience (eliminating pricing based on age, gender, or place of registration); and requiring companies to offer insurance to any qualified driver (thereby eliminating reported redlining of certain neighborhoods).⁷ Although the voters passed Proposition 103 over five years ago, few of its objectives to lower insurance premiums⁸ and increase the equity of the insurance system have been realized.

Frustrated with the slow enactment of the measures stipulated in Proposition 103, some legislators turned to PAYD as a means of reducing average insurance premiums throughout the state. By forcing all drivers to purchase insurance coverage either at the pump or through registration fees, PAYD would drastically reduce or eliminate the need for uninsured motorist coverage. In addition, by limiting the ability of drivers to sue for non-economic damages, PAYD would reduce the amount of money paid out in claims.

Mohamed El-Gasseir presented a PAYD proposal before the California Energy Resources Conservation and Development (now Energy) Commission on June 8, 1990. The proposal was entered as testimony during hearings on the 1990 Conservation Report, but was not formally introduced in the Legislature. In 1991, Senator Nancy Killea of San Diego introduced SB 1139, which would have established an interagency task force to direct a study of PAYD by the University of California. A committee hearing on the bill was scheduled in early 1992, but later cancelled, and the bill was never reconsidered.

7. California's Insurance Regulation Revolution: The First Two Years of Proposition 103, Stephen D. Sugarman, San Diego Law Review, vol. 27 no. 683, 1990.

8. According to a recent study by the National Association of Independent Insurers, the average premium in 1992 had increased 1.2 percent over the average premium in 1989. Although Prop 103 has held the line on dramatic increases in insurance premiums, many drivers have yet to see the promised 20 percent rollback in rates."

In early 1993 financial author Andrew Tobias printed a small book on "Pay-at-the-pump, Private, No-Fault" car insurance (PPN).⁹ PPN called for combining PAYD with a no-fault insurance system as a way to reduce average insurance premiums. Senator Art Torres, chair of the Senate Insurance Commission, held two public hearings on PPN, and introduced a bill based on the proposal, SB 684, in March. The Senate Rules Committee referred SB 684 to both the Committee on Insurance, Claims and Corporations and the Committee on the Judiciary. Torres held two legislative hearings in April, the first ever televised interactive hearings in the state. It took several major amendments, including a large reduction in benefits, removal of a cap on punitive damages, and replacing group insurance pools with individual policies, to get a version that the Insurance Committee passed SB 684 (by a vote of 6 to 4) to the Judiciary Committee. The Judiciary Committee defeated SB 684, however, and the measure died.

Later that year Tobias hired Michael Johnson to develop an initiative version of PAYD, the Uninsured Motorist Act of 1994 (UMA), to be included on the November 1994 initiative ballot, and to establish the Coalition for Common Sense Auto Insurance, a group to raise funds for and promote the initiative. Opposition groups established Californians to Save Our Economy to fight the initiative. By January of 1994, Californians to Save Our Economy boasted over 200 support groups, including representatives from the insurance, oil, tourist, and highway construction industries. UMA supporters removed the initiative from the ballot in February, citing focus group results indicating that voters were more interested in maintaining choice over the selection of insurance companies and agents than any purported cost savings from UMA. Several no-fault insurance reform measures are being proposed for the June 1996 ballot, none of which would involve per gallon, per mile, or registration-based surcharges.

2.2.1. Five California Proposals

This section summarizes the five PAYD proposals developed for California by various professors, legislators, and interest groups. At the end are short descriptions of alternative proposals which also modify the rating and purchase of automobile insurance.

California has a traditional tort liability system for settling auto insurance claims; therefore, much of the focus of California proposals involves a switch to a form of "no-fault" insurance. In addition, while all the proposals involve significant changes to the insurance system, not all have the same objectives. Mohamed El-Gasseir's PAYD proposal, for example, varies slightly from the other proposals because his focus is on economic equity and efficiency, not universal coverage.

Figure 1 summarizes the features of each major proposal, and allows easy comparison among the five proposals. A more detailed analysis of each major proposal follows, including any provisions made for special groups of drivers and interest group reaction to the proposal. A more detailed discussion of the various groups' positions on SB 684 and UMA is included in Appendix B.

Mohamed El-Gasseir and the Original PAYD Proposal

Background. In June, 1990, Mohamed El-Gasseir presented "The Potential Benefits and Workability of Pay-As-You-Drive Automobile Insurance" to the California Energy Resources Conservation and Development Commission. Although it is primarily an analysis of the probable impacts of a generic PAYD system, El-Gasseir provided a general description of a specific plan. El-Gasseir also estimated, using other specialized studies,¹⁰ consumer response to his proposal based on short term price elasticity of demand for gasoline.

9. *Auto Insurance Alert! Why the System Stinks, How to Fix It, and What to Do in the Meantime*, Andrew Tobias, Simon & Schuster, New York, 1993; and Preprint Senate Bill No. 1, Proposed by Senator Torres, State of California Senate, February 1, 1993.

10. See D. R. Bohi, *Analyzing Demand Behavior*, 1981, p. 160.

Figure 1: Features of Seven Pay-As-You-Drive Systems Proposed in California

Pay-as-you-Drive (PAYD)		Pay-at-the-Pump Private No-Fault (PPN)	SB 684 (A) First introduced March 3 Sen. Torres, Ayala, Killea	SB 684 (B) Passed by Insurance April 27 Sen. Torres, Ayala, Killea	SB 684 (C) Defeated by Judiciary May 25 Sen. Torres, Ayala, Killea	Vehicle Injury Plan (VIP)	California Uninsured Motorist Act (UMA) Coal. for Com Sense Auto Insurance
Mohammed El-Gasseir		Andrew Tobias, Sen. Torres, NICO				Stephen Sugarman	
Coverage Provided First Party	optional (no amount specified); can waive coverage and receive rebate based on gas receipts	\$50k or \$100k for medical and lost wages	unlimited medical unlimited lost wages	\$15k/\$30k for medical and lost wages \$5k for property damage	\$225k medical \$25k lost wages \$500 property damage (covers deductible of optional PD coverage)	all unreimbursed medical \$50k/yr lost wages 80% of other home expenses for 1 yr	\$1 million medical \$30k/yr lost wages
Third Party (Liability)	state minimum bodily injury (\$15k/\$30k) and property damage (\$5k); can opt for additional private coverage	none	unlimited death benefit none	none	none	unspecified death benefit none	\$50k death benefit none
Collision	optional (no amount specified); can waive coverage and receive rebate based on gas receipts	optional; would cost 1% of Blue Book value, with a deductible of 5% of Blue Book value or \$250, whichever is less	none	none	none	none	\$25k first party coverage if the driver is not at fault
Comprehensive	none	none	none	none	none	none	none
Restrictions on Lawsuits (all retain right to sue car manufacturers and governments)	no restrictions; retains existing tort liability system	"pure" no-fault; optional first party non-economic coverage; five levels of damages from \$500 or \$1k (minor) to \$50k (death)	"pure" no-fault; optional first party non-economic coverage; five levels of damages from \$1,500 (minor) to \$100k (death)	limited no-fault; verbal threshold based on New York definition, with no limit on damages	"pure" no-fault; optional first party non-economic coverage; five levels of damages from \$1,500 (minor) to \$100k (death)	"pure" no-fault; plan includes non-economic coverage for all drivers; schedule of damages capped at \$100k	"pure" no-fault; however, lawsuits allowed against convicted drunk drivers, with unlimited damages
Surcharges (1)	\$0.52/gallon; \$164/policy	\$0.40/gallon; \$25/vehicle; \$7/unsafe vehicle \$7/driver	\$0.30/gallon (\$0.50 max) \$20/vehicle; \$105/vehicle for PD; \$80, \$120/vehicle; \$120, \$1000/driver; \$250 for drivers <25; \$60 per new vehicle	\$7/gallon	\$7/gallon (estimated to be \$0.28), \$25/vehicle; \$7/unsafe vehicle; \$100/point	\$0.30/gallon; \$20, \$120, \$500/driver; \$40, \$80, \$120/vehicle; \$500 or \$250 for teens; \$250 per new vehicle	\$0.25/gallon; \$141/vehicle;
Average Premium (assumes 600 gallons purchased)	\$476	\$265	\$385	unknown	\$193	\$280	\$291
Percent variable	66%	91%	47%	unknown	87%	64%	52%
Rebates/Discounts (to low income or elderly)	unspecified	noted but unspecified	\$40 to \$90, depending on income, vehicle age, and vehicle safety features	none	none	noted but unspecified	Low income (greater of \$50 or 35%), and elderly (\$50)
Vehicles Covered	unspecified	all except those for commercial or govt. use	all except those for commercial or govt. use	all except those for commercial or govt. use	all except those for commercial or govt. use	all vehicles	all except heavy duty vehicles
Claims Administration	private; individual policies	private; insurers bid for groups of policies	private; insurers bid for groups of 5,000 policies	private; individual policies	private; individual policies	private; individual policies	private; individual policies

(A) First introduced March 3, 1993, and referred to Insurance and Judiciary Committees.

(B) Amended version that Insurance Committee approved April 27, 1993.

(C) Amended version that Judiciary Committee defeated May 25, 1993.

(1) Assumes 600 gallons per year (20 miles per gallon and 12,000 miles per year)

Description of Proposal. El-Gasseir's system has several features that make it unique among PAYD systems proposed in California. First, El-Gasseir's places no restrictions on lawsuits and retains the existing tort liability system. Second, his plan includes collision and medical coverage, but allows individuals to "opt out" of these programs and receive rebates through "an adequately designed rebate program."¹¹ Lastly, whereas the other proposals ostensibly are concerned with correcting the uninsured motorist problem, El-Gasseir is most interested in improving the efficiency and practicable degree of equity associated with automobile insurance.

- **Coverage:** El-Gasseir's PAYD proposal included only the minimum liability coverage required in the state (\$15,000 per person, up to \$30,000, for medical expenses, and \$5,000 for property damage), as well as an unspecified amount of first party medical coverage and collision coverage, "irrespective of who is at fault."¹² Drivers could waive the first party medical and collision coverage by producing receipts of their gasoline purchases for the year; they would then receive a rebate for the first party medical and collision coverage portion of the per-gallon charge (drivers would have to apply for this waiver in advance of coverage; otherwise, all drivers who weren't involved in an accident would apply for a rebate at the end of the year, thus receiving free coverage). Additional liability and comprehensive coverage could be purchased outside of the PAYD system from insurers.
- **Financing:** Under El-Gasseir's proposal, automobile insurance premiums would consist of two components: an incremental charge payable at the fuel pump and a direct payment to insurers. The fuel pump component would be charged on a uniform per-gallon basis throughout the state, and would be subject to periodic adjustments if necessary. The direct payment serves two purposes: it enables insurers to recover overhead, commissions and profits; and it permits the desirable degree of premium differentiation among motorists and automobiles. El-Gasseir estimated that a 52 cents per gallon and a \$164 direct payment would be required in California.
- **Average Premium:** The average premium, assuming 600 gallons purchased,¹³ would be \$476. If the driver had violations or drove a sports car, this figure would be higher because his or her "direct payment" would be modified. Alternatively, this figure would be lower if the driver purchased less gasoline. The variable portion of the premium represents 66 percent of the total premium.

Special Cases. Because he is most concerned with the equitable and efficient distribution of insurance costs, El-Gasseir uses the direct payment to correct for outliers and special cases. In the proposed system, for example, the direct payment could act as a regulator of potential over- and under-payments at the pump, caused by the wide variation of automobile fuel efficiency. When traveling the same number of miles, the motorist driving a 40 miles-per-gallon (mpg) vehicle will pay significantly less than the operator of a 10 mpg gas guzzler. He proposes that drivers of vehicles with low fuel economy should be eligible for a year-end rebate of any total gasoline purchases in excess of the statewide average, determined by submitting annual gasoline receipts and odometer readings.

Special Interest Reaction. Though the special interest reaction is likely to be similar to that found with the other proposals, the reaction may be less severe for two reasons. First of all, PAYD places no restrictions on lawsuits and retains the existing tort liability system to some degree.¹⁴ For obvious reasons, these elements would temper the trial lawyers' opposition.

11. Mohamed El-Gasseir, Ph.D., "The Potential Benefits and Workability of Pay-As-You-Drive Automobile Insurance", State of California Energy Resources Conservation and Development Commission, 1990, p. 7.

12. El-Gasseir, p.8.

13. Based on fuel efficiency of 20 miles to the gallon and driving 12,000 miles per year.

14. Unlike proposals that follow, for example, a motorist may sue for "pain and suffering" damages under PAYD.

Secondly, because drivers can waive collision and medical coverage and receive rebates based on gas receipts, PAYD may be more appealing to certain consumers, such as low-income or high-mileage drivers.

Andrew Tobias and Pay-at-the-Pump, Private, No-Fault (PPN)

Background. Andrew Tobias first described his idea for Pay-at-the-Pump, Private, No-Fault (PPN) in his 1993 book, *Auto Insurance Alert! Why the System Stinks, How to Fix It, and What to Do in the Meantime*. Under PPN, drivers would pay for insurance when they purchase gasoline, adding roughly 40 cents to the price of a gallon of gasoline; auto insurance premiums would be drastically reduced for most of those who do not choose to buy optional coverage for theft or fire. As the name suggests, the plan also included a comprehensive no-fault provision, which would eliminate all lawsuits to recover “non-economic” damages.

Description of Proposal. PPN would introduce three innovations to the current system. First, PPN would replace the current system with true no-fault insurance. Supporters argue that, by eliminating the need to determine fault, most of the insurance payments would go directly to cover health care costs, property damages, and lost wages, rather than to lawyers and court fees. In addition, PPN would cap the amount of damages victims could receive for non-economic claims. By introducing true no-fault insurance, PPN seeks to lower average insurance premiums by increasing the efficiency of awarding the appropriate level of damages to accident victims.

Second, PPN would eliminate uninsured motorist coverage for all drivers. In an accident involving an insured and an uninsured driver, uninsured motorist coverage pays all health and property damages incurred, regardless of who is at fault. PPN would levy a portion of insurance charges based on the gallons of gasoline consumed, through an additional surcharge collected “at the pump”; the remainder of the premium would be paid upon vehicle registration renewal, and from moving violation surcharges. The pump charge would eliminate the need for uninsured motorist coverage, since all drivers would have to purchase gasoline (and insurance) in order to drive. In addition, the pump charge would allocate insurance payments based on individual drivers’ exposure to potential accidents. Rather than paying a fixed premium based on estimated annual vehicle miles, drivers would pay for each gallon they purchase. By raising the price of gasoline, PPN may have additional benefits of reducing vehicle miles and resulting traffic congestion, fuel consumption, and air pollutant emissions.

Finally, PPN would randomly group individual motorists into blocks of 2,500 or 5,000; insurance companies would then bid to provide coverage for blocks of motorists. Group insurance is intended to eliminate the transaction costs insurance agents incur (and pass on to drivers) in writing individual policies for millions of California drivers.

- **Coverage:** The plan would provide a fairly generous amount (either \$50,000 or \$100,000) for medical expenses and lost wages. Tobias proposed optional collision coverage, premiums for which would be based on the Blue Book value of the vehicle. Rather than suing for punitive damages in excess of medical expenses and lost wages, drivers seriously injured in an accident would be paid according to a set schedule, ranging from \$500 to \$1,000 for minor injuries to \$50,000 for a permanent disability.
- **Financing:** PPN would be funded by: (1) an insurance surcharge of roughly 40 cents per gallon of gasoline; (2) a \$25 registration premium assessed on all vehicles; (3) an additional registration premium assessed on “high-risk” vehicles, such as motorcycles and sports cars, to be set by the Insurance Commissioner; and (4) an additional registration premium based on driver history, also to be set by the Commissioner.¹⁵

15. *Auto Insurance Alert*.

- **Average Premium:** The average premium, assuming 600 gallons purchased, would be \$265 per year. If the driver had violations or drove a sports car, this figure would be higher. The variable portion of this premium represents over 90 percent of the total premium.

Special Cases. Other than the surcharges based on driving record and type of car, PPN provides for few exceptions to the flat fuel surcharge. PPN does provide that vehicles operated for commercial purposes or by a government entity must provide the same level of coverage required of non-commercial vehicles, but may, upon proof at registration that the vehicle is insured by an admitted insurer, qualify for a tax credit equal to the amount expended on the fuel premium surcharge. This tax credit allows commercial and government vehicles to opt out of the program. PPN also exempts airplanes, marine vessels, and farm vehicles from the new system; these vehicles would be insured as they are currently.

Special Interest Reaction. Insurance reform and environmental advocacy groups generally supported PPN; Tobias dedicated a portion of the royalties from the sale of his book to the National Insurance Consumer Organization and the Rocky Mountain Institute. Opposition to PPN was not publicly expressed until a version of the proposal was introduced in the California State Senate (see below).

Art Torres and Senate Bill 684

Background. California State Senator Art Torres introduced a version of PPN as SB 684 in March, 1993, which was hailed by consumer and environmental groups as an innovative solution to the State's uninsured motorist problem.¹⁶ However, several major amendments were necessary to pass it out of Torres' own Committee on Insurance.

Description of Proposal. SB 684 was originally modeled after PPN. However, several major amendments, proposed by Senator Patrick Johnston, were necessary to get it past the Insurance Committee; the bill that the Insurance Committee passed was very similar to a bill Johnston proposed in 1988. Although additional amendments were made by the Judiciary Committee, the Committee failed to pass SB 684 and it died. The original bill called for insurers to bid to provide coverage for groups of 5,000 drivers, as proposed in PPN; this feature was dropped from subsequent versions of SB 684.

- **Coverage:** SB 684, as originally introduced, provided unlimited coverage for bodily injuries, lost wages, and death benefits, as well as \$25,000 of first party property damage coverage. SB 684 retained the schedule of non-economic payments Tobias proposed, but with higher damage levels, ranging from \$1,500 to \$100,000.¹⁷

In order to pass the Insurance Committee, two changes were made in the coverage the bill would provide. First, benefits were limited to the minimum currently required in the state (\$15,000 per person, up to \$30,000, for medical expenses, and \$5,000 for property damage). Second, the schedule of non-economic awards was replaced by a "verbal" threshold; this effectively removed the cap on non-economic awards in the original version of the bill.¹⁸

The Judiciary Committee made several more changes to the coverages. The generous benefits were restored, but limited to \$225,000 in medical expenses, \$25,000 in lost wages, and \$500

16. Support for Torres' proposal included among others: Consumers Union, Mexican American Political Action Network, Bay Area Air Quality Management Board, The Sierra Club of California, The Greenlining Coalition, Union of Concerned Scientists, Natural Resources Defense Council, Black Chamber of Commerce.

17. SB 684, March 3, 1993.

18. SB 684, as amended in Senate, April 28, 1993.

in property damages (intended to cover the deductible of third party property damage coverage). The Judiciary also reinstated the schedule of non-economic awards included in the initial version of the bill.¹⁹

- **Financing:** SB 684 originally required: (1) a 30 cents per gallon surcharge²⁰; (2) a \$125 registration premium for all vehicles, \$105 of which went to fund the property damage coverage; (3) a "basic registration" premium of \$80 for vehicles with "average" safety features and \$120 for vehicles with "less than average" features; (4) additional premiums (from \$120 to \$1000) for drivers with a history of moving violations; (5) a \$250 premium for drivers under 25 years of age; and (6) a \$60 premium for new vehicles.

The version that the Insurance Committee passed removed the registration premiums, and stipulated that the per gallon charge would be established by an independent actuary appointed by the Insurance Commissioner. It was estimated that the required per-gallon charge required would be between 10 and 20 cents per gallon (the severe reduction in benefits allowed the per-gallon charge to be reduced, even though the registration premiums were also eliminated).

The final version of SB 684 called for a per-gallon charge (estimated to be 28 cents), as well as a \$25 premium for all vehicles, an unspecified premium for "high risk" vehicles, and a premium of \$100 per point (based on driving record).

- **Average Premium:** Assuming a clean driving record, a safe vehicle, and 600 gallons of gasoline purchased, the average annual premium would be \$385 (47 percent from the pump) for the original version of the bill, and \$193 (87 percent from the pump) for the final version. (The average premium under the version that passed the Insurance Committee can not be calculated, since this version did not specify a per gallon charge.)

Special Cases. Torres original bill included discounts on the "basic registration premium" (based on safety features) of 50 and 75 percent, based on a combination of driver's income, residence (rural), vehicle age, and vehicle value. These discounts were deleted in subsequent versions of SB 684.

Special Interest Reaction. Various interest groups supported SB 684 because it was designed to achieve several different objectives simultaneously: consumer groups were interested in reducing insurance premiums to all drivers, low-income advocates wished to transfer insurance payments to more affluent drivers, and environmentalists sought to reduce VMT and related environmental degradation.

SB 684 offended two of the most powerful special interests in California, the insurance industry and the trial lawyers, for different reasons. Although the insurance industry in general may support the concept of no-fault insurance, individual agents selling automotive policies opposed SB 684, fearing losing business or their jobs if individual insurance policies were converted to group policies. They also claimed that the driving public objected to any restrictions in their choice of insurance agents. The random assigning of policies to groups called for in the original bill was deleted by the Insurance Committee. Trial lawyers objected to the restrictions on non-economic awards that were in the original bill, arguing that they unnecessarily restricted drivers' ability to be fairly compensated for injuries. The Insurance Committee weakened the restrictions, but the Judiciary Committee later reinstated them.

