

Waste Amount Survey In Islamabad



October 2004

Pakistan Environmental Protection Agency



1. Purpose of this survey

Recently environmental issues are closed up in Pakistan too; especially water pollution and air pollution are commonly recognized among its citizens. Because these pollutions directly influent upon our daily life. Solid waste management is also one of these issues. We can easy to check the result of waste management. It is just look around ourselves whether the waste is scattering or not. But we only check the cleanliness just of our surroundings, and we do not mind where the wastes are carried to after the collection by the municipality.

It is said about 54,850 tons of solid waste generated daily in urban areas of Pakistan and 60% is collected by the municipal authorities. But actually weigh bridge is not installed in the any dumping site, except of Lahore as far as I know, so no one knows the amount of the waste generated properly.

Pakistan Environmental Protection Agency has a set of portable weigh bridge donated by Japan International Cooperation Agency in 2004. Pak EPA conducted the waste amount survey in Islamabad for the first time in Pakistan from 20th to 25th September 2004 in cooperation with Capital Development Authority. The purpose of this survey is as follows;

- (1) To carry out actual amount of solid waste into dumping site
- (2) To find out the capacity of waste collection and efficiency
- (3) To give some advice to improve the waste management

2. Methodology

2.1 Equipment (all from Pak-EPA)

- a. Portable Truck Scale(RW-15P)-----4 sets(with cable)
- b. Ramp for Truck Scale-----4 pair(8pieces)
- c. Indicator(RW-2601P)-----1 set

2.2 Man power

- a. Supervisor-----2 person(1 person × 2 shift) From CDA
- b. Traffic Control-----2 person(1 person × 2 shift) From CDA
- c. Recorder-----2 person(1 person × 2 shift) From CDA
- d. Assistant-----20 person(10 person × 2 shift) From CDA

Supervisor : Instruct all the stuff to weigh properly and smoothly

Traffic Control : Instruct all the drivers of vehicle to implement the study smoothly

Recorder : Record the weigh, truck No, entering time and exit time

Assistant : Adjust the scales to each wheel of vehicles

2.3 Method

a. Preparation

- (i) Charge the battery of indicator(RW-2601P) one day before survey(more than 12hours)
- (ii) Clean up the road for installation of Portable Truck Scale
- (iii) Place the 4 plates and 8 ramps same as vehicle width
- (iv) Confirm the contact between the plate and ground
- (v) Power on by pressing “POWER” switch
- (vi) Make sure that the weight is zero

b. Weigh (see attached drawing)

- (i) Place the 2 axles on the 4 plates
- (ii) Save and print the weighing data by pressing “PRINT” key and then “SUM” key
- (iii) If the 3 axle’s vehicle came, firstly place the front axle wheel on the 2 plates, then save and print the weighing data by pressing “PRINT” key.
Secondary, place the rear 2 axles wheel on the 4 plates, then save and print the weighing data by pressing “PRINT” key and then “SUM” key.
- (iv) If the tractor and trolley came, it is not necessary to weigh front axle of tractor, but to weigh rear axle and trolley axle on the 4 plates.
- (v) While weighing the vehicle, the recorder recodes the truck No, entering time and weighing data. On the vehicle exits the site, the recorder checks the truck No and records exit time.
- (vi) If it is not busy to weigh, it is also to be weighed the vehicles after dumping the waste.
- (vii) The recyclable materials recovered by scavengers are also to be weighed on request at any time.

c. Clean up

After weighing, it is necessary to clean the site for next day’s survey.

2.4 Schedule

This survey starts from 8 AM and ends 6 PM everyday. (10 hours)

First shift is from 7:30 to 13:30 and second shift is from 12:30 to 18:30

3. Survey result

3.1 Waste Amount

According to the survey result as showing Figure 1, total waste amount is 2,325.3 ton and the average is 387.6 ton/day. The minimum amount is 255.8 ton on Monday (20th September 2004) and the maximum is 557.6 ton on Saturday (25th September 2004). It is indicated that CDA has the capacity to collect solid waste around 600 ton/day in 10 hours. However the actual collection amount is usually below this capacity. It means daily collection amount is easy to vary depending on the availability of vehicle, manpower, whether and so on.

