SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Staff Report

Proposed Rule 1194 – Commercial Airport Ground Access

August 2000

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TABLE OF CONTENTS

ATTACHMENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AFV	Alternative Fueled Vehicle
AGA	Airport Ground Access
AGS	Airport Ground Support
AQMD	South Coast Air Quality Management District
ARB	California Air Resources Board
ATCP	Air Toxics Control Plan
CNG	Compressed Natural Gas
CO	Carbon Monoxide
COU	Courtesy Fleet Vehicle
EPA	United States Environmental Protection Agency
EXM	Fleet Vehicles Exempt From Airport Licensing Fees
HD	Heavy-Duty Vehicle
HSC	Health and Safety Code Section
LAX	Los Angeles International Airport
LDT	Light-Duty Vehicle
LEV	Low Emission Vehicle
LNG	Liquefied Natural Gas
MDV	Medium-Duty Vehicle
NMOG	Non-Methane Organic Gases
NOx	Oxides of Nitrogen
PM2.5	Particulate Matter Less than or Equal to 2.5 Microns in Diameter
PM10	Particulate Matter Less than or Equal to 10 Microns in Diameter
PSC	Passenger Stage Corporation
SULEV	Super Ultra Low-Emission Vehicle
TAC	Toxic Air Contaminant
TAX	Taxicabs
TCP	Transport Chartered Party
ULEV	Ultra Low Emission Vehicle
USEPA	United States Federal Environmental Protection Agency
VOC	Volatile Organic Compound
ZEV	Zero Emission Vehicle

EXECUTIVE SUMMARY

The South Coast Air Quality Management District (AQMD) is proposing a series of rules as part of a Clean Fleet Vehicles Program. The intent is to increase the use of cleaner vehicles in public and private fleets.

Despite the significant progress that has been made in reducing both mobile and stationary source emissions over the past twenty years, the South Coast Air Basin (Basin) which includes Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino Counties, is designated as an extreme nonattainment area for ozone and a serious nonattainment area for PM10 (particulate matter less than or equal to 10 microns in diameter). Based on the latest information available, on-road motor vehicles contribute more than half of all oxides of nitrogen (NOx), a precursor of ozone and particulate matter (PM), and carbon monoxide (CO) to the entire emissions inventory.

Proposed Rule 1194 (PR 1194) specifies that passenger transportation services at commercial airport terminals begin purchasing cleaner burning vehicles beginning July 1, 2001 when adding or replacing vehicles in their fleets. These emission reductions would be in excess of the current federal and state requirements. Requirements are applicable to all vehicle fleets with 15 or more vehicles picking up passengers at the six major commercial airports in the AQMD's jurisdiction. Because of the added air toxic concerns near commercial airports, compliant vehicles under PR 1194 are vehicles certified by the California Air Resources Board (ARB) to either meet or exceed the applicable model year ultra-low emissions vehicle (ULEV) standards (for light- and medium-duty vehicles) or are ARB certified alternative fueled (AFV) vehicles (for heavy-duty vehicles). AFVs are powered by alternative fuels such as compressed or liquefied natural gas (CNG/LNG), liquefied petroleum gas (LPG or propane), methanol, electricity, or fuel cells. PR 1194 compliant vehicles meet a lower certified mass emissions exhaust standards than would normally be required. Fleet operators would acquire these cleaner vehicles when purchasing, leasing or contracting for additional or replacement fleet vehicles.

This proposal will reduce the public's exposure to toxic air contaminants (TAC) as well as criteria pollutants from on-road vehicles. By 2010, total emissions reductions are estimated at 8 tons/year of VOC, 92 tons/year of NOx, 288 tons/year of CO, and 6 tons/year of PM10. These benefits would be surplus to existing state and federal regulations governing emission levels from on-road motor vehicles. Compared to the three fleet rules adopted to date (Rules 1191 - Clean On-Road Light- and Medium-Duty Public Fleet Vehicles; 1192 - Clean On-Road Transit Buses; and 1193 - Clean On-Road Residential and Commercial Refuse Collection Vehicles), PR 1194 would achieve greater emission reductions compared to Rules 1191. The incremental increase in vehicle cost associated with ULEVs and alternative fueled vehicles versus low emissions vehicles (LEV) can range up to a maximum of $35,000, the differential cost for a heavy-duty transit vehicle (HD). Compliant vehicles and products including substitutes are available. Potential cost factors include increased vehicle purchase price, operational and maintenance costs, and infrastructure costs. Based on the emissions benefits from the proposed rule, the cost effectiveness of the proposed rule is estimated to be $2,690 per ton.

SCOPE AND INTENT

PR 1194 is being developed by AQMD staff as part of a series of proposed fleet rules, affecting different types of fleets, operating within the boundaries of the AQMD. The intent of the rules is to promote the use of clean vehicle technologies in fleets, including those under consideration in PR 1194, in order to reduce toxic and criteria air pollutants. PR 1194 specifically focuses on commercial airport ground access (AGA) vehicle fleets at commercial airports within the AQMD. In this report AGA fleet vehicles are defined as courtesy shuttles and those vehicles licensed to pick-up passengers at commercial airports for a fee (such as taxi, door-to-airport shuttle, and limousine services).

PR 1194 requires fleets of 15 or more AGA vehicles to acquire less polluting, commercially available vehicles being produced by manufacturers. These include for the purposes of this rule ARB certified ULEVs, super ultra-low emissions vehicles (SULEV), zero emissions vehicles (ZEV) or in certain applications ARB certified AFVs. AFVs are powered by alternative fuels such as compressed or liquefied natural gas (CNG/LNG), liquefied petroleum gas (LPG or propane), methanol, electricity, or fuel cells.

There are a number of airport related fleet vehicles that provide passenger transportation services that are not affected by PR 1194. These include:

1. **AGA passenger drop-off activities.** Compliance tracking and verification of such fleet activities would be difficult. A significant portion of the same fleet vehicles that provide AGA passenger pick-up services are, however, likely also to provide drop-off services.
2. **Airport ground support operations (AGS) or "Tarmac Side" fleet vehicles** - owned and operated by airports for the express purpose of supporting airport operations and not used to transport passengers outside the airport.
3. **Long distance coach service** - typified by coaches that contain restrooms and are equipped with luggage racks and overhead storage bins, and generally provide services out of the Basin.
4. **Interstate and extra-AQMD operations.** Coach services (buses) that operate for the majority of the time outside AQMD boundaries or provide out of state transportation.
5. **Other fleet vehicle rule applicability** - Any vehicle covered by any other fleet vehicle rule, including public owned transit vehicles, school buses, and cars and trucks owned by governmental entities that may be used to pickup employees at airports or on an as needed basis.

Commercial airports for the purposes of this report currently are the six major airports with scheduled commercial airline service located within AQMD boundaries, shown in Table 1. These airports are ranked by the total estimated annual passenger traffic.

Table 1. Commercial Airports Within the AQMD Boundary

Airport	Code	Passengers* (Millions)
Los Angeles International	LAX	61.2
John Wayne	SNA	7.5
Ontario International	ONT	6.4
Burbank-Glendale-Pasadena	BUR	5.0
Palm Springs	PSP	1.2
Long Beach	LGB	0.9

* Rounded to nearest 100,000, unless otherwise noted. Based on latest annual data available.

PURPOSE AND LEGAL AUTHORITY

The AQMD is the local government agency responsible for air quality assessment and improvement. Despite the significant progress that has been made in reducing both mobile and stationary source emissions over the past twenty years, the Basin which includes Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino Counties, is designated as an extreme nonattainment area for ozone (severe for the Salton Sea Air basin) and a serious non-attainment area for PM10. The Basin also has PM2.5 levels (small particulate matter 2.5 microns or less in diameter) almost twice the annual PM2.5 standard level proposed by the USEPA.

The 1997 Air Quality Management Plan (AQMP) shows that mobile sources emit significant amounts of volatile organic compounds (VOC), NOx, CO and PM. Based on the latest information available, on-road motor vehicles contribute more than half of all NOx (and CO) to the entire emissions inventory. NOx is a precursor to ozone and PM10. In August 1998, the California Air Resources Board identified particulate matter from diesel engine exhaust as a toxic air contaminant (TAC) and as a surrogate for all diesel exhaust emissions including hydrocarbons as TACs. The Multiple Air Toxics Exposure Study II (MATES II conducted by the AQMD in the Summer 1998 through Spring 1999) and a special air monitoring study at LAX conducted in the Summer of 1999, identified mobile sources, particularly diesel particulate, as the overwhelming contributor to local air toxic risk levels. MATES II also showed the area in and around LAX is a regional toxic hotspot with respect to gasoline combustion sources (the significant gasoline components that are considered toxic air contaminants are benzene and 1,3-butadiene) and diesel particulates (see MATES II p. 4-14). Virtually all fleet vehicle types affected by PR 1194 operate at LAX, with most also operating at the other five major commercial airports. In addition, many of these fleets emit air emissions, including toxics, into highly urbanized pedestrian breathing zones and neighborhoods adjacent or in close proximity to airports.

Based on the results of MATES II, in March 2000, the AQMD Governing Board adopted the Air Toxics Control Plan (ATCP), which included an early action control measure now known as the Clean Fleets Program. The development of the Clean Fleets program is, in large measure, being driven by the results of the MATES-II and special LAX air monitoring study and regulatory efforts, which are detailed below. The development of the AQMD's

Clean Fleets Program is also given impetus by recent state and federal rulemaking efforts and actions that are intended to, or have resulted in, lowering on-road mobile source emissions by reducing tailpipe exhaust emissions and/or requiring the sale or purchase of alternative fuel vehicles. Some of these more important rulemaking activities, as well as their significance to the proposed fleet rule, will be described below, including the ARB's LEV Program and the U.S. Energy Policy Act (EPAct) requirements. Information is also provided regarding federal alternative-fuel policies for fleets and the AQMD's Clean Fleets Program. The purpose of the fleet rules is to accelerate the mitigation of the air contaminants described in this section. On June 16, 2000 the AQMD Governing Board adopted three fleet rules (Rules 1191, 1192, and 1193). These fleet vehicle rules covered light- and medium-duty public fleet vehicles, transit vehicles, and refuse collection vehicles. PR 1194 will achieve emissions reductions specifically associated with commercial airports operations.

For light- and medium-duty gasoline vehicles, benzene and 1,3-butadiene are the primary hydrocarbon compounds that contribute significantly to the overall toxic risk level. For medium- and heavy-duty vehicles operating on diesel engines, particulate emissions (used as a surrogate for all toxic contaminants found in diesel exhaust) contribute to overall toxic risk levels.

The primary air quality objective of PR 1194 is to reduce air emissions and toxic risk levels within the AQMD. California Health and Safety Code Section (HSC) Section 40919(a)(1) and (a)(4), provide certain nonattainment air districts (those that are designated serious or above for ozone) the legal authority to adopt measures requiring fleets to use a significant number of low-emission vehicles. For PR1194 a fleet of vehicles is any number of vehicles operating under a common entity providing transportation services at commercial airports. Low emission vehicles are defined in HSC Section 39037.05. Furthermore, HSC Section 40447.5(a) also specifically authorizes the AQMD to regulate fleets, both public and private. Low emission vehicles, and to the maximum extent feasible, AFVs, are to be required. Requirements would be implemented when adding to or replacing existing fleet vehicles and when new fleets are formed. Under HSC Section 40447.5, emergency vehicles are exempted from requirements until a sufficient infrastructure is in place such that emergency response is not impaired.

MATES II AND SPECIAL AIR MONITORING AT LAX

In November 1999 the AQMD issued a draft final report for the MATES II study. The objectives of this study were to monitor and evaluate urban air toxics, as well as update the toxics emission inventories for the Basin and conduct air toxic dispersion modeling to simulate the monitored data. During the course of the study, the ARB listed diesel particulate emissions as an air toxic contaminant. As such, the study provided an analysis of the potential air toxic impacts of diesel emissions. The study represented one of the most comprehensive air toxics programs ever conducted in an urban environment. The scope of the study included the monitoring of more than 30 toxic air pollutants at 24 sites over a one-year period ending last spring. The AQMD collected more than 4,500 air samples and with the ARB performed more than 45,000 separate laboratory analyses of these samples. The findings of this study indicated that the cancer risk from some air toxics in the Basin has declined by as much as 75 percent over the last decade. However, it also showed that based upon more extensive monitoring of the variety of toxic compounds in the air, the current

cancer risk from toxic air pollution averages about 1,400 in a million in the region. As shown in Figure 1, the study found that 71 percent of this cancer risk is attributable to diesel particulate. Other important toxic species contributing significantly to this cancer risk, originating from both gasoline- and diesel-powered mobile sources as well as stationary sources, are 1,3 butadiene (8 percent of risk), benzene (7 percent of risk), and carbonyls, which include formaldehyde and acetaldehyde (3 percent of risk).

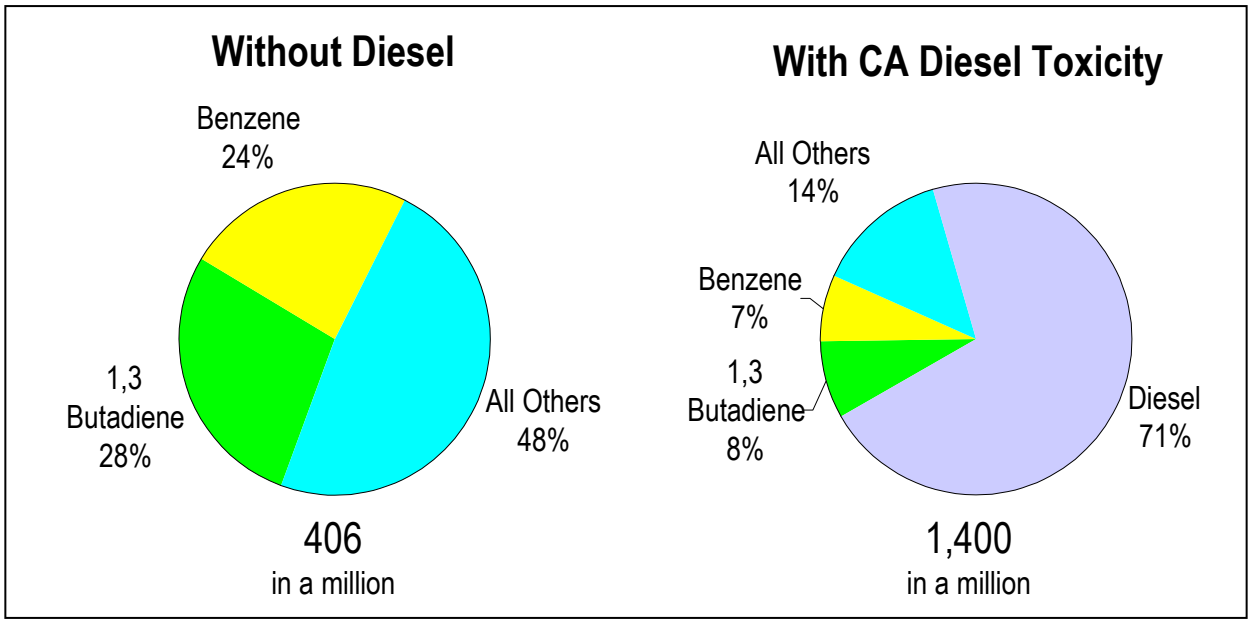


Figure 1. MATES-II Estimated Average Basin Toxic Risk Contributions

Figure 2 shows that Los Angeles and John Wayne airports as well as the major freeway interchanges are significant hotspots for other than diesel air toxics.

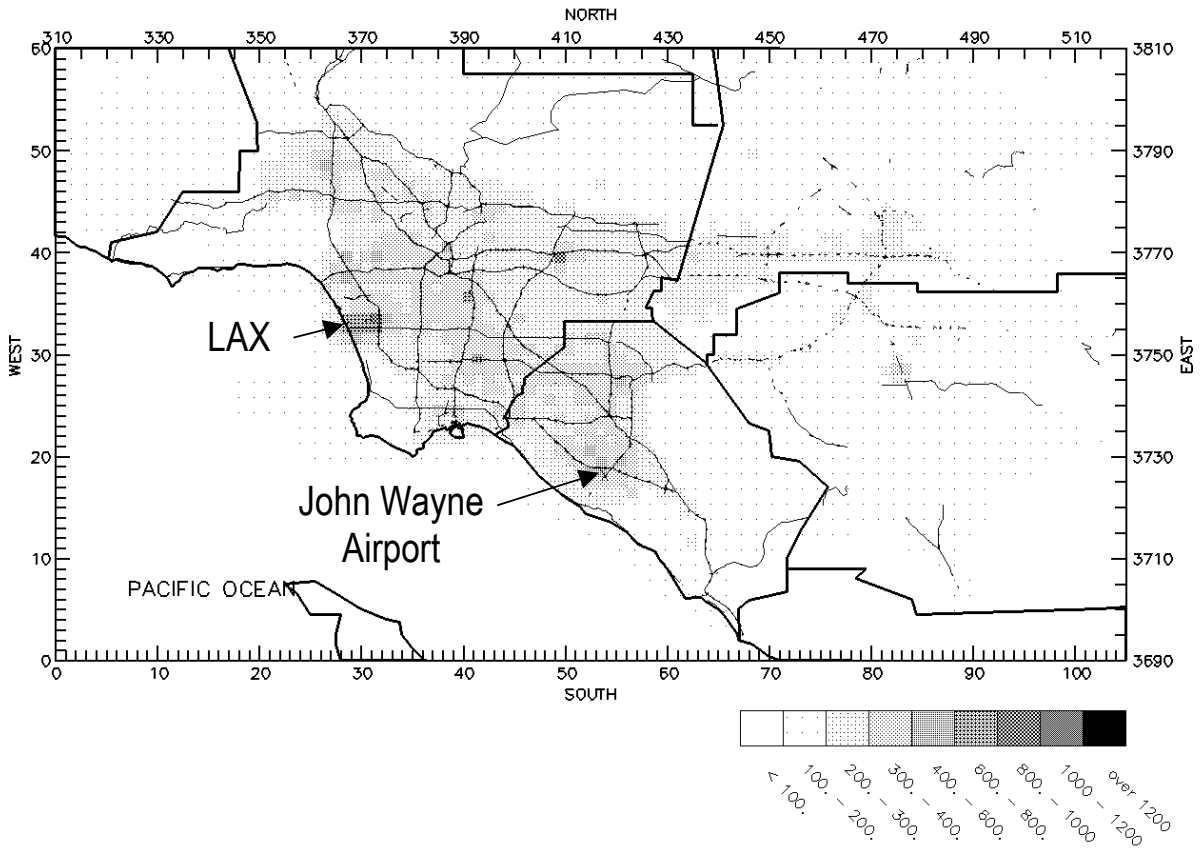


Figure 2. Model Estimated Risk for the Basin (Without Diesel Sources).

