Local Government & Community Development Department

Punjab Cities Program

Gap Analysis

of

Municipal Services infrastructure & service delivery

in

Vehari City

Punjab municipal Development Fund Company

Section-1 City Background

1.1. District Status

The city of Vehari is the administrative headquarters of Vehari District. The district was created on 1st July 1976 comprising of the three former tehsils of Multan District (Vehari, Burewala and Mailsi). The name Vehari means low-lying settlement by a flood water channel. The district lies along the right bank of the Tiver Sutlej, which forms its southern boundary. Vehari is known to be a city of cotton, among other crops and has dozens of cotton processing factories & cottonseed oil manufacturing plants along with sugarcane farming and processing. Fruits grown over here include mangoes in the summer and guava and other citrus fruits in the winter.

1.2. Location

Vehari city is located at 100 km (62 miles) distance from the historical city of Multan in the east at old Multan-Delhi Road constructed by Indian Muslim Emperor Sher Shah Soori and is the headquarters of Vehari District. It is located at 300 02' N and 720 21'E and connected with all cities through rail and road.

1.3. The Climate

The climate in Vehari is called a desert climate. July & August are hottest months when the temperatures generally reaches to 45°C and in night the average minimum temperature drops down to 28°C. The average humidity of city in August is 72%

Winter season starts from November and lasts till February. Mean maximum and minimum temperatures recorded during the month of January are about 21 and 5 degree Celsius respectively.

Demographic status

As per provisional statistics of Population census 2017, the population of Vehari city has been observed to be 112,840 persons in 2018. However the city had a population of 170,330 persons as per Land Scan exercise run in 2015 and projected up to 2017 at an annual growth rate of 3.36%. The population will rise to 237,037 persons in the year 2027 with this growth rate. It means that some inhabited areas of the city have not been included in the municipal limits which need to be extended by taking all the populated areas in the city limits.

1.4. Data collection

The formats for the data collection about the municipal services were designed and sent to the Municipal Committee. After receipt of these formats, the city was visited to;

1) Verify and correct the data provided by the Municipal Committee.
2) Update the descriptive maps of all the services in consultation with MC staff & Public Health Engineering Department local staff.
3) Identify the required improvements and extension of the municipal services infrastructure.
4) Identification of Public Private Partnership projects already executed.
5) Identify the capacity of the key officers to undertake the PPP projects and collaborative projects with other government agencies and MCs.
6) Public opinion surveys regarding the delivery of municipal services.

1.5. Situation analysis and Gap analysis

Situation analysis of the existing municipal services infrastructure and the quality of service delivery was done. Gap analysis was done to identify the problems, bottlenecks and shortcomings in the infrastructure itself and its operation & maintenance for each municipal service along with the correction/updating of descriptive maps which has been described in the following sections.

Section-2 Water supply system

2.1. Existing situation

The city is divided into two zones by Lahore Pakpattan-Lodhran railway track, Zone-1 oriented as Southern Zone) & Zone-2 given the name of Northern zone because of geographical orientation.

Both zones, served, un-served, contaminated and water shortage areas have been marked on the map attached with the report.

2.2. Fresh Water Source

The subsoil water in the city is brackish and not fit for human consumption. As such fresh water has to be imported from the fresh water zones around the city. Two possible fresh water zones around the city can be utilized to feed the water supply system of the city. Each of them is described below;

2.2.1 Seepage water from Pakpattan Canal

Pakpattan Canal off taking from Sutluj River as right bank canal from Sulemanki Barrage, is passing at north of the city. Deep tube wells have been installed at left bank of this canal for feeding the public water supply system of the city but this canal has now inadequate discharge to allow enough seepage for feeding the tube wells. As a result of excessive withdrawal as compared with the canal recharge to the sub soil aquifer, water quality has deteriorated and most of the tube wells are yielding water with higher value of total dissolved solids. Presently water of TDS value ranging from 305 ppm to 1045 ppm and arsenic contents of 25 to 100 ppb is being supplied to the citizen. Ordinarily this source should not be augmented by adding more tube wells over here as the water quality will further deteriorate.

2.2.2 Sutluj River recharged belt

The other possible fresh water source is a fresh water belt at the right bank of Sutluj River created because of recharge from the Sutluj River from its surface flows and the subsurface flows which have reduced in volume because of allocation of the water of this river to India under the Indus Basin Treaty. However enough recharge is still available to the belts along both sides of the river especially in the summer when larger flows are observed in the river. The brackish-fresh water interface goes on oscillating according to the flows in the river. The fresh water belt is located at average distance of 5-6 Km in the south which can be exploited as a reliable source for the public water supply system in the City. A water supply system was designed under PMSIP by tapping this fresh water belt by installation of tube wells but due to paucity of time the project could not be implemented.

2.3. The existing water source, storage and transmission network

2.3.1. Pakpattan Canal 24/WB Network:

The source of this water supply system is located on the Pakpattan Canal near Chack No-24WB and the system is named after number of this Chack. This system consists of under mentioned components;

S.N.	Component	Location & sizes	Present condition
1	**Tube wells (Installed in 1974)**		
	Tube wells No-1	Pakpattan canal bank	Non-functional. Electric works and transformer require repairs
	Tube wells No-2	do	Abandoned due to reduced discharge
	Tube wells No-3	do	Functional
	New tube wells installed by PHED = 4 Nos	do	One Functional & 3-Non Functional
2	**Transmission mains (Constructed in 1974)**		
	16" diameter	From tube wells to Khanewal Chowk	
	10" diameter	From Jahangir Cinema to Khursheed Anwar Stadium	
	10" diameter	Khanewal Chowk to Taimoor shaheed/Peoples colony water works	
	8" diameter	Khanewal Chowk to Madina Colony water works	
3	**Taimoor shaheed/peoples colony water works (Constructed in 1974)**		
	Ground storage tank	100, 000 gallons	Functional
	OHR	100, 000 gallons	Functional
	Pump house	One No	Requires plastering, white wash & color wash
	Pumping units	2 Nos of 1.0 cusec each	Functional but stuffing boxes leaking and painting required (Repairing required)
	Hypo chlorinator	One No	Working
	Disinfectant used	Bleaching powder	
	Areas served	Taimoor Shaheed colony / Peoples colony and some area of Faisal Town.	
4	**Madina Colony water works (constructed in 1999)**		
	Ground storage tank	100, 000 gallons	Functional but requires repairs
	OHR	50, 000 gallons	Functional
	Pump house	One No	Requires repairs white wash & color wash
	Pumping units	2 Nos of 1.0 cusec each	Functional but stuffing boxes leaking and replacement required
	Hypo chlorinator	One No	Functional
	Disinfectant used	Bleaching powder	
	Areas served	Zafar colony, Rehmania colony, Liaqatpura, Madinah Colony, Sarhang Colony, Masani Bagh, Sheikh Cotton Colony and Faisal Town.	

2.3.2 Housing Colony No.03 system (abandoned)

One tube well installed at the bank of Pakpattan Canal was connected with an OHR located at Housing Colony No 03 through a transmission main of 6'' dia AC pipe. This water supply system has been abandoned and water is being supplied to this locality from the 22 WB water supply systems.

2.3.3 Marla Scheme water supply system (abandoned)

One tube well installed at the bank of Pakpattan Canal was connected with a ground storage tank located in 5 Marla Scheme through a transmission main of 4'' dia AC pipe. This water supply system has been abandoned and water is being supplied to this locality from the 22 WB water supply system now.

2.3.4 Makkah Town water supply system

Tube well No-04 installed at the bank of Pakpattan canal is connected with this water supply network in Makkah Town. The system has got one OHR of 10,000 gallons capacity which is not in use. Water from the tube well was pumped directly into this reservoir through a 6" dia AC pipe transmission main which is not being done now due to low head of the pumping machinery. Hence water is now pumped directly into the distribution system of this town.

2.3.5 Pakpattan Canal 22WB water supply system

The source of this water supply system is also located on the Pakpattan Canal near Chack No-22WB and the system is named after number of this Chack. This system consists of under mentioned components;

Component	Location & sizes	Present condition	Served areas	Remarks
Tube wells (Installed in 1974)				
Tube well No-4	Pakpattan canal bank	Functional	Feeding Makkah Town directly into distribution system.	
Tube wells No-5		Functional	Housing Colony No-3, 5-Marla housing schemes, Chack No 9 WB and Chack No-11 WB, its Kachi Abadi & Khanewal Chowk.	Water quality deteriorates when the canal is closed. Only 2 tube wells are functional and acute water shortage is experienced in the area covered by these tube wells
Tube wells No-6		Abandoned		
Tube wells No-7		Functional		
Tube wells No-8		Non functional		
Tube wells No-9		Non functional		Pump & column assembly has fallen in the tube well.
Transmission main				
12" dia AC pipe	From Tube wells to Chack No-9/11 water works			Functional
Chack No-9/11 water works				
Ground storage tanks	60,000 gallons = 2 Nos		Functional but require repairs	
OHR	100,000 gallons		Functional	
Pumping units	2 Nos of 2.0 cusecs each		Functional but stuffing boxes leaking and replacement of 1 no required	

Pump house	Requires repairs, white wash and color wash.
Area served	Chack No-11 WB, 5 Marla Housing Scheme, Housing Colony No-3, Kachi Abadi Chack No-9/WB, Kachi Abadi-9/WB and Khanewal Chowk.
Hypo-Chlorinator	Hypo chlorinator has been installed and found not working. Bleaching powder is used as disinfectant. Disinfection done once a month.