3.2 Number of trip

Table 1 shows the average trip number of collection vehicle. Most of open trucks are private vehicles usually carrying old eggs only two or tree trips in a week. Suzuki is used only two or tree trips in a week specially used for collecting animal dead bodies. As compactors and Tractors are low trips, it is the reason that both vehicles collect waste from not only one point but many points until their full capacity. On the other side, container trucks collect waste from only one point, so container trucks have relatively high trips than other vehicles.

Table 3.2 Average trip number of collection vehicle

Type of Vehicle	Compactor	Container Truck	Tractor	Open Truck	Suzuki	Average
Average of trip per week	7.7	25.8	10.2	2.4	2.6	8.1
Average of trip per day	1.3	4.3	1.7	0.4	0.4	1.4

3.3 Collection timing

Figure 3.3 shows the entry time and the number of vehicles at dumping site. It is not so much difference, and it is observed lunch break is around form 13:30 to 15:00. The number of vehicles increases linearly in proportion to the time.

3.4 Sector wise collection amount

Figure 3.4.1 shows the sector wise collection amount. It is observed that waste amount of G-6, I-8, I-10 and I-11 is higher than other sectors. I-10 and I-11 are Known to as industrial area and, also from the field observation, most of the waste from these area was rubbly waste such as bricks, sludge and concrete blocks etc. The waste from I-8 was also rubbly waste, but I-8 is not industrial area. It may be unusual sanitation activity, for example scooping waste from the open drainages or open plot, caused such a high waste amount. G-6 is known to as commercial area, so there produced high amount

of waste daily. It was also observed the waste from F-7, G-6, I-8, I-10 and I-11 was sudden increased on 24th and 25th September 2004 as compared with another 4 days. It may be unusual activities have done in these two days, too.

Figure 3.4.2 shows the sector wise population and Figure 3.4.3 shows the sector wise unit waste amount. Population data of Figure 3.4.2 is estimated from the census data of 1998 as 2004. From these figures it is indicated that the population of G-11 and G-5 is growing larger than the annual growth rate of 5.7 in 1998. Because the waste amount of both two sectors is too large for their estimated population, and there is not so many commercial or industrial activities. The reason of high unit waste amount in I-8 and I-11 has already referred in description of figure 3.4.1

