

**CAPCOG Fleet Emission Reduction Outreach and Technical Assistance
Final Report
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1. Introduction

Capital Area Council of Governments (CAPCOG) contracted with Lone Star Clean Fuels Alliance (LSCFA) to work with organizations that had previously made specific fleet emission reduction measure commitments under the CAPCOG Ozone Advance Program (OAP) Action Plan. The main focus of this work was to help these organizations achieve the maximum amount of emission reductions from the committed measures. It should be noted that, although the 5 county Austin-Round Rock Metropolitan Statistical Area is currently a near-nonattainment area for ozone, these commitments are voluntary.

The 20 organizations listed below (all members of the Clean Air Coalition) had made specific fleet management commitments:

- City of Austin
- City of Pflugerville
- Travis County
- City of Round Rock
- Williamson County
- City of San Marcos
- Hays County
- City of Bastrop
- City of Elgin
- City of Lockhart
- City of Luling
- Caldwell County
- City of Cedar Park
- City of Georgetown
- City of Sunset Valley
- Capital Area Metropolitan Transit Authority (Cap Metro)
- Central Texas Regional Mobility Authority (CTRMA)
- Lower Colorado River Authority (LCRA)
- Texas Commission on Environmental Quality (TCEQ)
- Texas Department of Transportation (TxDOT) – Austin District

2. Tasks

2.1 Data Collection

The focus of the first task was to gather fleet make-up information in the above 20 organizations. An initial questionnaire was emailed to these fleets by CAPCOG to establish fleet contacts, fleet size and alternative fuel use. Six of the 20 fleets responded to Questionnaire 1.

Rather than chase up responses to Questionnaire 1, it was decided to move ahead with the design and implementation of Questionnaire 2. This detailed questionnaire was emailed by LSCFA to the 20 fleets listed on page 1 of this report plus City of Hutto, Bastrop County, Texas Lehigh Cement and City of Buda. The objective of Questionnaire 2 was to obtain as much baseline fleet information as possible from which to be able to assess emission reduction potential and benefits. Data was requested for the following categories:

- light-duty vehicles,
- on-road heavy-duty vehicles, and
- non-road equipment.

Data requested for each category included the following:

- make,
- model/model year,
- fuel type,
- activity,
- average annual mileage,
- average fuel use,
- activity life, and
- total number of vehicles in each sub category.

Of the 24 fleets to which Questionnaire 2 was sent, replies were received from the following 11 organizations:

- City of Austin
- City of Pflugerville
- City of Round Rock
- City of Cedar Park
- Bastrop County
- City of San Marcos
- City of Lockhart
- City of Buda
- CapMetro
- TxDOT
- Texas Lehigh Cement

Of these replies, 4 fleets supplied the data as requested, 6 provided fleet data in various formats, and 1 did not supply any fleet data.

In addition to requesting fleet data, fleets were requested to update information about their fleet emission reduction measure commitments through 2018. Of the 11 fleets that replied, 9 provided no information regarding commitments, 1 fleet updated the information as requested, and 1 fleet provided the same information as reported to CAPCOG for 2014.

Appendix 1 shows the overall breakdown of responses by fleets.

2.2 Data Analysis

Given that for CAPCOG the most important focus of the Ozone Advance Program (OAP) Action Plan is reduction of NO_x emissions, it was agreed that the fleet analysis and discussions should focus on measures to reduce NO_x. Analysis of the fleet data received was therefore based on the following specific criteria:

- As evidenced by TCEQ Texas Emissions Reduction Plan (TERP) programs, there is now little interest in providing grants to replace light-duty vehicles since the greatest NO_x reductions can be achieved from replacing heavy-duty on-road vehicles and non-road equipment. Thus, in analyzing the fleet data received and in meetings with the fleets, the contractor chose to focus initially on heavy-duty on-road vehicles.
- The on-road heavy-duty vehicles in each fleet were categorized by the years when federal emission standards change, using vehicles MY 2010 and newer as the first category. By MY 2010, 100% of new heavy-duty engines had to meet the 2007 NO_x standard of 0.2 g/bhp-hr (the current federal standard in place).
- Heavy-duty vehicles were also analyzed by fuel type.