2.3.6 City Area water supply System:

The source of this water supply system is also located on the Pakpattan Canal and the system is named as city area scheme. This system consists of under mentioned components;

Component	**Location & sizes**	**Present condition**	**Remarks**
Tube wells			
Tube well No-10	Pakpattan canal bank	Non Functional	Tube well No 10 to 13 are connected with 10" diameter AC transmission main which carries water to Anwar abad water works and H-Block water works. Pump assembly of tube well No-13 fell in the tube well
Tube well No-11	do	Non Functional	
Tube well No-12	do	Functional	
Tube well No-13	do	Non functional	
Tube well No-14	do	Functional	This tube wells is connected with 12" diameter CI transmission main which also carries water to Anwar abad water works and H-Block water works.
Tube wells No-15	do	Abandoned	Pumping into 8" dia AC transmission main for Sharqi Colony & Hasilpur road
Tube wells No-16	do	Functional	
Tube wells No-17	do	Non Functional	Supplied water to village Joyawala in rural area. Not taken over by District Council. MC intends to join this tube well with city system.
Tube wells No-18	do	Functional	This tube wells is also connected with 12" diameter CI transmission main to Anwar abad and H-Block water works.
Transmission main			
10" dia AC pipe	From tube well Nos10 to13 to water works in H Block and Anwar abad		Functional
12" dia CI	From tube well Nos 14& 18 to water works in H Block and Anwar abad		Functional
8" dia AC	From tube well Nos15 & 16 to Sharqi Colony and Hasilpur road		Functional
6" dia AC pipe	From tube well No-17 to village joya wala.		Not functional as described above.

2.3.7 H-Block water works

Ground storage tank No-1	80,000 gallons	Functional (Constructed in 1975-76)
Ground storage tanks No-2	100,000 gallons	Functional (Constructed in 2001-02)
OHR H-Block	50,000 gallons	Functional

OHR General Bus stand	10,000 gallons	Abandoned
Pumping units	0.75cusecs = 2 Nos	Functional but required replacement
	0.25 cusec =3 No	All functional and water supplied directly to bus stand, Bhatta Ikram-ul Haq and Bhatta Shadi Khan separately by each unit
Pump houses	2 Nos	Repairs, white and color wash required
Area served	A to H Blocks, Officers colony, Shahi Danewal, Haider Colony, Tariq Bin Ziad Colony, Bhatta Ikram ul Haq, Bhatta Shadi Khan and General bus stand.	
Chlorinator	Hypo chlorinator has been installed and found not working. Bleaching powder is used as disinfectant.	

2.3.8 Anwarabad water works

Anwar abad water works		Constructed in 2001-02 except one GST
Ground storage tanks	20,000 gallons = 2 Nos	One functional and one non functional
OHR	50,000 gallons	Functional
Pumping units	1 Nos of 2.0 cusecs	Functional
	2 Nos of 0.5 cusec each	Non functional
Pump house	Requires white & color wash. Power cables scattered around.	
Area served	Anwar abad, Lalazar Colony and Vehari Chowk	
Hypo-chlorinator	Hypo chlorinator has been installed and found not working. Bleaching powder is used as disinfectant. Disinfection done once a month.	

2.3.9 Sharqi Colony water works

Sharqi Colony water works		Constructed in 1991-92
Served by tube well Nos -15 & 16 through 8” diameter AC pipe transmission main.		
Ground storage tanks	50,000 gallons = 1 No	Functional but requires minor repairs.
OHR	30,000 gallons	Functional
Pumping units	2 Nos of 0.75 cusecs each	Functional
Area served	Sharqi Colony, Kachi abadi	
Chlorinator	Hypo chlorinator has been installed and found working. Bleaching powder is used as disinfectant. Disinfection is done after one month.	

2.3.10 Joyawala water supply system

Village Joyanwala is served by tube well Nos -17 through 6” diameter AC pipe transmission main and pumping directly into the distribution system. It is a rural area. Scheme not taken over by District Council and stopped functioning. MC Intends to connect it with main city system and re-commission it.

2.4. Rehabilitation of water supply system by PHED

The rehabilitation of the water supply system was carried out by PHED in year 2012 with a total cost of Rs. 99.492 million. The main components of this scheme are given below;

Sr. No	Sub Head	Sanctioned Targets	Completed	Present functional status
1.	Tube wells 24WB water works chain	4 Nos.	4 Nos.	One tube well & machinery functional & 3 Non-Functional
2.	Pump Houses	4 Nos.	4 Nos	
3.	Pumping Machinery for Tube Wells	4 sets.	4 sets	
4.	Pumping Machinery for GST	5 sets.	3 sets	Functional
5.	Hypo Chlorinators	4 Nos	4 Nos.	Not functional
6.	**Transmission Mains**	**Pumping into existing 16" dia main**		
	8" AC/PVC	550 Rft	498 Rft	The data is based on the information from PHED Vehari. They could not explain the use of these pipe lines
	10" AC/PVC	3250 Rft	2439 Rft	
	14" AC/PVC	1275 Rft	1126 Rft	
	16" AC/PVC	500 Rft	---	
7.	**Distribution System**			
	3" i/d PVC	121026 Rft	136331 Rft	The system is working but not taken over by MC because it has not been tested to the required pressure as per specifications
	4" i/d PVC	14926 Rft	12211 Rft	
	6" i/d AC/PVC	19343 Rft	19611 Rft	
	8" i/d AC/PVC	5116 Rft	5426 Rft	
	10" i/d AC/PVC	11329 Rft	12691 Rft	
	12" i/d AC/PVC	974 Rft	500 Rft	
	14" i/d AC/PVC	3744 Rft	5258 Rft	
	16" i/d AC	823 Rft	---	
	18" i/d AC	1436 Rft	---	
8.	External Electrification	6 Jobs	6 Jobs	All components are reported to be functional. Neither MC nor PHED staff was ready to give any information about the system
9.	Ground storage tank 125,000 Gallons	1 No	1 No	
10	Pump house in IPS	1 No	1 No	
11.	Over Head Reservoir 100,000 Gallons	1 No	1 No	
12.	House Connections	5734 No.	5734 No.	-

The newly installed tube wells are pumping into the existing 16" dia AC transmission main. Intermediate Pumping Station (IPS) has been constructed in College Town from where the water is being pumped into the newly laid distribution system.

2.5. Installation of tubewells

Total Source capacity

No. of tube wells	Capacity each (cusecs)	Total capacity (cusecs)	No of tube wells		Present working hours per day	Daily water production (mgd)	
			in working order	Abandoned		Present with 6 hours pumping	Possible with 12 hours pumping
25	1.0	25	09	16	6	1.2	2.4
Present population of the city						153,840	Persons
Possible water production per capita per day						15.6	Gallons

The present source capacity of the installations is not enough. The discharge of tube wells is a question mark because no bulk water meters are installed. The source at Pakpattan Canal cannot afford installation of additional tube wells and some other fresh water aquifer around the city will have to be tapped to supply fresh water to the city residents. New distribution system is required to be laid in the unserved areas which should be connected with existing Network.

2.6. Problems and gaps in the system

Under mentioned problems are bottlenecks are faced by the consumers in this water supply system;

2.6.1 Water quality

Deep tube wells have been installed along the Pakpattan Canal which has been remodeled by reducing its discharge. As such very little seepage from the canal is intercepted by these tube wells and hence the quality of these tube wells has deteriorated. The tube wells are pumping into six intermediate pumping stations in the city and water has varying TDS value from 305 ppm to 1045 ppm. In this way water from 3 Nos water works is not chemically fit for drinking.

The source at Pakpattan Canal cannot afford installation of additional tube wells and some other fresh water aquifer around the city will have to be tapped to supply fresh water to the city residents. To fight the water shortage on urgency basis replacement and repair of tubewell is required.

2.6.2 Required rehabilitation of the old water supply system

Under mentioned components of the existing system need rehabilitation. Component wise details are given below

2.6.3 Tube wells

Repair & Replacements of pumping machinery for Tube wells

Type of Pump	Discharge each (cusec)	Replacement of Tube well with pumping units (Nos.)	Replacements proposed
Deep well turbine pumps	1.0	4	These tube-wells were installed in year 2008 and have reduced their discharge. Therefore they need replacement.

Collector and transmission mains will be required for connecting the new tubewells with the existing

2.6.4 Repair of Pump Houses:

Water works	Total Nos	Size (Ft.)	Type of repair
Tube wells	9	12'x12'	White washing, painting and renovation etc.

