Waste Amount Survey
In
Multan

October 2005

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 Multan for the second time in Pakistan from 16th to 22th September 2005 in cooperation with Tehsil Municipal Administration Multan. 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 From Pak-EPA,
   1 person From CDGM
b. Traffic Control---------- 1 person From CDGM
c. Recorder---------- 2 person From Pak-EPA
d. Assistant---------- 8 person From CDGM
e. Worker---------- 3 person From CDGM

*CDGM means City District Government of Multan

Supervisor : Instruct all the staff 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
Worker	: Sweep the waste and dust around the scales

2.3 Method

a. Preparation

(i) Charge the battery of indicator(RW-2601P) one day before survey(more than 12hours)

(ii) Purchase 2 full size chip boards and cut them into 2 pieces each

(iii) Clean up the road for installation of Portable Truck Scale

(iv) Place the 2 plates and 4 ramps on the chip board same as vehicle width

(v) Confirm the contact between the plate and ground

(vi) Power on by pressing "POWER" switch

(vii) Make sure that the weight is zero

b. Weigh (see attached drawing)

(i) Place the 1st axles on the 2 plates

(ii) Save and print the weighing data by pressing "PRINT" key

(iii) Then place the 2nd axles on the 2 plates

(iv) Save and print the weighing data by pressing "PRINT" key and then "SUM" key

(v) If the 3 axle's vehicle comes, repeat (ii) and (iii) before (iv).

(vi) If the tractor and trolley came, it is not necessary to weigh front axle of the vehicle, but to weigh rear axle and trolley axle.

(vii) 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.

(viii) If it is not busy to weigh, it is also to be weighed the vehicles after dumping the waste for empty data.

(ix) The recyclable materials recovered by scavengers are also to be weighed if possible.

c. Clean up

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

2.4 Schedule

From 15th September 2005 to 22nd September 2005

3. Survey result

3.1 Waste Amount

According to the survey result as showing Figure 3.1, total waste amount is 2,047ton and the average is 342 ton/day. The minimum amount is 247 ton on Friday (16th September 2005) and the maximum is 412 ton on Saturday (17th September 2005). It is indicated that TMA Multan has the capacity to collect solid waste around 400 ton/day in 8 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 3.2 shows the average trip number of collection vehicle. Most of tractors carry the garbage to dumping site only two trips per day. On the other side, trucks carry 3-4 trips per day. TMA Multan has only 3 trucks against 34 tractors, but these trucks carry the waste 506 ton per week against total amount 2047 ton. It is about a quarter of total amount. It means, in the view of efficiency, truck is much better than tractor.

Table 3.2 Average trip number of collection vehicle

Type of Vehicle	Truck	Tractor	Average
Average of trip per week	22.3	12.6	13.4
Average of trip per day	3.7	2.1	2.2

3.3 Collection timing

Figure 3.3 shows the entry time and the number of vehicles at dumping site. The number of vehicles increases linearly in proportion to the time. It is also observed Saturday (17th September) is higher pace and finish the work earlier than the other day.

3.4 Place wise collection amount

Figure 3.4 shows the place wise collection amount. It is observed that waste amount of commercial area (Shaheen Market, Dehli Gate, Dera Adda, Lohari Gate, Kalma Chawk and Sabz Mandi) is higher than other sectors. These top 5 places produce about 87 ton daily, and it is over 25 % of total waste.