The California Chamber of Commerce also opposed SB 684, arguing that the per-gallon surcharges would adversely affect California's tourist industry. Others that typically drive many

19. SB 684, as amended in Senate, May 18, 1993.

20. The bill allowed for the initial surcharge to be set as high as 50 cents per gallon, if needed.

miles in a year, such as rural householders and some commercial drivers, may also have opposed the cost allocation aspects of SB 684. Torres proposed reducing the per-gallon surcharge from the 40 cents Tobias proposed to 30 cents; this effectively reduced the per-gallon portion of the total premium the average driver would pay from 91 percent to 47 percent. However, the Judiciary Committee removed many of the registration premiums in the original version of SB 684, while reducing the per-gallon surcharge to 28 cents; these changes resulted in increasing the per-gallon portion of the total premium for the average driver to 87 percent. All of the versions of SB 684 allowed drivers of commercial vehicles to apply for an annual income tax credit for any per-gallon surcharges they paid.²¹

Stephen Sugarman and the California Vehicle Injury Plan (VIP)

Background. The California Vehicle Injury Plan (VIP) is a version of PAYD developed in 1993 by University of California Law Professor Stephen D. Sugarman.²² Like PPN and SB 684, VIP replaces auto insurance for bodily injury with a new system. The new system, funded through a series of new charges related to driving and the purchase of gasoline, would replace the current tort liability system. VIP has not been attempted politically, and few analyses have been done on its political or financial viability.

Description of Proposal. There are two major distinctions between VIP and previous PAYD proposals. First, VIP would provide non-economic benefits to any seriously injured driver, according to a schedule of payments for specific injuries. The payment schedule would be capped at \$100,000. This feature is similar to the capped payment schedules in PPN and the first and last versions of SB 684; however, this coverage would be provided to all drivers under VIP, whereas the coverage is optional under the earlier proposals.

VIP's administration of claims is also distinctive. Under PPN and SB 684, insurance companies would bid against each other for the right to administer claims of individuals or groups of drivers. Under VIP, the Insurance Commission would gain control of price setting, but would allow insurance companies to reduce premiums; this process would follow two steps. First, the Insurance Commission would set a generous "capitation" amount to cover the claims administrator's obligations and expenses plus a reasonable profit. Second, claims administrators would be allowed to engage in price competition by offering rebates to lure good drivers. Sugarman believes that this "rebate market" would function better than Tobias' bidding market.²³

- **Coverage:** VIP would cover all unreimbursed and reasonably incurred medical expenses, including rehabilitation costs; up to \$50,000 per year in lost wages; after a waiting period, 80% of reasonably incurred "home expenses;" and moderate amounts of non-economic damages, as described above.
- **Financing:** VIP would require (1) a per-gallon surcharge of 30 cents; (2) a registration premium of either \$20 (80% of drivers), \$120 (15-19%), or \$500 (1-5%), based on driving record and experience; and (3) an additional "safety feature" registration premium of either \$40 (15-20% of cars), \$80 (60-70%), or \$120 (10-20%), based on federal crash-test data. Novice drivers would pay an additional fee of \$500 (16- and 17-year olds) or \$250 (18- and 19-year olds, as well as novice adult drivers). Finally, a one-time charge of \$250 would be assessed at

21. For a complete description of special interests' reaction to SB 684, see Bill Ainsworth's "Pay-at-the Pump: Dead in the Water," *The Recorder*, May 5, 1993.

22. "Pay at the Pump" *Auto Insurance: The California Vehicle Injury Plan (VIP) for Better Compensation, Fairer Funding, and Greater Safety*, Stephen D. Sugarman, Institute of Governmental Studies, UC Berkeley, 1993, and personal communication with Stephen D. Sugarman, January 3, 1994.

23. Sugarman proposes creating a "state-run claims administrator who would serve as a default administrator for good drivers" (pp. 26-31).

the purchase of a new vehicle; credits would be given for vehicles that included safety features, such as air bags, anti-lock brakes, etc.

- **Average Premium:** Assuming an average driving record and vehicle, and 600 gallons of gasoline purchased, the average annual premium would be \$280 under VIP. The per-gallon payments represent 64 percent of this amount.

Special Cases. Sugarman makes note of special cases regarding the poor and long distance commercial motorists.²⁴ While VIP has no defined exceptions to the general proposal, Sugarman writes that if the poor were too burdened by VIP, they "could be provided with increased cash transfer payments or with transportation vouchers good for purchase of public transportation."²⁵

Sugarman also writes that VIP could be revised to deal with complaints of commercial, long-distance drivers. His two ideas are to provide tax rebates or lower the surcharge on diesel fuel, or to reduce the proportion of VIP revenue coming from the gasoline surcharge and to shift those funds into license and vehicle charges.²⁶ Sugarman points out that this issue is a "delicate matter" because the relatively low gas surcharge is based on the participation of commercial vehicles. In addition, shifting from fuel charges to license fees would weaken the incentive to drive less, thereby sacrificing the environmental and energy efficiency benefits gained from increasing the marginal costs of driving.

Special Interest Reaction. Insurance companies may find VIP more palatable than PPN or SB 684, since Sugarman's "rebate market" would allow insurance companies to market their product as they please. VIP's use of rebates also gives drivers greater choice over their insurance representative. However, trial lawyers most likely would object to the predetermined schedule of payments for non-economic damages.

Uninsured Motorist Act (UMA)

Background. After the defeat of SB 684, Andrew Tobias created and funded the Coalition for Common Sense Auto Insurance. The Coalition's goal was "to end run the Legislature and the lobbyists", and get a version of PPN, the Uninsured Motorist Act of 1994 (UMA), on the November, 1994, California ballot.²⁷

After several months of preparation, Tobias decided not to attempt to place the initiative on the 1994 ballot. Instead, he promised his plan would be on the ballot in 1996, and warned, "we will be stronger."²⁸ Tobias is still funding the Coalition for Common Sense Auto Insurance. It now appears that the Coalition is developing a no-fault insurance reform initiative that may not involve per gallon or per mile insurance surcharges.

Description of Proposal. Tobias made several changes, some taken from Sugarman's VIP proposal, to PPN to make it more attractive to California voters. First, rather than purchasing group insurance, drivers would continue to purchase individual policies from insurance agents; however, rates for good drivers would be established by the state Insurance Commissioner. Insurance companies would determine the higher rates to charge bad drivers. Second, victims of a convicted drunk driver could sue for unlimited non-economic damages. Other suits for non-economic damages are not allowed, however, and insurance companies are not required to provide optional coverage for first party non-economic damages. Third, light duty commercial and

24. See Sugarman, pp. 32-34 and pp. 42-45.

25. Sugarman, p.43.

26. Sugarman, p.44.

27. Andrew Tobias, *Auto Insurance Alert*, 1993, p. 98.

28. Anonymous Editorial, *National Underwriter*, January 24, 1994, p.14.

government vehicles are included in the plan. Heavy duty commercial vehicles (over 10,000 pounds gross vehicle weight) would pay \$350 a year for unlimited liability coverage; however, no surcharge would be collected on diesel fuel. Finally, low-income drivers and senior citizens would receive a \$50 credit on their registration fee.²⁹

- **Coverage:** UMA provides up to \$1 million for medical coverage, and \$30,000 per year in lost wages. Unlike previous proposals, UMA would provide up to \$25,000 in first party collision coverage; however, only if the driver of the vehicle was not at fault. In the event of death, UMA would provide \$25,000 or \$50,000, depending on whether or not the driver had dependents. Lastly, UMA would provide up to \$100,000 in liability protection for the cost of defending a person against a tort claim resulting from an accident outside of California.
- **Financing:** UMA would require: (1) an insurance surcharge of 25 cents per gallon, to be deposited into the Cal Auto Insurance Pass-Through Fund; (2) a registration premium of \$141 per vehicle; (3) an additional insurance premium for motorcycles, to be established by the Insurance Commissioner; and (4) a "bad driver" surcharge, based on driving record, to be determined by the Commissioner. In addition, UMA calls on the Commissioner to establish a schedule of credits against the registration premium, based on safety features and particular vehicle models, within two years of enactment.
- **Average Premium:** Assuming an average vehicle, and 600 gallons of gasoline purchased, the average annual premium would be \$291 under UMA. The per-gallon payments represent 52 percent of this amount.

Special Cases. UMA provides a \$50 discount on the registration premium for elderly drivers, and a discount of \$50 or 35 percent of the premium (whichever is greater) for low income drivers. UMA would cover all light duty vehicles, including those used for commercial or government use; drivers of these vehicles would not be allowed to apply for tax credits on any per-gallon surcharges paid.

Special Interest Reaction. After defeating Sen. Torres' SB 684, numerous special interest groups were well positioned and organized to mount a campaign against UMA. Very quickly after UMA's introduction, the opposition organized Californians to Save Our Economy. In five months insurance and petroleum companies contributed over \$170,000 to the opposition effort.³⁰ While the list of the Californians to Save Our Economy's supporters was long, only a few were active participants, financially and politically. In fact, the strongest advocates, the trial lawyers and the insurance industry, were not listed on the Coalition letterhead.

The campaign against the initiative, which grew to over 300 members, intended to focus on problems with the initiative itself, and not the issues per se. For example, opponents intended to focus on the fact that the initiative gives the Insurance Commissioner the power to raise taxes, something "even the President can't do without the approval of Congress."

2.2.2. Other Proposals

Three other PAYD systems have been proposed in other states. Some of the systems are quite different from those proposed in California.

29. The Uninsured Motorist Act of 1994 (Annotated), Coalition for Common Sense Auto Insurance, 1993.

30. Campaign Disclosure Statement dated February 1, 1994.

Pennsylvania Mileage Proposal (PA/NOW)

The National Organization for Women (NOW) has been backing auto insurance charged at per-mile class rates (per-mile) as an alternative to the present system and pay-at-the-pump proposals. Although NOW has been backing per-mile rating all over the country,³¹ the General Assembly of Pennsylvania is one of the few states trying to enact the proposal.

Proponents argue that per-mile rating is simple, and can be implemented by adding one sentence to the relevant state's insurance code. The amendment would read as follows:

"The exposure units for calculation of private passenger automobile insurance premiums at the appropriate classification rates shall be the car mile by audited odometer readings for driving coverage and the car year for nondriving coverage."

By specifying the unit of exposure, the amendment requires insurers to convert class rates from dollars-per-year to cents-per-mile for on-the-road insurance protection. As now, car owners would have to pay in advance to keep insurance in force. Premiums for driver coverage at cents-per-mile rates would be prepaid in mileage amounts and at time intervals as needed. The NOW proposal would not restrict insurance companies from basing rates on driver characteristics such as age, gender or place of vehicle registration.

Each car's insurance ID card would display the current odometer-mile and date limits to its prepaid protection. Policy renewals would be conditional on taking cars to company-designated garages for a once-a-year check of odometer readings and tamper-evident seals. Theft of insurance protection would be controlled because odometer tampering automatically voids the policy. Implementation of this proposal may be relatively simple, because odometer readings are already recorded regularly as part of the emission control system inspection in many states, and odometer tampering is already a federal crime.

For the last three legislative sessions, with the help and support of The National Organization for Women, Pennsylvania Senator Michael M. Dawida has introduced legislation to amend the state Casualty and Surety Rate Regulatory Act of 1947 relating to the regulation of automobile insurance rates. If passed, the legislation would convert premium calculation for most automobile coverage from dollars-per-year to dollars-per-mile class rates.

The latest version of the legislation (Senate Bill 1033) was introduced by Senators Dawida, Afflerbach and Fattah, and has remained in the Committee on Banking and Insurance since April 28, 1993. No version of the legislation has ever been discussed in committee.

Fairness in Automobile Insurance Rates (FAIR)

For the last three legislative sessions, Colorado Senator Bob Pastore has introduced legislation that is similar to PPN and UMA. Pastore's plan, however, would focus only on uninsured motorists. FAIR has never come close to passing the legislature, and Pastore is trying presently to raise funds to finance a voter ballot initiative. Much of the criticism of FAIR, coming mostly from the insurance and petroleum industries, has focused on the plan's feasibility.

FAIR would force drivers who do not have personal insurance into a "comprehensive automobile insurance pool." The measure would require uninsured drivers to pay additional premiums on fuel, license plates, drivers' licenses, and traffic offenses. All of these premiums would be collected to fund the cost of providing automobile insurance for the uninsured.

31. NOW testified at Sen. Torres' hearing on PPN. NOW agreed with PPN's principles, but argued that PPN would continue to treat car owners unequally.

The cornerstones of FAIR are surcharges at the pump and at registration. Drivers who cannot produce proof of insurance when purchasing gas would be required to pay 8 cents more per gallon. The state would keep a database containing the names of insured drivers, and drivers would be required to carry specialized identification cards that contain their insurance information. Uninsured drivers would also have to pay an additional \$30 for a driver's license and an extra \$100 to register a car.

Hawaii

Various bills were introduced in Hawaii's 1987 legislative session; each provided for the establishment of a Hawaii Driver's Insurance Fund (HDIF) to be the exclusive source for purchasing motor vehicle insurance in Hawaii. Further consideration of the bills was delayed pending a study done by Coopers & Lybrand.

The Coopers & Lybrand study focused on two basic options for forming the HDIF: (1) as a publicly-administered fund operated entirely by the state of Hawaii, or (2) as a privately-administered fund to be operated on a shared basis by existing insurance companies. While the administration of each option was different, both were to be funded with premiums collected in three ways: a fuel tax, vehicle registration fees, and driver's license renewals.

After several new versions of pay-at-the-pump were introduced in 1993, each of which died in committee, Representative Robert Herkes introduced "A Bill for an Act Relating to Motor Vehicle and Motorcycle Insurance" (HB 3596). HB 3596 was to create a special fund within the insurance division to award, through competitive bidding, a 3-year contract to a single insurer. That insurer would have provided exclusively the basic required motor vehicle and motorcycle insurance for an entire county. The bill also would have established a board of directors to administer the program.

The financing for the new fund would have come from three sources: premiums on the contracts through increased registration fees, increased drivers license application and renewal fees, and a gas tax at the pump. HB 3596 would also have subjected higher risk drivers and vehicles to higher fees, and would have granted tax credits to "certain classes of people whose vehicles consume fuel for off-road purposes."

Although HB 3596 was opposed by a number of tax and insurance groups,³² HB 3596 was successfully passed out of four different House Committees. In addition, the measure passed the full House in March 1994 by an unanimous vote (51-0). HB 3596 died in the Senate.

Quebec

Quebec instituted a per gallon surcharge to provide PD coverage in the early 1980's. However, the surcharge was quite low, and was discontinued after a few years. Other countries, such as Australia, New Zealand and South Africa, have experimented with per gallon insurance surcharges.

2.3. Impact on Insurance Premiums

Supporters of PAYD proposals in California contend that restrictions on non-economic damages, coupled with the elimination of uninsured motorists and therefore UM and UIM coverage, will lower average insurance premiums. In this section we present some data on relative insurance costs, type of liability system, and number of uninsured drivers by state. Several other factors, such as minimum compulsory coverage levels, assigned risk plans for risky drivers, and other

32. Department of Taxation, the Hawaii Independent Insurance Agents Association, Hawaii Transportation Association.

state policies, such as drunk driving laws, the legal drinking age, and speed limits, can affect the frequency and/or severity of vehicle accidents, and therefore state average insurance premiums. After we examine the current situation in the states, we summarize the results of several studies on the effect of introducing a no-fault liability system and compulsory insurance requirements on average insurance premiums.

2.3.1. State liability systems and minimum compulsory liability coverage levels

Every state has financial responsibility laws that require drivers to be able to pay for a specified amount of medical expenses and property damage they may inflict on others by their driving. Drivers can fulfill their legal responsibility with a minimum liability insurance policy, by posting bond for the same amount, or by depositing cash or securities in the same amount. Financial responsibility laws by themselves do not require motorists to buy insurance before their cars can be registered, and they do not make it a criminal offense to drive without insurance. Thirty-nine states and DC do require the purchase of insurance coverage, whether it be first party (PIP) or third party (BI, PD and MP) coverage, to cover the amount specified in their financial responsibility laws (see Table 2). Compulsory insurance laws often require drivers to present proof of insurance before they are allowed to register their car, and make it illegal to drive without such proof. Most states, however, require only that people sign affidavits attesting that they have, and will maintain, liability coverage.

Minimum coverage for bodily injury ranges from \$20,000 for all people injured, limited to \$10,000 per person, (in several states) to \$100,000, limited to \$50,000 per person (in Alaska). Minimum coverage for property damage ranges from \$5,000 to \$25,000. Table 2 also shows the minimum coverage levels of each state, as well as which states require insurance coverage for these levels.³³ UM coverage is not compulsory in any state.³⁴

2.3.2. Average premium by coverage type

PAYD would reduce insurance premiums in two ways: per-gallon (and to a lesser extent per-mile) surcharges would significantly reduce UM and UIM premiums, while restrictions on the right to sue for noneconomic damages would reduce premiums for excess liability coverage. We attempted to quantify the amount of these types of coverage drivers currently purchase in each state in order to determine how much money could be saved by adopting PAYD on a national level.

National data

The National Association of Insurance Commissioners (NAIC) provides state average premiums for combined liability (BI, PD, and PIP, depending on the state's liability system), collision, and comprehensive coverage. Most PAYD proposals would only reallocate BI, and not PD, coverage to a variable surcharge, however; NAIC does not calculate separate average premiums for BI and PD coverage. In addition, NAIC does not calculate state average premiums for UM or UIM coverage. As a result, these data cannot tell us how much of the average premium is for excess liability coverage.

Table 3 presents the NAIC state average premiums for liability coverage combined; currently drivers pay an average of between \$171 in North Dakota and \$753 in Hawaii for total liability coverage (note that both of these states have no-fault liability systems with dollar thresholds). The US weighted average premium is \$394. Tort states have the lowest weighted average premium

33. Insurance Issues Update: Compulsory Auto Insurance, Insurance Information Institute, New York, February, 1994.

34. Sean Mooney, *Auto Insurance: Critical Choices for the 1990's*, Insurance Information Institute, New York, 1989, pp. 63-74.

(\$348), followed by add-on states (\$376), no-fault states (\$461 with verbal threshold, \$451 with dollar threshold) and states that allow drivers to choose between a tort and no-fault system (\$478).

The NAIC data do not allow us to determine how much money was spent on liability coverage in excess of mandatory minimums. We did look at the portion of drivers in each state who purchased collision and comprehensive coverage, coverage that is not required in any state. PAYD would not replace the private market for this "excess" coverage; this exercise merely gives an indication of why some states may have larger total premiums, on the average, than other states. Throughout the US, 36 percent of total auto insurance expenditures are for collision and comprehensive coverage; statewide averages range from 23 percent (in Hawaii) to 51 percent (in Wyoming). Tort states tend to have a slightly larger percentage of insurance expenditures for collision and comprehensive coverage than the national average (39 percent to 36 percent). Seventy-seven percent of all US drivers, ranging from 58 percent in Oklahoma to 98 percent in New Hampshire, purchase collision or comprehensive coverage.

Differences among the state average liability premiums are partially attributable to the different coverage levels required in each state (see Table 2); Figure 2 plots the relationship between minimum liability coverage requirements and average liability premium, by the type of insurance system in each state. Two general observations can be made about Figure 2. First, there does not appear to be an increase in average premiums as minimum compulsory coverage increases, either for all states or for states grouped by their liability system. Second, for states with similar minimum coverage requirements, there does not seem to be a clear pattern between liability system and average premium. In states with \$20,000 and \$40,000 minimum BI coverage requirements, tort states seem to have lower average premiums than non-tort states; however, in states with \$30,000 and \$50,000 minimum coverage requirements, there is no clear pattern between liability system and average premium.

Statistical agent data

To obtain a breakout of average premiums for third party (BI and PD) and first party (UM/UIM and MP/PIP) coverage, one must obtain insurance company data, by state, from three statistical agents, the National Association of Independent Insurers (NAII), the Insurance Services Office (ISO), and the National Independent Statistical Service, and aggregate to the state level. Insurance companies reporting to two of these agents (NAII and ISO) account for roughly 90 percent of the auto insurance market; NAII represents a few large insurance companies, while ISO represents smaller insurance companies. In addition to representing some companies in the western states, NISS compiles data from the other two agents, aggregates it to the state level, and provides it to NAIC.

ISO and NAII would have provided us with the average BI and UM/UIM premiums their member companies charge in each state, for a fee. We decided that the cost of obtaining the data from each statistical agent, and re-aggregating them to achieve state average premiums for BI and UM/UIM coverage, was prohibitive. However, even if resources were available, differences in how each statistical agent reports state average premiums may have made such aggregation and state-by-state comparison impossible. For instance, ISO does not report PD insurance premiums per car-year, so the average PD premium cannot be separated from the BI premium (NAII does report both PD and BI premium by car-year).

In summary, data are not readily available to determine how much consumers pay in excess liability or uninsured/underinsured motorist coverage. Without these data, one cannot determine the average or aggregate cost savings from eliminating these coverages by adopting a PAYD system.

