VMT Reduction Options for Consideration in the Phase IV Rhode Island GHG Process

Introduction: Vehicle-related greenhouse gas (GHG) emissions are subject to two major influences, the GHG emissions rate per mile of travel and the total number of vehicle miles of travel (VMT). The GHG Transportation Working Group has focused on the first of these influences -- reducing the rate of GHG emissions -- through such measures as the Vehicle Emissions Efficiency Act (VEIA).

Programs such as the VEIA, that are designed to increase vehicle fuel efficiency and reduce per-mile emissions of GHG, generally do not *directly* influence VMT -- although they can produce secondary effects on VMT by decreasing the variable cost of travel through reduced fuel expenditures. During the Phase IV Rhode Island GHG Process, the Transportation Working Group will be considering options to affect the second major influence on vehicle-related GHG -- options with the potential to reduce VMT.

This paper is intended to be an *initial* sketch of options that *might* be considered. The intent of this paper is to put the universe of options on the table for Working Group consideration -- *not* to presume the viability of an option. Some options will not be viable in Rhode Island - for either political, social, or logistical reasons -- but it is at least appropriate to include these options in initial discussions, if for no reason other than to quickly reassess the universe of potential approaches. Socioeconomic (or other) changes, that can influence the previously determined viability of an option, may have occurred subsequent to that previous determination. Accordingly, this paper does not recommend specific options for consideration. Instead, it is hoped that the paper can be a starting point for Working Group deliberations.

It should also be recognized that the breadth of potential VMT reduction options is virtually boundless, in that measures can be developed that range from specificity to individual segments of society all the way up to society as a whole. For example, measures can be designed to directly limit VMT, or influence any of myriad indirect levers that can produce a VMT response (e.g., raising the cost of driving through any number of pricing mechanisms), or influence mode choice options without any direct change in pricing or limitation on VMT. Therefore, the options discussed in this paper are not comprehensive and any additional measures that are of interest to the Working Group are also appropriate for consideration.

It is hoped that this paper can provide an appropriate starting point for the Working Group to examine the potential VMT reduction options and reduce them to the select few that are most appropriate for Rhode Island. Then the selected options will be investigated more fully to refine related issues and more accurately estimate potential impacts, as resources allow.

Initial List of Potential VMT Reduction Measures: The following list is an attempt to present a well-rounded set of measures that could be envisioned. It should not be considered comprehensive, and additional measures should be added as appropriate. The list is grouped by

major influence mechanism, with those options that *directly* target VMT grouped as "Direct VMT Limit and Fee Options." Options that influence VMT through *secondary* pressures that affect the cost of driving (relative to other travel options) are grouped as "Indirect Pricing Options." Finally, options that derive their primary influence through "availability of travel alternatives" rather than "cost of travel alternatives" are grouped as "Mode Choice Options."

Direct VMT Limit and Fee Options

Restricted Vehicle Usage Zones
Emission/VMT Fees
Trip Reduction Programs

Indirect Pricing Options

Gas Tax (or Carbon Tax)
Pay-as-You-Go Insurance
Transit Subsidies
Parking Subsidy Payout
Tolls, User Fees, Parking Fees, Etc.
Time-of-Day Fee Schedules

Mode Choice Options

HOV Lanes
Transit Expansion
Flex-Time/Telecommuting Options
Transit Oriented Development
Mixed-Use Development
Bicycle/Pedestrian Facility Development

Each of the presented options has advantages and disadvantages, both in terms of feasibility and acceptability. The remainder of this paper provides a *brief* discussion of the options and presents a summary table of the major issues associated with each. The material presented is necessarily brief and only meant to provide a basic overview. Recognize also that there is some subjectiveness in the categorization and that opinions can vary, so the various expressed opinions should be considered in that context and refined by the Working Group. Finally, Working Group members may have first-hand experience with some of the options and that experience may provide invaluable insights into determining which potential options should move forward.

Before presenting each option, recognize that all VMT reduction options will reduce gas tax revenue as an inherent influence of reduced VMT. Some options offer an offsetting revenue source, while others do not. This should be considered in evaluating the potential impacts of both individual and combined options.

