

Consumer Incentives to Reduce Greenhouse Gas Emissions from Personal Automobiles

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ABSTRACT

The focus of this paper is short-term policy options to address greenhouse gas emissions from personal automobiles. Primary policies considered include gasoline taxes, carbon taxes, a carbon cap-and-trade program, cost-shifting initiatives, and a pay-at-the-pump auto insurance scheme are examined closely. Pay-at-the-pump auto insurance is recommended on the basis of cost effectiveness, equity, public appeal, and political feasibility. Also recommended are incentive-based transportation control measures such as congestion pricing, workplace parking subsidy reform, and accelerated vehicle retirement. These short-term complement the long-term strategies considered by the President's Policy Dialogue Advisory Committee (Car Talk).

INTRODUCTION

The transportation sector is the second largest producer of greenhouse gas emissions in the United States. In 1990, the transportation sector was responsible for 32% (over 400 million metric tons) of carbon emissions released into the atmosphere that year. Transportation was a close second to the utility industry, which released about 36% of the total.

Within the transportation sector, light-duty motor vehicles accounted for more than half of the greenhouse gas emissions released in 1990. The results are summarized in the graph below:
[insert pie charts -- (1) emissions sources and (2) transportation emissions]

Projections show overall greenhouse gas emissions likely to grow by 21% over 1990 levels, to 1,600 million metric tons annually by 2010. Transportation emissions are expected to grow slightly faster, by 27%, during this period. The President has announced intentions to curb this growth and return greenhouse gas emissions to the 1990 levels by the year 2005. Furthermore, in the Kyoto Protocol the United States has expressed its intent to reduce emissions levels to 7% below 1990 levels between 2008

and 2012.¹

Transportation is likely to play a key role in the emissions reduction strategy. Light-duty motor vehicles, of which the vast majority are personal cars and trucks, represent an opportunity to achieve significant reductions in transportation emissions.

POLICY RESPONSES

No federal policies have yet been implemented to reduce greenhouse gas emissions from light-duty vehicles. Three policies, the Corporate Average Fuel Economy (CAFE) standards, the Energy Security Act of 1992, and federal and state incentive programs address greenhouse gas emissions only indirectly, through fuel economy and alternative fuels regulations.

CAFE

The CAFE standards, first applied in 1978, specify fuel economies for all new cars and light trucks sold in the United States. The policy increased average new-car fuel economy from about 15 to 27.5 miles per gallon (MPG) by 1985, reducing greenhouse gas emissions accordingly. The standard remains 27.5 MPG today for cars and 20.7 MPG for light trucks.

However, the policy's effectiveness is limited because it fails to address vehicle travel. In fact, it makes vehicle travel more efficient and therefore less expensive. Along with the fall of gasoline prices to today's historically low levels, the CAFE policy has helped to finance a doubling of vehicle travel since 1970. Since overall greenhouse gas emissions depend on both average fuel consumption and total number of miles driven, this increase in travel has largely offset the effect of improved fuel economy toward reducing greenhouse gas emissions.

ALTERNATIVE FUELS REGULATIONS

The Alternative Motor Fuels Act of 1988 modified the CAFE regulations to include cars that can run on fuels other than gasoline. To give automakers

incentive to produce alternative-fuel vehicles, the CAFE formula greatly inflates their fuel economy. However, this policy does not give incentives for automakers to sell vehicles that run on low-carbon fuels. For example, a vehicle that uses M85 (85% methanol, 15% gasoline) does not offer dramatic greenhouse gas emissions reductions, but its fuel economy is inflated nearly seven times.

The National Energy Security Act of 1992 specifies percentages of new-vehicle purchases made by a variety of Federal, state, municipal, and private fleets to be AFVs. However, vehicles that run on virtually any fuel besides gasoline fulfill the requirement. No incentive is offered for fleet operators to choose AFVs that use currently available low-carbon fuels like natural gas. Furthermore, neither alternative-fuel vehicle policy requires the AFVs to burn alternative fuels, bringing their effectiveness into considerable doubt.²

Finally, a variety of State and Federal tax-credit incentives are available for buyers of alternative-fuel or low-emissions vehicles. However, one of the largest subsidies is given for electric vehicles, which may emit greater greenhouse gas emissions (especially if the vehicle is charged using electricity from a coal-fired power plant) than gasoline vehicles.³

Unfortunately, federal policy has not yet responded in a direct or effective way to the growing problem of greenhouse gas emissions.

TOWARD A MORE EFFECTIVE POLICY

A new set of policies must be implemented to curb automobile-related greenhouse gas emissions. Policy can aim for the following targets:

- *Fix the Car:* increase the fuel economy of the vehicle fleet by targeting new vehicles and/or existing vehicles
- *Fix the Driver:* reduce the overall travel of the vehicle fleet through alternatives such as carpooling, using mass-transit, eliminating unnecessary trips, and improving urban and suburban land-use strategies.
- *Fix the Fuel:* increase the use of fuels that offer low carbon-dioxide emissions per mile of travel

As the ineffective CAFE policies demonstrate, these three targets are interrelated; effective policies must target all three. Furthermore, they must offer the drivers and companies affected economic incentives to make decisive changes toward reducing greenhouse gas emissions. Such policies are known as market incentives or market mechanisms.⁴

CAR TALK

Recognizing the need to develop new policies, in 1994 the Clinton Administration assembled a Policy Dialogue Advisory Committee to Recommend Options for Reducing Greenhouse Gas Emissions from Personal Motor Vehicles. This panel included representatives of

government agencies, labor organizations, environmental and public interest groups, automobile manufacturers and suppliers, the transportation fuels industry, the insurance industry, and others. The Committee was charged to “develop consensus on three sets of policies that would, if adopted, most cost-effectively return greenhouse gas emissions from cars and light trucks to 1990 levels by the years 2005, 2015, and 2025, with no upturn thereafter.”

Because of the President’s desire to maximize cost-effectiveness, the Committee focused on market-incentive policies. They agreed on a comprehensive set of policies to address research and development in low-carbon fuels and alternative fuel vehicles. However, the Committee found that the effect of these policies would be small before 2025.

The Committee determined that improving fuel economy and reducing vehicle travel hold the greatest potential for significant greenhouse gas emissions reductions by 2005. They further agreed that a policy to increase the variable cost of driving, such as a gasoline tax increase, would accomplish both goals. Under this type of market mechanism, the overall cost of driving would be a stronger function of miles traveled, fuel consumed, and greenhouse gas emissions released. Consequently, drivers would see a clear economic incentive to drive more fuel efficient vehicles, eliminate unnecessary trips, live closer to work, use carpools and mass transit more frequently, and retire old, inefficient vehicles earlier.