2.6.5 Repairs and replacement in intermediate pumping stations:

Replacements	Replacement of pumping units in the IPS • 2 Nos. at H-block water works • 1 No. at 9/11WB water works • 1 No. at Madina colony water works • Sluice valves at various water works = 15 Nos
Repairs	Major repairs of; • Repair of pumping machinery in IPS =2 sets • Repair of OHRs. at different IPS in the city = 4 Nos • Replacement of damaged transmission main =1000 Rft • Repair of GST at IPS Madina Colony & 9/11 WB. = 2 Nos • Repair of pump houses in IPS = 8 Nos • Repair of boundary walls in various IPS= 2000 Rft • Repair of brick pavements at various IPS = 3000 Cft

2.6.6 Repairs & replacement of other components

These components include;

- Repair/ replacement of Hypo-chlorinators = 14 Nos.
- Repair/ replacement of motor control unit = 14 Nos.
- Bulk water meters to measure discharge = 09 Nos.
- Replacement of underground piping & saddles of sub-standard consumer connections = 4000 Nos.

2.6.7 Power Factor Improvement

After Energy Audit report, the power factor on all the tubewells and pumping stations will be assessed. If it would be less than 0.9 then power factor improvement equipment of required capacity will be installed to improve the power factor and eliminate the penalties being paid by MC due to less power factor.

2.6.8 Water contamination

Bacterial as well as chemical contamination has been found in the water supply systems of this city. Each of these has been described below;

a) Bacterial Contamination

Contaminated water is being supplied in following parts of the city;

- Chack No 9 & 11 WB and their Kachi abadis
- Housing scheme 3 and 5 Marlas housing scheme
- Anwar abad

Causes of bacterial contamination

- Main source of contamination is old and substandard consumer connections because of rusted and perforated GI service pipe resulting in ex-filtration and infiltration. Substandard PVC or lawn piping used in the consumer connections also causes pipe bursting and ultimate water contamination.
- Old and rusted main pipes are also leaking and producing contamination in the system. These pipes need replacement.
- The sluice valve chambers are filled with dirt and water and are one of the main sources of water contamination. This is due to non-packing of the valves stuffing boxes which is part of a routine maintenance.

b) Chemical contamination

Tube wells

- Arsenic contamination has been found in most in all of the tube wells (25 to 100 ppb) which is highly injurious for health. Arsenic poisoning interferes with DNA repair and metabolism of cells, causes skin problems, cancers, abdominal pain, nausea, vomiting and neurological manifestations like neuropathy and seizures.
- Water being received in three water works (named below) from tube well Nos 4, 5, 7, 12, 14 &18 is chemically unfit for human consumption because of high TDS value ranging from 882 to 1045 ppm. The areas served by these water works are given below;

a) Anwar abad water works

The served areas include; Anwar abad, Lalazar Colony and Vehari Chowk.

b) H-Block water works

The served areas include; A to H Blocks, Officers colony, Shahi Danewal, Haider Colony, Tariq Bin Ziad Colony, Bhatta Ikram ul Haq, Bhatta Shadi Khan and General bus stand.

c) 9-11 water works

The served areas include; Chack No-11 WB, 5 Marla Housing Scheme, Housing Colony No-3, Kachi Abadi Chack No-9/WB, Kachi Abadi-9/WB and Khanewal Chowk.

2.6.9 Water shortage

Water shortage is being experienced almost in the entire city but the main Mohalla's affected by acute water shortage are given below;

1. A to H block	2. Danewal town (Partly)	3. Sharqi colony	4. Bhatta Ikram ul Haq
5. Katchi abadi 1	6. Katchi abadi 2	7. Madina Colony	8. Rehmania Colony
9. Liaqat Pura	10. Sirhind Colony	11. Sheikh Cotton Factory	12. Faisal Town
13. Zafar colony	14. Peoples colony	15. Muslim town (partly)	16. Grid station (partly)
17. tariq bin ziad colony	18. Haider colony	19. Lalazar colony	20. Anwar abad
21. Officer's colony (partly)	22. 3 marla housing scheme	23. Housing colony no 3.	24. Makkah colony
25. Chak no 11/WB	26. Stadium town	27. Allama Iqbal town	28. College town
29. Wukla colony			

Reasons for the water shortage

Main and the only reason for acute water shortage is the scarcity of fresh water in and around the city. Sub soil water in the city is brackish and unfit for human consumption and hence water has to be imported in the city from some fresh water zone. Unless a comprehensive scheme for tapping the fresh water is planned and launched, the water shortage cannot be addressed.

Fresh water is available on the right bank of Sutluj River. Although the recharge to this aquifer has been reduced after implementation of the Indus Basin Project in mid-sixties, yet adequate sub soil recharge to the belt along the right bank of the river is available which can be tapped.

This has been identified by survey & inventory of 19 private tube wells installed in this belt. The parameters studied for these tube wells were; 1-Discharge, 2- Depth. 3. Quality of water, 4. Life of the tube well, 5. Other related information. The water quality was observed to be quite fresh having TDS value ranging from 180 to 620 ppm.

Un-Served areas:

The facilities could not be extended to entire city because of fresh water scarcity. Following areas are still deprived of the facility;

1. Chak no 13 WB	2. Sunder village	3. Iqbal town
4. Makkah colony	5. Pir murad	6. Jannat Colony
7. Chak no 45 WB	8. Usman abad	9. Wahdat colony
10. Canal view	11. New sharki colony	12. 32 quarter
13. Rehmat colony	14. Iftikhar block	15. Tariq bin ziad
16. Rizwan colony	17. Danewal town (partly)	18. Green town
19. Defence viw	20. Ghafoor town	21. Muslim town (partly)

22. Chak no 9 WB joia wala	23. Officer's colony (partly)	24. Grid station (partly)

2.7. Water supply hours and consumer connections

Water is being supplied to the city in the below given timings.

	Water Supply hours				Consumer connections			
Early Morning	**Morning**	**Noon**	**Evening**	**Total**	**Domestic**	**Commercial**	**Industrial**	**Total**
0.5	0.5	0.5	0.5	2.0	6117	62	1	6180

The water supply hours are very short and the water shortage prevails at remote ends of the distribution system because of unequal distribution of water in the absence of consumer metering.

2.8. Total coverage of the city

The total area coverage of water supply in the city is 57% out of which 6% area falls under water shortage and 13% under the water contamination. Rest of 43% area is unserved.

2.9. Tariff structure

The consumer connections are not metered and hence water wastage must be predominant over here. The tariff comprises of flat rates not even levied according to the area of houses. The water rates are given below;

Tariff Rates per month		
Domestic	**Com.**	**Ind.**
Rs. 50	Rs. 200	2500

2.10. Manpower deployment:

MC Vehari is facing acute manpower shortage especially for operation of the tube wells and water works. No staff has been sanctioned for the installation added to the system whereas number of slots has gone vacant because of retirement of the staff.

Slot	**Sanctioned strength**	**Existing strength**	**Vacant post**	**Manpower on daily wages**	**Total man power deployed**	**Additional MC demand**
Tube-well operators	31	24	7	0	24	40
Chowkidars	3	2	1	0	2	10
Electricians	0	0	0	0	0	5
Plumbers	1	0	1	0	0	10
Plumber helpers	0	0	0	0	0	5
Fitter Quli	3	3	0	0	3	10
Baildar	6	5	1	0	5	10
Water Superintendent	1	1	0	0	1	1
Total	**45**	**35**	**10**	**0**	**35**	**91**

The vacant positions of the field staff need to be filled for satisfactory service delivery.

2.11. Water wastage & Water management

Lot of water wastage is occurring in the water supply system in below given ways;

a) Some consumer connections have no taps.
b) Some consumers keep the taps open in all water supply hours although they do not need water.
c) Most of the overhead tanks of the consumers have no float valve and when their tank is full, the water flows down to the drains continuously during the supply hours.

The water wastage requires excessive water production and high electricity consumption. It is exerting a large pressure on the municipal budget. Large savings in the electricity bills and ultimately the O&M cost, can be affected by reducing the water wastage at the consumer ends. It will save lot of water and water shortage can be addressed by conservation of water being wasted at present. The best and efficient way to save water and reduce O&M cost is the consumer metering.

2.12. Installation of consumer meters.

The only and the effective way of water preservation and reduction of O&M cost is the consumer metering. Hence all the 4254 consumer connections are required to be metered. This will result in equal distribution of water, addressal of water shortage and supply of adequate water at good terminal pressure to all the consumers in the city. The concept of 24/7 water supply can also be practiced if consumer metering is accomplished.

2.13. O&M Charges and revenue recovery

The operation & maintenance charges and the revenue recovery affected during the last five years is given below;

Year	2013-14	2014-15	2015-16	2016-17	2017-18	Total subsidy in five years
O&M charges (million Rs)	32.1	39.94	38.11	31.14	38.32	**179.61**
Revenue recovery (million Rs)	1.08	0.86	0.49	0.73	2.11	**5.27**
Recovery % as compared with O&M exp.	3.36%	2.15%	1.29%	2.34%	5.51%	**2.93%**
Subsidy injected (million Rs)	31.02	39.08	37.62	30.41	36.21	**174.34**

The above mentioned data shows a very weak billing and recovery system of the water revenue which is required to be improved by capacity building of the recovery staff and taking the elected representatives in confidence.