During 1999, the AQMD performed special sampling of PM and VOC levels in the vicinity of the Los Angeles International Airport (LAX). Sampling was conducted at 24 sites, including residential and "fixed" location sites. The AQMD conducted this study to address public concerns about air pollutants which may be related to LAX operations, that are potentially impacting the air quality of communities near the airport. The principal findings of this study are as follows:

- The key toxic contaminants detected are benzene, butadiene, and elemental carbon. (The latter is used as a surrogate for diesel particulates.)

- All key compounds are associated with mobile sources.

- All key compounds are lower at residential sites than at Aviation and Felton School sites, which are influenced by emissions from major arterials (Aviation Blvd. and 405 Freeway) and potentially from emissions from the airport.

- Compared to the MATES-II Study, key compounds at residences north and south of the airport (upwind of the airport) tend to be lower than the MATES-II monitoring network averages, while residences east of the airport (downwind of the airport) tend to be near the network average.

- Fallout samples depict greater abundance of larger-than-PM_{10}-sized combusted oil soot particles than is observed at most other locations in the South Coast Air Basin.

- Limited sampling provides indicators of conditions. Longer term sampling is needed for more complete risk assessments.

Based on this study, higher concentrations of elemental carbon, benzene, and 1,3 butadiene were measured at locations adjacent to LAX compared to sites further away from the airport. Figures 3 and 4 show a comparison of elemental carbon (indicator of diesel combustion sources) and benzene (indicator of gasoline combustion sources) levels adjacent (Aviation Blvd.), but not at the Felton School site, to LAX compared to the basinwide maximum levels measured in the MATES-II, respectively. Staff believes that the higher concentrations of pollution near LAX are due primarily to the on-road vehicle activity resulting from airport operations, since the specific types of pollutants associated with these higher concentration levels are characteristic of on-road vehicle operation.

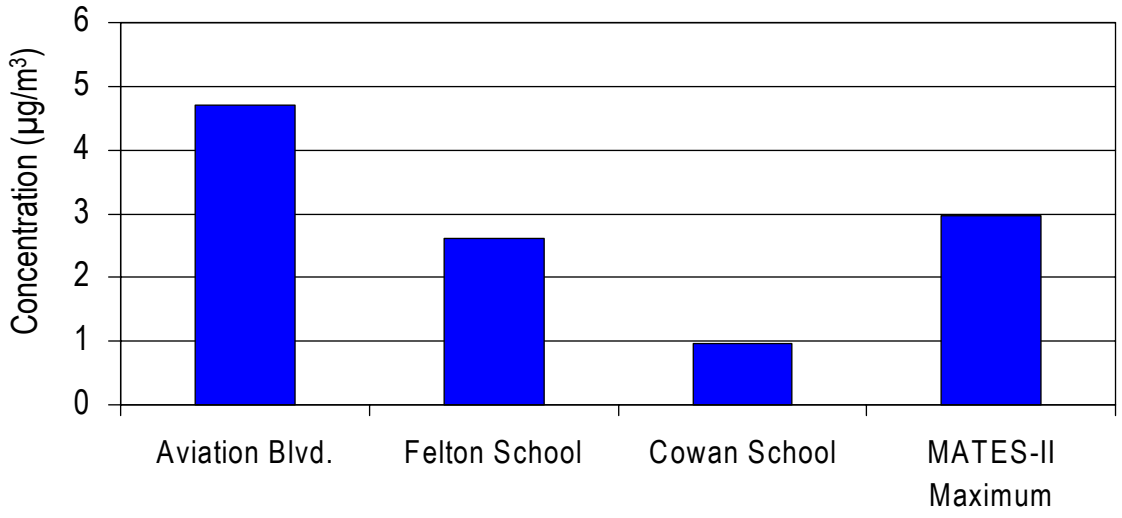


Figure 3. Measurement of Elemental Carbon from the LAX Study Compared to Mates-II

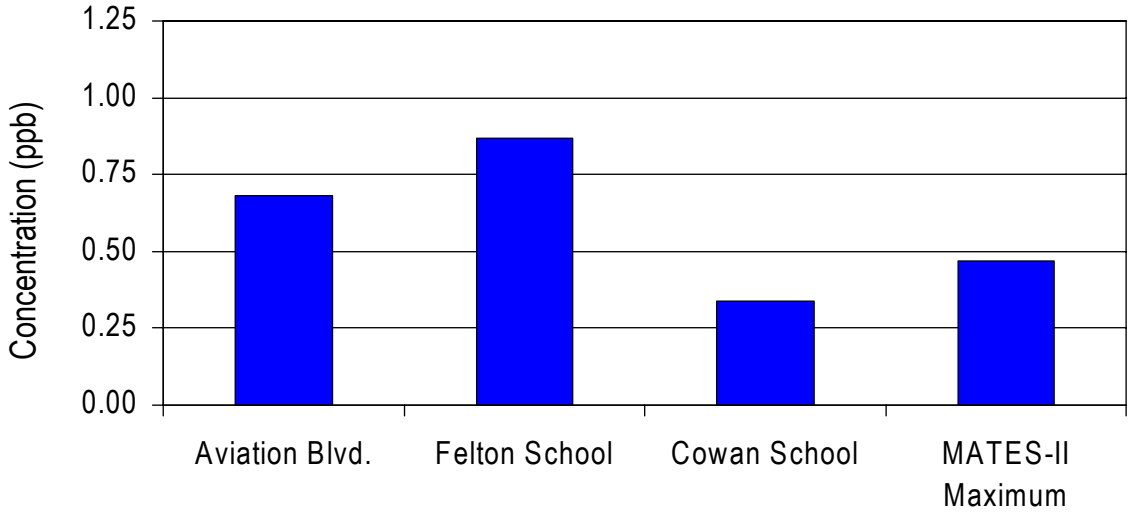


Figure 4. Measurement of Benzene from the LAX Study Compared to Mates-II

One of the primary objectives of PR 1194, based on the findings of this study, is to reduce the contribution to overall toxic risk of diesel exhaust emitted by AGA fleets and the gaseous air toxic compounds associated with gasoline vehicles in the region, by accelerating the implementation of currently available alternative LEV technology. Criteria pollutant benefits will also result.

ARB IDENTIFICATION OF DIESEL EMISSIONS AS A TOXIC AIR CONTAMINANT

In the early 1980's, the ARB established one of the nation's first comprehensive state air toxic programs - the California Air Toxics Program. Its goal is to protect public health by reducing air toxic emissions that pose the highest risk to Californians. This requires two separate steps. During the first step, risk assessment, the ARB identifies the highest risk substances called toxic air contaminants. In the second step or risk management step, the ARB and local air pollution control districts investigate and adopt measures requiring air toxics sources to minimize risk to public health.

There are approximately 200 substances on the TAC list. On August 27, 1998, the TAC list was expanded to include particulate emissions from diesel-fueled engines, culminating a near-decade long scientific investigation into the health effects of exposure to the fine particles and other pollutants in diesel exhaust. Similar to the findings of the MATES II study, the ARB identification of diesel exhaust particulate matter as a surrogate for all diesel exhaust emissions as a TAC provides another driving force for the AQMD to pursue the development of a cleaner vehicle fleet rule as a strategy to mitigate public exposure to this pollutant.

AIRPORT FLEET CATEGORIZATION

AGA transportation at airports in southern California is diverse. There is a wide range both of vehicle categories and classes. Service providers are public, private and contract. Table 2 gives a simple overview of the types of vehicles and the emissions classes that each falls into. For a more detailed breakdown see Table 6.

Table 2. Vehicle Types and Emissions Classes in PR 1194

Emissions Class	Abbr.	Vehicle Types
Passenger Car and Light Duty Vehicles	PC and LDT	All passenger cars. All vehicles under 6,000 lbs. GVWR. All limousines, town cars, and taxicabs.
Medium-Duty Vehicles	MDV	All commercial vans >7 passengers.
Heavy-Duty Vehicles	HD	Buses.

LAX uses the categorization shown in Table 3 to classify all authorized AGA fleets. All of the other five major commercial airports use this scheme or a variant, which consists of fewer but similar categories. As such the categorization scheme at LAX serves as a "Master Scheme."

Table 3. Categorization of Public and Private GA Fleets at LAX

Service Category	Code	Fleet Service Description
Courtesy	COU	Private short trip, such as hotel and parking lot shuttles.
Exempt*	EXM	Airport owned/operated/contracted service. Typically short to medium trip range.
Passenger Stage Corporation	PSC	Private *scheduled* services. Typically limited short to medium range trip.
Transport Chartered Party	TCP	Private, *unscheduled*, for hire, and by appointment only. Trip range is by arrangement and can vary from short to long range.
Taxi	TAX	Taxicabs

* Exempt refers to airport category classification scheme. Not exempt from PR 1194.

Fleet profiles can and do change as the number of vehicles in the fleet under discussion changes, even within the same category. An overview of each category is given below as it pertains to fleets with 15 or more vehicles in the category.

Courtesy (COU)

Vehicles in this category of authorized airport fleets are typified by HD (typically smaller sized shuttle buses) and some LDT and MDV (van) vehicles. Service providers are typically private entities such as hotels, rental car agencies and parking lot operators. The purpose of this type of service is usually to shuttle passengers between the airport and a close proximity off-site landmark. Courtesy fleet vehicles typically do not run on a schedule, rather they are operated as necessary.

Exempt (EXM)

This category of fleet vehicle is exempt from airport authority licensing fees (not from PR 1194) since it is the fleet operated by or under contract with the airport authority itself. Vehicles in this category of authorized airport fleets are typically heavy-duty vehicles (i.e. buses). At LAX there is only one exempt category AGA fleet – LAX Shuttle, comprised of a mixed fuel fleet of buses. At ONT there is an all propane fueled exempt airport fleet, comprised of 28 smaller sized school bus type vehicles. At SNA (John Wayne Airport) there are two fleets, one airport operated (AirportBus) and the other under contract to the airport (Ampco Parking). The purpose of this type of service is to provide site dedicated AGA by the airport authority. The majority of fleet vehicles in this category typically run on a schedule.

Passenger Stage Corporation (PSC)

Service providers in this airport authorized fleet category provide regular scheduled service and door-to-door service to the airport. Vehicles are not chartered. Fleets are comprised of all classes of vehicle, but are predominantly light duty vehicles (vans).

Transport Chartered Party (TCP)

Private, for hire, unscheduled AGA vehicles comprise overwhelmingly the single largest overall category of authorized airport fleets. Fleets are of all vehicle classes and types. This category has the most vehicle variety including but not limited to the following vehicle types: passenger buses, SUVs, minivans, limousines, town cars, and sedans.

Taxis (TAX)

In order for taxicabs to operate at an airport they must typically be authorized by the governing authority for the airport. As a result taxi fleets tend to have a specific dedicated airport for pickup of passengers. While a taxi can take a customer anywhere, trips tend to be to major metropolitan centers and other locations within the AQMD. There are currently ten entities authorized to operate in the City of Los Angeles of which nine are also authorized to pick up passengers at LAX. Many of the taxicab drivers in the Basin own their vehicles and most do not own more than one vehicle. However, in the City of Los Angeles most of these individual owner/drivers belong to either an association or a cooperative. The association or cooperative act as the responsible entity that a regulatory body (e.g., taxicab commissions, city or county regulatory bodies that the power to regulate taxicab services within their jurisdiction) can hold responsible in enforcing local codes or ordinances. The association or cooperative provides centralized dispatching of its taxicab members.

Relative to whether these organizations are considered a "fleet", by definition, a vehicle "fleet" is a collection of vehicles that "operate as a unit". Under this definition, the vehicles that are in an association or cooperative would be considered a "fleet" since they operate as unit. Factors entering into this definition include the fact that an association or cooperative performs the operation of directing (or assigning) available taxicabs to pick up passengers. In addition, the association or cooperative have a common color scheme and logo for the vehicles and provides an identification number. In the City of Los Angeles Department of Transportation Taxicab Rules and Regulations of the Board of Taxicab Commissioners, Section 101 defines an "ASSOCIATION or CO-OPERATIVE means a Board [Board of Taxicab Commissioners of the City of Los Angeles] authorized independent taxicab

enterprise or organization owned and operated by its Members for the financial benefit of its Members" and Section 127 defines a "TAXICAB POOL means the fleet of taxicabs that is managed and controlled completely by Grantee [as defined in Section 110 including association and co-operatives] and not by a member of Grantee." As such, the Taxicab Rules and Regulations clearly point to associations and cooperatives as entities that manage fleets of taxicab vehicles even though these vehicles may be individually owned. In the "Request for Proposals (RFP) for Taxicab Franchises in All Service Zones of the City of Los Angeles" recently released by the City of Los Angeles Department of Transportation, a "minimum fleet size" of 70 taxicabs for any Grantee must be met (page 3 of the RFP). Thus, the City of Los Angeles recognizes associations and cooperatives as operators of fleets of taxicabs. HSC Section 40919(a)(4) states that the AQMD may develop "measures to achieve the use of a significant number of low-emission motor vehicles by operators of motor vehicle fleets." As such, PR 1194 would apply to operators who direct or assign taxicabs to specific destinations for passenger pickup. The 15 or more vehicles restriction proposed in the rule is provided for consistency with HSC Section 40447.5 and other fleet rule proposals. Of the 2,450 total taxicabs in fleets of 15 or more authorized to operate at the six commercial airports in the District, 2,083 (or 85%) operate at LAX. Table 4 shows the approximate distribution of all taxicabs at the six commercial airports.

Table 4. Number of Taxi Companies and their Vehicle Populations for Fleets ≥ 15 Vehicles, by Airport

Airport	Number of Taxi Companies	Vehicles	Fleet Vehicle Distribution %
LAX	9	**2,083**	**85.0**
SNA	1	**85**	**3.5**
ONT	2	**90**	**3.7**
BUR	2	**32**	**1.3**
PSP	2	**38**	**1.6**
LBG	1	**122**	**4.9**
TOTAL	17	**2,450**	**100.0**

VEHICLE POPULATION AND OPERATOR PROFILES

The number of registered vehicles currently comprising a single fleet ranges from 237 down to a single vehicle. These fleets are typically private companies that average about five registered vehicles. PR 1194, however, only affects fleet entities operating 15 or more vehicles. In proposing this rule, the AQMD relies on statutory authority which defines the relevant fleet in terms of the fleet operator rather than the fleet owner [HSC Section 40919(a)(4)]. However, for consistency with the other AQMD fleet rule proposals, the size of 15 or more vehicles per fleet is referenced. Table 5 shows the number of public/private entities authorized to operate fleets of 15 or more airport-registered vehicles, by category. Some or all the vehicles of these service providers may be comprised of exempt vehicles. Almost all of the private fleet operators have their entire fleet of vehicles registered at most if not all the airports. This allows fleet operators to operate between the airports or at a particular airport at anytime. Due to the distance to the Palm Springs airport from the other major airports, fleets there tend to be comprised mostly but not solely of local operators.

Since almost all service providers operating within the AQMD boundaries are authorized to operate at LAX these numbers are a good approximation of the total number of unique airport AGA fleets. Service providers typically seek to obtain authorization at LAX prior to registering at other airports and many airports use the registration criteria and categorization or a subset thereof in use at LAX. Some of the companies shown in Table 5 may be exempt based on the type of fleet service provided (i.e. long haul buses). Overwhelmingly, the largest concentration of companies and fleets are in the TCP category as indicated by the shaded area in Table 5. This category is comprised of small to medium sized private companies with the typical fleet consisting of several vehicles from all the classes. As an example, one airport authorized company that would be impacted by PR 1194 has a fleet comprised of the following mix of vehicles: 6 vans, 5 limousines, 22 buses and 8 luxury sedans.

Table 5. Authorized AGA Operators with ≥ 15 Vehicle Fleets[(a)]

Category	LAX	SNA	ONT	BUR	PSP	LGB
Courtesy (COU)	8	-	-	-	-	-
Exempt (EXM)	1	2	1[(d)]	-	-	-
Passenger Stage Corp. (PSC)	8	8	3		*	-
Transport Chartered Party (TCP)	77	35	-	3[(e)]	2	6
Taxis (TAX)	9	1[(b)]	2	2	2	1
TOTAL[(c)]	104	46	6	5	4	7

- either no companies in this category or the airport does not track/authorize these fleet types
* Morengo Basin Transit (but no permit requirement)
(a) Almost all companies service more than one airport with the same fleet
(b) American Taxi (fleet entirely alternative fueled)
(c) Total number of PR 1194service providers authorized per airport
(d) Fleet is entirely propane fueled
(e) Both PSC and TCP licensed

Unless information to the contrary was available, any PSC or TCP category service provider registered at multiple airports was conservatively assumed to be operating the same vehicles at all airports. This eliminates any potential multiple counting of the same vehicle registered at several different airports. Table 6 shows the resulting estimated vehicle population for all fleet vehicles affected by PR 1194 at all six major airports, using this approach. Vehicles in each category are classified by the most likely applicable ARB emissions class (i.e. PC, LDT1, LDT2/MDV2, MDV3, MDV4, MDV5 or HD). The footnotes for Table 6 list the assumptions used for classifying each vehicle in the population.