DIRECT VMT LIMIT AND FEE OPTIONS

Restricted Vehicle Usage Zones. Under this option, certain areas (usually urban cores) are subject to restrictions on vehicle use, ranging from the complete elimination of vehicles to time-of-day restrictions and time-of-day usage fees that force drivers to evaluate their travel behavior in terms of the specific imposed restriction. The most recognized application of this policy is in effect in London (U.K.), where drivers operating in an eight square mile area of the city during certain hours (7 a.m. to 6:30 p.m.) are required to pay a fee of about $8 per day. The program is enforced through a video monitoring system that compares the vehicle license plate numbers of vehicles in the restricted zone against a database of approved vehicles.

Although the actual benefits of the London program are not well established, program operators estimate that about 60,000 fewer vehicles per day operate within the restricted zone. Estimates are that 20-30 percent of the reduction are simply vehicles diverting around the zone, but that 50-60 percent of the reduction results from a switch to public transport and 15-25 percent from a switch to other modes of transportation (e.g., taxi, bicycle, motorcycle, walking). The net effect is estimated to be about a one percent reduction in VMT at a cost of about $0.70 per mile, which equates to a cost of over $5,000 per ton of carbon reduced (for comparative purposes, technology-based carbon reductions are *generally* on the order of $50 per ton carbon or less), but there are other benefits such as reduced congestion and emissions of air pollutants that should also be considered.

It is also worth noting that Rhode Island did implement vehicle free zones in the 1980s through the construction of pedestrian-only malls in the downtown areas of Providence and Pawtucket. These programs were apparently abandoned in response to business complaints of reduced traffic. Thus, there is likely to be some sensitivity to renewed interest in this area.

Emission/VMT Fees: Under an emissions or VMT fee program, vehicle owners are assessed a fee in accordance with the number of miles they drive annually. Fee structures can be either flat, with all owners assessed fees at a given dollar per mile rate, or more innovative so that certain owners are subjected to different fee rates (e.g., no fee for first "x" miles, increasing fee rates at intervals thereafter). The basic premise is to make at least part of the cost of each trip visible and motivate drivers to reduces either trips or miles, but consumer acceptability issues are obvious.

From a technical standpoint, the options can offer a series of interesting synergies. Foremost is the fact that consumers can respond in a number of ways to a given fee level, each of which promotes reduced GHG. For example, owners can replace less efficient vehicles, reduce driving to control fees, or adopt more rigorous operation and maintenance procedures -- either individually or in combination. Nevertheless, the barriers are significant.

In addition to consumer acceptance, an administrative mechanism must be established and maintained. Moreover, although there is no practical experience with such options beyond very basic "one-time" (i.e., at registration) fuel economy fees, it has been estimated that relatively large fees will be required to produce significant carbon reductions. Administering such a fee as an increment to the pump price of fuel would significantly reduce the administrative burden, but remove design flexibility. In the absence of a sophisticated vehicle tracking system, only

flat-rate fee structures can be accommodated and the program reduces to what is essentially a gas tax.

Trip Reduction Programs: This option generally takes the form of employer-based programs designed to reduce commuting vehicle trips. While treated as a distinct option since compliance is determined through a single metric -- commuter vehicle occupancy rates -- trip reduction programs can include a wide range of employer-based strategies such as transit subsidy programs, carpool incentive programs, telecommuting programs, and similar programs designed to reduce single occupant vehicle utility. Trip reduction program requirements were a centerpiece of the Clean Air Act Amendments of 1990, which required that they be implemented in certain nonattainment areas. However, in response to substantial objections by business and community leaders, few programs were ever put in place. The fundamental problem with employer-based trip reduction programs is that they attempt to influence vehicle owner behavior by imposing a *requirement* on employers, who have only limited control over that behavior.

Employers are forced to implement whatever incentives or mandates are required to achieve the required travel limitations, leading to obvious acceptability and equity issues. Furthermore, assurance of program benefits would impose substantial recordkeeping and compliance verification overhead. Finally, as a result of these various issues, target trip reduction rates are generally modest, so that carbon benefits are equally modest. Since the cost of incentives and pricing policies required to promote this modest reduction can be significant, cost effectiveness is generally poor.