Figure 3.1 Waste Collection Amount

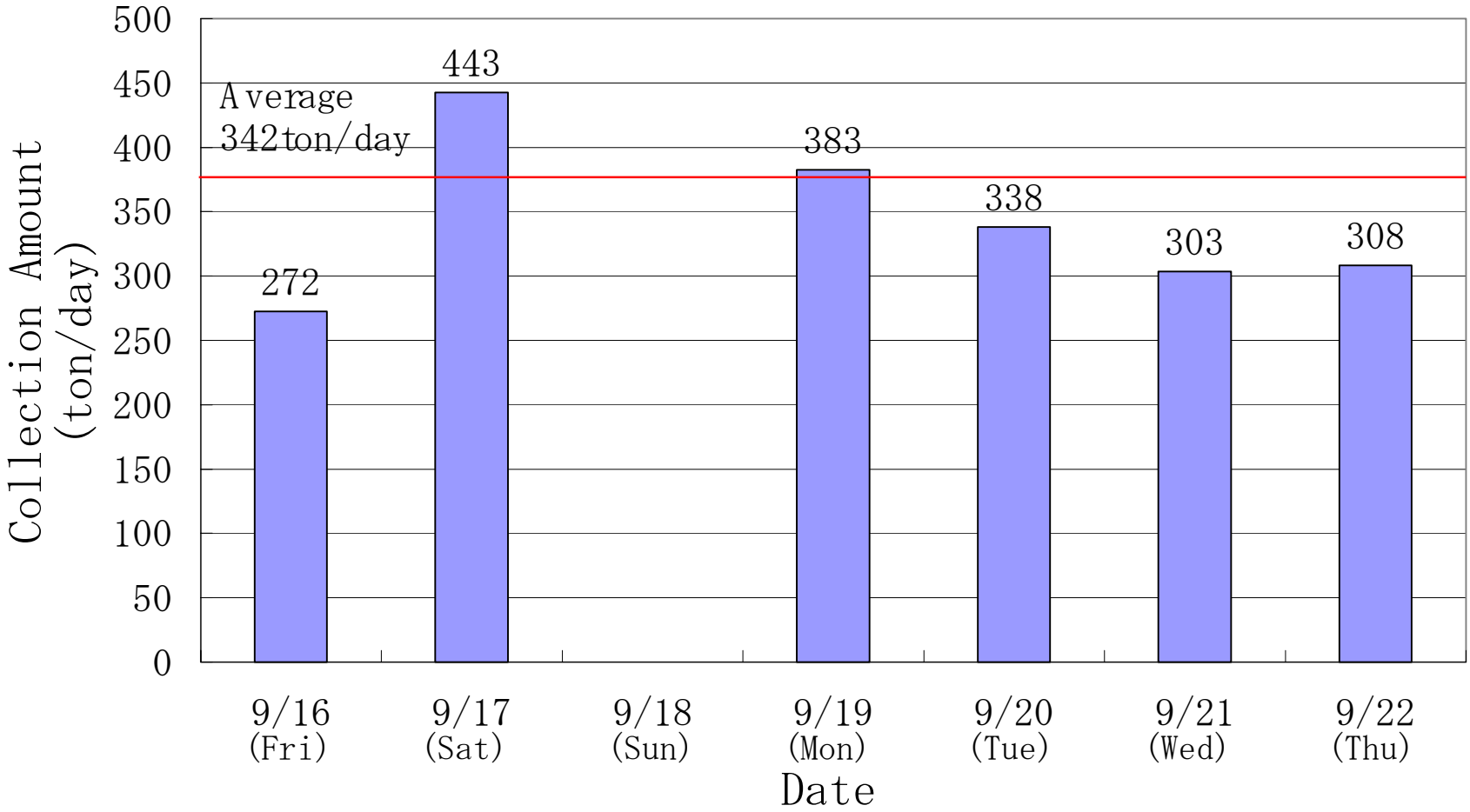