Table 6. Number of Airport Authorized Vehicles, by Category and Class, in Fleets with ≥ 15 Vehicles

Category	COU	EXM	PSC	TCP	TAX	TOTAL
PC and LDT1	0	0	504	1,155	2,450	4,109
LDT2/MDV2	3	0	73	123	0	199
MDV3	22	0	20	129	0	171
MDV4	2	0	0	3	0	5
MDV5	0	0	0	3	0	3
HD	150	81	62	1,133	0	1,426
TOTAL	**177**	**81**	**659**	**2,546**	**2,450**	**5,913**

PC and LDT1: all passenger cars, limousines (all between 5,000 -6,000 lbs. gvwr), and vans □7 passengers

LDT2/MDV2: 8 <= vans <=11 passengers and suvs <= 6,000 lbs. gvwr

MDV3: 12 <=vans <=15 passengers, all suvs > 6,000 lbs. gwvr

MDV4: 16<=vans <=20 passengers

MDV5: 21 <=vans <=30 passengers

HD: all buses

Table 7 summarizes the information in Table 6 into the 3 broad emissions classes: LDT, MDV and HD.

Table 7. Summary Vehicle Population Categorization and Class

Category	COU	EXM	PSC	TCP	TAX	TOTAL
LDT	3	0	577	1,278	2,450	4,308
MDV	24	0	20	135	0	179
HD	150	81	62	1,133	0	1,426
TOTAL	**177**	**81**	**659**	**2,546**	**2,450**	**5,913**

LDT = PC and LDT1 and LDT2

MDV = MDV2, MDV3, MDV4 and MDV5

From Table 7 it can be seen that the greatest concentration of vehicles in any class in fleets comprised of 15 or more vehicles is within the TCP category. Taxi's comprised the second largest concentration of vehicle sub-population and are comprised solely of passenger car (LDT) class vehicles.

VEHICLE POPULATION: PR 1194 VS. FLEETS ≥ 15 VEHICLES

Table 6 is a count of all vehicles comprising authorized fleets of 15 or more vehicles at all of the six major airports. To estimate emission reductions due to PR 1194 two adjustments are made to this fleet vehicle population. These adjustments remove vehicles from the population within fleets of 15 or more vehicles that will not be impacted by PR 1194. Such vehicles are either already clean fuel vehicles as required under PR 1194 or are otherwise exempt from the requirements of PR 1194.

Existing Alternative Fueled Vehicles in AGA Fleets

There are several current AGA fleets that are either partially or wholly comprised of AFVs. These are light-duty trucks and medium-duty vehicles in the PSC, COU/EXM, TAX categories, as follows:

1. By contract, ONT operates a fleet of **28 Propane** powered, EXM category shuttle buses. There is a propane fueling station located at ONT to service this fleet of vehicles.
2. By contract, American Taxi is the only taxi company allowed to pickup passengers at SNA. It operates a fleet of about **170 dedicated CNG** taxicabs.
3. SuperShuttle, an authorized PSC service company at several of the airports, operates a mixed fuel fleet of about 263 light duty vans, of which about **85** are **CNG** fueled.
4. LAX shuttle an authorized EXM category entity operates a fleet of **41 LNG** buses out of a total mixed fuel fleet of 53 vehicles.

An AGA clean fleet program is especially practical since vehicles begin/end their trips at a fixed site - the airport. These airports are all within proximity of existing/potential fixed refueling and service sites. In addition, John Wayne and Burbank airports indicated that alternative fuel refueling stations are proposed to be built in or adjacent to the respective airports.

Table 8 shows the adjusted vehicle fleet population with AFVs deducted.

Table 8. Revised Vehicle Population –AFVs Removed

Category	COU	EXM	PSC	TCP	TAX	TOTAL
PC and LDT	3	0	492	1,278	2,365	4,138
MDV	24	0	20	135	0	179
HD	150	12	62	1,133	0	1,357
TOTAL	**177**	**12**	**574**	**2,546**	**2,365**	**5,642**

Rule Exempt Vehicles

The intent of PR 1194 is to also exempt vehicles from rule requirements that operate predominantly outside the boundaries of the AQMD and those that are equipped with restrooms and luggage racks indicating long haul service. Service providers in the TCP category operate almost all of these types of vehicles. While TCP category companies can charter any vehicle in their fleet for any distance and period of time buses are typically the preferred fleet vehicle types. For PR 1194 the HD class comprises the population of buses. It is estimated that there are approximately 871 long haul buses (or 61%) within the heavy duty/bus class could potentially be exempt from PR 1194.

Table 9 shows the estimated population of all vehicles that would be subject to PR 1194 by category and class after alternative fueled vehicles and long haul bus counts are deducted.

Table 9. Estimated Vehicle Population Subject to PR 1194

Category	COU	EXM	PSC	TCP	TAX	TOTAL
PC and LDT	**3**	**0**	**492**	**1,278**	**2,365**	**4,138**
MDV	**24**	**0**	**20**	**135**	**0**	**179**
HD	**150**	**12**	**62**	**262**	**0**	**486**
TOTAL	**177**	**12**	**574**	**1,675**	**2,365**	**4,803**

The TCP category sub-population still comprises a significant 1,675 (or just over one-third) of all 4,803 vehicles. This is more than double the sub-population of the COU, EXM and PSC categories combined. The taxi sub-population comprised of 2,365 (or 49%) of all 4,803 vehicles is roughly equivalent to the all other vehicle sub-populations combined.

ARB'S LOW-EMISSION VEHICLE PROGRAM

ARB's LEV program, not to be confused with LEVs, was established in the early 1990's. It is segmented into LEV I and LEV II based on standards that will be phased in during this decade. This program serves as the backdrop for PR 1194 as described below.

Overview

In adopting the LEV regulations in 1990-91, the ARB established the most stringent exhaust regulations ever for LDT and medium-duty vehicles. Mass exhaust emissions standards for LDT and medium-duty vehicles are show in Attachment 2. There are six increasingly stringent tiers, as follows:

Tier 1
Transitional Low Emissions Vehicle (TLEV)
Low Emissions Vehicle (LEV)
Ultra Low Emissions Vehicle (ULEV)
Super Ultra Low Emissions Vehicle (SULEV)
Zero Emissions Vehicle (ZEV)

The regulations include three primary elements — (1) tiers of exhaust emission standards for increasingly more stringent categories of low-emission vehicles, (2) a mechanism requiring each manufacturer to phase in a progressively cleaner mix of vehicles from year to year, and (3) a requirement that a specified percentage of passenger cars and lighter light-duty trucks be ZEVs. It should be noted that for model year 2004 and beyond the Tier 1 and TLEV tiers have been eliminated.

Compliant Product Availability and Trends

Since the beginning of the ARB's LEV rule implementation in 1994, light-duty truck and medium-duty vehicle original equipment manufacturers (OEM's) have produced an array of vehicle models with varying types of control technologies that reduce vehicle emissions in varying degrees (Attachment 4). The dominant emission control strategy has been the development of sophisticated engine control systems (computerized control of the vehicle fuel system) in combination with extremely efficient aftertreatment hardware (advanced catalytic converters) as applied towards gasoline vehicles. In addition, these control technologies have also been employed on a number of commercially available AFVs powered by natural gas, M85 (a mixture of 85 percent methanol and 15 percent gasoline), and LPG. As mentioned above, OEM's have been required, and in some cases have voluntarily chosen, to produce for sale limited numbers of dedicated electric vehicles and hybrid electric vehicles. One of the objectives of the proposed rule is to require the purchase

of the cleanest vehicles for fleets, taking advantage of the varying levels of emission control relative to the wide array of vehicles being produced for compliance with the ARB LEV regulation. It is noteworthy that, other than zero-emission vehicles, the cleanest internal combustion engine light-duty truck commercially available today is the year 2000 model year Honda Civic, powered by compressed natural gas. This vehicle is 90 percent cleaner than the average new 2000 model year vehicle, and it is certified as a SULEV, according to ARB's LEV regulations. It would likely not be suitable as a taxicab. However, suitable ULEV substitutes are available (ULEV Buick Park Avenue and CNG Ford Crown Victoria).

ULEV AND AFV AVAILABILITY

A number of comparable class, manufacturer and model ARB certified ULEVs and AFVs are available for the 2000 model year (see Attachments 3 and 4). The type and number of these vehicles is expected to increase in subsequent model years as manufacturers are required to provide a lower ARB certified average emissions threshold product offering as exhaust emission standards become more stringent. Tier 1 and TLEV categories have been phased out as of this current model year further reducing the average allowable emissions threshold. In order for manufacturers to achieve this lower emissions average progressively more reduced emissions vehicles of all classes and types will have to comprise the product offering.

No ULEV or AFV Cadillacs, limousines or Ford Excursions and Expeditions are currently available. These vehicle types are currently part of the inventory of vehicles owned and operated by private fleet operators that would be subject to PR 1194. Due to their novelty and differentiation TCP operators especially include these vehicles as part of their marketing mix to attract customers. Shortened useful lifetimes due to the high usage of these vehicles in fleet applications means that manufacturers will need to begin offering comparable ULEV products within the next two to three years. The only ULEV SUV currently available is the Dodge Durango.

In addition to natural gas alternative fueled vehicles, there are several bi-fuel and dedicated liquefied petroleum gas (propane) fueled vehicles available commercially. In addition, there are technological developments for aftermarket conversion of gasoline engines to be powered by propane. Efforts are underway to have these conversion kits certified by CARB to meet the ULEV emission standard. The availability of such a CARB certified kit would provide an additional option to comply with PR 1194.

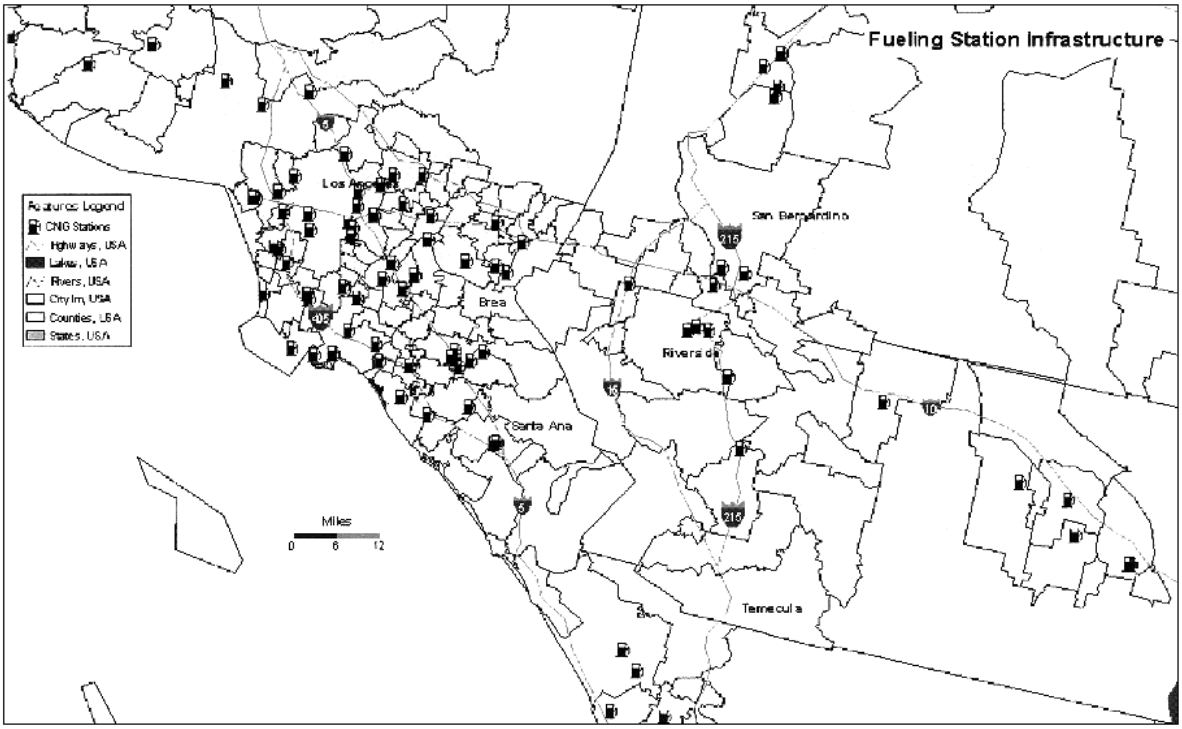
ADDITIONAL CURRENT AFV FLEETS

1. The City of Los Angeles approved a package of clean fuel taxicab incentives, including a 5% ULEV mandate, as part of an effort to refranchise taxicab services for the City.
2. Phoenix Sky Harbor Airport taxicab service recently approved three taxi services to operate 162 alternative fueled vehicles at its airport. By the beginning of 2001 all of the taxicabs in operation at the airport will be CNG powered.

3. San Francisco clean taxi incentives include reduced city fees, preferred airport access (due to expire within one year), and extended operating life for an extra year (to four years total.)
4. New York City clean taxi incentives allow clean taxicabs to operate for an extra two years (for a maximum of seven years).
5. Oakland International Airport has approved a mandate requiring that 50% of the taxicabs serving the airport be either electric or natural gas fueled by the beginning of 2001.
6. Dallas/Fort Worth International Airport has approved a mandate requiring that 50% of taxicabs serving the airport be clean fuel taxicabs. The airport is currently considering increasing the mandate to 100%.

EXISTING AFV INFRASTRUCTURE

There are a number of AFV refueling/recharging stations that are close to the major commercial airports subject to PR 1194. These stations are identified in the www.cleancarmaps.com website. There are many other conveniently located refueling station locations throughout southern California and the number of stations is expected to increase. Currently, there is a natural gas refueling station located near LAX and several in the downtown Los Angeles area. Figure 5 shows a map from the "cleancarmaps.com" website, showing the locations of compressed natural gas fueling sites in the Basin. Similar maps can be developed for other alternative fuel fueling stations in the Basin. Since AGA fleet vehicles generally travel throughout the District, these vehicles can potentially utilize all available AFV refueling/recharging stations located in the District in addition to those refueling/recharging stations that are close to the commercial airports. There are two publications the reader may refer to for additional station sites: Natural Gas Fueling Stations Directory (published by the California Natural Gas Vehicle Coalition) and a directory of propane fueling stations (published by the Western Propane Gas Association). For the most recent information contact the appropriate organization for the fuel you will be using.



Source: The Gas Company

Figure 5. Location of CNG fueling sites in the South Coast Air Basin

PR 1194 REQUIREMENTS

The intent of PR 1194 is to achieve the maximum exhaust emissions reductions feasible for AGA vehicles. PR 1194 (see Attachment 1) requires the acquisition of vehicles that have been certified to ARB's ULEV or cleaner standard for light- and medium-duty vehicles and alternative fueled heavy-duty vehicles if these vehicles are authorized to pick up passengers at commercial airports. Other purchases of vehicles that do not operate at commercial airports are not subject to PR 1194. Requirements for all fleets affected by this proposal begin July 1, 2001 but are bifurcated based on the type of vehicles provided. Taxicabs and all shuttle services that pick-up passengers and then travel outside the airport will be required to purchase, lease, or contract for ULEVs when replacing existing light- and medium-duty fleet vehicles for the same service. However, for shuttle van services that provide multiple-party passenger transportation services and generally operate on non-fixed or nonscheduled routes such as Supershuttle, beginning July 1, 2001, 50 percent of new purchases or leases must be light- or medium-duty vehicles certified by ARB to ULEV or cleaner emission standards. Beginning July 1, 2002, 100 percent of new purchases or leases of vehicles for shuttle van services must be certified by ARB to be ULEV or cleaner. New purchases of heavy-duty fleet vehicles that pick-up passengers at the airport and transport them to parking lots, hotels/motels and new transit vehicle purchases, leases and operations contracts, shall be ARB certified alternative fuel vehicles.

In order to implement these fleet acquisition requirements, as part of Rule 1194 the AQMD will publish a list of light- and medium-duty vehicle/engine models that meet ULEV or cleaner standards. It is intended that fleet managers will simply choose vehicles from this list for rule compliance purposes when light-duty vehicles and medium-duty vehicles need to be

acquired for their vehicle fleet. Since manufacturers certify their vehicles with ARB throughout the year, the list of compliant vehicles will be updated every six months. Attachment 3 lists model year 2000 light-duty vehicles and medium-duty vehicles that would qualify for the proposed rule, if it were in effect today. In addition, vehicles not on the list would also qualify if they have been certified by ARB to meet ULEV or cleaner emission standards.

For a list of ARB certified PR 1194 complaint heavy-duty engines for model year 2000, see Attachment 4. Attachment 4 is provided for illustrative purposes only. There will be a different list of engines when actual rule implementation begins.

