Solid Waste Management

Action Plan

2019

NAGAR NIGAM BAREILLY

Bareilly City Map

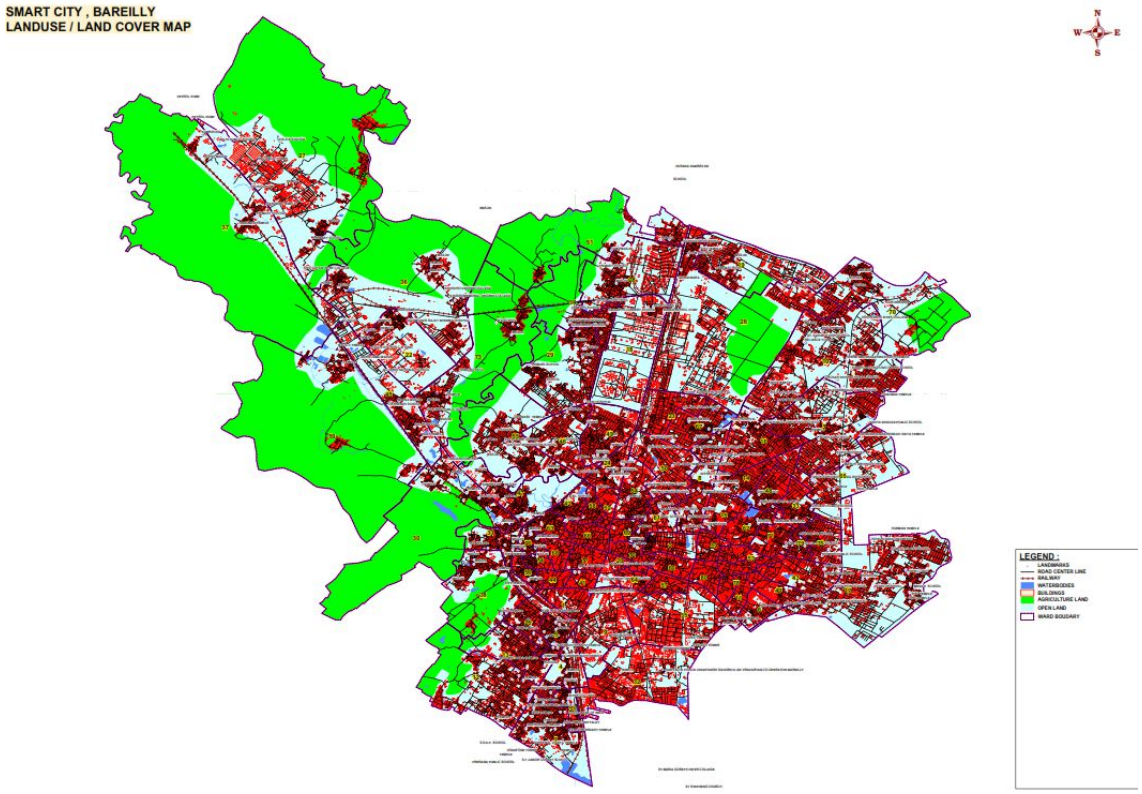


Table of Contents

1 CITY PROFILE

Name of the ULB	:	**Bareilly Municipal of Corporation**
Type of Municipal Body	:	**Nagar Nigam Bareilly**
Population (2011)	:	985752
Present Population	:	**1028000**
Area	:	**106 sq. m.**
Number of wards	:	**80 number**
Number of houses	:	**1,64,515 number**
Total road length	:	**1490 kms**
Waste generated	:	**450 tones per day**

Data used for Action Plan updation :

311218

1.1 Introduction

Bareilly is a city in Bareilly district in the northern Indian state of Uttar Pradesh. Located on the Ramganga it is the capital of Bareilly division and the geographical region of Rohilkhand.

The city is 252 Kilometers north of the state capital, Lucknow and 250 kilometers east of the national capital New Delhi. It is eight largest city in Uttar Pradesh and 50th largest city in India. Bareilly also selected as a smart city list in India. This city is also known by the name Nath Nagri (known for the seven Shiva temples located in the Bareilly region as --DhopeswarNath, MadhiNath, AlakhNath, TapeswarNath, BankhandiNath, PashupatiNath and Tivrinath)

1.2 Objective:-

a) To consolidate the information on the existing system of solid waste management.

b) To detail the action plan for solid waste management in conformity with the Integrated State Policy on solid waste management and the MSW rules 2016.

c) To provide a document which would be used for procurement of equipment and services for implementation of the integrated solid waste management system and provide a base line for all future plans for solid waste management for the city.

1.2.1 Brief description of MSW Rule 2016:-

- Hotels and restaurants should segregate biodegradable waste and set up a system of collection to ensure that such food waste is utilized for composting / bio-methanation.
- Resident Welfare associations and gated communities with an area >5,000 sqm should segregate waste and handover recyclable material to either the authorized waste pickers or the authorized recyclers, or to the urban local body.
- Bio-degradable waste should be processed, treated and disposed of through composting or bio-methanation within the premises as far as possible.
- Street vendors should keep suitable containers for storage of waste generated and deposit such waste at waste storage depot or container or vehicle as notified by the local authority.

  High calorific wastes shall be used for co-processing in cement or thermal power plants.
- Developers of Special Economic Zone, industrial estate, industrial park to earmark at least 5% of the total area of the plot or minimum 5 plots/ sheds for recovery and recycling facility.
- Manufacturers of disposable products such as tin, glass, plastics packaging etc. shall provide necessary financial assistance to local authorities for the establishment of waste management system.
- Companies that sell products in non-biodegradable packaging material should put in place a system to collect back the packaging waste generated due to their production.
- All such manufacturers, brand owners or marketing companies should educate the masses for wrapping and disposal of their products.
- Construction and demolition waste should be stored, separately disposed off.