Of the 10 fleets that supplied detailed fleet data, 2 of the fleets showed no heavy-duty vehicles (City of Buda, and Texas LeHigh Cement), and have not been included in the current data analysis. The City of Round Rock supplied considerable data but in a format that did not allow the contractor to easily identify all the heavy-duty vehicles and Bastrop County Precinct 1 only had a total of 10 heavy-duty vehicles and 5 pick-ups.

Appendix 2 shows the heavy-duty vehicle fleet summary data from the other 6 fleet questionnaires.

2.3 Fleet Meetings

The 11 fleets that responded to Questionnaire 2 were contacted with a view to meeting to discuss fleet data, potential grant application support, retrofit possibilities, and other issues. At the time of writing this report, meetings have taken place with the following 7 fleets:

- Round Rock

- Pflugerville
- Cedar Park
- Bastrop County
- San Marcos
- TxDOT
- CapMetro

Fleets were provided their individual fleet analysis summary together with the TCEQ TERP program list, specific information about the TERP Emissions Reduction Incentive Grants (ERIG) program (currently open for applications) and information about retrofits (See Appendices 3, 4, and 5). Discussion covered:

- Explanation of the analysis, particularly in relation to grant applicability re NOx emissions reductions (e.g. TERP ERIG requires at least 25% Nox reduction from most grant activities);
- Fleet interest in applying for grants;
- How fleet purchasing requirements are assessed, etc;
- Fleet interest in retrofitting older vehicles with emission reduction equipment rather than purchasing new vehicles.
- Interest in alternative fuels;
- How fleet commitments were arrived at and who is responsible for seeing that the commitments are met.

2.4 Fleet Responses/Views

While the city fleets visited varied in size from a total of 15 to 506 vehicles, all had similar responses to questions about reducing emissions, applying for grants, vehicle purchase, retrofitting vehicles, and fleet commitments to emission reduction measures.

The two organizations with a wider remit, CapMetro and TxDOT Austin Area, have fleets of 630 and 204 on-road vehicles respectively (TxDOT Austin Area also has 122 non-road vehicles). Both these organizations have very specific emissions reduction and sustainability principles built into their organizational management systems.

The responses from the city fleets and the two larger organizations are summarized below.

2.4 (a) Applying for grants

City fleets:

- Special efforts to reduce NOx emissions are not important to these fleet managers as Nox reductions will be achieved as older vehicles are eventually replaced with vehicles meeting the most stringent NOx standards
- These fleets do not want to have to replace vehicles before they age out (as required in many of the TERP grant programs). Nor do they want to be

required to scrap the replaced vehicle, often preferring to keep it as a back up vehicle.

- When an older vehicle is ready to be scrapped, scrappage sales are often included as part of a fleet's budget. Cities expect to obtain sums higher than the \$1,000 that the TERP programs generally allow to be claimed as income from scrapping an older vehicle.
- Given the limited mileage of many fleet vehicles in the smaller municipalities, some vehicles that fleets might be willing to replace before the end of their useful life may not qualify for TERP grants. (However in this situation fleets may be able to use the default mileage rates set by TCEQ).
- In the TERP ERIG program, the engine of a new vehicle purchase or lease that is not replacing an older diesel vehicle must be MY 2012 or newer and emit at least 25% less NOx than the current federal standard (0.2 g/bhp-hr) . If a fleet wishes to apply for a grant for a new vehicle purchase, a NOx reduction 25% cleaner than 0.2 g/bhp-hr would currently be difficult for heavy duty engines other than electric, hydrogen fuel cell, and possibly CNG. Given the circumstances of the fleets visited, it is unlikely that any of these fleets would be applying for grants to expand their fleets with new purchases.
- These cities do not have the staff or time to apply for grants and manage a grant contract if an award is received.

CapMetro/TxDOT:

- CapMetro has received TERP grant funds for vehicle purchases and will apply for more funds in the current ERIG round. The organization has no problem with scrapping older vehicles as required by the ERIG program.
- TxDOT has an interest in applying for grants (where eligible), particularly for alternative fuel vehicles.