Table 3: Average 1992 Liability (Combined BI and PD) Premium, by State

State	Insurance System (1)	Average Premium (2) Total	Liability	Percent "Excess" Coverage (dollars) (3)	Percent "Excess" Coverage (policies) (4)
Arkansas	Add on	\$424	\$247	42%	63%
Delaware	Add on	\$745	\$529	29%	86%
District of Columbia	Add on	\$880	\$518	41%	81%
Maryland	Add on	\$702	\$472	33%	88%
New Hampshire	Add on	\$638	\$391	39%	98%
Oregon	Add on	\$535	\$359	33%	77%
South Carolina	Add on	\$528	\$358	32%	65%
South Dakota	Add on	\$333	\$184	45%	59%
Texas	Add on	\$646	\$420	35%	68%
Virginia	Add on	\$503	\$335	33%	82%
Washington	Add on	\$588	\$400	32%	77%
Wisconsin	Add on	\$492	\$292	41%	87%
Kentucky	Choice-D	\$473	\$308	35%	67%
New Jersey	Choice-V	\$957	\$650	32%	77%
Pennsylvania	Choice-V	\$642	\$433	33%	83%
Colorado	NF-D	\$653	\$422	35%	71%
Connecticut	NF-D	\$878	\$615	30%	89%
Hawaii	NF-D	\$974	\$753	23%	65%
Kansas	NF-D	\$392	\$212	46%	67%
Massachusetts	NF-D	\$860	\$603	30%	76%
Minnesota	NF-D	\$566	\$368	35%	84%
North Dakota	NF-D	\$319	\$171	46%	62%
Utah	NF-D	\$463	\$282	39%	69%
Florida	NF-V	\$684	\$487	29%	81%
Michigan	NF-V	\$661	\$359	46%	77%
New York	NF-V	\$799	\$507	36%	76%
Alabama	Tort	\$510	\$259	49%	78%
Alaska	Tort	\$685	\$424	38%	69%
Arizona	Tort	\$667	\$469	30%	75%
California	Tort	\$800	\$518	35%	84%
Georgia	Tort	\$514	\$299	42%	68%
Idaho	Tort	\$402	\$243	40%	68%
Illinois	Tort	\$534	\$296	45%	81%
Indiana	Tort	\$497	\$299	40%	74%
Iowa	Tort	\$379	\$212	44%	75%
Louisiana	Tort	\$724	\$495	32%	72%
Maine	Tort	\$468	\$283	40%	80%
Mississippi	Tort	\$519	\$295	43%	72%
Missouri	Tort	\$493	\$287	42%	73%
Montana	Tort	\$393	\$228	42%	63%
Nebraska	Tort	\$352	\$195	45%	65%
Nevada	Tort	\$673	\$453	33%	66%
New Mexico	Tort	\$543	\$343	37%	63%
North Carolina	Tort	\$448	\$301	33%	67%
Ohio	Tort	\$503	\$304	39%	87%
Oklahoma	Tort	\$448	\$263	41%	58%
Rhode Island	Tort	\$837	\$550	34%	80%
Tennessee	Tort	\$478	\$258	46%	77%
Vermont	Tort	\$484	\$262	46%	86%
West Virginia	Tort	\$557	\$352	37%	74%
Wyoming	Tort	\$366	\$180	51%	61%
Total US		\$617	\$394	36%	77%
No-Fault, verbal threshold states	3	\$723	\$461	36%	78%
No-Fault, dollar threshold states	8	\$673	\$451	33%	76%
Choice states	3	\$709	\$478	33%	78%
Add-On states	12	\$577	\$376	35%	76%
Tort States	25	\$568	\$348	39%	76%

Notes:

(1) NF-V = no-fault with verbal threshold; NF-D = no-fault with dollar threshold; Choice = choice between tort or no-fault liability; Add on = no restrictions on lawsuits. Between 1987 and 1992 GA switched from NF-D to T, NH and WI switched from T to AO, and PA switched from AO to C-V.

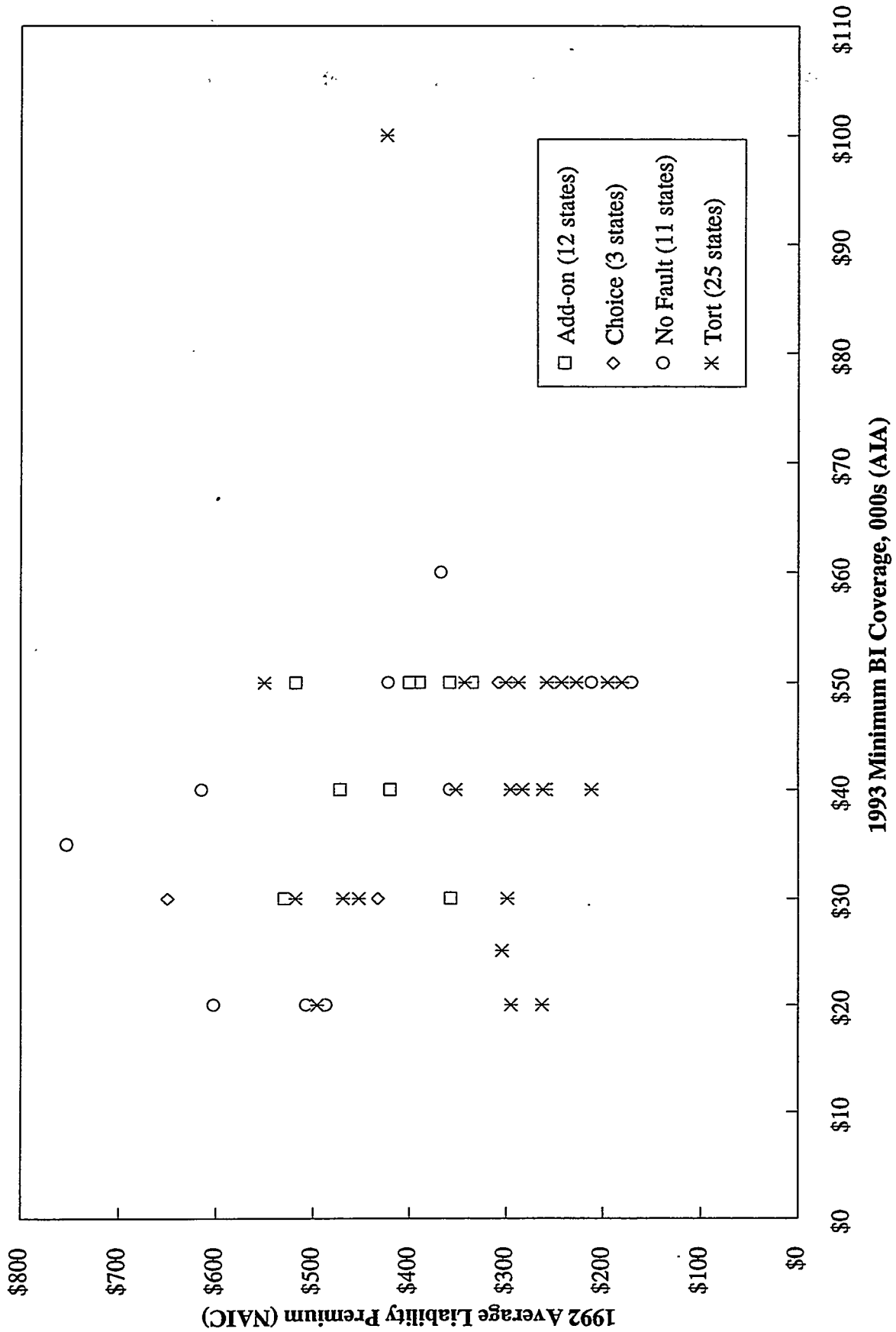
(2) Average liability premium is combined bodily injury and property damage premiums divided by car-years of policies written; average total premium is total premiums divided by car-years.

(3) Fraction of total insurance premium payments for collision or comprehensive coverage.

(4) Fraction of total insured drivers who purchase collision or comprehensive coverage.

Source: National Association of Insurance Commissioners, 1993

Figure 2: State Average Premium vs. Minimum BI Coverage, by 1992 Insurance System



2.3.3. Distribution of premiums and coverage

Of course, there is no such thing as an average driver or premium; individual drivers will pay more or less than the average premium. A distribution of premiums paid by coverage type would be useful to determine what portion of the population is paying for "excess" liability or UM/UIM coverage, and therefore give an indication of how many drivers would benefit (pay lower premiums) from a PAYD system.

Most states allow insurance companies to provide separate rates for different locations, coverages, driver profiles, and other variables. As discussed above, there is no single source of the average insurance premium charged by coverage type in each state, let alone a distribution of premiums by coverage amount or rating characteristics. However, some states survey insurance companies to obtain specific rates available for different amounts of coverage and different driver profiles, in different rating territories throughout the state. States conduct this type of survey and publish reports to assist consumers in finding companies that charge the least expensive premiums. Unfortunately, there is no national set of driver profiles. Different insurance companies define driver classes differently (one may include all 20- to 30-year-olds in their "young" age class, while another may include only 22- to 30-year-olds); in addition, the same company typically has different class categories for different states. Finally, although these surveys give an indication of the range of premiums charged for specific coverage levels and driver profiles, they do not indicate how many policies are purchased at each premium. Consequently, data on the distribution of premiums paid or coverage levels are not readily available (however, we did look at several state surveys to determine the minimum premium charged in each state; see Appendix C).

2.3.4. Average claims payment by coverage type

In 1987 the Insurance Research Council (IRC) conducted a Closed Claim Survey, a national sample of nearly 47,000 claims closed during 1987 which provided payments to policyholders (the IRC will soon release the results of a similar study conducted in 1992). The 34 companies that wrote the claims in the sample represented 60 percent of all policies written in that year. (IRC also conducted a Consumer Panel study of 200,000 households between 1982 and 1986 to obtain data on people injured in accidents who did not receive compensation from auto insurance policies.)

The following table shows the distribution of number of claims and claim payments by coverage type (third party, or BI, UM, UIM, coverage versus first party, or MP and PIP, coverage) and type of liability system (no-fault, add-on, or tort) in each state (claims for death or permanent disability are excluded).

Table 4: Distribution of Claims and Payments by Insurance System and Coverage Type

State	Percent of Claims		Percent of Claim Payments	
	Third Party (BI, UM, UIM)	First Party (MP and PIP)	Third Party (BI, UM, UIM)	First Party (MP and PIP)
U.S. average	54%	46%	80%	20%
No-fault states	31%	69%	69%	31%
Add-on states	56%	44%	81%	19%
Tort states	70%	30%	90%	10%

As expected, claimants in no-fault states make much greater use of first party coverage; the distribution of claims covered by third versus first party coverage switches from 30/70 percent in no-fault states to 70/30 percent in tort states. The distribution of claims and claim payments by coverage type and state are presented in Table 5. Weighted averages for five types of states,

including verbal and dollar threshold no-fault states, and states that give claimants a choice between liability system, are calculated at the bottom of the table.

Table 5 also shows that average total claim payment for each state ranged from \$2,082 in North Carolina to \$11,965 in Hawaii; the US weighted average was \$4,197. Tort states have the lowest weighted average total claim payments (\$3,973), followed by add-on states (\$4,012) and no-fault and choice states (between \$4,448 and \$4,700).

Figure 3 is a plot of 1992 average liability (combined BI and PD) premiums (from NAIC) and 1987 average claim payment (total payments over total claims, from IRC), by state. State average premium levels appear to increase as state average claim payments increase; however, the coefficient of determination (r^2) of a regression line drawn through the points is only 0.45. The r^2 is not improved if outlying states (Hawaii and Delaware) are removed. The relationship is no stronger if type of liability system (no fault, add-on, or tort) is taken into account (the four states that changed liability systems between 1987 and 1992 are noted separately on the figure).

IRC also found that a larger fraction of claimants injured in auto accidents received payments in no-fault states than tort states. About one-third of claimants who received first party payments in no-fault states would not have received benefits in tort states without liability thresholds, because they were either involved in a single vehicle accident or were the party at fault. The fraction of claimants that were eligible to file tort claims that exceeded the liability threshold ranged from 63 percent in New Jersey (with a \$200 threshold that is easily exceeded) to 12 percent in Michigan (with a strong verbal threshold). About 21 percent of the claimants could have made tort claims if the threshold in their state was removed; this figure ranged from 11 percent in New Jersey to 36 percent in Michigan. These figures indicated the relative effectiveness of dollar and verbal thresholds reducing the number of tort claims.

2.3.5. *RAND Study*

The RAND Institute for Civil Justice (RAND) examined the closed claim data collected by the Industry Research Council, along with other sources of data, and developed a statistical model to compare average claims in tort liability and no-fault states, and to estimate the change in average claims if current tort states were to adopt a no-fault insurance system.³⁵ The RAND study found that switching to a no-fault liability system will not necessarily result in cost savings. Under a tort system, all claims for economic and noneconomic losses are paid by liability coverage (BI or UM) to claimants that successfully demonstrate fault. Under no-fault, claims for economic losses only are paid by PIP to all claimants, regardless of fault; claims for noneconomic losses can only be made if they exceed the threshold. Switching to no-fault will reduce costs if enough claims are diverted from the liability system (and their noneconomic damages eliminated) to counteract the increased costs of making full PIP payments for economic damages to all claimants. Where the threshold is set is critical in determining how many claims are diverted, and, therefore, whether the switch to no-fault will lower costs.

RAND modeled the change in total injury costs, net compensation, and transaction costs if all current tort states were to adopt a no-fault system with a verbal threshold and a \$15,000 PIP benefit level. The study found that transaction costs (both the insurer's and the claimant's) were reduced from \$1,829 to \$1,110 (40 percent); however, the switch also resulted in a decrease in average net compensation from \$3,645 to \$3,182 (13 percent). By cutting transaction costs (legal fees and processing costs paid by insurers and claimants) and reducing net compensation, a reduction in total injury coverage from \$5,474 to \$4,292 (22 percent) is possible.

35. Carroll et al, 1991 and Carroll and Kakalik, 1993.

Table 5: 1987 Distribution of Claims and Payments (by Type) and Average Total Claim, by State

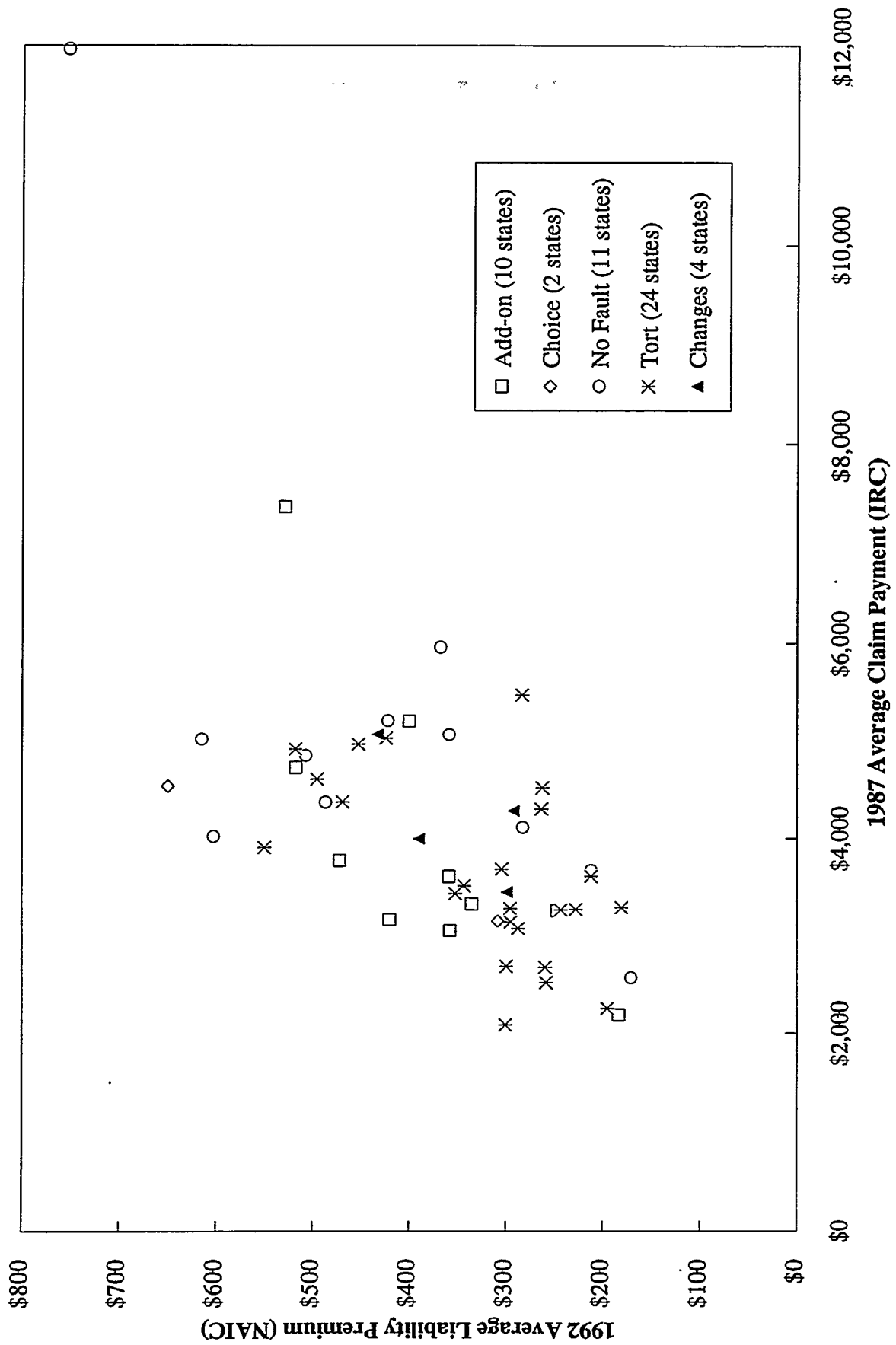
State	Insurance System (1)	Percent of Claims (2)				Percent of Claim Payments (2)				Average Total Claim
		BI	UM/UIM	MP	PP	BI	UM/UIM	MP	PP	
Arkansas	Add on	68%	8%	11%	14%	81%	10%	3%	6%	\$3,260
Delaware	Add on	43%	6%	1%	50%	72%	14%	0%	15%	\$7,419
District of Columbia	Add on	59%	7%	3%	30%	64%	8%	0%	28%	\$4,723
Maryland	Add on	53%	4%	3%	40%	77%	6%	2%	15%	\$3,771
Oregon	Add on	56%	6%	1%	37%	73%	7%	1%	19%	\$3,606
Pennsylvania	Add on	34%	5%	22%	39%	54%	12%	8%	26%	\$5,064
South Carolina	Add on	62%	3%	3%	32%	84%	5%	1%	10%	\$3,049
South Dakota	Add on	65%	5%	25%	5%	91%	3%	5%	2%	\$2,187
Texas	Add on	57%	6%	1%	36%	72%	11%	0%	16%	\$3,168
Virginia	Add on	55%	7%	36%	2%	73%	13%	12%	1%	\$3,327
Washington	Add on	62%	12%	6%	20%	65%	26%	1%	8%	\$5,201
Kentucky	Choice-D	22%	4%	5%	70%	66%	5%	2%	27%	\$3,154
New Jersey	Choice-V	31%	4%	0%	65%	59%	6%	0%	35%	\$4,540
Colorado	NF-D	15%	9%	9%	67%	46%	11%	4%	38%	\$5,205
Connecticut	NF-D	26%	4%	0%	70%	62%	20%	0%	18%	\$5,014
Georgia	NF-D	36%	5%	3%	56%	65%	10%	1%	24%	\$3,449
Hawaii	NF-D	20%	5%	0%	75%	61%	21%	0%	18%	\$11,965
Kansas	NF-D	20%	2%	2%	75%	59%	12%	1%	29%	\$3,667
Massachusetts	NF-D	40%	5%	4%	51%	72%	14%	2%	12%	\$4,019
Minnesota	NF-D	24%	4%	1%	71%	58%	20%	0%	22%	\$5,960
North Dakota	NF-D	13%	0%	0%	87%	39%	0%	0%	61%	\$2,567
Utah	NF-D	38%	4%	3%	54%	82%	1%	1%	16%	\$4,116
Florida	NF-V	21%	7%	23%	49%	46%	27%	3%	24%	\$4,370
Michigan	NF-V	11%	3%	0%	86%	32%	6%	0%	63%	\$5,058
New York	NF-V	27%	2%	0%	71%	69%	3%	0%	27%	\$4,847
Alabama	Tort	50%	13%	36%	1%	66%	23%	11%	0%	\$2,676
Alaska	Tort	60%	6%	35%	0%	70%	2%	28%	0%	\$5,025
Arizona	Tort	56%	9%	34%	2%	73%	12%	13%	1%	\$4,378
California	Tort	57%	15%	28%	0%	72%	17%	10%	0%	\$4,916
Idaho	Tort	60%	3%	38%	0%	76%	5%	19%	0%	\$3,268
Illinois	Tort	65%	9%	26%	0%	73%	15%	12%	0%	\$3,284
Indiana	Tort	60%	5%	34%	1%	80%	10%	11%	0%	\$2,684
Iowa	Tort	57%	5%	37%	1%	86%	7%	7%	0%	\$3,614
Louisiana	Tort	70%	11%	18%	0%	66%	28%	6%	0%	\$4,605
Maine	Tort	67%	6%	19%	9%	70%	10%	3%	17%	\$5,475
Mississippi	Tort	59%	12%	27%	2%	82%	12%	5%	1%	\$3,145
Missouri	Tort	61%	9%	28%	2%	75%	16%	8%	1%	\$3,074
Montana	Tort	57%	4%	33%	6%	80%	14%	6%	0%	\$3,276
Nebraska	Tort	56%	2%	42%	1%	84%	2%	13%	0%	\$2,255
Nevada	Tort	61%	14%	24%	1%	66%	26%	8%	0%	\$4,961
New Hampshire	Tort	52%	5%	37%	6%	72%	13%	8%	7%	\$3,996
New Mexico	Tort	64%	12%	23%	1%	74%	17%	10%	0%	\$3,514
North Carolina	Tort	57%	2%	40%	1%	80%	6%	13%	1%	\$2,082
Ohio	Tort	63%	6%	30%	1%	84%	9%	7%	0%	\$3,682
Oklahoma	Tort	59%	9%	31%	1%	68%	23%	9%	0%	\$4,301
Rhode Island	Tort	67%	7%	22%	4%	76%	14%	7%	3%	\$3,911
Tennessee	Tort	64%	10%	24%	2%	75%	18%	7%	1%	\$2,517
Vermont	Tort	66%	3%	24%	8%	84%	7%	4%	6%	\$4,519
West Virginia	Tort	57%	4%	37%	2%	85%	3%	11%	1%	\$3,438
Wisconsin	Tort	73%	8%	18%	1%	84%	12%	4%	0%	\$4,282
Wyoming	Tort	67%	6%	17%	11%	58%	1%	2%	40%	\$3,296
Average US		47%	7%	17%	29%	66%	13%	5%	15%	\$4,197
No-Fault, verbal threshold	3	22%	4%	9%	65%	53%	12%	1%	33%	\$4,700
No-Fault, dollar threshold	9	29%	5%	3%	63%	62%	15%	1%	22%	\$4,654
Choice states	2	30%	4%	1%	65%	59%	6%	0%	34%	\$4,448
Add-On states	11	50%	6%	12%	32%	67%	12%	5%	17%	\$4,012
Tort States	26	60%	10%	29%	1%	74%	16%	10%	1%	\$3,973

Notes:

(1) NF-V = no-fault with verbal threshold; NF-D = no-fault with dollar threshold; Choice = choice between tort or no-fault liability; Add on = no restrictions on lawsuits. Between 1987 and 1992 GA switched from NF-D to T, NH and WI switched from T to AO, and PA switched from AO to C-V.

