Appendix 4

VMEPs

APPENDIX H

VOLUNTARY MOBILE EMISSION REDUCTION PROGRAM FOR THE HGB ATTAINMENT DEMONSTRATION SIP REVISION FOR THE 1997 EIGHT-HOUR OZONE STANDARD

Excerpt from
Evaluation of Mobile Source
Control Strategies for the
Houston-Galveston-Brazoria
State Implementation Plan

Prepared for Houston-Galveston Area Council
Prepared by ENVIRON International Corporation

This appendix supplements the discussion provided in Section 4.6.2.2, Voluntary Mobile Emission Reduction Program (VMEP), and details the voluntary commitments made in this state implementation plan (SIP) revision. The VMEP emission reduction was included in modeling sensitivity runs described in Chapter 3, Photochemical Modeling. The 2.25 tons per day tpd reduction of nitrogen oxides (NO_X) emissions resulting from these voluntary commitments are referred to as the Houston-Galveston Area Council (H-GAC) reductions.

Alternative Commuting

Bicycle and Pedestrian Actions

Bicycle measures encouraged by bicycle and pedestrian action groups include new bicycle lanes, new bikeway plans, and encouraging greater use of existing lanes instead of vehicle use. Bicycle action groups and other bicycle measures included in the H-GAC *Regional Bikeway Plan* from the 2035 RTP are evaluated below. The Regional Bikeway Plan, described in Appendix G of the 2035 RTP is intended to serve as a guide for investment, interagency coordination, and best practices in developing facilities for bicyclists in the eight-county Houston-Galveston Transportation Management Area (TMA). The plan acknowledges that the current level of bicycle travel within the TMA is not precisely known, making it difficult to define a benchmark for increases in bicycle travel replacing vehicular travel. Unfortunately, the Houston-Galveston region also has one of the highest rates of crashes involving motorists and bicyclists in Texas. The plan may be reviewed at http://2035plan.org/docs/final/Appendix%20G-%20Draft%20Ped%20Bike%20RTP%20Appendix.pdf.

Notable examples of local bikeway networks include Alvin, Conroe, Houston, Lake Jackson, La Porte, Missouri City, Pasadena, Sugar Land, and The Woodlands. The H-GAC plans to continue to work with local entities to identify projects that further the development of local bikeway networks as part of the overall regional transportation system.

There are two employment centers within the TMA that generate a significant level of bicyclist commuters: the Texas Medical Center (TMC) in Houston and the University of Texas Medical Branch (UTMB) in Galveston. The TMC draws the greatest amount of commuter bicyclists of any employment center in the TMA. According to the 2000 census, there were 50,238 work trips, of which 36,973 drove alone, 7,927 carpooled, 4,018 took the bus, 430 walked, 379 biked, and 511 used other means (motorcycle, taxi, permanent telecommute). The 430 walking trips and the 379 biking trips represent 0.9% and 0.8% respectively of all trips. The TMC has the highest concentration of bicycle trips within a census tract in the region (even greater than downtown Houston), and the third highest concentration of walking trips in the region (after downtown and the UTMB in Galveston). Recent observations made by H-GAC and TMC staff indicate that over 1,000 bicyclists now commute to the TMC on a daily basis.

The 2000 Census indicated that UTMB had 10,470 daily work trips. Of these 89% were by private vehicle, 1.3% by bus, 2.2% by bicycle and 5.3% walking trips. These are much higher than the regional average of 0.3% by bicycling and 2.1% by walking.

Cleaner Diesel Fuel/Alternative Fuels

The cleaner diesel control measure would consist of a change in diesel fuel from Texas Low Emission Diesel fuel (TxLED) to either cetane additive enhanced (CAE) or Fischer-Tropsch (FT) diesel fuel. It is anticipated that, due to the nature of CAE and FT diesel technology, this program may not be a mandatory change to CAE or FT diesel, but may more likely be for a localized or demonstration project on specific Class 8b Heavy Duty Truck (HDT) fleets.

TxLED fuel contains less than 10 percent by volume of aromatic hydrocarbons and has a cetane number of 48 or greater. CAE diesel would consist of diesel to which additives were supplemented, producing a cetane number increase of 5 points with no changes in other parameters from TxLED fuel. FT diesel fuel

would consist of typical FT fuel with a cetane number of 74 and an aromatic content of 0.1 percent (Clark et. al., 1999).