Figure 3.2 Number of Trip

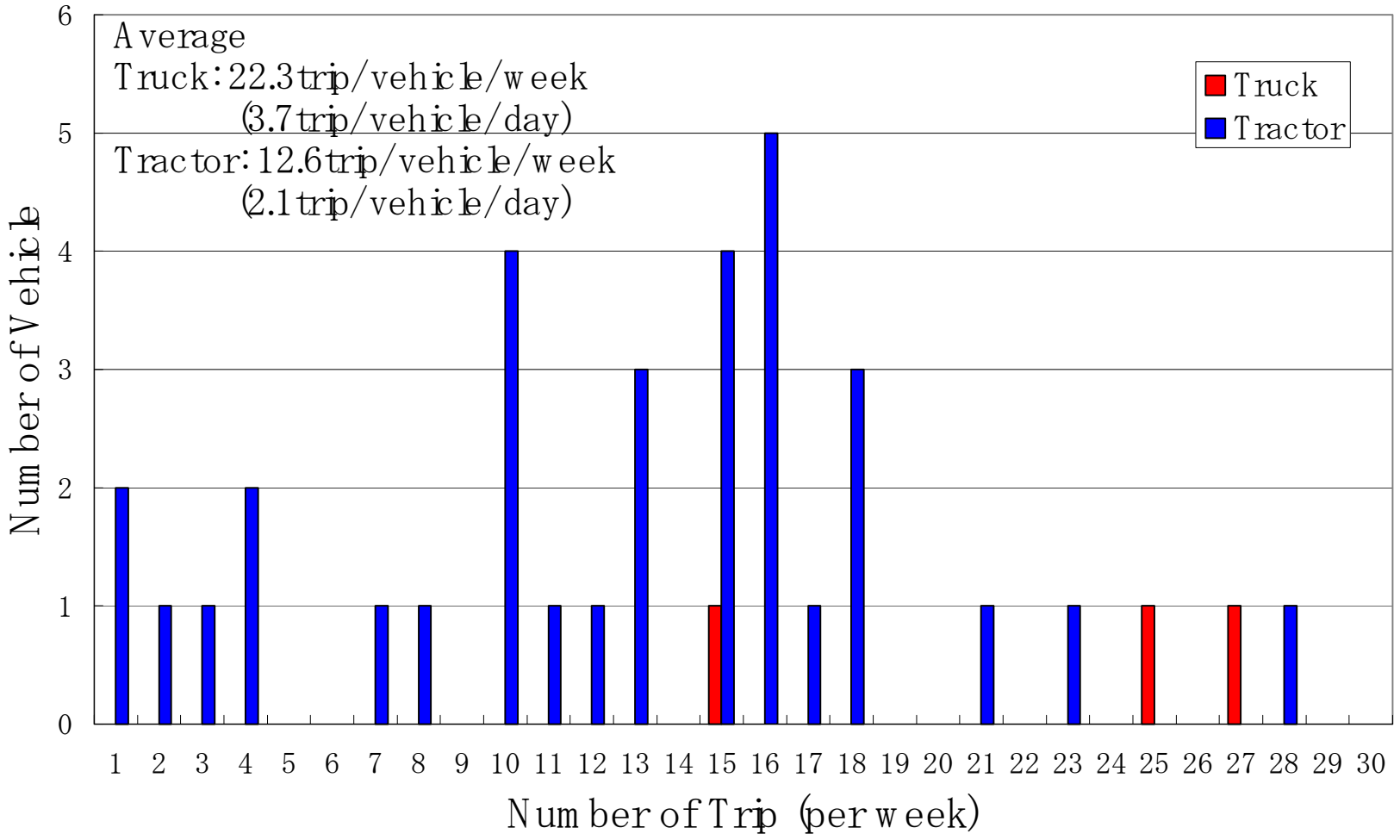