2.14. Service delivery & recommendations

1. Main and the only reason for acute water shortage is the scarcity of fresh water in and around the city. Sub soil water in the city is brackish and unfit for human consumption and hence water has to be imported in the city from some fresh water zone. Unless a comprehensive scheme for tapping the fresh water is planned and launched, the water shortage cannot be addressed.

2. Fresh water is available on the right bank of Sutluj River. Although the recharge to this aquifer has been reduced after implementation of the Indus Basin Project in mid-sixties, yet adequate sub soil recharge to the belt along the right bank of the river is available which can be tapped.
3. Water supply is intermittent and total 2 hours per day. The quantity of water being produced presently is not enough even in the served areas because of lesser supply hours which need to be increased to at least 10 hours a day.
4. Quite a large area is being supplied with contaminated water due to leaking pipes and substandard consumer connections. Replacement of these pipe lines is required for reduction of water contamination.
5. Most of the area is un-served due to lack of distribution system. Water supply facility for these areas needs to be planned & implemented.
6. Service piping and saddles of all existing substandard consumer connections in the underground should be replaced by HDPE piping and saddles.
7. Illegal connection should be detected by consumer surveys and regularized.
8. None of the consumer connection is metered and it is proposed to meter all the consumer connections to conserve water, reduce O&M cost, address water shortage and supply of adequate quantity of water to every consumer.

Section-3 Sewerage system

3.1. Existing situation

3.1.1. Coverage

The city has 70% coverage of sewerage system but only the main and branch sewers have been laid and the lateral sewers have been provided in small area of the city.

3.1.2. Drainage zones.

The city has been divided in 4 zones with respect of the waste water drainage. Each zone with its coverage is described below;

a) Zone-1

This zone comprises of the areas lying in the south of the railway track. Two trunk sewers of 21" dia and 27" dia collect the waste water from these areas and discharge in Taimoor Shaheed disposal works. All branch and lateral sewers in mohallahs of Peoples Colony, Zafar Colony, Liaqatpura, Faisal Colony, Rehmania Colony, Madina Colony, Sheikh Cotton Colony, Sirhind Colony, A,B,E & F blocks have been connected to these outfall sewers. Waste water from Taimoor Shaheed disposal station is disposed-off for broad irrigation into an outfall sump through two DI force mains of 10" and 12" diameter.

PHED has laid a new force main of 24" dia AC pipe and the water is now being dispose-off in two separate outfall sumps through three force mains.

b) Zone-2

This zone comprises of areas lying in the south of the railway track and is drained off into 32-Quarter and Bhatta Ikramul Haq disposal works. The disposal works Bhatta Ikramul Haq is quite old and collecting waste water by 24" & 18" dia. trunk sewers. The waste water is being disposed-off for broad irrigation through 16" RCC pipe and finally by sullage carrier. The disposal works 32-Quarter is collecting waste water by 33" & 36" dia. trunk sewers. The waste water is being disposed-off for broad irrigation through existing 16" dia AC force main and recently laid 36" dia AC force main. The areas named as C, D, G, H blocks, Officers Colony, DHQ Hspital, Sharqi Colony, New Sharqi Colony, Bhatta Ikramul Haq, 32-Quarter, Rehamtabad, Kachi abadi, Tariq Bin Zaid Colony, Haider Colony and Danewal Town are connected with Drainage area-2.

c) Zone-3

This zone of comprising of three disposal works as given below;

1) **Disposal work Housing Colony**

   This areas is lying in the North of the railway track and is drained off into Housing Colony disposal works which is discharging waste water for broad irrigation through sullage carrier along the Khanewal road.

2) **Anwarabad Disposal station**

   Another small disposal station is working in Anwarabad which is only draining a pond and disposing-off water in fields for broad irrigation. This is not connected with any sewerage system.

3) New disposal station

PHED Vehari has constructed a disposal station in the northern area with outfall sewer of 36"dia and 28" force main. This disposal works has been constructed to remove the waste water flooding in the eastern areas of the existing housing colony disposal works system for which new sewers have been laid to take of the load from that system. Some existing sewers have also been connected with newly laid sewers and the system is being operated for last so many month.

Both the disposal works in this zone are serving the areas of Ghafoor Colony, Muslim Town, Anwar abad, Lala Zar Colony, 3-Marla Scheme, Housing Scheme, Chak 11/W.B, Kachi Abadi, Iqbal town, College town, Stadiun town and Wukla Colony.

d) Zone-4

This zone comprises of areas of Peer Murad Colony lying in the North of the railway track at western side of the city and is drained-off into Peer Murad disposal works through a trunk sewer of 36" dia. The waste water is being disposed-off for broad irrigation through sullage carrier.

3.1.3. Sewer lengths

The length of old sewers as per information given by the Municipal Committee, are given below; these are approximate lengths and may vary if actually measured at site;

Table3.1 Approximate lengths of existing sewers

Sewer dia. (inch)	**9**	**12**	**15**	**18**	**21**	**24**	**27**	**Total length in Km**
Length in Km	20	8.0	3.0	4.0	2.0	4.0	2.0	
Sewer dia (inch	**30**	**33**	**36**					**47.5 Km**
Length in Km	2.0	1.5	1.0					

3.2. New sewerage system under construction by PHED

Salient features of the sewerage scheme being constructed by PHE Department are given below;

Name of Scheme	Comprehensive Water Supply & Sewerage scheme for Vehari City District Vehari.		
Administrative Approval	Rs. 308.199 Million Dated: 11.04.2016		
Technical Sanction	Rs. 332.198 Million Dated: 29.04.2016		
FINANCIAL POSITION	(Million PKR)		
Year	**Allocation**	**Fund Released**	**Expenditure**
2015 - 16	50.000	2.000	2.000
2016 - 17	10.000	148.346	148.295
2017 - 18	25.000	157.904	157.835
2018 - 19	23.999	6.000	5.981
2019 - 20	18.068	18.068	14.560
Total up to date (October-2019)	**127.067**	**332.318**	**328.671**

SCOPE OF WORK		
Description of Work	**Quantity**	
	As per scope	**Completed**
A. Sewerage		
Survey Investigation & Design Survey	1 Job	1 Job
RCC Sewers 36" i/d	10079 Rft	10050 Rft
33" i/d	399 Rft	395 Rft
27" i/d	2665 Rft	2660 Rft
24" i/d	2450 Rft	2440 Rft
21" i/d	3324 Rft	3320 Rft
18" i/d	7096 Rft	7093 Rft
15" i/d	5100 Rft	5100 Rft
12" i/d	4022 Rft	4020 Rft
9" i/d	36345 Rft	35486 Rft
Screening Chamber	1 No.	1 No.
Collecting Tank	2 No.	2 No.
Pumping Chamber	1 No.	1 No.
Pumping Machinery	5 No.	5 Nos.
Out Fall Chamber	4 No.	3 No.
Inter Connection	1 Job	1 Job
External Electrification	1 Job	1 Job
AC Force main 24” Dia	3340 Rft	3270 Rft
AC Force main 28" Dia	500 Rft	500 Rft
AC Force main 32" Dia	6000 Rft	5985 Rft
Sullage Carrier 2.50' x 3.50'	500 Rft	450 Rft
Sullage Carrier 2.50' x 3.00'	500 Rft	400 Rft
Sullage Carrier 3.00' x 3.50'	500 Rft	450 Rft
Staff Qaurter	1 No.	1 No.
Boundary wall Gate & Gate Pillar	800 Rft	800 Rft
Tuff Tile	208931 Rft	208448 Rft
P.C.C. (1:2:4)	29568 Rft	0 Rft
Cleaning of R.C.C. Sewer	1 Job	1 Job
Generator 200 KVA	1 No.	1 No.
Generator Room	1 No.	1 No.
Remarks:- Work on sewerage system is nearly complete and for rest of the components it is in progress.		

3.3. Existing pumping / disposal stations

The details of each pumping station already working in the city is given below;

Location	Nos of collect. tanks	Nos of pumps	Discharge each (cusecs)	Total discharge (cusecs)	Motor BHP	working status	Force main/S. Carrier			Ultimate disposal
							Size	Length	Condition	
Anwar abad	1	1	1.0	1.0	20	working	9" dia	1.5 km	Good	Broad irrigation
Bhatta Ikram ul Haq (main)	2	3	2.0	6.0	40	01 No working	12" RCC pipe & SC	1.0 km	poor	do
Bhatta Ikmra ul Haq mini	1	1	1.0	1.0	20	working	6" dia	0.18 km	Good	do
Tamoor Shaheed Colony	3	4	4.0	16.0	50,50, 60,60	working	10', 12" & 24" dia	2.0 km	Good	do
Housing Colony	2	4	5.0	20.0	60	2 Nos working	Sullage carrier	2.62 km	Fair	do
32 Quarter	2	3	4.0	12.0	50	working	16" & 36"	2 km	Poor	do
Peer Murad	1	2	1.0 0.5	1.5	20 10	01 No working	Sullage carrier	100 ft	good	do
New disposal station	2	5	5.0	25	60	Working	28" dia	500 ft	good	do

3.4. The main issues and problems in the system

The main problems and bottlenecks confronted by the city are given below:

3.4.1. Damaged & surcharging sewers

Some of the sewers have been chocked or damaged and are resulting in surcharging and overflowing of waste water thus damaging public as well as private property. These sewers will require replacement. The detail is given below:

S.N.	From	To	Length in feet	Dia in inches	Problem	Solution
1	Hasilpur road	University of Education	3000	24	Chocked	Replacement
2	Bhatta Ikram ul Haq	32-Quarter	2500	36	Chocked	Replacement

3.4.2. Areas flooded with waste water

Under mentioned areas of the city in the western side are usually subjected to waste water flooding because of sewer surcharging and overflowing.