(2) Excludes claims for death and permanent total disability.

Figure 3: State Average Premium vs. Average Claim Payment, by 1992 Insurance System



RAND also looked at different designs of no-fault systems, by varying the threshold and PIP benefit level. The table below shows the percent change in total injury coverage costs from adopting a variety of no-fault systems in all tort states.

Table 6: Change in Total Costs from Different No-Fault Systems

<i>PIP Benefit Level</i>	<i>Tort Threshold</i>			
	<i>\$1,000</i>	<i>\$5,000</i>	<i>Verbal</i>	<i>Ban</i>
<i>\$15,000</i>	-12%	-14%	-22%	NA
<i>\$50,000</i>	NA	-6%	-12%	-52%
<i>\$250,000</i>	+13%	+11%	+5%	NA
<i>Unlimited</i>	NA	NA	NA	-29%

Clearly, as the threshold increases, the cost savings increase, whereas as the PIP benefit level increases, the cost savings decrease. A no-fault plan that provides up to \$250,000 in PIP benefits and eliminates only those non-economic claims under \$1,000 will increase average total injury coverage costs 13 percent; a plan that provides up to \$50,000 in PIP benefits and eliminates non-economic claims altogether will reduce average total injury costs by 52 percent.

Recent data from Massachusetts tend to confirm these findings. In 1989 Massachusetts raised its dollar tort threshold from \$500 to \$2,000, but also raised its PIP benefit level from \$2,000 to \$8,000. The state predicted that combined BI and PIP payments would be reduced 13 percent, due to 20 percent and 22 percent reductions in BI claims and payments, respectively, and a 33 percent increase in PIP payments. However, total payments declined less than 1 percent, due to small decreases in BI claims and payments (2 and 12 percent, respectively), and a large increase in PIP payments (63 percent). Analysts attribute the lack of savings to increased buildup of medical claims to exceed the higher threshold. Such buildup has been noted even in Hawaii, which has the highest dollar threshold in the country (\$10,000).³⁶

Finally, RAND examined how various no-fault systems would affect the costs in four tort states individually (California, Illinois, Indiana, and Ohio). The relative ranking of each state does not change under each alternative no-fault plan; in general, California has the largest potential cost savings, and Ohio the least, from switching to no-fault, of the four states studied. RAND found that switching to a no-fault liability system will result in greater savings in states that have:

- a higher percentage of medical loss claims less than \$500 (and therefore subject to a low threshold);
- a higher percentage of claimants with attorney representation (and therefore higher transaction costs);
- a higher percentage of claimants receiving third-party compensation (and therefore more claims in the liability system); and
- a higher average compensation for economic losses between \$1,000 and \$2,000 (and therefore higher awards for liability settlements).

2.3.6. Uninsured motorists

Since these motorists are breaking the law in many states, no hard data on the number of uninsured motorists are available. An IRC report uses the ratio of UM claim frequency to BI claim frequency as an indicator of the percentage of uninsured motorists by state. As shown in Table 7, this measure indicates that uninsured motorists represent from 5 percent of all drivers in North Carolina to 30 percent in Colorado. Annual IRC surveys find that, nationally, only 10 percent of motorists

36. "The System Misfired," Herbert I. Weisberg and Richard A. Derrig, *Best's Review*, 93(8) (December 1992): 37-40,87.

Table 7: Estimates of Uninsured Motorists, by State

State	Ratio of UM to BI Claim Frequency (1)	Average Loss (2)	State studies
North Carolina	0.046	\$89	
Vermont	0.051	\$90	
Massachusetts	0.058	\$214	
South Dakota	0.059	\$61	
New York	0.062	\$178	6.5% of registered vehicles (DMV, 1979); 8% to 19% (ins. industry, 1979)
New Hampshire	0.068	\$130	
Maine	0.071	\$91	
Nebraska	0.074	\$67	
North Dakota	0.074	\$72	
Idaho	0.075	\$80	
West Virginia	0.075	\$95	
Connecticut	0.085	\$185	
Iowa	0.086	\$70	
Montana	0.086	\$90	
Kansas	0.087	\$82	
Indiana	0.088	\$85	
Kentucky	0.093	\$71	
Hawaii	0.095	\$165	
Utah	0.096	\$95	
New Jersey	0.097	\$317	
Oregon	0.101	\$125	
Wyoming	0.101	\$61	
Wisconsin	0.102	\$92	
South Carolina	0.110	\$139	
Arkansas	0.114	\$78	
Ohio	0.117	\$98	
Maryland	0.123	\$181	
Arizona	0.132	\$143	
Texas	0.133	\$103	
Alaska	0.140	\$126	
Illinois	0.143	\$118	15% of all drivers
Nevada	0.143	\$140	
Delaware	0.147	\$172	
Missouri	0.149	\$96	
Michigan	0.161	\$105	11% of all drivers (1978)
Pennsylvania	0.162	\$171	6% to 7% of all drivers (Dept. of Trans., 1980)
Virginia	0.165	\$97	
Oklahoma	0.180	\$86	
Rhode Island	0.189	\$144	
Minnesota	0.195	\$127	
Louisiana	0.198	\$152	
New Mexico	0.198	\$86	
Washington	0.201	\$113	
Mississippi	0.220	\$83	
Georgia	0.221	\$128	24% of licensed drivers (Dept. Public Safety)
Tennessee	0.222	\$93	
California	0.233	\$162	28% statewide, >90% in some zipcodes (Ins. Dept., 1995)
Alabama	0.248	\$66	
Florida	0.297	\$141	nearly 33% of all drivers (Ins. Dept., 1983)
Colorado	0.303	\$133	
District of Columbia	NA	NA	
Total US	0.138		

Notes:

- (1) UM/BI is the ratio of uninsured motorist claim frequency to bodily injury claim frequency.
(2) Total payments for BI, PD and PIP coverage divided by the total number of insured vehicles.

Sources: Industry Research Council, 1989; Mooney, 1989.

are uninsured; however, this data is self-reported, and therefore is a low estimate. The same annual surveys indicate that households with incomes below \$15,000 own 69 percent of uninsured cars.³⁷

Several states have developed estimates of uninsured motorists, ranging from 6 to 33 percent statewide (a recent California Department of Insurance study found uninsured motorist rates of over 90 percent in some Los Angeles zipcodes).³⁸ The results from state studies of uninsured motorists are also shown in Table 4.

Insurance companies argue that covering uninsured motorists will not involve simply transferring UM/UIM premiums to uninsured motorists. They claim that uninsured motorists are more likely to be involved in an accident, and therefore will be more costly than the average uninsured driver. Recent data from Texas support this claim; the data indicate that claims for newly insured (formerly uninsured) drivers were double the normal rate.³⁹ To the extent that uninsured motorists do not buy coverage because they are risky, rather than low-income, drivers, forcing uninsured motorists to purchase insurance may increase, rather than decrease, average premiums.

2.4. Rating Variables

Most states allow insurance companies to base premiums on a number of rating factors. A 1980 IRC study collected information on nearly 4 million policies written in 12 states in 1978. The lowest and highest class average premium for a particular class of driver (i.e., holding all other variables constant) were compared to determine the price range of certain rating factors. The study found that, for one-car policies, vehicle list price and driver age/gender category had the highest ratio of the highest premium to the lowest premium (1.9 and 1.8, respectively). Other significant factors that affect differences in rates are vehicle age (1.6), driver accident history (1.4), territory (rural vs. urban) (1.4), and coverages purchased (comprehensive only vs. comprehensive and collision) (1.4).⁴⁰ A more recent survey of the ten largest insurance companies in ten states found that premiums vary by as much as a factor of five, depending on the driver profile (including variables such as number of cars/drivers, age, gender, driving record). Premiums vary much less (a factor of less than two) depending on where the vehicle is garaged (urban, suburban, or rural), holding driver profile variables constant.⁴¹ The premium that different insurance companies in the same state charge for the same coverage can vary by as much as a factor of five.⁴²

In theory, a similar analysis could be done using the average premium data provided by the statistical agents, as mentioned above. However, one would have to have information on all rating variables in order to assess the price differential of a single rating variable. For example, to determine the effect of driver age on premiums, one would compare policies that were written for drivers that had the same characteristics except for age; one would have to hold other variables constant in analyzing the effect of driver age on premiums. Also, given that definitions of driver classes (class plans) vary by state and company, this would be difficult. ISO provides suggested class plans for its member companies, but the larger companies tend to have a different class plan for each state.

37. *Uninsured Motorists*, All-Industry Research Advisory Council, October 1989.

38. *Commissioner's Report on Underserved Communities*, California Department of Insurance Statistical Analysis Bureau, February 1995.

39. "Compulsory Auto Insurance Laws Can Work Better," Sean Mooney, *National Underwriter*, 9(34) (August 22, 1994): 39, 37.

40. *The Cost of Auto Insurance*, All-Industry Research Advisory Council, December 1980.

41. *Paying for Automobile Insurance at the Pump: A Critical Review*, American Petroleum Institute, December 1994.

42. "Auto Insurance, What Coverages Do You Need?" *Consumer Reports*, August 1992, pp. 493-499.

Legislation in some states (e.g. NC, MI, MA) restricts insurance companies from using some rating factors (e.g. age, gender, marital status, territory) in determining premiums. A 1986 GAO study found that these restrictions on rating factors resulted in insurance companies refusing to provide coverage to certain classes of drivers.⁴³

In general, annual vehicle miles traveled is not used to determine premiums. Some companies provide a premium discount if estimated future mileage is less than a certain level (typically 7,500 miles), or based on the estimated distance to work and whether the customer drives to work. One company, Allstate, provides different premium discounts for 6 categories of annual miles driven. However, these distances are self-reported, and insurance companies do not read vehicle odometers to verify reported estimated future mileage. In general, the insurance industry believes that the location of driving appears to be a more important factor than the total number of miles driven annually; commuting in dense urban areas is thought to be of higher risk than recreational driving on less crowded highways.⁴⁴

2.4.1. Statistical Analyses

Several studies have been undertaken to determine what are the best factors in predicting accident or frequency or severity. The results of these studies are summarized below. One reason that insurance companies have not undertaken more thorough analysis of this issue is that they generally do not collect certain types of data that may be correlated with accident rates or severity. As mentioned above, few companies record annual mileage, and those that do rely on drivers' estimates of future mileage.

American Petroleum Institute analysis

A recent study by the American Petroleum Institute used 1991 state level data to determine the impact average mileage per vehicle has on the average insurance premium in each state. The study showed that there is little relationship between state average mileage per vehicle and state average insurance premium per vehicle (using NAIC state average premiums, described above). However, there is a strong relationship between average premium and traffic density, defined as state VMT In 100,000 miles) divided by road capacity (vehicle lane miles). The API study demonstrated that a univariate regression model indicates that traffic density accounts for 76 percent of the variance in state average premium. A statistical model that utilized several additional variables (attorney representation, daily hospital charges, auto repair costs, percent licensed youth, vehicle speed, law enforcement and safety expenditures, and per capita disposable income) increased the explained variation to 83 percent; however, few of the additional variables were statistically significant. API concluded from this analysis that traffic density, not mileage, explains average insurance premiums and costs, and that maintaining and expanding road capacity would have a greater effect on lowering insurance premiums than instituting a per mile insurance surcharge. We replicated API's univariate statistical model (premium vs. traffic density) using 1992 state average premium, VMT, and capacity data. We then decomposed the traffic density variable into its two components, VMT and capacity, and ran a translog regression; Table 8 compares our multivariate regression with API's univariate model.

43. *Auto Insurance: State Regulation Affects Cost and Availability*, US General Accounting Office, August 1986.

44. Mooney, p. 38.

Table 8: API and LBNL Models Explaining Average State Insurance Premium

<i>Study</i>	<i>Variable</i>	<i>Coefficient</i>	<i>t-statistic</i>	<i>F statistic</i>	<i>R²</i>
API	<i>constant</i>	347.95	16.44	120.10	0.71
	<i>density (VMT/capacity)</i>	67.58	10.96		
LBNL	<i>constant</i>	6.68	20.77	56.61	0.70
	<i>log VMT</i>	0.29	9.77		
	<i>log capacity</i>	-0.35	-9.75		

VMT expressed in 100,000s of miles

* Insignificant at the 0.05 level

We found that average premium increases as VMT increases, and decreases as capacity increases, as one would expect. The coefficients for VMT (in 100,000s) and capacity are of the same magnitude, suggesting that reducing statewide VMT (by 100,000 miles) or increasing roadway capacity (by one mile) would have about the same impact on average insurance premiums; doing both would reduce average premiums even more. Several constraints on increasing capacity (such as limitations of land and financial resources) may make reducing VMT a preferable alternative to reduce insurance premiums.

Statistical analyses of state averages of variables are instructive, yet must be viewed with caution. Analysis of state averages ignores the variation within each state of the variables analyzed. A more robust analysis would examine the relationship between insurance claim costs and accident frequency and severity for individual insurance claims. Actuarial firms perform this analysis of individual policies when selecting rating variables and quantifying the risk associated with those variables. Below we summarize several studies of individual policies to determine which variables account for the variance in accident frequency and severity.

SRI International Analysis

In 1979 Stanford Research Institute International (SRI) estimated the risk assessment efficiency of the ISO 217 class plan. SRI found that the ISO 217 plan explained 12 percent of the variance in expected losses. When combined with merit rating (based on driving record), the plan explained 16 percent; territorial ratings improved the efficiency to 22 percent, and accounting for assignment to preferred or assigned risk pools improved the efficiency to 30 percent. The report cites other research (Bailey, 1960) that found similar results; namely, that plans with five or six driver classes explain 12 to 13 percent, merit rating explains about 5 percent, and territorial rating explains about 7 percent of the variance in expected losses. The report concludes that these studies confirm that "current risk assessment schemes in automobile insurance resolve only a small fraction of the uncertainty about individual expected losses", and that "it is quite easy to find any number of characteristics that correlate significantly with loss experience--age, sex, territory, and even weight and height may be correlated with motorists' claim records."⁴⁵

Response to SRI Analysis

Richard Woll of Allstate Research Bureau disputed the SRI findings.⁴⁶ Woll claimed that the SRI model underestimated the efficiency of rating plans since it assumed that there were no random elements that would affect an individual's exposure to loss. According to Woll, the SRI model should be seen as a lower estimate of the efficiency of a given rating system. Woll developed a model that accounted for random exposure to loss by using a negative binomial distribution rather than a Poisson distribution to estimate the degree to which classes are homogenous.

45. SRI, p. 203 and p. 174, respectively.

46. Richard G. Woll, "A Study of Risk Assessment," *Proceedings of the Casualty Actuarial Society*, volume LXVI, 1979.

Woll applied both his model and the SRI model to data collected by the Massachusetts State Rating Bureau (MSRB). The Massachusetts data were preferable to the data used in the SRI study in that they were provided by insurance companies, they represent a better cross section of insurance business, and they show "differences in homogeneity by class." MSRB collected the data to analyze what effect introducing merit rating (basing premiums in part on driver history) would have on the efficiency of the existing class plan, using the SRI model. They found that the existing plan had an efficiency of 8.9 percent, which would increase to 28.9 percent if the proposed merit rating were adopted.

Woll found that by assuming that claim frequencies are based on a negative binomial, rather than a Poisson distribution (to account for random exposure), the efficiency of the existing Massachusetts class plan improved to 11.8 percent (from 8.9 percent, a 32 percent increase). However, the efficiency of the proposed plan including merit rating was only 26.4 percent, less than predicted by the SRI model (28.9 percent).

Lemaire Analysis

In 1987 Jean Lemaire used statistical techniques to determine the efficiency of Belgium's insurance premium rating plan, which is based on a flat per vehicle fee, a fee for horsepower (later changed to engine size), and a "bonus-malus" fee based on a driver's history of accident claims. First, he obtained data on 106,000 policies written by an insurance company over a one-year period; roughly 10 percent of these policies resulted in accident claims. Next, Lemaire determined the efficiency of the pre-1971 Belgian tariff (based in part on horsepower rather than engine size). He ran a regression of the number of claims by driver type (business vs. commuter/recreational), bonus-malus system premium, and vehicle horsepower, finding that these variables accounted for only 1 percent (0.0112) of the variance in the *number of claims*. The bonus-malus was responsible for most of the accuracy of the initial statistical model; removing this variable lowered the predictive power to 0.001. The pre-1971 tariff was even less accurate in predicting the *claim amount* (0.0003). The post-1971 tariff, based on driver type, the bonus-malus premium, engine size, and sport vs. conventional vehicle, explained even less of the variation in number of claims or amount than the pre-1971 tariff (0.0106 and 0.0003, respectively).

Lemaire then tested the predictive power of eighteen separate variables. The best model consisted of 9 variables (bonus-malus premium, accidents where driver not at fault, vehicle power, vehicle age, driver age, comprehensive coverage, rural drivers, language, and suburban drivers, in order of predictive power). Lemaire surmised that the high explanatory power of the variable number of "faultless" accidents may indicate the lack of an exposure variable in the model, such as vehicle miles travelled. He also concluded that language (non-Dutch) may play a large role since non-Dutch speakers may not understand traffic signs. This model still explained less than 2 percent of the variation in the *number of claims* (0.0175), although the model efficiency was 56 percent higher than that for the pre-71 tariff. The model that best predicted the *value* of claims used four variables (engine horsepower, bonus-malus premium, accidents where driver not at fault, and driver language); here, this model is only a slight improvement over the tariff system (0.0019).

Lemaire next surveyed new policy holders to obtain information not normally included in policies: occupation, marital status, nationality, number of children, if car driven by others, number of cars, number of total kilometers driven, number of kilometers driven for business and vacation, and commute distance. Household information and claim data were obtained for 3,995 policies over a one-year period. The best predictor of the number of claims was a model using 8 variables: driver age, bonus-malus premium, vehicle horsepower, geographic area (urban, suburban, or rural), annual kilometers, occupation, nationality, and marital status, in order of predictive power. The efficiency for this model was 0.0231; extending the analysis to a 2.5 year period increased the efficiency to 0.0410. The coefficient on the annual kilometer variable was 0.00048; increasing annual kilometers by 2,000 (620 miles) would result in a 0.1 percent increase in claim frequency.