Figure 3.3 Schedule

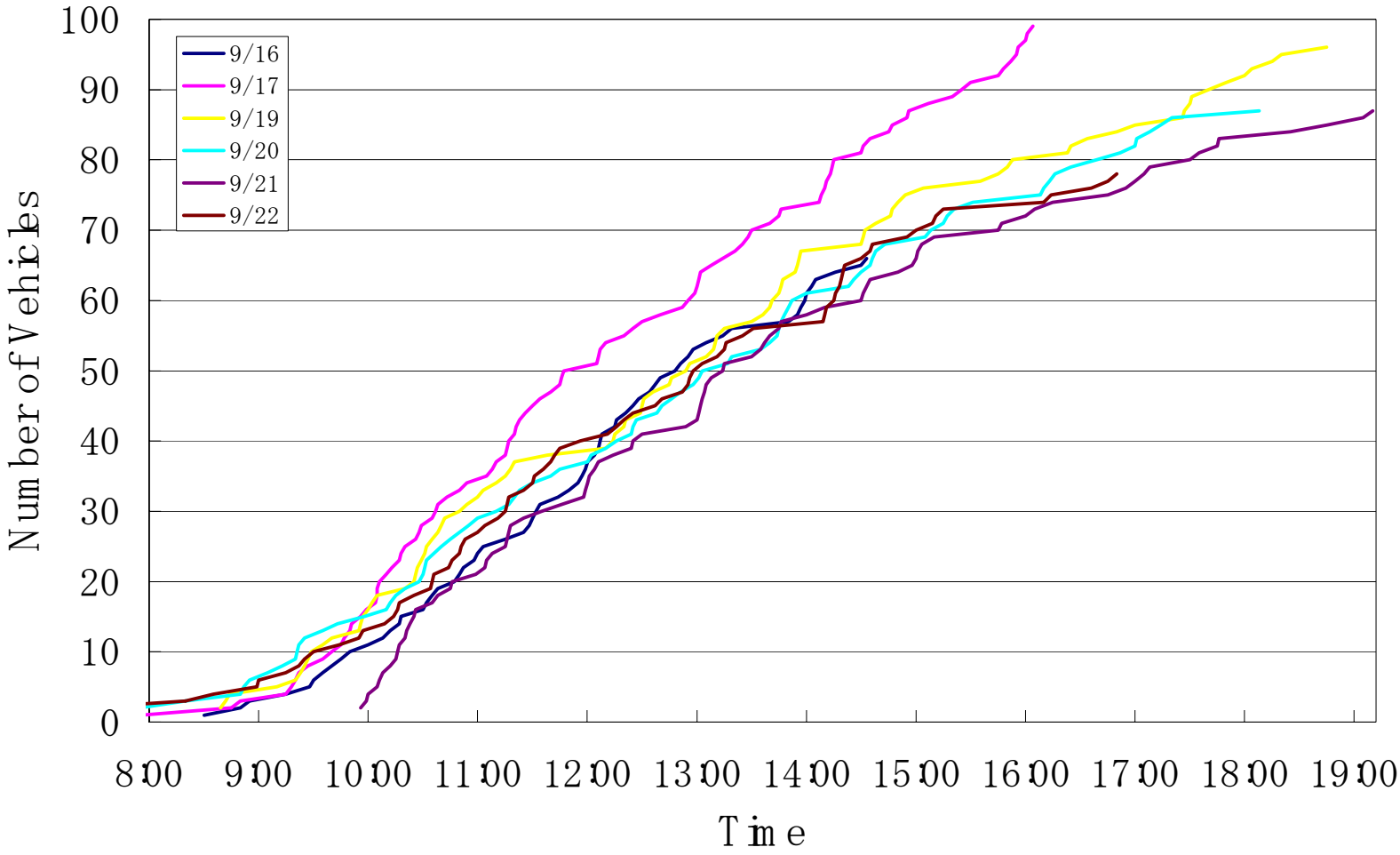
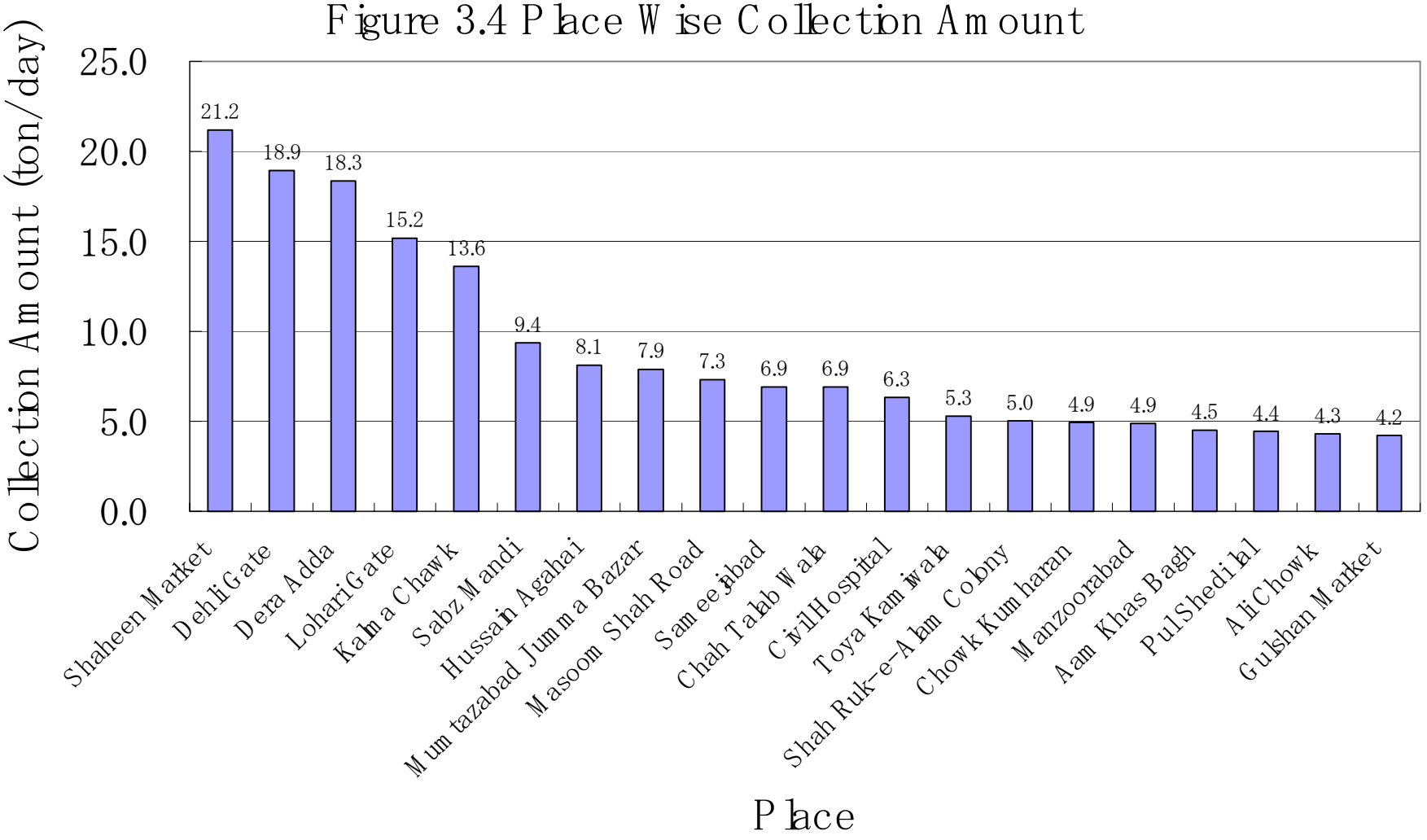