Figure 3.1 Waste Amount Survey

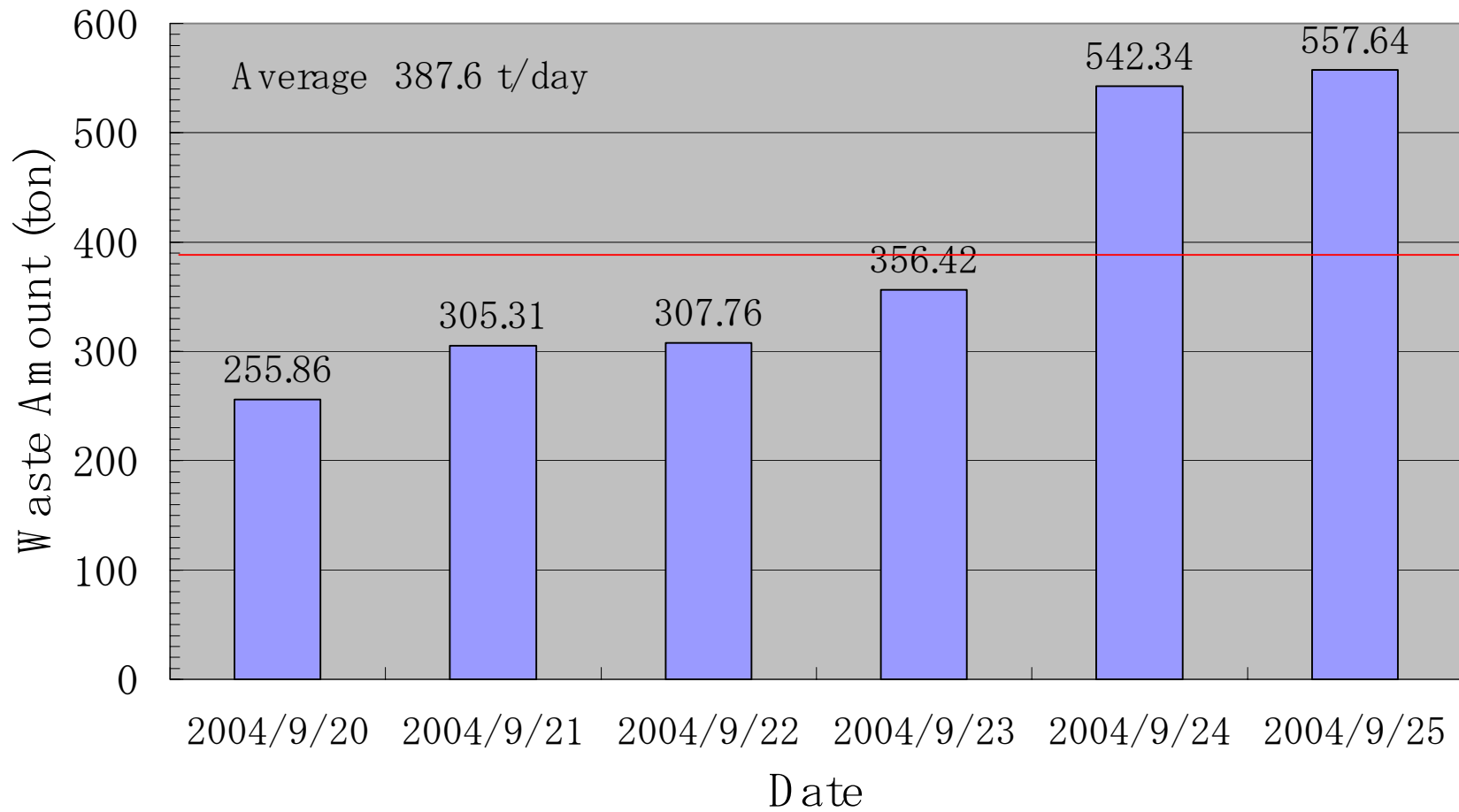


Figure 3.2 Number of Trip

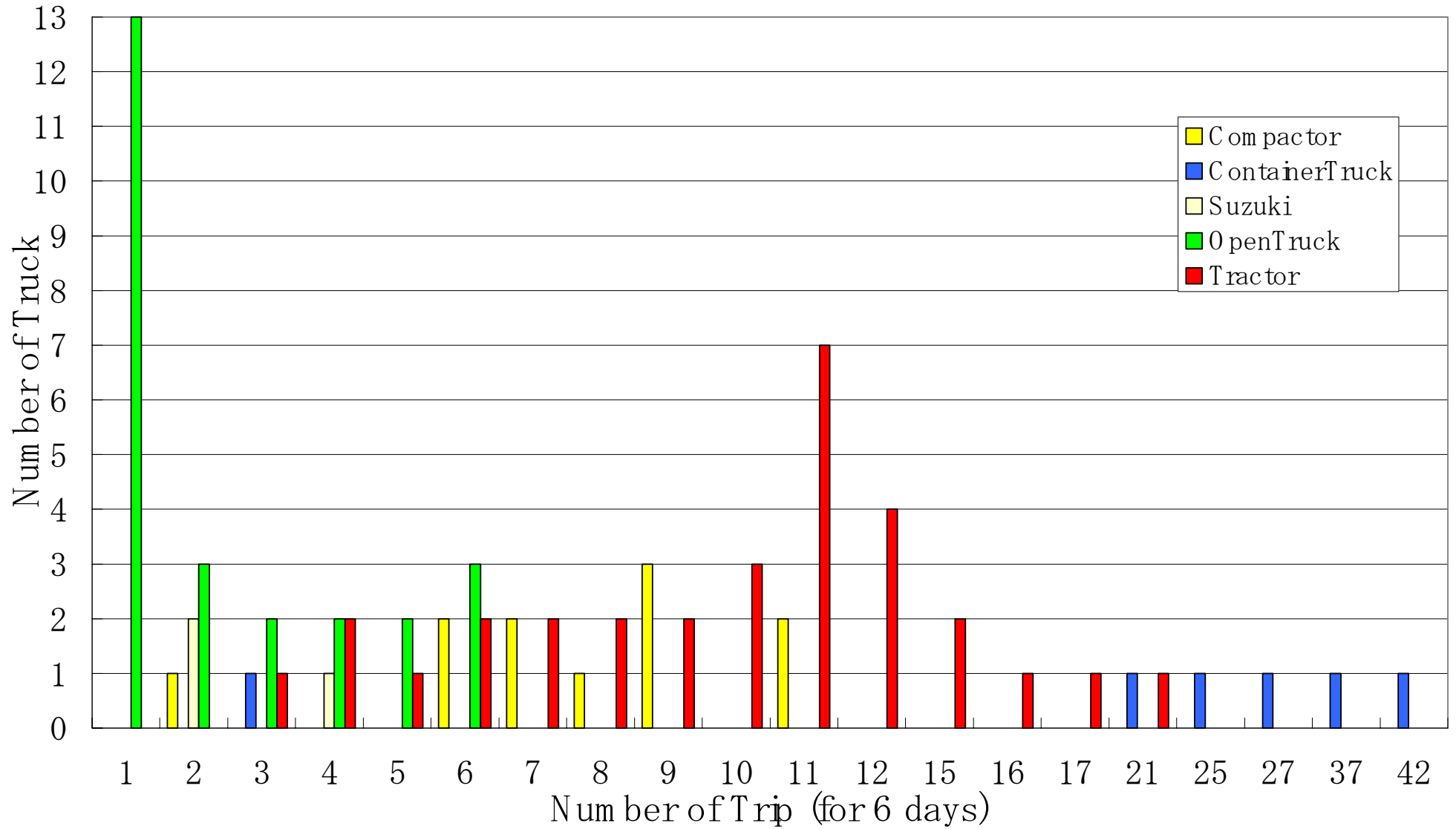


Figure 3.3 Schedule

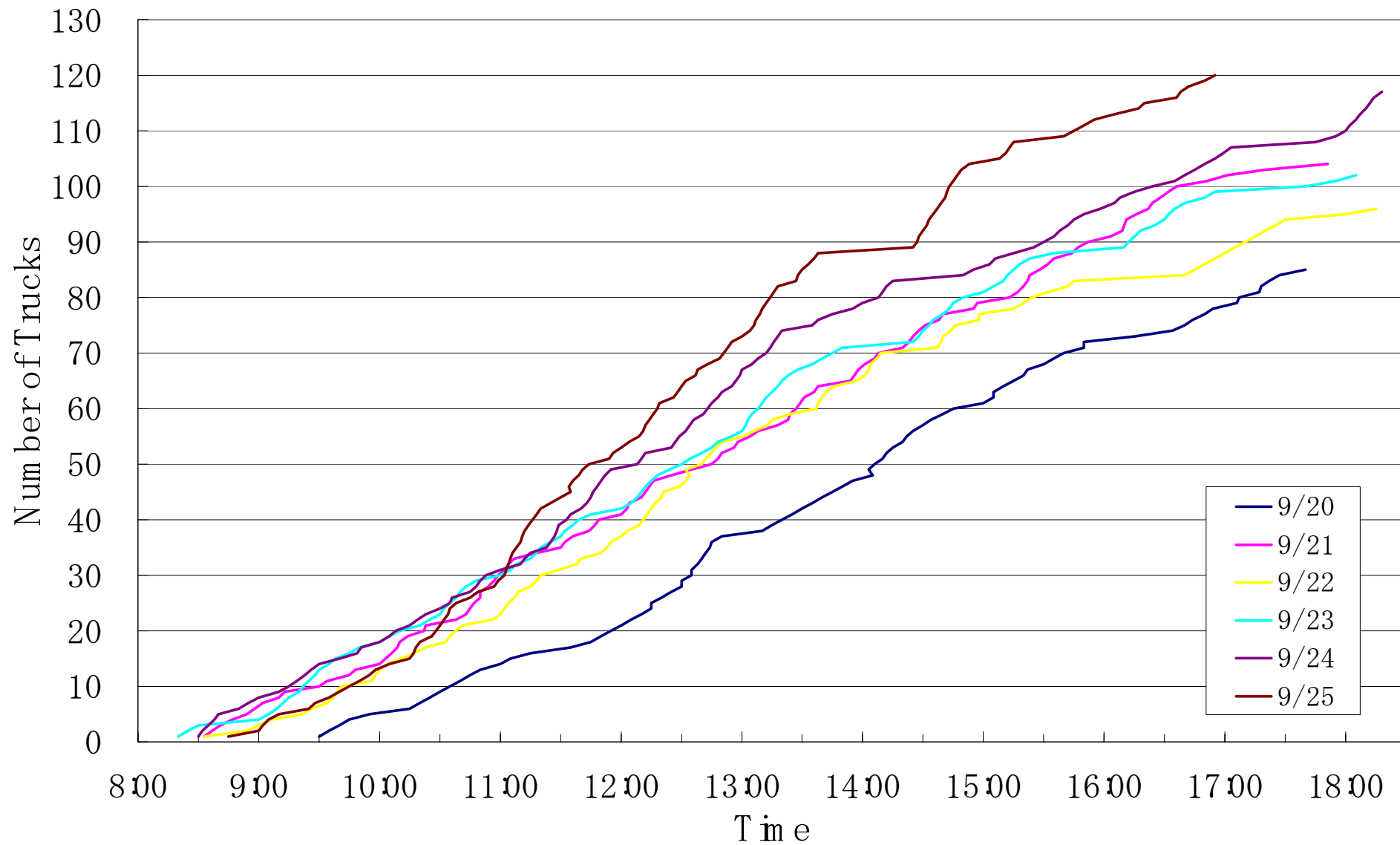


Figure 3.4.1 Sector Wise Waste Amount

