

A Collaborative Report Presenting Recommended Air
Quality Strategies for Further Consideration by the State
of New Jersey



Prepared by
The Gasoline Cars & Trucks Workgroup

October 31, 2005

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

List of Workgroup Members

Workgroup Leader: Jeff Cantor

Workgroup Non-State Team Members:

Cheryl Drach – USPS	Joseph Carvella – TransOptions
David Heller – NJTPA	Bob Johnson – Sierra Club
Chris Magielnicki – Service Plus	Kirk Barrett – Montclair University
Mac Wubben – Center for Clean Air Policy	

Workgroup State Team Members:

John Gorgol – NJDEP	Dave West – NJDEP	Rich Janiak – NJDEP
Rob Schell – NJDEP	Gail Carter – NJDEP	Amy Hillman – NJDEP
Sudhir Joshi – NJDOT	Nathan Cumar – NJDOT	Bob Miller – NJDOT
Chuck Grill – NJDOT	Tom Bednarz – MVC	Jim Arose – MVC
Jerry Lutin – NJT	Steve Jurow – NJT	

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

Table of Contents

List of Workgroup Members	i
Table of Contents	ii
List of Abbreviations	iii
List of Tables	iv
Executive Summary:	v
Introduction:	1
Background:	1
Purpose and Goals:	2
Workgroup Prioritization of Measures for Further Consideration:	2
Structure of Workgroup:	3
Summary of Meetings/Conference Calls/Data Reviewed:	3
Initial Workgroup Control Measure Considerations:	4
Initial Control Measure Ideas	4
Control Measure Evaluation Process	5
Review of All Measures Evaluated by the Workgroup	6
<i>Most Promising</i>	6
<i>Promising</i>	9
<i>Least Promising</i>	10
Detailed Review of Promising Control Measures	14
Summary of Parking Lot and Crossover Issues	19
Comments	20
References	20
White Papers Submitted from Individual Members of the Workgroup	21
Appendices:	21

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

List of Abbreviations

CARB	California Air Resources Board
CIF	Central Inspection Facility (state run)
CNG	Compressed Natural Gas
CO	Carbon Monoxide
ETRP	Employee Trip Reduction Program
HC	Hydrocarbons
I/M	Inspection and Maintenance Program
LDT	Light Duty Truck
LEV	Low Emission Vehicle
LIRAP	Low Income Repair Assistance
LNG	Liquefied Natural Gas
MTBE	Methyl Tertiary Butyl Ether
MVC	New Jersey Motor Vehicle Commission
NJDEP	New Jersey Department of Environmental Protection
NJDOL	New Jersey Department of Labor
NJDOT	New Jersey Department of Transportation
NJT	New Jersey Transit
NOx	Oxides of Nitrogen
O3	Ozone
OBD	On-Board Diagnostics
OE	Original Equipment
OEM	Original Equipment Manufacturer
PCTP	Pollution Credit Trading Program
PIF	Private Inspection Facility
PM2.5	Fine Particulate Matter (below 2.5 micron diameter)
RSD	Remote Sensing Detector
SIP	State Implementation Plan
SOx	Oxides of Sulfur
SUV	Sport Utility Vehicle
TDM	Transportation Demand Management
TLEV	Transitional Low Emission Vehicle
ULEV	Ultra Low Emission Vehicle
USEPA	United States Environmental Protection Agency
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

List of Tables

Table 1 – Summary of Most Promising Control Measures	vi
Table 2 – Identified Control Measures.....	4
Table 3 – TDM Concepts	17
Table 4 – Vehicle Emissions Classes.....	18

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

Executive Summary:

This report presents the control measure strategies developed by the Gasoline Cars & Trucks Workgroup for further consideration by the State of New Jersey. The group, consisting of twenty two individuals representing four State agencies, two non-government agencies, two environmental organizations, one federal agency, and one academic institution, came together over the last three months and generated nearly fifty initial concepts for reducing the production of fine particulate matter (PM_{2.5}) and ozone (O₃) precursors such as nitrogen oxides (NO_x) and volatile organic compounds (VOC) from this segment. From these initial concepts, twenty-eight distinct control measures were developed, eight of which are identified as being most promising due to their likelihood of having a positive impact prior to the PM_{2.5}/O₃ attainment dates plus an additional two that can be implemented rather easily but may take longer to generate a measurable affect. A summary of these ten measures is shown below.

Table 1 – Summary of Most Promising Control Measures				
Control Measure	Populations Affected	Pollution Reduction (ton/yr)		
		PM _{2.5}	NO _x	VOC
<i>Anti-idling education/enforcement</i>	<i>All NJ Motorists; Local police departments</i>	<i>Proportional to fuel savings</i>	38	20
<i>Roadside RSD (gross emitter)</i>	<i>Owners of poorly maintained vehicles</i>	<i>Indeterminate</i>	18	20
<i>Repair assistance for older cars</i>	<i>Low income owners of older poorly maintained vehicles</i>	<i>Indeterminate</i>	29	31
<i>Employee trip reduction programs</i>	<i>Employees of large companies</i>	<i>Proportional to fuel and VMT savings</i>	192	165
<i>Travel demand management</i>	<i>All NJ Motorists</i>	<i>Proportional to fuel and VMT savings</i>	211	247
<i>State gas guzzler tax (including credit for high efficiency cars)</i>	<i>NJ Motorists considering the purchase of a new vehicle</i>	<i>Proportional to fuel savings</i>	40	8
<i>Annual I/M for cars over 10 years</i>	<i>Owners of vehicles over 10 years old</i>	<i>Indeterminate</i>	624	669
<i>Supply gas caps at CIFs to vehicles failing that test</i>	<i>All NJ Motorists who use CIFs</i>	<i>None</i>	<i>None</i>	<i>Unknown</i>
<i>General education programs (drive-thru, tire inflation, hot-weather refueling) partnered w/ AAA etc</i>	<i>All NJ Motorists</i>	<i>Proportional to fuel savings</i>	64	42
<i>Increase fuel tax</i>	<i>All Motorists who purchase fuel in NJ</i>	<i>Proportional to fuel savings</i>		

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

Where possible, order-of-magnitude estimates or ranges of pollution reductions have been calculated and are shown in Table 1. It should be understood that these figures are ROUGH ESTIMATES ONLY and that far more detailed analysis will be necessary prior to the implementation or decision to implement of any of these control measures. For comparison sake, by the year 2010 when many of these control measures could be expected to be implemented, MOBILE6 models put emissions from this segment at nearly 100 tons per day of both O₃ precursors; NO_x and VOC.

Figures for PM_{2.5} emissions from this segment are far harder to estimate, hence the more general reduction estimations presented in the table. This is indicative of the fact that particulate emissions have not historically been the focus of academic research, industry development, or tailpipe measurement and regulation for this segment. Furthermore, unlike NO_x and VOC emissions, PM_{2.5} emissions stem from brake and tire wear, not just from combustion. Therefore control measures that reduce VMT can have greater impact on these emissions than those that reduce fuel consumption alone. As the current research explores the health impacts of finer and finer particulates – down to and including ultra-fine, nanometer sizes – and the technology to measure and then control these emissions is developed, more detailed estimates will be possible.

Gasoline Cars & Trucks Workgroup Report October 31, 2005

Introduction:

One thing is clear, of all the control measures identified and evaluated by the Workgroup, no single one is sufficient to eliminate PM_{2.5} and O₃ pollution from this sector. Moving forward, a comprehensive array of control measures will be required in order to bring New Jersey to attainment. Some of these measures will be technological, others behavioral and as discussed by the Workgroup, the situation is too severe to permit the dismissal of any identified measure.

To avoid the perception of hypocrisy, it seems appropriate that the State, and particularly the Department of Environmental Protection, take the lead, wherever practical, in the adoption of programs and technologies that will reduce PM_{2.5} and O₃ precursors from this segment. As a large employer and manager of a large fleet of vehicles, the State is in an excellent position to lead by example and demonstrate how many of these concepts could be implemented. The performance of successful pilot programs can facilitate the implementation of these concepts on a statewide basis.

It is also important that the Department not focus solely on the measures determined by the Workgroup to be 'most promising' – as listed in Section VII – as there are some relatively quick and simple ideas such as a general education and awareness campaign regarding the ills of drive-thru lanes, proper tire inflation, and hot weather refueling that could be accomplished very easily and with minimal expense. In addition, some concepts require a much longer timeframe in which to be developed and to have full effect and therefore must be begun now even though they may not provide much short-term benefit. The full list of both the 'most promising' measures and these quick and simple ideas is presented in the Executive Summary table.

I. Background:

Poor air quality affects everyone's health and comes from many sources, including factories and power plants; cars and trucks; and products and services everyone uses. New Jersey's air quality on the whole has improved significantly since the Federal Clean Air Act became law 35 years ago. The Garden State has met the health-based standards for carbon monoxide, sulfur dioxide¹ and lead and has made progress cleaning up other air pollutants. However, New Jersey continues to exceed health-based standards for fine-particle pollution and ozone.

To bring the State into compliance with the U.S. Environmental Protection Agency health based air quality standards for fine-particle pollution (particulate matter, often referred to as PM_{2.5}) and ozone (O₃), the sources of these pollutants must be reduced. Achieving these reductions will be especially challenging because much of the PM_{2.5} and all of the O₃ is actually formed in the atmosphere as the result of chemical reactions among several pollutants. These precursor pollutants, as they are known, are oxides of nitrogen (NO_x), oxides of sulfur (SO_x), and volatile organic compounds (VOC), which in

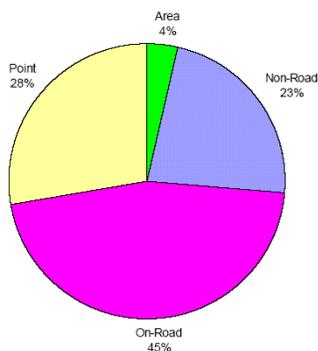
¹ Except in Warren County which is directly effected by the plume from the PP&L Martins Creek Generating Station.

Gasoline Cars & Trucks Workgroup Report October 31, 2005

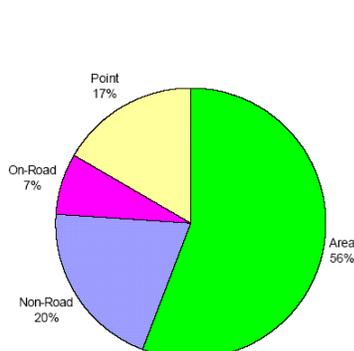
turn derive from fuels such as coal, gasoline, and diesel fuel, and from paints, thinners, coatings, solvents, and other chemicals.

As can be seen from the charts below, on-road sources – of which gasoline powered cars and trucks make up a major portion – are a significant source of two of these precursors as well as direct emitters of PM_{2.5}.

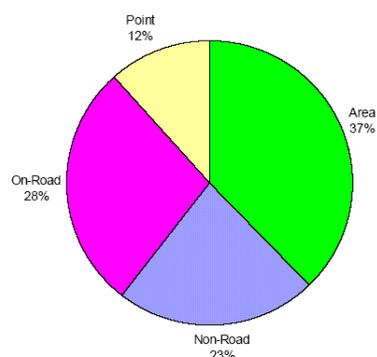
DRAFT 2002 New Jersey NO_x Emissions by Sector



DRAFT 2002 New Jersey PM_{2.5} Emissions by Sector



DRAFT 2002 New Jersey VOC Emissions by Sector



While the pollution from any individual gasoline powered vehicle is very small, collectively this sector is an immense contributor and given that immense contribution to O₃ precursors as well as PM_{2.5} emissions, even a modest reduction in emissions from this sector can have significant value in an overall plan aimed at reducing ambient levels of these contaminants, and therefore, no attempt to improve New Jersey's air quality would be complete without a thorough review of opportunities to reduce emissions from gasoline powered cars and trucks.