EMISSIONS REDUCTION ESTIMATION AND BENEFITS

Criteria Pollutants

ARB vehicle emissions standards exist for all new vehicles and engines that enter the southern California market. Emissions reductions for the purposes of PR 1194 then are calculated as the incremental mass exhaust emissions reductions that are expected to be obtained by limiting new and replacement fleet vehicle to ULEVs as opposed to current purchase practices of mainly used Tier 1 police vehicles. A baseline emissions inventory is not estimated in this case since only incremental reductions (Tier 1 versus ULEV) can be attributed to PR 1194. Incremental emissions reductions for this rule were estimated as the difference between ARB mandated and PR 1194 proposed fleet average maximum allowable emissions per vehicle for the given model year, category, class and tier of vehicle.

For passenger cars and light-duty trucks, manufacturers sell a specific mix of vehicles certified to the various categories of low-emission vehicles to ensure compliance with a fleet-average NMOG emission level. Emission reductions are achieved over time by the gradual reduction of this fleet average NMOG standard. The fleet-average NMOG emission level for passenger cars, for example, is specified at 0.07 g/mi for the 2001 model year. This level is reduced annually, lowering to 0.035 g/mi for the 2010 model year. In the medium-duty vehicle category, the ARB LEV regulation achieves emission reductions by requiring all vehicles to be certified to more stringent emission categories in specified model years (i.e., LEV in 2002 and ULEV in 2004). Notwithstanding the requirement schedule, medium-duty vehicle manufacturers also have the flexibility, similar to that of light-duty trucks, to balance the sale of higher emitting vehicle models (e.g., vehicles certified to Tier-1) with vehicles certified to more stringent emission standards (e.g., vehicles certified to ULEV).

Emission reduction benefits are expected to consist of reduced toxic exposure to certain types of chemical species, including but not limited to diesel particulate matter, 1,3 butadiene, benzene, and carbonyls (formaldehyde and acetaldehyde). Emission reduction benefits also include reduced generation of criteria pollutants including hydrocarbon, carbon monoxide, and NOx. The proposed fleet rule is specifically based on achieving emission reductions beyond the ARB Low Emission Vehicle regulation.

Emission reductions of the proposed fleet rule will be the result of affected vehicle fleets purchasing a cleaner mix of vehicles than they would have otherwise purchased.

Specifically, fleets are required to purchase vehicles certified to the ULEV category or cleaner. Using ARB manufacturer sales projections and staff projections of low-emission vehicles to be purchased by fleets as a result of the proposed fleet rule, corresponding fleet average emission rates by pollutant can be calculated and combined with vehicle population data to estimate overall emission reduction benefits.

The methodology used to estimate incremental emissions reductions is also based on the average (typical) vehicle miles traveled (VMT) and the useful life of a vehicle in the given sub-population. Table 10 shows the typical age of a vehicle by category and class. For taxicabs most airport and city licensing authorities have vehicle age restrictions. In the city of Los Angeles, and hence at LAX, no taxi vehicle can be in service where the model year exceeds 8 years from the current year. The typical age of a City of LA taxi is about five years old. At SNA and PSP taxicabs cannot be in service if the model year exceeds 4 years from the current year. For all other vehicle types a database of over 3,400 individual records was utilized. The most applicable averaging statistic (mean, mode, median) was used to smooth variations between individual vehicles and select the most representative vehicle model year. Across all vehicle classes and categories data on vehicle age shows a uniform type distribution. In the Final Program Environmental Assessment (PEA) for the fleet rules which includes PR 1194 the assumption is made that the vehicle population of any fleet is replaced on a rolling average basis. In this case, for any given fleet the current vehicle model year forms the terminal year, the average vehicle model year statistic the middle year and earliest vehicle model year the beginning year of the uniform distribution. The useful life (Table 11) of any given vehicle (by class and category) is approximated as double the average vehicle in-service (age) values as shown in Table 10. This approach seeks to smooth out variations as opposed to using the value for the span between the latest and oldest model cars in the applicable fleet categories.

Table 10. Average In-Service Age of Vehicles by Category and Class

Category	COU	EXM	PSC	TCP	TAX
PC and LDT1	-	-	1997	1998	1995
LDT2	1998	-	1999	1997	-
MDV2	-	-	-	-	-
MDV3	1998	-	1995	1997	-
MDV4	1994	-	-	1997	-
MDV5	-	-	-	1997	-
Buses <20	1995	-	-	1997	-
Buses 20-45	1995	-	-	1997	-
Buses 46-57	-	1999	1982	1994	-
Buses >58	-	-	-	1996	-

Table 11. Typical Estimated Vehicle Useful Lifetime (Years)

Category	COU	EXM	PSC	TCP	TAX
PC and LDT1	-	-	6	4	5[a]
LDT2	4	-	2	6	-
MDV2	-	-	-	-	-
MDV3	4	-	10	6	-
MDV4	12	-	-	6	-
MDV5	-	-	-	6	-
Buses <20	10	-	-	6	-
Buses 20-45	10	-	-	6	-
Buses 46-57	-	2	36[b]	12	-
Buses >58	-	-	-	8	-

[a] Taxicabs could operate 10 years, except for the 5 and 4 year caps placed by the licensing authorities.
[b] This value is not used in calculations since this class consists mainly motorcoaches that are exempt from PR 1194.

Table 12 lists the estimated average VMT for each emissions class by category, based on a number of discussions with fleet operators. This is the most difficult variable to estimate due to a lack of publicly available information.

Table 12. Typical VMT by Class and Category (Miles/Year x 1000)

Category	COU	EXM	PSC	TCP	TAX
PC and LDT	-	-	30	30	70
MDV	70	-	70	70	-
HD	100	100	100	100	-

The methodology described herein, and outlined in the PEA, is used to analyze the data presented in this report to estimate incremental reduction benefits by pollutant for PR 1194. Table 13 shows the cumulative tons of reduction by pollutant, class and category by 2010 (8.5 years after implementation of PR 1194). Table 14 summarizes this information. All estimated emissions reductions and benefits from implementation of PR 1194 are surplus beyond existing and proposed on-road mobile source rules from ARB and the U.S. Environmental Protection Agency (EPA.)

Table 13. Estimated Total Emissions Reductions (Tons) by 2010

		COU	EXM	PSC	TCP	TAX	TOTAL
PC/LDT1	NMOG	-	-	1.17	3.51	58.3	63.0
	NOx	-	-	0.25	0.78	111.5	112
	CO	-	-	54.6	163	2117	2335
LDT2/MDV	NMOG	0.03	-	0.84	1.27	-	2.14
	NOx	0.00	-	0.04	0.04	-	0.08
	CO	1.49	-	37.9	56.8	-	96.2
MDV3	NMOG	0.24	-	0.16	1.32	-	1.72
	NOx	0.00	-	0.00	0.00	-	0.00
	CO	2.77	-	1.16	12.3	-	16.3
MDV4	NMOG	0.90	-	-	0.04	-	0.94
	NOx	0.00	-	-	0.00	-	0.00
	CO	0.00	-	-	0.00	-	0.00
MDV5	NMOG	-	-	-	0.05	-	0.05
	NOx	-	-	-	0.00	-	0.00
	CO	-	-	-	0.00	-	0.00
HD	PM	15.0	2.16	6.21	36.8	-	60.1
	NOx	174	22.4	72.0	399	-	668

Totals may differ since all values are rounded off to the nearest significant digit

Table 14. Summary of Estimated Total Emissions Reductions by 2010

POLLUTANT	PC+LD+MD [tons]	HD [tons]	CUMMULATIVE TOTAL [tons]	TOTAL (Avg. Annual) [tons/yr]
NMOG	67.8	-	67.8	**8**
NOx	113	668	781	**92**
CO	2447	-	2447	**288**
PM	-	60	60	**6.0**

Totals may differ since all values are rounded off to the nearest significant digit

Some factors that have not been assumed as significant for this analysis but could be if conditions change in the future (unless otherwise indicated) include the following:

1. ARB emissions standards may become more or less stringent for future implementation years.
2. As discussed in the Final Program Environmental Assessment (PEA) for the Fleet Rules, rate of fleet vehicle turnover may decrease to avoid the purchase/lease of a new mandated class vehicle (except where mandates exist such as some taxi fleets). The PEA concluded that this was not significant. This, however, is not likely to occur for one TCP category, for light-duty vehicles due to usage and marketing factors.
3. Type of vehicle purchased – PR 1194 would require the purchase of certified AFVs or ARB certified vehicles to meet or exceed the ULEV standards. Current emissions reduction estimates assume that most purchases will be certified AFVs or ULEVs. Incentives and marginal price differences might encourage a higher volume of SULEV/ZEV vehicles to be purchased than anticipated. In this case emissions reductions will be higher than estimated.

4. Some companies, especially those currently with 15 or slightly more vehicles, may decide to reduce their affected vehicle population below 15 in order to be exempted from PR 1194. Based on inventory data, the number of companies that could currently pursue this option is not significant.

Air Toxics

Estimated Relative Toxicity of Gasoline Powered Taxicabs Certified to Tier 1 Emission Standards Versus Gasoline and Natural Gas Powered Taxicabs Certified to ULEV Emission Standards

The relative air toxic risks of Tier 1 certified gasoline powered taxicabs versus ULEV certified gasoline and natural gas taxicabs were estimated using an approach based on determining risk weighted toxic emissions for the two fuels under consideration. The risk weighted emissions are determined by multiplying the emission rate for individual toxic constituents of the exhaust by their respective cancer potency factor, and then proportionately adjusting these values by an estimated annual mass emission rate of particulate matter (PM) and non-methane hydrocarbon emissions (NMHC). The purpose of this analysis is to use these weighted toxicity factors to estimate the number of Tier 1 certified gasoline powered taxicabs that are roughly equivalent to one ULEV certified gasoline powered taxi as well as the number of Tier 1 certified gasoline powered taxicabs that are roughly equivalent to one ULEV certified natural gas powered taxi, based on toxic risk.

For the purposes of this analysis, the toxic components for gasoline and natural gas powered taxicabs were estimated based on the PM contribution of nickel and hexavalent chromium emissions, and the NMHC emissions of formaldehyde, acetaldehyde, benzene, and 1,3 butadiene. ARB speciation profiles were used to develop nickel and hexavalent chromium fraction of the natural gas and gasoline PM exhaust. With regard to NMHC components for natural gas, a paper from West Virginia University (SAE paper 972971) was used to develop the benzene and 1,3 butadiene NMHC fractions, and an ARB speciation profile from an industrial natural gas-powered internal combustion engine was used to develop the formaldehyde and acetaldehyde NMHC fractions. (The West Virginia University paper provided speciation data generated from a CNG-powered engine used in on-road vehicle applications, but did not specifically include formaldehyde and acetaldehyde data.) For gasoline, ARB speciation profiles were used to develop the exhaust fractions of formaldehyde, 1,3 butadiene, benzene, and acetaldehyde.

For the purposes of this specific analysis, the annual PM emission rates for gasoline and natural gas taxicabs were assumed to be equivalent, based on a gram per mile emission rate developed from the exhaust PM inventory and vehicle miles traveled for catalyst equipped passenger cars from a year 2000 emission inventory using EMFAC 99. The annual NMHC mass emission rates for gasoline vehicles was based on the NMOG emission standards associated with the TIER 1 (0.25 gram per mile) and ULEV (0.04 grams per mile) certified passenger cars.

Table 15 shows the annual PM and NMHC mass emission rates, relative toxicity factors for PM and NMHC exhaust components, and the overall weighted toxicity factor. Based on these overall weighted toxicity factors, Table 16 shows the number of ULEV certified gasoline powered taxicabs that are roughly equivalent to one Tier 1 certified gasoline powered taxi as well as the number of ULEV certified natural gas powered taxicabs that are

roughly equivalent to one Tier 1 certified gasoline powered taxi. The number is equal to the overall weighted toxicity factor for Tier 1 certified gasoline powered taxicabs divided by the corresponding value for the ULEV certified gasoline powered taxi or the ULEV certified natural gas powered taxi.

Based on this analysis, it can be concluded that significant toxic emission benefits will occur on a per vehicle basis from the use of a ULEV certified gasoline or natural gas powered taxicab, as compared to a Tier 1 certified gasoline powered taxicab. Specifically, it is estimated that based on relative toxic risk, one Tier 1 certified gasoline powered taxi is equivalent to 11 ULEV certified natural gas powered taxicabs and 5 ULEV certified gasoline powered taxicabs.

Table 15

Estimated Relative Toxic Risk for Taxicab Vehicles

POLLUTANT	COMPOUND	Gasoline Tier 1	Gasoline ULEV	CNG ULEV
PM (lb/yr)		0.62	0.62	0.62
NMHC (lb/yr)		38.5	6.2	6.2
Resultant Emission-weighted Toxicity Risk Factors				
	METALS[1]	0.0241	0.0241	0.0241
	NMHC[2]	0.8182	0.1309	0.0519
OVERALL WEIGHTED TOXIC RISK		0.8423	0.1550	0.0760

1. Toxic risk for PM exhaust in gasoline and CNG vehicles based on nickel and hexavalent chromium (Cr^{+6}).
2. Toxic compounds in NMHC exhaust emissions for CNG and gasoline vehicles included in this analysis are formaldehyde, acetaldehyde, benzene, and 1,3 butadiene.

Table 16

Estimated Taxicab Vehicle Toxic Risk Ratio[1]

RISK RATIO	
MINIMUM	MAXIMUM
5	11

1. Minimum represents number of ULEV certified gasoline powered taxicabs that are roughly equivalent to one Tier 1 certified gasoline powered taxi and maximum represents the number of ULEV certified natural gas powered taxicabs that are roughly equivalent to one Tier 1 certified natural gas powered taxi, based on toxic risk.

Estimated Relative Toxicity of Diesel and Natural Gas Powered Heavy-Duty Vehicles

The relative air toxic risks of diesel and corresponding natural gas heavy-duty vehicles were estimated using an approach based on determining weighted toxic risk factors for the two fuels under consideration. The weighted toxic risk factor is determined by multiplying the individual toxic constituents of the exhaust by their respective cancer potency factor, and then proportionately adjusting these values by an estimated annual mass emission rate of particulate matter (PM) and non-methane hydrocarbon emissions (NMHC). The purpose of this analysis is to use these weighted toxicity factors to estimate the number of natural gas heavy-duty vehicles that would be roughly equivalent to one diesel urban bus based on toxic risk.

For the purposes of this analysis, the toxic component analyzed for diesel heavy-duty vehicles is limited to total PM emissions. This is because ARB listed diesel PM emissions as a surrogate for all toxic air contaminants emitted from the diesel exhaust and the toxic risk factor for diesel PM already incorporates toxic risks from all other constituents in diesel exhaust. For natural gas heavy-duty vehicles, the relative toxic risk was estimated based on the PM contribution of nickel and hexavalent chromium emissions, and the NMHC emissions of formaldehyde, acetaldehyde, benzene, and 1,3 butadiene. ARB speciation profiles were used to develop nickel and hexavalent fraction of the natural gas PM exhaust. With regard to NMHC components, a paper from West Virginia University (SAE paper 972971) was used to develop the benzene and 1,3 butadiene NMHC fractions, and an ARB speciation profile from an industrial natural gas-powered internal combustion engine was used to develop the formaldehyde and acetaldehyde NMHC fractions. (The West Virginia University paper provided speciation data generated from a CNG-powered engine used in on-road vehicle applications, but did not specifically include formaldehyde and acetaldehyde data.)

For the purposes of this specific analysis, the annual PM emission rates for diesel and natural gas heavy-duty vehicles were developed using the same assumptions contained in the criteria pollutant benefit methodology. These assumptions include diesel heavy-duty vehicle emissions of 0.1 g/bhp-hr for 2000 and subsequent years, and natural gas heavy-duty vehicle emissions of 0.03 g/bhp-hr for 2000 and beyond. The annual mass emission rate of NMHC emissions for natural gas engines are highly variable based on input received by engine manufacturers, as evidenced by ARB certification data for natural gas engine families approved for sale in California. For the purposes of this analysis, a range of NMHC emissions was estimated using this certification data. Using this range, which corresponds to 0.3 g/bhp-hr to 0.8 g/bhp-hr, for the 2000-to-September 2002 time period and 0.3 to 0.5 g/bhp-hr for the October 2002-and-beyond time period, assumed conversion factors of 2.6 bhp-hr/mi for heavy-duty vehicles, and an annual mileage assumption of 100,000 miles per year, annual NMHC emissions were determined.

Table 17 shows the annual PM and NMHC mass emission rates, relative toxicity factors for PM and NMHC exhaust components, and the overall weighted toxicity factor. Based on these overall weighted toxicity factors, Table 18 shows the number of CNG heavy-duty vehicles that is roughly equivalent to one corresponding diesel-powered heavy-duty vehicle. The number is equal to the overall weighted toxicity factor for the diesel heavy-duty vehicle divided by the corresponding value for the natural gas heavy-duty vehicle. Different timeframes are utilized in this analysis to account for more stringent emission standards for PM, NOx, and NMHC that are implemented in the overall time frame being analyzed.

Based on this analysis, it can be concluded that significant toxic emission benefits will occur on a per vehicle basis from the use of a natural gas heavy-duty vehicle versus a diesel heavy-duty vehicle. Depending on the timeframe, one diesel heavy-duty vehicle is estimated to have the same toxicity as up to 81 corresponding natural gas heavy-duty vehicles. It should also be noted that these toxic reductions will mostly occur in the urban areas where MATES II results indicated significant toxic exposure.