1.3 Project Methodology:-

a) A template for data collection from Nagar Nigam Bareilly was prepared. The data was collected from Health, Engineering, Tax and administrative section. Frequent field visits were done to check the present status of solid waste management and for data collection.

b) Preparation of action plan involved the following steps:-

- Study of municipal solid waste (management and handling) Rules-2016
- Referred the solid waste management state policy prepared by State of U.P.
- Prepared a rough action plan discussion with Hon'ble Mayor, Municipal Corporator and Senior Officers.
- Proposed a feasible solid waste management system.

Bareilly Municipal Corporation and Out Growth, with population of about 9 lakh is Bareilly sub district's only Municipal Corporation and out growth located in Bareilly sub district of Bareilly district in the state Uttar Pradesh in India. Total geographical area of Bareilly Municipal Corporation and out growth is 106 km^2. Population density of the city is 8501 persons per km^2. There are 80 wards in the city, among them Bareilly Ward No 46 is the most populous ward with population of about 41 thousand and Northern Railway Colony (OG) Ward No 71 (rural Mdds Code:130478) is the least populous ward with population of 1129.

Nearest railway station is Bareilly which is 26 km far from here. Bareilly is the sub district head quarter of the city. District head quarter of the city is Bareilly which is 26 km away. Lucknow is the state head quarter of the city and is 275 km far from here. Yearly average rainfall of the city is 715 mm. Maximum temperature here reaches up to 45°C and minimum temperature goes down to 8°C.

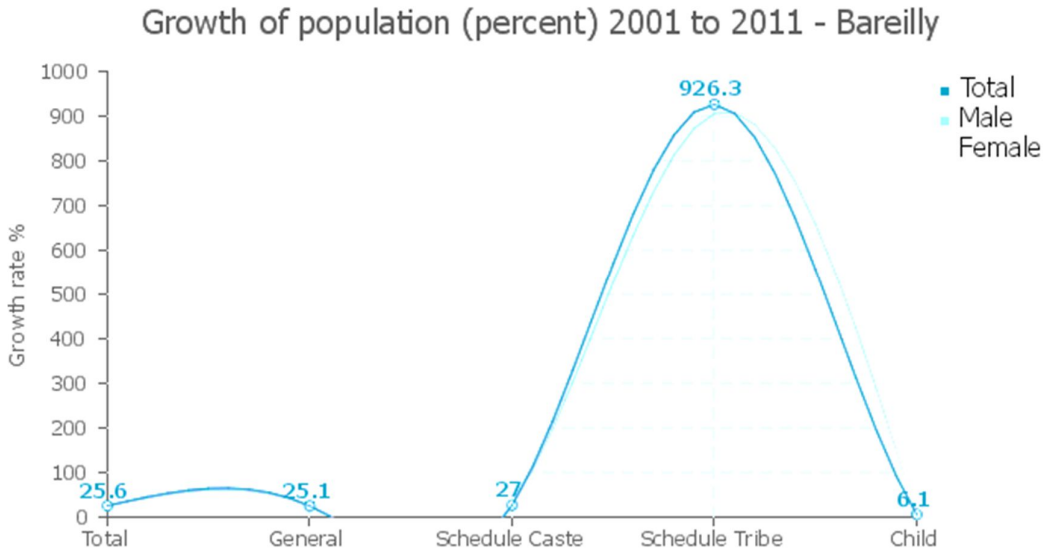
2 Demographics

The city is home to about 9 lakh people, among them about 4.8 lakh (53%) are male and about 4.3 lakh (47%) are female. 92% of the whole population are from general caste, 8% are from schedule caste and 0% are schedule tribes. Child (aged under 6 years) population of Bareilly Municipal Corporation and out growth is 12%, among them 53% are boys and 47% are girls. There are about 1.7 lakh households in the city and an average 5 persons live in every family.

3 Growth of population

Population of the city has increased by 25.6% in last 10 years. In 2001 census total population here were about 7.2 lakh. Female population growth rate of the city is 25.5% which is -0.2%

lower than male population growth rate of 25.7%. General caste population has increased by 25.1%; Schedule caste population has increased by 27%; Schedule Tribe population has increased by 926.3% and child population has increased by 6.1% in the city since last census.

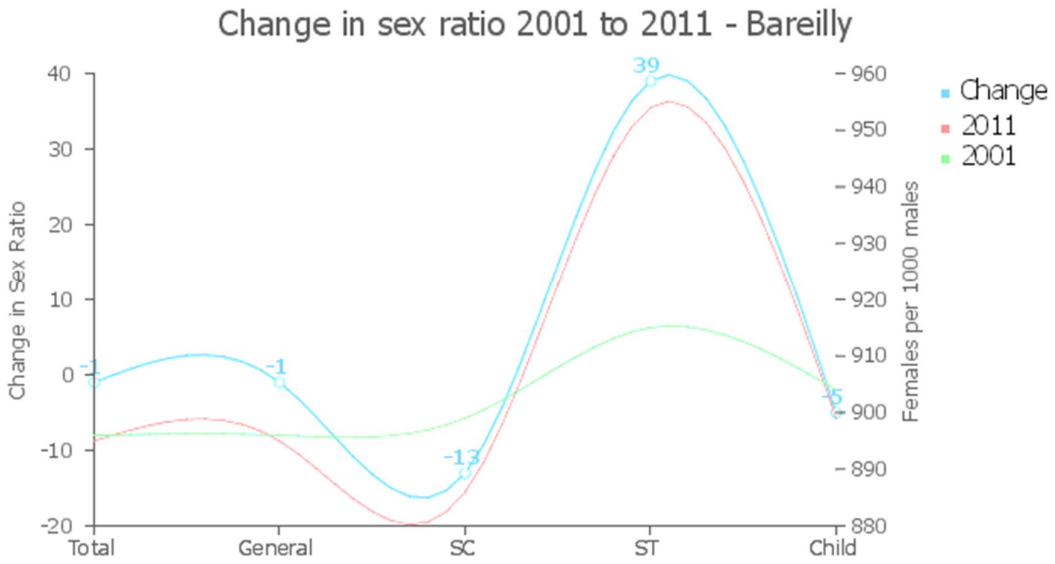


4 Growth of population (percent) 2001 to 2011 - Bareilly

	Total	General	Schedule Caste	Schedule Tribe	Child
Total	25.6%	25.1%	27%	926.3%	6.1%
Male	25.7%	25.2%	27.9%	905.7%	6.4%
Female	25.5%	25.1%	26%	948.8%	5.8%

5 Sex Ratio - Females per 1000 Male

As of 2011 census there are 895 females per 1000 male in the city. Sex ratio in general caste is 895, in schedule caste is 886 and in schedule tribe is 954. There are 899 girls under 6 years of age per 1000 boys of the same age in the city. Overall sex ratio in the city has decreased by 1 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has decreased by 5 girls per 1000 boys during the same time.

