

**APPENDIX A**

**VOLUNTARY MOBILE SOURCE EMISSION REDUCTION PROGRAMS  
FOR THE HOUSTON-GALVESTON-BRAZORIA EIGHT-HOUR OZONE STATE  
IMPLEMENTATION PLAN**

This appendix supplements the discussion provided in Section 4.2.3, Voluntary Mobile Source Emission Reduction Programs (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 2. The 2.82 tons per day (tpd) reduction of nitrogen oxides (NO<sub>x</sub>) emissions resulting from these voluntary commitments are referred to as the Houston-Galveston Area Council (H-GAC) reductions.

### **Public and Private Sector Clean Fuel Fleet**

This measure seeks to reduce on-road vehicle emissions through rapid turnover to newer, lower emitting engines, retrofit of existing engines with approved devices, or new, lower emission technologies. These kinds of programs have been mandated or voluntarily implemented with incentive funding from state (e.g. Texas Emission Reduction Plan (TERP)) or federal (Congestion Mitigation and Air Quality (CMAQ)) sources. Clean fleet programs have been successfully established in Houston, Los Angeles, and Sacramento. Implementation of the clean fleet program in the Houston-Galveston-Brazoria (HGB) area relies on a partnership between the transportation planning organization, the H-GAC, the Texas Department of Transportation, and the Federal Highway Administration to properly distribute CMAQ dollars. The H-GAC has dedicated staff time to administer the program, address funding, prepare contracts, conduct verification and reporting, and perform other functions associated with this program.

The HGB clean fleet program has successfully gained public acceptance and increased participation with each funding cycle. Similarly, during the 2005 fiscal year, the TERP program also increased participation and reduced the cost per emission reduction from that of previous years.

The H-GAC Clean Cities/Clean Vehicles program conducted a review of cost and effectiveness of the CMAQ program and determined that the most cost effective use of these funds for emission reductions is to target heavy-duty vehicles. Although other competing uses of CMAQ dollars, such as vanpool and other commute reduction programs, were not excluded from the program, more emphasis was directed toward heavy-duty vehicles since targeting these is more cost effective.

Through 2005, the H-GAC Clean Cities/Clean Vehicles program had committed funding to nearly 100 projects, most of which involved many vehicles in a fleet under a single project. The projects include alternative fueled vehicles, hybrid-electric drive trains, and clean diesel engines. These projects reduced emissions of NO<sub>x</sub>, particulate matter, and volatile organic compounds. Projects funded in the Houston area through 2005 represent approximately 900 tons per year (tpy) of NO<sub>x</sub> emission reductions with total CMAQ funding of \$50,000,000 (equivalent to about \$56,000 per ton).

The measure affects emissions from heavy-duty diesel vehicles, heavy-duty gasoline vehicles, and buses. Benefits from the Clean Cities/Clean Vehicles program primarily impact non-holiday weekday travel, as there is considerably less heavy-duty vehicle activity on weekends and holidays. An approximate value of 290-295 average weekdays of emissions per year has been used by the Texas Commission on Environmental Quality (TCEQ) for modeling purposes. Based on an average capital cost of \$30,000 - \$56,000 to reduce emissions by one tpy, the cost to gain a one tpd reduction would be approximately \$9,000,000 - \$16,000,000. Based on a \$20,000,000 annual program budget over four years (2006 – 2009), a NO<sub>x</sub> emissions reduction benefit in excess of 5 tpd and up to 9 tpd could be achieved in addition to the 3 tpd NO<sub>x</sub> reduction achieved to date under a similar program. The lower bound is the progress to date of this program, though some projects in place will have expired by 2009. The TCEQ already credits 3 tpd of emission reductions from this measure in its baseline emission inventory. Therefore the emissions reductions from this program could be from 0 to 9 tpd. The H-GAC conservatively estimates that 2 tpd of NO<sub>x</sub> reduction, above and beyond the 3 tpd included in the baseline, can be achieved with this measure.

## **Commute Solutions**

### ***Compressed Work Week***

Compressed work weeks are among the most effective transportation demand management measures. Many Houston area employers offer compressed work week programs to their employees. Typically, employees work either 4/40 schedule or a 9/80 schedule. A 4/40 schedule means that employees work four ten-hour days per week and have one day off. A 9/80 schedule means the employees work 9 hours per 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 operates under the umbrella of the Commute Solutions program and 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.

While an analysis was performed to examine potential reductions if a certain hypothetical growth of the program occurred (see Appendix D: *Evaluation of Mobile Source Control Strategies for the Houston-Galveston-Brazoria State Implementation Plan*), given the uncertainties and the assumptions associated with this estimate, the H-GAC has decided to pool several commute solutions reductions into one reduction estimate. All of the commute solutions measures listed in this SIP revision will together achieve approximately 0.77 tpd in NO<sub>x</sub> reductions.

### ***Telecommuting Incentives or Mandates***

Telecommuting is among the most effective travel demand management programs because it completely eliminates a work trip for the days a person telecommutes. Telecommuting programs can operate through an employee working from home part-time, such as one day per week, or from a satellite work center closer to their residence. Obstacles to telecommuting are mostly related to uncertainty about the ability of an employee to work a full day without supervision, issues regarding provision of computer and phone equipment, and issues related to the provision of insurance while working at home. Additionally, some studies have shown a possible increase in the amount of non-work-related driving on telecommuting days (employees working from home have more time for errands, for example). Benefits can include a reduction in worker stress resulting in fewer sick days and increased productivity. The implicit trust required to allow an employee to work from home also leads to an increased sense of importance and “ownership” of their work, which can also increase productivity. In practice, most employees that work hard at the office will work just as hard at home. This measure incorporates suggestions for telecommuting ranging from mandates to incentives to additional video conferencing between worksites. The H-GAC has operated a telecommuting program for several years as part of the Commute Solutions and Best Workplaces programs. The program has operated as an incentive program and has been marketed through phone calls and face to face meetings with potential companies, advertising, and other outreach by the H-GAC and various consulting groups.

Currently there are 1,115 telecommuters, from 97 different area companies, participating in the program. The frequency varies enormously with some participants telecommuting nearly full-time and others telecommuting once or twice a month. The average frequency is assumed to be once per week, and based on data on the teleworkers collected by the companies and by the H-GAC, the average round trip distance is 52 miles. As experience with the program has grown, so has the effectiveness of implementation methods. While an analysis was done to examine potential reductions if a certain hypothetical growth of the program occurred (see Appendix D), given the uncertainties and the assumptions associated with this estimate, the H-GAC has decided to pool several commute solutions reductions into one reduction estimate. All of the commute solutions measures listed in this SIP revision will together achieve 0.77 tpd in NO<sub>x</sub> reductions.

### ***Expanding Vanpooling***

The H-GAC vanpooling program consists of ongoing efforts by METRO and a newer effort called “miniPOOL” to recruit vanpoolers. The program began operation in 1996 and is funded

using Surface Transportation Program funds, METRO local funds and employer incentives, which provide reduced monthly costs to participating employees. As of December 2005, the vanpool program had 508 vans and 5,874 vanpoolers, with an average of 11.6 riders per van. The miniPOOL program vanpoolers average 67.7 miles per day (round trip). The METRO vanpool use is expected to be higher, but no data was provided on their activity; therefore an average of 70 miles per round trip is assumed for all vanpooling trips. The reduction in vehicle miles traveled (VMT) resulting from these vanpools is 411,180 miles per day, or 100.7 million miles per year (assuming a 260 day work year). Since vanpools are driven 35,560 miles per day, or 9.2 million miles per year, the total VMT reduction is 91.5 million miles per year. While an analysis was done to examine potential reductions if a certain hypothetical growth of the program occurred (see Appendix D), given the uncertainties and the assumptions associated with this estimate, H-GAC has decided to pool several commute solutions reductions into one reduction estimate. All of the commute solutions measures listed in this SIP revision will together achieve 0.77 tpd in NO<sub>x</sub> reductions.

### ***Internet Ridematching Service and Incentives***

A new H-GAC ridesharing program uses computer-based methods similar to other online travel programs such as Travelocity began in August of 2005. The internet-based program uses the consultant NuRide, Inc. (<http://www.nuride.com>), the nation's first incentive-based rideshare network, that lets individuals use 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 incentives provided by the program are significant and the program has nearly 2,500 participants after only three months of operation. Other program incentives are the ease and convenience and a "cool factor."

Since the program is used for work and non-work trips it is assumed to operate 365 days a year. The program tracks miles in the carpools by all riders except the driver. In the first quarter of operation the program removed 459,386 VMT from Houston roadways, a reduction of approximately 5,100 miles per day. It is highly likely the program will exceed its goal of removing two million miles, or approximately 5,479 miles per day, during its first year.

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### ***Personalized Rapid Transit and Subscription Service***

Among the major obstacles to transit use are limitations in service between residential and employment areas. If transit service were designed specifically for use between certain residential areas and certain employment areas, transit use could increase substantially. An example of such a service would be between the Katy area to downtown areas such as the Texas Medical Center. There are number of potential services that could assist in transit use between such area, including personalized rapid transit, subscription bus service, business first buses, easier access between Metro and other services such as those provided by the British Columbia-based Trip Reduction, Research, Education, and Knowledge (TREK) Program (such as a universal card), and personalized transit planning. There is likely latent demand for individual transit services since alternative transit can significantly offset the time spent in traffic and gas, maintenance, and parking costs. For example, personalized transit planners could assist individuals by showing them how to easily use transit and such services could even be provided online. In addition, some buses could be equipped with fold-down tables and wireless internet

connections so that people could work while on the buses, and feeder shuttles could bring people from transit stops directly to work centers.

While an analysis was done to examine potential reductions if a certain hypothetical program occurred (see Appendix D), given the uncertainties and the assumptions associated with this estimate, the H-GAC has decided to pool several commute solutions reductions into one reduction estimate. All of the commute solutions measures listed in this SIP revision will together achieve 0.77 tpd in NO<sub>x</sub> reductions.