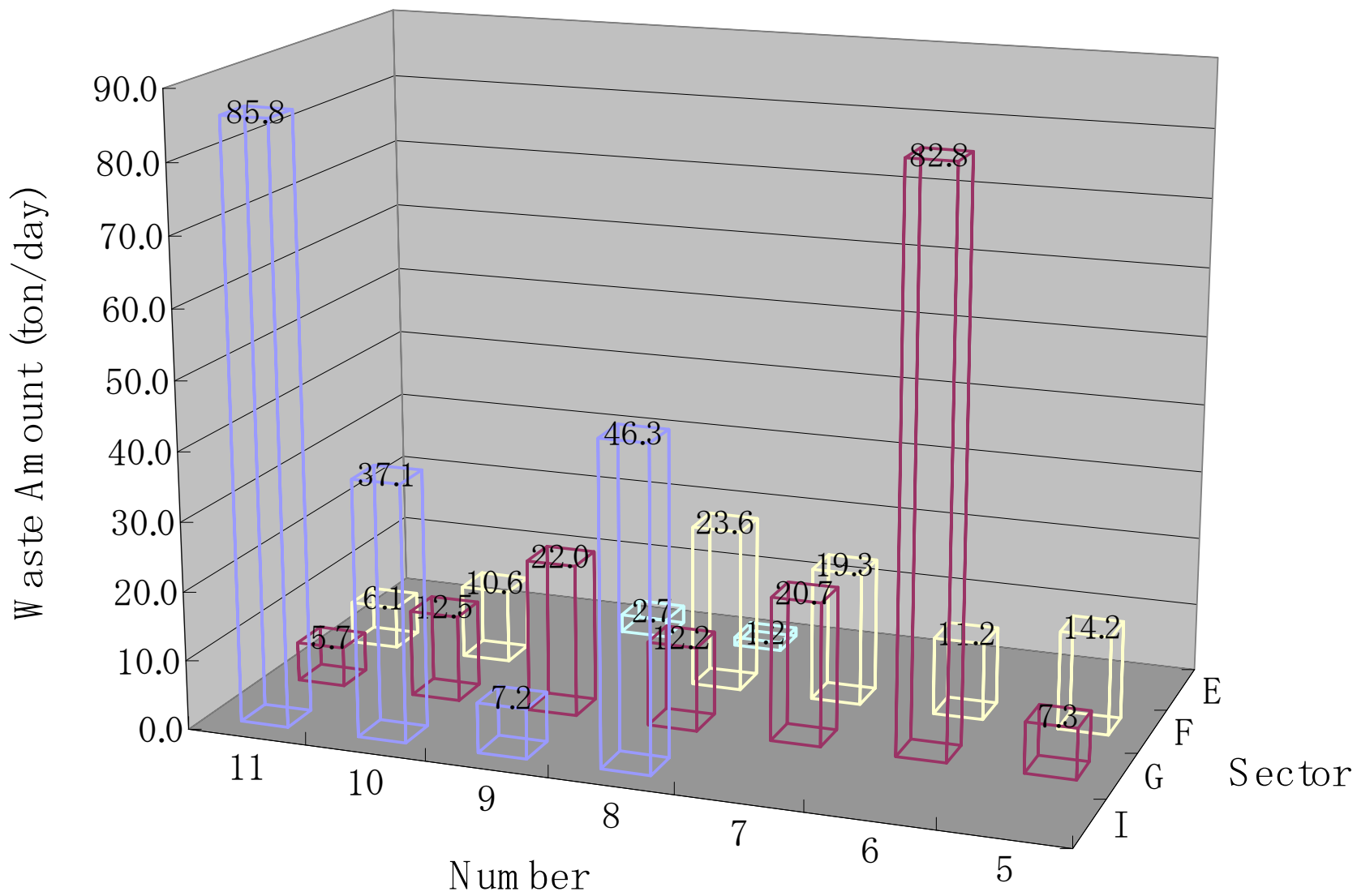


Figure 3.4.2 Sector Wise Population

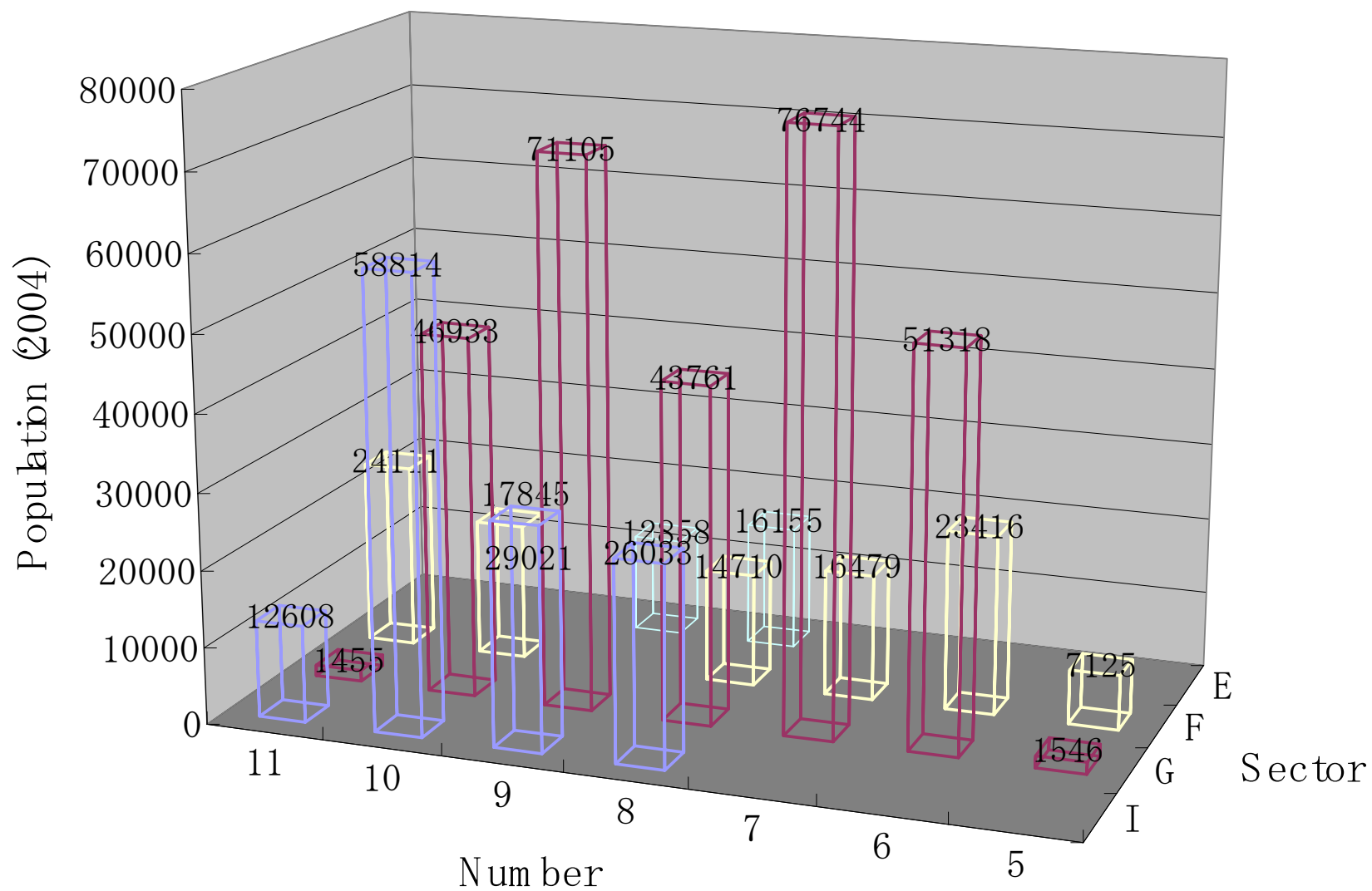
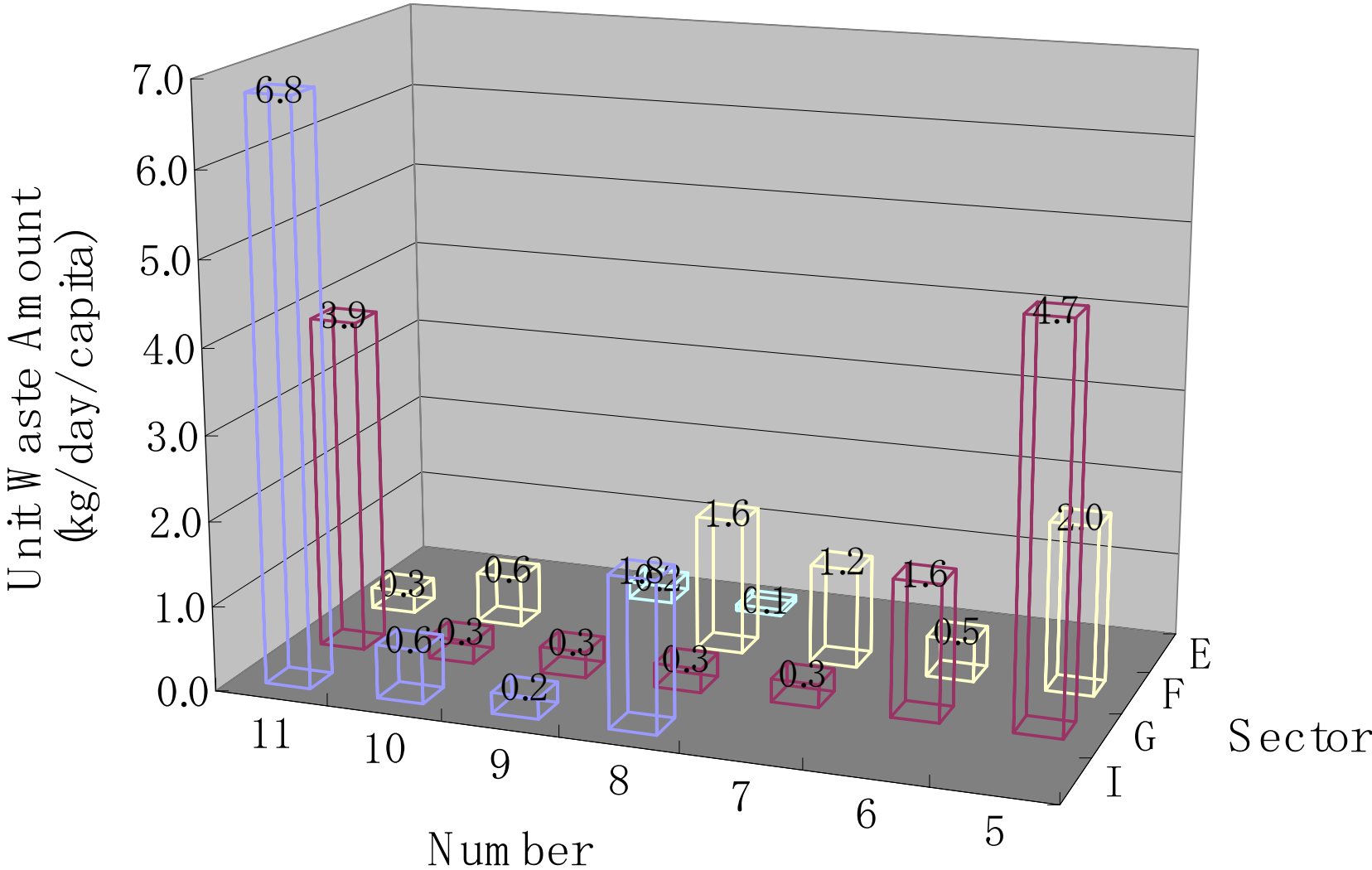


Figure 3.4.3 Sector Wise Unit Waste Amount



4. Conclusion

Pak EPA and CDA have conducted the actual waste amount survey in Islamabad for the first time in Pakistan. Following facts are observed.

- (1) Total waste amount is 2,325.3 ton in 6 days and its average is 387.6 ton/day.
- (2) The minimum amount is 255.8 ton on Monday (20th September 2004) and the maximum amount is 557.6 ton on Saturday (25th September 2004)
- (3) CDA has the capacity to collect solid waste around 600 ton/day in 10 hours.
- (4) The waste from F-7, G-6, I-8, I-10 and I-11 was sudden increased on 24th and 25th September 2004 as compared with another 4 days.

5. Recommendation

CDA should install a static weighbridge at H-12 dumping site;

- (1) To monitor the waste collection amount daily
- (2) To monitor and evaluate the work of waste collection contractors
- (3) To plan future waste management plan
- (4) To reduce the waste collection cost
- (5) To estimate the life expectancy of dumping site
- (6) To be first model city of waste management in Pakistan

Appendix 1	Site Location
Appendix 2	Raw data of the Survey
Appendix 3	Survey record (By vehicle)