



Cairo Air Improvement Project
Vehicle Emissions Testing Component

**Tune-Up Program, Phase 1
Survey and Status Report
17-24 February 1999**

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Acronyms and Abbreviations

CAIP	Cairo Air Improvement Project
CO	Carbon monoxide
HC	Hydrocarbon
£E	Egyptian pound (currency)
LETU	Low Emissions Tune-up
ORT	On-road testing
VET	Vehicle Emission Testing

Executive Summary

This report presents the results of a survey to assess the current status of the Cairo Air Improvement Project's (CAIP) Vehicle Emissions Testing (VET) Tune-up Phase I Program. Staff from CAIP's VET and Transition Assurance (TA) Teams, Ramy Riad, VET Specialist, and Raja Sheriff, Senior Training Coordinator conducted the survey. It is a part of the monitoring plan for the Tune-up Phase I Program. The survey aimed to assess previous training efforts as well as current program operations to allow for effective planning and efficient implementation of Phase II of the Tune-up Program.

Most of the findings of this report are positive. Survey results show that tune-up capabilities in Greater Cairo are available and are used by motorists. The figures show that 65 percent of all vehicles tested during the period of the survey (17–24 February 1999) had been tuned up. These figures concur with the average tune-up operations performed under the Tune-up Program Phase I. Furthermore, the report identifies a pressing need for CAIP/VET to enhance the professional skills of tune-up technicians, in its attempt to enhance local tune-up capabilities to accommodate vehicle owners who will seek tune-ups after having their auto emissions tested at VET centers.

Part 1

Current Status of Tune-up Program Phase I

The Vehicle Emission Testing (VET) component's of Cairo Air Improvement Project (CAIP) Tune-up Program Phase I (formerly known as Quick Start) was an initiative to introduce emissions testing analyzers and the concept of emissions tune-ups in Greater Cairo. The program is being carried out in cooperation with 28 gas stations, which have been equipped with 41 emission analyzers. These stations are located in 17 of the 25 Traffic Departments of Greater Cairo. Before the program was launched, training was provided for 27 station managers and 59 technicians.

This report presents the results of a survey to assess the current status of the program. It was conducted by staff from CAIP's VET and Transition Assurance Teams (Ramy Riad, VET Specialist, and Raja Sheriff, Senior Training Coordinator) as part of the monitoring plan for Phase I. The survey aimed at assessing previous training efforts as well as current program operations to allow for effective planning and efficient implementation of Phase II of the Tune-up Program.

Station Managers and technicians who participated in Phase I training filled out especially designed questionnaires, as shown in the attachment. The questions covered initial training, which took place 16–19 and 27 May 1998, and asked for input about future training needs and station requirements to sustain program operation.

Action required to implement Phase II of the Tune-up Program and to assure its sustainability—which will fulfill the long-term objective of enhancing local tune-up capabilities—are described in this report.

The Tune-up Phase I Program offers emissions testing services in gas stations using exhaust analyzers checking either exhaust gas content or exhaust opacity. Trained technicians from participating gas stations use the test equipment.

When the On-road Testing Program (ORT) began, the need to update emissions testing and tune-up skills in participating gas stations became even clearer. Vehicles not complying with emission standards under Law 4 of 1994 (the “Environmental Law”), were guided to Tune-up Program Phase I gas stations. To equip stations to fill the demand, the Low Emissions Tune-up Training Program (LETU) provided training on air/fuel mixture adjustment, timing adjustment, and parts replacement.

The testing and tune-up services offered in participating gas stations were limited or unavailable before the initiation of the Tune-up Program Phase I.

Status of Participating Service Stations

Twenty-eight gas stations were surveyed. One of the original participating stations had been replaced by another one; a second was undergoing renovation and data was not obtained for this station. Tables 1-3 show the participating stations, number of technicians, and details of tune-up services offered.

Table 1
Oil Companies/Stations Visited

Oil Company	Operational Stations	Non-operational Stations	Number of Technicians	Technician Turnover*
Caltex	3	0	4	0
Co-op	8	0	10	-3
Esso	6	1**	10	-2
Misr Petroleum	5	0	8	-1
Mobil Oil	2	0	2	0
Shell	3	1†	11	-1
Total	27	2	45	-7

* Technician turnover refers to mechanics who were trained during the earlier program, but who have since left their jobs at the participating stations

** This station was replaced by another

† This station is currently under renovation

Table 2
Stations Offering Testing and Tune-up Services

Oil Company	Operational Stations	Procedures Offered at Stations Performing Tune-ups		
		Air/Fuel Mixture Adjustment	Timing Adjustment	Parts Replacement
Caltex	3	2	2	2
Co-op	8	3	3	4
Esso	6	4	2	2

