PROJECT FOR INTEGRATED SOLID WASTE MANAGEMENT MASTER PLAN IN GUJRANWALA

INCOMING WASTE AMOUNT SURVEY TO GONDLANWALA DISPOSAL SITE, GUJRANWALA

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1. INTRODUCTION

Gujranwala is located at 32.16° north, 74.18° east and is 226 meters (744 feet) above sea -level. Total area of the city is 61.5Km^2. Gujranwala is a major agricultural and industrial city of Punjab. Gujranwala shares its boundary with Wazirabad in North, NowsheraVikran and Kamoke in South, Gujranwala's industrial areas have numerous textile mills, crockery manufacturing and large agricultural processing plants, ceramics industries, electronic equipments and auto industry.

In Gujranwala, project for Integrated Solid Waste Management Master Plan (hereinafter referred to as "ISWMP") was initiated by JICA in cooperation with the authorities concerned of the Government of Islamic Republic Pakistan. The project involves various kinds of field surveys and studies because of unavailability of basic data and information regarding solid waste management. This survey "Incoming Waste Amount" is conducted in view of estimation of solid waste dumping at the Gondlanwala disposal site. The survey is done by the ISWMP project team with collaboration of Gujranwala Waste Management Company (hereinafter referred to as"GWMC").

Landfill operation at Gondlanwala started in March 2014. Since then, the number of incoming vehicles had been recorded manually by the supervisor until 8 May 2014. Recording of loading weight started from 9 May 2014 at a private weighbridge located along the way to Gondlanwala.

A weighbridge was later installed under the scheme of the Project at an area adjacent to the Gondlanwala landfill site. Weighing of incoming waste amount was then made continuously from 2 September 2014 at the weighbridge of Gondlanwala disposal site and digital recording is now available. The incoming waste amount at Gondlanwala was estimated based on the data recorded from the sources mentioned above.

2. OUTLINE AND PURPOSE OF SURVEY

2.1 Objective of the Study

The objective of the survey is to obtain the actual waste amount disposed of at the existing disposal site for estimating the lifespan of the landfill in addition to obtaining the operation status of waste collection and transportation vehicles for a basic data to formulate the ISWM Master Plan.

2.2 Scope of Work

1) To calculate the monthly incoming waste amount dumping at disposal site
2) To calculate the average no. of trips and loaded weight by the types of vehicles
3) To estimate the bulk density of loaded waste by the type of vehicles

This report is prepared on the basis of data collected in the months of October 2014 to February 2015.

3. METHODOLOGY

Monthly base data and information of the incoming vehicles and waste amounts disposed were obtained from the truck scale installed at Gondlanwala Disposal site. The data was recorded through scale management system as shown in **Figure 3.1**.

Figure 3.1Truck Scale Computer Operator Room at Gondlanwala Disposal Site

Following are the primary information that was collected from the truck scale computer operator room at disposal site;

- Raw data excel sheets consisted of waste load carried and no. of trips by each type of vehicle. This excel sheet also comprised of other information like time of arrival, the area of collection/UC's/Zones, vehicles code and number etc. presented in **Appendix I**.
- Processed excel sheets with average incoming waste from eight zone and total no. of trips in a day by each type of vehicle. **Appendix II**

Those collected data were processed and analysed in accordance with the requirements stated in the Scope of Works.

4. DATA PROCESSING AND RESULT OF SURVEY

4.1 Number of Vehicle Trips and Incoming Waste Amount

Primary data then processed in MS-Excel to calculate the total number of trips and average waste amount disposed per day by each type of vehicle.

Three types of vehicles Arm-roll Trucks (26 No.); Tractor Trolleys (37No.) and Mini-Dumpers (35No.) are in operational by the Gujranwala Waste Management Company (GWMC) to transport collected solid waste from jurisdiction area. These vehicles collect waste form specified points and allotted areas on daily basis and then disposed at designated point located near Gondlanwala village.

Total number of trips in the month of October 2014 and November 2014 were 5,934 and 5,228 respectively. Total trips per day varied from minimum 57 to maximum 404 in the month of October while in the month of November range was 137 to 253. Trips of each vehicle were also calculated. It is come to see that average trips in **working days** of October were 128 by Arm-roll Trucks, 73 by Tractor Trolleys and 6 by Mini Dumpers whereas in the month of November 123 Arm-roll trucks, 72 Tractor Trolleys and 7 Mini Dumpers were recorded at weigh bridge. Average trips **per day of each month** i.e. October and November were 120 by Arm-roll Trucks, 69 by Tractor Trolleys and 2 by Mini Dumpers and 106 by Arm-roll Trucks, 62 by Tractor Trolleys and 5 by Mini Dumpers respectively shown in **Figure 4.1 and Figure 4.2** and also presented in **Table 4.1 and Table 4.2.**