Table 17

Estimated Relative Toxic Risk For Heavy-Duty Vehicles

POLLUTANT	COMPOUND	2000 THRU 9/2002		10/2002 & LATER	
		DIESEL	CNG	DIESEL	CNG
PM (lb/yr)		57.3	17.2	57.3	17.2
NMHC (lb/yr)		----	172-458	----	172-286
Resultant Emission-weighted Toxicity Risk Factors					
	DIESEL PM[1]	171.8	----	171.8	-----
	METALS[2]	----	0.67	----	0.67
	NMHC[3]	----	1.45-3.86	----	1.45-2.42
OVERALL WEIGHTED TOXIC RISK		171.8	2.12-4.53	171.8	2.12-3.11

1. Based on ARB input, the unit risk factor associated with diesel PM includes toxic risk contributions for all other compounds in exhaust.
2. Toxic risk for PM exhaust in CNG vehicles based on nickel and hexavalent chromium(Cr^{+6}).
3. Toxic compounds in NMHC exhaust emissions for CNG vehicles included in this analysis are formaldehyde, acetaldehyde, benzene, and 1,3 butadiene.

Table 18

Estimated Heavy-Duty Vehicle Toxic Risk Ratio[1]

TIME PERIOD	RISK RATIO	
	MINIMUM	MAXIMUM
2000 thru 9/2002	38	81
10/2002 and later	55	81

1. Number of CNG vehicles equal to one equivalent diesel vehicle based on toxic risk.

COST ANALYSIS

Estimates for capital cost (purchase price) differentials for ULEVs and AFVs are expected to decline over time as model availability increases. Model year 2000 vehicles are the standard currently.

ULEVs

The cost impacts of the proposed rule are expected to be minimal since cleaner gasoline vehicles are promoted by the rule. Staff has evaluated the cost of current vehicle models that are ARB certified to the ULEV or higher mass exhaust emissions standards and has determined that this cost range basically coincides with current vehicle costs.

AFVs

Table 19 shows the approximate vehicle price differential between the current model year AFVs as opposed to a conventionally-fueled vehicle. In the case of taxicabs the overwhelmingly predominant vehicle of choice is the Ford Crown Victoria. Chevrolet Caprice sedans, passenger vans and a few specialty vehicles complete the inventory. For model year 2000, the choice for a new taxi purchase would be between a CNG powered Ford Crown Victoria priced at about $27,000 or a comparable gasoline powered ULEV such as either the Buick Park Avenue, Ford Windstar, Chevrolet Astro or GMC Safari priced at about $22,000. In the absence of PR 1194, the typical new fleet vehicle acquisition in the TAX category is a used Ford Crown Victoria police cruiser, that is about 2 to 3 years old, priced at about $10,000 including conversion costs from the police vehicle to taxicab specifications. These police cruisers are desired because they are equipped with a "Police Package" that extends the useful life of the vehicle. Assuming that $8,000 of the $10,000 would be used as a down payment on a new vehicle, a new vehicle would cost about $19,000 before other financial incentives are accounted. With additional financial incentives such as the MSRC funds and auto manufacturer's rebates discussed later in this document, the cost differential could be reduced to approximately $11,500.

Table 19. AFV Purchase Price Differential ($)

Category	Pass. Car (Taxicabs)	Limousine, Town Car	Van	Bus
LDV	11,500	5,000	5,000	-
MDV	-	-	10,000	-
HD	-	-	-	35,000

FUNDING PROGRAMS

For those fleets that pursue the acquisition of AFVs, financing is a central issue in any effort to acquire and use these vehicles. There is a wide variety of incentives offered to encourage the expanded use of AFVs. Federal, state, and local monies/incentives are available that could potentially be used to offset costs incurred by rule compliance. Generally, incentives are available to fund differential (premium) capital costs, as well as subsidizing the capital cost of AFV refueling equipment or facilities, which would lead to significantly lower fuel cost. It should also be noted that CNG or LPG refueling equipment can potentially be installed at no capital cost by means of a long-term contract arranged between the fleet and

the alternative-fuel provider. Private funds and in-kind services may also be available that would result in lower overall fuel costs.

A list of funding sources, including identification of public or private sources, purpose of funds, limitations, contact person, and relevant Internet sites follows. It is a compiled from Internet Web sites and published material based on staff research and input received from personal contacts from relevant sources in government and private organizations. In addition, a more detailed list is provided in the AQMD Economic Report for the Clean Fleet Vehicle Rules. The purpose in providing the information is to facilitate use of the funds for Proposed Rule 1194 compliance.

Federal Incentives, Funding Sources and Regulations

U.S. Department of Energy (DOE) 1000 Independence Avenue, SW, Washington, DC 20585. General telephone number: (202) 586-5000, fax (202) 586-5049.

Energy Policy Act of 1992 (EPAct). Congress passed EPAct, or Public Law 102-486, on October 24, 1992, to accelerate the use of alternative fuels in the transportation sector. With EPAct in place, DOE's primary goals are to decrease the nation's dependence on foreign oil and increase energy security through the use of domestically produced alternative fuels. DOE's overall mission is to replace 10% of petroleum-based motor fuels by the year 2000 and 30% by the year 2010. EPAct mandates federal, state, and alternative fuel provider fleets to purchase AFVs.

Federal fleets must follow guidelines established in Executive Order 12844 (April 21, 1993) and subsequently reinforced by Executive Order 13031 (December 13, 1996). An AFV guide for federal fleets is located at http://www.whitehouse.gov/WH/EOP/OMB/html/mheda/afvguide.html. State and fuel provider fleets must meet the requirements outlined in the Alternative Fuel Transportation Program, Final Rule [10CFR Part 490], located at the Web site: http://www.afdc.doe.gov/ ottdocs/fprovrule.pdf.

Clean Cities Program. DOE's Clean Cities Program coordinates voluntary efforts between locally based government and industry to accelerate the use of alternative fuels and expand AFV refueling infrastructure. For more information, please see the Clean Cities Section of this guide on pages 1-13.

State and Alternative Fuel Provider Fleets AFV Credits Program. Congress created the credits program to encourage fleets or covered fleet operators to use AFVs early and aggressively. Credits are allocated to state fleet operators and covered Alternative Fuel Provider fleet operators when AFVs are acquired over and above the amount required, or earlier than expected. Since credits can be traded and sold, fleets have the flexibility to acquire AFVs on the most cost-effective schedule without impeding the achievement of EPAct national oil displacement goals. Please see the AFV Acquisition and Credits Web site for more information on the credits program at www.ott.doe.gov/credits, or call the National Alternative Fuels Hotline at (800) 423-1DOE or (800) 423-1363 or email at hotline@afdc.nrel.gov.

ANOPR. DOE published an advance notice of proposed rulemaking (ANOPR) for **AFV acquisition requirements for private and local government fleets** on Friday, April 17,

1998. Programs potentially created by the ANOPR would help ensure that DOE meets its energy replacement goals. A copy of the ANOPR is available on the *Federal Register Web site* at http://www.access.gpo.gov/su_docs/aces/aces140.html or directly from the Web site at http://www.ott.doe.gov/pdfs/anopr.pdf.

State Energy Program. States will promote the conservation of energy, reduce the rate of growth of energy demand, and reduce dependence on imported oil through the development and implementation of a comprehensive State Energy Program. The State Energy Program is the result of the consolidation of two formula grant programs: the State Energy Conservation Program and the Institutional Conservation Program. The State Energy Program includes provisions for competitively awarded financial assistance for a number of state-oriented special project activities, including alternative fuels. In addition to funding for special project activities, states may choose to allocate base formula funds to program activities to increase transportation efficiency, including programs to accelerate the use of alternative transportation fuels for government vehicles. For more information, contact your State Energy Office or the DOE Regional Office for your region, listed under the Points of Contact section for your state, or contact Ron Santoro at DOE Headquarters at (202) 586-8296.

Local Incentives

Motor Vehicle Registration Fees (AB 2766 funding)

Mobile Source Air Pollution Reduction Review Committee's **(MSRC)** Discretionary Funds.
This annual work program, that typically includes a HD incentive program, pays the incremental cost for the purchase of new OEM alternative-fuel engines and vehicles. For light-duty trucks the incentives for dedicated alternative-fuel OEM vehicles are based on emissions certification: $5,000 for ZEVs, $3,000 for ULEVs, $1,000 for LEVs. Contracts are with OEMs; one consumer price includes one incentive. The current program sunsets January 1, 2001.

Thirty percent of the funds collected each year from a $4 surcharge on vehicle registration created by AB 2766 (Sher) goes to the MSRC to be used to implement programs to reduce mobile source emissions. Managers of the program have apportioned the available funding into several technology-specific categories, including: HD; ZEVs/ULEVs; research, development and demonstration of advanced low-emission transportation technologies; transportation control measures; and intelligent transportation systems.

The AQMD contact is Ray Gorski (MSRC Technical Advisor) at 909-396-2479.

Local Government Subvention Funds
Forty percent of the AB 2766 funds collected go to local governments based on a pro-rated share of population and must be used to reduce mobile source emissions. Cities can use their funds to purchase alternative-fuel vehicles or engines. While these funds are used primarily by municipalities for their own projects, these monies can be allocated by the cities for public-private partnerships to pursue AFV and EV projects. Funds not expended carry over from year to year.

The AQMD staff contacts are Larry Rhinehart (AQMD) at 909-396-3780 and Oscar Abarca (AQMD) at 909-396-3242.

Utilities/Private Incentives

Automobile manufacturers and alternative fuel providers are in the process of developing financial incentives to reduce the additional costs associated with the purchase of a new alternative fueled vehicle. Ford Motor Company is offering a $2,000 incentive on its dedicated F-Series NGVs and dedicated and bi-fuel Econoline NGVs. Incentives for the Ford Crown Victoria NGV range from $1,500 to $2,025 depending on the purchase of Ford's Extended Range Package. Other incentives include $1,500 for the bi-fuel propane F-Series pickup and bi-fuel propane Econoline Van, and $1,000 for the Taurus Flexible Fuel Vehicle (FFV). For more information on pricing and incentives for fleets, contact Ford at 877-ALT-FUEL or at http://www.fleet.ford.com.

SOCIOECONOMIC IMPACT ASSESSMENT AND COST-EFFECTIVENESS

For the purpose of this analysis, a total of 4,803 vehicles operated by 172 public and private entities are assumed to be affected. The majority of the vehicles are in the light-duty category. All the affected vehicles are part of the local and intraurban transportation sector (SIC 41). Specifically, the sector is further divided into local and suburban transit (SIC 4111), local passenger transportation (SIC 4119), and taxicabs (SIC 4121).

Costs Impacts

Out of the 4,803 affected vehicles, 2,851 vehicles have cost impacts associated with their operation and replacement. This is because all medium and light-duty vehicles, except for taxicabs, will be able to use gasoline-powered vehicles to comply with the PR 1194 requirements.

It is assumed that all replaced heavy-duty vehicles and light-duty taxicabs will be alternative fuel powered. Even though there are gasoline-powered light-duty vehicles that meet the ARB ULEV emission standards, taxicab drivers/owners prefer larger sized vehicles and the only large sized light-duty vehicles certified to the ULEV emission standard are alternative fueled vehicles. It is assumed that alternative-fuel fueling stations are available at the commercial airports for affected vehicles to refuel since there is a natural gas refueling station at LAX and Burbank and John Wayne Airport are planning on building natural gas fueling stations at their respective airports. Therefore, construction of additional refueling stations is not necessary. The total average annual cost of the replacement is comprised of one-time capital and annual operating and maintenance cost. Table 20 shows the various components used to assess the incremental costs of converting an existing non-compliant vehicle to a CNG-powered one. Additionally, the annual vehicle miles traveled are assumed to be 100,000 for heavy-duty vehicles and 70,000 for taxicabs. The assumption of 100,000 miles for heavy-duty vehicles is for heavy-duty vehicles that are in the charter service category. These vehicles operate primarily within the District providing group charter services.

The incremental cost of a diesel heavy-duty vehicle relative to an alternative-fueled vehicle could be as much as $35,000. Currently, used police patrol vehicles are the main source for the replacement of aging taxicabs. The cost of a used patrol vehicle, including upgrades to convert the used vehicle to meet taxicab vehicle specifications, is approximately $10,000.

Under the proposed rule, operators of taxicabs may purchase a comparable CNG vehicle (e.g., Ford Crown Victoria) when their taxicabs are in need of replacement. The price of a brand new Crown Victoria, including taxes, is assumed to be about $27,000. Approximately $3,000 funding from the Mobile Source Air Pollution Reduction Review Committee (MSRC) and $6,500 funding from other financial incentive programs are potentially available to bring down the purchase price to $17,500. The incremental cost of purchasing a brand new Crown Victoria relative to a used police patrol car thus becomes $11,500 with a down payment of $8,000 (part of the monies used to purchase a used vehicle as described above) and a cost of $2,000 to upgrade the vehicle to meet taxicab specifications. The incremental cost would be tempered by new vehicle warranties provided by the automobile manufacturer. Furthermore, new vehicles will last longer than used vehicles. The vehicle life shown in Table 20 is used as an indicator for the vehicle replacement frequency and the annualization of one-time incremental capital costs.

Table 20. Cost Assumptions Used for the Socioeconomic Assessment

Vehicle Type	Class	No. of Vehicles	Vehicle Life	Diesel/ Gasoline Fuel Efficiency	CNG Fuel Efficiency (mi/gal)	Vehicle Cost Differential
HD	COU	150	10	3.5	2.7	$35,000
HD	EXM	12	8	3.5	2.7	
HD	PSC	62	10	3.5	2.7	
HD	TCP	262	8	3.5	2.7	
LD	TAX	2365	5	18	15	$11,500

COU = courtesy, EXM = exempt, PSC = passenger stage corporation, TCP = transport chartered party, TAX = taxicabs

The total average annual cost of implementing the proposed rule is estimated to be $5.051 million between 2001 and 2015. The conversion of heavy-duty vehicles from diesel to alternative fuels will result in a total average annual cost of $2.276 million, while the conversion of taxicabs to CNG would result in a total average annual cost of $2.774 million.

Cost Effectiveness

It is projected that the proposed rule will result in a total average annual of 1,877 tons of emission reductions, which was calculated by averaging the sum of annual NOx, VOC, PM and one-seventh of the CO emission reductions from the years 2001 to 2015. The cost effectiveness of the proposed rule is $2,690 per ton of combined pollutant reduced.

Incremental Cost Effectiveness

Health and Safety Code Section 40920.6 requires an assessment of incremental cost effectiveness for proposed regulations relative to ozone, CO, SOx, NOx, and their precursors. Incremental cost effectiveness is defined as the difference in control costs divided by the difference in emission reductions between two potential control options that can achieve the same emission reduction goal of a regulation. A more stringent control option would be to include an additional 800 TCP buses that provide unscheduled long haul service in the Basin. The more stringent option's average annual emission reductions would

be 2,099 tons. The incremental cost effectiveness would be $3,975 per ton of combined pollutant emissions reduced.

Small Business Impacts

There are several definitions of a small business. The SCAQMD defines a "small business" in Rule 102 as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. However, for qualifying for assistance offered by the SCAQMD's small Business Assistance Office only, a small business means a business with total gross annual receipts of $5,000,000 or less, or a total number of employees of 100 or fewer. In addition to the SCAQMD's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments (CAAA) of 1990, and the California Department of Health Services (DHS) also provide their own definitions of a small business. Two common characteristics of the SBA's, CAAA's, and DHS's definitions are the following: (1) standards are unique to each industry type, and (2) the businesses have to be independently owned and operated and cannot be dominant in their field.

The SBA's definition of a small business uses the criterion of either gross annual receipts (ranging from $0.5 million to $17 million, depending on industry type) or number of employees (ranging from 100 to 1,500). The CAAA classifies a facility as a "small business stationary source" if it: (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either VOC or NOx, and (3) is a small business as defined by SBA. The DHS definition of a small business uses an annual gross receipts criterion (ranging from $1 million to $9.5 million, depending on industry type) for non-manufacturing industries and an employment criterion of fewer than 250 employees for manufacturing industries.

Based on the AQMD's, SBA's, CAAA's, and DHS's definitions of small businesses, some of the TCP (limousines, buses, minivans) and almost all of the owner-operated taxicabs operating in franchised cooperatives would be considered small businesses. The AQMD staff is evaluating potential availability of funds from the AQMD's Small Business Assistance Program to assist smaller taxi operators in the purchase of rule compliant vehicles.

Identification of Funds to Offset Capital Costs for Individual Taxicab Owners

Since the release of the draft staff report, several entities have made proposals providing financial incentives that would substantially reduce the differential capital costs when purchasing a rule compliant vehicle. The MSRC funds assumed in the original cost estimates were recently approved for use in Fiscal Year 2000-01 for a $3,000 buydown of alternative-fueled light-duty vehicles. In addition, rebate proposals from various auto manufacturers/fuel providers were refined and would provide capital cost reductions and operational cost reductions. Lastly, other programs such as U.S. Department of Energy grants and potentially funds from the AQMD Small Business Assistance Program and/or Air Quality Investment Program (AQIP), could be used to further reduce the differential financial and operational costs. Table 21 provides an illustration of the application of the funding incentive programs and an estimated additional monthly cost to an individual taxicab owner/driver when a rule compliant vehicle is purchased. In estimating the monthly cost, assumptions were made that the vehicle would be driven approximately 6,000 miles per month, monthly fuel savings of $137 (based on the 6,000 miles driven), and maintenance

savings of $108 (based on information from the U.S. Department of Energy). As shown in Table 21B, there are funds identified that would offset a significant amount of the additional capital costs associated with the purchase and maintenance of the alternative-fueled vehicle. The remaining cost could be offset by additional fuel savings that would occur after the vehicle is paid off after the third year (Table 21B showing the savings from the fourth year to the seventh year).