2.4 (b) Retrofitting or Repowering Older Vehicles

City Fleets:

- None of the fleets visited are interested in retrofitting older vehicles even if the cost of purchase and installation of the retrofit technology is paid for by a grant or if CAPCOG were to provide incentives higher than 100% of the cost of purchase and installation. (Note: if CAPCOG were to offer incentives additional to potential grant awards, fleets would be required to reduce the grant amount applied for by the amount of the CAPCOG incentive.) Fleet managers also worry about the impact on engine operation of retrofit technologies and the possibility of having to meet the costs of repairing vehicles if the retrofit malfunctions.
- As with retrofits, there is little interest in repowering older vehicles

CapMetro/TxDOT:

- CapMetro did receive a TERP grant in 2007 to retrofit vehicles but now has no interest in further retrofits.

- TxDOT has no interest in retrofits.

2.4 (c) How Fleet Purchasing Requirements are Assessed

City fleets:

- Municipal fleets are very cognizant of the fact that they are spending tax payer money and must be as cost effective as possible in their purchases.
- The individual municipal budget cycles do not always match up to TERP rounds. Municipalities truly interested in receiving TERP funds must plan out 1-2 years ahead.

CapMetro/TxDOT:

- Both organizations have extensive systems re fleet evaluation and purchasing decisions.
- TxDOT Fleet Operations Division oversees TxDOT's alternative fuels program.
- CapMetro has a sustainability plan that deals with energy use, greenhouse gas reduction and reducing fuel use, all of which are factored in to purchasing decisions.

2.4 (d) Alternative Fuels and Fueling

City fleets:

- Given the cost differential between alternative fuel vehicles and gasoline or diesel vehicles, alternative fuel vehicles continue to be cost prohibitive for many fleets. While TERP funding is available for alternative fueled heavy-duty vehicles (there is currently no grant funding available for the purchase of alternative fuel light-duty vehicles), availability of fuel is a concern for many fleet managers. Depending on which alternative fuel is pursued, building their own fueling infrastructure can be cost prohibitive.
- Many of the fleets visited do not have on site fueling and use local convenience stores or other similar locations.

CapMetro/TxDOT:

- CapMetro was an early adopter of CNG in the '90's. It was not cost-effective for buses at that time. They are, however, very interested in electric buses.
- TxDOT has had an alternative fuel (propane) program since before 2000, having been recognized and awarded by the Dept of Energy Clean Cities program in 2001. Today TxDOT is revamping its alt fuels program with heavier concentration on districts within the "Clean Transportation Triangle". The goal is to have 50% of the TxDOT fleet run on bi-fuel CNG or propane.

2.4 (e) Fleet OAP Action Plan Commitments

City Fleets:

- For most of the city fleet managers, the commitments to the voluntary emission reduction measures listed are not the driving force behind their fleet management and purchasing decisions.
- There was a general lack of enthusiasm about the commitment process, including reporting to CAPCOG.
- The current fleet managers do not appear to have been involved in the commitment process in their organizations – in many cases commitments were originally made by a manager who has now left the organization and fleet personnel have also changed. In many cases, responsibility for managing the commitments has not been communicated down to the fleet.

CapMetro and TxDOT:

- For both organizations, commitment to most of the emission reduction measures dovetail with their fuel and sustainability management plans.

The OAP fleet measures currently listed and the general response of the city fleets are listed below.

- Fueling in the evenings after 6 pm. *Most municipal offices and vehicle yards close at 5.00 pm, making fueling after 6pm impractical.*
- Treat any biodiesel used for fleet vehicles and equipment with Texas Low Emission Diesel (TxLED) –equivalent additives. *Not specifically discussed*
- Vehicle maintenance according to specifications. *All fleets do this as a matter of course. Vehicle maintenance programs are of utmost importance to maintain operational longevity.*
- Limiting idling of fleet vehicles to 5 minutes or less. *Most fleets have an anti-idling policy.*
- Employee training on alt fuels and fuel efficiency. *Limited interest.*
- Conducting a business evaluation of fleet usage, including operations and right sizing vehicles analysis. *Most fleets do this as part of normal fleet management.*
- Prioritize the purchase of low-emission (Tier 2, bin 4 or better) light duty vehicles. *Vehicles are purchased based on need and cost.*
- Prioritizing the purchase of hybrid vehicles. *Limited interest. Vehicles are purchased based on need and cost.*
- Increasing fleet fuel efficiency. *Not specifically discussed.*
- Increase the substitution of alternative fuels for conventional fuels. *Limited interest due to cost differences*
- Vapor recovery on pumps. *Not specifically discussed.*
- Prioritizing the purchase of alternative fuel vehicles. *Limited interest for most smaller fleets.*

- Replacing, repowering and retrofitting older, higher emitting vehicles and equipment, including through any TERP and DERA grant funding available during the OAP Action Plan. *Little or no interest.*

While the CAC Annual Reports show many of the fleets having checked off some of the above measures, the reports do not require further information as to the extent of the efforts or specific quantification of the measures taken by the fleets.

3. Additional Fleet Outreach

LSCFA has made phone calls to the remaining unresponsive fleets to ascertain if meetings would be helpful regarding their emission reduction commitments, or if they have questions that can be addressed over the phone. Those fleets contacted over the Christmas period provided little information, requesting to wait until after the first of the year to talk in any detail. Calls were placed to:

- Travis County
- Caldwell County
- Bastrop County Precinct 3
- City of Bastrop
- City of Elgin
- City of Georgetown
- City of Luling
- City of Sunset Valley
- City of Taylor
- Hays County
- Williamson County

Summary of Responses:

- Travis County: the County is finalizing an RFP for a consulting firm to perform an evaluation of the entire fleet. They are also purchasing a Fleet Maintenance program. Travis County has not been applying for TERP or other grants because of staff limitations and, the fact that, after many hours of work are performed gathering information, grant awards cannot be guaranteed. The County is interested in applying for an ERIG grant if consulting assistance can be provided to help with the legwork.
- Bastrop County Precinct 3: would like consulting assistance to help with the ERIG application process to replace one heavy-duty truck. They do not have a grant writer on staff.
- Caldwell County: asked to wait until after the first of the year.
- City of Georgetown: information/request will be forwarded to Customer Care Dept.
- Williamson County: staff has more work than can be handled and do not have time to gather data for an additional questionnaire. They do have a successful Propane alternative fuel program in the Sherriff's Department

(constables and support vehicles) but may not continue the program because the incremental cost of propane vehicles remains expensive and there are no current incentives for the purchase of light duty vehicles.

Information on the ERIG grant (and the other sources of information attached in Appendices 3, 4, and 5) was emailed as a final form of contact to all the fleets listed above. In addition, Questionnaire 2 was re-sent in an attempt to gain more fleet data.

Note: Throughout the Fall, LSCFA sent all CAC members information on all grant programs as they were made available. LSCFA has also made it clear to all the fleets that it will pay for up to two hours of consulting on TERP application preparation for CAC member stakeholders (visited fleets were provided this information during the meetings).

4. Conclusions/Recommendations

4.1 OAP Commitments

4.1 (a) Suggested Changes to List of Commitment Measures

As some of the measures appear to be standard practice in the fleets that provided specific information, CAPCOG may wish to consider removing the following measures from the list:

- Business evaluation and right sizing analysis
- Employee training on alt fuels and fuel efficiency
- Vehicle Maintenance to manufacturer specifications.

The following suggestions were received during the fleet meetings regarding possible additions to the list of commitment measures:

- Eco-driving training – perhaps courses could be developed in association with Austin Community College.
- Grants specifically available for electric vehicle charging stations.

Recommended changes to the commitments process:

- Commitments should be made at the management level with a plan of action adopted by the organization and measures put in place to assess performance, etc.
- Where at all possible, CAPCOG should provide general cost benefit data for emission reduction measures to help fleets assess the impact of taking action.
- CAPCOG should try to collect more specific data from fleets on measures implemented.

- Encourage more commercial fleets to undertake OAP commitments.
- Undertake more public outreach regarding the benefits of implementing the OAP emission reduction measures – including the costs of becoming non-attainment for ozone, etc.

4.2. Recommendations for Future Study/Work

Continue to follow up with the committed organizations to collect data about their current fleets, how they operate, what the commitments mean to them in practical terms, etc. Where sufficient data is obtained, estimate baseline fleet emissions. Given the experience of the contractor on this project to date, understand that this process will take longer than ideally desired. The program is voluntary, and therefore considered as such by fleet managers.

Offer fleet analysis assistance regarding potential grant applications to replace older, high-emitting heavy-duty vehicles and non-road equipment.

Where possible, carry out cost benefit analysis on items in the current list of emission reduction measures and provide this information in readily available format.

Work with the representatives on the CAC committees to make the commitment process more meaningful for fleet managers.

Include school districts in the OAP Action Plan outreach and support.

Undertake research regarding other agency Clean Fleet Policies and draft a Policy for CAPCOG to use in the Austin-Round Rock MSA.

APPENDICES

1. Summary of fleet responses to Questionnaire 2
2. Summary analysis of fleet heavy-duty vehicles.
3. Grant programs available in Texas (prior to December 2015)
4. TERP Emissions Reduction Incentive Grants (ERIG) program
5. Retrofit information

APPENDIX 1
Responses to Fleet Questionnaire 2

Fleet Response to Questionnaire 2			
(X = response received)			
ORGANIZATION	Q2	Comments	Commitments
(M) = meeting took place			
City of Austin	X	No data provided	No information
City of Pflugerville (M)	X	Completed form as requested	No information
Travis County			
City of Round Rock (M)	X	List of all vehicles - not categorized	No information
Williamson County			
City of San Marcos (M)	X	List of all vehicles - not categorized	No information
Hays County			
City of Bastrop			
City of Elgin			
City of Lockhart	X	As originally supplied to CAPCOG	No information
City of Luling			
Caldwell County			
City of Cedar Park (M)	X	Completed form as requested	Updated
City of Georgetown			
Cit of Sunset Valley			
City of Hutto			
Bastrop County	X	Basic information provided	No information
Cap Metro	X	Completed form as requested	No information
CTRMA			
LCRA			
TCEQ			
TXDOT (M)	X	Data for Central Texas fleets	As reported 2014
Texas Lehigh Cement	X	Basic information provided	No information
City of Buda	X	Data as requested	No information
TOTAL: 24	11		

APPENDIX 2

Summary Analysis of Fleet Heavy-duty Vehicles from Fleets that Provided workable data

Heavy Duty On-road Fleet Vehicles summarized by Model Year related to emission standards								
(Note: by MY 2010, 100% of heavy duty engines had to meet the 2007 standard of 0.2 g/bhp-hr Nox								
For MY 07-09, most manufacturers certified their engines to meet a Nox limit of about 1.2 g/bhp-hr)								
Fleet	Heavy Duty Vehicles (including HDDV2b)							HDV Total
	MY 2010+	MY 07-09	MY 04-06	MY 98-03	MY 91-97	MY 1990	<1990	
Cedar Park	28	22	11	6	1	0	0	68
Pflugerville	5	4	0	16	1	0	1	27
San Marcos	13	10	10	8	6	0	4	51
Cap Metro	183	80	37	208	0	0	0	508
Lockhart	2	5	7	6	5	0	8	33
TxDOT	33	25	45	30	18	1	5	157
Heavy Duty On-road Vehicles by fuel type								
	Fuel							Total
	Diesel	Gasoline	Propane	CNG	Hybrid	E85		
Cedar Park	28	32	8	0	0	0	68	
Pflugerville	27	0	0	0	0	0	27	
San Marcos	49	2	0	0	0	0	51	
Cap Metro	497	8	0	0	3	0	508	
Lockhart	27	5		0	0	1	33	
TxDOT	133	6	16	0	0	2	157	

APPENDIX 3

Grant Programs available in Texas

TCEQ Texas Emissions Reduction Plan (TERP)

- **Texas Clean Fleet Program:** replace on-road light duty and heavy duty diesel vehicles with alternative fueled or hybrid vehicles. Opened Sept 8, closes November 10, 2015.
- **Emissions Reduction Incentive Grants (ERIG):** up-grade or replace on-road, on-road vehicles or non-road equipment, locomotives, marine vessels, stationary equipment, refueling infrastructure, on-site electrification and idle reduction infrastructure, on-vehicle electrification and idle reduction infrastructure, and rail relocation and improvement projects in Texas. Scheduled to open early November 2015, close early February 2016.
- **Natural Gas Vehicle Grant Program:** replacement or repower of on-road heavy-duty or medium-duty vehicles. Scheduled to open early December 2015, close May 2017.
- **Clean Transportation Triangle (CTT) Program/Alternative Fuel Facilities Program (AFFP):** grants for the creation of natural gas fueling stations along interstate highways between the Houston, San Antonio, and Dallas/Fort Worth areas. Scheduled to open early November 2015 and close early February 2016.
- **Rebate grants:** replacement of on-road heavy-duty diesel vehicles and non-road diesel equipment. Scheduled to open January 2017, close end May 2017.
- **Light Duty Vehicle Program:** no longer funded.