1. Peoples Colony	2. Zafar Colony	3.Faisal Colony
4. Pir Murad Colony	5. Lalazar Colony	6. Muslim Town
7. Ghafoor Town	8. Anwar Abad	9. Grid station

- Main reason for flooding of these areas is the surcharging of main outfall sewers due to non-cleaning of the sewers by MC Vehari.

3.4.3. Problems in the pumping stations

Presently under mentioned components of these disposal stations need repairs or replacement;

Location of disposal works	Year of construction	Required rehabilitation required
Anwar Abad	2011	• MC intends to eliminate this disposal by laying the lateral sewers and connecting with the sewerage system nearby.
Bhatta Ikram ul Haq (mini)	2011	• MC intends to eliminate this disposal by laying the lateral sewers and connecting it to the 32-Quarter disposal station.
Taimoor Shaheed Colony	1998	• Replacement of 2 Nos sullage pumping units • Replacement of suction & delivery pipes of all pumping units • Repair of 2 Nos pump houses. • Repair of collecting tanks (plaster + railing) • Repairs of screening chambers (plaster + railing + manhole cover + screen repairs) • Up gradation of control room • Painting of pumping units, piping & valves • Repair of staff quarter
Housing colony disposal works	2004	• Replacement of 1 Nos sullage pumping units • Replacement of suction & delivery pipes of all pumping units • Repair of 2 Nos pump houses. • Repair of collecting tanks (plaster + railing) • Repairs of screening chambers (plaster + railing + manhole cover + screen repairs) • Up gradation of control room • Painting of pumping units, piping & valves • Repair of boundary wall • Repair of staff quarter • Replacement of penstock
32-Quarter	1996	• Replacement of suction & delivery pipes of all pumping units • Repair of 2 Nos pump houses. • Repair of collecting tanks (plaster + railing) • Repairs of screening chambers (plaster + railing + manhole cover + screen repairs) • Up gradation of control room • Painting of pumping units, piping & valves • Repair of boundary wall • Replacement of penstock
Bhatta Ikram ul Haq	1985	• MC intends to eliminate this disposal by laying the connecting main sewer lines to the 32-Quarter disposal station.

Pir Murad Colony	1998	• Replacement of 2 Nos sullage pumping units • Replacement of suction & delivery pipes of all pumping units • Repair of pump house. • Repair of collecting tank (plaster + railing) • Repairs of screening chamber (plaster + railing + manhole cover + screen repairs) • Up gradation of control room • Painting of pumping units, piping & valves • Replacement of penstock

3.4.4. Un-served areas

The following areas of the city have not been provided with sewerage system as yet.

1. Defence View	2. Iftikar Block	3. Vehari Town
4. Rizwan Colony	5. New Sharqi Colony(partly)	6. Iqbal Town(partly)
7. Sunder Village	8. Makkah Colony	9. Bhatta Shadi Khan
10. Jannat colony	11. Wahdat colony	12. Chak no 45 WB
13. Usman abad	14. Canal view	15. Chak no 39 WB
16. Tariq bin ziad	17. Madina town	18. Shabir abad
19. Chak no 9 WB	20. Chak no. 13 WB	

Extension of the facility to the above mentioned un-served areas is needed serving the entire population of the city.

3.4.5. Provision of winch machines

1) Number of sewers are being silted up and chocked because of non-desilting of the sewers. Manual desilting of manholes is being done by MC but it is not so effective unless the silt from the barrel of the pipes is removed. For this purpose 2 No sewer de-silting winch machines are required to eliminate the flooding of sewer line.
2) MC is not de-silting the collecting tanks due to which the sewer lines are being choked. Hence winch machine for the de-silting of collecting tanks will be required to keep the collecting tanks free of silt.
3) Similarly the sullage carriers are not being de-silted properly by MC because of dearth of labor and cleaning machinery. These are also responsible for flooding of waste water in the city. Hence at least 01 No back-hoe machine for the de-silting of sullage carriers is required.

3.4.6. Sucker & jetting machines

01 No sucker and 01 No jetting machines are being used by MC to remove blockades and cleaning of sewers. The sucker and jetting machines are quite old and require repairs along with supply of required pressure pipe for jetting machine.

3.4.7. Provision of gully grating chambers and manhole covers:

- Some of the gulley grating chambers need repair. Actual Nos to be repaired should be determined and repairs completed.
- The top of some manholes gone lower than the roads because of raising of roads. These manholes should be raised to bring them to in level with roads.
- Manhole covers at many places are missing and MC is not attending these complaints because of money constraints. Hence MC will need to replace the missing manhole covers along with some base frames. MC should keep adequate number of manhole covers in stock to replace the covers immediately after these are damaged or stolen.

3.5. Waste water treatment

Waste water from all zones is being disposed-off for broad irrigation of the lands situated around Vehari city. No treatment facility is available at all discharge points which is polluting the lands and atmosphere. Waste water treatment plants are required be constructed to lower down the BOD level as per National Environmental Quality Standards (NEQS).

3.6. Consumer connections

No consumer sewer/drain connection survey in the city has been conducted by this time. Hence the exact number of these connections cannot be estimated at this stage. However Rs. 20/- per month fee is being charged approximately from 6000 Nos. households.

3.7. Tariff structure

All the sewer connections are not being charged. Only 6000 Nos. connections are being charged at the rate of Rs 240 per annum.

3.8. Operation & maintenance cost vs revenue recovery

The operation & maintenance cost of the sewerage system for the last five years along with the revenue recovery is given below;

O&M Expenditure vs Revenue Recovery (million Rs) (includes manpower, electricity, repairs/replacement & supplies)						
Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**Total for 5 years**
O&M expenditure	20.161	21.967	16.104	9.958	16.575	84.764
Revenue earned	0.016	0.021	0.044	0.015	0.062	0.158
Percentage recovery vs O&M cost	0.08%	0.010%	0.27%	0.15%	0.37%	0.19%
Subsidy given	20.145	21.946	16.060	9.943	16.513	84.606

The service charges levied for the liquid waste management are very nominal and the collection of the revenue is not giving any attention neither by the key officers nor by the public representatives.

3.9. Manpower deployed

The manpower deployed presently for the operation & maintenance of the system is given below against the total regular strength of 27 persons.

Pump operators	2
Baildars	0
Supervisors	2
Sewer men	23
Total	27

MC is demanding additional manpower because of increase in population as they are serving those areas in the city which are not included within the municipal boundary.

3.10. Service delivery level

The service delivery is not satisfactory. Southern areas of the city are facing poor service delivery because of;

- Silting up of main sewers from Hasilpur road to Sharqi Colony disposal.
- The area lying in remote end of the system are being silted up because of water stagnancy and very low velocity of water.
- In 30% of the city area no sewerage facilities have been provided.
- The city has main and branch sewers on main roads and streets but most of the streets are not equipped with lateral sewers. These areas are being served with surface drains discharging into the sewers without gulley grating chambers which is allowing all the silt and the floating materials in the sewers. This forms the main reason for chocking of sewers and flooding of the roads and streets.
- MC de-silting the sewers by taking out muck from the manholes only which is not so effective. Service delivery in areas with healthy sewerage system is good but it is poor in the areas which are subjected to sewer surcharging and flooding as well as those areas where sewerage system does not exist.

3.11. Remedy to the main issues

Interventions described below are required to be implemented for relieving the flooded areas.

a) Elimination of Bhatta Ikram ul Haq mini Disposal by connecting ultimate disposal through main sewer line with 32-Quarter Disposal station.
b) Peoples Colony old/damaged sewer lines required to be replaced to eliminate flooding problem.
c) Peer Murad disposal station required to be upgraded.
d) Newly built sewerage system in the northern areas should be taken over and operated effectively to eliminate the flooding in Ghafoor Colony & Muslim Town.
e) Storm water in the main city area floods the entire area which needs to be addressed.

Section-4 Solid waste management

4.1 Existing situation

4.1.1 Available resources

a) Equipment & Machinery

Under mentioned collection and transportation machinery is available with MC to handle the solid waste.