INDIRECT PRICING OPTIONS

Gas Tax (or Carbon Tax): Under a gas (or carbon) tax option, the cost of fuel is increased to induce travel reductions. Gas tax increases have been an often-discussed, never implemented policy in the U.S. for decades. Of course, during this time gas taxes have been increased for revenue purposes, but these increases are generally limited to a few cents per gallon and seldom adjusted for inflation so that the real cost of driving has declined almost steadily until very recently. As a VMT reduction measure, the level of tax increase required to promote significant changes in driver behavior is generally quite high relative to current gasoline tax levels.

For example, a recent analysis of potential gas tax options estimated that a $0.28 tax (which is approximately equal to the total $0.30 state tax currently imposed in Rhode Island) would reduce light duty vehicle VMT by about 4 percent over the long term.[1] This is generally consistent with the findings of a recent Congressional Budget Office study, which predicted a 6 percent reduction in VMT for a $0.46 gas tax increase.[2] Because response to a gas tax is two-faceted, carbon savings are actually greater than VMT reductions. For example, the same $0.28 gas tax study was estimated to reduce light duty vehicle carbon by over 7 percent. The multi-faceted response is due to the fact that consumers respond to the increased tax in two ways. Initially, a

[1] Meszler Engineering Services, *Transportation Policy Options, Policy Definitions and Discussion*, prepared for the National Commission on Energy Policy, March 31, 2004.

[2] *The Economic Costs of Fuel Economy Standards Versus a Gasoline Tax*, Congressional Budget Office, December 2003.

consumer has little choice but to drive less. However, over time consumers can respond by buying more fuel efficient vehicles, so that the long run response includes VMT reduction *and* increased fuel efficiency - both of which induce carbon reductions.

Economists tend to view gas taxes as the most efficient and cost effective means of promoting carbon reduction. For example, a 2003 Congressional Budget Office study found gas tax options to be more cost effective than increased fuel economy standards.[3] However, these conclusions are dependent on a critical assumption employed by economists -- namely that the increase in gasoline price is *not* a cost to consumers. Economists instead view this as a transfer of money from consumers to the government, with no net change in the cost of goods. Since total government revenue is assumed to be unchanged, consumers theoretically receive an equivalent decrease in tax transfer elsewhere. However, these assumptions are seldom true in practice, and consumers certainly view increases in gasoline taxes as an increased cost.

If these increased gasoline prices are considered, tax programs become less cost effective than technology solutions to vehicle efficiency. The main reason for this reversal is that while gas taxes are an effective pricing lever to induce vehicle efficiency change, the price lever required to induce a change in behavior is *greater* than the savings due to reduced fuel use. Once implemented, a gasoline tax continues to apply to every gallon of fuel sold -- in contrast to the setting of fuel economy standards, which generally carry higher incremental vehicle (one-time) costs, but *no* associated incremental fuel cost.

Consumer acceptance of increased gas taxes is well understood (i.e., consumers certainly view increased taxes as costs). It is possible that political acceptance may currently be somewhat more favorable than usual given current revenue issues, but it is unlikely that any acceptance would extend to large tax increases. Moreover, the optimum effect of gas tax increases would be achieved if additional revenues were allocated to supporting VMT reduction programs such as transit improvements, rather than to general fund allocations.

Pay-as-You-Go Insurance: The pay-as-you-go insurance option is essentially a modification to current vehicle insurance practices that would set insurance rates on the basis of individual driving characteristics instead of current pooled characteristics. At least one component of the overall insurance rate would be based on actual VMT. In some research applications, this is the only component of the overall insurance rate, but this approach ignores differences in "skill" levels between drivers. However, there is no technical reason why a separate risk premium could not be applied on top of a base travel premium. Regardless, the option provides an incentive for drivers to minimize travel to control insurance rates.

From a logistical standpoint, there are several mechanisms that could enable such a program. In the simplest sense, premiums could be collected at the refueling pump, but this poses problems in allocating payments to specific insurance providers. Several insurance companies are experimenting with onboard dataloggers, as such devices are becoming quite inexpensive and may become ubiquitous as vehicle electronics continue to proliferate. However electronic

[3] *The Economic Costs of Fuel Economy Standards Versus a Gasoline Tax*, Congressional Budget Office, December 2003.

tracking is a contentious privacy issue not likely to be resolved anytime soon (if at all). In this case, consumers may be more accepting of this privacy loss given that there is a direct financial return.

On the other hand, for every individual who saves on insurance premiums under this policy, there will be another individual who pays more. While there is an incentive for all drivers to reduce VMT, it is unlikely that the insurance industry will reduce per-mile premiums on an average basis. What will occur is a redistribution of premiums for any given level of travel. Nevertheless, the overall impact on VMT could be significant as drivers strive to minimize their premiums. *Some* insurance companies do currently attempt to base premiums on annual mileage accrual, but these mileages are usually self-reported and rarely checked (although there are exceptions) -- and the overall mileage-based portion of the premium is small.

Pay-as-you-go insurance could also offer other advantages such as reduced occurrences of uninsured vehicle operation and "instant" premium reductions for individuals suffering short term setbacks such as job loss, etc. Moreover, lower income drivers would be able to "obtain" only the level of insurance they need, rather than paying the "unlimited mileage" premiums typical of most insurance companies today.

Aside from the potential privacy issue, there is little downside risk to this option. As indicated several companies are moving in this direction and given that infrastructure costs will be borne privately, there should be little disruption of state resources.

Transit Subsidies: Transit subsidy options are reasonably self-explanatory, but there are a number of mechanisms through which subsidies could be implemented. In addition to reduced transit fares, subsidies might take the form of tax credits for individual transit users or employers who provide transit subsidies to employees. This eliminates the direct impact on transit agencies, but an overall revenue loss is likely unless transit ridership is being increased commensurate with the subsidy. Since the subsidy will apply to both new and existing transit riders, it is difficult to envision a scenario in which overall revenue will not decline. This is not meant to imply that transit subsidies are not a viable option, simply that a viable funding source will be required. Ideally, this would involve a transfer of revenue from non-transit modes as further encouragement to mode shift, but such transfers are unlikely to be easily accepted. Finally, the degree of VMT and carbon reduction associated with modest subsidies is likely to be equally modest.

Parking Subsidy Payout: Under a parking subsidy payout, employers would be encouraged to provide employees with the option to receive as a cash payment, the inherent subsidy otherwise paid to provide free or reduced cost parking. The employee would then be free to use this payout for other purposes, including reduced cost transit usage. The U.S. EPA has estimated that as many as 9 out of 10 metropolitan area workers park for free or at below market prices, so the potential impact of the option is not insignificant. However, since only the *difference* in the cost of paid parking versus the cost of alternative transportation will be effective in influencing mode shifting, the practical benefits are generally modest.

Under a new Rhode Island law (R.I.P.L. 37-5-7.1), certain large employers are required to offer transit passes as an alternative to subsidized parking, but the impacts of this program are as yet unknown. However, the program represents an effort to treat transit riders on an equitable basis rather than an effort to encourage mode shifting. Since parking practices are unchanged and the net difference between parking subsidies and the cost of the transit pass is not available to the employee, the incentive for mode shifting is limited. Nevertheless, developing a reliable set of data on employee transit usage before and after the implementation of this requirement would help assess the potential benefits of not only the new requirements, but of similar programs that could be implemented in the state.

Tolls, User Fees, Parking Fees, Etc.: Tolls and other fee options can generally be imposed to influence the cost of driving relative to other transportation alternatives. The potential scope of such programs is boundless, but there are wide variations in implementation issues. For example, while it may be impractical to institute toll collection facilities, instituting or raising parking fees might be relatively simple. However, the increasing use of electronic collection technology has dramatically reduced the potential cost of toll implementation, while simultaneously increasing potential geographic applicability.

Time-of-Day Fee Schedules: The time-of-day fee option is simply a variant of the general fee option, designed to discourage travel during certain periods such as peak commuting hours. As a result, issues are similar to those of the general fee option. However, the program can be tailored to maintain the bulk of program benefits through the imposition of fees during the periods of greatest travel activity. Since the differential between peak and off-peak travel has declined significantly over the last decade or so, the potential benefit loss associated with time-of-day fees may be counterproductive. However, there are additional benefits, such as reduced congestion, that could outweigh the benefit loss, but such secondary benefits are difficult to justify on a carbon reduction basis. On the other hand, since Rhode Island has a growing problem with congestion, such a program might be attractive for the congestion mitigation benefits, with the GHG benefits as a bonus.

MODE CHOICE OPTIONS

HOV Lanes: The concept of High Occupancy Vehicle (HOV) lanes is well understood and probably represents the most common VMT reduction measure employed to date in the U.S. At the same time, it remains quite controversial as a TDM strategy, with critics pointing to potential negative influences that include reduced transit usage (as some commuters are drawn into carpool arrangements) and a poor utilization of highway capacity. Generally, however, such facilities are only appropriate in areas of consistently high congestion since the incentive to move from traditional lanes to HOV lanes (and thus reduce travel) only exists when the impedance on traditional lanes is high. In that respect, it is not clear that application in Rhode Island is either warranted or appropriate. Apparently RIDOT has considered HOV options in the past and reached similar conclusions.

In addition to the potential for relatively modest benefits, HOV facilities involve high infrastructure costs and long planning horizons. While HOV lane infrastructure costs can be reduced by converting traditional lanes to HOV use, consumer acceptance of such conversions

will be considerably less than for highway expansion dedicated to HOV -- although the former approach may actually have greater VMT reduction benefits. HOV lanes can also induce shifts to transit if high speed transit operations are established to take advantage of the additional lane capacity and reduced travel time. However, the high capital expenditures coupled with potentially limited application in Rhode Island should indicate a need for extensive and detailed consideration of HOV options and impacts prior to any affirmative decisionmaking.

Transit Expansion: Transit expansion is also an option that is generally well understood and it is clear that increasing transit options and improving system infrastructure will engender increased transit demand and act as a restraint on continuing increases in VMT. However, transit in Rhode Island is subject to the same revenue issues that are currently prevalent throughout the U.S. RIPTA is currently in the midst of a transit contraction and this clearly sends the wrong signal from a carbon reduction perspective. If RIPTA eliminates services as recently proposed, there will be an associated VMT increase and a loss of traction that may take years to overcome. As with many metropolitan areas, it is very difficult to recover operating expenses from farebox receipts and without supporting revenue sources, service cutbacks are inevitable. Therefore, perhaps the most appropriate way to view transit expansion in today's economic climate is through the guise of how best to stabilize service through alternative funding mechanisms.

Clearly, synergies could be invoked with other VMT reduction options. For example, if any of the pricing strategies were moved forward, a portion of the associated revenues could be allocated to transit programs. Thus, not only is travel reduction encouraged from the demand side, but transit alternatives are strengthened and enhanced. Unfortunately, current development practices hinder the ability of integrated transit system development since an extensive network of diffuse transit routes must be both established and well coordinated to serve as a viable transportation alternative for a large segment of the population. As a result, both investment and maintenance expenses are considerable and VMT reduction returns usually limited.

Regardless of the VMT reduction options considered, transit serves as the primary alternative upon which travel decisionmaking will be based. Therefore, it is almost mandatory that efforts to shore up the current system be moved forward, including the development of a reliable and inflationary-adjusted revenue source. Transit revenue must be a top priority of any serious efforts to address viable VMT reduction options. It is also likely that a critical review of current transit facilities, routes, etc, would be advantageous in maximizing the current returns and building a sound base upon which future expansion could be considered. Are the roles of Rhode Island transit providers clearly defined, with adequate interplay between the various systems (e.g., rail, bus interactions)? Without clear and definitive cross-support, it is likely that transit options will never reach their full potential. While such an effort is clearly beyond the scope and resource requirements of the GHG Process, it is possible that initial recommendations and efforts toward the requisite review could be considered.

Flex-Time/Telecommuting Options: Both flex-time and telecommuting can promote reductions in VMT through alternative work arrangements. Both programs have become relatively commonplace although neither has reached the levels of participation envisioned in the mid-1990s. There are a variety of reasons that current programs are limited, ranging from set-up costs for telecommuting to traditional concerns about employee productivity in alternative work

settings. Clearly, the unending expansion in electronic communications capability has created an environment in which remote work options are viable. It is likely that future expansion of offsite and home-based working arrangements will continue through advances in technology alone, but the timing and scope of such expansion can be promoted.

In 2002, the Rhode Island Statewide Planning Program conducted an introductory study of telecommuting and recommended that the State undertake additional research and evaluation to determine potential benefits and barriers. This study could serve as a starting point for further consideration through the GHG Process.

Transit Oriented Development: Transit oriented development (TOD) was discussed at some length in the Phase III GHG Process and continues to be an option of considerable interest in Rhode Island. The primary focus of the option is to direct development in the state into areas that are adequately served by existing or planned transit facilities. The State Growth Planning Council was created in 2000 with a mission to balance economic and residential development with environmental preservation. With a membership including representatives of the state, communities, business, and non-profit organizations, the Council has a sufficient diversity of interests to promote partnerships critical to planning success. The Council has issued a series of reports on issues affecting current state development practices and these could serve as important resources for further considerations of the Working Group.

In addition, the Statewide Planning Program is continuing work with the Washington County Regional Planning Council and the Town of North Kingstown to consider potential TOD options in that area. A contractor study of options for local communities to best address issues associated with expansion of commuter rail is currently being commissioned and could serve as focus for Working Group TOD efforts in Phase IV.

Mixed-Use Development: In some ways, mixed use development can be viewed as an adjunct to TOD, but an ideal mixed use development would rely on transit not to reach far off work centers, but rather an integrated travel option for local needs. Under mixed use development, housing centers would be integrated with complementary service and employment centers, harkening back to more traditional village-type development practices. This is in stark contrast to the development patterns of the 1980s and 1990s, where tract after tract of suburban homes have been developed with little or no integrated recreational, service, or employment facilities. This sprawl-type development has resulted in considerable numbers of suburban communities where travel is an absolute necessity for virtually all non-household activity. Clearly, such development practice has been fostered by certain economic realities and it will be a challenge to influence those practices in a meaningful and immediate fashion. Nevertheless, many states have established Smart Growth programs in an effort to foster more environmentally friendly development, and Rhode Island is no exception. As indicated above, the State has established a Smart Growth Council and it might be advantageous to have the Council provide an overview of their current activities and perhaps indicate where Working Group support could be most helpful.

Bicycle/Pedestrian Facility Development: As an adjunct to transit system development and expansion, the continued development of non-motorized facilities is also an important mechanism to promoting a full range of transportation options. On an overall basis, the VMT

reduction potential of such facilities is quite limited, but as part of an integrated package of development recommendations, they can be a viable and community enhancing transportation option -- with relatively modest investment costs compared to other alternatives.

Summary: Clearly, there is a wide range of options that could be considered from a VMT reduction standpoint -- ranging from relatively modest investment requirements and associated benefits to highly controversial options with larger returns. While a complete treatment of any one of these options is probably beyond the resources and time constraints of the Working Group, efforts can be directed toward the initial consideration of the various options and recommend an approach leading to further evaluation and implementation. As discussed, there is considerable subjectiveness in the categorization of the various options discussed, and Working Group members are encouraged to offer opinions in variance to those presented herein. Viewpoints honed from existing experience are especially encouraged, as are the addition of measures that may have been omitted from this initial overview.