Environmental Protection Agency (EPA)

Clean diesel Funding Assistance Program: emission control technologies such as exhaust controls, cleaner fuels, and engine upgrades, verified idle reduction technologies, verified aerodynamic technologies and low rolling resistance tires, certified engine repowers, and/or certified vehicle or equipment replacement. Eligible diesel vehicles, engines and equipment may include buses, Class 5 – Class 8 heavy-duty highway vehicles, locomotives and nonroad engines or equipment. Eligible entities include school districts, municipalities, metropolitan planning organizations (MPOs), cities and counties with jurisdiction over transportation or air quality. Opened April 30, 2015, closed June 15, 2015.

APPENDIX 4

TCEQ TERP EMISSIONS REDUCTION INCENTIVE GRANTS (ERIG) PROGRAM Now Accepting Applications: Closing date February 2, 2016

1. Who can apply?

Individuals, corporations, organizations, governments or governmental subdivisions or agencies, school districts, business trusts, partnerships, and associations.

2. What can fleets apply for?

Reimbursement grants for the following activities:

On-road heavy-duty vehicles (greater than 8,500 GVWR): all categories must achieve cost effectiveness of \$15,000 or less per ton of NOx reduced.

- New purchase or lease: 100% of incremental cost; emit 25% less NOx than current standard.
- Replacement: 80% of incremental cost; new vehicle engine must be MY 2012 or later and emit 25% less NOx; replaced vehicle must have 5 years of useful life and must be scrapped;
- Repower of engine: 80% of incremental cost; at least 25% NOx reduction
- Retrofit: 100% of incremental cost; achieve at least 25% NOx reduction.

Non-road heavy-duty vehicles (engine greater than 25 hp): all categories must achieve cost effectiveness of \$15,000 or less per ton of NOx reduced.

- New Purchase and lease: 100% of incremental cost; emit 25% less NOx than under current standard required for new non-road engine.
- Replacement: 80% of incremental cost; emit at least 25% less NOx; replaced vehicles must have 5 years of useful life and must be scrapped.
- Repower of engine: 80% of incremental cost; emit 25% less NOx.
- Retrofit: 100% of incremental cost; achieve at least 25% NOx reduction.

Additional categories:

- Stationary equipment
- On-vehicle electrification and idle reduction
- Rail relocation and improvement.

3. Eligible Counties:

Bastrop, Bexar, Brazoria, Caldwell, Chambers, Collin, Comal, Dallas, Denton, El Paso, Ellis, Fort Bend, Galveston, Gregg, Guadalupe, Hardin, Harris, Harrison, Hays, Henderson, Hood, Hunt, Jefferson, Johnson, Kaufman, Liberty, Montgomery, Nueces, Orange, Parker, Rockwall, Rusk, San Patricio, Smith, Tarrant, Travis, Upshur, Victoria, Waller, Williamson, Wilson, and Wise.

Information and workshop dates: www.tceq.texas.gov/airquality/terp/erig.html

APPENDIX 5

RETROFITS

Diesel engine exhaust emissions reduction after-treatment should not impact engine or vehicle operation. The list of EPA verified retrofit technologies for use in on-road and non-road vehicles can be found at:

www3.epa.gov/otaq/diesel/verification/index.htm

The most commonly used retrofit technologies are as follows:

To reduce Particulate Matter (PM) and Hydrocarbons (HC)

- Diesel Particulate Filters (DPF) most effective: up to 90% PM, 95% HC. Available for on-road and non-road engines.
- Diesel Oxidation Catalysts (DOC) systems: up to 25% PM and 58% HC

Cost range:

- DPF On-road: \$6,000 to \$10,000 for passive systems. Installation around \$4,000. Annual cleaning up to \$500 per DPF.
- DOC On-road: \$1,000 to \$2,000.

To Reduce NO_x, PM and HC

- Selective Catalytic Reduction (SCR): up to 70% NO_x, 90% PM, 90% HC

Cost Range

- SCR On-road: \$30,000. Installation around \$6,000. Additional running cost for urea.