Lemaire concluded that a bonus-malus system is a good indicator of claim frequency; he proposed an improved bonus-malus system for Belgium with stronger penalties. About the low predictive power of all of the rating systems he analyzed he noted that "this almost total inefficiency has been noticed in many countries. It expresses the intuitive idea that the individual characteristics of each driver are dominant: there is always great heterogeneity in each tariff class."⁴⁷

Woll Analysis

Richard Woll recently conducted another study to determine the impact of California's Proposition 103 on the efficiency of rating systems.⁴⁸ Recall that Proposition 103 required insurers to base rates on three variables, driving record, miles driven, and years of driving experience; insurers can only use previously used variables, such as territory, gender, or vehicle characteristics, if they can demonstrate that including these variables will improve the efficiency of the rating system. Woll used four methods⁴⁹ to calculate how much of the variance in average liability, collision, and comprehensive payments could be explained by the variables Proposition 103 required, as well as other commonly used variables.⁵⁰ Territory, number of years licensed, and annual mileage were the three variables that explained the most variance in average losses for the three types of coverage. These three factors explained between 21 and 31 percent of the variance in average liability claim payments, depending on the method used; the three factors only explained between 10 and 19 percent of the variance in average collision and comprehensive claims. Territory was the single variable that explained the most variance in liability payments, between 10 and 13 percent; annual mileage explained between 3.2 and 4.0 percent of all liability variance. Annual mileage accounted for more of the variance in collision (between 3.8 and 4.7 percent) and comprehensive (between 4.1 and 5.2 percent) losses. Previous research by Allstate indicated that vehicle characteristics are a good predictor of average collision and comprehensive losses.

Proposition 103 intended to identify which variable could be used as a substitute for territory; Woll found that none of the other variables mentioned above would add as much explanatory power as would territory. He examined using other variables as a substitute for territory. Litigation rates alone explain nearly 60 percent of the variance in territory rates; adding income, medical costs, and population density raised this figure to 63 percent.

In conclusion, these studies indicate that there is no definitive method to quantify the accuracy or efficiency of an insurance rating system comprised of specific variables. However, each of these studies confirm what insurers have argued for years: that territory and either driver history or years licensed account for much of the variance in accident and claim frequency. The studies also confirm what seems intuitive to the layperson: that within a driver class, accident rates and losses increase with miles driven.

2.5. Teenage Drivers

Some critics fear that PAYD would encourage teenagers (the most risky drivers) to drive to Saturday night parties (if alcohol is involved, potentially the most risky trip). This is a problem only if those teenagers would not have driven under the current system. If PAYD consisted of only a per gallon surcharge, even a fairly high one, total insurance costs may be less than under the

47. Lemaire, p. 81.

48. Richard G. Woll, *Auto Insurance and Territorial Rates*, unpublished manuscript.

49. The four methods are: the "naive" method that does not account for possible correlation between variables; the "sequential" variable that examines variables in sequence in order to account for correlations; and simple additive and multiplicative models developed by R.A. Bailey.

50. The variables examined were previous minor and major traffic violations, at-fault claim history, annual mileage, years licensed, use of vehicle, single or multi-car policy, territory, and gender. Vehicle characteristics were not examined.

current system. By reducing total insurance costs to teens, PAYD may be encouraging more teens to purchase insurance and drive, thereby possibly increasing accident rates.

Under the current system the annual premium for teenagers can be prohibitively expensive. For example, in California the *average* rate for a 19-year old male for minimal coverage ranges from \$1,228 in Northern California to \$2,708 in Los Angeles (one company charges \$5,782 for this policy in LA). By eliminating the need to purchase expensive policies under the current system, PAYD may induce some teens who currently do not have access to a car to purchase a car and drive it.

Given the high premiums for teens, it is unlikely that many teens purchase their own insurance; instead, they either don't drive, drive uninsured, or are included in their parents' policy. To predict the effect of PAYD on teenage driving, it is critical to determine the distribution of teenagers among these four categories.

Information on the distribution of teenage *drivers* among the three driver categories (see table below) is critical to design a PAYD system that does not encourage increased teen VMT. All three categories of teenage drivers would face a higher marginal cost of driving under PAYD, so they may drive less than they do currently. However, teens with their own insurance probably would pay much less in total insurance costs than they do now, and therefore may drive more even though the marginal cost of driving is higher (the income effect; they use some of the money they save from lower premiums by driving more). These teens probably have the highest per person VMT of the three groups.

The final PAYD proposal in California included a variable registration fee based on driver experience. In order to drive legally, teens would have to pay the annual fee, which presumably would be fairly high for inexperienced drivers, and would represent a larger portion of the total insurance premium (registration fee plus per gallon charge). Therefore, teens purchasing their own insurance would be less influenced than other drivers by the marginal driving costs under PAYD. For example, VIP proposes an additional fee of \$500 (on top of the \$20 fee) for a teenage driver, and an additional fee of \$40 for an "unsafe" vehicle (presumably most teens drive older cars that don't have safety features such as airbags). A teenager likely would pay \$820 (\$180 in per gallon surcharges, \$520 per driver, \$120 per vehicle) rather than \$280 a year, and the per gallon portion would fall from 64 percent to 22 percent (if the teen drove fewer miles than the average driver, 12,000, the per gallon portion would be even less).

Teens on their parents' policy likely don't pay for any of their coverage now (their parents do); even if a teen does pay his or her portion of the family policy, adding a teen to a family policy costs less than a separate policy.⁵¹ As shown in the table, the difference between current insurance costs and insurance costs under PAYD is not as great as for teens currently purchasing their own insurance. In fact, teens on a family policy may face a higher total cost as well as higher marginal cost of driving under PAYD, so some of these teens may actually drive less than they do currently.

Teens with no insurance would also face a higher marginal cost of driving, and therefore also would tend to drive less under PAYD than they do now.

51. One could argue that teens who are on their parents' policy do not pay the full cost of their coverage under the current system, even if they reimburse their parents for their portion of the family policy.

Table 9: Relative Insurance Costs Faced by Teenage Drivers

		<i>Categories of Teenage Drivers</i>		
		<i>Purchase own insurance</i>	<i>On parents' policy</i>	<i>Uninsured</i>
Current system	<i>Marginal cost</i>	\$0/gallon	\$0/gallon	\$0/gallon
	<i>Total cost</i>	\$2,000 ?	\$0 (\$400?)	\$0
	<i>Per person VMT</i>	high	medium	low
Under PAYD	<i>Marginal cost</i>	\$0.50/gallon	\$0.50/gallon	\$0.50/gallon
	<i>Total cost</i>	\$820	\$180 (\$410)	\$180
	<i>Percent per gallon</i>	22%	100%	100%

Clearly the extent to which PAYD would result in more teenagers driving, and whether current drivers would be induced to drive more, depends on the distribution of teens among these four groups (non-drivers, purchase own insurance, on parents' policy, uninsured). If a large number of teenagers currently do not drive, then PAYD may well encourage more teens to purchase vehicles and drive without adequate insurance coverage, possibly leading to more accidents. However, if most teenagers currently drive, then PAYD could be designed to lessen the incentive for increased teen VMT. The distribution of teenagers among the three groups of driving teens would be critical in designing a PAYD system. If most teens are in the first category (purchase own insurance), then a PAYD that included a high registration fee for inexperienced drivers would limit increased driving by teens. However, if most teens are in the latter two categories (parents pay or uninsured), a high per gallon fee would have the most impact in limiting increases in teenager VMT.

3. Impact on Fuel Consumption, CO₂ Emissions and Vehicle Miles Traveled

In addition to reducing the average automobile insurance premium, PAYD may help reduce fuel consumption, CO₂ emissions, and vehicle miles traveled (CO₂ emissions are directly correlated with fuel use). General consumer responses to a per mile or a per gallon surcharge would be similar. In the short run, both a per mile and per gallon surcharge would provide an incentive for drivers to take fewer trips or use different modes of transportation. In the long run, both surcharges would encourage drivers to change the location of their home or workplace; a per gallon surcharge would give consumers an additional incentive to purchase more fuel efficient vehicles. The long run response for either surcharge would be much stronger than the short run response. Although many studies have analyzed the impact of a fuel tax on auto purchases and use, very few have examined the impacts of a PAYD system. In this section we summarize the findings of several studies of per gallon or per mile fees.

Researchers with the American Council for an Energy Efficient Economy recently modeled the effectiveness of several policies, including PAYD, in reducing greenhouse gas emissions. Assuming a per gallon insurance charge of \$1.00 is adopted by all states by 2010, vehicle miles traveled would be reduced by 5.1 percent, on-road average fuel economy would be increased by 8.4 percent, and national greenhouse gas emissions would be reduced by 58.6 metric tons, or 12 percent from baseline values.⁵²

Deakin, Harvey, Skabardonis (DHS) have forecast the impacts of several market-based transportation control measures (TCMs) using regional travel demand models. These models were

52. *Bridging the Gap: Initiatives to Achieve President Clinton's Climate Commitment*, Geller et al, ACEEE and NRDC. The analysis assumes: separate fuel price elasticities for vehicle miles traveled (-0.1) and new car certified fuel economy (0.3); a per gallon surcharge of \$0.50 in 2000, \$0.75 in 2005, and \$1.00 in 2010; and adoption of the surcharge in 40 percent of the country in 2000, 70 percent in 2005, and 100 percent in 2010. Spreadsheet calculations in support of Geller et al and personal communication with John DeCicco (ACEEE), November 18, 1994.

originally developed, using detailed trip diaries, to forecast the effects of transportation improvements, demand management, and pricing strategies, including increases in fuel prices, on vehicle miles traveled, fuel consumption, and air pollutant emissions. The auto ownership, trip generation, trip distribution, and mode choice elements of the model system are based, in part, on the cost of travel; by increasing the cost of travel, through raising per gallon or per mile costs, these models can forecast the effect of alternative PAYD policies for an entire region (large-scale modeling), or a sample of households from the region (microsimulation modeling). Microsimulation modeling techniques were used to evaluate the distributional consequences of each TCM analyzed, including per gallon and per mile fees.⁵³ The Environmental Defense Fund has developed a spreadsheet version (called the Transportation Efficiency and Distribution, or TREAD, model) of the DHS model for Los Angeles.⁵⁴ A \$0.01 per mile fee (which represents roughly \$0.25 per gallon) would reduce VMT and fuel consumption 2.3 percent, and criteria pollutants between 2.0 and 2.3 percent.⁵⁵ We assume that similar fees on a national scale would have similar effects on total driving.

Greening et al conducted a detailed analysis of Consumer Expenditure Survey data to determine the short run effect of a 50 percent and a 150 percent gas tax on household gasoline consumption. The researchers also estimated the effect of a change in gas price on short run vehicle efficiency for each type of household. In the short run, households owning more than one vehicle can change their overall efficiency by reallocating their vehicle miles travelled (VMT) among the individual vehicles. The net effect of these two responses can be considered the change in VMT due to a change in the gas price per mile driven. Greening et al modeled this response directly as well, using per mile gasoline expenditures (total gasoline expenditures divided by total miles driven). This analysis can be considered a rough approximation of the effect of a per mile fee (a more accurate model of consumer response to a per mile fee would also include other existing per mile costs, such as vehicle maintenance).

Table 10 shows the parameter estimates for gallons of gasoline, vehicle efficiency, and vehicle miles traveled, as well as compensating variation, a measure of quarterly tax burden, from the analysis. The average household can mitigate a portion of the change in gas price by driving a more fuel efficient car more miles, thereby reducing its tax burden. By comparing the coefficients on gallons consumed and VMT, one can see that consumer response is greater to a change in gasoline price than a change in VMT "price".

If desired, one could mitigate the effect of a gasoline tax on specific population groups (low-income households, for example) by returning to them their estimated tax burden, in the form of a rebate or an income tax deduction. Such an action would lead to a slight increase in demand for gasoline, even at the higher price (that includes the gas tax); this increased demand due to increased income is known as the income effect. The "after tax income" coefficients in the table show the relative magnitude of this income effect. For all households, the gasoline demand response (increase) to an increase in income is smaller than the demand response (decrease) to the initial gasoline tax.

53. *Air Quality, Congestion, Energy, and Equity Impacts of Market-Based Transportation Control Measures*, proposal submitted to CARB by DHS, October 2, 1992; *A Manual for Regional Transportation Modeling Practice for Air Quality Analysis*, version 1.0, by DHS for National Association of Regional Councils, July 1993; and *Positive Feedback Approaches to Emission Reduction for the South Coast Region*, draft report, DHS and Cambridge Systematics, Inc.

54. *Efficiency and Fairness on the Road: Strategies for Unsnarling Traffic in Southern California*, Michael W. Cameron, Environmental Defense Fund, 1994.

55. Personal communication with Michael Cameron (EDF), September 15, 1994.

Table 10: Effect of Two Levels of Gasoline Tax on Gasoline Consumption, Vehicle Efficiency, and Miles Traveled

Variable		50 Percent Tax	150 Percent Tax
Gallons of Gasoline	<i>Real Gas Price</i>	-0.433	-0.433
	<i>After Tax Income</i>	0.217	0.217
	<i>CV (quarterly \$)</i>	71.22	250.77
Vehicle Efficiency	<i>Real Gas Price</i>	0.199	0.199
	<i>After Tax Income</i>	0.009	0.009
	<i>CV (quarterly \$)</i>	-18.95	-109.32
Vehicle Miles Traveled	<i>Real Gas Price/Mile</i>	-0.292	-0.292
	<i>After Tax Income</i>	0.223	0.223
	<i>CV (quarterly \$)</i>	56.56	145.64

CV: Compensating Variation (a measure of quarterly tax burden)

Although these studies give an indication of the effect a per-gallon and per-mile surcharge would have on VMT and CO₂ emissions, they do not account for three subtleties in modeling PAYD policies. First, one would expect that a per-gallon or per-mile *insurance surcharge* would be slightly less effective in reducing VMT than a traditional tax on gasoline, since all consumers would receive a dramatic reduction in, or elimination of, their annual insurance premium. Many consumers might use the money they save on lower annual insurance premiums to purchase more fuel, and drive more miles, than they would have otherwise. Second, would expect a per-gallon surcharge to be more effective in reducing VMT than a per-mile surcharge, since consumers would face a higher marginal cost of driving at every refueling, rather than an annual lump-sum charge at time of registration. Finally, a per-gallon fee would likely impact consumer vehicle purchase decisions, and therefore have a much larger long run effect on fuel use and CO₂ emissions than a per-mile fee. A model that explicitly accounts for these subtleties is necessary to determine the relative effectiveness of gas taxes and per-gallon and per-mile surcharges.

4. Equity Issues

In this section we identify how a PAYD system might impact a number of driver classes, and summarize the results of studies to determine this impact. If it is important to protect certain classes of drivers from economic impacts of PAYD, adjustments can be made to accommodate them and make the system more equitable. We also examine the potential impact on the insurance industry and trial lawyers.

4.1. Impact on driver classes

PAYD may have a negative economic impact on several classes of drivers, including uninsured low-income drivers and high-mileage drivers, such as commercial and rural drivers. Information on the number of vehicles owned and gasoline purchased by households is shown in Table 11.

Table 11: Analysis of Gasoline Consumption by Various Groups of Drivers

Group	Households over US average (555 gallons/FYVE)			Households 300 gallons over US average (855 gallons/FYVE)	
	Households (mlns)	FYVE per household	Gallons per FYVE	Households (mlns)	Percent
All Car-Owning Households	81.3	1.81	555	34.5	42%
Income					
< 10k	10.2	1.30	501	3.4	34%
10k-15k	11.8	1.43	535	4.6	39%
15k-20k	8.2	1.60	550	3.2	40%
20k-25k	8.6	1.74	554	3.8	44%
25k-30k	16.0	1.83	564	6.9	43%
35k-50k	12.9	2.19	592	6.1	47%
50k-75k	8.8	2.32	569	4.2	48%
75k +	4.5	2.38	584	2.1	47%
Race					
Caucasian	71.5	1.85	552	30.2	42%
Non-caucasian	9.8	1.57	579	4.3	44%
Location					
Northeast	15.2	1.75	524	5.3	35%
North Central	20.4	1.85	542	8.1	40%
South	28.3	1.79	583	13.7	48%
West	17.3	1.88	554	7.4	43%
Density					
Urban	24.0	1.61	529	8.7	36%
Suburban	39.0	1.93	558	17.4	45%
Rural	18.3	1.84	584	8.4	46%

Note: FYVE = full year vehicle equivalent

Source: September 10, 1993 memorandum from Howard Gruenspecht, DOE, to Sue Tierney, Jack Riggs, and Abe Haspel, citing data from *Household Vehicles Energy Consumption, 1991*, U.S. Department of Energy, Energy Information Administration.

Table 11 indicates that nearly 35 million households (42 percent) consume more gasoline per vehicle than the national average (555 gallons). These households would pay more for insurance coverage under a PAYD system utilizing a per-gallon charge for insurance. About 8 million households (10 percent) consume substantially (300 gallons) more gasoline per vehicle than the national average; these households would be most adversely affected by a national PAYD system. Figure 4 shows the distribution of these households by income; nearly half of the households in the upper income groups consume more fuel than the national average, compared with only 35 to 40 percent of lower income households. However, the portion of households in each income group that purchase substantially more fuel than the national average, and therefore would be most affected by PAYD, is fairly similar among income groups. Figure 5 shows the distribution of affected households by race, location, and housing density. Slightly more non-Caucasian households will be adversely affected by PAYD. Households located in southern and western states, and in suburban and rural areas, also will be more affected. The distributions of households that will be substantially affected are similar to those of all affected households for these three characteristics.

Figure 4: Percentage of Households, by Annual Gasoline Consumption per Vehicle and Household Income

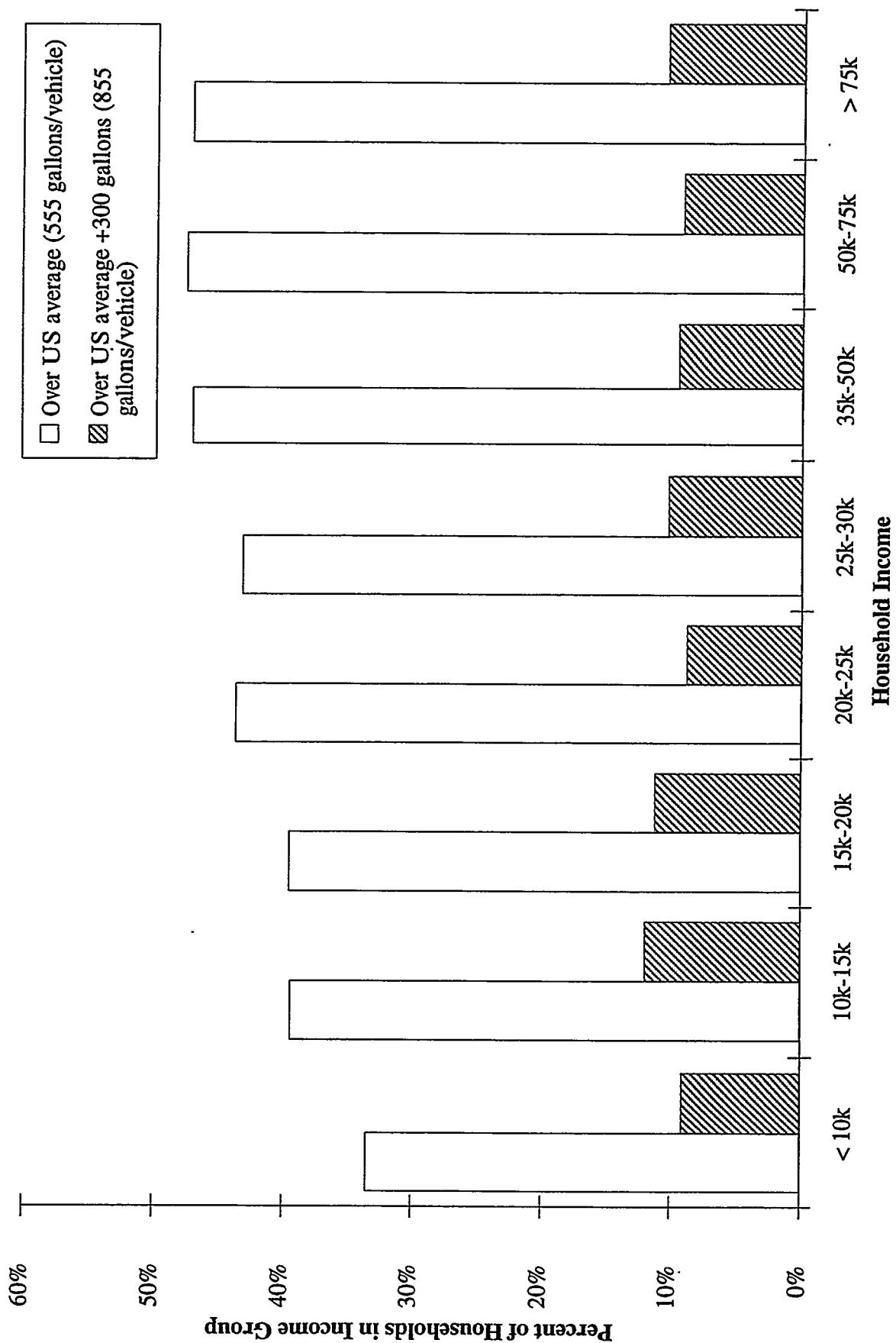
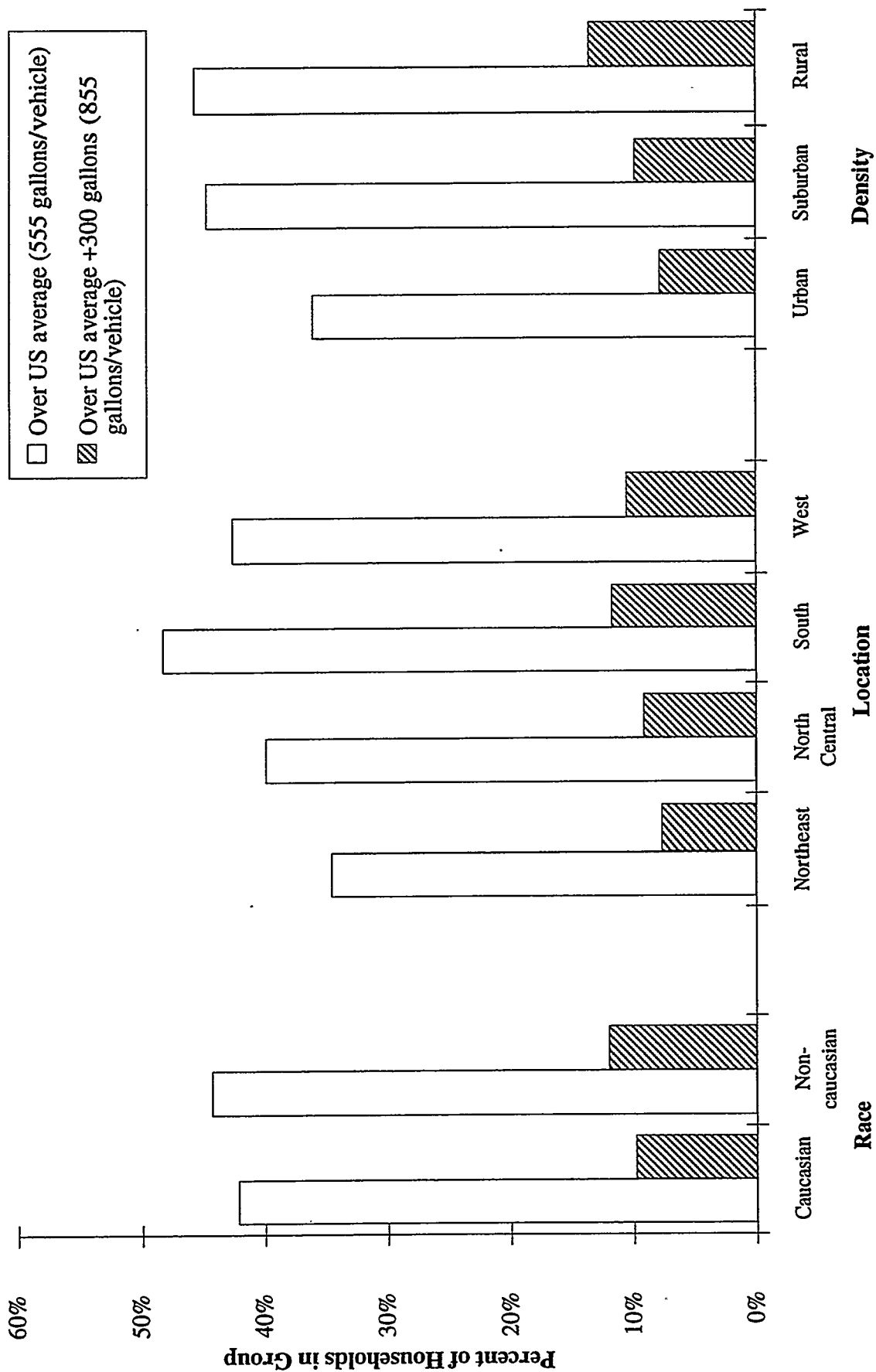