Option	Carbon Reduction Potential	Carbon Reduction Cost per Ton	Likely Consumer Acceptance	Likely Political Acceptance	Additional Issues/Considerations		
					Logistical Issues	Revenue Issues (1)	Other Considerations
Mixed-Use Development	Modest, Large Long Run Potential	Neutral, Potential Cost Savings	Neutral to High	High	Formidable challenge to influence current market based development.	Unclear, but should be minor.	Long term effort required to produce significant impacts.
Transit Oriented Development	Modest, Large Long Run Potential	Neutral, Potential Cost Savings	Neutral to High	High	Formidable challenge to influence current market based development.	Unclear, but should be minor.	Long term effort required to produce significant impacts.
Pay-as-You-Go Insurance	Large	Low, Could be Cost Neutral	Modest to High	High	Insurance company buy-in, tracking system required.	No macroscopic, but likely insurance rate redistribution.	Two-tier insurance system possible, separate use and skill.
Flex-Time/ Telecommuting Options	Modest	Neutral, Potential Cost Savings	High	High	Some infrastructure issues, but generally modest.	Neutral	Inertial barriers to widespread implementation.
Bicycle/Pedestrian Facility Development	Modest	Modest	High	High	No systematic issues, modest infrastructure costs.	Neutral	Promotes community and livability.
Gas Tax (or Carbon Tax)	Large, but Practically Constrained	Generally Low Cost per Ton	Poor	Could be Modestly Acceptable	None, collection mechanism in place.	Positive revenue, even with reduced VMT.	Economically efficient means to promote higher vehicle efficiency
Transit Expansion	Modest, but Backbone of Other Options.	Generally High Cost per Ton	Neutral	High, if Revenue Available	Difficult to implement efficiently with current development practices.	Transit operating deficits likely to increase.	Without a large scale system approach, benefits are limited.
Transit Subsidies	Modest	Generally High Cost per Ton	High	High, if Revenue Available	Administrative system required.	Without supporting funding source, revenue loss almost certain.	Hefty subsidies required to promote significant mode shifting.
Parking Subsidy Payout	Modest	Generally High Cost per Ton	High	High	Few if administered through employer accounting systems.	None	Requires employer buy-in, establishment of paid parking accounting.

(1) All options will reduce gas tax revenue as an inherent influence of reduced VMT. Some options offer an offsetting revenue source, some do not.

(2) While consumer and political acceptability are usually similar, there are certain pressures (e.g., tradeoffs between business and social impacts, or between fiscal and social impacts) that can lead to differences. For example, while gas taxes are not generally acceptable from a consumer viewpoint, they can be acceptable from a political standpoint if they are a fiscal necessity.

Option	Carbon Reduction Potential	Carbon Reduction Cost per Ton	Likely Consumer Acceptance	Likely Political Acceptance	Additional Issues/Considerations		
					Logistical Issues	**Revenue Issues (1)**	**Other Considerations**
Emission/VMT Fees	Practically Limited	Can be Low	Poor	Poor	Confirmation mechanism required (I/M or registration).	Can be positive due to fees, but there is infrastructure expense.	Reduced emissions of other pollutants (emissions fee).
Tolls, User Fees, Parking Fees, Etc.	Modest	Generally High Cost per Ton	Poor	Could be Modestly Acceptable	Administrative and infrastructure issues.	Can be positive.	Electronic monitoring possible, but opens up "tracking" implications.
Time-of-Day Fee Schedules	Modest	Generally High Cost per Ton	Poor to Moderate	Could be Modestly Acceptable	Infrastructure issues, but electronic tracking possible.	Can be positive.	"Tracking" implications of electronic monitoring are potential problem.
HOV Lanes	Modest	Generally High Cost per Ton	Poor	Poor	Construction issues as well as loss of non-HOV expansion options.	Highly intensive capital expenditures.	Relatively widespread experience relative to other options.
Restricted Vehicle Usage Zones	Generally Low	Generally High Cost per Ton	Poor	Neutral	Alternative access must be available.	Enforcement expense, but fees provide some payback.	Congestion reductions in restricted zones.
Trip Reduction Programs	Practically Low	Generally High Cost per Ton	Poor	Poor	Scope limited, enforcement difficult.	Enforcement expense.	Past attempts have been highly unpopular and almost always repealed.

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(2) While consumer and political acceptability are usually similar, there are certain pressures (e.g., tradeoffs between business and social impacts, or between fiscal and social impacts) that can lead to differences. For example, while gas taxes are not generally acceptable from a consumer viewpoint, they can be acceptable from a political standpoint if they are a fiscal necessity.