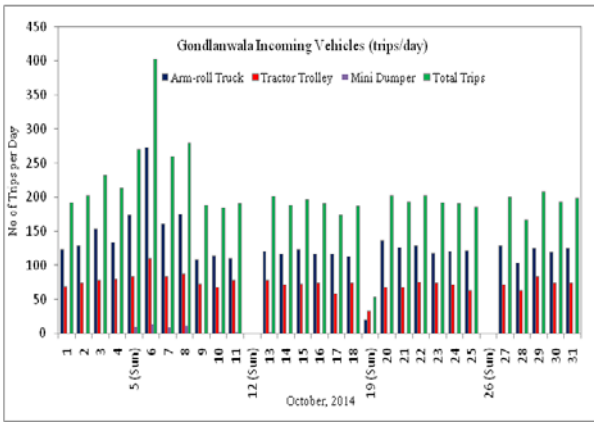

Figure 4.1 Incoming Vehicles (trips/day) in October

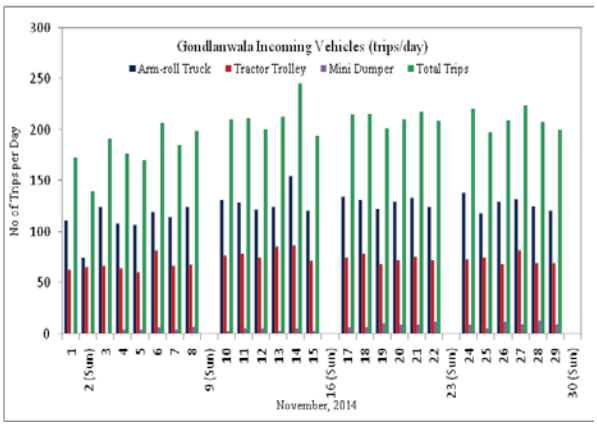

Figure 4.2 Incoming Vehicles (trips/day) in November

Some tractor trolleys were also hired for Eid-ul-Azha days in October to collect and transport animal wastes from the city. The total trips by these private tractor trolleys were 27 with an average of 7 per day.

Table 4.1Incoming Vehicle Trips in October 2014 (unit: trip)

Vehicle Type	**Arm-roll Truck**	**Tractor Trolley**	**Mini Dumper**	**Private Tractor Trolleys**	**Total**
Total	3,726	2,130	51	27	5,934
Minimum	20	33	1	3	57
Maximum	273	110	14	7	404
Average trips -Working Days (29 days)	128	73	6	5	212
Average trips per day (31 days)	120	69	2	1	192

Table 4.2 Trips in November 2014 (unit: trip)

Vehicle Type	**Arm-roll Truck**	**Tractor Trolley**	**Mini Dumper**	**Total**
Total	3,193	1,874	161	5,228
Minimum	74	60	3	137
Maximum	154	86	13	253
Average trips -Working Days (26 days)	123	72	7	202
Average trips per day (30 days)	106	62	5	173

Numbers of trips by all vehicles were 5,231 in month of December, 2014 and 5,910 in the month of January, 2015 recorded on truck scale management system that is installed at the site. Total trips per day varied from minimum 34 to maximum 229 in the month of December, 2014 while in the month of January, 2015 range was 51 to 234 as shown in **Figure 4.3 and Figure 4.4**. Trips of each vehicle were also calculated. It is come to see that average trips in **working days** of December, 2014 were 117 by Arm-roll Trucks, 28 by Tractor Trolleys and 12 by Mini Dumpers whereas in the month of January, 2015 118 Arm-roll trucks, 61 Tractor Trolleys and 12 Mini Dumpers were recorded at weigh bridge. Average trips **per day of each month** i.e. December, 2014 and January, 2015 were 106 by Arm-roll Trucks, 52 by Tractor Trolleys and 10 by Mini Dumpers and 118 by Arm-roll Trucks, 61 by Tractor Trolleys and 12 by Mini Dumpers respectively and also presented in **Table 4.3 and Table 4.4.**

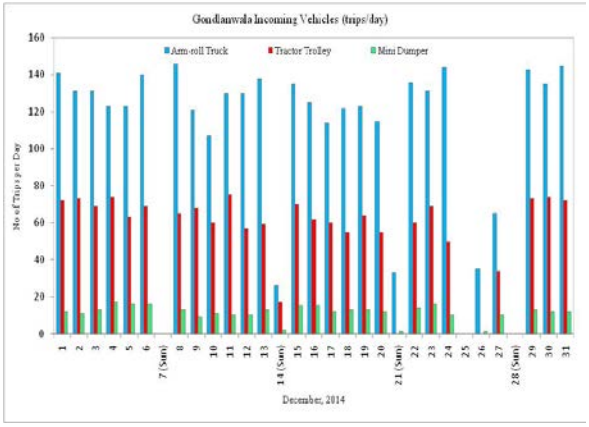

Figure 4.3 Incoming Vehicles (trips/day) in Dec, 2014

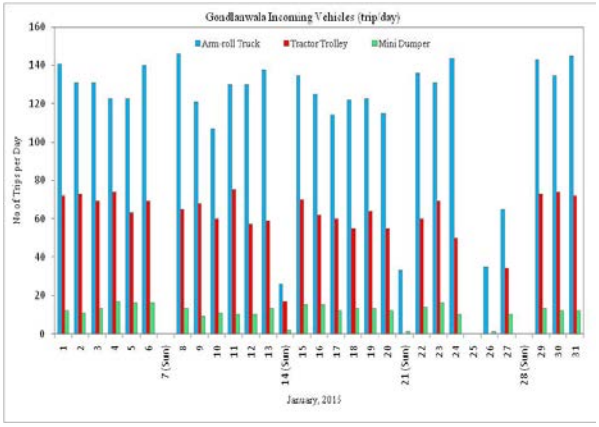

Figure 4.4 Incoming Vehicles (trips/day) in Jan, 2015

Some hired compactors were also tested as a trial at transfer station to transport and dispose of solid waste. Mini-dumpers were unloaded directly in this test trial to check transportation efficiency and to introduce compactors at transfer stations. Some trips were also recorded by these compactors at Gondlanwala site. However, the total numbers by these compactors were "2" in December, 2014 and "11" in month of January, 2015.