Though they agreed on the type of policy, the Committee could not reach consensus on a detailed plan of action. Some members feared that the market mechanism alone would not guarantee results. To complement the market incentive policy, they recommended an increase in CAFE standards to 45 MPG for cars. The automobile company representatives refused any increase in CAFE standards because they were concerned that this would reduce the chances for the innovative market incentive policy to be implemented. This single point of contention was largely responsible for Car Talk’s failure.⁵

The remainder of this paper will examine the specific policies that the Committee discussed to return greenhouse gas emissions to 1990 levels by 2005. These policies will be evaluated on the basis of cost-effectiveness, equity, political feasibility, and public appeal.

These policies fall into three categories: variable cost of driving, fuel economy, and transportation alternatives.

INCREASING THE VARIABLE COST OF DRIVING

One class of market incentive policies aims to increase the variable cost of driving. These policies give drivers economic incentive to purchase more efficient vehicles, replace their old cars more quickly, and drive fewer miles.

There is a strong economic argument for increasing the marginal cost of driving. Since 1950, the

proportion of automobile costs that vary with miles traveled has been decreasing, as shown in Table 1.

Table 1: Variable Cost of Driving, 1950-1994*

Year	Variable Cost (per 10,000 mi)	Total Cost (per 10,000 mi)	Percent of Total
1950	\$328	\$861	38%
1975	645	1,831	35
1994	920	3,745	20%

*Data are not adjusted for inflation.⁶

Furthermore, 1993 federal highway statistics show that the variable user fee revenues collected (gas taxes and tolls) to fund road and highway expenditures fell short of annual outlays by \$47 billion. This means that property taxes and general appropriations (i.e., income and sales taxes) financed \$20 billion of road-related expenditures. Bond issue proceeds plus investment income at the state and local level added nearly \$13 billion.⁷ Here, the cost of driving did not fully reflect the cost that drivers paid through other charges. When this occurs, the market is considered to be distorted, and efficiency losses result.

Any mechanism that reduces fuel consumption by raising the variable cost of driving causes a deadweight loss. This loss represents the foregone consumer surplus benefit of driving.⁸

If the policy also raises the overall cost of driving, as a gasoline tax is often assumed to do, then further losses will result. The increased cost will reduce the disposable income level of the average household and cause inflation. These effects will cause short-term economic slowdown, though they will stimulate investment and encourage long-term economic growth. In the short term, however, the additional losses will cause drivers to conserve even more fuel, making the policy extremely cost-effective but potentially increasing poverty, unemployment, and social upheaval.

Other tax cuts could help avoid this short-term suffering. Income-tax rebates would help maintain disposable income levels for consumers, and reductions in the employer-paid payroll tax would help dampen inflation.

Another argument for replacing income or payroll taxes with gasoline taxes is the "double dividend" hypothesis. Distortionary taxes, including income and payroll taxes, cause a deadweight loss by creating a disparity between marginal cost and price. Similarly, the price of driving is generally considered to be well below its actual cost in road maintenance, environmental damage, etc. As a result of these competing effects, the deadweight loss of a gas tax could be lower than that of the distortionary taxes it replaces. Unfortunately, economists have concluded that for the specific case of carbon emissions, interactions with other taxes would likely nullify the double dividend hypothesis effect.⁹

Another way to avoid the short-term losses is to alter the cost structure of driving. The overall costs of driving include the cost of the vehicle, sales taxes, depreciation, the cost of fuel, fuel taxes, insurance

premiums, tolls, vehicle registration fees, and, in some areas, the cost of required vehicle inspections. Many of these costs are fixed and do not vary with mileage. Policy can make these costs a stronger function of miles traveled, fuel consumed, and greenhouse gas emissions released without raising the overall cost of driving.

The tax schemes considered by the Car Talk Committee include the gasoline tax, a carbon fuels tax, and a carbon cap-and-trade program. The tax-free ideas include VMT (vehicle miles traveled) fees and pay-at-the-pump auto insurance.¹⁰ These will now be examined in turn.

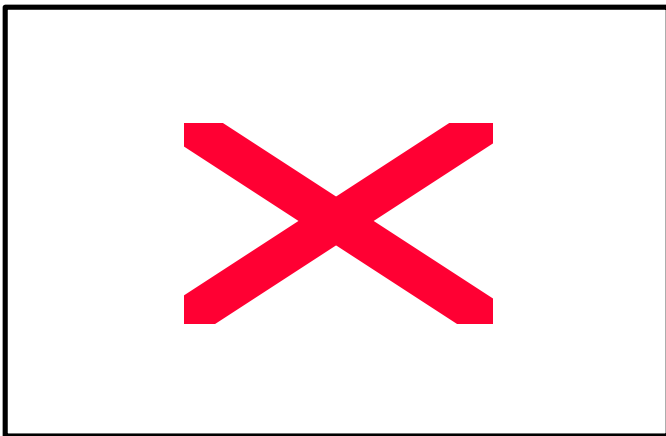
GAS TAX

Increasing either the state or federal gasoline taxes would give drivers a real economic incentive to limit car travel, purchase more fuel-efficient vehicles, or both. Current gasoline taxes include a federal tax of 18.4 cents per gallon and state taxes ranging from 4 to 29 cents per gallon.¹¹ Charles River Associates projects the deadweight loss of a gasoline tax to be one fifth that of CAFE standards designed to achieve the same emissions reductions.¹²

An increase in the federal gasoline tax would require federal legislation, while an increase in state gasoline taxes would require separate action in each state. If the tax were to be called a fee rather than a tax, then it could be implemented at the federal agency level without the need for tax legislation.

A major objection to the gasoline tax concerns equity issues. This policy would especially burden the poor and those who live in rural and Western areas since they have little opportunity to purchase high-efficiency vehicles or limit their driving, respectively. A study by Resources for the Future determines the burden of an increase in the federal gasoline tax by calculating the extra taxes paid as a percentage of household income in various demographic groups. It finds that households in the lowest income quintile would face nearly three times the burden of those in the highest quintile. Households in the West South Central states would face nearly twice the burden of those in the Mid-Atlantic States. Also, rural households would face a burden nearly 50% greater than urban and suburban ones. Figure 2 shows the regional burdens.

Figure 2: Relative burden of gas tax by region



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Tax cuts would be needed in order to reduce short-term economic losses associated with the tax or fee, and in principle they could be designed to correct for the inequities shown above.