II. Purpose and Goals:

The Workgroup established as its purpose the identification and evaluation of the broadest possible range of potential emissions reduction measures from the gasoline powered car and truck sector, and to report its general consensus as to reasonable approaches that the State should consider in working to attain the new federal health and visibility standards. The goal was to provide a draft report for NJDEP consideration in a timely fashion and in support of legislative and regulatory initiatives it might attempt to sponsor to improve air quality in the near (5-year) and far (10-year) term of the Plan's intended implementation schedule.

III. Workgroup Prioritization of Measures for Further Consideration:

The Workgroup began with a series of brainstorming sessions in which ideas for pollution reduction within the gasoline cars and trucks segment were explained and grouped, primarily as they affect specific populations (SUV or heavy-vehicles owners, off-hour commuters, the economically disadvantaged etc) or as they related to specific

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

technologies (electric vehicles, hybrids, etc). Over fifty different ideas were suggested. Some ideas were combined or grouped due to their similarity or complementary nature.

A table summarizing all of these concepts can be found in Section VII.

It should be noted that some of the control measures can be implemented within a short timeframe and therefore could have an impact by the PM_{2.5}/O₃ attainment dates, while others may require a much longer lead time before they will be likely to have any measurable effect. This is not to say that some of these longer-term strategies would not ultimately be as or more effective than some of the short-term ideas, merely that it will take a longer time for them to deliver what in some instances may be significant emissions reductions. The Workgroup felt it important to distinguish between the shorter and longer-term actions, and to ensure that all ideas be carried forward for possible future consideration after first implementing the most feasible and appropriate short-term actions and gauging their effectiveness. Thus, it is the Workgroup's opinion that an idea that cannot be implemented in time to achieve emissions reduction by the PM_{2.5}/O₃ attainment dates may still be very effective in addressing pollution issues in 2015 or beyond and should be retained in all-future discussions.

IV. Structure of Workgroup:

The Workgroup elected to remain a single committee throughout the process, rather than separate into sub-groups covering specific areas. During one meeting, small sub-groups conducted evaluation of some of the reduction ideas; assignment of the various strategies to these smaller groups was random and done simply to facilitate more rapid evaluation.

V. Summary of Meetings/Conference Calls/Data Reviewed:

The Workgroup held its initial meeting on the afternoon of June 29th following the Air Quality Workshop general sessions. Additional meetings were held July 20th, August 10th, and September 7th and all were of the entire workgroup: no formal sub-groups were formed.

Minutes and agendas for each meeting are attached in Appendix A and B. Minimal data was reviewed in the process; however, group members presented some detailed written concepts to the Workgroup as white papers. These are attached separately.

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

VI. Initial Workgroup Control Measure Considerations:

A. Initial Control Measure Ideas

Table 2 contains the complete list of control measures, divided into three rough levels – most promising through least promising. In addition, the following distinctions represent the possible timeframe for each concept:

- **Bold control measures could probably be implemented rather quickly and would likely have immediate results**
- Plain-text measures would either require extensive infrastructure development, be slow to provide significant results, or both.
- Underlined concepts fall somewhere in between with moderate investment requirements and less than immediate results.

Most Promising	<ul style="list-style-type: none"> • <i>Anti-idling education/enforcement</i> • <u>Roadside RSD (gross emitter)</u> • <u>Repair assistance for older cars</u> • <u>Employee trip reduction programs</u> • <u>Travel demand management</u> • <i>State gas guzzler tax (including credit for high efficiency cars)</i> • <i>Annual I/M for cars over 10 years</i> • <i>Supply gas caps at CIFs to vehicles failing that test</i>
Promising	<ul style="list-style-type: none"> • <u>Convert State and large corp. fleets to hybrid or alt. fuel</u> • <i>General education programs (drive-thru, tire inflation, hot-weather refueling) partnered w/ AAA etc</i> • <u>MPG/emissions requirements for large fleets</u> • <u>Employer shuttles to train/bus</u> • <u>Registration fee based on VMT</u> • Intercept Park-n-ride • <u>Alternate fuels tax credit</u>
Least Promising	<ul style="list-style-type: none"> • Electric shuttles in structured communities • Electric vehicle charging stations • <u>Expand NJT night/weekend service</u> • Extend NJT routes (geography) • <u>Revise gasoline formulation</u> • Hydrogen vehicles • <i>Increase fuel tax</i> • <u>Early vehicle retirement programs</u> • Pollution credit trading program • Expand bike/hiking trails • <u>Catalytic converter retrofit program</u> • <u>Registration fee based on vehicle weight</u> • Ban drive-thru banks, fast food

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

B. Control Measure Evaluation Process

After the initial sessions, outlining the broad array of control measure strategies, the workgroup reviewed each control measure using a matrix evaluation tool that considered the following areas:

- Environmental Benefits
- Technical Feasibility
- Economic Feasibility
- Implementation Feasibility
 - Political Considerations
 - Social Considerations
 - Environmental Justice
 - Ease of Enforcement

During the discussion, each workgroup member scored each measure for each evaluation category with a score from 1 to 5 with 5 being the best (or lowest cost for “economic feasibility”). All scores were then averaged to provide a general indication of what the group as a whole felt about the prospects of each measure. It should be noted that this evaluation process was not meant to provide a hard ranking of the measures, but to serve as a general guide for comparing them, yet still recognizing that single issues could dominate an overall score. As such, during the final ranking of measures, extremely low scores (1 or lower) were discussed as to their origin and, if they were found to accurately reflect the group’s sentiments, served as a basis for eliminating a control measure from further consideration for inclusion in the Plan. The result of this system was that strategies with relatively high scores overall but at least one factor with a score of 1 were relegated to the *Least Promising* ranking.

The Workgroup used the following category definitions:

Environmental Benefits – The estimated actual reduction in criteria pollutants (PM_{2.5} and O₃ precursors) directly associated with gasoline powered cars and trucks. Emissions associated with other sources such as electrical generation, where potentially impacted, were not considered. The effects of measures on emissions of greenhouse gases were generally ignored, as was fuel efficiency.

Technical Feasibility – The availability of the technology necessary to implement the measures. Some weight was also placed on the ease of creating the necessary information infrastructure where applicable.

Economic Feasibility (cost) – This was generally taken to be the cost to the State to fund or promote the measure. Out-of-pocket costs to the motoring public were not addressed here but rather under implementation.

Implementation Feasibility –

- Political Considerations – This was an estimation of how palatable the measure might be to the State legislature and other elected officials

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

whose action would be required to implement the concept. This included some discussion of politically well-connected special interests that might weigh in strongly one-way or the other.

- Social Considerations – This was an estimation of how palatable the measure might be to the general public. This category was frequently used by the Workgroup to gauge the effectiveness of a measure since an unwilling public is not likely to adopt a new technology or process in large enough numbers to have much of a positive effect.
- Environmental Justice – This was generally a judgment of how much adverse impact the measure might have on disadvantaged communities. Evaluations in this category may not have been as consistent between concepts as in other categories.
- Ease of Enforcement – This considered how easily systems and processes could be developed to enforce compliance with the measure. For voluntary rather than mandatory measures, systems and processes for measurement of participation were considered under this category. Several measures raised concerns about fraud. Evaluation of these issues was generally included under both technical feasibility – how well systems could be created to reduce the potential for fraud – and enforceability.

C. Review of All Measures Evaluated by the Workgroup based on the criteria in Section B above.

Most Promising

Anti-idling education/enforcement – This control measure entails increased publicity of the current anti-idling laws with an emphasis on the wasted fuel and related cost savings combined with increased enforcement. A simple restatement of the anti-idling laws and a demonstration of the costs of idling given the current price of fuel may be all that is necessary for the public. Out reach to local law enforcement to explain the role they can play in idling enforcement is also warranted as many municipal police departments may not be fully aware of their ability to ticket motorists for idling infractions and that the fines are retained at the local level. The effectiveness of this measure will be highly dependant on the level of public compliance. Many partnership opportunities are available to assist in disseminating this message including AAA, convenience store chains such as Wawa, and possibly the insurance industry given the greater likelihood of vehicle theft when vehicles are left idling.

Roadside RSD (gross emitter) – Implement a system of remote sensing devices (RSD) targeting gross emitters similar to those systems used by Colorado, Missouri, and Virginia. A gross emitter targeting system would get the worst vehicles repaired faster than depending on the normal inspection cycle however it would increase the number of inspections slightly as failing vehicles would be directed to their local inspection facility for re-inspection within 45 days of being identified by the RSD system as a gross emitter. The benefits could be rather significant since gross emitters contribute up to

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

5%² of the total emissions even though they represent only a small fraction of the total fleet. Under a gross emitter-targeting program, an array of RSD sensors would be deployed across the state in such a way as to monitor the largest possible portion of the vehicle fleet on a regular basis. Owners of vehicles that are detected in the gross-emitter range would receive notification via mail of the possible offense and be required to present their vehicle for inspection at a CIF within a set period of time (say 45 days). This inspection would be used to confirm the gross emitter status of the vehicle after which the vehicle owner would be required to perform repairs on the vehicle and return for re-inspection in a timely fashion (say another 30 days).

Repair assistance for older cars – Also referred to as a Low Income Repair Assistance Program (LIRAP), this control measure would provide financial assistance for owners of failing vehicles to get them repaired to passing levels. This would likely apply primarily to older vehicles that, while they represent a fairly small portion of the fleet, contribute a disproportionately large fraction of the pollutants. Currently New Jersey offers an emissions waiver process in which a vehicle is exempted from meeting emissions testing standards if, after a set expenditure on qualifying repairs, it still is not able to pass. These vehicles would be the primary targets of such a repair assistance program that would offer additional funds to further improve the vehicle's emissions. Concerns include the potential for fraud and the ability of the State to ensure that emissions improvements were gained through these efforts. California has a very similar program in affect for heavy-duty diesel vehicles that may be a good model. A white paper providing a more extensive analysis of this control measure is attached.

Employee trip reduction programs – Several locales have legislated Employee Trip Reduction Programs (ETRP), including New Jersey. (The New Jersey program was later repealed.) These programs require employers, usually those with a number of employees at a given location exceeding a specific threshold, to institute programs to reduce the number of single occupant autos used by employees to commute to work. ETRPs usually set target percentages, which may be mandatory, for single occupant vehicle trip reductions. Such programs can include strategies such as telecommuting, carpool matching, vanpool subsidies, and parking cash-out. ETRP has the potential to significantly reduce auto VMT. However, such programs do not impact a large number of employees working in smaller establishments. In addition, the repeal of New Jersey's earlier ETRP angered many employers who had spent considerable time and effort to implement the program, only to see it become "voluntary".

Travel demand management – Travel demand management (TDM) strategies are designed to reduce or eliminate the number of single-occupant auto trips. Employee trip reduction programs mentioned above are a category of TDM. TDM strategies also typically include: encouraging substitution of transit, bicycles, and walking for auto trips, carpooling and ride sharing, parking management and parking pricing. Most TDM strategies are voluntary. TDM requires that individuals modify their behavior, and may be less effective in areas of low population density. The success of TDM strategies in reducing single occupant auto trips is likely to be highly correlated with the extent of

² Based on modeling experience.

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

education and marketing campaigns and the magnitude of the reduction in trip cost relative to the costs associated with single-occupant auto travel.

State gas-guzzler tax (including credit for high efficiency cars) – Patterned after the current federal gas-guzzler tax in that it would be charged at the time of new car purchase (or lease). If implemented as a sliding scale across the entire new vehicle fleet, it could provide a tax credit or rebate for the purchase of the most efficient vehicles, no impact for the moderately efficient vehicles, and a significant additional tax on the purchase of the most inefficient vehicles. This would have the effect of allowing people to “pay to pollute”, while also communicating that the burden polluters place on society, human health, and natural resource damage they cause must be compensated. The impact on State tax revenues could be made to be revenue neutral where the tax collected on the sale of gas-guzzlers would fund the tax credits given on the sale of high efficiency vehicles if so desired. Effectiveness of this measure may be somewhat muted by the fact that emissions and fuel efficiency are not always closely correlated. Additional discussions questioned whether this tax could be implemented for the sale of used vehicles as well the rationale being that such a tax would depress the value of gas guzzlers throughout their lifespan and perhaps lower the demand for such vehicles. The political and social acceptance of such a tax that included used vehicle sales would likely be much lower than one aimed at the initial new vehicle sale only, as it might be viewed as double taxation. Finally, given the current popularity of hybrid vehicles with today’s high fuel prices, the tax credit portion of this measure may not be all that effective or necessary. However, the workgroup felt that it should still be considered perhaps for use at some future point in time when market demand shifts.

Annual I/M for cars over 10 years – Since the most polluting vehicles are generally the oldest, and since frequent maintenance tends to minimize pollution, increasing the inspection interval on vehicles over 10 years old would prompt owners to make more frequent repairs and thus cut emissions from the dirtiest portion of the fleet. The cost impact to the State would be small as older vehicles make up a small fraction of the fleet. Initially the Workgroup considered reducing the initial new vehicle exemption from four years to two but decided that the added expense of inspecting such a large number of additional vehicles – vehicles likely to be extremely clean and in a very good state of repair – could not be justified as it would not provide much benefit, while heavily burdening the MVC in terms of personnel, scheduling, and, of course, significant cost.

Supply gas caps at CIFs to vehicles failing that test (and that test ONLY) – During review of the MVC inspection data, it was discovered that nearly 30,000 vehicles fail inspection each year solely for a leaking gas cap. Providing these vehicle owners with a free replacement cap at the time of initial inspection would have several benefits:

- Immediate correction of the leaking cap and therefore immediate reduction in VOC emissions.
- Elimination of 30,000 vehicle re-inspections per year and the associated driving and idling.
- A cost savings to the State since the replacement caps cost approximately \$8 vs. the \$28 cost of the re-inspection.

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

This measure would also generate good will with the public – how often does one get something for free from MVC that prevents the need for a return trip to the inspection station?

Promising

Convert State and large corp. fleets to hybrid or alt. fuel – One of the recurring themes in the Workgroup discussions, was that the State should lead by example. Conversion of State fleets and large corporate fleets to hybrid vehicles or clean burning alternate fueled vehicles such as CNG would set this example and begin the building of the necessary refueling infrastructure which would then permit increasing use of alternate fuel and electric vehicles by the public. Large fleet owners are constantly upgrading their fleets through the purchase of new vehicles. By modifying the specifications used for new purchase to require such hybrid and alternate fueled vehicles, fleet owners would be able to convert their entire fleet to these types of vehicles over time through attrition.

General education programs (drive-thru, tire inflation, hot-weather refueling) partnered w/ AAA etc – With today's higher fuel prices, reminding the driving public of the fuel savings that come from avoiding drive-thru's, reducing long term idling, and maintaining proper tire inflation should be easy. The emissions impact of hot-weather refueling would be harder to convey. AAA might be a good partner in such an education campaign. Also discussed was the possibility of including a tire pressure check in the inspection process at CIFs. With very little effort this strategy could produce modest benefits across the entire gasoline powered vehicle fleet.

MPG/emissions requirements for large fleets – NJDEP or MVC would establish fuel-economy standards for fleets of various sizes. Enforcement would be difficult; absent voluntary compliance, access to the information would be through the MVC registration process, and would require MVC data systems and enforcement action.

Employer shuttles to train/bus – Employer shuttles to rail and bus terminals provide a means to connect dispersed employment locations, such as suburban office campuses, with public transit services that would otherwise be too distant from employment locations to be a practical alternative to single occupant auto commuting. Shuttle service is typically scheduled to correspond with train and bus arrivals and departures. The success of employer shuttles is highly correlated with the frequency of the service on the connecting rail and bus lines, the travel time required for the shuttle, schedule reliability, and cost to the user. Employers, local governments, or transit operators may sponsor such services.

Registration fee based on VMT – While emissions rates, not VMT is the primary source of air pollution, even a clean engine will, if driven extensively, contribute to poor air quality. This strategy proposes a sliding scale registration fee based on odometer readings reported by the owner each year. The Workgroup noted extraordinarily difficult enforcement issues associated with odometer tampering and the need for stiff fines for intentional mis-reporting discovered through spot-checking. Since people do not always

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

have the car they are registering with them, and since much registration is now done online, it was considered that this strategy might depend upon sophisticated new radio transmission odometer systems that automatically communicate their status to MVC through cell-phone technology in order to have any value. Such systems come with their own list of drawbacks and concerns including price, security, and privacy.

Alternate fuels tax credit – Initially the workgroup considered credits for all alternate fuels but on further consideration decided to limit this suggestion to just CNG, LNG, and propane and not to include ethanol. The reason for this approach is that ethanol is already growing rapidly in its use due in part to large subsidies within the farming community. Furthermore, New Jersey is already moving towards the use of ethanol as an oxygenate to replace MTBE. For these reasons, the workgroup felt that ethanol usage would likely continue to increase without the need for further incentives. CNG, LNG, and propane, on the other hand, are not likely to be widely utilized without some government support given the much greater capital and infrastructure investment needed to make them economically attractive. These gaseous fuels have a significant emissions benefit over gasoline, more so even than ethanol. A tax credit program aimed at reducing the tax burden for those who use CNG, LNG, or propane as a motor fuel would help offset the higher cost of vehicle modification and fueling equipment installation.

Intercept Park-n-ride – Park-n-ride programs provide remote parking lots linked with major destinations by scheduled transit services or shared ride facilities. Park-n-rides may not reduce “cold starts” which contribute to air pollution, but they can reduce vehicle miles of travel by single occupant autos. The effectiveness of park-n-rides is highly correlated with the magnitude of traffic congestion that can be avoided by switching to transit, the frequency, cost, and quality of the transit service provided, and the cost savings that may be achieved by avoiding high-cost parking in some urban areas. However, since government investments that make long-distance commuting easier may have the secondary effect of supporting ex-urban growth, this control measure should be studied carefully as not all opportunities for intercept park-n-ride may be appropriate or effective in the long term.

Least Promising

Electric shuttles in structured communities – Some residential communities are configured such that much local travel can be done with short-range and/or smaller electric vehicles. This strategy considered government purchase and provision of such vehicles and/or government incentives to communities to create their own small transit operation using such vehicles. As most travel in New Jersey requires significant exposure to highway conditions, however, it was determined that, while the strategy would advance the cause of cleaner air symbolically, it would not be likely to fit the needs of the great majority of prospective users, and would therefore have low overall value.

Electric vehicle charging stations – As there are some electric vehicles in use, and as they are rapidly becoming competitive in terms of range and cost with gasoline-powered

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

vehicles, this strategy would have the State pay to install charging devices in town centers (along with parking meters or at specially designated sections of parking lots) and at malls, such that the conditions for their use would improve and private citizens so inclined might be more likely to purchase and begin to use them. Since the electric grid is ubiquitous, and the technology is established, this was seen as relatively easy to do, but costly and not likely to produce much change in vehicle ownership patterns in the near future.

Expand NJT night/weekend service – New Jersey Transit would provide additional service on existing train and bus lines to broaden the time of day during which public transit travel is possible. This will help increase transit ridership at the margin, where commuters now use cars if their hours are not likely to fit conventional commuting schedules. The environmental benefit was judged to be small and potentially negative in some cases where the pollution from the bus might be greater than the two or three cars that would have been driven otherwise. While public transit remains the primary alternative to traveling by auto, transit needs must be planned strategically so that they can do the most good. Transit is cost-effective and provides the best service to customers only when it can serve trips that have clustered origins and destinations. Putting transit into low-density environments with very dispersed trip patterns – which the late night hours frequently are – would serve very few riders thus requiring much greater subsidy and rendering much smaller, if any, emissions benefits.

Extend NJT routes (geography) – As the State develops, the need for extended bus and train routes continues to evolve. New Jersey Transit should – either on a permanent or on a demonstration and/or pilot basis – add and extend existing routes, combined with advertising campaigns and, if necessary at first, fare discounts, to build additional ridership and create a basis for increasingly dense development along transit lines, as an alternative to general sprawl organized entirely around private auto dependency. As with the time extension of transit routes, questions were raised within the Workgroup as to the significance of the environmental benefit. The success of transit route additions or extensions in reducing auto travel will be highly correlated with the frequency of transit service and the ability of transit to compete with the auto in terms of travel time. While public transit remains the primary alternative to traveling by auto, transit needs must be planned strategically so that they can do the most good. Transit is cost-effective and provides the best service to customers only when it can serve trips that have clustered origins and destinations. Putting transit into low-density environments – which many of the more rural areas of the State are – with very dispersed trip patterns would serve very few riders thus requiring much greater subsidy and rendering much smaller, if any, emissions benefits.

Revise gasoline formulation – New Jersey could require gasoline manufacturers to create custom blends aimed at reducing PM_{2.5} and O₃ precursors. The strategy appears flawed in that a substantial portion of the pollution in New Jersey originates from cars fueled out-of-state, and that the price premium would likely be quite high, with adverse impacts on disadvantaged communities disproportionate to the benefits they would receive. Furthermore, based on text in the recently passed Federal energy bill,

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

creation of “boutique” fuels will be actively discouraged by the EPA and other federal regulators.

Hydrogen vehicles – While hydrogen vehicles are beginning to be demonstrated in normal use situations, neither the fueling infrastructure nor the technology is sufficiently mature to permit deployment of a strategy aimed at inducing private owners to purchase such vehicles at this time.

Increase fuel tax – Additional fuel taxes tend to burden the poor both in terms of the lower fuel economy older vehicles typically achieve and because the higher cost is a larger percentage of their annual income than for wealthier drivers. Fuel taxes are likely to be imposed over the next several years on top of higher fuel prices. Adding to this burden to suppress automobile and truck use would appear to be unnecessary and unlikely to produce additional measurable reductions in air emissions, beyond what is already achieved from current increased prices and future taxes being considered to fund road and public transit improvements. These trends toward higher prices in recent months have been cited as a major factor in a 6-15% decrease in gasoline sales³ that has likely resulted in similar reductions in pollution. Unfortunately it is impossible to tell how long this behavior modification will remain nor what change in price will result in a desired change in usage.

Early vehicle retirement programs – As older cars contribute emissions disproportionate to their numbers, programs to facilitate their retirement (after, perhaps, 10 years or 150,000 miles) could effectuate some air quality improvement at minor inconvenience to a relatively small number of people. It should be noted, however, that those of lower economic means disproportionately own older cars so considerations of environmental justice must be carefully evaluated in undertaking such a strategy. If it were determined that this strategy should be pursued, such approaches as rapidly increasing registration costs, or absolute deadlines (age or mileage) might be employed, or emissions failures greater than 100% above standards. It was also noted by the Workgroup that in the past, such programs have received strong opposition from collector car groups.

Pollution credit trading program (PCTP) – Since each driver contributes a share of the regional pollution problem, and since those who drive higher-than-average-emission vehicles or greater-than-average VMT contribute proportionately more, this strategy envisions a basic pollution allowance for each adult citizen, which could then be traded between those needing less credit and those whose lifestyles require more credit. Thus, if each citizen were allowed 1,000 pounds of PM_{2.5} or ozone credit each year, a person who drove their auto fewer miles or did not own a car, could sell credits to somebody with a larger-than-average car or who needed to drive more-than-average VMT. This would permit everybody to share in both the cause and the cure of the air quality problem, by either choosing not to use their credits – thus reducing their emissions contribution – or purchasing the right to contribute more emissions to the overall regional total. Ideally, the credits could be bought and sold through a brokerage system established through a data system organized and deployed by MVC. Since

³ USA Today “Many Reduce Gasoline Usage” 9/28/05.

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

such data systems are now a matter of course (EZPass, automatic credit-card debits and credits), establishing the system would not be technically difficult, although institutional issues would have to be addressed. It was thought by the Workgroup that, while the proposal is far-sighted and visionary, and would be likely to raise awareness of our individual contributions to regional air quality problems, it would be strongly opposed by many, viewed as an unfair tax by those with larger travel needs, and therefore be difficult to implement. A white paper providing additional detail on a mobile source credit-trading program is attached.

Expand bike/hiking trails – Expansion of bike paths, sidewalks, and trails will provide safe pedestrian and bike routes in many areas of the State where walking and biking are difficult and unsafe. This will permit the shift of some shorter auto trips to these non-polluting modes. In addition, the absence of safe and comfortable pedestrian routes is a major impediment to using public transit. Any future expansion of the State's transit system must be accompanied by expansion of the bicycle and pedestrian network.

Catalytic converter retrofit program – As originally conceived, this measure would provide incentives for the owners of older vehicles to replace their catalytic converters, perhaps with a more modern and more effective unit than originally supplied with the vehicle. This retrofit would be done regardless of whether a vehicle passed the emissions inspection. Benefits would include the possible transition from two-stage to three-stage catalytic converters for many older cars that would theoretically reduce NO_x emissions in addition to the reductions in CO and VOCs. Unfortunately catalytic converters are relatively expensive and aftermarket versions are often of dubious quality and effectiveness thus leaving only OE designed converters as a viable option for most cars. While this might improve emissions on some vehicles where the converter had degraded over time, it would not allow for any additional improvements beyond original specifications, as the conversion to three-stage units would not be possible. Therefore it appears that focusing on a general repair assistance program as described above would be better. Such a program would include the catalytic converter as one of the possible components to replace.

Registration fee based on vehicle weight – As with the registration fee based on VMT, this strategy would acknowledge that larger vehicles – while they may well meet the emissions standards established for their weight class – still impose a greater burden on society than do smaller vehicles, and would charge them accordingly. Thus, it would be permissible to buy and use larger and more polluting vehicles, but the owner would pay for the privilege. Currently, only two levels of vehicle weight are recognized within the MVC registration fee schedule a relatively small fee difference between them. In order to make this measure effective, additional weight ranges and much more significant fee differentiation would need to be implemented. Issues of social acceptability, legislative resistance, and MVC implementation reduce the appeal of this strategy.

Ban drive-thru banks, fast food – In an effort to reduce idling, this strategy would phase out all drive-through facilities, which often involve 5-15 minute idling periods. Given the immense investment by private sector institutions in such facilities, the strategy appears

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

infeasible, impractical, and, at some level might constitute a government taking, requiring compensation well beyond the capacity of the State budget. The response from private citizens would likely be equally strong and negative.

VII. Detailed Review of Promising Control Measures

Anti-idling education/enforcement – As stated in the general description of this control measure, the impact will be dependant on the level of compliance by the motoring public. However, using a few assumptions, a rough estimate of the emissions reduction can be made.

The Motor Vehicle Commission registration database currently lists around five million vehicles – we will assume that 70% of them are on the road on any given day (this rate is probably higher on weekdays and lower on the weekend): 3,500,000 vehicles. Of these, approximately 90% are light duty gasoline powered: 3,150,000 vehicles. Idling time per vehicle probably varies dramatically and will need to be studied more closely as part of the process of determining the true potential of this measure however for estimating purposes, assume 10 minutes of unnecessary idling (warming the vehicle, waiting for children, in drive thru, at convenience store etc.): 31,500,000 minutes of unnecessary idling. The level of compliance that this measure will incur is hard to estimate however compliance with similar safety or environmental regulations such as seat belt use and speed limits might be a useful corollary. For the purposes of these calculations, assume a 2% reduction in unnecessary idling initially⁴ or 630,000 minutes. Estimates of NO_x and VOC (or HC) emissions at idle are 0.0025 g/s and 0.0013 g/s respectively⁵ which results in reductions of 208 lbs/day and 108 lbs/day respectively. Extrapolating this out over the entire year, this control measure has the potential to reduce NO_x emissions by 38 tons/year and VOC emissions by 20 tons/year.

Roadside RSD (gross emitter) – Originally the workgroup considered three options for implementation of this measure: a mandatory enforcement approach targeted at getting gross emitters re-inspected and repaired or off the road; a voluntary clean screening approach aimed at allowing those cars that are significantly below the regulatory limits specific to make, model, and year to forgo the normal biannual inspection process; or a combination of both. It was decided that the gross emitter approach would be the most beneficial as clean screening may actually be counter productive for OBD II equipped vehicles, which make up the vast majority of the fleet. For these cars, the OBD inspection is actually a predictive inspection that prompts repair BEFORE a major emissions issue arises which in turn will lead to a cleaner fleet. Exempting these cars from this inspection process via an RSD clean screen would potentially put off these repairs and lead to dirtier air.

Based on past inspection data, it appears that less than ½% of the OBD equipped cars and around 1-2% of the non-OBD cars would qualify as gross emitters – tailpipe emissions significantly greater than 150% of certification values. Given a state fleet of

⁴ It is possible that over time the compliance level may go up slightly however it is not likely that the public will give up a comfort/convenience habit for what they perceive as having very little benefit.

⁵ Taken from the MOVES modeling bins as this is the most current mobile source modeling software and the MOBILE6 software designers “did not include the calculation of idle emissions rates as such”.

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

around five million cars, 75% of which are OBD equipped, that would mean 43,750 gross emitting cars on the road each year. Remote sensing detection would not be able to capture all of these vehicles due to limitations in the number of RSD installations and the abilities of the technology to function successfully under all weather and traffic conditions. Assuming that 10%⁶ can be identified and 80% of those motorists comply with the requirement to have their cars inspected immediately, then this program would add 3,500 additional inspections annually at a cost of \$98,000 assuming \$28 per inspection. Obviously this does not account for the significant capital and operating expenses involved in setting up and running the RSD system.

Since many of these gross emitters are likely to be older vehicles that are likely to be owned by low-income households, combining this control measure with a LIRAP should be considered both for the emissions benefits but also for to avoid having an undue adverse impact on the poor.

An emissions benefit for this control measure can be estimated starting with the 3,500 vehicles noted above and assuming that 5% are either false positives or end up not being repaired along with the following emissions assumptions:

- Fleet average NO_x emissions are 0.7 gram/mile⁷
- Fleet average VOC emissions are 0.6 gram/mile⁸
- Gross emitters have emissions 150% greater than the average
- Fleet average annual VMT is 12,000 miles

The resulting estimate for emissions reduction is 18 tons per year of NO_x and 20 tons per year for VOC. It should be noted that these estimates are based on overall fleet average emissions rates and assumes that repairs are made relative to those rates. In actuality, most of the older vehicles that would likely be caught by an RSD program, would have emissions levels much higher than the fleet average and would only be repaired to a level just below the applicable standard for each individual vehicle; a standard which is also likely to be much higher than the current fleet average.

Therefore these calculations likely overestimate the reductions that would be realized from this control measure.

Repair assistance for older cars – This program would apply to older vehicles that have failed multiple inspections. Based on current inspection data, between 13,000 and 29,000 vehicles would fall into this category. Assuming that 50% of these vehicles belong to motorists who would qualify under the program's income requirements and that, of those, 50% would decide to participate, then between 3,250 and 7,250 vehicles would apply for and be granted assistance. Assume an average of 5,250. Given an allocation of up to \$500 per vehicle, the cost to the State would be \$2,625,000 per year. Calculating the benefits of this measure requires making some assumptions about the vehicles themselves and their emissions:

- Fleet average NO_x emissions are 0.7 gram/mile⁹

⁶ The capture rate will be extremely dependant on the number, placement, and publicity of the RSD program. However it is very likely that as owners of gross-emitters or those who suspect that their vehicle is a gross-emitter learn of the program, the capture rate will drop dramatically as those motorists find ways to avoid the RSD equipment.

⁷ Averaged from various US DOT and US EPA data

⁸ Averaged from various US DOT and US EPA data

⁹ Averaged from various US DOT and US EPA data

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

- Fleet average VOC emissions are 0.6 gram/mile¹⁰
- Vehicles participating in this program are similar to gross emitters with emissions 150% greater than average
- Fleet average annual VMT is 12,000 miles

Again similar to the gross emitters, it is assumed that repairs to these vehicles can achieve 40% reductions in NO_x emissions and 50% reductions in VOC emissions. The final result is a potential emissions benefit of 29 tons per year of NO_x and 31 tons per year of VOC. As with the RSD gross-emitter targeting program, the estimates presented here assume that vehicles participating in the LIRAP can be repaired to emissions levels comparable to the overall fleet average. This is not likely to be the case. Instead, these older vehicles are likely to be far dirtier than the average and are likely to be repaired only to the applicable standard for each vehicle – again a level higher than the fleet average. Once again, these calculations probably overestimate the actual reductions that would be achieved.

It should be noted that if this control measure is implemented alongside the RSD gross emitter screening, the emissions benefits could not be taken separately and added together as the two programs overlap.

Employee trip reduction programs – Estimating the effectiveness of ETRPs is quite difficult. In the past, New Jersey has come close to implementing a mandatory ETRP program that had the potential to produce some significant reductions. A voluntary program such as is being recommended here, is much less likely to reach the same level of effectiveness, as participation both by employers and by their individual employees is not guaranteed.

However, the following calculations do demonstrate the potential that exists and provide a basis for future consideration. According to the New Jersey Department of Labor (NJ DOL), there are approximately four million non-farm employees statewide. According to census data provided by NJDOL, 44% of them work at facilities with more than 100 employees – a breakpoint at which implementing such programs is feasible – and that 20% of the employers and then 10% of their employees volunteer; 200,000 employees participate in the program. The US Census Bureau recently concluded that the average commute time in New Jersey is 28.3 minutes. If the average commuter's speed is thirty miles-per-hour, than the average one-way commute is fourteen miles. Assuming that 10% of the trips can be eliminated over a standard 250-day work year, then 249,040,000 commuting miles are eliminated. Using rough average emissions rates available from a variety of sources (US DOT, US EPA, CARB) for NO_x (0.7 gr/mi) and VOC (0.6 gr/mi), the potential benefit from this control measure could be as high as 192 tons per year of NO_x and 165 tons per year of VOC.

Travel demand management – Numerous concepts fall under the general umbrella of TDM. Estimating emissions benefits from these control measures is difficult given this variety and the fact that many specific programs are often proposed with a voluntary structure. In 2001, NJDEP proposed, and more recently, implemented an EPA approved SIP utilized many of these TDM programs. Although detailed calculations are not included in the SIP background documentation that was reviewed, emissions

¹⁰ Averaged from various US DOT and US EPA data

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

benefits presented therein are an indication of some of the types of control measures that have been considered as part of TDM in the past and some indication of the range of reductions that might be attained from each measure.