S.N	Equipment/machinery	Total available Nos	Working	Requiring repairs
1	Tractor trolleys	3	3	3
2	Arm roll truck	1	1	-
3	5.0 m3 containers	7	7	7
4	Garbage dumpers	5	5	5
4	Front blade tractors	1	1	1
5	Front end loaders	2	1	1
6	Water bouzers	2	2	-
7	Mechanical sweepers	1	1	-

The existing machinery is neither sufficient nor cost effective and efficient giving rise to low efficiency of collection and disposal of the waste and as a result of that MC is facing higher waste management cost as well as complaints regarding the insanitary conditions in the city. Efficient and cost effective machinery is needed to increase the efficiency of collection and transportation for improving the sanitary conditions and lowering down the operational and maintenance costs.

b) Manpower Deployed

The manpower deployed for collection, transportation and disposal of the solid waste is given in the table below. As indicated by MC Officers, this manpower is not sufficient to serve the entire city at the given standards. Additional manpower required by the MC is also given here. Actual requirement will be identified after detail design and implementation of the project.

Slot	Sanctioned strength	Manpower actually deployed	Vacant post	Manpower on daily wages	Total man power deployed	Additional MC demand
Sanitary workers	198	151	47	27	178	150
Vehicle drivers	18	3	15	0	3	5
Supervisors	7	2	5	0	2	10
Sanitary inspectors	0	0	0	0	0	5
Clerk	1	0	1	0	0	4
Other	0	0	0	0	0	0
Total	224	156	68	27	183	174

The city has un-satisfactory solid waste management system. Limitation in resources is described as under;

4.1.2 Reasons for poor service

a) MC is facing shortage of vehicle drivers and other staff.
b) The equipment and machinery is neither efficient nor adequate to serve the entire city
c) No landfill site is available for dumping of solid waste. Currently waste is being dumped in open spaces near 9-11/W.B, Khanewal road & Kachi Abadi 9-11/W.B which is totally unhygienic.
d) The waste is being openly dumped without compaction and provision of covers which is creating all sort of hazards say; pollution of underground water, vector and vector borne diseases, obnoxious smell and highly insanitary conditions.

4.2 Un-served and partially served areas

The entire city is not served with solid waste collection and disposal. 35% area of the city is fully served, 40% is partially served and 25% is un-served as marked on the map. In partially served areas service is rendered intermittently depending upon availability of manpower and transportation machinery. The detail of these areas is given below.

a) Partially served areas

No regular service is rendered in the under mentioned areas. The main complaints are attended by sending the machinery & labor once or twice a week.

1	Bhatta Ikramul Haq	2	New Sharqi Colony	3	32-Quarter
4	Rehmat Colony	5	Kachi Abadi	6	Iftikhar Block
7	Tariq Bin Zaid	8	Officers Colony	9	Danewal Town
10	Green Town	11	Anwar Abad	12	Lalazar Colony
13	3-Marla Scheme	14	Housing Scheme No.3	15	Chak No. 11/W.B
16	Stadium town	17	College Town	18	Allama Iqbal Town
19	Wukla Colony	20	Gulberg	21	Madina town
22	Makkah colony	23	Sunder village	24	Chak no 13 WB

b) Unserved areas

Under mentioned areas are still unserved;

1	Defence View Society	2	Ghafoor Town	3	Muslim Town
4	Grid station	5	Pir Murad Colony	6	Chak No. 9/W.B
7	Wahadat colony	8	Usman abad	9	Peoples Colony (partly)
10	Chak No. 39/W.B	11	Canal View	12	Jannat Colony
13	Chak no 45 W.B	14	Madina town	15	Shabir abad

4.3 Solid waste Generation & Disposal

The solid waste management efficiency along with present dumping sites are given below;

Total waste generated per day		Total waste collected (Tons)		% Efficiency of disposal	Name of dumping sites with distance in Km from the city center		
					SiteNo-1	SiteNo-2	SiteNo-3
Cubic meters	**Tons**	**Cubic meters**	**Tons**		9-11/W.B Khanewal road	Kachi Abadi 9-11/W.B	Along Khanewal road
90	45	64	26	58%	Present dumping	Present dumping	Present dumping
Distance from city center (Km)					3.0 KM	3.5 KM	4 KM
Open dumping= **O** Landfill= **LF**					O	O	O

4.4 Landfill development

Approximate area of 10 acres will be required for the next 10 years for construction of landfills for safe and sanitary disposal of the solid waste of the city. Presently the waste is being dumped in 9-11/W.B, Khanewal road & Kachi Abadi 9-11/W.B. MC is trying to procure 10 Acres land in surroundings of Vehari city for landfill. The suitability of the landfill site will be determined after detailed surveys and design of the project by catering the requirement of the environmental standards in vogue in Punjab.

4.5 Vehicle parking Area:

MC has small but covered built-up parking area at present and the vehicles are parked in this area. It is located in G-Block and has an area of approximately 0.5 Acre. This space is required to be converted in to proper parking area by construction of parking sheds, vehicles washing and service arrangements, small office and other allied facilities.

4.6 Levying of sanitation fees

No sanitation fee has been levied by MC and the entire expenditure given below is being met from MC's own resources and the PFC share being given by Provincial government.

4.7 Solid waste management financials (million Rs)

Year	2013-14	2014-15	2015-16	2016-17	2017-18
O&M Expenditure	39.898	42.864	50.238	58.333	69.062
Sanitation fee/month per house hold	Nil	Nil	Nil	Nil	Nil
Subsidy injected	39.898	42.864	50.238	58.333	69.062

MC will have to levy the sanitation fee to meet the expenditure on solid waste management or at least to lower down the subsidy presently being injected.

4.8 Service delivery

At the average, the service delivery level is not good with 58% efficiency. Some portion of the city is either un-served or partially served because of shortage of sanitary staff and machinery & equipment whereas the existing machinery and equipment is inefficient having costly operation and maintenance.

The solid waste is being dumped in 9-11/W.B, Khanewal road & Kachi Abadi 9-11/W.B which is totally unhygienic because no proper landfill site is available. This is creating hazards like obnoxious smell, sub soil water pollution and breeding of vectors causing water borne and vector diseases. Apart from that this is also creating insanitary conditions resulting in frustration in the citizen.

Section-5 Roads

5.1 City Roads Hierarchy

The main roads in the city and emerging from the city have under mentioned hierarchy;

S.No	Name of the road	Owner department
1	Vehari- Lahore road	Punjab Highway road
2	Vehari- Multan road	do
3	Vehari-Khanewal road	do
4	Vehari-Hasilpur road	do
5	All other roads in the city	Municipal Committee roads

All these roads have been marked on the map of the city in different colors

5.2 Existing situation

Some of the primary roads in MC Vehari are in good condition & few main roads need rehabilitation, widening & improvement. Further many of the secondary roads/streets require rehabilitation. The detail of the problem roads is given below;

Problem roads in Vehari City									
S. N	**Name of road**	**From**	**To**	**Ownership**	**Type of surface**	**ROW (ft)**	**Paved width (ft)**	**Approx. length (Km)**	**Condition**
1	Jinnah Road	Ludden Road	Bilal Masjid Sirhind Colony	MC, Vehari	TST	55	40	2.5	Poor
2	DPS Road	Goal Chowk	Masani Bagh	MC, Vehari	TST	60	40	1.0	Poor
3	Faisal Park Road	Main People Colony Road	Commerce College Road	MC, Vehari	TST	40	40	0.75	Poor
4	Chamra Mandi Road	Club Road	Madina Colony Chowk	MC, Vehari	TST	60	40	0.75	Poor
5	Old Nadra Office Road	Club Road	Zoo	MC, Vehari	TST	60	40	1.0	Poor
6	Passport Office Road	Masani Bagh	New Sharqi Colony	MC, Vehari	TST	50	40	1.0	Poor
7	Main Road Sharqi Colony	Chungi No 5	Disposal Works Sharqi Colony	MC, Vehari	TST	100	40	1.0	Poor
8	Iqbal Road	Club Road	Karkhana Bazar Road	MC, Vehari	TST	100	40	0.5	Poor
9	Loha Bazar Road	Club Road	Karkhana Bazar Road	MC, Vehari	TST	100	40	0.5	Poor
10	Main People Colony Road	Pehla Chowk	Taimoor Shaheed Colony	MC, Vehari	TST	80	40	1.5	Poor
11	MNA House Road	Club Road	Quaid-E-Azam Park	MC, Vehari	TST	40	40	1.0	Poor
12	Jannat Colony Road	Habib Chowk	Jannat Colony	MC, Vehari	TST	40	30	0.25	Poor
13	Thana Sadar Road	Club Road	Nursing Hostel	MC, Vehari	TST	40	30	1.0	Poor
14	Mohammadi Bakery Road	Main DM Road	Makka Town	MC, Vehari	TST	40	25	2.0	Poor
15	Main Lalazar Road	DPO Office	Chaudry Garden	MC, Vehari	TST	40	30	1.0	Fair

16	Ghafoor Town Road	Dm Road	Ghafoor Town	MC, Vehari	TST	40		1.0	
17	Danewal main road	Quaid e Azam chowk	Rizwan colony chowk	MC, Vehari	TST	40	16	1.25	Poor
18	People colony road (along railway line)	Thana city	People colony	MC, Vehari	TST	30	10	2.5	Poor
19	Canal road (liaqatpura)	Eid Gah chowk	End of colony	MC, Vehari	TST	25	10	2.5	Poor
20	Zafar park road	Faisal town	Khachi Mandi	MC, Vehari	TST	40	24	0.5	Poor
21	Rail bazar	Goal chowk	Masjid baghwali	MC, Vehari	TST	50	40	0.3	Poor

5.3 Widening & improvement of roads

A total of 4 roads in the city need rehabilitation. All these roads need widening & improvement. Widening/ improvement of roads will not be included in the maintenance and repair projects and will be started from year two to onward.