Figure 3.4 Place Wise Collection Amount



4. Conclusion

Pak EPA and TMA Multan have conducted the actual waste amount survey in Multan for the second time in Pakistan. Following facts are observed.

(1) Total waste amount is 2,047 ton in 6 days and its average is 342 ton/day.

(2) The minimum amount is 247 ton on Friday (16th September 2005) and the maximum amount is 412 ton on Saturday (17th September 2005)

(3) TMA Multan has the capacity to collect solid waste around 400 ton/day in 8 hours.

5. Recommendation

TMA Multan should install a static weighbridge at 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

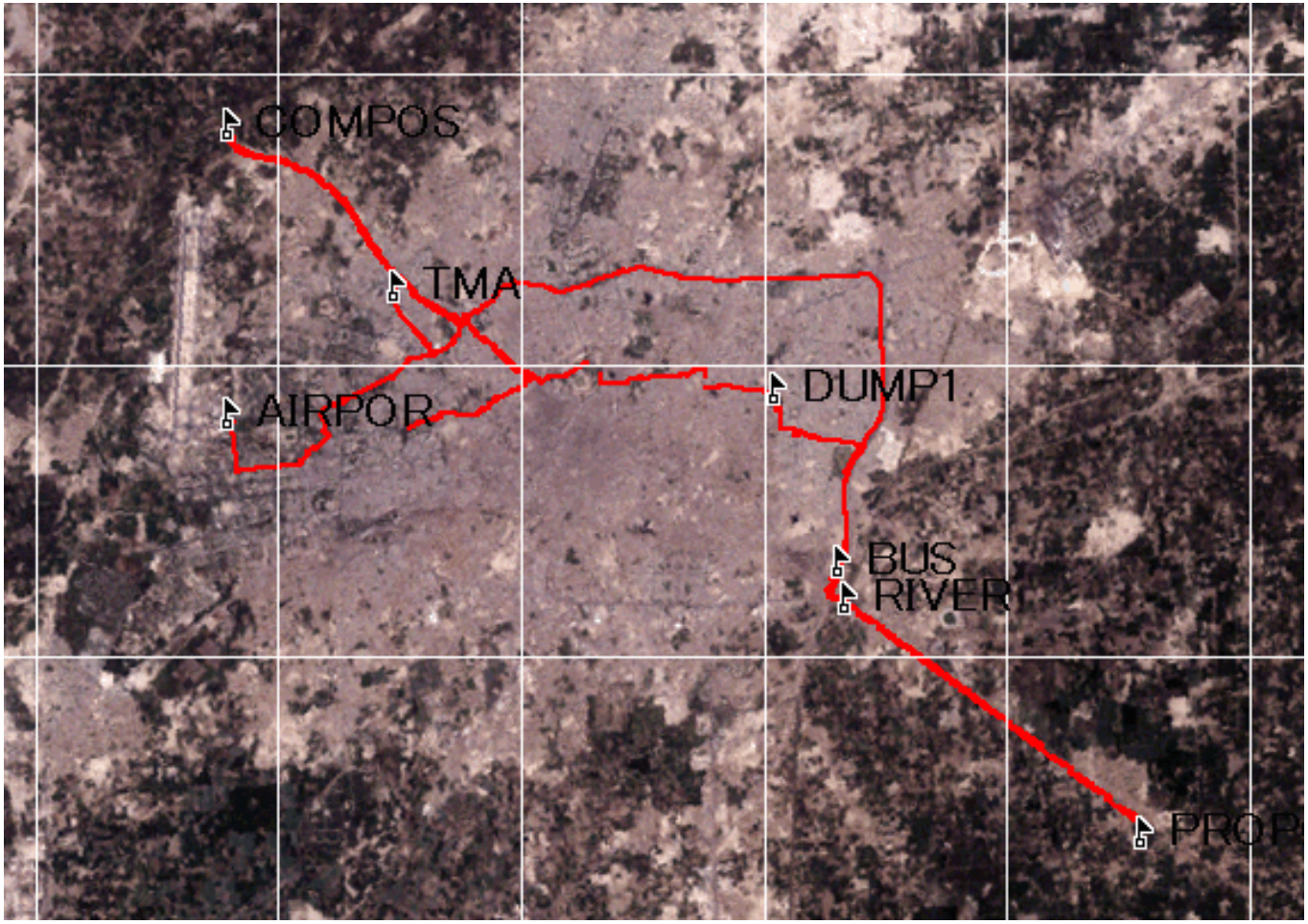
(5) To estimate the life expectancy of dumping site

(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)



Site Location