Table 3 – TDM Concepts	Reductions (ton/day)	
	Annual NO _x	Annual VOC
Bicycle/Pedestrian	59	38
Parking Cash Out	64	36
EZPass Improvements	20	82
Incident Management	61	16
Signal Improvements	4	73
Transit Villages	4	2
Grand Total	211	247

As with all of the control measures discussed by the workgroup and presented here, determining accurately what the emissions benefits will be is very difficult. It should also be noted that many of these programs have already been implemented or are to be implemented shortly as part of the previous SIP so additional credit may not be able to be taken for their reductions.

State gas-guzzler tax (including credit for high efficiency cars) – Implementation for sale of new cars is rather easy as it only impacts the new car dealers. However, expanding this tax system for used car sales could allow for a greater impact by depressing the value of these vehicles for their entire lifespan. Including used vehicles would, however, be more difficult as it would impact all used car dealers as well as private sales where sales tax is paid at the MVC agency. The level of confusion would likely be rather high as motorists would need to consult tables of fuel economy figures for the range of vehicles they were considering and compare those with the sliding tax scale. Furthermore, the correlation between fuel economy and emissions of NO_x and VOC is somewhat weak and will be getting weaker as new emissions standards are phased in over the next few years. A simple analysis of the impact of such tax program on new vehicle sales, however, provides an initial view of the potential of this control measure. According to the Motor Vehicle Commission (MVC), New Jersey motorists purchase 600,000 new vehicles each year. Assuming that our purchasing habits here are comparable with motorists throughout the United States, then nearly half of these are SUVs, trucks, or other low-efficiency vehicles (gas guzzlers) and around 14% are hybrid electric or other high-efficiency vehicles or 300,000 gas guzzlers and 84,000 high-efficiency cars. The remainder fall somewhere in the middle and would not be effected by this control measure. Next one must estimate what impact this program would have of the purchasing decisions of New Jersey motorists; a process fraught with difficulty however a 2% change at both ends of the efficiency spectrum is probably reasonable. This would mean that 6,000 fewer low-efficiency vehicles and 1,684 additional high-efficiency vehicles would be purchased each year due to the program. Calculating the emissions benefit requires use of average emissions rates for the three types of vehicles assuming that the new vehicle fleet in New Jersey falls under the LEV I standards as described by CARB and EPA.

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

Table 4 – Vehicle Emissions Classes	NO _x Std		VOC Std	
Low-Efficiency (LDT TLEV)	0.7		0.16	
Moderate Efficiency (LEV)	0.2	0.2	0.075	0.075
High-Efficiency (ULEV)		0.2		0.04
LDT TLEV to LEV	0.5		0.085	
	LEV to ULEV	0		0.035

Overall emissions benefits from this control measure are in the range of 40 tons per year NO_x and 8 tons per year VOC assuming that annual VMT is around 12,000 for all classes of vehicles and that no motorist goes from purchasing a low-efficiency vehicle directly to a high-efficiency vehicle.

Annual I/M for cars over 10 years – Based on past inspection data, the population of cars over 10 years of age is 20% of the fleet. Given a vehicle fleet of around five million cars, this would mean one million older cars that would be subject to annual inspections. Currently half of those cars are inspected on any given year to the annual increase in inspection volume would be 550,000 vehicles. Assuming that the motoring public continues to utilize the private inspection facilities (PIFs) at the same rate of 24%, this would mean an additional 420,000 inspections in the State run centralized inspection facilities (CIFs). The cost of an inspection per vehicle is \$28 for a total annual cost of \$11.8 million for this measure.

The benefit from this control measure can be estimated with the following assumptions:

- Vehicles over 10 years old have a 15% failure rate
- Those that fail average 150% of the average emissions
- Annual VMT for these vehicles is similar to the rest of the fleet: 12,000 miles
- Fleet average NO_x emissions are 0.7 g/m; VOC emissions are 0.6 g/m
- Seventy-five percent of the vehicles that fail under this program are repaired
- Repairs to these vehicles result in 40% reduction in NO_x emissions and 50% reduction in VOC emissions

This results in reductions in the range of 624 tons per year of NO_x and 669 tons per year of VOC. Since these estimates are based on the same fleet average emissions that were used for estimating the LIRAP and RSD program benefits, they are subject to the same caveats: actual reductions are likely to be smaller due to the fact that these vehicles are likely to be repaired only to the applicable standard rather than to the full extent possible. Furthermore, annual VMT data is based on a fleet wide average and it has been suggested that these older vehicles are generally driven fewer miles that would further reduce the benefit of this program. These are areas that need to be investigated further prior to implementation of this control measure.

As with the gross emitter RSD suggestion, this control measure has the potential to impact low income households more heavily. Therefore combining this control measure with a LIRAP should be considered both for the emissions benefits but also for to avoid having an undue adverse impact on the poor.

Supply gas caps at CIFs to vehicles failing that test (and that test ONLY) – Estimating the actual VOC emissions savings from this measure may well be nearly impossible. Factors that may play a significant role include the length of time the cap is leaking prior to failing inspection, the effect of temperature on the vapor pressure of the gasoline in

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

the tank, the effect of the level of gasoline in the tank, the number of times the tank is filled per week, the amount of time the car is driven versus parked, where the car is parked, and the list goes on. However, the work group felt that this measure should still be strongly considered since the cost to the State to provide replacement caps is LESS THAN the cost of the re-inspection and, while quantifying the emissions reduction may not be possible, there is no question that a reduction would be realized as it would eliminate several extra vehicles trips to purchase a replacement and to return for re-inspection and it would eliminate the VOC leakage immediately rather than some number of days later when the motorist got around to purchasing a cap on their own.

VIII. Summary of "Parking Lot" and Crossover Issues

Sprawl – Several of the control measures proposed by the Workgroup, such as expansion of New Jersey Transit routes either in time or geography and the creation of intercept park-n-rides, have the potential to induce or encourage sprawl and ex-urban growth. The question of how these measures are implemented, if at all, must include a thorough analysis of sprawl. The NJDOT 2030 plan addresses sprawl under critical issues:

Over the past 50 years, New Jersey has developed its land in a way that has had profound impacts on our mobility and transportation system. Housing construction has largely shifted from compact lots in the cities to large homogeneous tracts of single-family houses on sprawling lots in the suburbs. The restaurant or drug store that one could walk to does not exist in the suburbs. Sidewalks are sparse. The only way to travel is by car.

Shopping no longer is focused in stores one could walk to from home, or could reach by public transportation in busy downtowns. Now we shop at "big box" "strip" retail centers surrounded by acres of parking and reachable only on roads that are as crowded on Saturdays as they are on weekday mornings.

Jobs, likewise, have moved to sprawling office and warehouse "campuses" in the suburbs, surrounded by large parking lots. Major employment concentrations, health care facilities and educational institutions once were located in city centers, conveniently at the hub of many radial public transportation routes, where transit choices were rich and service frequent. Now, many have relocated out along a single transit route, and require long and circuitous transit trips to reach them, or relocated beyond the reach of public transportation altogether.

The sprawl of industry, warehousing and retail away from the rail freight infrastructure also has increased the dependence on trucks to move the goods we need and has increased the distance trucks must travel.

In short, the way we have settled our land has created an overwhelming reliance on the auto and a need to travel great distances to meet our daily needs. While we value the unprecedented mobility available to us, the fact is that our increasing need to travel by truck and auto has overwhelmed our capacity to build new roads and add more lanes to the congested highway system. We are caught in a spiral of sprawling growth and increasing highway congestion.

While our transportation providers still have some options to improve our lot, unless there is a fundamental change in the way we develop our cities and suburbs, no amount of transportation improvements will free us from the spiral of increasing congestion and delay which imperils the quality of life and economic vitality of New Jersey.

Gasoline Cars & Trucks Workgroup Report October 31, 2005

Given these circumstances, some improvements – particularly the extension of transit routes further and further into outlying new development areas and the creation of intercept or fringe (of suburbs) park-n-ride facilities – may actually prove counter-productive in the long run, by facilitating personal decisions to domicile families further and further from the region's core, where public transit can be operated most effectively and pedestrian activities are a meaningful component of daily travel. Such strategies must therefore be looked at critically in each case and, in some cases, should be carefully coordinated with specific Transit-Oriented land-use and zoning initiatives on the part of the municipalities these strategies are intended to serve.

Pollution from Energy Conversion Processes – Several of the Workgroup's suggested control measures revolve around the use of alternative fuels such as ethanol, CNG, LNG, or electricity. Each of these alternatives requires converting or generating the fuel from primary energy sources. In the case of electricity, this is often coal or natural gas but also includes nuclear power plants as well. For ethanol, conversion begins with the production of a farm crop such as corn followed by the fermentation of that corn into ethanol. Natural gas based fuels such as CNG and LNG require their own type of conversion, either compression or cooling and liquefaction respectively. Each of these conversion or generation processes produces varying amounts of the criteria pollutants that the workgroup process is charged with reducing. Before any control measure based on an alternative fuel is put into practice, a thorough review of the net pollution effects of these alternative conversion or generation processes compared to the pollution created in the refining of gasoline must be conducted. This will likely be a highly controversial evaluation.

Pollution Levels of Alternate Transportation Fuels – In addition to the pollution associated with the conversion or generation of alternate fuels, consideration must also be given to the direct pollution from the combustion of these fuels in motor vehicles as compared to the combustion of gasoline. Various studies have shown mixed results and often point to a trade off between the reductions of one pollutant versus the elevation of another. This type of analysis was not considered in the development or evaluation of the control measures presented here but must be undertaken prior to their implementation.

Other strategies suggested from outside the workgroup too late to be fully evaluated:
Trans-Hudson passenger rail tunnel
Rapid implementation of high-speed EZPass toll lanes and other incentives to encourage EZPass use

IX. Comments

X. References

Victoria Transportation Policy Institute www.vtpi.org/tdm
Wisconsin Department of Natural Resources www.dnr.state.wi.us

Gasoline Cars & Trucks Workgroup Report
October 31, 2005

USEPA Office of Transportation & Air Quality www.epa.gov/otag
USDOT Federal Highway Administration www.fhwa.dot.gov
NJDEP 2001 SIP for 1-Hour O₃ Attainment

XI. White Papers Submitted from Individual Members of the Workgroup

LIRAP White Paper submitted by Rob Schell, NJDEP
PCTP White Paper submitted by Kirk Barrett, Montclair University

Appendices:

Appendix A – Workgroup Meeting Agendas
Appendix B – Workgroup Meeting Minutes

AGENDA



Gasoline Cars and Trucks Meeting

July 20, 2005

10:00 am to 2:00 pm

NJ DOT Headquarters – Foran Building

1035 Parkway Ave., Ewing, NJ 08618

Meeting called by John Gorgol

Facilitator: Jeff Cantor

Please read: Minutes from 6/29/05 Mtg

Please bring: Ideas, suggestions related to concept list generated at last meeting. Also, please feel free to bring your lunch or some extra \$\$ as we can order out for pizza.

10:00 – 10:10 **Introduction/Announcements**

10:10 – 10:30 **Overview**

Review minutes from previous meeting; add any new control concepts that may have surfaced since our last meeting.

10:30 – 1:30 **Discussion**

- *Develop strategy for evaluating and ranking the different suggestions on our list.*
- *Begin evaluating all suggestions*
- *Prioritize and categorize suggestions*

1:30 – 2:00

Wrap-up

- **Assignments for next meeting**
- **Logistics for next meeting**
- **Agenda for next meeting**
- **Feedback**

Obtain feedback on workgroup/meeting process if time allows

AGENDA



Gasoline Cars and Trucks Meeting

August 11, 2005

10:00 am to 2:00 pm

NJ DOT Headquarters – Foran Building

1035 Parkway Ave., Ewing, NJ 08618

Meeting called by John Gorgol

Facilitator: Jeff Cantor

Please read: Minutes from 7/20/05 Mtg.