Sr Nos.	Name of Roads / Streets	ROW	Length	Pavement width (feet)	
		Ft	Km	Existing	Proposed
W1	DPS Road	60	1.0	40	48
W2	Faisal Park Road	50	0.75	40	40
W3	Main Road Sharqi Colony	100	1.0	40	48
W4	Loha Bazar Road	100	0.5	40	48

5.4 Resurfacing of roads

The given below roads have developed potholes and broken edges and need repairs and resurfacing

Sr. No.	Name of Roads / Streets	ROW (Ft)	Length (Ft)	Width (Ft)
R1	Club Road	70	3280	28+28
R2	Jinnah Road (one way)	70	1300	24+24
	Jinnah Road (Two way)	50	2800	32
R3	Iqbal Road	40	800	14
R4	Club Road to Nursing School DHQ Hospital Vehari	26	3000	18
R5	Club Road to Quaid-e-Azam Park Road	26	1800	18
R6	Govt. College for Women to Eid Gah Road	60	2650	20+20
R7	Bhatta Ikram ul Haq To Masani Bagh	18	3200	10
R8	Goal Chowk Karkhana Bazar To Sirhind Colony	50	1650	30
R9	Zoo Road	50	2600	18
R10	Imam Bargah To Club Road	50	1300	24
R11	Police Station City to Peoples Colony Main Road	40	1650	14
R12	Quaid-e-Azam Chowk to Danewal Main Road	30	3000	16
R13	Water Works 9-11/WB to Main Multan Road	20	3300	12
R14	V Block to Y Block main road	40	1500	14
R15	Imam Barghah to Main Peoples Colony road	70	1320	20

5.5 Construction of new roads

Sr#	Name of Area	ROW	Length	Pavement Proposed	
				Width	Type
		Ft	Ft	Ft	Concrete Pavers
C1	Sharqi Colony Bhatta Ikram Ul Haq	40	7500	40	do
C2	City Area (C-D-G & F Blocks)	40	5000	40	do

Section-6 Parks and open spaces

6.1. Existing parks

There are 26 major parks in the city. The inventory of parks is given below

Sr No.	Name of Park	Area in Acres	Location
1	Chandani parks/ Ladies park	13.0	Near DCO House
2	Kalsoom Nawaz Park	3.0	Vehari Chowk
3	Muhammadi park	15.0	On seed farm road
4	Faisal park	4.0	Faisal colony
5	C-block park	0.5	C-block
6	F-block park	0.25	F-block
7	G-block park	1.75	MC employees colony
8	H-block park	1.50	H-block
9	Suzuki park	0.75	On Ludden road
10	Allama Iqbal park	3.0	Near DPO office
11	Awais park	1.5	9-11/W.B kachi abadi
12	Y-block park	12.0	Peoples colony
13	V-block park	2.0	Peoples colony
14	U-block park	0.25	Peoples colony
15	W-block park No.1	0.25	Peoples colony
16	W-block park No.2	0.75	Peoples colony
17	X-block park No.1	0.25	Peoples colony
18	X-block park No.2	2.0	Peoples colony
19	Z-block park	0.50	Peoples colony
20	Southern block park	2.0	Sharqi colony
21	Quaid e Azam park	5.0	Sharqi colony
22	Children park	1.0	Sharqi colony
23	Northern block park No.2	1.0	Sharqi colony
24	Aysha park	5.0	Danewal town
25	Family park	0.40	Near Khanewal chowk
26	Zafar colony park	2.0	Zafar colony/Liaqatpura

6.2. Existing situation

a) Vehari City has 26 Nos. major parks in addition to the green belts and small parks. The condition of the parks is not satisfactory. The missing facilities in the parks required to be provided for healthy environment in the city.

b) An open space with area of 4.0 acre is available in the city located at Sharqi Colony.

6.3. Rehabilitation of the existing parks

The existing parks mentioned below are equipped with some facilities which are working in good condition but some of the facilities are in poor condition and need to be

rehabilitated. On the other hand some important facilities are missing and need to be provided. The detail of all the parks required interventions to be done in these parks, for their upgrading, is given blow;

Repair/replacement of existing facilities like benches, toilets, path ways, swings and improvement of lawn watering system is urgently required in the following parks:

S. No.	Name of Park
1	Kalsoom Nawaz Park
2	Allama Iqbal Park
3	Awais Park
4	Suzuki Park
5	Ayesha Park Danewal
6	H-Block Park
7	Muhammadi Park
8	G-Block
9	Children Park Sharqi Colony
10	V-Block Park
11	W-Block Park
12	X-Block Park
13	F-Block Park
14	Zaffar Colony Park

6.4. Open spaces

The city has one open space. Municipal Committee desires to convert the open spaces in to parks because of congestion in the existing parks. Construction of park will bring about good recreational facilities for the citizen. Details of open spaces for conversion in to parks are given below:

Conversion of open spaces to Parks/Play-ground

1	Location	**New Sharqi Colony**
2	Area in acres	4-Acre
3	Present land use	Nil
4	Water table depth & quality	Water table depth = 70 ft Quality-good
5	Does MC intends to convert it into park?	Yes
6	Does MC intends to convert it into playground or stadium?	-
7	If no what are bottlenecks	-
8	Will the space attract visitors if converted to park?	Yes

9	If both the proposals are not there then what land use is proposed by MC?	-

6.5. Expenditure on Maintenance of Parks

Under mentioned expenditure has been incurred on the upkeep of parks during the last 5 years;

(All figures in million Rs.)

Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
O&M cost	6.044	5.369	4.769	3.336	5.020
Revenue earned	Nil	Nil	Nil	Nil	Nil
Subsidy injected	6.044	5.369	4.769	3.336	5.020

6.6. Manpower for Maintenance of Parks

Due to the large number of parks in the city, shortage of manpower is the major issue of the MC Vehari and demanding the additional manpower for proper maintenance. The existing manpower is given below:

Sanctioned Regular strength	**Actual Regular deployment**	**Regular Vacant Slots**	**Employed on daily basis**	**Shortage of regular personnel**
30	7	23	0	23

Section-7 Street Light

7.1 Existing Situation

Street light facility is available at many roads on WAPDA electric poles in MC Vehari. Energy saver bulbs and LED bulbs are used instead of LED lamps which are fulfilling the requirements. MC requires the street lights on major roads and streets. Street light facility is available only on the under mentioned roads in the city;

Sr.#	Name of road/street	From To	No. of Lights
1	Ludden Road	Quaid e Azam Chowk to Bhatta Shadi Khan	48
2	Multan Road	Khanewal Chowk to Peer Murad Road	50
3	Purana Lorry Adda Road	Khanewal Chowk to V-Chowk	88
4	Burewala Road	V Chowk to new Sabzi Mandi	90
5	Jinnah Road	V Chowk to Khanewal Road	24
6	Club Road	Quaid-e-Azam Chowk to Masjid Bagh wali	56

7.1.1 Ward wise street light:

The details of street lights available on internal roads and streets are given below; Most of the lights are either energy saver or LED bulbs. The ward wise detail of street light is given

Ward No	Area	Type of light		Total	Operational Status	Pole type used
		LED Bulb (30 Watt)	Energy Saver 24-30 Watt			
1	Chak No/11, Girls School Makkah Town	2	8	10	7	WAPDA pole
2	Qari Latif wala Mohala, Muhammadi Baikri	8	42	50	37	WAPDA pole
3	Katholik church road murtaza abad Mohallah Jogian	12	20	32	23	WAPDA pole
4	Baba Pan Shop, Mohallah Shamsh Masjid	10	40	50	30	WAPDA pole
5	Mohallah Rana Shah Muhammad, old Lorri Adda	12	68	80	44	WAPDA pole
6	Madina Hospital Road, Changer Mohallah, Ouncha Mohallah	5	35	40	31	WAPDA pole
7	Basti Khjoor wali, Masjid Zaki Shaha	8	52	60	39	WAPDA pole
8	Androon Kachari Road, lalazar colony	12	28	40	23	WAPDA pole
9	Anwar abad, Muslim Town	4	52	56	28	WAPDA pole