CARBON TAX

A tax based on the full-cycle carbon content of fuel could complement the gasoline tax naturally. This policy would tax gasoline at the same rate as the gas tax policy above, but the tax rates of other fuels would be higher or lower depending on carbon content. The carbon tax would create a consumer demand for low-carbon vehicle technology, prompting automakers and fuel distributors to accelerate research and development efforts.

Determining the tax rate for fuels like ethanol, whose full-cycle carbon emissions depend largely on the method of production, could be problematic. However, it is unlikely that this incentive will induce a large movement toward use of currently available alternative fuels. For example, natural gas contains 80% of the carbon content of gasoline.¹⁴ The tax rate for natural gas would be only 20% less than the gas tax, probably not enough of a savings to induce widespread use of natural gas in automobiles by 2005.

In principle, the carbon fuels tax offers drivers a choice to use low-carbon fuels rather than limit their driving. Unfortunately, this choice is likely to be extremely limited before 2005 and has potential for significant effect only in the long term.

CAP-AND-TRADE

An alternative to the carbon tax would be a carbon cap-and-trade program. The government would set "budgets" for greenhouse gas emissions explicitly at 1990 levels to ensure that the U.S. achieves its target emissions reductions. Then, the government would issue emissions allowances to individual firms. Consumers would pay higher fuel prices as the supply decreases to 1990 emissions levels. For the case of automobile emissions, each refiner, importer, or other automotive fuel distributor would be required to possess emissions allowances corresponding to the full-cycle

carbon content of the fuel it distributes. A market would be created in which these allowances could be bought and sold.

There are two methods for distributing allowances. One method, known as "grandfathering," is to give allowances to those interests who have historically held a stake in the automotive fuels sector, who would gain an extra profit margin as a result of rising fuel prices. The preferred method is to hold an auction in which any interest, new or old, may buy permits. Here, the extra profit margin is returned to the federal government in the form of auction revenues. Income tax and employer-paid payroll tax cuts would be needed to dampen inflation, maintain disposable income levels, and reduce short-term economic slowdown.¹⁵

As production becomes limited, gasoline prices would rise. The price of alternative fuels would rise according to their full-cycle carbon content. In this way, the carbon cap-and-trade program is very similar to the carbon tax.¹⁶

The primary market, in which firms buy and sell allowances, identifies those distributors who can make emissions reductions at the lowest possible cost. A secondary (or futures) market would also develop based on future prices of allowances. This futures market would reveal expectations about the near- and long-term prices of motor fuels, guiding investment decisions and future planning by auto companies, fuels distributors, transportation infrastructure planners, and the real estate development market.

One disadvantage of the cap-and-trade program is the uncertainty involved with the science of greenhouse gas emissions. Since global warming is an unproven phenomenon, emissions budgets cannot be set with certainty. A cap-and-trade program controls quantities tightly but leaves cost uncertain. If uncertain costs are a large concern, then the carb charged the most insura—lùà, may be more appropriate than cap-and-trade.

Neither the carbon tax nor the cap-and-trade programs needs to be restricted to motor fuels. Fuel distributors for all sources of greenhouse gas emissions, including transportation, residential, commercial, industrial, and electric utilities, could be included in the trading program. This could improve the cost-effectiveness of the policy significantly by expanding the opportunities to making inexpensive emissions reductions.¹⁷ Charles River Associates estimates the expected price increases by 2010 and 2030 under a comprehensive cap-and-trade program set at 1990 emissions levels. They find that the tax would need to rise as the economy grows throughout the next century in order to maintain 1990 greenhouse gas emissions levels. The results are summarized in Table 2:

Table 2: Price increases for various fuels under cap-and-trade¹⁸

Energy source	Price increase (2010)	Price Increase (2030)
Petroleum	\$0.50/gallon	\$1.13/gallon
Natural gas	\$2.65/million ft ³	\$5.93/ million ft ³

Coal	\$95.11/short ton	\$213.15/short ton
Electricity	\$0.02/kWh	\$0.03/kWh

VMT FEES

Charging vehicle registration fees, taxes, and inspection fees based on vehicle travel is another way to increase the variable cost of driving. This is a revenue-neutral, non-tax policy that promises many of the benefits associated with the gasoline tax.

Administrative costs associated with fee collection are the main argument against a VMT fee. In order to be effective, the fee must be apparent to the driver each time he makes the decision to drive. If these fees are collected annually or semi-annually (e.g., at vehicle registration), the effect will not be as great as that of a gasoline tax collected at each fill-up.

Measuring vehicle mileage at regular intervals is problematic, since drivers may tamper with their odometers. Some proposals have suggested VMT fees based on the nationwide average mileage for each type of car, but this gives drivers little incentive to limit vehicle travel. Another proposal is to use roadside sensing devices to identify each vehicle and record its travel. Resources for the Future has shown the potential of roadside sensing to be more cost-effective than centralized vehicle inspection, they could also compromise the right to privacy if they also identify the travel patterns of individual vehicles.¹⁹

Collecting VMT fees at the pump would make regular collection easier. This would probably require "smart card" technology to record mileage and/or fuel consumption, on which fees would be based. Retrofitting vehicles with this technology could be difficult and expensive, so this policy would be slower to take effect than a gasoline tax.

PAY-AT-THE-PUMP INSURANCE

In 1988 and again in the 1990's, California revisited an idea that Senator Daniel Patrick Moynihan (D-NY) proposed in the late 1960's.²⁰ This is the idea of providing universal liability insurance coverage with a surcharge on each gallon of gasoline. Even though liability insurance is mandatory in all states, many drivers forego this coverage. In the California plan, a pay-at-the-pump (PATP) surcharge of 30 to 40 cents per gallon would replace the personal-injury liability premium (private collision premiums and other fees would be unchanged). These revenues would be placed in a fund that would pay all personal-injury damages. Coupled with a no-fault insurance law in the state, the plan would provide generous damages according to an agreed formula and without costly litigation. The savings realized by eliminating litigation and salesmen's commissions (up to 20% of the insurance premium) would be passed along to all drivers²¹

The effect of an insurance surcharge per gallon of fuel would be the same as that of a gasoline tax. PATP nullifies the regressivity concerns associated with the gas tax; many advocates of low-income groups see

this program as a benefit because it allows everyone to purchase insurance in a more affordable way than they currently can. Ninety percent of drivers can expect to pay less in total auto insurance costs under the new plan, with only those who drive an excessive amount paying higher overall costs.²²

Arguments opposing the PATP concept come mostly from the insurance and oil industries. These disadvantages include the following:

- There is little statistical correlation between vehicle travel and insurance costs
- PATP does not consider important risk factors such as the driver's age, sex, and driving record, the type of vehicle, and traffic density;
- Rural and Western drivers would pay more than urban drivers despite lower risk;
- Highway safety would be compromised because of a shift to smaller, lighter, more fuel-efficient vehicles.²³
- Highway safety would be compromised because drivers would no longer have an incentive to avoid accidents
- Heavy, gas-guzzling cars would be charged the most insurance despite their superior performance in crashes
- PATP reduces the number of uninsured motorists on the road, who will increase overall vehicle travel

There is no consensus on the correlation between vehicle travel and insurance costs. An American Petroleum Institute Research Study attempted to show little statistical correlation between miles traveled per vehicle and insurance costs.²⁴ However, their method is suspect, since API considers only the average driver in each state. An equally critical paper by the Insurance Institute for Highway Safety admits that insurance cost (risk) is related to exposure but that other disadvantages of PATP outweigh this factor²⁵. Whether or not vehicle travel is the strongest factor in determining insurance costs, it is a factor that can be separated from the others.

Similarly, there is no consensus about the effect of traffic density on the accident rate.²⁶ A study by the American Petroleum Institute shows that it is a strong factor, but Sugarman (Tobias?) suggests that it is not. If traffic density is an important factor, then PATP could be expanded to include congestion fees (see discussion in the Transportation Control Measures section).

PATP would not correct for differences in drivers or vehicles, but neither would it completely replace auto insurance as we know it. Those who choose to carry collision coverage (optional in all states) would still make annual or semi-annual payments to a private. This premium could account for any factors depending on individual driver or vehicle characteristics, just as it does under the current system.

Like the gas tax, PATP would burden the low-income, Western, and rural drivers the most. PATP would actually benefit, rather than burden, low-income

drivers because it would give them a more affordable way to purchase insurance. PATP, if set to the insurance costs in each state, would relieve the excess burden on drivers in Western states because these states typically have low population densities and low insurance costs (see Table 3). The only remaining inequity issue is rural drivers. The private insurance premium can best correct for these inequities, since place of work and residence are both driver characteristics.

Since the private collision insurance premium would correct for inequities due to driver and vehicle characteristics, some drivers would have more incentive to carry private collision coverage than they do now. Particularly reckless drivers would probably try to avoid private collision insurance because of the extra fees. In this case, the fee for a poor driving record should be levied as a tax.

Some have argued against PATP because of differences in fuel economy among vehicles. Under PATP, drivers of cars with low fuel economy would pay more insurance than those with high-efficiency vehicles. The industry points out that high-efficiency vehicles tend to be lighter and less crashworthy and therefore prone to more severe injury accidents than heavy gas guzzlers. For this reason, the insurance industry argues that PATP would unfairly collect the most insurance from the safest vehicles.²⁷

To phrase the issue in different terms shows that PATP collects the most liability insurance from the most dangerous vehicles. The most important factor in predicting the extent of injury in an automobile crash is the disparity of vehicle weights. When a heavy vehicle collides with a lighter one, the occupants of the lighter car experience extremely large forces relative to those in the heavier. For this reason, heavy cars pose a serious threat to every other vehicle on the road, whereas light cars are relatively innocuous. Moreover, large, heavy vehicles tend to crash more frequently than light vehicles, increasing their threat.²⁸

Still another argument against PATP points to some studies showing that lighter cars are less crashworthy than heavier vehicles in collisions involving similar vehicles. Still, this risk is small compared to the danger that heavy vehicles pose to lighter cars. One way to settle this problem would be for the insurance industry to provide special purchase incentives for light vehicles that score well in government crash tests. Currently, the government test simulates a head-on collision at 35 MPH with a vehicle of equal weight, but the purchase incentive could be based on other crash test data, including side impact and frontal offset, or average insurance costs for the type of vehicle. These incentives would motivate automakers to develop technology new safety technology for light vehicles and would give consumers an incentive to buy this technology.²⁹

Khazzoom makes several arguments for the safety benefits of PATP. He points to the fact that PATP would accelerate fleet turnover, increasing the number of cars with new safety features. He suggests that many

drivers would switch to alternative models of travel, such as public transportation, which are safer than driving. Overall, the PATP program would reduce activity on the roadway, lowering traffic densities, exposure, risk, and insurance costs for the average driver.³⁰

PATP's universal coverage would reduce the risk created by uninsured motorists on the highway, but it would also draw previously uninsured drivers onto the road, potentially increasing vehicle travel. However, Sugarman shows that the overall effect of the policy would be a decrease in vehicle miles.³¹

Ultimately, it was the issue of safety that kept PATP from becoming law in California. Legislators and voters worried that a shift to lighter vehicles coupled with a no-fault insurance law would lead to an increase in highway casualties, and some research corroborated those expectations. This is likely the most difficult concern to settle. The no-fault insurance law compromises highway safety somewhat by reducing the economic incentive for drivers to be cautious. PATP could be implemented independently of any no-fault law, but the elimination of litigation would drive down average insurance costs and increase the appeal of the program.

ANALYSIS AND POLICY ALTERNATIVES

These policies will be evaluated on the following four criteria:

1. *Cost-effectiveness*: can the policy achieve significant effect in 10 years, the shortest policy time frame that the Committee considered, at low cost?
2. *Equity*: Does the policy avoid burdening certain groups more than others?
3. *Political feasibility*: Can the policy be implemented quickly with minimal legislative debate, and do influential interest groups support it?
4. *Public appeal*: Does the policy offer convincing reasons for the general public to support it?

Each criteria will be taken up in turn.

Cost Effectiveness

Compared to traditional "command-and-control" policies like CAFE standards, each of the policies discussed to increase the variable cost of driving are highly cost-effective. These market-incentive policies are cost-effective because they give consumers incentives to buy fuel-efficient vehicles, reduce vehicle travel, retire old, inefficient vehicles, and make efficient land-use decisions. Studies show that a set of policies designed to address each issue individually would not be as cost-effective as any of these pricing policies. The Car Talk Committee found that these policies have the greatest likelihood of impacting greenhouse gas emissions in the first ten years.

The gas tax, carbon tax, and cap-and-trade program would be slightly more cost-effective if not accompanied by tax cuts. Because of reduced

disposable income and inflation, drivers would see a greater incentive to conserve gasoline. The revenue-neutral policies, including the above taxes accompanied by equal-yield income and employer-paid payroll taxes, mileage-based vehicle registration and inspection fees, and pay-at-the-pump auto insurance, would be slightly less cost-effective because they are designed to avoid short-term economic slowdown.

Among the revenue-neutral policies, the gas tax, carbon tax, cap-and-trade, and pay-at-the-pump programs all offer a similar level of cost-effectiveness. For all four programs, regular collection at filling stations would be easy to implement.

The carbon tax promises greater long-term effectiveness because it offers incentive for research and development of low-carbon fuels and vehicle technologies. In principle, a carbon cap-and-trade program would cause the same price increase and emissions reduction as a carbon tax. Since this policy sets emissions budgets rather than fuel price, its effectiveness in achieving emissions reduction goals is guaranteed. Both of these programs depend on the accurate measurement of full-cycle carbon emissions that depend on fuel source and vehicle efficiency. This may require new methods to track fuel production and collect data on average vehicle efficiency, but this should not add major expense to the programs.

Pay-at-the-pump auto insurance may increase vehicle travel by drawing new drivers onto the road, especially elderly and low-income drivers who make up the majority of uninsured motorists.³² However, Sugarman shows that this increase would change the effectiveness of the program only minimally.³³

The VMT fee as described appears to be the least cost-effective policy. In order to be as effective as the other options, the fee would need to be weighted by fuel economy and collected at least weekly, like gasoline taxes.³⁴ There appears to be no inexpensive way to collect accurate information about vehicle mileage and fuel economy and levy appropriate fees at such regular intervals. Collecting VMT fees as a surcharge on gasoline would make the policy cost-effective through inexpensive, regular collection and fuel-economy weighted fees. However, the effectiveness of the policy is limited because vehicle registration and inspection fees are low -- only about 5 to 11 cents per gallon at current fuel consumption levels.³⁵ If the fees were to provide further highway revenues that currently come from tolls, bond issues, and income, sales, and property taxes revenues, the effectiveness of this policy would be slightly greater but still less than that of the other policies.

The gas tax, pay-at-the pump insurance, and carbon tax or cap-and-trade would be similarly cost effective.

Equity

Any increase in gasoline prices will place particular burdens on low-income, Western, and rural drivers. The pay-at-the-pump auto insurance resolves

these equity issues most effectively. It offers low-income drivers, who often drive short distances, a more affordable way to purchase insurance. If the fee is tied to the liability insurance costs in each state, then mostly rural states will pay lower fees than densely populated states that typically offer more transportation alternatives (see Table 3). Private industry, rather than government, would settle all other equity issues. Competition would give each insurer incentive to find ways to determine risk factors like the type of driving (urban vs. rural), actual mileage, etc., in order to satisfy their customers. This process is likely to be effective in resolving equity issues because it would take place outside of the political arena.

Gas taxes, carbon taxes, and a cap-and-trade program with auctioned allowances could settle inequity issues by designing income and payroll taxes cuts to benefit low-income, Western, and rural drivers by an amount proportional to their burden. This "revenue-recycling" idea is attractive in principle, but it is largely untested in practice. The debate over the allocation of tax cuts is likely to be highly political. The affected parties are likely to get less representation in this debate than other, more powerful interests.

The VMT fee could reduce the burden on low-income drivers, but only if based strictly on vehicle mileage. In this way, it would avoid penalizing low-income drivers because of their tendency to drive older, less fuel-efficient vehicles. However, they would still pay more of their income in VMT fees than wealthier drivers. Furthermore, this type of policy would be considerably less effective than one that factors vehicle fuel economy into the fee calculation. VMT fees collected at the pump would achieve this. State governments could correct for equity concerns through yearly refund checks issued at vehicle registration or inspection. In contrast to VMT fee proposals in which fees are collected at registration, this policy would provide an economic incentive for some drivers to have their vehicles registered.

In principle, the carbon tax and cap-and-trade programs offer rural and Western drivers the choice of using low-carbon fuels instead of limiting their travel or buying more fuel-efficient vehicles. However, this choice is severely limited in the near term, since low-carbon vehicle technology is still in the development stage. Current low-carbon fuels, such as natural gas, would offer minimal savings. The re-fueling infrastructure, especially to rural and Western areas, will follow the introduction of low-carbon vehicles by a significant time delay.

Pay-at-the pump auto insurance resolves equity issues most effectively.

Public Appeal

The pay-at-the-pump auto insurance has the greatest potential for public appeal because it promises to lower their overall insurance costs. In fact, 90% of drivers would pay less for auto insurance under pay-at-the-pump than under the current system. The savings come from reducing the private insurers' marketing

costs, which can be 20% of the current premium, and eliminating the burden of uninsured motorists on the rest of the driving public.³⁶ Further savings will result from coupling the policy with a no-fault law to reduce litigation costs. Drivers can further reduce their insurance costs simply by limiting their travel. There is economic reason for the public to support this plan independent of its environmental benefits.

Another advantage is that PATP, along with VMT fees, are clearly revenue neutral. Both have great potential for wide popularity since it is easy to understand that they involve methods of collecting current auto-related expenses rather than creating new costs. Still, public education is necessary for either program to be widely appealing. In California's experience with a pay-at-the-pump proposal, the public was not convinced that the policy would lower their overall insurance costs, so taxpayer groups opposed the program.³⁷

The gasoline tax, carbon tax, and carbon cap-and-trade programs could be less popular because they involve levying new taxes or fees. The short-term economic slowdown caused by these taxes, including reduced disposable income levels and higher inflation, would be extremely unpopular. These new charges could be accompanied by equal-yield tax cuts in other areas to reduce these effects. The tax cuts should be designed to relieve the extra burden on low-income, rural, and Western drivers. Appeal with the general public would depend on the details of those tax cuts, and this could compromise the government's ability to correct for equity issues. Moreover, the debate over these tax cuts is likely to be highly political, and the public may be skeptical that these tax cuts will actually be made.

The carbon cap-and-trade program offers an advantage in public appeal over all of the other pricing programs. The purpose of the cap-and-trade program is clear: to limit greenhouse gas emissions to 1990 levels. The purpose of pricing policies, especially taxes, is not so lucid. Until the public fully understands fully the purpose of a pricing policy and how it will effect the other costs they pay, the public is unlikely to support the price increase. Though in principle, a cap-and-trade program will cause the same price increase and decrease in consumption as a tax, cap-and-trade's clear purpose gives it an advantage in public appeal.

Pay-at-the-pump has the greatest public appeal because it actually lowers the overall cost of driving while shifting fixed costs to variable costs. Drivers have reason to support this plan independent of its environmental benefits.

Political feasibility

The political debate over a pricing policy will be shorter and less contentious if the plan requires minimal legislative action in order to take effect. Policies such as gasoline taxes, carbon taxes, and the carbon cap-and-trade program require legislation only federal legislation. A VMT fee policy would require legislation in every state since states set vehicle registration and inspection rates.

Also, PATP should be implemented on a state-by-state basis in order to tie the PATP surcharge to the traffic density and insurance cost in each state.

However, tax policy and the cap-and-trade program are likely to be highly contentious. The debate surrounding the accompanying tax cuts to relieve short-term economic slowdown and correct for inequities is likely to be highly political. Low-income, Western, and rural drivers, who would be most burdened by the tax, are likely to get less representation in this debate than other, more powerful interests.

The Car Talk Committee meeting summaries give an indication of what the political debate is likely to be. Amoco's representative submitted a letter to the Car Talk Committee indicating his company's complete opposition to any policy to increase the variable cost of driving. However, in compromise talks, the oil industry representatives acquiesced to a VMT fee policy. This shows that the VMT fee could be favored in a political debate.

Next, some other Committee members expressed concern that a pricing policy would not achieve the estimated emissions reductions. These members suggested increased CAFE standards to complement the VMT fee as a policy "backstop," but this was not acceptable to auto industry representatives, who insisted on market incentives.³⁸

This question about the effectiveness of pricing policy suggests that a cap-and-trade program could have a political advantage if that concern is great enough. Cap-and-trade guarantees that emissions will not exceed the set budgets. Furthermore, taxes and fees must increase as the economy expands in order to maintain 1990 emissions levels, whereas cap-and-trade needs no adjustment and avoids the political debate over future tax increases.

Despite these advantages of the cap-and-trade program, cost is the primary concern for those affected by these policies. Taxes and fees are appropriate as primary policy instruments because they guarantee that costs will not exceed the set rates. A cap-and-trade program is ideal as a backstop policy in case the tax or fee fails to achieve the promised effect. Coupling a primary pricing policy with a cap-and-trade backstop, to take effect if satisfactory results are not achieved after a certain period of time, could add to the political feasibility of the program.

A proposal in California to implement PATP auto insurance faced strong opposition on a number of fronts. Many of the groups opposed were also opposed to gasoline taxes. These included oil companies, truckers, taxpayer groups, the travel industry, and the California Chamber of Commerce. Their specific arguments are outlined below:

- *Oil companies*: face lower product demand;
- *Truckers*: though trucks over 10,000 lbs. were largely exempt, truckers feared that any fees on fuel purchases could be too easily expanded as a result of PATP;
- *Taxpayer groups*: skeptical that other costs will not

be reduced as much as promised;

- *Travel service industry*: a decrease in vehicle travel would harm tourism
- *Chamber of Commerce*: loss of funding from tourism industry

Some of the arguments were specific to PATP. These included opposition from insurance companies and agents, trial lawyers, and the highway construction industry. Their arguments are outlined below:

- *Insurance companies and agents*: expected a reduction in agent commission income, saw PATP as an intrusion into their business, though they favored the no-fault component of the plan;
- *Trial lawyers*: business would be reduced if non-judicial means were used to resolve cases;
- *Highway construction industry*: belief that PATP would reduce the public's willingness to accept additional gasoline taxes, which finance its business

Of course, environmental and energy efficiency groups, including the Union of Concerned Scientists, the Sierra Club, the Natural Resources Defense Council, and the Rocky Mountain Institute, favored the PATP proposal for the same reasons that they favor the gas tax. However, several groups came out in favor of PATP even though they do not necessarily favor gasoline taxes or similar programs. These include groups representing and low-income, multicultural and minority interests, consumer groups, taxi drivers, and medical groups. Their arguments are outlined below:

- *Low-income, multicultural and minority groups*: a fairer way for these groups, who often drive relatively few miles, to purchase insurance;
- *Consumer groups*: a means to make insurance more affordable;
- *Taxi drivers*: insurance savings would be greater than higher fuel costs;
- *Medical groups*: often work without compensation under the current system

The support of low-income groups shows that PATP successfully addresses the extra burden on low-income groups, which is the largest inequity issue associated with the gasoline tax. This is despite the fact that Consumer groups supporting PATP include the National Insurance Consumer Organization (NICO). Their support counters opposition from the insurance industry and agents. The insurance industry cannot continue indefinitely to resist what its customers demand. Also, the insurance industry is particularly susceptible to projected property damage from possible rising waters, altered weather patterns, and other effects associated with the global warming phenomenon. It has a long-term economic interest to take an active role now in the reduction of greenhouse gas emissions.³⁹

Minor modifications to the PATP auto insurance plan as proposed in California could easily appease

some of the other groups opposed to PATP. Any plan should demonstrate to taxpayers that PATP will lower their overall insurance costs. Oil companies, though generally opposed to PATP, are not unified against gas taxes or PATP. Amoco's letter to the Committee stated that any plan to increase the variable cost of driving was unacceptable.⁴⁰ However, the CEO of Chevron has announced that his company supports gasoline taxes (or similar measures such as PATP) over increased CAFE standards because these market incentives lower overall costs for their consumers.⁴¹

PATP is the only policy supported by consumer groups and low-income advocates. However, it is the only policy opposed by powerful trial lawyers and insurance companies. The most politically feasible policy is not clear.

FUEL ECONOMY

CAFE Standards

The CAFE standards have been shown to be fairly ineffective as a policy to reduce greenhouse gas emissions from automobiles because it encourages increased vehicle travel. All of the pricing policies described above are preferable to CAFE standards because they address not only new-vehicle fuel economy, but also vehicle travel, alternative fuels, land-use decisions, etc.

The Car Talk Committee agreed to assume that the elasticity of new-vehicle fuel economy (MPG) with respect to fuel price is 0.4. Therefore, an \$0.85 cent gasoline tax, for instance, would result in an increase in the average new-vehicle fuel economy to 35 MPG.⁴² In principle, CAFE standards could be raised to 35 MPG without any short-term consequences.

However, CAFE standards would influence automakers' research and development investment decisions. CAFE standards force automakers to develop technologies to increase fuel efficiency, whereas pricing policies merely stimulate a consumer demand for low-cost technology. For example, a car that achieves 35 MPG would save about \$1,500 of gasoline over today's average car (assuming gasoline costs \$2.00 per gallon and vehicle life is 100,000 miles). The value of this fuel savings at the time of vehicle purchase (assuming a 10-year vehicle life and a discount rate of 10%) is only \$1,000. The National Research Council estimates that an increase in average fuel economy from 27.5 MPG to 35 MPG would add \$500 to \$2000 to the price of the average vehicle.⁴³ Drivers will choose the more efficient car only if the extra cost is less than \$1,000.