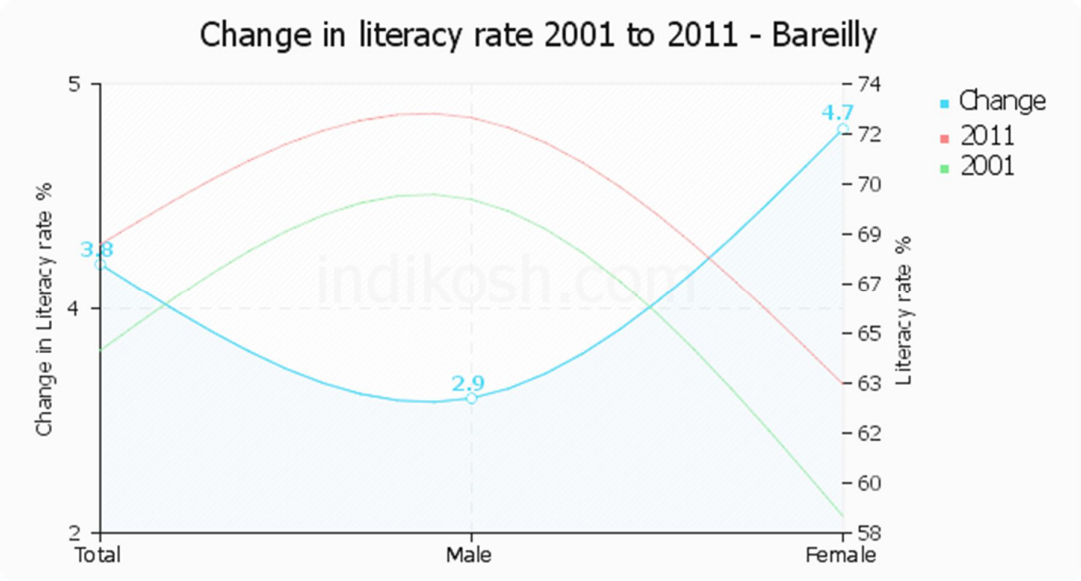


6 Change in sex ratio 2001 to 2011 - Bareilly

	Total	General	SC	ST	Child
Change	-1	-1	-13	39	-5
2011	895	895	886	954	899
2001	896	896	899	915	904

7 Literacy

Total about 5.4 lakh people in the city are literate, among them about 3.1 lakh are male and about 2.4 lakh are female. Literacy rate (children under 6 are excluded) of Bareilly is 68%. 73% of male and 63% of female population are literate here. Overall literacy rate in the city has increased by 3%. Male literacy has gone up by 3% and female literacy rate has gone up by 4%.

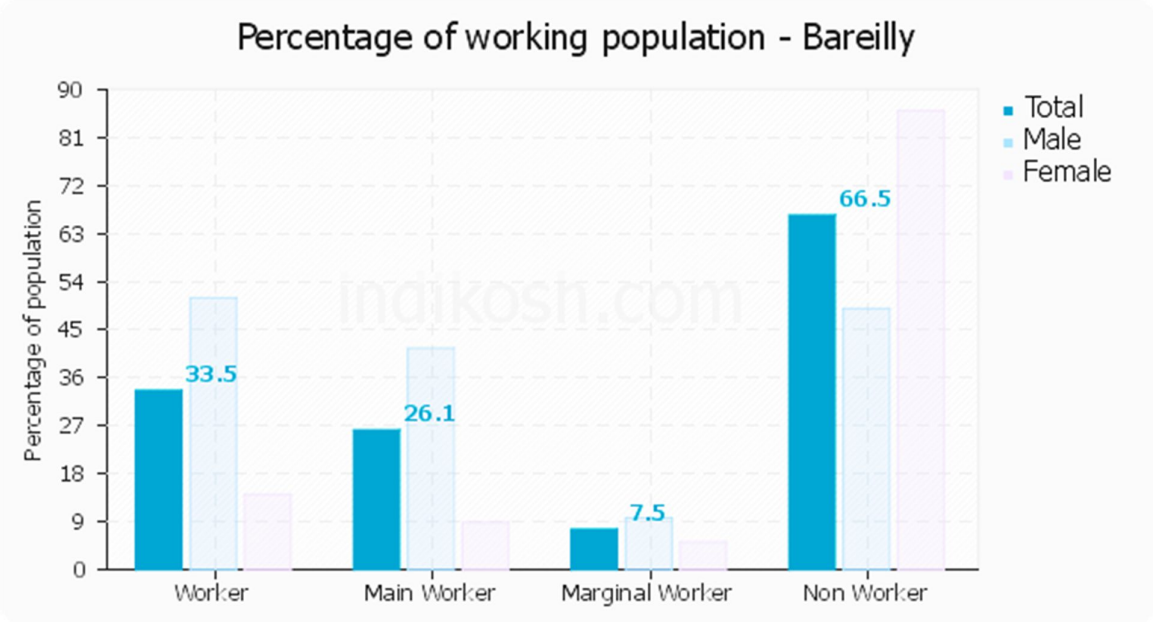


8 Change in literacy rate 2001 to 2011 - Bareilly

	Total	Male	Female
Change	3.8%	2.9%	4.7%
2011	68.3%	72.8%	63.3%
2001	64.5%	69.9%	58.6%

9 Workers profile

Bareilly has 34% (about 3 lakh) population engaged in either main or marginal works. 51% male and 14% female population are working population. 41% of total male population are main (full time) workers and 10% are marginal (part time) workers. For women 9% of total female population are main and 5% are marginal workers.



10 Percentage of working population - Bareilly

	Worker (Among total population)	**Main Worker** (Among workers)	**Marginal Worker** (Among workers)	**Non Worker** (Among total population)
Total	33.5%	26.1%	7.5%	66.5%
Male	51%	41.4%	9.6%	49%
Female	14%	8.8%	5.1%	86%

10.1 Salient Feature of Bareilly City.

Table 1: Salient Feature of Bareilly City.

Ward No.	Population(a)	Area (sq. km) (b)	House holds		Density of population (persons persq.km) (a/b)	Shops	Shelter Home	Theater	Hotel		Apartments	Hostels and institutions	Meat Shop/slaughter houses	Markets		Temple
			Slum house holds	Non slum House-holds										vegetable vegetable	meat	
1	10853	0.296	810	2008	36665	360			4				3	2	1	3
2	10195	0.372		2039	27405	441							2	1	2	4

3	12971	2.040	605	2473	6358	308		2	10		1		1	4	1	3
4	11229	0.919	504	2145	12218	163			22				4	3	3	2
5	11931	0.383		2386	31151	375							2	2	1	1
6	11696	0.235	810	2177	49770	360							1	1	0	0
7	12738	1.300	306	2486	9798	314		1	6				2	3	1	1
8	11938	1.15	805	2226	10380	308		1	10		3	2	1	2	2	1
9	11631	1.075	718	2182	10819	282		2	12				2	4	0	2
10	12859	2.11		2571	6094	225							3	3	2	3
11	10348	0.720	703	1929	14372	602			4				2	1	3	2
12	12765	2.252	508	2451	5668	412		1	12				1		1	1
13	10390	0.972	745	1446	10689	251			2				2	1	1	0

14	11366	0.628		1704	18098	311			3				3	3		2
15	12984	0.344		1947	37744	279	2		3				4	2		4
16	12595	0.770	1002	1738	16357	255			8		1		2	1		5
17	12701	3.430	903	1769	3702	385			7			3	1	2		2
18	9733	1.730	611	1368	5626	411			2		2	4	2	3		6
19	11834	1.220		1775	9700	441							2	2	2	2
20	10871	0.343		1630	31693	312		1	6				18	1		3
21	12719	0.350	805	1787	36340	245			2				2	3		
22	12916	1.450	506	1861	8907	538			4	2			2	1		1
23	11040	0.860		1656	12837	418			8		5	6	1			2
24	10134	0.324	604	1429	31277	302							9	2		3

25	11492	0.368	540	1642	31228	258							1	1	1	1
26	12406	3.790		1860	3273	152					1		2	2		2
27	13400	6.950	603	1919	1928	321		1		67			11	3	1	3
28	9644	1.520		1446	6344	326	1						9	3		1
29	13190	2.40	654	1880	5495	345			8				9	2		
30	9710	3.47		1456	2798	418			3				12	1		
31	13326	0.680	845	1872	19597	222							14	1		
32	10739	0.950		1610	11304	275		2	58		2		2		1	1
33	12255	0.512		1838	23935	182			2				2	1		1
34	9935	1.134	880	1358	8761	210			3				2			3
35	1088	2.1	654	65	518	135	1	2	6				1			2

36	12401	6.430		1860	1928	211				42			2	2		3
37	11928	9.860	555	1705	1209	444							3	3		4
38	12403	2.550	421	1797	4863	301	1						3	1		2
39	12538	0.204		1880	61460	272			3				11	2		3
40	9969	0.307		1495	32472	152			2				7			3
41	9915	0.192		1487	51640	118			4				5	2	1	3
42	12417	0.307		1862	40446	96			2		1		2	1		4
43	10017	0.757	690	1399	13232	502			4				1			2
44	10086	0.450		1512	22413	444			3				6	2	1	4
45	10299	1.136	1078	1383	9066	125							6	1		2
46	11761	1.124	504	1688	10463	179			2				1			

47	10738	1.049		1610	10236	160			1				9	3		2
48	12816	0.0384		1922	333750	195			2				12		1	1
49	9582	0.665	703	1331	14409	121			2				1	3		
50	10207	5.136	965	1386	1987	224			10				1	2	1	2
51	9891	2.608	597	1394	3792	272			4				6	1		1
52	9935	1.250		1490	7948	238			4				11	2		2
53	12469	0.358		1870	34829	219			2				12	1	1	3
54	11718	0.613	1078	1596	19115	108			8				5	3		2
55	10995	2.804	790	1530	3921	98		1	9		2		3	4		3
56	9629	0.023		1444	418652	310			8				2	1	1	4
57	10978	0.200		1646	54890	225			4				7	2		2

58	11445	0.180	690	1613	63583	205							5	3		1
59	10746	7.620		1611	1410	221			3				8	3		2
60	12552	0.280	603	1792	44828	321	1		2				7	2		3
61	11096	0.320		1664	34675	116			1				3	1		2
62	12312	0.432	816	1724	28500	419			4				12			1
63	9669	0.263		1450	36764	312							3	3		2
64	11010	0.200	812	1529	55050	119		1	21				4			3
65	11322	1.020	801	1578	11100	145			22				2			4
66	9769	0.278		1465	35140	178			7					2		3
67	12936	0.480	1103	1774	26950	219					4		2	1		2
68	9675	0.281		1451	34430	238			2				1	2		4

69	10018	0.222	711	1396	45126	318			8				11	1		5
70	10385	1.410		1557	7365	301			2				11	2		3
71	12598	0.248		1889	50798	402			6				7	1		2
72	9843	0.230		1476	42795	211			12				5	3		1
73	11864	2.945	608	1688	4028	106							7			5
74	9985	0.310		1497	32209	92			5				9	2		3
75	12934	0.512	709	1833	25261	109			8				12	1		2
76	9599	0.242	1203	1259	39665	191			4				4	2		4
77	9340	0.276	611	1309	33840	172		1	8				2	4		2
78	12597	0.306	980	1742	41166	208			1				8			1
79	12583	0.483	852	1759	26051	506			2				12			2