10	Rizwan Colony, Tariq bin zyad Colony, Daniwal	35	165	200	126	WAPDA pole
11	Rehamat Colony, Bhatta Shadi Khan	20	230	250	170	WAPDA pole
12	Bhatta Ikram ul haq, H block	16	70	86	40	WAPDA pole
13	Masani Bagh, Sharqi Colony	40	210	250	156	WAPDA pole
14	D Block, G Block	50	250	300	256	WAPDA pole
15	A Block, B Block, C Block	12	48	60	38	WAPDA pole
16	E Block, Madina Colony	20	280	300	164	WAPDA pole
17	Liaqat Pura	40	110	150	94	WAPDA pole
18	Chamara Mandi, Sheikh Cotton Colony, Faisal Colony	10	80	90	56	WAPDA pole
19	X Block	12	88	100	59	WAPDA pole
20	Zafar Colony, Y Block	8	52	60	32	WAPDA pole
21	Z Block, W Block	13	102	115	68	WAPDA pole
22	V Block, U Block	7	73	80	45	WAPDA pole
23	Peer Murad Colony	2	8	10	6	WAPDA pole
24	Iqbal Town, College Town	10	60	70	46	WAPDA pole
	Total	**368**	**2171**	**2539**	**1618**	

7.2. Replacement of LED

MC desired to replace the street lights on major roads and streets. The detail of roads which required replacement of luminaries and repairs is given below;

Sr.#	Name of road/street	From To	No. of Lights
R1	Ludden Road	Quaid e Azam Chowk to Bhatta Shadi Khan	48
R2	Multan Road	Khanewal Chowk to Peer Murad Road	50
R3	Purana Lorry Adda Road	Khanewal Chowk to V-Chowk	88
R4	Burewala Road	V Chowk to new Sabzi Mandi	90
R5	Jinnah Road	V Chowk to Khanewal Road	24
R6	Club Road	Quaid-e-Azam Chowk to Masjid Bagh wali	56

7.3 Provisions of new street lights

The detail of the proposed provision of services is as follows.

Sr.#	Name of Road/Street	From To	Length (RFT)
N1	Club Road	Quaid Azam Chowk to Islamia School	2.5
N2	Jinah Road	Ludden Road to Sirhand Colony Bilal Masjid	2.5
N3	Eid Gah Road	Madina Colony to Chungi No.5	0.5
N4	District Hospital Road	Chungi No.5 to Girls Collage	2.0
N5	Officer Colony	DPO House to Takiya Nawab	0.5
N6	University of Education	Takiya Nawab to 32 Quarter	1.0
N7	Bhatta Ikram Road	Ludden Road to New Sharqi Colony	1.0
N8	Rehmat Colony Road	New Sharqi Colony to Rehmat Colony	1.0
N9	Old Nadra Office Road	Club Road to Imam Bargah Madina Colony	2.0
N10	Muhammadi Bakri Road	Main Road to Makkah Town	3.0
N11	Muslim Town Main Road	Main Road to 9 Joyia wala	3.0
N12	Main Danewal Road	Burewala Road to Luddan Road	3.0
N13	Khanewal Road	Khanewal Chowk to VTI College	2.0
N14	Jail Road	Main Road to District Jail	1.0
	Total length in Km		25.0

7.4 Expenditure on street lights

Under mentioned expenditure on the Operation & Maintenance of the existing street lights has been incurred by MC Vehari during the last 5 years. This includes the energy cost, manpower cost and cost of repairs and replacements.

(All figures in million Rs)

Year	2013-14	2014-15	2015-16	2016-17	2017-18
O&M Expenditures	10.699	11.177	8.160	10.481	12.240

The expenditure is very high although the energy cost of energy saver luminaries is low.

Section-8

Public Private Partnership projects & Collaborative Projects executed by MC

8.1. Planning & Execution of PPP projects

As informed by Chief Officer no project in the Public Private Partnership Mode & Collaborative Mode has ever been executed by the Municipal Committee or defunct TMA Vehari. As such the key officers and staff have no experience as well as capacity for planning estimation and execution of such projects.

Section-9
Budgetary provisions on development of services infrastructure and O&M Cost

9.1. Development expenditure

The expenditure incurred on the development projects from year 2013-14 to the current financial year & source of financing is given below

(All figures in million Rs)

Description	2013-14	2014-15	2015-16	2016-17	2017-18
Expenditure on Development Projects	21.703	2.903	134.351	73.957	46.503
Source of Financing of Development Projects	Own source revenue	ADP grants	PFC share	PPP	Others (Specify)
	√	-	√	-	-
Expenditure on O&M of services and revenue generated					
Water supply					
Total O&M cost	32.1	39.94	38.11	31.14	38.32
Revenue earned	1.08	0.86	0.49	0.73	2.11
% revenue earned vs O&M charges	3.36%	2.15%	1.29%	2.34%	5.51%
Subsidy injected	**31.02**	**39.08**	**37.62**	**30.41**	**36.21**
Sewerage/drainage					
Total O&M cost	20.161	21.967	16.104	9.958	16.575
Revenue earned	0.016	0.021	0.044	0.015	0.062
Subsidy injected	**20.145**	**21.946**	**16.06**	**9.943**	**16.513**
Solid waste management					
O&M cost	39.898	42.864	50.238	58.333	69.062
Revenue earned	Nil	Nil	Nil	Nil	Nil
Subsidy injected	**39.898**	**42.864**	**50.238**	**58.333**	**69.062**
Parks					
O&M cost	6.044	5.369	4.769	3.336	5.020
Revenue earned	Nil	Nil	Nil	Nil	Nil
Subsidy injected	**6.044**	**5.369**	**4.769**	**3.336**	**5.020**
Slaughter houses					
O&M cost	0.423	0.457	0.512	0.310	0.204

Revenue earned	0.022	0.220	0.681	0.291	0.554
Subsidy injected (-) Income (+)	0.401	0.237	-0.169	0.019	-0.350
Street Light					
Total Expenditure	10.699	11.177	8.160	10.481	12.240
Revenue earned	The service is not charged.				

Section-10 Manpower deployment & shortage

The manpower deployed by MC Vehari in various Municipal Services is given below. MC is experiencing manpower shortage in some of the services which is also explained herein.

Description	Sanctioned Regular strength	Actual Regular deployment	Regular Vacant Slots	Employed on daily basis	Shortage of regular personnel	Additional requirement
Office manpower						
Key officers (BPS-17 & above)	9	1	8	0	8	0
Sub engineers	4	3	1	0	1	0
Support staff (BPS-16 & below	100	73	27	0	27	0
Total office manpower (A)	113	77	36	0	36	0
Municipal services						
Water supply	45	35	10	0	10	60
Sewerage	27	17	10	5	5	45
Solid waste management	224	156	68	27	41	174
Parks	30	7	23	0	23	100
Street lights	3	1	2	0	2	10
Slaughter houses	3	2	1	0	1	0
Total municipal services (B)	**332**	**218**	**114**	**32**	**82**	**389**
Grand Total (A+B)	**445**	**295**	**150**	**32**	**118**	**389**

Section-11
Summary public opinion surveys regarding the municipal service delivery

S. No.	Name of Service	Total persons interviewed	Opinion of the persons interviewed				Average consumer opinion
			Poor (Nos)	Fair (Nos)	Good (Nos)	Excellent (Nos)	
1	Water supply quantity	**9**	**4**	**3**	**2**	**0**	**Fair**
2	Water supply quality	**9**	**6**	**2**	**1**	**0**	**Poor**
3	Sewerage	**9**	**4**	**4**	**1**	**0**	**Fair**
4	Drain cleaning	**9**	**5**	**3**	**1**	**0**	**Poor**
5	Street sweeping	**9**	**3**	**2**	**4**	**0**	**good**
6	Solid waste collection & disposal	**9**	**3**	**3**	**3**	**0**	**good**
7	Condition Parks & play grounds	**9**	**3**	**6**	**0**	**0**	**Fair**
8	Slaughter house functioning	**9**	**2**	**7**	**0**	**0**	**Fair**
9	Street light functioning	**9**	**3**	**5**	**1**	**0**	**Fair**
10	General condition of roads	**9**	**2**	**3**	**4**	**0**	**Good**
11	Complaint attending capability	**9**	**4**	**1**	**4**	**0**	**Good**

Survey of Public general view over service delivery

S.No	Name of person interviewed	Muhallah or colony	Water supply		Sewerage	Drain cleaning	Street sweeping	Solid waste collection & disposal	Roads	Parks & play grounds	Slaughter houses	Street light	Complaint addressal
			Quantity	Quality									
1	Nazir Ahmad	Pir Murad colony	Fair	Poor	Poor	Poor	Good	Fair	Good	Fair	Poor	Fair	Good
2	Ahmad Raza	Khanewal road	Poor	Poor	Poor	Poor	Poor	Poor	Good	Fair	Fair	Poor	Poor
3	Ghulam Mustafa	Anwarabad	Good	Poor	Fair	Fair	Good	Good	Good	Fair	Fair	Fair	Good
4	Fatah Ullah	C-block	Poor	Poor	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Fair	Fair
5	Khalid Jawed	Y-block	Good	Fair	Poor	Poor	Good	Fair	Good	Poor	Fair	Poor	Poor
6	Kashif Ali	Sharqi colony	Fair	Good	Fair	Good	Good	Good	Fair	Fair	Fair	Fair	Poor
7	Shakeel Khan	X-block	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor	Fair	Good	Good
8	Fazal Ahmad	Bhatta Ikram	Poor	Fair	Poor	Fair	Poor	Good	Poor	Fair	Fair	Fair	Good
9	Abbas Shah	Lorry Adda	Poor	Poor	Good	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor