



**State of Palestine
Palestinian Central Bureau of Statistics**

**Energy Consumption in Transport Survey 2014
User Guide**

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Introduction

Most countries collect official statistics on energy use due to its vital role in the infrastructure, economy and living standards.

In Palestine, additional attention is warranted for energy statistics due to a scarcity of natural resources, the high cost of energy and high population density. These factors demand comprehensive and high quality statistics.

In this contest PCBS decided to conduct a special Energy Consumption in Transport Survey to provide high quality data about energy consumption by type, expenditure on maintenance and insurance for vehicles, and questions on vehicles motor capacity and year of production.

The survey aimed to provide data on energy consumption by transport sector and also on the energy consumption by the type of vehicles and its motor capacity and year of production.

The report of the Energy Consumption in Transport Survey 2014 comprises three chapters: the first chapter briefly describes the main findings; the second chapter presents the methodology used in the survey, including the questionnaire design, sampling design, field work operations, data processing, data quality and technical notes; while the third chapter describes the concepts and definitions.

PCBS hopes that the results of this survey will contribute towards providing the data required to develop the energy transport sector and to save and raise the efficiency of energy consumption in this sector as well as filling gaps in energy statistics and providing useful data for decision makers, researchers and other users.

Concepts and Definitions

This section presents the main concepts and definitions used to derive the main indicators of energy consumption from different sources. These concepts and definitions are based on international recommendations in the field of energy statistics, and they are the same in all subjects in Palestinian Central Bureau of Statistics. The main concepts and expressions mentioned in this report were as follows:

Vehicle:

A vehicle running on wheels and intended for use on roads.

Motor Vehicle:

A vehicle fitted with auto propulsive engine, it is normally used for carrying persons or goods, and drawing vehicles.

Passengers Vehicle:

Include Private Cars, Taxis, Motorcycles, and Buses.

Private Car:

A motor vehicle, other than motorcycle intended for the carriage of passengers and designed to seat no more than 9 persons (including the driver).

Taxi:

A motor vehicle intended for the carriage of passengers (in return for payment), and designed to seat no more than 9 persons (including the driver), and described in its license as a taxi.

Motorcycle:

Two wheeled motor vehicles with or without sidecar.

This category includes scooter, three-wheeled vehicles not exceeding 400 kg.

Motorcycles are classified according to the engine capacity as: less than 50 cm³, 50-100 cm³, 100-250 cm³, and greater than 250 cm³.

Bus:

A motor vehicle designed to carry more than 9 passengers (including the driver).

Trailer:

Goods road vehicles designed to be hauled by a road motor vehicle. Excluding agricultural trailers and caravans.

Semi-Trailer:

Goods road vehicle with no front axle designed in such a way as to be hauled by road tractor.

Road Tractor:

A motor vehicle designed exclusively or primarily to haul other vehicles, which are not power-driven. Agricultural tractors are excluded.

Goods Vehicles:

Include Trucks and Commercial Cars.

Truck:

A motor vehicle designed for another purpose than passenger transport, its height is more than 250 cm, and described in its license as a truck.

Commercial Car:

A motor vehicle designed for another purpose than passenger transport, weights more than 2,200 kg, its height is more than 175 cm and less than or equal to 250 cm, and described in its license as a commercial vehicle.

Other Vehicle:

A vehicle designed for purposes other than the carriage of passengers or goods. This category includes: ambulances, mobile cranes, self-propelled rollers, bulldozers with metallic wheels or tracks, vehicles for recording film, radio, and TV programs, mobile library vehicles, towing vehicles for vehicles in need of repair.

Fuel:

It refers to any matter used for producing energy via thermal, chemical or nuclear interaction.