Table 4.3 Vehicle Trips in December, 2014 (unit: trip)

Vehicle Type	**Arm-roll Truck**	**Tractor Trolley**	**Mini Dumper**	**Compactor**	**Total**
Total	3,288	1,619	322	2	5231
Minimum	26	0	1	1	34
Maximum	146	75	17	1	229
Average trips -Working Days (29 days)	117	58	12	1	187
Average trips per day (31 days)	106	52	10	0	169

Table 4.4 Vehicle Trips in January, 2015 (unit: trip)

Vehicle Type	**Arm-roll Truck**	**Tractor Trolley**	**Mini Dumper**	**Compactor**	**Total**
Total	3,652	1,879	368	11	5,910
Minimum	30	5	1	0	51
Maximum	153	77	18	2	234
Average trips -Working Days (26 days)	118	61	12	1	191
Average trips per day (30 days)	118	61	12	0	191

In month of February 2015, numbers of trips recorded by all type of vehicles were 5,060. Total trips per day varied from minimum 62 to maximum 244 as shown in **Figure 4.5.** Trips of each vehicle were also counted in this month. It comes to see that average trips in **working days** of February, 2014 were 136 by Arm-roll Trucks, 41 by Tractor Trolleys and 14 by Mini Dumpers. Average trips **per day in this month** were 131 by Arm-roll Trucks, 38 by Tractor Trolleys and 12 by Mini Dumpers presented in **Table 4.5.**

Table 4.5 Vehicle Trips in February, 2015 (unit: trip)

Vehicle Type	**Arm-roll Truck**	**Tractor Trolley**	**Mini Dumper**	**Total**
Total	3,669	1,059	332	5,060
Minimum	54	8	5	62
Maximum	188	57	23	244
Average trips -Working Days (26 days)	136	41	14	187
Average trips per day (30 days)	131	38	12	181

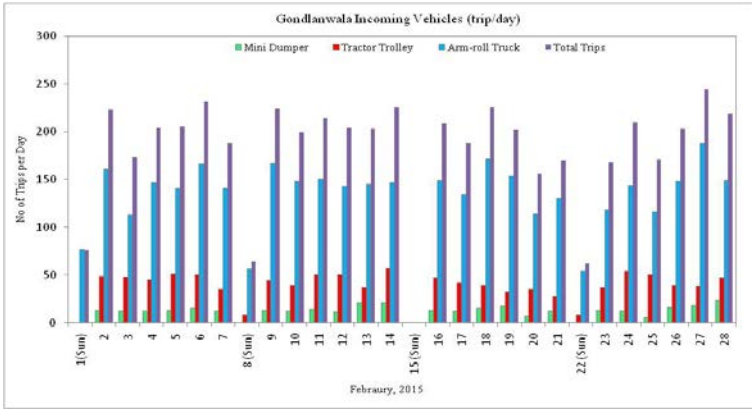

Figure 4.5 Incoming Vehicles (trips/day) in February, 2015

Total amount of waste hauled in October and November 2014 was 16,734 tons and 12,688 tons, respectively. **Working days** average incoming waste amount in October, 2014 and November, 2014 was 577 tons and 488 tons, respectively. However, **monthly average** per day was 540 tons and 423 tons in October and November, 2014. Solid waste transported in month of October was recorded from minimum 471 tons (Sunday) to maximum 697 tons (Monday) and in month of November its range was 368 tons (Sunday) to 506 tons (Monday) as shown in **Figure 4.5 and Figure 4.7** and details are described in **Table 4.5 and Table 4.6.**

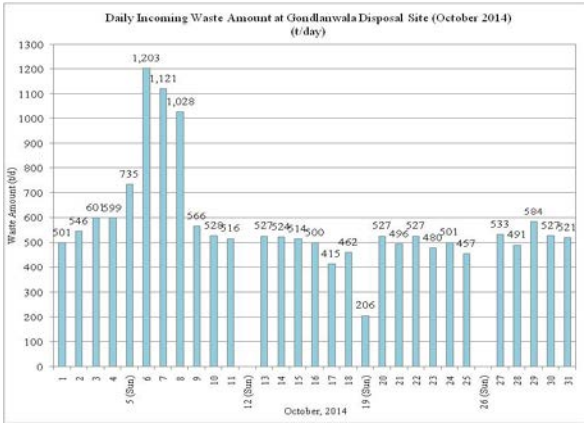

Figure 4.6 Incoming Waste Amount (t/d) in October

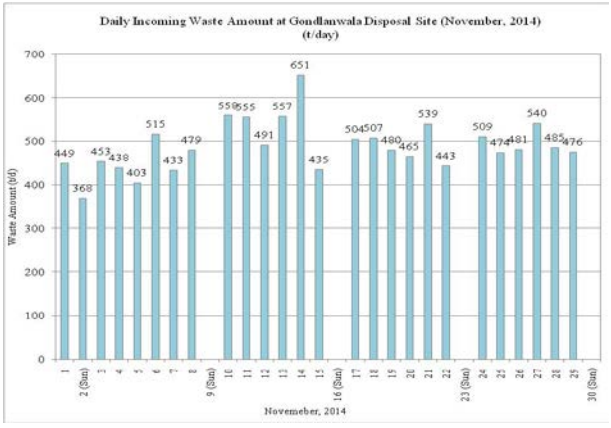

Figure 4.7 Incoming Waste Amount (t/d) in November

Table 4.6 Incoming Waste Amount in October, 2014 (unit: t/day)

Day of the Week	1st Week	2nd Week	3rd Week	4th Week	5th Week	Total (t)	Average Incoming Waste Amount by the Day of the Week	Ratio to the Working-day Average (%)
Monday		1,203	527	527	533	2,789	697	120.9%
Tuesday		1,121	524	496	491	2,631	658	114.0%
Wednesday	501	1,028	514	527	584	3,154	631	109.3%
Thursday	546	566	500	480	527	2,618	524	90.8%
Friday	601	528	415	501	521	2,565	513	88.9%
Saturday	599	516	462	457		2,035	509	88.2%
Sunday	735		206			942	471	81.6%
Total	2,982	4,962	3,148	2,986	2,656	**16,734**	-	
Working-day Average Incoming Waste Amount, 29days							577	
Daily Average Incoming Waste Amount, 31days							540	

Table 4.7 Incoming Waste Amount in November 2014 (unit: t/day)

Day of the Week	1st Week	2nd Week	3rd Week	4th Week	5th Week	Total	Average Incoming Waste Amount by the Day of the Week	Ratio to the Working-day Average (%)
Monday		453	558	504	509	2,025	506	103.7%
Tuesday		438	555	507	474	1,974	493	101.1%
Wednesday		403	491	480	481	1,855	464	95.0%
Thursday		515	557	465	540	2,077	519	106.4%
Friday		433	651	539	485	2,109	527	108.0%
Saturday	449	479	435	443	476	2,280	456	93.5%
Sunday	368					368	368	75.5%
Total	817	2,721	3,247	2,938	2,965	**12,688**	-	
Working-day Average Incoming Waste Amount, 26days							488	
Daily Average Incoming Waste Amount, 30days							423	

Total amount of waste hauled in December, 2014 and January, 2015 was 12,976 tons and 15,293 tons, respectively. **Working days** average incoming waste amount in December, 2014 and January, 2015 was 463 tons and 493 tons, respectively as shown in **Figure 4.8 and Figure 4.9**. However, **monthly average** per day was 419 tons and 493 tons in December, 2014 and January, 2015. Solid waste transported in month of December, 2014 was recorded from minimum 140 tons (Sunday) to maximum 575 tons (Monday) and in month of January, 2015 its range was 264 tons (Sunday) to 570 tons (Monday), details are described in **Table 4.8 and Table 4.9.**

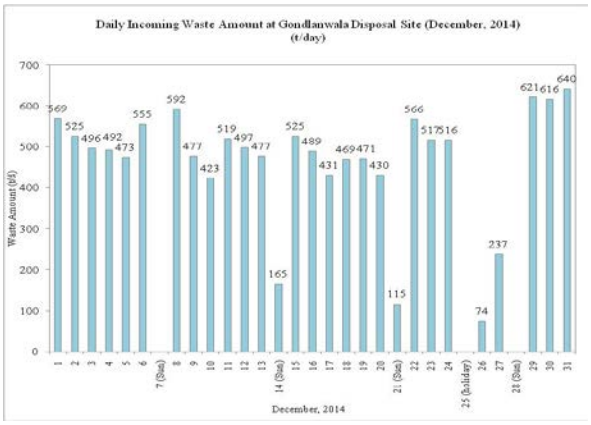

Figure 4.8 Incoming Waste Amount (t/d) in Dec, 2014

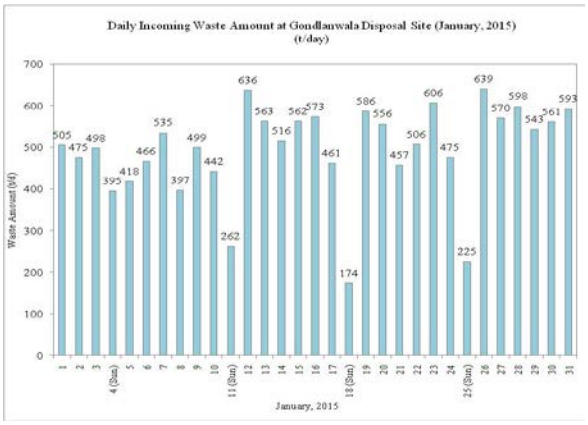

Figure 4.9 Incoming Waste Amount (t/d) in Jan, 2015

Table 4.8 Incoming Waste Amount in December, 2014 (unit: t/day)

Day of the Week	1st Week	2nd Week	3rd Week	4th Week	5th Week	Total	Average Incoming Waste Amount by the Day of the Week	Ratio to the Working-day Average (%)
Monday	569	592	525	566	621	2,873	575	124.0%
Tuesday	525	477	489	517	616	2,623	525	113.2%
Wednesday	496	423	431	516	640	2,506	501	108.2%
Thursday	492	519	469			1,479	493	106.4%
Friday	473	497	471	74		1,516	379	81.8%
Saturday	555	477	430	237		1,698	425	91.6%
Sunday		165	115			280	140	30.2%

Total	3,109	3,150	2,930	1,910	1,877	**12,976**	-	
Working-day Average Incoming Waste Amount (t/d), 28days							463	
Daily Average Incoming Waste Amount (t/d), 31days							419	

Table 4.9 Incoming Waste Amount in January, 2015 (unit: t/day)

Day of the Week	1st Week	2nd Week	3rd Week	4th Week	5th Week	Total	Average Incoming Waste Amount by the Day of the Week	Ratio to the Working-day Average (%)
Monday		418	636	586	639	2,280	570	115.5%
Tuesday		466	563	556	570	2,155	539	109.2%
Wednesday		535	516	457	598	2,106	526	106.7%
Thursday	505	397	562	506	543	2,514	503	101.9%
Friday	475	499	573	606	561	2,714	543	110.0%
Saturday	498	442	461	475	593	2,469	494	100.1%
Sunday	395	262	174	225		1,056	264	53.5%
Total						**15,293**	-	
Working-day Average Incoming Waste Amount (t/d), 31days							493	
Daily Average Incoming Waste Amount (t/d), 31days							493	

In the month of February, 2015 total waste disposed was 14,799 tons. **Working days** average incoming waste amount in this month was recorded as 548 tons. However, **monthly average** per day was 529 tons presented in **Figure 4.10**. Solid waste transported in month of February, 2015 was recorded from minimum 264 tons (Sunday) to maximum 606 tons (Friday) are described in **Table 4.10.**

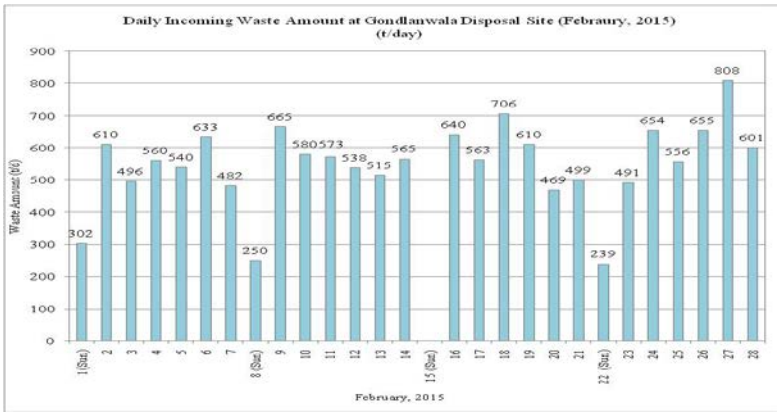

Figure 4.10 Incoming Waste Amount (t/d) in February, 2015

Table 4.10 Incoming Waste Amount in February, 2015 (unit: t/day)

Day of the Week	1st Week	2nd Week	3rd Week	4th Week	5th Week	Total	Average Incoming Waste Amount by the Day of the Week	Ratio to the Working-day Average (%)
Monday		610	665	640	491	2,406	602	109.7%
Tuesday		496	580	563	654	2,292	573	104.6%
Wednesday		560	573	706	556	2,394	599	109.2%
Thursday		540	538	610	655	2,343	586	106.9%

Friday		633	515	469	808	2,425	606	110.6%
Saturday		482	565	499	601	2,148	537	98.0%
Sunday	302	250		239		791	264	48.1%
Total						**14,799**	-	-
Working-day Average Incoming Waste Amount (t/d), 27 days							548	
Daily Average Incoming Waste Amount (t/d), 28days							529	

4.2 Carrying Capacity and No. of Trips per Vehicle

Carrying capacity by the type of vehicles in each month were calculated using software generated data sheets shown in **Appendix I.** Average waste carrying capacity per vehicle (ton/car) in the month of October, 2014 to February, 2015 was calculated as 2.98 tons for AR-truck, 2.23 tons for Tractor Trolley and 0.51 tons for Mini-Dumpers. Average trips per vehicle (trip/day) were 4.7 for AR-trucks, 1.7 for Tractor Trolley and 2.4 for mini-dumper presented in **Table 4.11**.

Table 4.11 Vehicle' Waste Carrying Capacity (ton/car) and Number of trips per Vehicle (trip/day)

Vehicle Type	Month	October, 2014	November, 2014	December, 2014	January, 2015	February, 2015	Average
AR-Trucks	Vehicle Carried Waste (t/car)	2.94	2.76	2.89	3.08	3.27	2.98
	No. of Trips per vehicle (trip/day)	4.9	4.7	4.5	4.5	5.2	4.7
	Waste Amount (t/day)	357	326	303	341	415	348
Tractor Trolley	Vehicle Carried Waste (t/car)	2.35	2.07	2.09	2.27	2.39	2.23
	No. of Trips per vehicle (trip/day)	2.0	1.9	1.6	1.6	1.5	1.7
	Waste Amount (t/day)	165	146	121.3	146	133	142
Mini Dumper	Vehicle Carried Waste (t/car)	0.56	0.47	0.46	0.53	0.51	0.51
	No. of Trips per vehicle (trip/day)	1.8	1.6	2.6	2.7	3.1	2.4
	Waste Amount (t/day)	3	2.4	4.87	6.37	6.32	4.6

4.3 Actual and Nominal Volumes of the Vehicles

As described earlier three types of vehicles (arm-roll trucks, tractor trolleys and mini-dumpers) are in use by GWMC to carry and transport of solid waste from the urban city. Waste containers are carried by arm-roll trucks to transport solid waste from secondary collection points to final disposal point. Nominal volume of the container is 5 m^3 (actual volume is 6 m^3) whereas the actual volume of tractor trolley is 3.4 m^3 dragged by tractors and newly purchased mini-dumper is mounted with a container of nominal volume of 1m^3 (actual volume is 1.2 m^3).

4.4 Monthly and Cumulative Waste Disposal Amount at Gondlanwala

Monthly incoming waste amounts to disposal site and the cumulative landfill waste amounts are shown in **Table 4.12**. In month of March, 2014 the incoming waste was recorded as 9,980 tons. Landfill waste amount is accumulating day by day at the Gondlanwala disposal site and the filled waste to the site was found 76,708 tons at the end of September, 2014 (Source: JICA ISWMP Progress Report Dec, 2014). Waste was being dumped to this site from October, 2014 to February, 2015. Total

cumulative waste dumped at Gondlanwala as of February, 2015 was found as 149,144 ton also presented in Figure

Table 4.12 Monthly and Cumulative Waste Disposal Amount at Gondlanwala

Month	Monthly Waste Disposal Amount at Gondlanwala Disposal Site (ton/month)	Cumulative Waste Disposal Amount at Gondlanwala Disposal Site (ton)
September, 2014	13,159	76,708
October	16,734	93,442
November	12, 688	106,130
December, 2014	12,976	119,106
January, 2015	15,239	134,145
February	14,799	149,144

*Source: JICA ISWMP Progress Report Dec, 2014

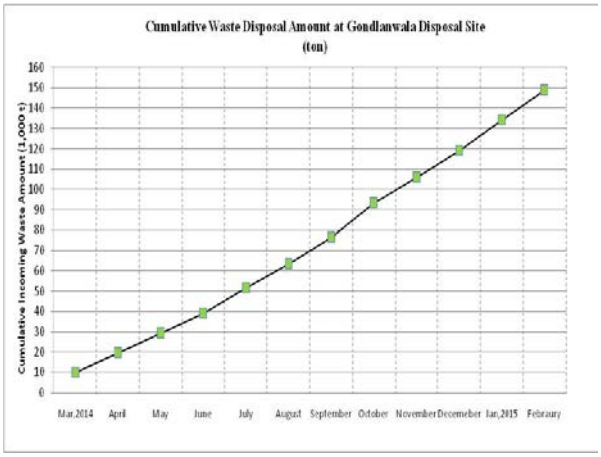

Figure 4.11 Cumulative Waste Disposal Amount (ton)

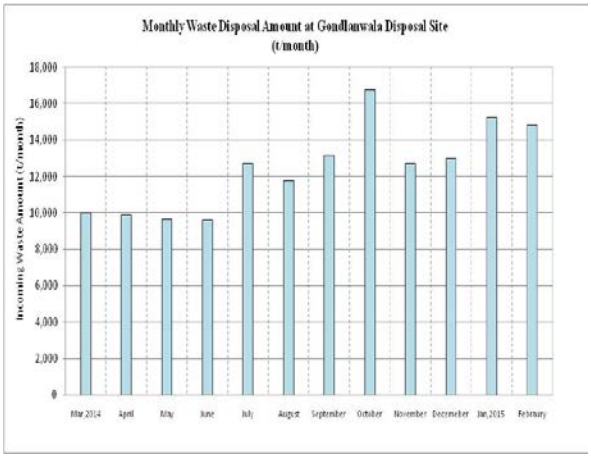

Figure 4.12 Monthly Waste Disposal Amount (t/month)

5. EVALUATION OF SURVEY RESULT

- Waste disposed to Gondlanwala site varied in each day of the week. Maximum incoming waste amount per day in the months of February, 2014 was recorded as 606 ton/day on Friday. While working day average waste amount in this month was 548 ton/day. Collected waste ratio per day in a week to average of working days is also found minimum 48% t to maximum 110%.

- Using average waste load per vehicle per trip shown in **Figure 5.1** and actual loading volume of each type of vehicle described in **section 4.3**, the loaded bulk density was calculated and the bulk density of the tractor trolley obtained the highest at 657 kg/m^3 because of overloading and wet waste collected by this type of vehicle. Meanwhile, the loaded waste bulk density of Am-roll truck and mini dumper were obtained at 496 and 422 kg/m^3 respectively. Average bulk densities of all type of vehicles are calculated as 525 kg/m^3 from October, 2014 to February, 2015 as shown in **Figure 5.2**.

