

**Transportation Control Measures and Voluntary Mobile Source Emission Reduction Programs for the Houston-Galveston-Brazoria State Implementation Plan**

**Background**

The Texas Commission on Environmental Quality requested that H-GAC work to formulate voluntary mobile control strategies to be included in the 8-hour Ozone Attainment Demonstration State Implementation Plan (SIP) for the Houston-Galveston-Brazoria (HGB) region, which will affect the 85 ppb 1997 8-hour ozone standard. Voluntary control strategies typically fall into two categories: Transportation Control Measures (TCMs) which are project specific on-road voluntary strategies that reduce vehicle use or improve congestion, and Voluntary Mobile Source Emission Reduction Programs (VMEPs) which contribute to emission reductions, but are not project specific.

**Current Situation**

A preliminary list of TCM and VMEP measures were introduced to the Transportation Policy Council (TPC) at the November 21, 2008 meeting. The TPC requested that H-GAC return with cost effectiveness estimates for the proposed TCMs. Please see Table 1 for this list of recommended TCMs with the requested cost effectiveness estimates.

Also during the November meeting, TPC requested that H-GAC return with a list of proposed VMEPs for inclusion in the SIP. This requested list takes the form of the On-Road Control Strategies Short List and can be found in Table 2. This Short List has gone through an initial round of committee review and public comment to identify control strategies that meet EPA criteria for inclusion in the SIP as well as those which can be implemented successfully within the HGB region. These strategies fall into several categories: alternative commuting activities such as teleworking, vanpooling, bicycling, walking; vehicle retrofits and replacements; traffic flow improvements through improvements to the regional intelligent transportation system; as well as other emission reduction policies which have no current local analog.

H-GAC continues to hold stakeholder meetings which include representatives from various industry and government entities to solicit VMEP commitments as a Memoranda of Agreement (MOA). Additionally, the public comment period for the final Control Strategies Short List is now open and will continue through January 15, 2009.

**Action Requested**

Approve recommendations of TCMs and VMEPs for the 8-hour Ozone Attainment Demonstration SIP and forward those recommendations to the Transportation Policy Council for additional consideration.

**TAC Agenda Item 5**  
**Mailout – 01/07/09**

**Table 1: POSSIBLE TRANSPORTATION CONTROL MEASURE PROJECTS FROM TIP**

| <b>CSJ #</b> | <b>Sponsor</b>                        | <b>Street</b>                    | <b>Description</b>                                  | <b>Annualized Cost</b> | <b>NOx Emission Reduction (tons/day)</b> | <b>Cost Effectiveness (\$/ton)</b> |
|--------------|---------------------------------------|----------------------------------|---|------------------------|--|------------------------------------|
| 0912-72-145  | Greater Southeast Management District | Holman                           | Pedestrian Improvements                             | \$15,410               | 0.0001862                                | 253,871                            |
| 0912-72-146  | Greater Southeast Management District | Elgin, Ennis, Alabama            | Pedestrian Improvements                             | \$25,569               | 0.0004562                                | 172,066                            |
| 0912-72-147  | Uptown Houston Association            | Westheimer                       | Pedestrian / Transit Improvement Program            | \$599,282              | 0.0137628                                | 85,027                             |
| 0912-71-544  | City of Houston                       | Columbia Tap Rail to Trail       | Construct Bikeway                                   | \$345,286              | 0.0002721                                | 4,376,248                          |
| 0912-71-801  | City of Houston                       | Columbia Tap Union Station Trail | 12' Wide Concrete Shared Use Path with 5' Bike Lane | \$110,210              | 0.0005840                                | 692,274                            |
| 0912-71-655  | City of Houston                       | Terry Hershey Park               | West Houston On-Street Bikeway Network (Phase 2)    | \$160,062              | 0.0001653                                | 3,420,128                          |
| <b>Total</b> |                                       |                                  |   | <b>\$1,255,819</b>     | <b>0.0154266</b>                         |                                    |

**Table 2: RECOMMENDED VMEPS**

**a. Recommended Alternative Commuting Strategies**

Some strategies in this category such as: rail expansion, internet ridematching services, and vanpooling are already active within the HGB region. Implementation of these strategies at current funding levels through 2015 and beyond will likely result in the following continued reductions:

- Funding programmed for this category during current TIP: **\$29 million**
- Additional funding requested for this category until 2015: **\$29 million**
- Estimated NOx reductions in 2015, assuming consistent funding: **1.03 tpd**

| ID | Control Strategy   | Description  | NOx Emission Reduction Potential (tpd) | NOx Cost Effectiveness (\$/ton) | NOx Reduction per \$1 million (tons) |
|----|--|--|--|---------------------------------|--------------------------------------|
| 1  | Bicycle and pedestrian action  | Benefits from bicycle measures include new bicycle lanes as well as encouraging greater use of existing lanes instead of vehicle use. But it can be difficult to determine the benefits of such programs.              | 0.03                                   | \$913,242                       | 1.10                                 |
| 2  | Encourage bicycle use by using ITS to increase safety in strategic bicycle/automobile conflict areas | Duplicate or supplemental measure.   | 0.03                                   | \$913,242                       | 1.10                                 |
| 3  | Subscription bus service   | On demand personalized transit service similar to other commercial shuttle services but providing lower cost and less stressful methods of commuting or running errands in parts of town that are far from residences. | 0.05                                   | \$2,099,900                     | 0.48                                 |
| 4  | Accelerate rail expansion  | Increase transit capacity. Rail evaluations would need to have specific proposals and market analysis.   | 0.07                                   | Unknown                         | Unknown                              |
| 5  | Internet ridematching services   | Real-time ridematching offered via a Website, by an employer, or by a third party (sponsored by city or transportation authority).   | 0.38                                   | \$1,012                         | 988.0                                |
| 6  | Purchase vans for vanpools   | Commute reduction along with the opportunity to buy cleaner vans.  | 0.07                                   | \$171,067                       | 5.85                                 |