Because the demand for new-vehicle fuel economy depends on the price of the technology and the price of fuel, automakers might limit their development efforts to "off the shelf" fuel-efficiency technologies that are very likely to be inexpensive. By contrast, CAFE standards are technology forcing; they would give automakers reason to invest in riskier projects that would advance vehicle technology more rapidly.

CAFE standards also offer a political advantage. Even if they are set no higher than the expected effect of the pricing policy, CAFE standards to complement a primary pricing mechanism give assurance that the estimated effects will be realized. Some members of the Car Talk Committee pushed for increased CAFE standards because they were concerned that the pricing policy would not guarantee emissions reductions. The automakers refused to agree to increased standards, and the attempt to reach consensus failed.

The Car Talk Majority Report, signed by 17 of the 30 Committee members, recommends a policy equivalent to a \$0.28 gasoline tax. This would cause new-vehicle fuel economy to increase to 30 MPG. However, they also recommend an increase in CAFE standards from today's 27.5 to 45 MPG for cars. This is far above the effect expected from the pricing policy alone. It would have significant short-term consequences, among them increased vehicle cost and slower turnover of the vehicle fleet to more fuel efficient vehicles.

It is inappropriate to steer greenhouse gas emissions policy toward increased fuel economy. Instead, policy should consider fuel consumption, which determines greenhouse gas emissions, rather than fuel economy.

The following analysis shows that an increase in fuel efficiency may not lead to a substantial decrease in fuel consumption. CAFE's increase in fuel economy from the 1970's level of 15 MPG to 27.5 MPG saved 3.0 gallons for every 100 miles of travel. A subsequent 12.5 MPG increase in fuel economy (to 40 MPG) would save only 1.1 gallon per 100 miles of travel – an effect nearly two thirds less than that of the original policy. The lower effect is despite the high estimated cost of another CAFE policy.

Higher vehicle fuel efficiency is part of the solution to the greenhouse gas emissions policy, but market forces, rather than policymakers, should determine the most efficient combination of fuel efficiency, reduced travel, and alternative-fuel use. A cap-and-trade policy, for example, would set emissions budgets at 1990 levels but not dictate a particular solution. Those who push for CAFE due to their certainty of effect might also support the cap-and-trade program on the same grounds. Those who argued for CAFE standards in the Car Talk Recommendations might have been persuaded to choose cap and trade.

According to Ben Knight, a member of the Car Talk Committee representing Honda, the Committee shied away from cap-and-trade because it was seen as a comprehensive policy not limited to automobiles. The Committee did not feel comfortable recommending a policy that would affect industries outside of the automobile sector.⁴⁴

FEEBATES

Coupled with the Car Talk Committee's recommendations for increased CAFE standards was an innovative market-incentive known as "feebates." This

policy charges a tax to buyers of cars with lower-than-average fuel efficiency and returns that revenue to high-MPG cars in the form of a rebate. These price adjustments are essentially the same ones that automakers currently use to meet CAFE standards; for example, Chevrolet sells each subcompact Cavalier under cost but recovers that loss on its high-profit sports cars and sport-utility vehicles.

The advantage of feebates is that they can be designed to promote certain vehicle characteristics. For example, feebates can reward cars for having extra safety features or high crashworthiness. Feebates could stimulate demand for safety features that improve the safety of lightweight cars. Feebates could also be based on domestic content, since policies to induce higher fuel economy would favor many foreign automakers that specialize in small cars.⁴⁵

Feebates to increase new-vehicle fuel economy seems to be a dubious policy, since it offers no certainty advantage over the pricing mechanism. Feebates based on domestic content would appeal to domestic automakers but hamper the competitiveness of the domestic industry over the long term.

A much more promising policy is the feebates to improve the crashworthiness of light, fuel efficient vehicles.

TRANSPORTATION CONTROL MEASURES

WORKPLACE PARKING SUBSIDY REFORM

This policy addresses commuter travel in a cost-effective way. It convinces businesses that offer subsidized parking for their employees to refund the subsidy to workers who choose to forfeit their parking space. This refund gives incentive for workers to use carpools and public transportation to get to work. The results are reduced greenhouse gas emissions and less congestion during rush hours. Since the policy offers an economic incentive to reduce vehicle travel without cost to government, businesses, or employees, it is a cost-effective policy with large potential for adoption in many other urban areas. Most of the policy experience to date is from California, but workplace parking subsidy reform shows promise for application in any urban area.

The Car Talk Majority Report recommends this policy. It estimates the reduction in greenhouse gas emissions to be 5 MMT by 2005.

ACCELERATED VEHICLE RETIREMENT

Accelerated Vehicle Retirement is a policy that offers the drivers of older cars a cash payment to let them be scrapped. This policy usually requires that the vehicle be driven under its own power to the scrapping site to ensure that the vehicles are driveable. Studies of a Delaware Vehicle Retirement Program show that that the ideal payment is about \$300.⁴⁶

This is an especially cost-effective policy for reducing hydrocarbon emissions, because the hydrocarbon emissions of an older vehicle can be many

times greater than that of a newer car. Hydrocarbon emissions regulations were considerably less stringent 15 years ago than they are today, and catalytic converters lose their effectiveness after 50,000 or 100,000 miles. The policy is also effective for reducing greenhouse gas emissions because older cars, especially those manufactured before the CAFE standards were first applied in 1978, are not as fuel efficient as newer vehicles. Also, fuel efficiency decreases with engine wear.

Accelerated Vehicle Retirement was not a recommended policy in the Car Talk Majority Report, but the representatives of the five automakers (who did not sign the Majority Report) indicated their support for this program in a separate letter. They estimated greenhouse gas emissions reductions of 5 MMT by 2005.⁴⁷

CONGESTION PRICING

Congestion pricing is the practice of charging tolls for driving on certain roads at rush hour. Drivers' time savings justify the cost of these tolls. The BTS study finds that congestion pricing is an nearly as cost effective as the Workplace Parking Subsidy Reform for reducing both miles traveled and hydrocarbon emissions released⁴⁸.

Resources for the Future shows that public support for congestion pricing is sensitive to the details of the program. Public support for refunding some of the toll costs through local tax cuts is high. Perhaps more important is that these tolls be applied to new construction only so that open-access resources are not reduced.⁴⁹

Congestion pricing was not considered for recommendation at Car Talk.