80	11265	0.249	812	1567	45240	302			4				7	2		3

Factsheet of each ward has been annexed with annexure no. 1

10.2 Population Growth and Density

Total Area of the city : **106** Sq.km

Total population residing in the city : **1028000**

Floating population : **20,000** (Approximately)

Population growth in the ULB:-

Table 2: Population growth in the ULB

Census year	Population (a)	Area (Sq. Km.) (b)	Gross Density (persons/Sq. Km.) (a/b)
1991	590661	106.46	5550
2001	720315	106.46	6767
2011	903668	106.46	8488.33
2021	105664 (Projected population)	106.46	992.52

10.3 Socio- Economic Characteristics:

According to the 2011 census report, the total population of Bareilly City Region (Bareilly Municipal Corporation) is 8,98,167 having distribution as 53% males and 47% females nearly.

The main population consists of Jatavs and Valmikis, Hindus form 62% of population and Muslims 26% of the population, Sikhs form about 10% of population and remaining are Jains, Buddhists and Christians. Total children (0-6) in Bareilly city are 94,915 as per Census 2011 figure. There were 50,224 boys and 44,691 girls. The children form 10.57 % of total population of Bareilly City

Table 3: Land use pattern

SI. No.	Land Type	Proposed area in 2001 (Area in Hect.)	Master plan 2021 (Area in Ha.)	Change in Area (Ha.) (Increase/Decrease) Proposed in 2021	(%) out of total area
1.	**Residential**	3390	6900.15	3510.15	41
2.	**Commercial**	308	911.5	603.2	5.5
3.	**Public & semi public services**	1344	1257.20	-86.8	7.5
4	**Industrial**	1919	1057.42	-861.58	6
5.	**Administrative Offices**	252	279.39	27.39	2
6.	**Park and play ground**	1769	3675.87	1906.87	22
7	**Traffic and transportation**	1009	1782.65	773.65	11
8	**Railway**	220	0	-220	0
9	**Other**	0	857.95	857.95	5
10	**Total**	**10211**	**16721.83**	**6510.83**	**100**

11 Present Scenario of Solid Waste Management

The Major components of Solid Waste Management are:

1. Composition of municipal solid waste
2. Participation of stake holders
3. Source Segregation
4. Primary Collection
5. Secondary Storage
6. Secondary Transportation
7. Processing and Disposal
8. Problems faced by the ULB during implementation of present SWM system in the city.

Table 4: Waste collection capacity of ULB

SI.No.	Type of Vehicle	Total No.	Each Capacity in (m^3)	No. of Trip	Total Waste transport in (m^3)
1.	Big Truck	06	10.5	4	252
2.	Mazda/Medium Truck	11	4	4	176
3	Tractor Trolley	40	3	3	360
4.	Compactor	02	10	2	40
5.	D.P. Vehicle	07	4.5	4	126
6.	R.C. Vehicle	03	8	3	72
	Total	69			1026

Total average waste collection capacity of MCB = 1026X.45 MT/m3 = 461.7 MTD

The following bar-chart figures is indicative of the typical waste fractions in municipal solid waste generated in India.

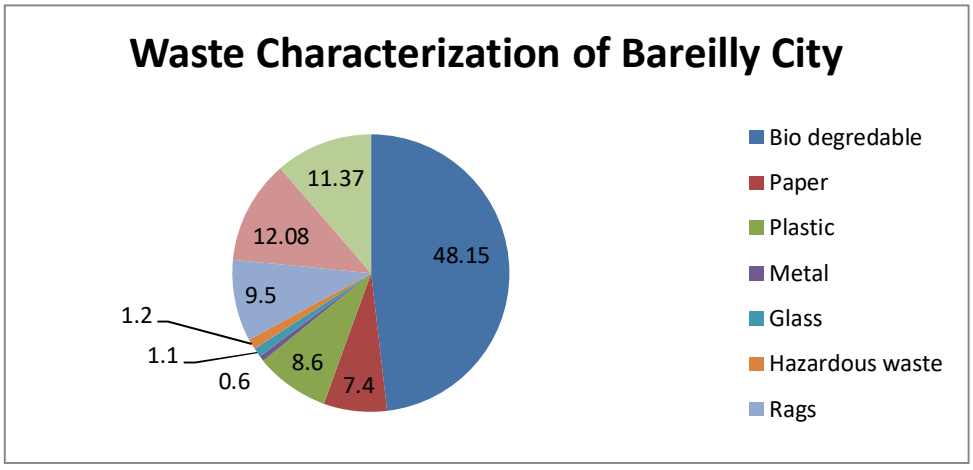


Table 5: Estimation of Source Wise Generated Per Day

SI. No.	Type of Solid Waste Source	Total	Unit quantity of waste generated by various source in (Kg.)	Total quantity of waste generated per day in	(%) out of total waste
A - 1	Non - Slum House holds	130709	1.5	196.06	43.95
-2	Slum House holds	33813	1.25	42.27	9.48
-3	Commercial shops	21650	3	64.95	14.56
-4	Hotel bed >25 bed	14	25	0.35	0.08
-5	Small Hotels	436	11.5	4.86	1.18
-6	Markets (small)	40	350	14	3.13
-7	Weekly market	5	2500	12.5	2.57
-8	Choultries	24	50	1.2	0.26
-9	Hostels	35	21	0.74	0.16
-10	Institutions	185	2.5	0.46	0.10
-11	Boarding & lodging centers	15	35	0.53	0.11
-12	Vegetable shops	850	50	42.5	9.52
-13	Meat shops	412	4.5	1.85	0.41
-14	Slaughter House	2	245	0.49	0.10
-15	Municipal waste from Industries	35	125	4.38	0.98
-17	Theater	7	5	0.04	0.008
-18	Street sweeping waste			35	7.85
-19	Horticulture waste			12	2.69
-20	Waste from floating population				
Total Solid Waste				**448.89**	
B- Total C&D waste generated per day (in mT)				**100.00**	

Table 6: Calculation of Waste as per Capita Generation

Present Population of the City (a)	Waste generation /day/Capita (b)	Total Waste generated per day in TDP(a*b)
10,28,000	**0.435**	**447.18**

11.1 Characterization of Municipal Solid Waste :

a) Total Organic Waste / Wet Waste - **215.3**mTD.

b) Total inorganic Watse /Dry Waste - **172.5**mTD.

c) Total inert Waste - **54.05**mTD.

d) Total hazardous Waste - **5.70**mTD.

11.2 Participation of Contractor & their performance

- Total number of wards: - **80**
- Number of wards out sourced: - **Zero**
- Number of wards managed by the ULB: - **80**
- List of SWM activities that are outsourced:
  - Door to door collection (DTDC) in 59 wards.
  - Main road sweeping 60 km.(10 wards)
- Hired the workers for street sweeping and DTDC: - **320**
- Number of contractor's workers engaged for, Street sweeping:- **120**
- Primary collection of waste: - **59 wards**
- Number of Storage (community bins +PuccaDhalaw): - **230**
- Treatment Unit: - **01 of 100 MTD capacity**
- Waste Disposal Unit: - **01**

11.3 Segregation:-

Segregation has not started yet. All wastes (organic/inorganic) are collected & dumped together in community bins and dhalawghar from where the waste is collected &disposed off at dumping site (**Bakerganj, 5 km from city)**

11.4 Primary Collection:-

Total quantity of waste generated in each day : **450mTD(approx)**

Partial primary collection is done to collect waste from households, commercial establishment & bulk generators at the point of generation, waste are dumped into community bins.
At present, 17 nos. of Auto tripper and 200 nos. of rickshaw and 300 nos. of push cart are in use to collect the waste from door step.

Table 7: Total number of community bins and pucca dhalaw ghar located in the city.

Type 'A' PaccaDhalawGhar @ 40m^3 each	Type 'B' Community Bin @ 4.5 m^3	Type 'C' Community Bin @ 02 m^3	Type 'D' Community Bin @ 01 m^3	Type 'E' Litter Bins @ 0.16 m^3
20	90	40	80	500

11.5 Street Sweeping

About 60% of total roads and streets are swept daily, about 20% of total roads swept /cleaned on alternate days and the remaining twice a week.

11.6 Desolation of Road Side Drains:

- Frequency of desilting the road side drains :- twice per year. (**May &Nov**.)
- Frequency of desilting major storm water drains :- twice per years. (**April & Nov**.)

A- Under ground drainage/Sewer System:

Approximately 45 Km. trunk sewer/underground water drainage system exists in a city but at present no treatment facilities are available. Trunk Drain/sewers are cleaned regularly as per requirement.

B- Major storm water drains:-

Process adopted for desilting: Machines are use (JCB, Nala Safayi machine for desilting of main storm water drains.

11.7 Secondary Storage

The waste from individual household are dumped in to community bins and dhalawghar. The waste is then loaded into tractors, truck, dumper placer (D.P) Vehicle etc. and then taken to Bakarganj dump site for disposal. Vehicles deployment for collection of the waste from different locations/ dhaloghar and bins and transportation upto dumping site Bakarganj has been annexed in **annexure no. 2.**

11.8 Transportation

Quantity of waste transported per day 440 Tones per day. Distance between the city and dumping site is 5 km.

Table 8: Transportation

SI. No.	Type of Vehicle	Total No.	Each Capacity in m^3	No. of Trip	Total Waste transport in m^3
1.	Big Truck	06	10.5	4	252
2.	Mazda/Medium Truck	11	4	4	176
3	Tractor Trolley	40	3	3	360
4.	Compactor	02	10	2	40
5.	D.P. Vehicle	07	4.5	4	126
6.	R.C. Vehicle	03	8	3	72
	Total	69			1026

The road route for transportation of waste is not fixed or defined yet. This is in process. **Vehicle deployment chart for collection of waste from different dhalawghar is annexred as annexure 2**

7.8 Processing and Disposal of waste

Disposal method for waste collected from residential area:

Waste is collected from community bins and puccca dhalaw ghar and is dispose off by processing about 100mTD remaining waste is dumped at Bakarganj disposal site.

Disposal Method for waste collected from street sweeping:

The Waste collected from street sweeping is disposed off open dumping method in Bakarganj.

Disposal Method for desilted waste:-

Waste collected from desilting drains is disposed off by open dumping method in Bakarganj

Land dumping site.

Number of sites used for the disposal of waste in the ULB:

Only one disposal site. (Bakarganj)

Location of the site: Ward No. 38 Bakarganj.

Decentralized system.

No decentralized system of solid waste treatment is practiced .

11.8.1 Problems faced by the ULB during the implementation of SWM

- Lack of knowledge and awareness among the public regarding SWM.
- Problem of free riders.
- Difficulty in collection of user charges for door to door collection (DTDC)
- Non-cooperation of public &staff for DTDC.
- No previous planning & late start of SWM process in the city.