Figure 5: Percentage of Households, by Annual Gasoline Consumption per Vehicle and Household Race, Location, and Density



The American Petroleum Institute used Consumer Expenditure Survey data to estimate which households would pay more for insurance under PAYD (API based its analysis on the Uninsured Motorist Act PAYD proposal, which consisted of a \$0.25 per gallon surcharge and a \$141 registration surcharge). API calculated percent gasoline and insurance expenditures of total expenditures, and average number of vehicle per household, by pre-tax income quintiles, reference person occupation, and reference person age group. API assumed that insurance expenditures under PAYD would be redistributed according to the existing distribution of gasoline expenditures. They divided the existing fraction of gasoline expenditures by the fraction of insurance expenditures to determine the change in insurance expenditures for each group as a result of the per gallon fee, and added the per vehicle fee based on average number of vehicles per household. Table 12 shows the groups that would have the largest changes in insurance expenditures under PAYD.

Table 12: Estimated Changes in Average Insurance Premiums, by Group

<i>Variable</i>	<i>Biggest Decrease</i>	<i>Biggest Increase</i>
<i>Income</i>	-14% (wealthiest 20%)	+28% (poorest 20%)
<i>Occupation</i>	-14% (managers, professionals)	+22% (construction, mechanics, operators, fabricators, laborers)
<i>Age</i>	-7% (45 to 54)	+10% (under 25)

Poor households, blue collar workers and young drivers would pay higher insurance premiums under PAYD, whereas wealthy households, white collar workers, and middle aged drivers would pay less.

One flaw with API's study is that they do not account for households' expenditures for optional coverages. Most proposed PAYD systems would only provide coverage for medical expenses and lost wages; property damage, collision and comprehensive coverages would be optional, and could be purchased separately. Including these optional coverages skews the distribution of existing insurance premiums, and biases the estimates of changes in insurance expenditures under PAYD. For example, higher income households are more likely to purchase optional coverage, such as collision and comprehensive. As described above, about 77 percent of the population purchases optional coverage; the dollar amount of this coverage represents about 36 percent of total insurance expenditures. We adjusted the CES distribution of total insurance expenditures by reducing the total amount by 36 percent, assuming that no drivers in the lowest quintile purchase optional coverage, and that all other drivers' distribution of expenditures on optional coverages is the same as their distribution of total insurance expenditures (this last assumption is rather conservative, in that higher income households most likely tend to purchase optional coverages more often than lower income households). The distribution of total insurance expenditures and the calculated distribution of mandatory insurance expenditures is shown in Table 13.

Table 13: Re-Estimation of the Impact of PAYD on Insurance Expenditures

<i>Income Quintile</i>	<i>Distribution of Gasoline Expenditures</i>	<i>Distribution of Total Insurance Expenditures</i>	<i>Change in Insurance Expenditures (API)</i>	<i>Distribution of Mandatory Insurance Expenditures</i>	<i>Change in Insurance Expenditures (LBNL)</i>
<i>Lowest 20%</i>	9.4	7.2	30.6%	11.3	-16.4%
<i>2nd 20%</i>	14.4	13.6	5.9%	13.0	10.6%
<i>3rd 20%</i>	20.3	19.1	6.3%	18.3	11.0%
<i>4th 20%</i>	25.4	25.1	1.2%	24.0	5.7%
<i>Highest 20%</i>	30.4	34.9	-12.9%	33.4	-9.0%
<i>Total</i>	100.0	100.0		100.0	

As one can see from the table, when one bases the change in insurance expenditures on expenditures for mandatory coverages only, the poorest households would pay less under PAYD. Households with the highest incomes would also pay less; however, as API points out, these households probably would purchase additional optional coverage, thereby reducing, if not eliminating, any savings in insurance expenditures under PAYD.

As discussed above, Greening et al used the CES data to construct an econometric model of consumer response to changes in gasoline price. This analysis was performed for three groupings of households: four types of family/occupation (traditional nuclear, white-collar family; dual earner, white-collar family; blue-collar, spouse does not work or single individuals or single parents with children; retired households); seven stages in the life cycle (beginning families, single consumers, single parents with one child; families with pre-schoolers and school age children; three later stages of child rearing; retired couples; and single, solitary survivors); and five regional locations (northeast urban; midwest urban; south urban; west urban; and rural). A summary of their results of the analysis of a 50 percent gas tax is presented in Table 14. As mentioned above, households with access to more than one vehicle can mitigate the effect of a gasoline tax by reallocating miles travelled to the more fuel efficient vehicle. Table 14 indicates that some households are more able than others to drive different vehicles to maintain VMT. For instance, Type 2 households can lower their tax burden (compensating variation, or CV) substantially by driving a more fuel efficient vehicle; however, they still face the highest burden of the four family occupations. Retired households and traditional white-collar households are least affected by a gas tax after accounting for changes in household vehicle efficiency. Similarly, families at the beginning and end of the life cycle (Stages 1 and 7) are least affected by a gas tax, although retired couples (Stage 6) are the second most affected of the stages studied. Finally, rural households, followed by midwestern urban households, face the largest burden from a gas tax, while northeastern urban households face the smallest burden (since there is relatively little variation in prices within a region, both coefficients on vehicle efficiency are insignificant for all locations, so the ability to mitigate the impact of a gas tax cannot be determined).

Detailed discussion of how PAYD would affect distinct classes of drivers is presented below.

4.1.1. Uninsured low-income drivers

Many uninsured drivers would purchase insurance, and drive legally, if they could afford it. A per-gallon surcharge would force these drivers to pay for at least a portion of their insurance. Since they do not pay for insurance now, uninsured low-income drivers would pay more under any PAYD system (low-income drivers who currently purchase insurance most likely would pay less under a PAYD system). However, if features to reduce the average insurance premium, such as restrictions on non-economic damage awards, were included in a PAYD system, low-income households would benefit, in that they would be able to purchase full auto coverage at an

Table 14: Effect of Gasoline Tax on Various Types of Households

		<i>Family Occupation Type</i>				
Variable		Overall	Type 1	Type 2	Type 3	Type 4
Gallons of Gasoline	<i>Real Gas Price</i>	-0.433	-0.608	-0.425	-0.404	-0.294
	<i>After Tax Income</i>	0.217	0.148	0.077	0.186	0.206
	<i>CV (quarterly \$)</i>	71.22	64.41	93.92	78.99	42.66
Vehicle Efficiency	<i>Real Gas Price</i>	0.199	0.290	0.274	0.054*	0.087*
	<i>After Tax Income</i>	0.009	0.008*	0.019	0.014*	0.009*
	<i>CV (quarterly \$)</i>	-18.95	-18.18	-29.95	-11.84	-6.96
Vehicle Miles Traveled	<i>Real Gas Price/Mile</i>	-0.292	-0.447	-0.205	-0.369	-0.227
	<i>After Tax Income</i>	0.223	0.153	0.092	0.195	0.213
	<i>CV (quarterly \$)</i>	56.56	46.35	76.01	71.63	40.78

* Insignificant at 0.010 level

CV: Compensating Variation (a measure of quarterly tax burden)

Type 1: Traditional nuclear, white-collar family

Type 2: Dual earner, white-collar family

Type 3: Blue-collar, spouse does not work or single individuals or single parents with children

Type 4: Retired households

		<i>Stage of Life Cycle</i>							
Variable		Overall	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
Gallons of Gasoline	<i>Real Gas Price</i>	-0.433	-0.666	-0.501	-0.476	-0.184*	-0.405	-0.192*	-0.592
	<i>After Tax Income</i>	0.217	0.162	0.120	0.043*	0.358	0.171	0.185	0.247
	<i>CV (quarterly \$)</i>	71.22	61.09	83.30	56.64	20.54	100.00	85.47	31.65
Vehicle Efficiency	<i>Real Gas Price</i>	0.199	0.312	0.315	0.208*	-0.367*	0.308	0.046*	0.047*
	<i>After Tax Income</i>	0.009	0.024	0.007*	0.000*	0.082*	0.030	0.006*	0.006*
	<i>CV (quarterly \$)</i>	-18.95	-17.28	-27.04	-7.16	-13.68	-34.05	-24.18	-23.27
Vehicle Miles Traveled	<i>Real Gas Price/Mile</i>	-0.292	-0.514	-0.271	-0.329	-0.133	-0.139	-0.152	-0.574
	<i>After Tax Income</i>	0.223	0.174	0.125	0.043*	0.429	0.197	0.190	0.250
	<i>CV (quarterly \$)</i>	56.56	43.20	63.67	53.18	113.82	69.36	74.96	29.11

* Insignificant at 0.010 level

CV: Compensating Variation (a measure of quarterly tax burden)

Stage 1: Beginning families, single consumers, single parents with one child

Stage 2: Families with pre-schoolers and school age children

Stages 3, 4, 5: Later stages of child rearing

Stage 6: Retired couples

Stage 7: Single, solitary survivors

		<i>Location</i>					
Variable		Overall	Northeast urban	Midwest urban	South urban	West urban	Rural (all)
Gallons of Gasoline	<i>Real Gas Price</i>	-0.433	-0.358	-0.366	-0.431	-0.355	-0.424
	<i>After Tax Income</i>	0.217	0.175	0.233	0.228	0.273	0.236
	<i>CV (quarterly \$)</i>	71.22	64.41	76.89	70.29	72.56	85.05
Vehicle Efficiency	<i>Real Gas Price</i>	0.199	0.150*	0.173*	0.040*	0.089*	0.115*
	<i>After Tax Income</i>	0.009	0.013	-0.004*	0.011*	0.023*	0.008*
	<i>CV (quarterly \$)</i>	-18.95	-10.59	-12.15	-18.94	-11.24	-12.34
Vehicle Miles Traveled	<i>Real Gas Price/Mile</i>	-0.292	-0.245	-0.234	-0.407	-0.292	-0.341
	<i>After Tax Income</i>	0.223	0.185	0.229	0.235	0.289	0.241
	<i>CV (quarterly \$)</i>	56.56	62.10	80.56	63.77	68.56	78.74

* Insignificant at 0.010 level

CV: Compensating Variation (a measure of quarterly tax burden)

Northeast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

Midwest: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY

inexpensive price, and become legal drivers. In addition, discounts on vehicle registration fees (as proposed under UMA), gasoline purchases, or mileage fees could be given to low-income drivers.

A recent study by the Union of Concerned Scientists estimated the effect of UMA on low-income households in California. Using national transportation data⁵⁶, UCS found that low income households own fewer vehicles, and purchase less fuel, than households with higher incomes (see Table 11); therefore, under UMA, the average low income household would pay less for insurance than other households. This is in contrast to the current system in California; because of territorial rating policies, and high percentages of uninsured drivers in low-income areas, low income households pay up to twice what other households pay for the same level of coverage.⁵⁷ Many low-income advocates have supported the no-fault aspects of PAYD systems proposed in California; one study of 800 low-income drivers in three areas of California found that 89 percent, and 96 percent of uninsured drivers, favored a specific PAYD proposal.⁵⁸

Several researchers (Poterba, 1991; Krupnick et al, 1993; Greening et al, 1995b) have studied the effect of a national gas tax on different segments of the population (such as low-income or rural households); however, no one has explicitly studied the distributional aspects of a national per-gallon or per-mile insurance surcharge.

Train (Train, 1990; Davis and Train, 1994) has developed a national household level vehicle purchase and use model similar to the regional transportation demand models used by DHS, using data collected by the US Department of Transportation's 1977 Nationwide Personal Transportation Survey (NPTS). Several researchers are using an updated version of the model, based on more recent NPTS data; the California Energy Commission intends to use their version, the Personal Vehicle Model, to forecast the impact of a variety of transportation policies, including PAYD insurance, on California gasoline consumption and vehicle miles traveled.⁵⁹

4.1.2. Commercial drivers

Certain motorists whose occupations require driving long distances daily, such as truckers and salespeople, may also bear a large burden under a PAYD system (because their premiums tend to be very high now, taxi drivers may pay substantially less under PAYD). Any additional insurance costs borne by these commercial drivers would likely be passed on to the consumers of their products and services. These additional charges may induce the utilization of more economically efficient modes of freight transport (rail, air, ship) or service provision (telecommunications, postal service); therefore, no adjustments may be necessary to accommodate these classes of drivers. However, PAYD systems could be adjusted by exempting certain classes of commercial drivers (as proposed under PPN), or by awarding income tax credits based on annual gallons purchased (as proposed by El-Gasseir) or miles driven.

4.1.3. Rural drivers

As shown in Table 11 and Figure 5, rural drivers, who typically have to drive farther to access services in sparsely populated areas, would likely pay more for coverage than urban drivers under a PAYD system. Some rural drivers may even pay more for insurance than they do under the

56. *Household Vehicles Energy Consumption 1991*, US Department of Energy, Energy Information Agency.

57. *An Equity Analysis of "Pay-as-You-Drive" Automobile Insurance in California*, Jeff Allen, Roland Hwang and Jane Kelly, Union of Concerned Scientists, December 1993 Draft.

58. "Pay at the Pump In-Person Survey of 800 Californians," Public Advocates, Greenlining Coalition, Hermandad Mexicana Nacional, and Mexican-American Political Association, April 14, 1993. The survey asked respondents' opinions of an insurance system similar to the original version of SB 648: \$1 million in medical coverage and \$25,000 per year in lost wages, for a cost of between \$200 and \$300 per year, including a \$0.30 per gallon surcharge.

59. Chris Kavalec, CEC Demand Analysis Office.

current system. Costs to rural drivers could be reduced by charging them lower registration, per gallon, or per mile fees.

4.2. Impact on insurance companies and trial attorneys

The influence of the insurance industry and trial attorneys was very instrumental in defeating various PAYD proposals in California. Many of the arguments against PAYD, that it would reduce the role of individual insurance agents and would restrict the public's right to sue for non-economic damages, are precisely why Tobias proposed PPN in the first place.

4.2.1. Insurance Companies

PAYD systems, such as PPN, that force drivers to purchase group insurance policies, rather than individual policies, would eliminate some of the business of individual insurance agents. The relative impact on the insurance industry of requiring group insurance policies can be evaluated by determining the portion of total premium dollars that are written for auto liability coverage. Across the US, 30 percent of the value of premiums written for all lines of coverage are for auto liability coverage (for both private and commercial vehicles). The share of total premiums written in each state ranges from 16 percent in Washington, DC to 39 percent in Maryland and West Virginia.⁶⁰

A PAYD system could be modified to allow drivers to enter individual, rather than group, policies with private insurance companies, thereby retaining the demand for individual insurance agents. This is a major difference between PPN and UMA; UMA would allow drivers to select a private insurance company, or to be assigned a company based on market share. VIP would have the government establish two "capitation charges" that insurance companies would be paid for each good and bad driver that they cover. Companies could then engage in price competition by offering rebates to attract good drivers; bad drivers would be assigned to insurance companies based on their market share. The government could establish a competing public claims administrator to cover any good drivers that do not sign up with a private insurer. Differential rebates to good drivers could be allowed (although Sugarman recommends that they be restricted to specific criteria such as driving experience, but not race or gender). In addition, all California PAYD proposals would allow agents to continue to sell additional optional coverage for collision, comprehensive, or non-economic damage coverage.

4.2.2. Trial Lawyers

Trial lawyers opposed PAYD systems proposed in California because of the restrictions they would put on an individual's ability to sue for non-economic damages. However, all proposed PAYD systems would allow drivers to continue to sue vehicle manufacturers for vehicle defects, governments for poorly designed roads and intersections, and drivers that intentionally cause injury. UMA also would allow drivers injured in drunk driving accidents to sue for non-economic damages, with no limit on the amount of damages. Data on the percentage of attorney revenue from auto injury claims have not been identified.

5. Range of Possible PAYD Systems

Table 15 identifies the most significant features of a PAYD system, as well as the range of reform possible for each feature.

60. The Fact Book, 1994, Insurance Information Institute.

Table 15: Range of Possible PAYD Features

<i>Feature</i>	<i>Minor Change</i>	<i><=====></i>	<i>Major Reform</i>
<i>Surcharges</i>	All fixed (registration fee, moving violations)	Roughly half fixed, half variable	All variable, based on each gallon purchased or annual miles driven
<i>Vehicles covered</i>	Private cars and light trucks only (commercial and government vehicles exempt) (PPN)		All vehicles (commercial and government cars, alternative fueled vehicles, heavy duty trucks, buses, motorcycles) (VIP)
<i>Restrictions on lawsuits?</i> (any restrictions will affect trial lawyers)	No new restrictions (tort liability) (MEG)	No-fault insurance with either dollar or verbal threshold (UMA)	Pure no-fault insurance with cap on non-economic damages (PPN, VIP)
<i>Coverage provided</i>	Minimum liability only (BI and PD) (MEG)	BI and PD plus MP (MEG); or replace all three with no-fault PIP, including lost wages and death benefit (VIP, UMA)	Add collision coverage (UMA)
<i>Amount of consumer choice</i> (how will claims be administered affects consumers and insurance companies)	State pays per policy payment to insurers (MEG)	State pays per policy payment to insurers, insurers offer rebates to attract consumers (VIP)	Insurance companies bid on blocks of policies (PPN)
<i>Restrictions on allowable rating factors</i> (e.g. gender, age, territory)	No new restrictions	Limit rating to driver experience/age, vehicle safety features, and urban vs. rural	Limit rating to driver experience/age and vehicle safety features
<i>Rebates for classes of drivers</i>	No rebates		Rebates to low-income, elderly (UMA), commercial (PPN), or rural drivers

MEG: Mohammed El-Gasseir

UMA: Uninsured Motorist Act

PPN: Pay-at-the-Pump, Private No-Fault

VIP: Vehicle Injury Plan

Depending on one's objective, different features of a PAYD system are of particular interest. If the objective is providing drivers incentives to reduce fuel consumption and/or vehicle miles travelled (VMT), the first two features in Table 15, the type of surcharges and the vehicles covered, are most relevant to the design of the PAYD system. A PAYD system that transferred all insurance payments to a per-gallon or per-mile surcharge clearly would increase the marginal cost of driving the most, and would have the greatest impact on gasoline consumption and VMT.

There are several advantages to a per-gallon rather than a per-mile fee. Per-gallon surcharges would probably have a more immediate impact on the marginal decision to drive, since the fees are paid at every fill-up rather than once a year at vehicle registration. A disadvantage of per-mile fees is that drivers would be given a greater incentive to tamper with vehicle odometers. Odometer tampering is a federal crime; it is not clear how prevalent tampering is currently, or if a per-mile insurance surcharge would increase tampering rates, requiring additional enforcement or tamper-proof technology. The biggest disadvantage of per-gallon fees is that it would be administratively difficult to apply different per-gallon insurance surcharges for different classes of drivers and/or vehicles.⁶¹ The PAYD system proposed by NOW would set different per-mile insurance

61. Gallons of fuel consumed annually is a proxy for vehicle miles driven, and likely is not as good a measure of exposure to a potential accident.

surcharges for different driver and vehicle classes; the appropriate per-mile surcharge would then be multiplied by the annual miles to determine the total premium. Although insurance would be based on the number of miles driven, insurance payments would still be made annually, and the incentive to reduce marginal costs would be less than with a per-gallon surcharge. VIP solves this tradeoff between the more immediate driving disincentive of a per-gallon fee and the greater rate flexibility of a per-mile fee by combining a per-gallon fee with variable registration fees based on approved rating variables. The registration fees could be assessed per mile driven, similar to the NOW proposal, to strengthen the relationship between VMT and driving costs.

The types of vehicles covered, and therefore the coverage of per-gallon or per-mile surcharges, also is critical in reducing fuel consumption and VMT. Commercial and government vehicles are exempted from some PAYD proposals, presumably to reduce the impact of marginal cost pricing on long-distance drivers; however, it may be more appropriate to provide rebates or discounts on registration premiums for certain classes of drivers, rather than exempting them from the system altogether.

The other five features in Table 15 involve aspects of insurance reform. These features do not directly address the objectives of reducing fuel consumption and/or VMT; however, states may want to include insurance reform features in their PAYD system to make insurance more affordable to the average driver, as well as to currently uninsured low-income drivers.

The most important insurance reform feature of a PAYD system is the extent to which lawsuits for non-economic damages are restricted. Such lawsuits can be limited to only those that pass a strict test, such as meeting either a written definition of "serious" injury ("verbal threshold") or a specified damage amount ("dollar threshold"). These thresholds would only limit the circumstances under which victims could sue for non-economic damages; the actual award in a successful lawsuit would not be limited. Or non-economic suits can be eliminated altogether, with non-economic damages automatically paid according to a specified, limited schedule. Coverage for non-economic damages could be purchased as optional first party coverage outside of the PAYD system (such as proposed in PPN and some versions of SB 684), or could be included as a benefit of the PAYD coverage (such as proposed in VIP).

Most PAYD proposals would provide coverage only for medical expenses, lost wages, and perhaps a death benefit. As discussed above, coverage for non-economic damages could be included in the program, or purchased separately. First party property damage could also be provided, as proposed in SB 684. Expanding coverage to include property damage could be used to increase the per-gallon or per-mile payment, thereby increasing the marginal cost of driving; however, this would likely also increase the average premium for uninsured low-income drivers, if not for all drivers. In addition to minimizing the average premium, keeping some coverage optional retains the private market for insurance provision, and might reduce insurance industry opposition to PAYD.

Polling of focus groups indicates that California drivers desire to retain control over who administers their insurance claims.⁶² Rather than randomly assigning drivers to group policies (PPN), states may want to retain the competitive insurance industry. VIP would allow consumers to continue to choose their insurance provider: under VIP the state would collect the revenue from the per-gallon surcharge and registration fees directly, and would set a single payment per policy (the capitation payment) to be given to insurance companies for each policy written. Insurance companies would compete to attract customers by offering a portion of their expected capitation payments to customers in the form of discounts on the average policy premium. Accident claims of any drivers who do not (or cannot) purchase a policy from the insurance companies would be administered by an agency established by the state.

62. Mike Johnson, Coalition of Common Sense Auto Insurance.

Most PAYD proposals seek to replace certain rating variables used to determine insurance premiums (driver gender, age, location) with new variables that may reflect accident frequency or severity more accurately: the number of vehicle miles driven, or, as a proxy, gallons of fuel consumed. Other important variables, such as driver record or experience, and vehicle safety features, can be incorporated in the registration premium. Rebates or discounts for certain classes of drivers (low-income, rural or long-distance drivers) can also be included in the registration premium to make PAYD more equitable.

6. Alternatives to Increase the Variable Cost of Driving

In this section we discuss three alternatives to change the marginal costs of driving as a means to reduce national fuel consumption, CO₂ emissions, and VMT. The first two alternatives, variable driving fees and revenue-neutral gas or mileage tax, would not have any effect on how drivers currently pay for insurance. The other two alternatives, market-based PAYD insurance and state-run PAYD insurance, represent the range of possible PAYD insurance systems, and can be adopted in combination with variable driving fees or a revenue-neutral gas or mileage tax.

6.1. Variable Driving Fees

The marginal cost of driving can be increased without changing how automobile insurance is provided in each state. Every state charges an annual vehicle registration fee and a driver's license renewal fee, and regions that do not meet the air quality standards of the Clean Air Act charge fees for regular (annual or biennial) inspection and maintenance of vehicle emission control systems (I/M). About half of the states also charge an annual vehicle safety inspection fee. Rather than charging an annual per-vehicle fee, states could charge a per-mile fee based on annual odometer readings.⁶³ Table 16 shows the per-vehicle average registration, license renewal, safety inspection, and I/M fees for each state. Combined, these annual fees range from about \$14 (in some sections of Arizona) to \$138 (in some areas of Minnesota) per vehicle; the median is \$40 per vehicle. If these fees were charged on a per-mile basis, an average vehicle driving 12,000 miles would pay from 0.1 cents to 1.1 cents per mile (or 2.9 cents to 28.7 cents per gallon, assuming a vehicle fuel economy of 25 miles per gallon). Figure 6 compares the national median of these fees with the states with the lowest and highest fees.

It may be difficult to charge license renewal fees on a per-mile basis, since these fees typically are assessed every four years, and may involve taking a driving test. States could either charge the fees on an annual basis at the same time as vehicle registration, or keep odometer records from the time of the last license renewal. The latter strategy would significantly weaken the disincentive to drive, in that per-mile fees would be charged for miles driven several years ago. In addition, since renewal fees currently are charged per driver rather than per vehicle, states would have to develop a mechanism to calculate average miles driven for each license holder in the household. For example, a two-driver household may own only one vehicle, which is registered to one of the drivers; the total vehicle mileage could be divided by the number of licensed drivers in the household to determine the per-mile renewal fee for each driver. However, each of these drivers would pay half of the license renewal fee that a single driver who drives the same number of miles would pay. Finally, since driver's licenses are often used for identification purposes, a part of the population may need to own a driver's license yet not drive a vehicle⁶⁴; if renewal fees were based solely on miles driven, these people would not pay for license renewal. Part of the renewal could

63. In theory, these fees could be charged on a per gallon basis. However, it would be difficult to administer at-the-pump charges that vary based on vehicle class (currently done for registration fees), driver age (currently done for license renewal fees), or location (currently done for I/M fees).

64. Some states, such as California, provide state identification cards for citizens that choose not to purchase a driver's license for identification purposes.

Table 16: Annual Vehicle Fees, by State

State	Vehicle Inspection and Maintenance Fees					Combined Fees (6)				
	I/M Program Type (1)	Cars Subject to I/M	Percent of All Vehicles	Annual I/M Fee (2)	Annual Safety Inspection Fee (3)	Annual License Renewal Fee (4)	Typical Vehicle Registration Fee (5)	per Vehicle	Cents per Mile	Cents per Gallon
Arizona	Central	1,115,603	41%	\$5.75	NA	(7)	\$8.00	\$13.75	0.1	2.9
Indiana	Central	395,002	9%	\$0.00	NA	\$1.50	\$12.75	\$14.25	0.1	3.0
South Carolina	None	None	NA	NA	\$3.00	\$2.50	\$12.00	\$17.50	0.1	3.6
Wyoming	None	None	NA	NA	NA	\$3.75	\$15.00	\$18.75	0.2	3.9
Montana	None	None	NA	NA	NA	\$4.00	\$15.25	\$19.25	0.2	4.0
Nebraska	None	None	NA	NA	NA	\$3.75	\$17.50	\$21.25	0.2	4.4
Kentucky	Both	616,331	22%	\$6.00	NA	\$2.50	\$13.50	\$22.00	0.2	4.6
Delaware	Central	220,537	42%	\$0.00	Free	\$2.50	\$20.00	\$22.50	0.2	4.7
South Dakota	None	None	NA	NA	NA	\$1.50	\$21.00	\$22.50	0.2	4.7
Oregon	Central	742,893	30%	\$5.00	NA	\$6.56	\$15.00	\$26.56	0.2	5.5
Arkansas	None	None	NA	NA	?	\$3.50	\$25.00	\$28.50	0.2	5.9
New Jersey	Central	3,934,846	72%	\$0.00	?	\$4.00	\$25.00	\$29.00	0.2	6.0
Alabama	None	None	NA	NA	NA	\$5.00	\$24.25	\$29.25	0.2	6.1
Kansas	None	None	NA	NA	NA	\$3.50	\$27.25	\$30.75	0.3	6.4
Tennessee	Central	760,360	17%	\$6.00	NA	\$3.50	\$22.00	\$31.50	0.3	6.6
Ohio	Both	1,919,695	22%	\$8.00	NA	\$2.69	\$21.50	\$32.19	0.3	6.7
Maine	None	None	NA	NA	\$6.00	\$4.83	\$22.00	\$32.83	0.3	6.8
Washington	Central	970,946	23%	\$6.00	NA	\$3.50	\$23.85	\$33.35	0.3	6.9
Georgia	Decentral	968,014	17%	\$10.00	NA	\$3.75	\$20.00	\$33.75	0.3	7.0
Mississippi	None	None	NA	NA	\$5.00	\$5.00	\$23.75	\$33.75	0.3	7.0
Louisiana	Decentral	210,394	7%	\$10.00	\$10.00	\$4.50	\$12.00	\$36.50	0.3	7.6
Colorado	Mixed	1,320,304	47%	\$9.00	NA	\$3.00	\$24.60	\$36.60	0.3	7.6
New Mexico	Decentral	252,157	20%	market	NA	\$3.25	\$34.00	\$37.25	0.3	7.8
Pennsylvania	Decentral	3,271,554	42%	\$8.48	?	\$5.50	\$24.00	\$37.98	0.3	7.9
New Hampshire	Decentral	59,077	7%	market	?	\$8.00	\$31.20	\$39.20	0.3	8.2
Rhode Island	Decentral	565,517	94%	\$4.00	?	\$6.00	\$30.00	\$40.00	0.3	8.3
Missouri	Decentral	930,226	24%	\$7.00	\$7.00	\$2.50	\$24.00	\$40.50	0.3	8.4
Utah	Decentral	676,997	56%	\$14.00	\$10.00	\$3.00	\$13.50	\$40.50	0.3	8.4
West Virginia	None	None	NA	NA	\$7.00	\$2.63	\$31.50	\$41.13	0.3	8.6
Massachusetts	Decentral	3,085,230	86%	\$15.00	in I/M fee	\$6.75	\$20.00	\$41.75	0.3	8.7
Wisconsin	Central	1,016,047	29%	\$0.00	NA	\$2.50	\$40.00	\$42.50	0.4	8.9
Idaho	Decentral	80,909	8%	\$10.75	NA	\$4.88	\$27.53	\$43.16	0.4	9.0
Maryland	Central	1,773,497	49%	\$4.25	NA	\$4.00	\$35.00	\$43.25	0.4	9.0
Virginia	Decentral	561,835	11%	\$6.75	\$10.00	\$2.40	\$26.50	\$45.65	0.4	9.5
Vermont	None	None	NA	NA	?	\$5.00	\$42.00	\$47.00	0.4	9.8
North Carolina	Decentral	919,601	18%	\$15.40	\$9.25	\$2.50	\$20.00	\$47.15	0.4	9.8
Florida	Central	3,191,077	33%	\$10.00	NA	\$3.75	\$33.60	\$47.35	0.4	9.9
California	Decentral	13,494,527	64%	\$18.50	NA	\$3.00	\$28.00	\$49.50	0.4	10.3
Illinois	Mixed	3,928,097	51%	\$0.00	NA	\$2.50	\$48.00	\$50.50	0.4	10.5
Connecticut	Central	2,351,996	93%	\$10.00	NA	\$8.88	\$35.00	\$53.88	0.4	11.2
Nevada	Decentral	394,026	45%	\$18.00	NA	\$5.13	\$33.00	\$56.13	0.5	11.7
Michigan	Decentral	2,285,596	32%	\$10.00	NA	\$3.00	\$50.00	\$63.00	0.5	13.1
New York	Decentral	6,528,464	68%	\$17.00	\$10.00	\$10.56	\$28.50	\$66.06	0.6	13.8
North Dakota	None	None	NA	NA	NA	\$2.50	\$70.00	\$72.50	0.6	15.1
District of Columbia	Central	383,000	155%	\$5.00	\$10.00	\$5.00	\$55.00	\$75.00	0.6	15.6
Hawaii	None	None	NA	NA	?	\$3.00	\$73.88	\$76.88	0.6	16.0
Iowa	None	None	NA	NA	NA	\$4.00	\$75.00	\$79.00	0.7	16.5
Texas	Decentral	3,206,372	26%	\$17.25	\$10.00	\$4.00	\$50.80	\$82.05	0.7	17.1
Alaska	Decentral	137,048	29%	\$50.00	NA	\$3.00	\$35.00	\$88.00	0.7	18.3
Oklahoma	None	None	NA	NA	\$5.00	\$3.50	\$100.00	\$108.50	0.9	22.6
Minnesota	Central	1,282,280	39%	\$8.00	NA	\$4.63	\$125.00	\$137.63	1.1	28.7
Total/Average/Median		63,550,055	35%	\$8.00	\$9.25	\$3.63	\$25.00	\$40.00	0.3	8.3

Notes:

(1) EPA requires only certain areas within states to operate vehicle emission control inspection and maintenance (I/M) programs. Some areas in the same state have different systems (centralized vs. decentralized; annual vs. biennial).

(2) Areas in a given state may have different fees; highest fee shown. Some states allow I/M stations to set the fee ("market"); CA average fee estimated by EPA.

(3) From "1994 Digest of Motor Laws," American Automobile Association.

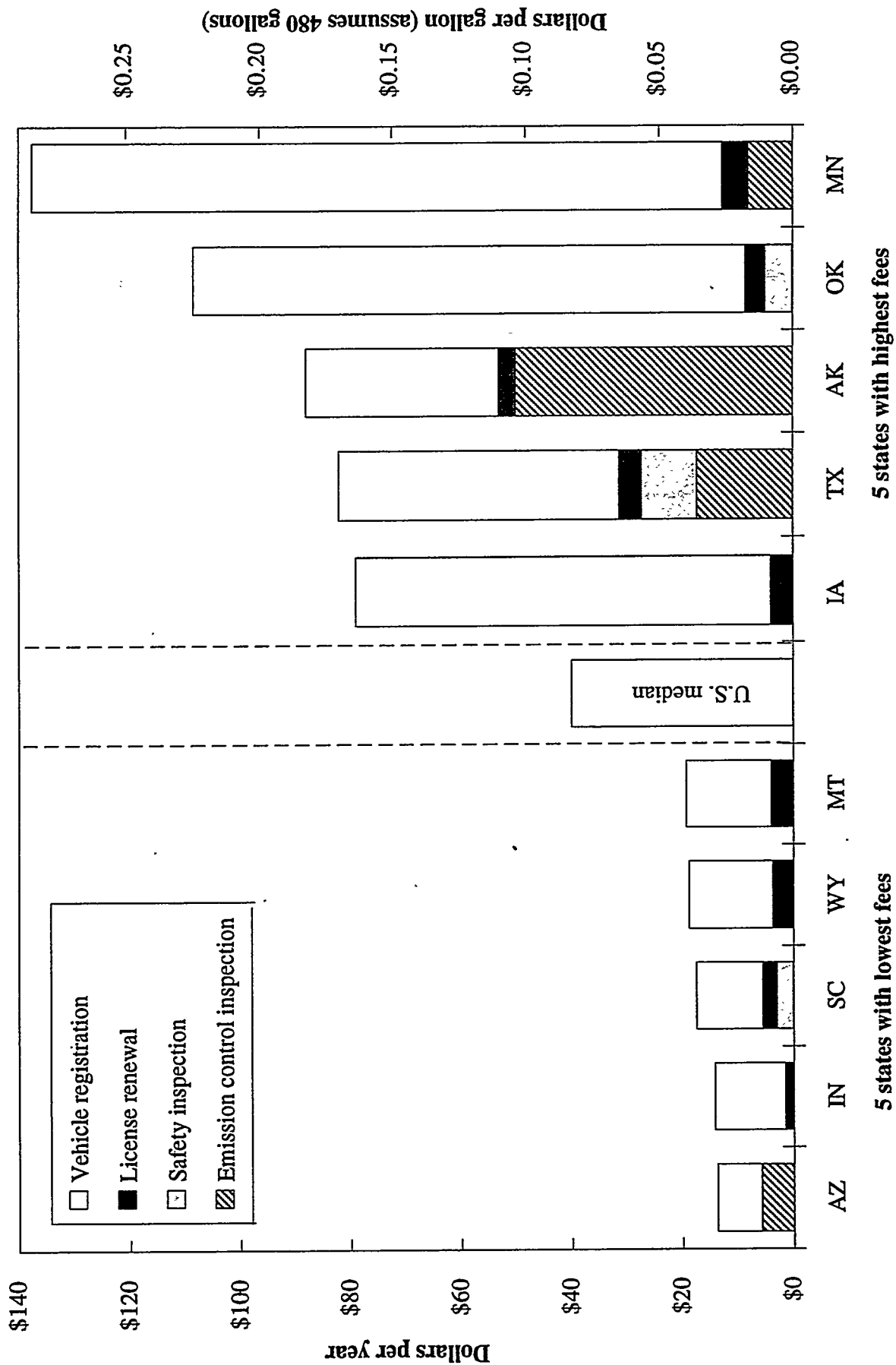
(4) Highest renewal fee for largest non-commercial driver/vehicle class divided by length of renewal term (from AAA).

(5) Typical vehicle as defined by FHWA: a 1987 4-door sedan of 3,260 pounds empty weight.

(6) Per mile fee assumes average 12,000 miles per vehicle; per gallon fee assumes 25 miles per gallon per vehicle.

(7) One time fee good until 65th birthday, based on age (\$25 for ages 16-39).

Figure 6: Current Annual Fees in Selected States



be a flat, per person fee; however, this would lower the amount of the per-mile fee, reducing its effectiveness in curtailing VMT.

6.2. Variable Insurance Surcharge plus Flat Rebate

A state could adopt an insurance surcharge based on gallons purchased or miles driven as a means to increase the variable cost of driving. Revenue collected from the per-gallon or per-mile charge would be placed in a separate fund. The state could distribute the revenue to each insurance company based on the number of policies written (similar to El-Gasseir's proposal); however, to ensure that companies pass the rebate on to each customer, the rebates could be made directly to each insured driver. Because the state would distribute all fee revenue it collects, the fee would be revenue-neutral. Insurance companies would continue to establish rates and write policies as they do now.

The amount of the fee would be determined by dividing the total amount of vehicle liability claims (BI and PD) paid by all insurers in the state by the total amount of gallons sold (or VMT) in the state. The amount of the refund would be calculated by dividing total fee receipts by all insured vehicles or drivers. The intent of this alternative is to increase the marginal cost of driving, and to transfer revenue from high-mileage drivers to low-mileage drivers, with minimal impact on the existing insurance system in each state.

Per-gallon fees would be more effective than per-mile fees, since many drivers do not register their vehicles and therefore do not pay annual registration fees. This alternative would not extend insurance to uninsured drivers; it would only charge them for each gallon purchased (or mile driven). In fact, since rebates would only be made to insured (or registered) drivers, uninsured drivers would end up subsidizing insured drivers. This may be enough of an incentive for uninsured drivers to purchase insurance, in order to recover any fees they have paid at the pump (or at vehicle registration). However, since the proposal would not change the insurance system, the average premium would not be more affordable to uninsured drivers, many of whom are likely to be low-income. A state could set aside a portion of the surcharge revenue to establish coverage for uninsured drivers; however, it would be impossible to determine what portion of gasoline purchased (or miles driven), and therefore what portion of the surcharge revenue, can be attributed to uninsured drivers.

The flat rebate should not be too much higher than the minimum premium currently paid in a state; otherwise, drivers that now pay insurance premiums that are lower than the flat rebate (and who drive the average number of miles or purchase the average amount of gasoline) would receive insurance coverage for free, or would realize a net savings. A state would have to calculate the minimum annual premium currently charged in order to determine the size of the flat rebate, and calculate the per-gallon or per-mile fee. We sought estimates of the minimum premium charged in several states to give an indication of the maximum fees that could be assessed. These data were readily available for only three states: Illinois (\$67), New York (\$152), and California (\$166). These figures represent the minimum premium charged by any company for the minimum insurance coverage required in each state. Appendix C describes provides more detail on the state surveys from which these data come.