Subscription Bus Service

There are many types of subscription bus services offered in the Houston and other metropolitan areas. The analysis presented here focuses on a subscription bus service catering to those that are least likely to use transit – white collar workers whose work load would make a quiet stress-free ride to work with internet access offered very attractive. Among the major obstacles to transit use are limitations in service between residential and employment areas. If transit service were designed specifically for certain residential areas to highly used but somewhat underserved employment areas, transit use could increase substantially. An example of such a service would be between the Katy areas to downtown areas such as the TMC.

There are a number of potential services that could assist in transit use between such areas, including personalized rapid transit, subscription bus service, business first buses, easier access between METRO and other services such as those provided by TREK (such as a universal card), and personalized transit planning. There is a likelihood of some latent demand for transit service that specifically serves individuals because of time spent in traffic, gas prices, maintenance and parking costs that can be significantly offset by using an alternative mode of transportation such as transit. For example, personalized transit planners, somewhat like personal shoppers, could assist individuals by showing them how to easily use transit from one point to another (such as home to work, work to lunch spots or meeting locations, and work to home). Such a service could even be provided online. In addition, some buses could be equipped with fold-down tables and wireless internet connections (for example, through cell-phone companies) so that people could work while on the buses, and feeder shuttles could bring people from transit stops directly to work centers.

This measure evaluates the benefits of a hypothetical and ambitious program that would provide these services. It is assumed that 100 new business buses (buses equipped with fold-down tray tables and wireless internet) seating 35 people each providing service directly from neighborhoods to specific work locations would operate four trips per morning and four per evening. Service would also be augmented by the addition of 100 shuttle buses to provide service between current METRO stops and (1) under-served residential area too far from transit centers or park and ride lots to utilize them; and (2) employment areas in downtown Houston which currently do not have sufficient transit access. The shuttle buses are assumed to seat 15 people each and operate six trips each morning and six each evening. For the purpose of simplicity it is assumed that currently planned expansions to METRO service would accommodate the extra ridership created by the shuttle services. If this measure results in emissions significant enough to merit further review, this assumption, along with the others would need to be refined.

Public Transit Improvements

There are two measures related to transit options in the list of measures that could produce measurable emissions reductions shown below:

- Electrified buses, and
- Light rail expansion.

The electrified buses or light rail require infrastructure improvements (overhead catenary or rail construction), but would result in an elimination of the engine emissions on those routes served.

Compressed work week

Compressed work weeks are among the most effective transportation demand management measures. Many Houston area employers currently have compressed work week programs. Employees in most of these programs either have a 4/40 schedule or a 9/80 schedule. A 4/40 schedule means they work four ten

hour days per week and have one day off. A 9/80 schedule means the employees work 9 hours a day and take one day off every two weeks. Most programs operate on a 4/40 schedule.

Currently the H-GAC alternative work schedules program, which operates under the umbrella of the Commute Solutions program, helps employers implement several measures including telecommuting, carpooling, vanpooling, alternative parking, and compressed work weeks. A mandatory program specifically aimed at increasing the amount of compressed work weeks is not currently in place but could be implemented as a part of the overall ozone attainment plan.

Internet Ridematching Services

An H-GAC ridesharing program began in August of 2005, which utilizes computer-based methods similar to other online travel programs such as Travelocity. The program is internet based and uses the consultant NuRide, Inc. (http://www.nuride.com), the nations first incentive-based rideshare network. NuRide's innovative online program lets individuals use NuRide's patent-pending technology to find the ideal partner with whom to share a single ride for work or pleasure. Subscribing to the philosophy that people sharing rides provide a valuable service to their community, NuRide offers its members rewards each time they use the ridesharing program. By accumulating "NuRide Miles", members earn enough points to acquire gift cards and gift certificates from a variety of corporate sponsors such as Old Navy, TGI Fridays, Macy's, and many other familiar retailers and restaurants.

The program's incentives to ridesharers are significant enough to have made the program grow from a few hundred carpoolers to nearly 5,000 in August 2008. The incentives mentioned above earn points at dozens of participating retailers. Points are only earned when, for each ridesharing day, ridesharers match themselves with an online carpool and fill out a survey form (all ridesharers must fill out the survey or no credit will be given).