Misr Petroleum	5	3	2	1
Mobil	2	1	1	1
Shell	3	2	2	2
Total	27	15	12	12

Table 3
Method of Offering Testing Service at Service Stations

Oil Company	Testing Service Offered	
	New, Separate Service	Complimentary Service
Caltex	3 stations	
Co-op	6 stations	2 stations
Esso	6 stations	
Misr Petroleum	5 stations	
Mobil		2 stations
Shell	2 stations	1 station
Total	22	5

Testing and Tuning Services

The emissions testing services are currently being offered for a price ranging from £E3–10. Each oil company has set a uniform price for the service in its participating gas stations. Table 4 shows the prices, although there may be some exceptions to the stated policies.

Table 4
Price of Testing Service

Oil Company	Price (£E)
Caltex	5
Co-op	3
Esso	Free of Charge
Misr Petroleum	10
Mobil	No charge with other service
Shell	8

The price of tune-up services varies from one station to another, ranging from £E5–45 when performed without an analyzer. Tune-ups performed using engine diagnostic

analyzers cost from £E25–45. Each of the 12 stations providing timing adjustments is equipped with a diagnostic machine in addition to the CAIP analyzer. When the tune-up requires replacement of parts, which are mostly distributors and other electrical parts, replacement is done on site and the customer is charged for the parts in addition to the tuning fee.

The questionnaire included inquiries about the average number of weekly tests and tune-ups performed in participating gas stations. The answers are given in Table 5. While the influx of vehicles is highly variable, the figures shown in the table reflect an estimated average on a weekly basis.

Table 5
Weekly Testing and Tuning Operations (17–24 February 1999)

Oil Company	Testing Operations	Tune-up Operations		
		Air/Fuel Mixture Adjustment	Timing Adjustment	Spare Parts Replacement
Caltex	35	21	21	17
Co-op	71	40	33	43
Esso	55	43	32	32
Misr Petroleum	28	16	9	9
Mobil*	—	—	—	—
Shell	19	16	12	12
Total	208	136	107	113

* Mobil stations received analyzers on February 24, 1999

Again, this table shows estimated average testing and tuning operations performed on a weekly basis under the Tune-up Program Phase I. Of the testing operations, all 208 are performed using the analyzers. Sixty-five percent of vehicles tested fail and are tuned using the analyzer to adjust the air/fuel mixture. Eighty-three percent of those vehicles need parts replaced; 79 percent need timing adjustments. The analyzer is used to tune-up engines by making adjustments to optimize performance by measuring HC and CO emissions.

Public Awareness

The survey aimed also to gather information about current public attitudes towards vehicle emissions testing and tune-ups. Table 6 shows the technicians' impressions of

motorists' reaction to CAIP's VET efforts. Table 7 summarizes station personnel's level of awareness of Law 4, as well as their participation in disseminating accurate information.

Table 6
Motorist Reaction to CAIP VET Activities

Pleased	Interested	Not Pleased	No Opinion
26%	47%	21%	6%

Table 7
Station Personnel Awareness of Law 4

Knowledge of Law 4/94	Expected Time the Law will be Implemented	Motorists Provided with CAIP Public Awareness Information
99%	Beginning of 1999	100%

Part 2

Training Assessment Survey of Tune-up Program Phase I

Assessment of training provided was addressed in the questionnaire as well. It asked for feedback on the “Quick Start” Training Program for Phase I that was given 16–19 May 1998. In addition, the technicians who were trained by Quick Start contributed comments for future training. The information will be useful in implementing Phase II of the program.

Phase I Training: Summary and Objectives

Course Description

This training course covered vehicle emissions testing and diagnosis using exhaust gas analyzers. Technicians from selected gas stations learned how to operate the various vehicle emissions testing devices that were provided to the stations. In addition, simple tune-up techniques were demonstrated.

Course Objectives

The “Quick Start” Training objectives were to:

- ◆ Introduce the concept of emissions testing to the motoring public.
- ◆ Introduce the concept of low emissions tune-ups (minor adjustments).
- ◆ Introduce the relationship between vehicle emissions and fuel efficiency to the motoring public.

Course Outline

The training program covered the following:

General Session

Introduction to CAIP

Introduction to VET
Introduction to Law 4 of 1994
Quick Start Training
Data Collection and Report Generation
Public Awareness for Motorists
Distribution of Public Awareness Materials
Program Promotion in Gas Stations
Role of CAIP and Stakeholders

Hands-on Session

1. Basic Engine Construction
2. Combustion in Gas and Diesel Engines
3. Improving Engine Performance by simple tuning
 - a. Adjusting CO levels
 - b. Adjusting HC levels
4. Familiarization with Emission Exhaust Analyzers
 - a. Setting the equipment
 - b. Use of equipment (testing)
 - (1) Warm-up
 - (2) Calibration
 - (3) Daily maintenance
 - (4) Proper storage
5. Data Collection Registration

This training program did not cover emissions tune-ups in detail.

Status of Trained Technicians

As mentioned above, this survey was conducted with the gas stations from six oil companies involved in the original training program. The integrity of the data gathered is ensured since most of the 52 technicians who participated in the training program were still working. All of the technicians perform emissions testing using gas analyzers; some also perform tune-ups. Since the time of the training, seven technicians have left their work—13 percent of the total. The reasons they left were unrelated to the program, but were normal career changes. Table 8 shows the status of the trained technicians at each participating oil company.

This table also illustrates the success of the training efforts under the Tune-up Program Phase I. The number of technicians qualified to perform low emissions tune-ups was increased by 52, although at the time of the survey seven had left their employment with stations participating in the CAIP VET program.

Table 8
Status of Technicians Trained under the Tune-up Program Phase I

Oil Company	Number of Technicians Originally Trained	Number of Technicians Currently Employed
Caltex	4	4
Co-op	13	10
Esso	12	10
Misr Petroleum	9	8
Mobil Oil	2	2
Shell	12	11
Total	52	45

Evaluation of the Tune-up Program Phase I

The questionnaire used during the survey asked technicians to provide feedback about the training they received. This information will be useful in implementing Phase II of the Tune-up Program. Five questions were asked, and technicians replied by checking the appropriate box in a table format. The program was definitely successful in delivering training that is being used by the technicians. More than 80 percent of them found it very useful in their work. Table 9 summarizes the technicians' responses to the survey questions.

Table 9
Evaluation of Tune-up Program Phase I Training

Item	Excellent	Good	Fair	Poor	No opinion
Usefulness of training in present work	45%	36%	11%	0	8%
Quality of material provided	42%	33%	19%	6%	0
Quality of instructors	64%	19%	8%	6%	3%
Length of training	31%	25%	25%	16%	3%
Level of detail in the training	28%	44%	22%	6%	0

Future Training

The last section of the questionnaire asked technicians if they would be interested in more training, and what they would want covered. They all wanted more training. The types of training they specified can be grouped into four categories:

- ◆ Emissions Tune-up Training
- ◆ Advanced Equipment Training (New Technology)
- ◆ Vehicle Maintenance
- ◆ Public Awareness and Management Training

The last category, Public Awareness and Management Training, was indicated mostly by gas station managers. They want to know appropriate ways to talk to customers about Law 4, low emission tune-ups, the relationship between gas stations and the ORT program, etc. They unanimously agree that the public awareness materials prepared by CAIP have helped them do their jobs.

No information was gathered regarding tune-up efforts at stations before training was given.

Recommendations

The CAIP VET and Transition Assurance teams recommend the following for Phase II:

1. Address mechanics training needs through contracting with training facilities/schools to provide
 - a. Short-term low emissions tune-up training
 - To cover mechanic turnover
 - To establish a baseline course
 - b. Long-term low emissions tune-up training
 - Increase industry capacity
 - Use baseline course to train trainers (TOT)
 - Expand tune-up and repair capacity through using trained trainers
2. Provide stations managers with program management and public awareness training.
3. Monitor efficient data collection and registration.
4. Include more binding terms and commitment in contracts between CAIP and stakeholders (oil companies and analyzer agents).

5. Develop a broader public awareness campaign to increase motorists' awareness of the program.

Tune-up Program Phase I

Operations and Training Assessment Questionnaire

Oil Company: _____ Station: _____ Date: ____/2/1999

Station Manager:

Tech. Name:

1. Please rate the following:

- a. Usefulness of training in present work
- b. Quality of material provided
- c. Quality of instructors
- d. Length of training
- e. Level of detail in the training

Excellent	Good	Fair	Poor	No Opinion

2. If more training was offered, would you take it?

Yes ___ No ___

If YES, what would you want to see covered? _____

3. Do you do Low Emissions Tune-ups at your station? Yes___ No___

If yes, What equipment do you use? _____

4. What Service do you provide? Testing _____ how much _____
Tuning _____ how much _____
Air/fuel mixture _____ how much _____
Timing Adjustments _____ how much _____
Parts replacement _____ how much _____

5. How do you offer the testing and tuning services?

Separate Service_____ Associated service_____ New Service_____

6. What is the most common reaction you get from motorists when they hear about CAIP?

Pleased_____ Interested_____ Not Concerned _____ Neutral_____

7. Do you know about Law 4 of 1994 and when will it be enforced?

Yes___ No___ When _____

8. Do you disseminate this information to the motorist?

Yes___ No___