Gasoline:

Gasoline is a hydrocarbon fuel used mainly in internal- combustion engines. This fuel is obtained via filtration of crude oil. The quality of this type of fuel is measured by the octane number (from 0 to 100), which points to its resistance of early burning. This number is obtained by comparing the performance of its resistance of early burning with a mixture of

C^7H^{16} and C^8H^{18} . For instance, the performance of “Gasoline 95” equals the performance of a mixture of 95% C^8H^{18} and 5% C^7H^{16} .

Diesel:

It is a liquid hydrocarbon fuel obtained by the distillation of crude petroleum. It is heavy oil distilled between 200°C and 380°C. Its point is always above 50°C, and its specific gravity is higher than 0.82.

Questionnaire

This section presents a documentation of the methodology used in preparing this survey.

Questionnaire

The design of the questionnaire was based on the experiences of other similar countries in energy statistics subject to cover the most important indicators for energy statistics in transport sector, taking into account Palestine’s particular situation.

Target Population:

All the operating vehicles in Palestine in 2014.

Sample Frame

A list of the number of the operating vehicles in Palestine in 2014, they are broken down by governorates and vehicle types, this list was obtained from Ministry of transport.

Sample size:

The sample size is 6,974 vehicles.

Sampling Design:

it is stratified random sample, and in some of the small size strata the quota sample was used to cover them.

The method of reaching the vehicles sample was through :

- 1- reaching to all the dynamometers (the centers for testing the vehicles)
- 2- selecting a random sample of vehicles by type of vehicle, model, fuel type and engine capacity.

Sample strata:**The target population was divided by:**

1. Region: 11 governorates in West Bank and Gaza Strip.
2. Vehicle type: private, public passenger transport, motorcycles, public buses, private buses, trucks, tractors, ... Etc.
3. Type of engine fuels (gasoline, diesel).
4. Model (2004 and less, 2005 and more).
5. Engine capacity (2500 and less, more than 2500).

Weight calculation

The sampling weight for the vehicle is the mathematical inverse of the selection probability for that vehicle. But, weights were modified after data collection to account for the non-

response rate Weight adjustment will be summarized by merging some strata sample design to become with higher levels after survey conducted.

Reference Period

This file shows the main finding of energy consumption in transport sector survey 2014.

Data Collection

Field work activities started on 01/06/2015 and ended on 30/06/2015. This survey covered the year of 2014. Field workers were distributed to all governorates according to the sample size of each governorate. The field work team consisted of 35 members, including 21 interviewers, field work coordinators, supervisors, and editors.

Response Rate

The survey sample consisted of around 6,974 vehicles, of which 5,631 vehicles completed the questionnaire, 3,652 vehicles from the West Bank and 1,979 vehicles in Gaza Strip.

The Sample Distribution According to the Result of the Interview

Result of the Interview	No. of Cases
Completed	5,631
Others	1,343
Total sample size	6,974

Response and non-response formulas:

$$\text{Non response rate} = \frac{\text{Total cases of non response}}{\text{Net Sample size}} \times 100\%$$
$$= 19.3\%$$

Net sample = Original sample – cases of over coverage
there are no cases of over coverage

$$\text{Response rate} = 100\% - \text{non-response rate}$$
$$= 80.7\%$$

Data Quality

The concept of data quality covers many aspects, starting from the initial planning of the survey to the dissemination of the results and how well users understand and use the data. There are seven dimensions of statistical quality: relevance, accuracy, timeliness, accessibility, comparability, coherence and completeness.

Data Accuracy

1. Sampling Errors

Data of this survey may be affected by sampling errors due to use of a sample and not a complete enumeration. Therefore, certain differences are anticipated in comparison with the real values obtained through censuses. The variance was calculated for the most important indicators: the variance table is attached with the final report. There is no problem in the dissemination of results at national and regional level (North, Middle, South of West Bank,

Gaza Strip). However, some indicators show a high variance, as explained in the statistical tables in the main report.