CONCLUSIONS

Workplace Parking Subsidy Reform, Accelerated Vehicle Retirement, and Congestion Pricing are cost effective programs because they offer drivers economic incentive to reduce their driving or scrap their vehicles. Each policy, like the pricing policies, could have a small effect by 2005.

The beauty of these policies is that they are primarily designed to solve other problems associated with driving, such as hydrocarbon emissions or traffic congestion. It should be easier to find support for these policies, which solve immediate problems, than for policies like fuel economy regulations that merely address a long-term problem like global warming.

CONCLUSION

PAY AT THE PUMP AUTO INSURANCE

Of the mechanisms to increase the variable cost of driving, pay-at-the-pump auto insurance appears to offer the most advantages. It offers high cost-effectiveness easily through at-the-pump collection.

Equity concerns can be settled outside of political circles by the private insurance industry. Advocates of low-income and minority groups, who are otherwise opposed to gas taxes, support the PATP program. Though the insurance industry generally opposes the program, the National Insurance Consumers' Organization supports it. Most drivers would pay lower overall insurance costs under the plan than in the current system, giving the plan large potential for public appeal.

Because of these advantages, it is recommended that a pay-at-the-pump auto insurance program be implemented on a state-by-state basis with federal coordination. The simplest way to implement it would be to base the PATP fee on the premium for the safest driver category in each state. The table below shows the minimum premiums in selected states and the equivalent PATP charge:

Table 3: Insurance Premiums for Selected States

<u>State</u>	<u>Minimum Liability Premium</u>	<u>Per-Gallon (PATP) Equivalent</u>	<u>Average Liability Premium</u>
California	\$166	\$0.28	\$518
Georgia	94	0.16	299
Illinois	67	0.11	296
Nebraska	88	0.15	195
New York	152	0.25	507

If based on the safest driver category, the PATP charge would be \$0.25 per gallon or less in every state but California.⁵⁰ This may not give consumers a strong economic incentive to reduce greenhouse gas emissions. The elasticity of demand for gasoline consumption depends on the magnitude of the price increase. The Car Talk Committee agreed that full elasticity could not be assumed with an increase in fuel price less than \$0.25 per gallon.⁵¹ Furthermore, the results of a survey of 26,000 new vehicle buyers establishes the price of \$2.10 per gallon as the point at which seven out of ten drivers become willing to change the type of vehicle they drive. The other 30% are not willing to change at any price.⁵²

For the policy to be effective, then, the fee should be at least 25 cents per gallon. Table 3 shows that PATP cannot reach this minimum level if the safest driver category determines the fee. Therefore, it is recommended that average, not minimum, liability insurance premiums form the basis for PATP fees in each state. For the states represented in Table 3, this would mean fees of 33 to 87 cents per gallon. The actual PATP fee would probably be slightly lower, since overall liability insurance would necessarily be lower under PATP because of the inclusion of currently uninsured motorists. The magnitude of this decrease in each state depends on the number of previously uninsured motorists and whether or not the PATP program is coupled with a no-fault law.

If PATP fees are set by the average liability premium in each state, then drivers who have better-than-average driving records will be eligible for refunds.

It is recommended that these refunds be distributed in the form of discounts on private collision insurance. Drivers would see these refunds as a considerable incentive to purchase private collision insurance (which is optional in all states) and to maintain an excellent driving record to maximize the refund. In order to maintain the incentive to reduce vehicle travel, the refund should not be based on individual vehicle mileage or fuel consumption. If the refund exceeds the cost of the collision insurance premium, it is not recommended that cash refunds be distributed. Otherwise, car owners might keep inoperative vehicles and insure them in order to collect the refund.

State-based implementation of the program is recommended under federal coordination. Since the States regulate automobile insurance, the Federal government should not impose a mandate requiring adoption of PATP programs. The federal role should be to provide incentives to encourage states to voluntarily adopt PATP programs following the recommended guidelines. Examples of appropriate incentives include Clean Air Act Amendment State Implementation Plan (SIP) Credits and highway funding incentives. The former applies to states with pollution problems and the latter applies to all states. Highway funding incentives include withholding of funds from states that do not adopt PATP and distribution of extra funds to those who do. Both are tested policies that could be implemented without new legislation and only minimal changes to current laws.

State implementation of the PATP insurance system implies establishment of funds for receipt of PATP payments and of appropriate accounts and budgeting. The revenues would be used to fund claims processed by the private insurance industry. It is recommended that this fund be dedicated to PATP in order to insulate the revenues from other demands.

Table 3 shows that PATP fees would probably differ significantly across state lines. However, these differences would be no greater than under the current system. In fact, this points out another of PATP's equity advantages: residents of mostly rural states like Nebraska, where traffic density and insurance costs are low, would pay a fraction of the PATP fees charged in states like New York, New Jersey, and California. States could decide to extend this equity advantage by increasing PATP fees in urban areas and lowering them in rural areas. However, this is not a general recommendation since it would create an incentive for motorists to drive from urban or suburban areas to rural areas or distant suburbs to purchase gasoline.

It is recommended that the PATP fee be increased gradually over time to the level corresponding to the average liability premium in each state. It is reasonable to expect that such an increase could be completed in less than a ten-year period. The Car Talk Committee calculated the reductions in greenhouse gas emissions achievable by 2005 by a PATP phased in nationwide starting in 1995. Table 4 shows their results.

<u>Size of PATP fee</u>	<u>Reductions Achievable by 2005</u>
\$0.15/gallon	24 million metric tons (MMT)
\$0.30/gal	47 MMT
\$0.50/gal	77 MMT

Table 4 shows that a nationwide average PATP fee of 30 to 50 cents per gallon would be sufficient to achieve the majority of the 83 MMT reduction needed to return emissions to 1990 levels by 2005. PATP fees of 33 to 87 cents per gallon, based on the average liability premium in each state, could easily achieve such a nationwide average.⁵³

This fee should increase gradually, over perhaps a 10-year time period, and remain fixed thereafter. If the policy is clearly not working within a five-year time period, then a switch to cap-and-trade should be implemented. The Car Talk Committee estimated that other policies, including research and development in liquid biofuels, the Partnership for a New Generation of Vehicles, integrated land-use management strategies, and other long-term policies recommended would become highly effective after 2005. The PATP fee would not need to increase after the initial 10-year period in order to maintain 1990 emissions levels in the growing economy, as long as those other policies are implemented. In the meantime Transportation Control Measures as described should be implemented where cost effective and as problems of congestion and pollution make them politically

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