It should be noted that in addition to NuRide, there are several other internet based carpooling websites. eRideshare.com is the leading carpool/ridesharing website, according to Yahoo and Google. It has been recognized as "Best of the Net" by About.com, and was featured in Al Gore's book, *An Inconvenient Truth as a way to Take Action*. GoLoco, Zimride (which uses a facebook application), Mycarpools.com, and CarpoolWorld.com are other examples of carpooling websites. These internet sites saw enormous growth during 2008 while gas prices were rising. Specific statistics on Houston for all ridesharing sites are not available.

Vanpooling

The H-GAC administers a vanpooling program that consists of ongoing efforts to reduce congestion by providing alternative transportation through trip sharing with vanpools. The program began operation in 1996 and is funded using Surface Transportation Program (STP) funds, METRO local funds and employer incentives, which provide reduced monthly costs to participating employees. As of August 2008, the vanpool program had 755 vans and 7,846 riders with an average of 10.4 riders per van. The vanpools average 54.6 miles per day (round trip).

The VMT reduction resulting from these vanpoolers will be about 54.6 miles per day, or about 100 million miles per year, assuming a 260-day work year. As vanpools are driven about 11 million miles per year to offset the 111 million miles that would have been driven in passenger vehicles.

Regional Traffic Flow Improvement

Local Intersection Signal Improvements

Traffic signalization improvements, reversible lanes, and intersection improvements are an ongoing part of the H-GAC plan and Transportation Implementation Plan (TIP). According to evaluations of Congestion Mitigation and Air Quality (CMAQ) projects, as well as straightforward logic, traffic flow

improvements encouraged by improved intersections or traffic signals provide benefits for 2 to 5 years (3 years was used for this analysis) before latent demand and growth in traffic cause the facility to return to approximately the same flow level as prior to the signal or other improvements (although better able to handle higher traffic volume).

Vehicle Retrofit and Replacement

Public and Private Sector Clean Fuel Fleets

This measure seeks to reduce on-road vehicle emissions by rapid turnover to newer lower emission engines, retrofit of existing engines with approved devices, or new lower emission technologies. These programs have been mandated or voluntarily implemented with federal incentives or state funding from programs such as the Texas Emissions Reduction Plan (TERP).

In Houston, the H-GAC administers a program under The Clean Cities/Clean Vehicles Program (http://www.houston-cleancities.org/#) where CMAQ funds are distributed to replace and retrofit lower emitting heavy-duty vehicles.

In Texas, the TERP program has been successful in co-funding many different types of emission reduction projects including on-road trucks, construction and off-road equipment, marine vessels, and locomotives. To date, about $300 million of projects have been approved in the HGB area from 2002 through 2008 with most of the funding occurring in the 2004 through 2008 period. The most recent projects have just been approved, so not all of the emission reductions have been realized and are still pending.

Dedicated Funding for School Bus Replacement

A fund dedicated to helping meet the costs of purchasing new buses to replace older buses has accelerated the replacement of older buses in school district fleets. Buses that are replaced should be scrapped.

Electric Vehicles/Increased Use of Hybrid Buses

The electric vehicle control measure consists of the voluntary inclusion of a greater percentage of zero emission vehicles (ZEVs) or zero emitting travel through the use of plug-in hybrids or other vehicles. This could occur through new purchases or a replacement program for existing vehicles.

The hybrid buses available have two main advantages. No new (other than the buses themselves) infrastructure is required and fuel consumption is reduced. The main disadvantage is that a fraction of emission reductions (about 25%) would be applied to already low emission new bus engines. Therefore, the emission reduction in tons per year would be lower than that for projects implemented through 2007.

Off-road Measures

Voluntary Non-Road Replacement and Retrofit Programs

Voluntary retrofit and replacement programs have been used across the US to reduce emissions using a variety of co-funding incentive programs to offset the costs incurred.

In Texas, the popular TERP program has been successful in providing co-funding for many emission reduction projects of many different types of emission sources, including, on-road trucks, construction and off-road equipment, marine vessels, and locomotives. To date, about $300 million of projects have been approved in the HGB area from 2002 through 2008 with most of the funding occurring in the 2004 through 2008 period. Because the most recent projects have just been approved, not all of the emission reductions have been realized and are still pending.

In addition, there are other funding sources for control strategy projects including the EPA grant program run by a local collaborative (http://www.blueskyways.org/). The EPA funding program was relatively

limited at $5,000,000 in 2008 (http://www.blueskyways.org/pdf/clean-diesel-FY08.pdf) for the states of Arkansas, Louisiana, New Mexico, Oklahoma, Texas, Iowa, Kansas, Missouri, Nebraska, and Minnesota. Nationally this program was funded at $49.2 million in 2008, of which, $27.6 million was available for national Clean Diesel Funding Assistance Program. Half of the national Clean Diesel Funding Assistance Program is dedicated to public fleets. Other monies were distributed to the States, research, and revolving loan program.

There may be additional funding sources available through State and Federal actions and other programs.

Government Construction Incentives

An incentive program or a requirement for publicly-funded (including just captive state, county, and municipal fleets of off-road equipment) or all construction projects could effect emission reductions by encouraging fleet turnover to those meeting lower emission standards. A TxDOT plan provides an example of an incentive program. Alternatively, many other states and localities have suggested or implemented emission standard (by model year) requirements for construction contracts. (EPA, 2008, http://www.epa.gov/diesel/construction/contract-lang.htm) While some areas target NO_x control and others PM control, the incentives or requirements for new equipment based would control both pollutants.

Promote Cleaner Lawn and Garden Equipment

A program designed to promote the use of clean lawn and garden equipment. The primary benefit of these programs will be to reduce VOC and CO emissions.

There are at least two examples of a replacement/purchase program to replace gasoline equipment with electric versions including several in California (http://www.aqmd.gov/tao/lawnmower.html, http://airquality.org/mobile/mowdown/mowdowngeneral.shtml) and the Central Texas program (http://www.cleanairforce.org/2008MowingFlyer.pdf). These programs have worked out many of the issues related to transfer of ownership and determining appropriate incentives.

Reduced Idling

Idling is an inefficient use of equipment in general and generates unnecessary emissions. Idling however cannot be avoided in all cases, such as during normal work when work is performed intermittently, and the time to restart the engine would be considered an annoyingly significant delay. This measure would seek to limit excessive idling when equipment is not required immediately. Suggested periods for limiting idling could be s little as 15 minutes maximum. Many on-road trucks have factory-installed engine shut down devices that automatically shut down the engine after a set period, or devices could be added to existing equipment.

To implement this measure, idle shut-off devices could be employed with idle timers set to a period that would not cause typical operational problems. But operator training could provide significant idle reduction perhaps beyond idle shut-off devices.

Development of Clean Air Action Plans for Regional Port and Marine Operations

This measure seeks to adopt a plan that effects emission reductions from HGB area ports and private terminals. The plan could cover several or all emissions sources associated with marine activity include water and shoreside activities as outlined by EPA's Clean Ports USA (http://www.epa.gov/otaq/diesel/ports/index.htm).

A program might use California ports plans as a model of what might be accomplished. The most widely sample plan is that for the Ports of Long Beach and Los Angeles who have adopted the San Pedro Bay Ports Clean Air Action Plan (CAAP), a plan aimed at significantly reducing the health risks posed by air

pollution from port-related ships, trains, trucks, terminal equipment and harbor craft. (http://www.cleanairactionplan.org/about/default.asp) the primary purpose of this California plan is the reduction of particulate matter emissions where the primary purpose of the HGB plan might be VOC and NO_x reduction for ozone attainment.

Rail Efficiency Measures

This strategy suggests projects that might improve rail efficiency requiring less activity from line-haul locomotives. Some measures to effect this improvement could be public/private partnerships while others might be implemented by the railroads.

Railroads have been improving their efficiency through technology and operational measures. The technologies include wheel and rail lubrication, better bearings, more efficient engines, perhaps other technologies yet to be identified. The operation changes include idle reduction, improved aerodynamics, longer trains, and improved training and evaluation of engineers to reduce braking, idling, and other inefficient operations.

Program Type	NO_X Reduction Estimate (tons per day)
Alternative Commuting	0.20 tpd
Regional Traffic Flow Improvement	0.05 tpd
Vehicle Retrofit and Replacement	1.30 tpd
Off-road Measures	0.70 tpd
Total	2.25 tpd