**TAC Agenda Item 5**

Mailout – 01/07/09

**b. Recommended Regional Intelligent Transportation System-Related Strategies**

The strategies in this category have already been implemented to some degree throughout the HGB region. As new technologies are introduced into the existing system and this system is expanded through the region, additional emission reductions are expected. By implementing these control strategies at current funding levels through 2015 and beyond will likely result in the following continued reductions:

- Funding programmed for this category during current TIP: **\$365.4 million**
- Additional funding requested for this category until 2015: **\$365.4 million**
- Estimated NOx reductions in 2015, assuming consistent funding: **1.86 tpd**

| ID | Control Strategy  | Description   | NOx Emission Reduction Potential Based On Historical Estimates (tpd) | NOx Cost Effectiveness (\$/ton) | NOx Reduction per \$1 million (tons) |
|----|---|---|--|---------------------------------|--------------------------------------|
| 7  | Local intersection signal improvements  | Effectively increasing road capacity to reduced stop and go progression improving arterial speeds.  | 0.93   | \$392 million                   | 0.00000003                           |
| 8  | Traffic signal equipment or software updating                                   | Effectively increasing road capacity to reduced stop and go progression improving arterial speeds.  |  |                                 |                                      |
| 9  | Emphasis on major route traffic signalization; through route traffic platooning | Effectively increasing road capacity to reduced stop and go progression improving arterial speeds.  |  |                                 |                                      |
| 10 | Real-time traffic flow management   | Traffic signals that change timing/cycles to accommodate real-time traffic conditions.  |  |                                 |                                      |
| 11 | Adaptive traffic signals and signal timing                                      | Effectively increasing road capacity to reduced stop and go progression improving arterial speeds.  |  |                                 |                                      |
| 12 | Signal timing and coordination to promote traffic progression                   | Currently signal coordination tends to focus on reducing delay time for individual drivers; alter coordination to promote greatest movement for traffic as a whole. |  |                                 |                                      |

**c. Recommended Vehicle Retrofit and Replacement Strategies**

The strategies in this category are currently implemented as the H-GAC Clean Vehicles Program. This program currently reduces over 4 tons per day of NOx within the HGB region. This is H-GAC’s most successful emission reduction program and continued funding will result in additional emission reductions for the region.

- Funding programmed for this category during current TIP: **\$16 million**
- Additional funding requested for this category until 2015: **\$64 million**
- Estimated NOx reductions in 2015, assuming consistent funding: **1.10 tpd**

| ID | Control Strategy                             | Description   | NOx Emission Reduction Potential (tpd) | NOx Cost Effectiveness (\$/ton) | NOx Reduction per \$1 million (tons) |
|----|--|---|--|---------------------------------|--------------------------------------|
| 13 | Private sector clean fuel fleets             | This measure is patterned after the H-GAC Clean Cities Program where clean engines (whether alternatively fueled or no) are purchased for fleets to reduce emissions. | 1 – 2.5                                | \$11,000 - \$25,000             | 90.9 - 40                            |
| 14 | Public agency clean fleet program            | Commitment by public agencies to purchase cleanest possible fleet vehicles could be an element in funding or a voluntary commitment.                                  | 1 – 2.5                                | \$11,000 - \$25,000             | 90.9 - 40                            |
| 15 | Dedicated funding for school bus replacement | Clean Cities Clean Vehicle or TERP or EPA funding sources. This program specifically targets school bus fleets that trend toward older models.                        | 0.77                                   | \$15,000                        | 66.67                                |
| 16 | Increased use of hybrid buses                | Hybrid heavy-duty vehicles have been funded to date in current air quality programs.  | 0.23                                   | < \$350,000                     | > 2.857                              |

**TAC Agenda Item 5**

Mailout – 01/07/09

**d. Recommended Weight of Evidence Strategies**

These programs are being requested for approval as weight of evidence measures which will not specifically count towards meeting the emission reductions required for attainment. Because of this, your support for these measures is requested, however funding for these measures is not requested.

| ID | Control Strategy                                       | Description   | NOx Emission Reduction Potential (tpd) | NOx Cost Effectiveness (\$/ton) | NOx Reduction per \$1 million (tons) |
|----|--|---|--|---------------------------------|--------------------------------------|
| 17 | Pay-As-You-Drive Insurance (per-mile)                  | Insurance costs would be associated with mileage driving by a vehicle increasing the incremental cost per mile driven. The cost of insurance then becomes an incremental cost and could be combined with mileage based registration fees and fuel tax increases to add incentive to alternative transportation. | 2.2                                    | < \$4,000                       | > 0.0025                             |
| 18 | Limitations on idling of heavy-duty vehicles           | May require city ordinance. Will require additional power sources for local major events. Large truck stops have constructed alternatives to idling partially funded by TERP.   | 0.45 – 0.73                            | \$1,200+                        | < 833                                |
| 19 | Enhanced enforcement for Smoking Vehicles Program      | Link to I/M test status: encourage local police to enforce existing smoking vehicle legislation- vehicle impounding for violators (like Dallas Emissions Enforcement Pilot Program)   | 0.04                                   | \$11,028                        | 90.68                                |
| 20 | Creation of regional government idling restriction MOU | Idling is usually a small portion of the emissions from vehicles.   | 0.45 – 0.73                            | \$1,200+                        | < 833                                |