Please bring: Your evaluation matrix from our last meeting and thoughts on any ideas that we didn't cover especially neighborhood electric vehicles. Lunch will once again be bring your own or bring some \$\$.

10:00 – 10:10 **Introduction/Announcements**

10:10 – 10:30 **Overview**

Review minutes from previous meeting; add any new control concepts that may have surfaced since our last meeting.

10:30 – 1:30 **Discussion**

- *Discuss and evaluate neighborhood electric vehicles and any other ideas which we may not have reviewed last meeting*
- *Review evaluation results and ranking*
- *Generate list of affected parties for major ideas*
- *Begin report write-up outline*

1:30 – 2:00 **Wrap-up**

- **Assignments for next meeting**
 - **Logistics for next meeting**
 - **Agenda for next meeting**
 - **Feedback**
- Obtain feedback on workgroup/meeting process if time allows*
-
-

AGENDA



Gasoline Cars and Trucks Meeting

September 7, 2005

10:00 am to 2:00 pm

NJ-DEP Satellite Office – BMVI&M

380 Scotch Rd., Ewing, NJ 08618

Meeting called by John Gorgol

Facilitator: Jeff Cantor

Please read: Minutes from 8/11/05 Mtg.; latest draft of the Workgroup report

Please bring: Copy of the Workgroup report and any comments/suggestions you have. Lunch will once again be bring your own or bring some \$\$.

10:00 – 10:10 **Introduction/Announcements**

10:10 – 10:30 **Overview**
Review minutes from previous meeting.

10:30 – 1:30 **Discussion**

- *Review process descriptive sections of report*
- *Review grouping of concepts (most promising, promising, least promising)*
 - *Should we distinguish between short term and long term?*
 - *Are the 'most promising' the only ones we are truly recommending?*
- *Review concept descriptions*
 - *Summary descriptions by group*
 - *Detailed descriptions with numerical evaluation for recommended concepts*
- *Appendices, white papers, and other attachments*

1:30 – 2:00 **Wrap-up**

- **Assignments for next report draft**
- **Do we need another meeting?**
- **Logistics for final report**
- **Overall feedback on Workgroup process**

Obtain feedback on workgroup/meeting process if time allows

An Overview of a Low Income Repair Assistance Program For Older Vehicles in New Jersey

October 2005

Robert Schell, Jr.

Interim Manager, Bureau of Motor Vehicle Inspection & Maintenance

New Jersey Department of Environmental Protection

Phone: 609/530-4038 Fax: 609/530-5342 email: rob.schell@dep.state.nj.us

The purpose of this proposal is that the State provides financial assistance, most likely income based, to owners of failing vehicles to get the vehicles repaired to meet emission standards. This would likely apply primarily to older vehicles that, while they represent a fairly small portion of the fleet, contribute a disproportionately large fraction of the pollutants. Currently, NJ offers an emission waiver process in which a vehicle is exempted from meeting emissions standards if, after a set expenditure on qualifying repairs, it still is not able to pass. These vehicles would be the primary targets of such a repair assistance program that would offer additional funds to further improve the vehicle's emissions. Concerns include the potential for fraud and the ability of the state to ensure that emissions improvements were gained through these efforts.

General Requirements

In order to limit the scope of repair assistance, we need to apply some basic requirements to both vehicles and owners. These are some recommended requirements to start with, subject to policy review and further development.

Eligibility requirements for the vehicle:

1. Out of warranty coverage (over 8 years or 80,000 miles).
2. Must have emission-related inspection failure based on tailpipe exhaust measurement or OBD test.
3. Gas cap failures do not count (this is an inexpensive self-repair item).
4. Safety failures do not count.
5. If there is evidence that any emission control devices have been detached, deactivated, or modified (e.g., catalyst removal, performance tuning chip or ECM replacement, O2 sensor defeat, aftermarket turbocharger or supercharger, nitrous oxide injection system, etc.) the vehicle is disqualified.

Eligibility requirements for the vehicle owner:

1. Must be registered owner of the vehicle.
2. Must demonstrate financial hardship (to be determined).

Regardless of the type of emission test each participating vehicle is normally subject to, every vehicle should receive a before and after tailpipe emission test so we can quantify the emission reductions. In order to minimize fraud, there also needs to be some restraints

on the eligible vehicle repairs. Currently all vehicles that are not self-repaired must have emission-related repairs performed at a registered Emission Repair Facility (ERF). In addition to requiring that all repairs made in compliance with the repair assistance program be performed by an ERF (no self repairs should qualify), we might also require that the participating ERFs be GoldStar rated. GoldStar ERFs have at least one certified technician who has been trained above and beyond the minimum requirements and represent some of the shops that may be more likely to be good partners with the State. The amount spent on repairs needs to be capped at some level. A typical cap might be about \$500. We need to make a determination as to whether repairs should be authorized or not based on estimates from the technicians in consideration of the value of the vehicle. For example, a \$500 repair on a 10-year-old car that will very likely bring the car into compliance is probably worth it. A \$500 repair on a 20 year old car for which the technician estimates really needs a whole new engine for \$2000 is probably going to achieve little emission reduction on a vehicle of low residual value to begin with. The repair assistance program must have some mechanism to interface with State representatives who can authorize the repairs based on some reasonableness of the estimates.

Estimating eligible vehicle population

Most vehicles in NJ that fail an emissions inspection are repaired to pass to the test. With the introduction of the enhanced inspection program in 1999, a waiver system was added to help mitigate the impact of a newer and more stringent emissions test. Very few motorists take advantage of the waiver opportunity, either because their vehicle can be repaired at a cost below the waiver limit, the motorist is simply unaware of the waiver process, the vehicle is fraudulently passed at a PIF, or for some other reason such as the vehicle does not meet waiver criteria (e.g., it fails an idle test or emits smoke). We know from reported data that 136 vehicles received a waiver in 2003. Of those vehicles, the peak model years were 1991 and 1993 (see Figure 1).

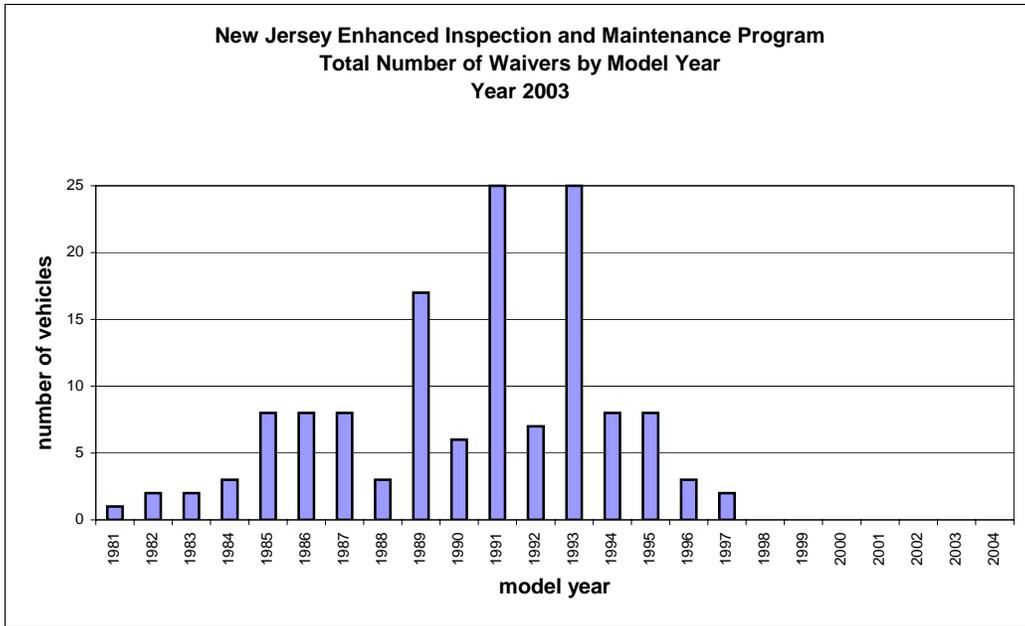


Figure 1

Let us assume that waiver participation reflects somewhat the more difficult and expensive vehicle repairs. If we target the peak of the waiver vehicles and those older, we would be primarily looking at vehicles at least 10 years old as the most likely candidates. This matches well with the assumption that most people in the lower income category are driving older vehicles because they can't afford to buy newer vehicles.

In 2003, about 1.7 million vehicles received a tailpipe emissions test, of which, about 138,000 failed. Of the initial failures, about 110,000 are at least ten years old. After the first retest, there are about 36,000 failures of which about 29,000 are at least ten years old. After the second and subsequent retests, we are down to about 16,000 failures of which about 13,000 are at least ten years old. If we assume that the vehicles that are likely to be the best candidates for repair assistance are the older vehicles that don't pass on the first retest or subsequent retests, our eligible vehicle population is somewhere between 13,000 and 29,000 per year.

The program would have an income eligibility component, which is assumed to reduce the number by 50%. Another 50% reduction can be taken for those owners who for one reason or another choose not to participate. Applying these reductions to the eligible vehicle population would yield 3,250 to 7,250 vehicles per year. For the sake of discussion, let's say that 5,000 vehicles per year would qualify.

An allocation of up to \$500 per vehicle would cost the state \$2.5 million per year.

Estimating emission reduction benefits

Based on 2003 inspection data, we can project what the average emission reduction might be for a vehicle repair. We measure concentrations of HC and CO at idle for vehicles 1980 and older. We measure concentrations of HC, CO and NO_x using the ASM5015 loaded dynamometer test procedure for vehicles 1981 through 1995. Most vehicles 1996 and newer receive an OBD test, so we have no emissions measurements. The typical after repair emission reduction for 1980 and older vehicles is about 60% of HC. The typical after repair emission reductions for 1981 through 1995 vehicles is about 50% of HC and more than 40% of NO_x. It is important to note that these are percent change in average before repair and after repair exhaust gas concentration measurements. This does not give us enough information to estimate the real emission reductions in mass. The cutpoints for each vehicle or model year and vehicle type is different, to further complicate the analysis.

It is quite possible that the vehicles that would be the best candidates for a repair assistance program could have higher than average before repair emissions, otherwise they likely would have been repaired and passed inspection before becoming a candidate. Given that the typical after repair reductions in pollutant concentrations is significant, and that candidate vehicles are somewhat more likely to be older vehicles and have higher emissions to start with, the potential for significant emission reductions is good. A pilot study to better quantify the specific emission reductions might be needed to obtain a better estimate.

A proposal for tradeable personal pollution allowances for air pollution from personal automobiles in New Jersey

August 2005

Dr. Kirk R. Barrett, PE, Director, Passaic River Institute
Montclair State University, Montclair, NJ 07043
phone: 973-655-7117 fax: 973-655-4390 email: kirk.barrett@montclair.edu

Market-based pollution regulatory schemes such as tradeable emission allowances are now well established; probably the most well known is the United States Environmental Protection Agency's (USEPA) sulfur dioxide trading program, which has achieved considerable success at reducing emissions at least cost. Perhaps it is time to extend the market-based approach the individual level; that is, implementing personal tradeable allowances for emissions from personal automobiles. An individual-oriented trading scheme would be a major step from existing, industry-based schemes; such a big step is fraught with difficulties, but I believe it can and should be taken.

In this scheme, every adult resident of the State of New Jersey would receive a personal air pollution allowance (a PAPA), used to "pay" for the pollution damage they emit via driving. (To make the program simpler and more understandable to the public, it may be desirable to issue the allowance in terms of dollars, rather than terms of pounds of specific pollutants.) If their automobile emissions caused less damage than their allowance, a person could trade the balance on the open market. If they caused more, they would have to buy additional allowances.

One exceptional feature of this program compared to the sulfur dioxide program is that the amount of the allowance could be based on the actual cost of the damage caused by emitting air pollution. Scientists, doctors and economist have estimated this cost, albeit very roughly. A 1998 report entitled "The Real Price of Gasoline" by the International Center for Technology Assessment (<http://www.icta.org/pubs/>) is one of the more comprehensive reviews. The report states that "approximately \$39 billion per year is the lowest minimum estimate (for nation-wide environmental, health and social costs caused by automobiles) reckoned by researchers in the field of transportation cost analysis, although the actual total is surely much higher and may exceed \$600 billion." Using a mid-range figure of \$250 billion per year and dividing by national population (~250 million over age 18) gives an average per-person damage cost of about \$1000 per year. Since this is the cost of damage that each person (on average) is *currently* causing, the PAPA could logically be initially set at this amount -- every adult resident of the State would be mailed/mailed personal air pollution allowance certificates totaling \$1000, say 40 at \$25 each. (While this concept of an allowance to cause \$1000 in damage via pollution might be abhorrent to some, the counter argument is that, presently, individuals have an unlimited allowance to pollute, and pay nothing for the damage they cause.)

Next, each automobile's emissions need to be translated into dollar costs. One way to do this is to calculate the cost per mile traveled, and then multiply by the miles traveled per year. Annual, nation-wide vehicles miles traveled for passenger cars is about 1.7×10^{12} (Federal Highway Administration, www.fhwa.dot.gov/ohim/hs01/vm1.htm), which works out to about 12 cents damage cost per mile, on average. This average cost per mile can be adjusted based on the aggregated pollutant emission rates (grams of pollutants per mile) of different vehicles, a task already addressed by the USEPA.

The USEPA has tested many models of cars and publishes a table of "grams emitted per mile" for several pollutants for several vehicle classes back to 1974. These emission rates have been aggregated in to an "Air Pollution Score" from 1 (worst) to 10 (best) (<http://www.epa.gov/autoemissions/detailedchart.pdf>). Assuming the average vehicle is a "5", the emission rate adjustment factor for a particular type of vehicle would be calculated by dividing that vehicle's "air pollution score" by 5. (A more rigorous but more complicated method would be based on the actual emission rates measured during the vehicle's annual inspection, with the rates again translated into a dollars per mile figure).

During a vehicle's annual inspection, the odometer reading would be recorded, which (after subtraction from the previous year's reading) determines the miles driven; this would be reported to the State emissions trading program.

An automobile's annual pollution damage cost would be calculated as

$$\text{Miles driven} \times \text{avg. damage cost per mile} \times \text{emission rate adjustment factor} = \text{annual pollution damage cost}$$

Accordingly, the automobile's owner would be required by the State to submit allowances equal to their annual damage cost. If the automobile caused less damage than their allowance (\$1000 in this case), the owner could trade the balance on the open market. If they caused more, they would have to buy additional allowances. Brokers (many web based) to buy and sell allowances would soon spring up; check-cashing stores would probably handle them.

People could also pay the balance in cash, but people would prefer to pay with allowances, since they will certainly sell at a discount because they could only be used to pay for the pollution damage cost. The cash-payment option alleviates the problematic scenario in which there are no pollution allowances available for people who must buy them.

How could this program reduce pollution? The State could ratchet down the amount of the allowance year-by-year, and let the market forces go to work as each individual determines out the best way for him/her to reduce their pollution damage cost. (Using a damage figure larger than the minimum would stimulate these efforts).

This program is more politically palatable than a simple pollution tax because little to no money would go to the State. Instead, money would transfer from those who pollute more to those who pollute less, which, in my opinion at least, seems entirely fair.

When/if total damage cost exceeds the total allowances, then the State will collect cash for the balance. The money should be used to reduce and/or mitigate air pollution damage, for example by planting trees which remove pollutants, funding alternative transportation facilities (buses, trains, bicycles and walking) to give polluters an alternative to driving, or asthma treatment/research.

Perhaps the most important benefit of this personal allowing trading scheme is that it will get the public much more involved, educated and concerned with air pollution issues. It is my impression that most people do not understand the sources, chemicals or effects of air pollution, likely because they really do not and cannot do much personally to significantly affect air pollution. Yes, an individual can drive less, keep their engine tuned, etc., but why should you care since you are only one of millions of drivers and, as far as you know, no one else is acting to reduce air pollution?

The personal trading program gets the public very much involved – every adult in the State would get a pollution allowance, learn what the allowance is all about and decide what to do with it. Moreover, every automobile owner would be confronted with the damage they cause by their automobile's air pollution -- they will have to compensate for that damage. This program could help change the mindset that the government and industry are supposed to take care of pollution to an understanding that each individual is responsible for pollution and for reducing it.

The per-mile cost could also be incremental to discourage heavy polluters-- the more you drive, the more it costs.

Incremental cost would reduce the burden on the poor, who tend to drive less. In any case, however, the program would not be regressive. Using gasoline expenditures as an indicator of miles driven, 2003 US Bureau of Labor statistics show that the top 20% income households drove 10 times more miles than the bottom 20%. Furthermore, about 1/3 of the households in the bottom 20% did not even own or lease a car. (<ftp://ftp.bls.gov/pub/special.requests/ce/share/2003/quintile.txt>)

The New Jersey Motor Vehicle Commission would administer the program. They already maintain databases registration and odometer readings. Administration of the program would be by could be funded through licensing fees for brokers and by a small percentage on each trade done through a broker.

In conclusion, although such a program is "out of the box", its implementation is based on other programs that are already in place. The main need for this program to happen is considerable political courage. Launching such an unprecedented trading program would indeed be daunting, but the benefits make it worth serious consideration.

SUMMARY

Prepared by Jeff Cantor
On Monday, October 31, 2005



Gasoline Cars And Trucks Workgroup Meeting

Held 6/29/05

Trenton War Memorial

Meeting called by: John Gorgol

Facilitator: Jeff Cantor

Attendees: Bob Miller, NJDOT; Cheryl Drach, USPS; Joseph Caravella, TransOptions; David Heller, NJTPA; Bob Johnson, Sierra Club; Mac Wubben, Center for Clean Air Policy; Sudhir Joshi, NJDOT; Chris Magielnicki, Service Plus; Gail Carter, NJDEP; Nathan Cumar, NJDOT; Steve Jurow, NJ Transit; Jeff Cantor, NJDEP; Dave West, NJDEP; Rob Schell, NJDEP; John Gorgol, NJDEP (see attached table for complete contact information)

Materials: Workgroup ground rules; workgroup summary presentation

Introduction/Announcements [10 minutes]

Workgroup participants introduced themselves and indicated their reasons for attending. A variety of expectations were expressed including:

- Learning
- Developing proactive ideas rather than reactive
- Generate transportation control measures (TCM)
- Promote alternative transportation
- Incorporate land use considerations
- Promote/explore alternate fuels
- Address repair issues and the repair industry (esp. re. newer vehicles)
- Promote CA vehicle standards

Overview [5 minutes]

Reviewed workgroup process, charter, and ground rules; set subsequent meeting outline and next meeting time and place.

Discussion [90 minutes]

Brainstorming on "how to reduce emissions of criteria pollutants – NOx and PM in particular – from gas powered cars and trucks". The following ideas were suggested and will be discussed in more detail at the next meeting:

- | | |
|--|--|
| State tax credit for purchase of hybrid vehicle | State tax dis credit for purchase of SUV |
| Employee trip reduction program | Early vehicle retirement program |
| Convert fleets to hybrid or alt. Fuel vehicles | Public awareness and education |
| Provide repair assistance for older vehicles | Increase inspection frequency for older vehicles |
| Track vehicle repair records and allow for inspection bypass w/ frequent repairs | |
| State tax credit for alt. fuels/bio-fuels | Hydrogen vehicles |
| Travel demand management | |
| Telecommuting | |
| Alt. workweek scheduling | |
| Voluntary or mandatory? | |
| Preferred employee parking | |
| Registration fee based on vehicle weight with steep increase for heavier vehicles | |
| Ban drive thru banks/fast food/etc. | |
| Expand NJT weekend/night service | |
| Registration fee based on VMT | Employer shuttles to train/bus stations |
| Neighborhood electric vehicles | |
| Privately owned or co-op | |
| Registration issues | |
| Use on public roads? | |
| Park-n-ride out of urban areas | Older vehicle retrofits – catalytic converters |
| Fleet requirements | |
| Revive Clean Fuel Fleet program | |
| mpg requirements | |
| Emissions requirements | |
| Vehicle maintenance education | |
| Emphasize cost savings | |
| Avoids problems | |
| Tire inflation programs | Team up with insurance industry |
| Use AAA as education partner | |
| Expand bike/pedestrian trails for transportation and improve quality of trails for all uses (e.g., rollerblades need smooth asphalt) | |
| Increase fuel tax | Revise gasoline formulation (regionally?) |
| Increase anti-idling education/enforcement | Increase overall I/M frequency |
| Remove 4-yr new car I/M exemption | Avoid mid-day refueling – education/mandatory? |

Wrap-up

Next meeting: Wednesday July 20th at 10 am at NJDOT headquarters in Ewing, NJ. Transportation for those traveling to the Trenton area by train to be coordinated through Jeff Cantor.

SUMMARY

Prepared by Jeff Cantor
On Monday July 25th, 2005



Gasoline Cars And Trucks Workgroup Meeting

Held 7/20/05

NJ-DOT HQ – Foran Building

Meeting called by: John Gorgol

Facilitator: Jeff Cantor

Attendees: Bob Miller, NJDOT; Cheryl Drach, USPS; Joseph Caravella, TransOptions; David Heller, NJTPA; Sudhir Joshi, NJDOT; Nathan Cumar, NJDOT; Steve Jurow, NJ Transit; Jeff Cantor, NJDEP; Rob Schell, NJDEP; John Gorgol, NJDEP; Chuck Grill, NJDOT; Rich Janiak, NJDEP; Tom Bednarz, NJMVC; Jerry Lutin, NJ Transit (see attached table for complete contact information)

Materials: Minutes from last meeting; evaluation matrix listing brainstorming ideas

Introduction/Announcements [5 minutes]

Brief introductions of attendees followed by a review of the minutes from last meeting.

Overview [10 minutes]

Developed criteria for evaluating pollution reduction ideas. Suggested criteria included:

Timeframe –	Short term ideas that can be implemented immediately Long term ideas that require extensive planning in order to be put into practice
Cost –	Cost borne by the state Cost borne by the regulated community
Effectiveness –	Reduction of O ₃ , PM _{2.5} , and precursors such as NO _x (pollutants of concern) Focus only on direct emissions of MVs (ignored electric or H ₂ generation) Not concerned with efficiency per se (CO ₂ emissions)
Implementation –	Political hurdles (appeal to legislature) Social hurdles (acceptance by the regulated community) Enforcement (ability to control or measure success including fraud) Environmental justice (undue impact on disadvantaged communities)
Technical feasibility –	Do the necessary technologies exist Can a process be developed easily Has the idea been tried before either in NJ or by other states Some discussion of fraud prevention issues
Who benefits/suffers –	Unintended consequences

Discussion [3 ½ hours w/ break for lunch]

Each idea was reviewed, some by sub-committees, some by the whole group using the evaluation matrix with the questions above as the main focus of discussion. Three criteria were not discussed yet: who benefits or suffers (unintended consequences), the costs to the regulated community (state costs were discussed in some detail), and the timeframe most appropriate to each idea. Also, one suggested idea, the use of electric 'neighborhood' vehicles, was not reviewed at all due to lack of time. This idea will be reviewed and evaluated by each workgroup member individually before the next meeting at which time it will be discussed briefly by the whole group.