Table 9: Deficit Analysis of Preset SWM system

Deficit Analysis of present SWM System			
Action	**MS Rule 2016**	**Present Status of**	**Proposed SWM system**
Segregation	• Organizing awareness programmes. • Extent of segregation • Promoting recycling or reuse of segregated materials. • Phased programme to ensure community participation in waste segregation	• No effective awareness programmes are organized • No segregation and recycling is followed. • Recycling and reusing is not followed. • No phased programmes are arranged to ensure community participation	• Effective awareness programmes by dedicated team are proposed from May 2019. • Segregation at source effectively formulated through third party from July 2019. • Recycling and reusing is followed by involving local rag pickers at different material recovery facility (MRF). • Programmes to ensure community participation in waste segregation by using enforcement of law.
Primary collection	• Door to door waste collection. • Slums, bulk generators, Commercial and agricultural waste should have separate collection system. • MSW should not mix with hospital and industrial waste • No burning of waste • Recycling of non-biodegradable waste	• Door-to-Door collection is followed only in 59 wards with partial coverage, in remaining of the wards the waste is dumped into community bins. • MSW sometime mixed with other type of waste. • Partial recycling at few houses or other institutions followed by selling of recycling material to local rag-picker.	• Effective door to door collection in all 80 wards with 100% coverage of house and commercial establishment. • Separate collection system is proposed at each door step level by out sourced agency activities enforced by using by laws. • Enforcement of MSW rule 2016 used for maintain the separate waste stream upto the disposal point.
Secondary storage	• Adequate number of covered storage bins • Colorization of the bins: • Bio-degradable wastes -green • Recyclable wastes - blue • Other wastes– black. • Avoid manual handling of waste	No separate secondary storage system is Followed. All the waste are collectively dumped in community bins	• Procured sufficient number of color coded covered storage bins at required place for separate type of waste. • Color coding are strictly enforced • Manual handling of waste is avoid using different type of available technique (liner bag with thread) for handling the waste.

Transportation	• Covered transportation vehicles • Avoid multiple handling of waste • No open dumping • Regular clearance frequency	Partial covered transportation is used and waste are multiple handled and dumped in disposal site.	• Covered Vehicles are used for transportation of wastes. • Avoid multiple handling of waste. • Open dumping is followed
Processing:	• Waste recycling . • Bio-degradable waste has to be inertised and preferably reused after processing like compost etc. • Inert should be land filled in a scientific manner.	Only 100m^3 tones waste processed scientific manner remainning waste is dump on disposal site.	• Recyclable wastes should be recycled. • Bio-degradable wastes to be processed after processing in the form of manure. • Inert waste send to land fill site for scientific disposal. * Scientific disposal or Processing of waste is proposed.
Disposal	• Sanitary landfill	Land has been identified.	✓ Scientific Processing of waste is proposed.
Financial arrangement	-------	It is done through revenue from Municipal fund	✓ Initially 20 Crore has been ear-marked from Nagar Nigam funds and 14th finance commission fund for implementing the solid waste management as per rule 2016. Remaining amount are arrange from VGF under SBM.
Institutional arrangement	-------	Arrangements are made	The entire chain i.e. source to disposal site 3rd party will be identified through proper procedure and part payment will be borne by Nagar nigam while the remaining by user charges collected from public as per tariff decided by the Nagar nigam

12 Proposed Solid Waste Management Action Plan

Table 10: Analysis for the Proposed SWM System

Activity	Proposed Action Plan	Activities that ULB can take up	Activities that has to be privatized
Creating awareness among the community and training of the SHGs worker	Detailed action plan of awareness with the different stakeholders are prepared with date and month wise proposed activities. Community Level-Ward sabha School Level: Awareness camp Staff Level: Meetings and workshops Institutional Level: Meetings and workshops	Awareness organize in Ward Sabha along with the help of Counselors and local peoples. Initiate training program of sanitation staff and officers for improving their capacity building.	Involving the NGO's and other organization for achieving the goal.
Street Sweeping includes **• clearance of dry waste** **• clearance of waste from litterbins** **• Street sweeping along with roadside drain cleaning**	Main road of the city is outsourced for cleaning the road and road side pathway. Presently 60 km of main roads of the city is outsourced for cleaning both dry and wet wastes. Which will have to increased upto 100 km. in the near future	Municipal Corporation will procure street sweeping machines and its operation and maintenance will be outsourced.	Street sweeping and cleaning of main road of the city will be out sourced to different agencies and service level agreement will be put in place and be enforced.
Debris clearance	Debris will be collected separately in the last trip and will dumped separately or will be used for filling low lying area.	ULB is responsible for the clearance of debris which is collected on identified area from where it can be suctioned periodically it can improve the earning of ULB.	Debris clearance activity is not outsourced. It will be collected and disposed of in regular interval. It will be managed by ULB.
Door-to-door waste collection in non slum households	Total number of non-slum households:. 130709 nos. Number of Auto tippers required:80no. Number of Pushcarts required:325no. Number of tricycle required: 210 no	The ULB initially supports the auto tippers, pushcarts, tricycles as a capital cost to the outsourced agency. ULB also integrate the SHGs group with door to door collection team.	The expenditure on door to door Collection is partially borne by the ULB. Maximum part of the expenditure will be funded by the user charges.

Waste Collection of Bulk Generators	**Bulk waste generated per day = 4.865 TPD**	Bulk waste generators should dispose their waste in-situ or MCB can provide service of waste collection through third party on payment basis.	Waste collection is outsourced on payment basis.
Waste Collection in Slum Area	**Collection Plan:** Total number of slum households: 33813 nos. Number of auto tipper required: 09 Number of Pushcarts required: 200 nos. Number of Tricycle required: - 50 nos.	In all slums area, ULB will collect the waste From door step. A separate strategy will adopt for waste collection.	Color coded bins are Placed at identify area to dump the house hold waste. ULB and outsource agency will work with proper understanding for waste collection and clearance from slum area .
Transportation of Street Sweeping Waste and Debris	ULBs provide separate Vehicular fleet for street sweeping and debris as per requirements. 05 Street sweeping machines, 08 tractors and 02 compactors all use for this purpose.	The ULB is responsible for transportation of street sweeping waste	ULB transports all type of waste by own resources from transfer station to disposal site at Bakerganj. ULB proposes to procure required number of big trucks equipped with GPS and geo-fencing technology will be used to track movement and trips of the vehicles.

Processing and disposal	A concessionaire M/s AMAZO Waste Solution Pvt. Ltd. engaged through an agreement to dispose all the incoming waste in scientific manner by converting the waste into crude oil, sin gas and inert material, at present 100 TPD plant is installed and successful trial is achieved. Agency will replicate this plant for processing of all incoming wastes as well as legacy waste. For segregated wet waste decentralized compost plant is proposed in future for this land identification work is in progress.	For segregated wet waste decentralized compost plant is proposed in outskirts of the city at available land / park. For segregated dry waste material recovery facilities is being proposed at different location in the city with the help of local rag picker. For inert material sanitary landfill site has to propose for which land identification work is under progress.	.