Additional economic benefits would also occur with the purchase of a new vehicle versus a used vehicle. To account for some of these benefits it is estimated that a new vehicle would experience less "down time" due to maintenance, an owner/driver would need to save less towards the next vehicle's down payment, and the utilization of HOV (high occupancy vehicle) lanes by single occupancy vehicles that are operated on alternative fuels (this would allow a taxicab driver to return to the airport faster during heavy commute hours) would lead to additional passenger pickup at the airport. For the example provided in Table 21, it is assumed that: 1) a new vehicle could be operating as much as an additional 10 percent more time given the less amount of maintenance required (this information is based on comments made by several taxicab operations) and the owner/driver bring in on the average, $100/day in fares; 2) an owner/driver needing to buy a replacement vehicle in seven years (for a new vehicle) versus five years (for a used vehicle) would have to save another $10,000 (assumed down payment) over these periods; and 3) the owner/driver brings in one additional fare on the days that the taxicab vehicle is operated at the airport (i.e., six additional fares in a month at an average of $30/fare if operating at LAX) and makes use of the HOV lane. The estimated monthly monetary benefits realized is estimated to be in excess of $100. This monthly monetary benefit would offset additional costs associated with financing the purchase of a new vehicle for the three-year term of the lease/contract agreement. After the first three years, the new vehicle purchased would have "down times" similar to the used vehicle, and the monetary benefits are not as great as in the first three years. However, the benefits are estimated to be greater than $100.

In addition to maintenance cost savings, the AQMD is proposing to augment current transportation coupon programs when a Rule 1194 compliant taxicab is used to transport passenger. Such a funding program could provide an additional $100 per month in benefits to the individual taxicab driver. When all of the above cost and savings factors are taken into account, individual taxicab owner/drivers may realize substantial financial benefits over the life of the vehicle.

Table 21. Example of Financial Incentives Applied Toward the Purchase of a PR 1194 Compliant Vehicle

A. Initial Cost Reductions

Dealer Fleet Price (Inc. Destination & Delivery)	$27,000
Incentive Funding (Minimum five vehicles)	
1. Ford Motor Company	
a) "Clean Air Vehicle" Decal Program	$1,000
b) Fleet Customer Incentive	1,046
c) AFV Incentive	1,500
2. MSRC	3,000
3. AQMD*	2,000
4. Other (DOE Grants, SoCalGas)*	1,000
Total Incentive Funding	($9,546)
Net New Vehicle Purchase Price	$17,454
Taxicab Conversion Costs	$2,000
Down Payment	($8,000)
Balance to be Financed	**$11,454**

*The manner by which funds are distributed is currently under development

B. Monthly Costs and Fuel/Maintenance Savings

	Year 1	Years 4 to 7
Amount to be Financed	$11,454.00	n/a
Annual Interest Rate	10%	n/a
Period	3 Years	n/a
Principal & Interest	$369.59	n/a
Sales Tax (@8.25%/36)	$40.00	n/a
Registration & Misc. Fees (@1.5%/12)	$21.82	n/a
Additional Insurance	$40.00	n/a
Monthly Financing Cost	**$471.40**	n/a
Fuel Savings	$137.00	$137.00
Maintenance Savings	$108.33	0.00
Other Estimated Monthly Benefits*	$100+	$100+
AQMD Coupon Program Proposal	$100	$100
Net Monthly Cost/(Savings)	**$26.07**	**($337.00)**

* Includes reduced vehicle downtime; HOV Lane Usage; reduced income deferred for next vehicle

SUMMARY AND DRAFT FINDINGS

Proposed Rule 1194 is part of the AQMD's strategy to attain federal and state ambient air quality standards. Long-term air quality benefits are expected from attaining and maintaining the ambient air quality standards for particulate matter, NOx, and ozone. Improved air quality will ultimately reduce negative public health impacts from these criteria pollutants.

Proposed Rule 1194 is technologically feasible and cost-effective, while reducing particulate matter and NOx emissions from diesel-powered vehicles; and the proposed rule addresses concerns raised by the public, wherever possible. Therefore, staff recommends the adoption of Proposed Rule 1194.

These findings are being made in compliance with state law requirements.

DRAFT FINDINGS REQUIRED BY THE CALIFORNIA HEALTH AND SAFETY CODE

Health and Safety Code Section 40727 requires the AQMD to adopt written findings of necessity, authority, clarity, consistency, non-duplication and reference.

Necessity - The emission reductions associated with Proposed Rule 1194 are needed for the following reasons:

a) State and federal health-based ambient air quality standards for particulate matter and ozone are regularly and significantly violated in the South Coast Air Basin. The reduction of particulate matter and NOx emissions from diesel powered vehicles by adopting Proposed Rule 1194 is needed to meet federal and state air quality standards.

b) By exceeding state and federal air quality standards, the health of people within the South Coast Air Basin is impaired.

c) By exceeding state and federal air quality standards, the quality of life is reduced in the South Coast Air Basin in numerous respects.

d) The California Clean Air Act (Cal. Health and Safety Code Section 40910 et seq.) requires that the air districts make every effort to attain federal and state ambient air quality standards as soon as practicable. Proposed Rule 1194 makes progress toward that goal. Section 40919 requires air districts to include measures in their plans to achieve the use of a significant number of low-emission vehicles in fleets. PR 1194 makes progress towards that goal.

e) About 71 percent of cancer risk from air toxics is attributed to diesel particulate emissions, which would be reduced by the proposed rule. About 15 percent of cancer risk from air toxics is attributed to several key gasoline components of light- and medium-duty vehicle exhaust emissions, which would be reduced by the proposed rule. About 71 percent of cancer risk from air toxics is attributed to diesel particulate emissions, which would be reduced by the proposed rule.

Authority - The AQMD Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code Sections 40000, 40001, 40440, 40441, 40463, 40702, 40725 through 40728, 40910 through 40920 and 40447.5

Clarity - The AQMD Board determines that Proposed Rule 1194 is written or displayed so that its meaning can be easily understood by persons directly affected by it.

Consistency - The AQMD Board determines that Proposed Rule 1194 is in harmony with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or regulations.

Non-Duplication - Proposed Rule 1194 does not impose the same requirements as any existing state of federal regulation and is necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference - In adopting this proposed rule, the Board references the following statutes which the AQMD hereby implements, interprets or makes specific: Health and Safety Code Sections 40001 (rules to achieve ambient air quality standards), 40440(a) (rules to carry out AQMP), and 40447.5(a) (rules to require fleets of 15 or more vehicles operating substantially in the AQMD to purchase vehicles powered by methanol or other equivalently clean burning alternative fuel when adding or replacing vehicles), and 40919(a)(4) (measures to achieve the use of a significant number of low-emission vehicles by operators of motor vehicle fleets).

COMPLIANCE AUDITING AND ENFORCEMENT

PR 1194 will require that affected airport service providers and fleet authorities keep sufficient records to document rule compliance, and that these records be maintained for a minimum of two years. The AQMD intends to audit these records at the vehicle fleet location or by requesting appropriate documents to be submitted to the AQMD for review. The specific records to be kept by vehicle service providers include vehicle purchase date, vehicle make, model, model year, and ARB engine family number. If a service provider or licensing authority is found to be in non-compliance with rule requirements, they may be subject to penalties specified in Health and Safety Code Division 26, Part 4, Chapter 4, Article 3. The AQMD also plans to develop an enforcement guideline document that will stress the implementation of corrective actions by fleets rather than punitive monetary penalties during the initial years of rule implementation for first time violators.

To facilitate compliance by affected service providers and airport licensing authorities and minimize AQMD enforcement actions, any procurement materials that are used to register or solicit contracts with PR 1194 affected fleet vehicles with the airport licensing authority must include language that requires only PR 1194 compliant vehicles be acquired. For example, the following language could be used; "Vehicles shall be certified as Ultra-Low-Emission Vehicle (ULEV), Super Ultra-Low Emission Vehicle (SULEV), or Zero-Emission Vehicle (ZEV) by the California Air Resources Board, and shall comply with all applicable state and federal regulations."

RESPONSE TO COMMENTS

The following summarizes public comments and staff responses specifically regarding the development of PR 1194. These comments were received in writing and in discussions at various meetings between staff and interested parties, including public workshops and focused working group meetings. The AQMD received comments from representatives of federal, state, and local agencies, as well as fuel suppliers, engine manufacturers, and environmentalists.

Comment 1. Previously owned police vehicles (mostly Ford Crown Victorias) are currently acquired as taxi fleet vehicles in the City of Los Angeles. What substitute vehicles are available and at what cost?

Response 1. There are two substitute vehicles currently available. The alternative fuel (CNG) Ford Crown Victoria and the gasoline powered ULEV Buick Park Avenue. Purchase prices for second hand police vehicles range from $6,000 to $8,000 and for a CNG Ford Crown Victoria approximately $27,000. The retail purchase price for several ULEV certified minivans is about $22,000. Airport authority as well as manufacturer incentives proposals for the purchase of alternative-fueled vehicles, along with reduced operating (primarily savings in fuel usage costs) and maintenance costs, however, will likely result in comparable equipment lifetime costs for all the vehicles discussed.

Comment 2. The AQMD needs to provide a mechanism to allow for the efficient dissemination of information regarding the list of vehicles that public fleets may purchase for compliance with PR1194.

Response 2. The AQMD plans to post a list of compliant vehicles on its Internet Site (www.aqmd.gov) and request that ARB provide updated vehicle certification information to AQMD staff to allow for semi-annual updates of this list.

Comment 3. Police and other public agencies appear to have the better resources for compliance with PR 1190 rules. Specifically a pre-owned police vehicle market would be created if PR 1194 included such agencies. Why are they not included in PR 1194?

Response 3. California Health and Safety Code 40447.5(a) prohibits the adoption of any clean fleet rules that could even potentially impair emergency response. Moreover, this represents sound public policy in avoiding impacts which could impair emergency response. At this time the AQMD Board has not determined that such a potential does not exist. At a future date, when a determination is made that emergency response is not impaired, emergency response vehicles could be included.

Comment 4. There is a dearth of qualified maintenance and repair professionals for AFVs.

Response 4. Both equipment manufacturers and suppliers have indicated that they are eager to provide training on the repair and maintenance of AFVs to service professionals. AQMD staff has been advised that the time required for this training is not significant. Attachment 5 provides a draft document regarding training.

Comment 5. AQMD's legal authority to regulate fleets may be preempted by the Clean Air Act.

Response 5. PR1194 is not a rule setting motor vehicle emission standards as contemplated by the Clean Air Act's preemption provision, but is a requirement that fleets purchase the cleaner of available vehicles. Staff believes that, such fleet requirements are consistent with the Clean Air Act and are not preempted.

Comment 6. Current non-complaint Ford Crown Victoria taxicabs have significant room for luggage and passengers. Are comparable compliant vehicles available?

Response 6. Both the CNG Ford Crown Victoria and gasoline ULEV Buick Park Avenue are comparable substitutes for existing non-complaint Ford Crown Victoria's. They both have comparable luggage and passenger carrying capacity. In addition, Ford CNG Crown Victoria's are currently in use for airport taxi service at John Wayne Airport.

Comment 7. What constitutes a fleet for the purposes of PR 1194?

Response 7. The AQMD is relying on HSC Section 40919(a)(4) which defines fleets in terms of the operator. PR 1194 is limited in scope to fleets of 15 or more under one operator. Relative to whether these organizations are considered a "fleet", by definition under this rule, a vehicle "fleet" is a collection of vehicles that "operate as a unit". Under this definition, the vehicles that are in an association or cooperative would be considered a "fleet" since they operate as a unit. Factors entering into this definition include the fact that an association or cooperative performs the operation of directing (or assigning) available taxicabs to pick up passengers. In addition, the association or cooperative have a common color scheme and logo for the vehicles and provides an identification number. In the City of Los Angeles Department of Transportation Taxicab Rules and Regulations of the Board of Taxicab Commissioners, Section 101 defines an "ASSOCIATION or CO-OPERATIVE means a Board [Board of Taxicab Commissioners of the City of Los Angeles] authorized independent taxicab enterprise or organization owned and operated by its Members for the financial benefit of its Members" and Section 127 defines a

"TAXICAB POOL means the fleet of taxicabs that is managed and controlled completely by Grantee [as defined in Section 110 including association and co-operatives] and not by a member of Grantee." As such, the Taxicab Rules and Regulations clearly point to associations and cooperatives as entities that manage fleets of taxicab vehicles even though these vehicles may be individually owned. In the "Request for Proposals (RFP) for Taxicab Franchises in All Service Zones of the City of Los Angeles" recently released by the City of Los Angeles Department of Transportation, a "minimum fleet size" of 70 taxicabs for any Grantee must be met (page 3 of the RFP). Thus, the City of Los Angeles recognizes associations and cooperatives as operators of fleets of taxicabs. HSC Section 40919(a)(4) states that the AQMD may develop "measures to achieve the use of a significant number of low-emission motor vehicles by operators of motor vehicle fleets." Under this statute, it is not required that all fleet vehicles be owned by the same person. The association or cooperative serves as the "operator". As such, PR 1194 would apply to operators who direct or assign taxicabs to specific destinations for passenger pickup. The 15 or more vehicles restriction proposed in the rule is provided for consistency with HSC Section 40447.5 and other fleet rule proposals.

Comment 8. Currently, the individual taxicab owner purchases a two to three year old used Ford Crown Victoria's when retiring the existing taxicab from service. PR 1194 essentially forces the individual taxicab owner to purchase a new ULEV taxicab with a substantial price premium.

Response 8. It is expected that both public (MSRC) and private incentive funding will reduce the actual price differential for a new CNG Ford Crown Victoria as opposed to a used non-compliant gasoline vehicle. An additional benefit is that the new vehicle comes with a manufacturer's warranty and will likely have reduced maintenance and operational costs associated with fuel usage cost savings and that new vehicles require less maintenance than used vehicles. This staff provides an example of the economic benefits that could be realized with the purchase of a rule compliant vehicle. In addition to fuel and maintenance cost savings, this staff report provided an estimate of other economic benefits of operating an alternative fuel vehicle that includes less "down time" for repairs or maintenance, the ability to use the high occupancy lane (HOV) by single occupant alternative-fueled vehicles, and a longer vehicle life. While there may be an increase in capital costs, there would be overall savings over the life of a new alternative-fueled vehicle compared to a used vehicle. The AQMD staff is investigating the potential to use the AQMD Small Business Assistance Program to provide guaranteed loans to individual taxicab drivers to help finance the differential capital costs.

Comment 9. The additional cost to purchase a rule compliant vehicle for taxicab services would essentially force an individual taxicab driver to become a "bandit" operator.

Response 9. While there are additional costs associated with the purchase of a rule compliant vehicle, many of the associated costs are offset through fuel and maintenance savings. In addition, the AQMD is evaluating the use of the Small Business Assistance Program to provide guaranteed loans to individual taxicab drivers so that the initial capital cost differential could be financed. Regardless of the initial capital costs, the AQMD staff believes that an individual taxicab driver will realize economic benefits with the purchase of a new rule compliant vehicle. The Commentor is referred to the section on Cost Analysis for a more detailed discussion on cost to purchase a rule compliant vehicle for taxicab services.

Comment 10. Relative to shuttle van services and other transportation services of passengers that are picked up at airport terminals and transported to various locations within the District, the typical shuttle van may accumulate up to 100,000 miles per year and in many situations may not find a convenient location to refuel if the vehicle is operating on alternative fuel.

Response 10. The AQMD staff has been evaluating the fueling infrastructure needed to implement the series of fleet vehicle rule proposals. The AQMD staff recognized that for most of the vehicles affected by PR 1194, a refueling station will be available at or near each of the commercial airports. While there are several areas with a large number of alternative-fuel fueling stations, some areas do not have many stations located conveniently for shuttle vans to refill. Staff will continue to monitor the progress in developing the necessary fueling infrastructure and if necessary, would propose rule amendments to delay the implementation of Rule 1194 to allow for further infrastructure development.

Comment 12. While the rule proposal is to purchase ULEV or cleaner vehicles, the rule proposal does not provide any incentives to purchase cleaner vehicles such as that provided in Rule 1191. The AQMD should consider a phase-in approach requiring purchases of SULEV or cleaner vehicles.

Response 12. The AQMD's authority is limited in developing more stringent requirements than that provided under State Law. Under HSC Section 40919(a)(4), the AQMD can require fleets to use a substantial number of low-emission vehicles. Based on HSC Section 39037.05(c), a "low-emission vehicle" is one that operates on alternative fuels and its emissions do not have an adverse impact on ozone greater than a vehicle operating on methanol, or a vehicle operating on gasoline that has hydrocarbon emission levels that are twice as stringent as the current hydrocarbon emission standard. Vehicles certified to ULEV standards

meet this test. So, the AQMD cannot require the purchase of vehicles cleaner than ULEV. While the purchase of SULEV or cleaner vehicles would provide greater emission benefits, the AQMD will encourage the purchase of such vehicles as affected parties consider new vehicle purchases.

Comment 13. In the limousine service industry the Lincoln Town Car is one of a handful of vehicles that are considered for use as a "luxury" transportation vehicle. Currently, there are no luxury cars that are certified to ULEV or cleaner emission standards. Do the limousine service companies need to buy a rule compliant vehicle that is not considered a luxury car and would essentially force the limousine service industry out of business.

Response 13. The intent of the AQMD fleet vehicle rule is to achieve reductions in emissions from fleet vehicles in the most feasible and practical manner. To the extent that certain "niche" services require a certain type (model) of vehicle, PR 1194 provides an exemption in Section (e)(2) of the proposed rule that would allow the purchase of a vehicle that is not certified as ULEV cleaner if an alternative-fuel/chassis is not commercially available or could not be used in the specific application. While there are no large luxury vehicles certified to ULEV or cleaner emission standards, the AQMD staff believes that with more stringent future emission standards, automobile manufacturers will offer larger luxury vehicles that will be certified to the ULEV standard. In addition, the AQMD staff will continue to encourage automobile manufacturers to produce larger vehicles that could be certified to ULEV or cleaner emission standards as soon as possible.