Ranking of ideas based on evaluation matrix will be completed at next meeting.

State tax credit for purchase of hybrid vehicle

- Tax credit on annual income tax filing or sales tax exemption at time of sale
- New vehicle purchases only or all purchases

- Cost based on 600K new vehicle registrations per year assuming 3% market penetration and ~\$2,000 per vehicle
- Could sunset at set market penetration percentage
- Emissions of pollutants of concern is not always directly related to fuel economy

State gas-guzzler tax

- Started as SUV tax; using mpg as basis hits broader range of vehicles
- Not all SUVs really that bad – especially new hybrids
- Many cars not very good
- Mirror operation of current federal tax
- Emissions of pollutants of concern is not always directly related to fuel economy

Employee trip reduction program

- Voluntary
- State promoted

Early vehicle retirement program – voluntary; \$500

- Must require vehicle be in operating condition and be currently registered over previous year
- Limits based on vehicle age or actual emissions?
- Must ensure prompt destruction of vehicle
- Partnership with auto salvage industry may be problematic

Convert fleets to hybrid or alt. Fuel vehicles

- Mandatory for government fleets
- Voluntary for corporate
- Emissions from alternate fuels not always better
- Focus on ethanol (E10, E85)

Public awareness and education

- Anti idling
- Vehicle maintenance
- Mid-day refueling
- Drive-thru windows
- Tire inflation
- Could be done in partnership w/ AAA or the insurance industry

Provide repair assistance for older vehicles

- Include income testing
- Might be best to combine with early retirement and current waiver programs
- Extensive record keeping and fraud issues

Increase inspection frequency for older vehicles – at 10yrs (combine w/ complete frequency overhaul)

Track vehicle repair records and allow for inspection bypass w/ frequent repairs

- Logistic nightmare
- Possible privacy issues

State tax credit for alt. fuels/bio-fuels

- Some unknowns regarding tailpipe emissions with alternate fuels
- Primary focus on ethanol (E10, E85)

Hydrogen vehicles

- Infrastructure intensive
- While not within scope for this group, source of H₂ can be huge pollution issue

Travel demand management

- Telecommuting
- Alternative workweek scheduling

- Preferred parking
- All voluntary with state education/awareness programs

Registration fee based on vehicle weight with steep increase for heavier vehicles – variation on gas-guzzler tax

Ban drive thru banks/fast food/etc.

- Probably extremely unpopular
- Benefit may not be as clear cut as expected if idling not well enforced

Expand NJT weekend/night service

- Concerns about very low usage actually being worse than people in cars
- Could alternate vehicles be used (vans vs. buses?)
- Some issue of perceived safety

Registration fee based on VMT – variation on gas-guzzler tax

Employer shuttles to train/bus stations

- What is source of funds
- Questionable effectiveness

Neighborhood electric vehicles – to be discussed at next meeting

Park-n-ride out of urban areas

Older vehicle retrofits (catalytic converters)

- Extension of the repair assistance concept
- Compatibility with older vehicles may be problematic

Fleet requirements (mpg/emissions requirements)

- Adoption of CA standards
- Major regulatory battle with EPA if dealing with mpg

Expand bike/pedestrian trails for transportation and improve quality of trails for all uses

Increase fuel tax

- Large impact on disadvantaged communities
- Small increase would have minimal impact (witness minimal changes with current high prices)

Revise gasoline formulation (regionally?)

- Conflicting authorities with EPA especially on oxygenated fuel
- Benefit hard to quantify
- 'Boutique' fuels add to expense

Increase anti-idling education/enforcement

- Easy to do
- Potential for some public backlash

Increase overall I/M frequency

- Several options discussed
- Remove 4 year new car exemption
- Maintain 2 year interval for vehicles until 10 years
- Annual inspection for cars over 10 years
- Use of mileage difficult but probably better

Wrap-up

Next meeting: Thursday August 11th at 10 am at NJDOT headquarters (Foran Building) in Ewing, NJ.

Transportation for those who wish to travel to the Trenton area by train can be coordinated through Jeff Cantor.

SUMMARY

Prepared by Jeff Cantor
On Monday July 25th, 2005



Gasoline Cars And Trucks Workgroup Meeting

Held 8/11/05

NJ-DOT HQ – Foran Building

Meeting called by: John Gorgol

Facilitator: Jeff Cantor

Attendees: Joseph Caravella, TransOptions; Sudhir Joshi, NJDOT; Nathan Cumar, NJDOT; Steve Jurow, NJ Transit; Jeff Cantor, NJDEP; Rob Schell, NJDEP; John Gorgol, NJDEP; Rich Janiak, NJDEP; Jim Arose, NJMVC; Jerry Lutin, NJ Transit; Kirk Barrett, Montclair University (see attached table for complete contact information)

Materials: Minutes from last meeting; evaluation matrix listing brainstorming ideas

Introduction/Announcements [5 minutes]

Brief introductions of attendees followed by a review of the minutes from last meeting.

Overview [10 minutes]

Began with evaluation of remaining ideas from last meeting and new suggestions using the same evaluation matrix and criteria. Then developed method for ranking ideas for possible recommendation (high, medium, and low) using the following steps:

- Significant environmental benefit – a score greater than 3 with the understanding that short term and long term benefits might be different
- Look for any fatal flaws – a score of less than 1 in any category but especially technical feasibility and cost
- Highest overall score

During discussion it was agreed that there is no single best way to do this ranking and that subjective judgments would be critical. It was also suggested that an idea which might not be appealing today for short term use and inclusion in the pending SIP might be very attractive in years to come. Therefore it is important that ALL ideas be carried forward as part of the public record and be periodically reevaluated.

Discussion [3 ½ hours w/ break for lunch]

Discussion on neighborhood electric vehicles identified three different ideas; electric shuttle vehicles in self contained communities, electric charging stations at train stations and shopping malls, and privately owned – low speed electric vehicles for use on short errands. Each of these ideas was evaluated separately along with two other ideas left over or missed from the last meeting and one brand new idea.

Shuttle vehicles in community (electric)

- Senior communities; high density areas with integrated services
- Similar to shuttles already in use in some areas (Hoboken)
- Education may be all that is needed as economics could be positive
- Long term potential much better than short term

Support electric vehicle charging stations

- Could partner with PSE&G, GPU etc
- Locate at train stations, shopping malls, downtown shopping districts
- Provide charging station; owner pays for electricity (credit card)
- Short term potential very low due to lack of vehicles

Pollution credit trading program

- Allot credits to each car/driver based on societal cost of driving

- Drivers who don't need all of their allotment can sell to those who use more
- Trading directly or through brokers (state run or private)
- Credits needed determined by annual VMT and certified emissions
- Biggest positive in making pollution costs real to drivers

Expand NJ Transit route geography

- Similar issues as extended timetable
- Costs very high (especially for rail)
- May have negative impact if rider ship is too low

Park-n-ride out of urban areas

- Example: lot on I-195 in Robbinsville w/ shuttle service into Trenton
- Probably only work if combined with shuttles
- Might induce sprawl (is this our concern?)

Evaluations of a couple of ideas from the previous meeting were revisited. The environmental benefit of revised gasoline formulation was down graded significantly as it was felt that very little improvements can still be made in this area for the pollutants of interest to this group (PM and NO_x). It was also felt that the change in I/M frequency should just be made for older vehicles as changes to the new vehicle exemptions would be very unpopular, be very expensive due to additional inspection volume, and probably have little impact on emissions.

Ranking of ideas based first on environmental benefit, as this is likely to be the first criteria of the Department. It was then recognized that a very low score in any of the other criteria but particularly technical feasibility or cost would stop the implementation completely. Ideas with environmental benefit of three or greater and without a fatal flaw – one or less in the other criteria – will be considered the 'high' group. Those with moderate scores across the board will be the 'medium' group and the remainder the 'low' group.

Based on this process, the groupings are as follows:

High	Medium	Low
Anti-idling education/enforcement	Tax credit for purchase of hybrid vehicles (high efficiency)	Electric shuttles in structured communities
Roadside RSD (gross emitter or clean screen)	Convert state and large corp. fleets to hybrid or alt. fuel	Electric vehicle charging stations
Repair assistance for older cars	General education programs (drive-thru, tire inflation, hot-weather refueling) partnered w/ AAA etc	Expand NJT night/weekend service
Employee trip reduction programs	Mpg/emissions requirements for large fleets	Extend NJT routes (geography)
Travel demand management	Employer shuttles to train/bus	Revise gasoline formulation
State gas guzzler tax (inc'd credit for high efficiency cars)	Tire inflation programs	Hydrogen vehicles
Annual I/M for cars over 10 years	Registration fee based on VMT	Increase fuel tax
Alternate fuels tax credit		Early retirement programs
Park-n-ride out of urban areas		Pollution credit trading program
		Expand bike/hiking trails
		Catalytic converter retrofit program
		Registration fee based on vehicle weight
		Ban drive-thru banks, fast food

Wrap-up

Next meeting: Wednesday September 7th at 10 am at the Bureau of Motor Vehicle Inspection & Maintenance; 380 Scotch Road, Ewing, NJ. Transportation for those who wish to travel to the Trenton area by train can be coordinated through Jeff Cantor.

Prior to the next meeting, an initial draft of the workgroup's final report to the Department will be distributed for review. Further development of the report will be the main agenda item in September.

SUMMARY

Prepared by Jeff Cantor
On Monday July 25th, 2005



Gasoline Cars And Trucks Workgroup Meeting

Held 9/7/05

NJ-DEP BMVIM – 380 Scotch Rd, Ewing, NJ

Meeting called by: Jeff Cantor

Facilitator: Jeff Cantor

Attendees: Joseph Caravella, TransOptions; Sudhir Joshi, NJDOT; Nathan Cumar, NJDOT; Steve Jurow, NJ Transit; Jeff Cantor, NJDEP; Rob Schell, NJDEP; John Gorgol, NJDEP; Rich Janiak, NJDEP; Tom Bednarz, NJMVC; Jerry Lutin, NJ Transit; Kirk Barrett, Montclair University; Cheryl Drach, USPS; Amy Hillman, NJDEP (see attached table for complete contact information)

Materials: Minutes from last meeting; initial draft of the final report

Introduction/Announcements [5 minutes]

Brief introductions of attendees followed by a review of the minutes from last meeting.

Overview [10 minutes]

Reviewed the schedule for the remainder of the workgroup process and the creation of our report. September 30th marks the end of our time to generate new ideas and descriptions; the month of October is the period for finalizing the report and our analysis before it is submitted to DEP management. We are currently a little ahead of schedule.

Discussion [3 ½ hours w/ break for lunch]

Reviewed the current report draft focusing on idea descriptions that were incomplete, detailed descriptions for the most promising suggestions, the executive summary and introduction, and the summary matrix of ideas showing level of promise as well as timeframe.

Added one new idea – a trans-Hudson passenger rail tunnel to allow NJ Transit to play a larger role in alleviating congestion and the associated pollution from auto commuters into NYC.

The results of these discussions will appear in the next draft of the report to the workgroup members.

Wrap-up

No additional meetings are planned. The only activity that remains for the workgroup is the continued revision of the final report that will be accomplished iteratively via email.