An alternative approach would be to give refunds (possibly in the form of tax credits) to all taxpayers, rather than refunding insured (or registered) drivers only. This approach would allocate economic benefits to non-drivers, as well as to drivers who drive fewer miles than the state average.

6.3. Market-Based PAYD Insurance

A more comprehensive approach would be to adopt a PAYD system similar to VIP or UMA, with insurance costs paid by a flat per-gallon or per-mile surcharge combined with an annual registration premium. The annual registration premium would vary based on safety characteristics of the vehicle and driving record. The annual registration premium could also be based on miles driven; rather than setting flat registration premiums based on vehicle and driver characteristics, the state could set per mile registration rates, to be multiplied by annual miles driven.

Private insurance companies would continue to administer claims, as proposed under VIP. The state would pay a fixed amount to each insurance company per policy written. Insurance companies would offer discounts on the average premium to attract customers.

6.4. State-Run PAYD Insurance

The most extreme alternative would be for a state to adopt a per-gallon or per-mile surcharge that covers all auto insurance costs, and to run its own insurance system. Transferring all insurance premiums into a per-gallon or per-mile surcharge would dramatically increase the cost of driving. Using a per-mile surcharge would allow for the use of differential rating; the state could simply multiply annual mileage by a specific rate for a particular combination of vehicle and driver characteristics. However, a per-mile fee would not provide as immediate a disincentive to drive as a per-gallon fee, and would not ensure that unregistered drivers purchase insurance. A per-gallon fee could be coupled with the per-mile fees to partially address these issues.

A state could establish a public system to provide insurance coverage to all drivers, or could allow insurance companies to bid to provide coverage to groups of randomly-selected drivers (as proposed under PPN). By requiring group policies, the state would ensure that all registered drivers are provided a similar level of coverage.

7. Conclusions

Although there has been extremely limited experience with Pay-as-You-Drive insurance systems, they may be an effective strategy to lower average automobile insurance premiums and increase the equity of the present insurance system. Additional benefits would be a reduction in fuel consumption, CO₂ emissions, and vehicle miles traveled. A national PAYD would be similar to a large increase in the federal gas tax, with an important difference: under PAYD, citizens would be receiving a direct benefit, fair and affordable automobile insurance coverage, in exchange for higher fuel prices.

A PAYD system can be designed to address many of the criticisms leveled at the programs proposed in California. For example, although there is little analysis of the relationship between vehicle miles driven and accident frequency or severity, the analysis that has been performed indicates that within a driver class, VMT is as good a predictor as any of accident costs. Registration fees based on driving record, vehicle safety features, and perhaps location, can be combined with per-gallon surcharges to account for more traditional rating variables. Claims administration can be structured so that insurance companies can continue to compete to provide drivers with policies. Many of these features exist in Stephen Sugarman's Vehicle Injury Plan.

Perhaps the most controversial element of the California proposals is the introduction of a no-fault auto insurance system. The effectiveness of no-fault systems in reducing average premiums has not been adequately demonstrated. There are indications, however, that such systems can reduce premiums if they include strict limits on lawsuits for non-economic damages. The decision about how to treat non-economic lawsuits is best left up to individual states.

Individual states can design a PAYD system that meets their own auto insurance needs. This flexibility makes PAYD an important policy to increase the costs of driving as a means of achieving national objectives, without the imposition of new taxes or fees.

Appendix A: California Legislative History

1975 A pay-at-the-pump proposal that does not include no-fault insurance is introduced in the state Assembly, but fails.

1990 *June 8.* Mohamed El-Gasseir describes his PAYD proposal before the California Energy Resources Conservation and Development (now Energy) Commission. El-Gasseir's proposal is entered as testimony during hearings on the 1990 Conservation Report, but is not formally introduced in the Legislature.

1991 Senator Nancy Killea introduces SB 1139, which would establish an interagency task force to direct a study of PAYD by the University of California. A committee hearing on the bill is scheduled in early 1992, but later cancelled, and the bill is never reconsidered.

1993 *January.* Andrew Tobias releases "Auto Insurance Alert," which describes his PAYD proposal in detail.

February 3. Senator Art Torres, chair of the CA Senate Insurance, Claims and Corporations Committee, holds a public hearing on PAYD.

March 3. Torres holds a second public hearing on PAYD, and Senators Torres, Ayala, and Killea introduce SB 684, "Pay-at-the-pump, Private, No-Fault" car insurance (PPN), which is essentially Tobias' proposal with some modifications. SB 684 is sent to the Rules Committee for assignment.

March 18. SB 684 is double-referred to the Committee on Insurance, Claims and Corporations, which is chaired by Torres, and to the Committee on the Judiciary, which is chaired by Bill Lockyer.

April. Stephen Sugarman, UC Berkeley Law Professor, publishes his perspective on PAYD, the "Vehicle Injury Plan" (VIP).

April 14 and 21. The Insurance Committee holds the first ever televised interactive call-in legislative hearings, moderated by Torres. Call-in comments are very mixed.

April 27. After several amendments, including a large reduction in benefits, removal of a cap on punitive damages, and replacing group insurance pools with individual policies, the Insurance Committee passes SB 684 by a vote of 6 to 4. The version that the Insurance Committee passes is similar to no-fault insurance legislation originally introduced by Senator Patrick Johnson in 1988. PPN is re-referred to the Committee on the Judiciary.

April 28, May 18. SB 684 undergoes two more rounds of amendments. The final version restores several features of the bill as originally proposed, including large medical benefits and caps on punitive damage awards.

May 25. The Committee on the Judiciary defeats SB 684 by a vote of 9 to 1.

August-November. Tobias hires Michael Johnson to look into a voter initiative. Tobias files initial documents for the "Uninsured Motorist Act of 1994" to be included on the November 1994 initiative ballot, and begins focus groups and polls to determine the level of support for the initiative.

December 17. Opposition groups hold Californians to Save Our Economy briefing meeting. Dick Fogarty of Woodward & McDowell, a political consulting firm, is hired to

head the opposition effort. The group begins a search for a spokesperson who is “not directly linked to the insurance industry or the opposition effort.”

1994 *January.* Californians to Save Our Economy grows to over 200 support groups, including representatives from the insurance, oil, tourist, and highway construction industries.

February. UMA focus groups show that voters “really cared about choosing their own insurance companies (*Auto Insurance Alert*).” Tobias withdraws the initiative from the 1994 ballot.

Appendix B: Summary of Opposition and Support for SB 684

This section summarizes the positions taken by various interest groups at hearings on California SB 684 (Pay-at-the-Pump auto insurance), as well as subsequent position papers on the proposed Uninsured Motorist Act (UMA) referendum. Note that much of the opposition is directed at the insurance reform aspects of SB 684/UMA, and that none of the opposition (or support) mentions Sugarman's Vehicle Injury Plan (VIP), designed to address many of the shortcomings of SB 684/UMA.

Opposition

In five months, insurance and petroleum companies contributed over \$170,000 to "Californians to Save Our Economy" (the Coalition).⁶⁵ While the list of the Coalition's supporters was long, only a few were active participants, financially and politically. In fact, the strongest advocates, the Trial Lawyers and the Insurance Industry, were not listed on the Coalition letterhead.

The four most active opponents of SB 684/UMA were:

- (1) the insurance companies and associations;
- (2) the California Trial Lawyers Association;
- (3) the petroleum industry;
- (4) and the California Chamber of Commerce.

Some two hundred other organizations signed on to the Coalition, which was coordinated by campaign managers at Woodward & McDowell, a political consulting firm. When asked questions about their positions, for example, many of the signatories and most of those who testified at the committee hearings referred to Woodward & McDowell.

The campaign against the initiative, which grew to over 300 supporters, intended to focus on the "initiative," not the issues. For example, they intended to focus on the fact that the initiative gives the Insurance Commissioner the power to raise taxes, something "even the President can't do without the approval of Congress."

A summary description of each major opponent's position follows.

Insurance Companies and Agents

Many insurance industry analysts claim that PAYD goes to the heart of their business: "it would disrupt consumer choice and the book of business that agents have developed over the years."⁶⁶ Insurance companies also argue that besides hurting their business, the bill would cause administrative problems, create a huge bureaucracy, and eliminate the consumer's right to choose a company.

During the brief Uninsured Motorist Act of 1994 ballot initiative, the insurance industry began to build coalitions across the state. In general, the insurance industry focused its criticism of PAYD on three issues: (1) lack of consumer choice, (2) the need for a large government bureaucracy, and (3) equity issues, such as the problem that although big cars are purportedly safer, big-car owners would be forced to pay more in auto insurance.⁶⁷

65. Campaign Disclosure Statement dated February 1, 1994.

66. John Norwood of Insurance Agents and Brokers Legislative Council.

67. (1) "Insurance News," Insurance Institute, January 29, 1993; (2) National Association of Independent Insurers, January 29, 1993; and (3) "News," National Association of Professional Insurance Agents, January 25, 1993. Also see Senate Judiciary Committee background information for Hearing dated May 25, 1993 (attached).

Trial Lawyers

The Trial Lawyers Association is not against PAYD in principle. If the Department of Energy plans to go with a No-Fault provision in their PAYD, however, the Trial Lawyer Lobby may prove to be the strongest opposition to the proposal. In California, for example, pay-at-the-pump legislation was defeated in the Senate Judiciary Committee after it had passed the Insurance Committee.

The trial lawyer lobby focused its arguments on the notion that people "give up the right to sue and they get nothing back."⁶⁸ The California Trial Lawyers Association opposed SB 684, and filed a memo describing their objection to No-Fault.⁶⁹

Petroleum Industry (Western States Petroleum Association)

The oil industry dislikes PAYD for one of the same reasons the environmental groups like it: higher prices mean a reduction in fuel consumption. The American Petroleum Institute recently issued a "Point Paper" which argued that "the [SB 684/UMA] proposal is bad for consumers, based on false expectations of cost savings, economically inefficient, unfair to many drivers, and harmful to many lines of business and their employees."⁷⁰

While it is clear that the petroleum industry is concerned with fuel consumption, the report criticizes SB 684, calling it "misleading," actuarially and economically "inefficient," and "unfair." The Western States Petroleum Association testified against SB 684.

Chamber of Commerce

Much of the funding for the California Chamber of Commerce comes from the insurance and tourist industries. During the debate over the Uninsured Motorist Act of 1994, the President of the California Chamber of Commerce spoke privately against the initiative, and worked to build coalitions against it among the insurance, oil, highway and agriculture industries. Later, the Chamber of Commerce led "Californians to Save Our Economy" and Kirk West, President of the Chamber, was the Chairman of the Coalition.

Coalition Signatories

Selected list of signatories: Highway Construction Companies, Associated General Contractors, Olive Growers Council, California Lodging Industry Association, Association of California Car Clubs, Federation of Minority Business Associations, Associated General Contractors Association, California Taxpayers Association, California Chamber of Commerce, California Manufacturers Association, Consolidated Freightways Inc, County Taxpayers Associations, and many others.

These signatories oppose SB 684/UMA for the general reasons mentioned above, as well as to protect their own interests. For example, highway construction companies claim that any PAYD proposal would restrict their business. Most of the funds provided to highway construction companies are generated through gasoline taxes. On the assumption that the public will only tolerate so many tax increases, highway construction companies assume that it will be more

68. Will Glennon, Legal Analyst for the California Trial Lawyers Association.

69. Memo to Senator Art Torres, February 2, 1993.

70. "Motorists Should Not Be Compelled to Pay for Auto Insurance When They Buy Motor Fuel," American Petroleum Institute, March 1994.

difficult for the state to enact excise taxes on gas if PAYD were to pass. This means fewer dollars and slower expansion for highway construction companies.

SB 684/UMA Support

Union of Concerned Scientists (UCS), Sierra Club, Natural Resources Defense Council (NRDC), Rocky Mountain Institute (RMI)

One feature of PAYD is that drivers should respond to the shift in the cost of fuel. In the short run, these responses would most likely include a decrease in the number of miles driven. Alternate forms of transportation will also become more financially attractive at the margin and, in the long run, drivers will favor more fuel efficient cars. The total number of vehicles per household might also be expected to decrease somewhat. Because of these pro-environmental impacts, which could be considerable, PAYD is very appealing to many environmental advocacy organizations. Each of these organizations expressed support for California State Senator Torres' SB 684, "Pay-at-the-Pump."⁷¹

Latino Issues Forum, Mexican American Political Action (MAPA), Hermandad Mexicana Nacional

Numerous Latino groups have been actively involved in auto insurance reform. Their focus has been on No-Fault (decriminalization), against redlining, and on efforts to cut the costs of auto insurance. The Latino Issues Forum worked closely with Andrew Tobias and Torres on the amendment of Torres' proposal in California. Although many groups expressed concern that the surcharge would end up hurting Latino drivers (because many own older and larger, and probably less fuel-efficient, cars), this issue was mitigated by the assertion that Latino drivers often have shorter distances to drive.⁷² Numerous Latino and Hispanic groups supported SB 684.

National Insurance Consumer Organization (NICO)

NICO claims to be interested in one thing: the very best auto insurance system that can be designed. They claim that pay-at-the-pump would cut the overhead cost of insurance by over 20%, increase the speed of delivery of benefits, solve the uninsured motorist problem, and reduce energy consumption and pollution. NICO produces publications that help consumers with problems, inquiries and general questions. The group has been very involved with the development of and support for pay-at-the-pump. Andrew Tobias has given all the proceeds of his book, "Auto Insurance Alert," to NICO and to the Rocky Mountain Institute, which promotes energy conservation.

National Organization for Women (NOW)

NOW issued a statement addressing "what's right and what's wrong with 'pay-at-the pump.'"⁷³ Although NOW points out that PAYD "would guarantee that any reduction in driving would deliver the same reduction in premium," it has concerns that the proposal "would continue to treat car owners unequally." NOW has written many letters to newspaper editors promoting insurance rates based on the number of miles driven.⁷⁴ NOW has supported "metered premiums" legislation in Pennsylvania (1992).

71. Union of Concerned Scientists Fact Sheet, July 1993.

72. Letter from Greenlining Coalition to Andrew Tobias, dated September 21, 1993.

73. Statement on Equal Treatment in Car Insurance, California Senate Committee on Insurance, Claims & Corporations Hearing, February 3, 1993.

74. Sacramento (CA) Bee, June 23, 1991 and "National Underwriter," August 10 and February 24, 1992.

Appendix C: Example of Driver Profile Survey: California

Some states survey insurance companies to obtain specific rates available for different amounts of coverage and different driver profiles, in different rating territories throughout the state. For example, the California Department of Insurance (DOI) constructed six profiles of typical drivers, based on driver age, gender, driving record, and amount of coverage. DOI then surveyed twelve companies (representing 80 percent of the state auto insurance market) to determine the premium charged for each driver profile in 67 zip codes (out of 2,600) throughout the state. The survey asked for the premiums companies charge for a specific level of coverage. One of the driver profiles is a 65-year-old with no violations, the least risky driver class, with the minimum amount of coverage required by the state. A driver could legally purchase less coverage than this driver profile, but many insurance companies refuse to sell less coverage. The purpose of the survey was to demonstrate that premiums can vary greatly by insurance company and by zip code. This dataset provides information not only by driver class, but by coverage level and by driver territory; therefore it gives a better indication of the minimum premium charged in the state than data collected by the statistical agents (described above).

In California, the minimum premium charged for minimal coverage is \$166; a company representing 20 percent of the statewide market offers this premium in a zip code on the Central California coast (San Luis Obispo). There is no estimate of the number of drivers fitting this profile that are insured in this zip code to give an indication of the number of drivers that pay this low of a premium. Note that maximum premium for this type of driver is \$806; this premium is charged in several zip codes in Los Angeles. Also note that the 67 zip codes surveyed represent 12 percent of the vehicles insured in the state.

Figure C-1 shows the minimum premium charged in six states, based on driver profile surveys undertaken by each state's Department of Insurance. Minimum premiums charged in Georgia and Nebraska are also included in the figure, although these data come from different sources: the Nebraska rate is from an ISO report prepared for the state, while the Georgia rate is the premium paid by an analyst in the state Department of Insurance. The minimum insurance premiums in Figure C-1 vary greatly by state. The lowest available annual premiums range from a high of \$482 (Colorado) to a low of \$67 (Illinois). When the driver profile and coverage received is similar, the lowest annual premium ranges from \$166 (California) to \$88 (Nebraska).

Figure C-1: Lowest Premiums Charged in Several States

State (1)	Lowest Premium	Companies Surveyed (estimated % of state market)	Regions Surveyed (estimated % of total)	Number of Driver Profiles	Coverage Received for Lowest Premium	Required Coverage in State	Problems with Data (2)	Quality of Estimate (3)	Source of Data (year)
California (T)	\$166	14 (80%)	67 (12%)	6	65-year-old with no violations, who uses the auto for 7500 miles of limited pleasure-driving. (1) MP \$2,000 (2) 15/30/5 (3) UMBI 15/30 (4) UMPD \$3,500	15/30/5		1	"Automobile Insurance Premium Survey" (1994)
Illinois (T)	\$67	250+ (99%)	13 (80%)	4	38-year-old married driver with no violations who drives to work and 16,000 miles annually. 20/40/15 with \$1000 medical and 20/40 UM.	20/40/15	e	1	IF4 Database of Auto Premiums (1993)
New York (NFV)	\$152	27 (80%)	36 (50%)	4	Retired 65-year-old with no violations, who uses the auto for limited pleasure-driving. (1) No-Fault/PIP. 50 (2) 10/20/5	10/20/5 No-Fault/PIP 50		1	"Consumer Guide to Auto Insurance" (1993)
Colorado (NF\$)	\$482	25 (78%)	4 (35%)	3	68-year-old female with no violations and average driving record, who uses the car for 7500 miles of limited pleasure driving. (1) 25/50/15 (2) plus comp. (\$100 deductible) and col. (\$250 deductible). This is above the minimum.	25/50/15	a,b	2	"Auto Insurance Premium Comparison" (1991)
Missouri (T)	\$376	26 (70%)	5 (35%)	4	Retired 62-year-old with no violations; travels 10 miles or less to work, 15,000 miles per year. (1) MP. \$1,000 (2) Limits 100/300/50, plus comp. and col. (\$250 deductible). This is above minimum.	25/50/10	b	2	"Consumer Shopping Guide for Auto Insurance" (October 1993)
Nebraska (T)	\$88	8 (60%)	6 (50%)	6	Married, 50-year-old preferred driver who uses the car for 7500 miles of limited pleasure driving. 50/100/25. This is above the minimum.	25/50/25		2	ISO Data provided by State Insurance Analyst (1994)
Florida (NFV)	\$186	10 (75%)	3 (25%)	2	40-year-old male with no violations; travels 8,000 miles per year. (1) PIP; \$10,000 (2) Limits 10/20/5, (3) plus comp. (\$100 deductible) and col. (\$250 deductible). This is above the minimum.	10/20/5 PIP: 10	b,c	3	"Auto Insurance Consumers' Guide" (1994)
Georgia (NF\$)	\$94	N/A	N/A	N/A	15/30/10	15/30/10	b,d	4	Analyst from Department of Insurance (1994)

- (1) T= tort liability; NFV=no-fault, verbal threshold; NF\$=no-fault, dollar threshold
(2) a. The lowest premium is in the Standard Driver profile. According to the Colorado Division of Insurance, the company has an extremely aggressive pricing strategy.
b. The number of different regions surveyed is very small.
c. The driver profile is for a 40-year-old male. This not the least expensive driver profile.
d. This is the premium paid by an analyst at the Georgia Department of Insurance.
e. The driver profile is for a 38-year-old male. This not the least expensive driver profile.
(3) 1 = highest quality
2 = includes comprehensive and collision coverage
3 = includes comprehensive and collision coverage, not least risky driver class
4 = single data point

List of Abbreviations

AIRAC	All Industry Research Advisory Council (now IRC)
API	American Petroleum Institute
BI	bodily injury liability insurance coverage
CEC	California Energy Commission
CES	Consumer Expenditure Survey
CO ₂	carbon dioxide
CV	compensating variation
DHS	Deakin, Harvey, Skabardonis
FAIR	Fairness in Automobile Insurance Rates
HDIF	Hawaii Drivers Insurance Fund
IRC	Insurance Research Council (was AIRAC)
ISO	Insurance Services Office
MP	medical payments insurance coverage
mpg	miles per gallon
MSRB	Massachusetts State Rating Bureau
NAIC	National Association of Insurance Commissioners
NAII	National Association of Independent Insurers
NISS	National Independent Statistical Service
NOW	National Organization for Women
NPTS	Nationwide Personal Transportation Survey
PAYD	pay as you drive insurance
PD	property damage liability insurance coverage
PIP	personal injury protection insurance coverage
PPN	Pay-at-the-pump, Private, No-Fault insurance
SRI	Stanford Research Institute International
TCM	transportation control measure
TREAD	Transportation Efficiency and Distribution model
UCS	Union of Concerned Scientists
UIM	underinsured motorist insurance coverage
UM	uninsured motorist insurance coverage
UMA	Uninsured Motorist Act
VIP	Vehicle Injury Plan
VMT	vehicle miles traveled

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