Comment 14. A comment was made that the AQMD should change the implementation date and/or consider the adoption of PR 1194 after the City of Los Angeles concludes its refranchising of taxicab services for the City.

Response 14. The AQMD staff believes that many of the implementation issues associated with PR 1194 have been addressed or resolved. With regards to the change in implementation date, staff believes that there is sufficient time for taxicab operators to anticipate or plan for the implementation of the rule requirements.

Comment 15. Are vehicles in a rental car company rental fleet subject to PR 1194?

Response 15. No, rental cars are not subject to PR 1194. However, the rental car company's transit vehicles used to transport passengers from the commercial airport terminal to the rental car lot or office are subject to PR 1194.

ATTACHMENT 1

PROPOSED RULE LANGUAGE

PROPOSED RULE 1194 IS PROVIDED IN AN EARLIER PART OF THE BOARD PACKAGE AND WILL BE INSERTED HERE UPON ADOPTION BY THE AQMD GOVERNING BOARD

ATTACHMENT 2

ARB LEV REGULATION
MASS EXHAUST EMISSIONS LIMITS

ARB LEV REGULATIONS

EXHAUST MASS EMISSION STANDARDS

LEV - I (current)

Vehicle Type	Mileage for Compliance	Vehicle Emission Category	NMOG (g/mi)	CO (g/mi)	NOx (g/mi)
All PC & LDT1 (0-3750 lb LVW)	50,000	Tier 1	0.25	3.4	0.4
		TLEV	0.125	3.4	0.4
		LEV	0.075	3.4	0.2
		ULEV	0.040	1.7	0.2
LDT2* (3751-5750 lb LVW)	50,000	Tier 1	0.32	4.4	0.7
		TLEV	0.160	4.4	0.7
		LEV	0.100	4.4	0.4
		ULEV	0.050	2.2	0.4
MDV2* (3751-5750 lb TW)	50,000	Tier 1	0.32	4.4	0.7
		TLEV	0.16	4.4	0.4
		LEV	0.100	4.4	0.4
		ULEV	0.050	2.2	0.2
MDV3* (5751-8500 lb TW)	50,000	Tier 1	0.39	5.0	1.1
		LEV	0.195	5.0	0.6
		ULEV	0.117	5.0	0.6
		SULEV	0.059	2.5	0.3
MDV4 (8501-10,000 lb TW)	50,000	Tier 1	0.46	5.5	1.3
		LEV	0.230	5.5	0.7
		ULEV	0.138	5.5	0.7
		SULEV	0.069	2.8	0.35
MDV5 (10,000-14,000 lb TW)	50,000	Tier 1	0.60	7.0	2.0
		LEV	0.300	7.0	1.0
		ULEV	0.180	7.0	1.0
		SULEV	0.09	3.5	0.5

TW = Test Weight = 0.5 * (LVW + GVW)
*Vehicle is MDV when GVWR > 6000 lb.

LEV - II (starting 2004)

Vehicle Type	Mileage for Compliance	Vehicle Emission Category	NMOG (g/mi)	CO (g/mi)	NOx (g/mi)
All PC & LDT (0-3750 lb LVW) ---------- Tested at LVW = curb weight + 300 lb	50,000	TLEV	0.125	3.4	0.4
		LEV	0.075	3.4	0.05
		LEV(1)	0.075	3.4	0.07
		ULEV	0.040	1.7	0.05
	120,000	TLEV	0.156	4.2	0.6
		LEV	0.090	4.2	0.07
		LEV(1)	0.090	4.2	0.10
		ULEV	0.055	2.1	0.07
		SULEV	0.010	1.0	0.02
	150,000	TLEV	0.156	4.2	0.6
		TLEV(2)	0.0125	4.2	0.5
		LEV	0.090	4.2	0.07
		LEV(1)	0.090	4.2	0.10
		ULEV	0.055	2.1	0.07
		SULEV	0.010	1.0	0.02
MDV (8500-10,000 lb GVWR)	120,000	LEV	0.195	6.4	0.2
		ULEV	0.143	6.4	0.2
		SULEV	0.100	3.2	0.1
MDV (10,000-14,000 lb GVWR)	120,000	LEV	0.230	7.3	0.4
		ULEV	0.167	7.3	0.4
		SULEV	0.117	3.7	0.2

(1) Optional, applies to up to 4% of mfr's LDT2 fleet with a maximum base payload > 2500 lb.

(2) Optional, applicable for 150,000 miles only (i.e., no 50,000 or 120,000 mile standard) & is not eligible for supplemental fleet average NMOG credit.

ATTACHMENT 3

PR 1194 COMPLIANT LIGHT- AND MEDIUM-DUTY VEHICLES FOR MODEL YEAR 2000

(PROVIDED FOR ILLUSTRATION)

MODEL YEAR 2000 - PASSENGER CARS

Ultra-Low-Emission Vehicles Passenger Car Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
DODGE, PLYMOUTH	Gaso	DED	YCRXV0 122V41	NEON
DODGE, PLYMOUTH	Gaso	DED	YCRXV0 122V40	NEON
FORD	CNG	DED	YFMXV0 4.6VP5	CROWN VICTORIA CNG
PONTIAC, BUICK, CHEVROLET	Gaso	DED	YGMXV 03.8901	BONNEVILLE, LESABRE, PARK AVENUE, IMPALA, GRAND PRIX, REGAL
PONTIAC, CHEVROLET, BUICK	Gaso	DED	YGMXV 03.8044	BONNEVILLE, IMPALA, LUMINA/MONTE CARLO, LESABRE, REGAL, PARK AVENUE, GRAND PRIX
HONDA	Gaso	DED	YHNXV0 2.3PL4	ACCORD EX, LX SEDAN, EX, LX COUPE
HONDA	Gaso	DED	YHNXV0 3.2GL4	3.2TL
HONDA	Gaso	DED	YHNXV0 1.0LA4	INSIGHT
MAZDA	Gaso	DED	YTKXV0 1.6VJM	PROTÉGÉ
MAZDA	Gaso	DED	YTKXV0 2.0VJM	626
TOYOTA	CNG	DED	YTYXV0 2.2PPA	CAMRY (CNG)
TOYOTA	Gaso	DED	YTYXV0 2.2JJB	CAMRY, CAMRY SOLARA, CAMRY SOLARA CONVERTIBLE

Super Ultra-Low-Emission Vehicles Passenger Car Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
HONDA	Gaso	DED	YHNXV0 2.3NL5	ACCORD
HONDA	CNG	DED	YHNXV0 1.6KA5	CIVIC GX
NISSAN	Gaso	DED	YNSXV0 1.85BA	SENTRA CA 4-DR

Zero-Emission Vehicles Passenger Car Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
General Motors EV-1	Elec	DED	N/A	EV-1
Honda EV Plus	Elec	DED	N/A	EV Plus
Hyundai Accent EV	Elec	DED	N/A	Accent EV
Nissan Altra EV	Elec	DED	N/A	Altra EV
Solectria FORCE	Elec	DED	N/A	FORCE
General Motors S-10	Elec	DED	N/A	S-10
Toyota RAV 4 EV	Elec	DED	N/A	RAV 4 EV

DED = Dedicated; Elec = Electric; CNG = Compressed Natural Gas; Gaso = Gasoline; N/A = Not Applicable

MODEL YEAR 2000 – LIGHT_DUTY TRUCKS

Ultra-Low-Emission Vehicles Light-duty Truck Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
FORD	Gaso	DED	YFMXT0 3.82JC	WINDSTAR
FORD	Gaso	DED	YFMXT0 3.82J5	WINDSTAR

Zero-Emission Vehicles Light-duty Truck Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
Dodge Caravan	Elec	DED	N/A	Caravan
Ford Ranger pickup	Elec	DED	N/A	Ranger
Plymouth Voyager Epic EV	Elec	DED	N/A	Voyager Epic EV
Plymouth Voyager EV	Elec	DED	N/A	Voyager EV

DED= Dedicated; Elec = Electric; Gaso = Gasoline; N/A = Not Applicable

MODEL YEAR 2000 - MEDIUM-DUTY TRUCKS

Ultra-Low-Emission Vehicles Medium-duty Truck Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
DODGE	Gaso	DED	YCRXA0 287H41	DURANGO 2WD/4WD SUV
CHEVROLET, GMC	Gaso	DED	YGMXA 04.3189	ASTRO AWD CARGO/PASSENGER (AUTO); SAFARI AWD CARGO/PASSENGER (AUTO)

Super-Ultra-Low-Emis Vehicles Medium-duty Truck Manufacturer	Fuel	Veh Type	Engine Family	Vehicle Model
CHRYSLER	CNG	DED	YCRXT0 5.26RC	RAM VAN 2500/3500/B3500 2WD, RAM WAGON 2500 W\2WD, RAM WAGON 3500 2WD HDV
FORD	CNG	DED	YFMXT0 5.4RP5	F-150 PICKUP NATURAL GAS
FORD	CNG	DED	YFMXT0 5.4RP6	E-250 NATURAL GAS, E-350 NATURAL GAS

DED = Dedicated; CNG = Compressed Natural Gas; Gaso = Gasoline

ATTACHMENT 4

PR 1194 COMPLIANT ON-ROAD HEAVY DUTY ENGINES AND NATURAL GAS FUELED BUSES FOR MODEL YEAR 2000

(PROVIDED FOR ILLUSTRATION ONLY)

2000 On-Road Heavy-Duty Engines for Transit Buses

Mfr	Engine Family	MAX BHP	FUEL TYPE	Service Class	THC	NMHC	CO	NOx	Opt NOx	PART
IMPCO	YTJXH07.4502	224	LPG	MHD	0.7	0.6	5.3	1.5		
IMPCO	YTJXH07.4505	229	LPG	MHD	0.7		20.6	0.8	1.5	
GM	YGMXH05.7582	255	GAS	MHD	0.3		4.9	2.4		
GM	YGMXH07.4502	270	GAS	MHD	0.6		8.9	1.5		
GM	YGMXH07.4503	290	GAS	MHD	0.6		11.1	3.9		
GFI	YG9XH06.88CP Dual-Fuel	310	GAS	MHD	0.1	0.1	2.4	0.5		
			LPG	MHD	0.3	0.3	4.1	1.3		
FORD	YFMXH05.4CF5	255	GAS	MHD	0.12		2.24	1.01		
FORD	YFMXH06.8BHF	310	GAS	MHD	0.157		2.6	0.407		
FORD	YFMXH06.8CF5	305	GAS	MHD	0.153		2.49	0.439		
Baytech	YBYTH05.7050 Dual-Fuel	211	NG	MHD	1.4	0	5.9	1.3		
		245	GAS	MHD	0.3	0.2	1.5	1.3		
Baytech	YBYTH05.7ILV	211	NG	MHD	1.4	0	5.9	1.3	1.5	
Baytech	YBYTH05.7LEV Dual-Fuel	245	GAS	MHD	0.3	0.2	1.5	1.3	1.5	
		211	NG	MHD	1.4	0	5.9	1.3	1.5	
Baytech	YBYTH05.7ULV Dual-Fuel	211	NG	MHD	1.4	0	5.9	1.3	1.5	
		245	GAS	MHD	0.3	0.2	1.5	1.3	1.5	
Deere	YJDXH08.1003	254	NG	MHD		0.4	1.8	2.2	2.5	0.02
Deere	YJDXH06.8004	239	NG	MHD		0.3	1.9	2.4	2.5	0.04
Deere	YJDXH08.1001	247	NG	MHD		0.4	2.2	2.6		0.05
Deere	YJDXH06.8002	229	NG	MHD		0.48	2.8	3.2		0.07
DDC	YDDXH08.5FJF	275	NG	UB		0.8	2.2	1.5		0.01
DDC	YDDXH08.5FJG	275	NG	UB		0.8	2.2	1.5	2.5	0.01
DDC	YDDXH12.7FGF	330	NG	UB		0.6	1.87	1.99		0.019
DDC	YDDXH12.7FGF	330	NG	UB		0.8	2	2		0.02
DDC	YDDXH12.7FGG	330	NG	UB		0.8	2	2	2.5	0.02
Cummins	YCEXH0359BBL	195	NG	UB	0.8		1	2.3	2.5	0.01
Cummins	YCEXH0505CBJ	275	NG	UB		0.2	0.6	1.7	2.5	0.01
Cummins	YCEXH0359BBK	230	NG	UB		0.06	2.7	1.83	2.5	0.02
Cummins	YCEXH0505CBI	275	NG	UB		0.6	0.9	1.837	2.5	0.02
Cummins	YCEXH0505CBG	275	NG	UB		1.1	7.1	2.19		0.07
Cummins	YCEXH0359BBJ	230	NG	UB	0.1		7.2	2.72		0.08

Dual-Fuel identifies engine families certified to operate on either of the two fuels designated.

Natural Gas Buses

– Available –

Manufacturer	Model	Engine		Bus Length	ADA
Blue Bird Corp	QBRE Q Bus	Cummins 5.9BG or J Deere 6.8L or 8.1L	30,000 - 36,000	29 - 37	
Blue Bird Corp	CSRE Commercial Series	Cummins 5.9BG or J Deere 6.8L or 8.1L	30,000 - 36,000	32 - 39	
Blue Bird Corp	C1FE Transhuttle	Cummins 5.9BG in CNG or LNG	24,000 - 25,000	25	
Blue Bird Corp	CSFE Commercial Series	Cummins 5.9BG in CNG or LNG	30,000 - 36,000	25 - 37	
Boyertown Trolley Co	Bus/Trolley/Step Van Bodies	Cummins or DDC	35,000		
Champion Bus Inc	Crusader Bus (Ford E-350)	5.4L V8 Ford CNG or LPG	**11,500**	21	
Champion Bus Inc	Challenger GT Bus	5.7L V8 Chevrolet CNG or LPG	**12,300**	21 - 28	
Champion Bus Inc	Contender Mid-Size Coach	Cummins B5.9G LNG, CNG, or LPG	31,000	28 - 30	
Champion Bus Inc	Commodore Bus	5.7L V8 Chevrolet CNG or LPG	**14,100**	25 - 27	
Champion Bus Inc	CTS Bus	Cummins 5.9L CNG or LPG	19,000 - 25,000	26 - 29	
Champion Bus Inc	SoLo Low-Floor Bus	Cummins 5.9L CNG or LPG	31,000	31	
Chance Coach Inc	American Heritage streetcar	CNG	29,500	28	Yes
ElDorado National	Transmark 29/32 Bus Conventional Floor	Cummins 5.9 or 8.3 CNG or Propane		29 - 32	Yes
ElDorado National	E-Z Rider 30 Bus, Low Floor	Cummins 5.9 or 8.3 CNG, LNG or LPG		30	Yes
ElDorado National	MST 28/30 Bus Conventional Floor	Cummins 5.9 CNG or Propane	19,000	24 - 28	Yes
Ford Motor Co	Econoline Dedicated Van E-250, E-250 extended, E-350 super-duty	5.4L Triton V8 Meets CA SULEV	**9,300**		
Ford Motor Co	Econoline Dedicated Van E-450	5.4L V8	**14,050**		
Freightliner Custom Chassis Corp	MB-19 Shuttle Bus Chassis GVWR 19,000 lb	Cummins B5.9G	19,000		
Freightliner Custom Chassis Corp	MB-55 Shuttle Bus Chassis GVWR 20,500 - 25,500 lb	Cummins C5.9G Range 300+ miles	20,500 - 25,500		
Neoplan USA Corp	AN 440 Transliner Low-Floor Bus	CNG			
Neoplan USA Corp	AN 440 Transliner Standard-Floor Bus	CNG			
Neoplan USA Corp	AN 340/345 Metroliner High-Floor Coach	CNG			
Neoplan USA Corp	AN 460 Articulated Bus	CNG			

Natural Gas Buses

– Available –

Manufacturer	Model	Engine	GVWR (lbs.)	Bus Length	ADA
New Flyer of America	C30LF Transit Coach, low flr	CNG		30	
New Flyer of America	C35LF Transit Coach, low flr	CNG or LNG		35	
New Flyer of America	C40LF Transit Coach, low flr	CNG or LNG		40	
New Flyer of America	C40HF Transit Coach, high flr	CNG or LNG		40	
North American Bus Industries (NABI)	40 LFW Transit Bus	DDC S50G or Cummins C8.3G	40,600	40	
North American Bus Industries (NABI)	35 LFW Transit Bus	DDC S50G or Cummins C8.3G	40,600	35	
North American Bus Industries (NABI)	45 LFW Transit Bus	DDC S50G or Cummins C8.3G	40,600	45	
North American Bus Industries (NABI)	60 LFW Transit Bus	DDC S50G or Cummins C8.3G	66,600	60	
Nova Bus	RT 82 NFD V-Drive Bus LNG, roof or under-floor CNG	DDC Series 50G or Cummins 8.3			
Nova Bus	RT 82 WFD V-Drive Bus LNG, roof or under-floor CNG	DDC or Cummins			
Nova Bus	RT 82 WFD T-Drive Bus roof-mounted CNG or LNG	DDC or Cummins			
Nova Bus	RT 72 NFD Bus LNG, roof or under-floor CNG	DDC or Cummins			
Nova Bus	RT 72 WFD V-Drive Bus LNG, roof or under-floor CNG	DDC or Cummins			
OmniTrans Distributing Inc	Cutaway Shuttle Bus CA ULEV, low NOx	5.7L Chevrolet/GMC CNG	**12,000 - 16,000**		
OmniTrans Distributing Inc	GM Passenger Van CA ULEV, low NOx	5.7L Chevrolet/GMC CNG	**12,000 - 16,000**		
OmniTrans Distributing Inc	Chevrolet Suburban 2500 CA ULEV, low NOx	5.7L Chevrolet/GMC CNG	**12,000 - 16,000**		
OmniTrans Distributing Inc	Workhorse Bus Body P-Chassis	5.7L CA ULEV, low NOx	**14,500**		
Orion Bus Industries	Transit Bus	Cummins B Series	41,000	21 - 26	
Orion Bus Industries	Transit Bus	Cummins L10G or DDC Series 50G	41,000	30 - 40	
Orion Bus Industries	Low-Floor Transit Bus	Cummins L10G	41,000	40	
Spartan Motors Chassis Inc	TB Rear-Engine Bus Chassis Transit-shuttle	Cummins 195-250 hp	26,000 - 36,200		
Spartan Motors Chassis Inc	SLF Super Low Floor Bus Chassis, Transit-shuttle	Cummins 195-230 hp	31,000 - 34,000		
Spartan Motors Chassis Inc	SP Front-Engine Bus Transit shuttle, Trolley	Cummins 195-230 hp	24,000 - 36,200		
Supreme Corp / Specialty Vehicles Inc	Classic American Trolley Tour Shuttle bus	Cummins B5.9 195G	20,500 - 25,500		
United Bus Corp	Braun/Ford Transit Van 15 person capacity	5.4L, 200-mi range	9,400	23	Yes

ATTACHMENT 5

DRAFT
TRAINING AVAILABILITY AND OPPORTUNITY

(Draft Document Released for Public Review on June 2, 2000)

TRAINING AVAILABILITY AND OPPORTUNITY
PROPOSED RULES 1191-1196

Background

AQMD staff is proposing a series of fleet rules that will require public fleets, and certain private entities that are contractors of public agencies, to purchase low emission and/or alternative fuel vehicles. In addition, staff is investigating the feasibility of amending Rule 431.2 to require a lower sulfur standard for diesel fuel sold in the Basin. The purpose of this document is to describe the type of training necessary to maintain and repair low emission and alternative fuel light- and heavy-duty vehicle technologies; describe the current availability of such training; and finally, make recommendations for programs to ensure that appropriate training is available to fleets implementing these advanced technologies.

Description of Proposed Rules

Light- and Medium-Duty Vehicles

Proposed Rule 1191 requires the procurement of light- and medium-duty vehicles meeting Air Resources Board Low emission Vehicle (LEV) or Ultra-Low Emission Vehicle (ULEV) emission standards. It is expected that the majority of vehicles purchased to meet this requirement will be standard gasoline-fueled cars, vans and trucks

Training options for the maintenance and repair of gasoline light- and medium-duty cars and trucks are well established. Gasoline vehicles are covered by standard manufacturer warranties, and can be serviced at automobile dealerships. Large fleets often perform their own warranty work, and the mechanics and technicians participate in manufacturer training. Service technicians may also obtain training to service gasoline fueled vehicles through a number of technical schools or the California Community Colleges. Because of the availability of options through vehicle manufacturers and colleges, training mechanics and technicians to maintain and repair gasoline light- and medium-duty vehicles is not seen as a barrier to implementation of Rule 1191.

In addition to the gasoline models available, there are a number of natural gas and propane vehicles meeting LEV and ULEV standards. Although natural gas, propane and electric vehicles are covered by manufacturer warranty, few dealerships are equipped to service these vehicles. The capability to service alternative fuel vehicles requires specific training and may require the purchase of specialized equipment. As independent businesses, not all dealerships choose to provide these services. A fleet with alternative fuel vehicles may not have a dealership capable of servicing these vehicles located conveniently. Fleet managers may choose to service their alternative fuel vehicles in-

house. This will require mechanics and technicians to obtain specific training. This training may be obtained from the manufacturer directly or through other training programs. The California community college system offers specific alternative fuel vehicle training through regular curriculum and special course offerings. This training will be discussed in more detail later in this report.

Public Transit Vehicles

Proposed Rule 1192 requires public transit or private contractor fleets with 15 or more public transit vehicles or urban buses to purchase alternative fuel vehicles for their passenger transportation services. This requirement includes medium- and heavy-duty buses. Typically, operators procure vehicles through competitive bid, with specific performance specifications for engines and vehicles. Vehicles are warranted by the chassis manufacturer and the engine manufacturer. Although engine warranty work can be performed by the manufacturers' local affiliations, most large public transit fleets perform much of their own warranty work. Training for technicians and mechanic is available though manufacturer classes, usually at the local dealer or distributor, and through curriculum and courses offered through the community colleges. However, the current availability of training programs for maintenance and repair of heavy-duty engines, whether diesel or alternative fuel, is considered inadequate for large properties to maintain a well-trained crew of technicians. The increased use of sophisticated electronics on the buses, and the advanced technology needed to diagnose problems, has caused difficulty for transit properties to attract qualified new employees and train existing staff.

School Buses

Most school districts maintain their own buses. Because of the typical low mileage accumulation of a diesel school bus, this maintenance consists mostly of changing the oil and inspecting tires and brakes. Because the school bus fleets keep vehicles in operation for 15 years or more, many school district mechanics and technicians are not familiar with the latest heavy-duty engine technologies, such as electronic engine controls. They may not have the sophisticated diagnostic tools necessary to maintain and repair current diesel or alternative fuel engine technologies.

Heavy-Duty Vehicles

As stated in previous sections, alternative fuel engines are warranted by the manufacturer, and service is available at local dealers or distributorships. However, similar to the situation for light-duty alternative fuel vehicles, all local dealers/distributors may not offer service for alternative fuel engines. As an independent business, the local dealer or distributor must make the decision whether to send technicians to manufacturer training, and to purchase specific diagnostic and repair equipment. Technician training is available through the community college system as part of the automotive technician curriculum, or through special classes. However, only certain colleges offer heavy-duty engine training, and even fewer schools offer training for alternative fuel heavy-duty engines.

Existing Training Programs

The Automotive Service Excellence (ASE) is a nationwide automotive technician certification organization. The program includes light-duty natural gas vehicle technology as part of the testing and certification program for technical competence. ASE is an integral part of professional training programs for automotive service personnel.

Advanced Transportation Technologies Initiative is part of the California Community College Economic Development Network (ED>Net). ED>Net was established in 1988 with the overall purpose of advancing California's economic growth and global competitiveness through quality education and services focusing on continuous workforce improvement, technology deployment and business development. The Advanced Transportation Technologies Initiative (ATTI) has established programs within the California Community College system to meet training needs. Participating campuses in the ATTI are:

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Bay Area Advanced Transportation Consortium (BAATTC), City College of San Francisco, College of Alameda & Skyline College *Center for Advanced Transportation Technology* *1400 Evans Ave* *San Francisco CA 94124* *Fax: (415) 550-4400* *Email: skorey@ccsf.cc.ca.us*	Suzanne Korey Rich Canino (415) 550-4437
College of the Desert, Palm Desert, CA ***Energy Technology Center*** ***43-500 Monterey Ave*** ***Palm Desert CA 92260*** ***Fax: (760) 776-0128*** ***Email: Stroublefield@dccd.cc.ca.us</B<>***	**Susie Troublefield** **(760) 773-2596**
Cypress College, Cypress, CA ***Center for Advanced Transportation Technology*** ***9200 Valley View Rd*** ***Cypress CA 90630*** ***Fax: (714) 527-1077*** ***Email: bettendorf_r@msn.com***	**Dick Bettendorf** **(714) 484-7234**
Fresno City College, Training Institute, Fresno, CA *Advanced Transportation Technology Center* *390 W. Fir Ave., Building B* *Clovis, CA 93611* *Fax: (559) 323-4811</B<>* *Email: kenm@fccti.cc.ca.us*	Ken Machoian (559) 323-4688 Ext 6489

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The typical community college automotive technician certificate program includes a curriculum of 62 units. Courses on alternative fuel engines are part of the standard mechanic/technician curriculum. Each school in the ATTI specializes in certain aspects of alternative fuel engine and vehicle repair and maintenance. Some focus on light-duty vehicles and others have specific training available for maintenance and repair of heavy-duty engines. According to Peter Davis, statewide Director of the ATTI program, and Richard Bettendorf, Cypress College, students in these programs are very much in demand and usually are offered jobs after completion of the first semester of training. The difficulty is attracting students to this curriculum. Potential students are unaware of the job opportunities in this field, nor are they aware of the opportunities for technology development in this area. Many high schools no longer offer automotive classes, which in the past have provided students to pursue this vocation at the community college level.

The ATTI member colleges and other training institutions, such as the Transportation Foundation of Los Angeles and the Los Angeles Trade-Technical College, are pursuing the availability of training for high school students and through local school district adult education programs. The College of the Desert has received a National Science Foundation Grant to design a training curriculum that will begin in high school and continue through the community college level. This program will be discussed in more detail in the "Recommendations" section.

In addition to the courses offered as part of the standard certificate curriculum, colleges participating in the ATTI offer programs tailored to a specific user and/or application. ATTI program staff are capable of designing one class or an entire curriculum that can be taught on the user's site. The ATTI, through Cypress College, operates a mobile training lab, using a tractor-trailer donated by the Orange Count Transportation Authority and refurbished by Cypress College. The Advanced Transportation Technologies Center at Cypress College is currently working with the OCTA to design and conduct training for personnel involved with OCTA's fleet of LNG buses. This training will be conducted at OCTA's facilities by ATTI staff.

The West Virginia University program is a federally funded training program that has become a national coalition known as the National Alternative Fuels Training Consortium (NAFTC). The NAFTC includes educational institutions, fuel providers, equipment and parts manufacturers, federal and state agencies, and professional educational and training associations. The NAFTC operates through a network of National Training Centers in 19 states. Currently, the only NAFTC member in California is College of the Desert, in Palm Desert. However, NAFTC staff proposes to expand to other community colleges through the auspices of the ATTI at College of the Desert. The centers provide training courses for natural gas, propane and electric vehicles. The following are standard courses offered through NAFTC member campuses:

- NGV System Integration and Service
- Propane Theory and Diagnosis
- Transient Emissions Training
- Forklift and Material Handling - AFV Applications
- AFV Electronics and Diagnostics
- Alternate Fuel Seminars
- CN Systems Theory and Design
- Cylinder Inspection Certification
- NGV System Integration and Electronics Training
- Propane Vehicle Training

Additional programs may be offered at different campuses. For instance, York Technical in North Carolina focuses on electric and hybrid technologies.

Individual engine manufacturers have programs to facilitate the use of their alternative fuel engine at the customer location. Most of these programs are after the sale to the customer and are usually part of the engine warranty agreement. This training only

supports work on the engine, and does not usually include the fuel delivery system. The following engine companies provide specific engine training:

- Cummins
- Detroit Diesel
- Power Systems (Caterpillar)
- Ford (medium-duty engines)
- General Motors (medium-duty engines)
- Mack
- John Deere

No heavy-duty chassis manufacturers have a program at this time, although PACCAR is considering such a program and Freightliner has begun to formulate an alternative fuel vehicle program.

Identifying Training Needs

It is apparent that proliferation of alternative fuel engine and vehicle technologies will depend on the ability to adequately maintain and repair these technologies. Training for light-duty vehicles is becoming more prevalent based on manufacturer-provided training, capabilities of local dealerships, and availability of training through the community colleges and other resources. For heavy-duty engines, manufacturer training for dealerships, distributors, and fleets is available, although the depth of that training varies. Some training is available through the community colleges and other resources.

Although the ATTI through the California Community Colleges is an exemplary program, it is not well recognized or utilized. In addition, local trade schools have the capability to provide training, although these schools are not currently focused on alternative fuels. There appears to be a great demand for trained mechanics and technicians; however, there does not appear to be sufficient interest in high school programs to prepare students for a career in automotive and engine service technology.

The use of liquefied natural gas (LNG) is expected to be a major contributor to the offset of diesel fuel use in future heavy-duty vehicle applications. Most of the courses offered through the National Alternative Fuel Technology Consortium and the Advanced Transportation Technology Initiative are directed to the use of compressed natural gas in light-duty vehicles. Training specific to cryogenic systems, methane detection and LNG on-board fuel systems is almost non-existent.

In addition to training to maintain engines, diagnose problems and repair them, there is a lack of understanding of the fundamentals of the design and operation of fueling facilities for alternative fuel vehicles. In general, fleets do not understand well the parameters of natural gas fueling facility design and operation, including code requirements, appropriate station sizing, and safety considerations. Fleets are also not well informed regarding necessary facility modifications that may be necessary to service alternative fuel vehicles and engines. There are few resources currently available to provide this information. Through the Interstate Clean Transportation Corridor project, Gladstein & Associates has sponsored a number of meetings for specific fleets that are planning to implement fueling stations. However, these meetings only provide an opportunity for vendors to explain their products to potential customers. They do not provide instruction

on how to design and build a station. The NGV Institute, in Las Vegas, Nevada, is a nonprofit organization that offers courses on natural gas fueling facility design and operation. The institute has a standard curriculum, and is capable of tailoring a curriculum to meet the user's needs.

Basin fleet managers have expressed their frustration in being able to find well-trained technicians for all their fleet vehicles. Particularly lacking, are technicians trained in the lasted electronic controls and advanced diagnostic equipment. The need for trained personnel will become more critical in the future as both diesel and alternative fuel technologies become increasingly complex.

Recommendations

AQMD shall take the lead in making fleets aware of training resources available, and in cosponsoring development of training programs. Support and cooperation from the American Trucking Association and the California Trucking Association could facilitate this effort. The AQMD will communicate to the manufacturers the need for comprehensive training programs for local dealers and distributors and major fleets. AQMD will work with area fleets, particularly transits and school bus fleets, to meet specific training needs. In addition, the AQMD will cosponsor curriculum development through foundations and other training organizations; and can cosponsor specific training activities, such as code requirements for siting natural gas fueling facilities, and necessary facility modifications.

The AQMD is working with members of the Advanced Transportation Technologies Initiative to become an active participant in the further development of this program in the Basin. The ATTI has initiated an effort to identify alternative fuel engine and vehicle technology training needs for fleets throughout the Los Angeles Basin. This is the first step in the process of developing programs and curriculum to address the needs of the Basin's fleets.

AQMD staff is working with staff of College of the Desert (COD) as a part of their curriculum and training development program. This three-year program is the result of grants received through the National Science Foundation as part of COD's affiliation with the National Alternative Fuels Training Consortium. This effort will incorporate classroom curriculum, fleet-specific training programs, and web-based and CD-ROM training materials.

Staff is also working with staff of West Virginia University to become a more active participant in the National Alternative Fuels Training Consortium. The Consortium has the capability of bringing specific training programs to Basin fleets.

In addition to these efforts, staff is also working with a local training foundation to evaluate current maintenance policies at Los Angeles Metropolitan Transportation Agency. These efforts are expected to produce a maintenance and repair troubleshooting manual that will include recommendations for repair procedures, preventative measures,

procurement specifications, and list of needed diagnostic equipment. The effort will also initiate curriculum development specific to the adult education system.

In order to ensure successful implementation of the fleet rules, the following specific AQMD actions related to public education, public outreach, and operator training are recommended.

Clean Fuel Fleet Operator Web Site

Description: The AQMD staff will develop a specific web site to dissimulate information relevant to rule implementation, such as:

- often asked questions for rule compliance,
- available manufacturer/ vendor information and linkage to manufacturer's web sites,
- training classes/programs opportunities,
- linkage to location maps of refueling sites and their accessibility and availability,
- local alt-fuel vehicle repair and maintenance service,
- funding opportunities,
- outstanding request for bids,
- rule implementation status (e.g., # of alternative fuel vehicles purchased, # of new refueling sites), and
- Feedback and comment from fleet operators.

This web site will serve as an information resource center to provide a clean vehicle fleet operator network.

Schedule: 6-month program development time to be online by July 2001.
Resource Need: $5-10K for start-up; $3-5K for annual maintenance.

Rule 119X Quarterly Newspaper

Description: The AQMD will prepare and distribute a quarterly newspaper to Rule 119X fleet operators to highlight the implementation progress, operational issues, lessons learned, success stories, and any other relevant information that can benefit the fleet operators.

Schedule: First edition January 2002.
Resource Need: Existing staff resources; $5 K annually for printing and distribution.

AQMD Fleet Rule Implementation Hotline

Description: The AQMD will have dedicated staff to provide technical assistance to fleet operators regarding their compliance and operating needs. In addition, staff effort will be made to have periodic contacts with fleet operators to resolve rule implementation issues in a timely and efficient manner.

Schedule: Dedicated phone lines available beginning in July 2001.
Resource Need: Two FTEs

Emergency and Safety Response Kit and Plan

Description: The AQMD staff will work with fuel suppliers and equipment vendors to develop an emergency response kit to ensure safe operation of CNG refueling stations and vehicles. The staff will also work with the Gas Company to expand and update the existing emergency preparedness plan to enhance the reliability and adequacy of fuel supply in the situation of catastrophes, such as earthquakes.

Schedule: 12-month lead-time.
Resources Need: Existing staff resources.

Annual Technology and Application Symposium

Description: The AQMD staff will conduct an annual technology symposium focusing on the technology development and operating experience for Rule 119X implementation. The symposium will provide a forum for information exchange, building a partnership between the public and private sectors and between the regulators and the regulated community; identifying research and development needs, and input for future rule refinements, etc.

Schedule: Annual meetings beginning in 2001.
Resources Need: $10K annually

Community Outreach Projects

Description: The AQMD staff will participate or sponsor community projects or events related to the clean air transportation technologies. Public education in consumer choices and community support for clean urban buses and school buses are examples of potential focus.

Schedule: 2-3 major events targeted annually.
Resources Need: Existing staff resources.