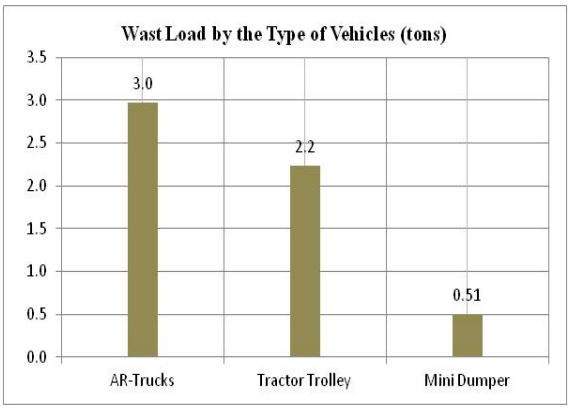

Figure 5.1 Waste Loads by the Type of Vehicle

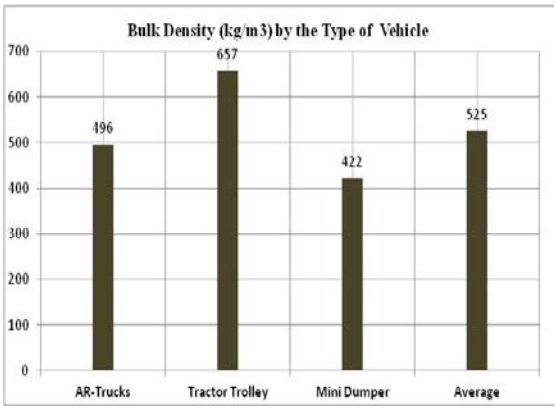

Figure 5.2 Bulk Density (kg/m^3) by the Type of Vehicles

- Lifespan of the Disposal Site: Total area acquired at Gondlanwala for dumping of solid waste is 63,700 m^2. Average depth of this site is 8 m calculated from the topographic map, survey conducted under this project. Assuming, 0.9 ton/m^3 density of the disposed waste, remaining life of the disposal site was estimated 1.7 years presented in **Table 5.1.** Average value (14,266 ton/month) of dumped waste from September, 2014 to February, 2015 as described in **section 4.4** is used in calculation of Gondlanwala remaining life.

Table 5.1 Estimation of Remaining Lifespan of Gondlanwala Disposal Site (as of February, 2015)

Area (m2)	**Depth (m)**	**Volume (m3)**
63,700	8	509,600
Filled Volume (m3)		165,716
Remaining Volume (m3)		343,884
Remaining Volume (tons)		309496
Remaining Life (month)		21.7
Remaining Life (year)		1.8

6. CONCLUSIONS AND RECOMMENDATIOS

- Total of 14,799 tons solid waste amount were carried in by the vehicles with the total 5,060 trips in the month of February, 2015 respectively.
- In average, the incoming waste amount of 3.0 ton, 2.2 ton and 0.51 ton was carried in per trip by arm-roll truck, tractor trolleys and mini-dumpers, respectively.
- The bulk density 496 kg/m^3 for Arm-roll trucks, 657 kg/m^3 for tractor trolleys and 422 kg/m^3 for mini-dumpers were estimated of all the types of vehicles.
- The remaining life-span of the existing disposal site at Gondlanwala is estimated at approximately 21 months as of February, 2015.
- Overloading, especially by the tractor trolleys and the mini dumpers, shall be avoided for unnecessary damage to the vehicles and the cost for repair.
- GWMC's regular analysis of individual vehicle will be useful for finding the managerial issues of each vehicle and the driver.
- The proposed landfill project at Bhakhraywali must be completed in two years by the end of remaining lifetime of the Gondlanwala disposal site.

APPENDICES

APPENDIX -I

SOFTWARE GENERATED DATA SHEET

RECORD NO.	PLATE NO	DATE2	TIME2	2ND WEIGHING (kg)	1ST WEIGHING (kg)	NET (kg)	FIRM	MATERIAL	POINT	TOWN	DRIVER	COLLECTION	SHIFT	USER
2723	H1	10/01/2014	7:38:18 AM	7640	4500	3140	GWMC	MUNICIPAL WASTE	QAIDE AZAM SCHOOL	AROOP	ILYAS	RTC	1ST SHIFT	zaryab
2724	H6	10/01/2014	7:44:57 AM	7460	4540	2920	GWMC	MUNICIPAL WASTE	KHIALI GODAM	QILLAH	SHAMSHAD	RTC	1ST SHIFT	zaryab
2725	MB17	10/01/2014	7:48:58 AM	6900	4700	2200	GWMC	MUNICIPAL WASTE	GILL ROAD STATION	AROOP	SAHIB	RTC	1ST SHIFT	zaryab
2726	MB16	10/01/2014	7:50:21 AM	5740	4700	1040	GWMC	MUNICIPAL WASTE	SESSION COURT	AROOP	IJAZ SHAH	RTC	1ST SHIFT	zaryab
2727	H14	10/01/2014	7:59:53 AM	7300	4400	2900	GWMC	MUNICIPAL WASTE	GARJAKHI GODAM	QILLAH	ARIF GHAURI	RTC	1ST SHIFT	zaryab
2728	H7	10/01/2014	8:31:05 AM	7680	4480	3200	GWMC	MUNICIPAL WASTE	NISHTAR PARK	QILLAH	NOBEL	RTC	1ST SHIFT	zaryab
2729	H9	10/01/2014	8:32:54 AM	6640	4500	2140	GWMC	MUNICIPAL WASTE	TALIB PARK	QILLAH	ARSHAD GOSHI	RTC	1ST SHIFT	zaryab
2730	MB3	10/01/2014	8:33:29 AM	7720	4620	3100	GWMC	MUNICIPAL WASTE	KHAN MEHAL	QILLAH	SHAHZAD	RTC	1ST SHIFT	zaryab
2731	H1197	10/01/2014	8:34:06 AM	7920	4560	3360	GWMC	MUNICIPAL WASTE	TAXY STAND	QILLAH	SHAGOO	RTC	1ST SHIFT	zaryab
2732	H11	10/01/2014	8:34:34 AM	7340	4460	2880	GWMC	MUNICIPAL WASTE	WORKER WELFARE	NANDIPUR	M.AFZAL	RTC	1ST SHIFT	zaryab
2733	H1196	10/01/2014	8:36:27 AM	6260	4640	1620	GWMC	MUNICIPAL WASTE	CHURCH ROAD	NANDIPUR	RANA SHAHID	RTC	1ST SHIFT	zaryab
2734	H6	10/01/2014	8:37:23 AM	8120	4540	3580	GWMC	MUNICIPAL WASTE	KHIALI GODAM	QILLAH	SHAMSHAD	RTC	1ST SHIFT	zaryab
2735	H10	10/01/2014	8:44:01 AM	7700	4600	3100	GWMC	MUNICIPAL WASTE	KT MODEL SCHOOL	NANDIPUR	M.AMIN	RTC	1ST SHIFT	zaryab
2736	H1	10/01/2014	8:47:03 AM	6400	4500	1900	GWMC	MUNICIPAL WASTE	ADIL SHARIF COLONY	AROOP	ILYAS	RTC	1ST SHIFT	zaryab
2737	MB1	10/01/2014	8:51:56 AM	8500	4620	3880	GWMC	MUNICIPAL WASTE	JINNAH PARK OPPOSITE	KHIALI	ISHAQ	RTC	1ST SHIFT	zaryab

Appendix -II

a) NUMBER OF TRIPS OF VEHICLES

SR#	PLATE NO	TRIPS
1	CG-2	3
2	H1	5
3	H10	6
4	H11	5
5	H1196	5
6	H1197	8
7	H12	5
8	H13	5
9	H14	3
10	H15	8
11	H2	8
12	H3	8
13	H4	5
14	H6	5
15	H7	4
16	H8	4
17	H9	7
18	MB1	4
19	MB16	5
20	MB17	4
21	MB18	10

SR#	PLATE NO	TRIPS
22	MB3	6
23	TT0278-03	2
24	TT260	2
25	TT3385	2
26	TT4022	2
27	TT4028	2
28	TT451	1
29	TT5262	2
30	TT5264	2
31	TT5265	3
32	TT5268	2
33	TT5271	2
34	TT5554	1
35	TT6159	2
36	TT6835	2
37	TT6836	2
38	TT6945	2
39	TT6946	2
40	TT7653	1
41	TT7960	2
42	TT8052	2

SR#	PLATE NO	TRIPS
43	TT8053	2
44	TT8402	2
45	TT9621	2
46	TT9624	2
47	TT9627	1
48	TT9629	2
49	TT9630	3
50	TT9631	1
51	TT9632	2
52	TT9634	2
53	TT9772	2
54	TT9773	2
55	TT9774	2
56	TT9776	2
57	TTH-1	3
58	TTH-2	1
59		
60		
61		
62		
63		

HAROON	BUCKUT 2	06:00	06:00
NAZEER	BUCKUT 1	06:00	06:00
NADEEM	BUCKUT 3	NIL	NIL
AMMANULLAH	TRACTOR BLADE	NIL	NIL
KHADIM	SAPRY		2
FRAZ YOUSUF	WATER SPRINKLER		1+1

HINO	123
TRALIES	69
TOTAL	**192**

Zaryab
Supervisor
GWMC

M N Kabeer
Assistant Manager
GWMC

M. Shehryar
Manager Landfill
GWMC

b) TOWN WISE SOLID WASTE DETAIL

COLLECTION	**KG**	**TONS**
RTC	475720	475.72
OTC	24980	24.98
TOWN	**KG**	**TONS**
AROOP TOWN	81580	81.58
KHIALI TOWN	84500	84.5
NANDIPUR TOWN	141180	141.18
QILLAH TOWN	193440	193.44
GRAND TOTAL	500700	**500.7**

Zaryab
Supervisor
GWMC

M N Kabeer
Assistant Manager
GWMC

M. Shehryar
Manager Landfill
GWMC

c) ZONE WISE TONNAGE OF MSW

ZONE	RTC	OTC	TOTAL
MISC	**55.46**	**7.46**	**62.92**
ZONE 1	**43.8**	**4.28**	**48.08**
ZONE 2	**41.86**	**4.1**	**45.96**
ZONE 3	**39.88**	**0**	**39.88**
ZONE 4	**64.16**	**0**	**64.16**
ZONE 5	**45.38**	**18.48**	**63.86**
ZONE 6	**51.3**	**0**	**51.3**
ZONE 7	**46.24**	**0**	**46.24**
ZONE 8	**64.8**	**8.64**	**73.44**
TOTAL	**452.88**	**42.96**	**495.84**