Summary for Variance Calculation for Main Indictors

Indicator	Estimate	Standard Error	C.V% *	95% confidence Interval		Number of observations
				Lower	Upper	
Total Value of the Diesel Consumed (1000 NIS)	4,054,609	99,754.0	2.5	3,859,015.4	4,250,199.7	3,249
Total Diesel Consumed (1000 liters)	631,560	15,538.0	2.5	601,092.7	662,024.9	3,249
Average Number of Kilometers Traveled Per Liter by the Passenger Diesel Vehicles	10.1	0.1	1.2	9.8	10.2	2,223
Average Monthly Consumed Fuel in Liters by the Goods Gasoline Vehicles.	335	24.2	7.2	287.7	383.1	198
Average Value of the Monthly Consumed Fuel by the Goods Gasoline Vehicles (NIS)	2,368	170.6	7.2	2,031.0	2,704.4	198

*C.V: coefficient of variation

2. Non Sampling Errors

The survey sample consisted of around 6,974 vehicles, of which 5,631 vehicles completed the questionnaire, 3,652 vehicles from the West Bank and 1,979 vehicles in Gaza Strip.

Comparability

The survey carried out for the first time in Palestine and therefore we didn't have the same previous data. However, it is possible to compare the data obtained from this survey with data from other surveys such as the Household Energy Survey, the Survey of Transport of the informal sector, and Transportation and Communication Statistics in Palestine, It was found that there is little difference in the results according to the methodological differences and the goal of survey.

Data quality assurance procedures

Several procedures were applied to ensure appropriate quality control in the survey. Where the implementation of primary test of the questionnaire, where field workers were trained on the questionnaire and then go to the vehicle inspection centers in Nablus governorate, and Ramallah and Albireh governorate, it has been out with a report on this experience and benefit from it in the implementation of the main survey. As for the main survey field workers were trained on the main skills prior to data collection, field visits were conducted to field workers to ensure the integrity of data collection, editing of questionnaires took place prior to data entry, then the data were reviewed. This was done to ensure that data were error free, while cleaning and inspection of anomalous values were carried out to harmonize the different questions on the questionnaire.

Technical notes

The following are important technical notes on the indicators presented in the results of the survey:

- Inability to access all the vehicles in the sample because of the shortness of the field work time, and not the influx of all types of vehicles to testing centers during the fieldwork period.
- Some Drivers did not provide accurate answers in the questionnaire.
- Answering questions related to consumption based on estimations.
- In all calculations relating to gasoline, it has been dealing with gasoline as a kind of one gasoline type 95 because of the lack of use of the gasoline type 98.
- The average monthly consumed quantity in liters was calculated by dividing the value of the monthly consumed fuel by the price of the fuel

Quantity of Fuel = Value of Fuel/Liter Price

- The average annual price of gasoline in the West Bank and Gaza Strip 7.06 NIS/Liter
- The average annual price of diesel in the West Bank and Gaza Strip 6.42 NIS/Liter
- The average USD exchange rate against the NIS for 2014 is 3.577

Computerize data

Data Processing:

The data processing stage consisted of the following operations:

1. Editing and coding prior to data entry: all questionnaires were edited and coded in the office using the same instructions adopted for editing in the field.
2. Data entry:

The survey questionnaire was uploaded on office computers. At this stage, data were entered into the computer using a data entry template developed in Access Database. The data entry program was prepared to satisfy a number of requirements:

 - To prevent the duplication of questionnaires during data entry.
 - To apply checks on the integrity and consistency of entered data.
 - To handle errors in a user friendly manner.
 - The ability to transfer captured data to another format for data analysis using statistical analysis software such as SPSS.
3. Audit after data entered at this stage is data entered scrutiny by pulling the data entered file periodically and review the data and examination of abnormal values and check consistency between the different questions in the questionnaire, and if there are any errors in the data entered to be the withdrawal of the questionnaire and make sure this data and adjusted, even been getting the final data file that is the final extract data from it.
4. Extraction Results: The extract final results of the report by using the SPSS program, and then display the results through tables to Excel format.