12.1 Conducting awareness among the community

The ULB's course of action for conducting awareness among the following target groups are as follows:

For General Public: Issue of handbills, use of local cable network, ward sabhas and through local mass-media.

In Schools: Awareness creating programme on importance of solid waste management

Other Institutions: Regular meeting with business community regarding management of waste.

Outsourced Staff: Weekly meeting explaining them about the work they have to perform and about solid waste management and taking care of their health.

SWM Health workers: Educate them on the importance of segregation, collection and handling of waste and regular health check up.

Elected representatives: Conducting workshop at ward level for elected members of ward prothsahan committee in monthly basis. IEC activities (Nukkad Natak, Awareness rally etc.) at ward level with the help of DTDC team, elected representatives, children and public.

Information, Education and Communication

For Bariely, success of solid waste project depends upon the attitude and willingness of waste generator in which IEC play an important role. For effective implementation of solid waste project, the IEC needed at three strata. Which are as followings:-

- Collection, segregation & treatment at household level
- Collection, Segregation & Treatment at community level
- Collection, segregation, transportation, treatment and final disposal at ULBs level

For effective implementation of waste management at these three levels, the required communication for target group will be identified on following basis:-

- To whom we are communicating (audience)
- What we are presenting (information)
- The method of communication (Mode of communication)
- Approach to bring changes (Action Plan)

Overall, Principles of strategy for IEC and Public awareness are based on the downward dissemination theory and Convergence theory for the message dissemination, Behavior change and capacity development on integrated Solid Waste Management (ISWM).

Following strategies shall be adopted by Nagar Nigam, Bariely to enhance the efficiency of cleanliness of city along with participation of community in waste management.

- **Sensitization cum Workshop of town leaders for BCC on SWM**

This workshop shall be aimed at sensitization of community leaders and also take their feedback. These town leaders shall be requested to disseminate the information amongst their community and they will be motivated to spearhead the movement in the town. This workshop shall also be utilized to identify volunteers dedicated to the cause of MSWM.

- **Sensitization cum workshop of Ward leaders for SWM**

This workshop shall be organized 7 – 10 days after the town leaders workshop and shall be aimed at establishing partnerships with the ward level community leaders. Ward level volunteers dedicated to the cause of waste management shall be identified in the workshop.

- **Sensitization cum workshop at community level**

It shall be done by way of ward level camps and other community based activities. SHGs formed in the wards could be assigned pivotal role in it. Use of folk dance, slogan and other community based communication system shall be established.

- **Training and sensitization of support organization and Volunteers on BCC**

Finally, the person who is collecting waste and manage waste shall be trained in such way that he could understand the objective of each activity.

- **Interpersonal Communication (IPC)**

Contacting every household through town leaders and supporting organizations, Volunteers. These volunteers shall convey the message to each and every household and take their feed back as well.

- **Adaptation of Convergence theory**

For the message dissemination and BCC by involving religious leaders, SHGs, Youth Clubs, Mahila Mandals, RWA and with prerecorded religious & Cultural progrmme.

- **Involvement of Academic Institution**

Involvement of Institutions academicians for the Environment and atmosphere building by school/College Student as School Rallies, Slogan writing, essay Competition etc.

- **Establishment of Swachhta Committee**

Formations and Involvement of Swachchata Committee comprising of Volunteers or Natural Leaders in each ward who will act as SBM ambassadors and take oath for Waste free Bariely and each committee shall have minimum 10 members. These motivated volunteer will play an important role and enforcement of SWM Rules, 2016 in their respective ward.

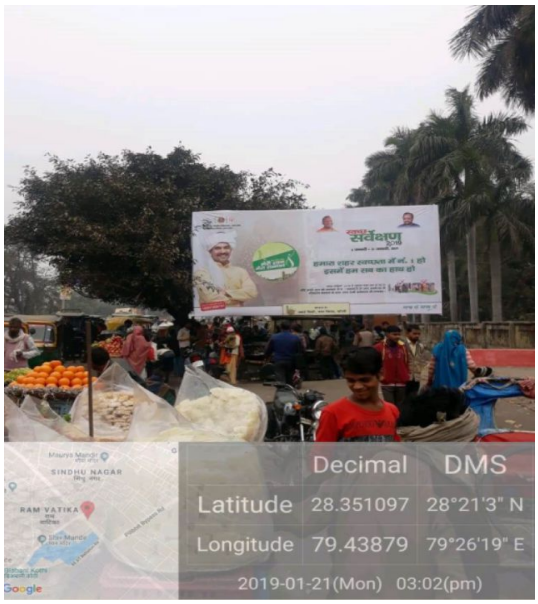
Details of IEC program/activities with the different stakeholders is annexed in annexure no. 3

IEC Activity Schedule

			Year 2019								
S.No	Activities	Stakeholders	April	May	June	July	Aug	Sep	Oct	Nov	Dec
1	Awareness Program	Residence Welfare Society									
2	SWM Trainning	Sanitary Worker Trainning									
3	Nukad Natak/ Public Awareness program	Religious Place, Bus Stand, Railway Station & Public Places									
4	SWM Workshop	All NGO/Hotels Association/Banquet Hall Association/Vyapaar Mandal Association/Hospital Association Etc									
5	SWM Trainning Program	Waste pickers									

6	SWM Workshop	Swachh Vatavaran Protshahan Samiti									
7	Nukkad Natak/ SWM Awareness Program	NNB Employees									
8	SWM Workshop	All Ward Councilor (01-80)									
9	Painting Competition, Eassy Competition, Logo Competition, SBM Quiz	Schools									
10	All Competition	Top 05 School Prize Distribution									
11	Maha Rally	Maha Rally									
12	SWM Trainning	Sanitary Worker									

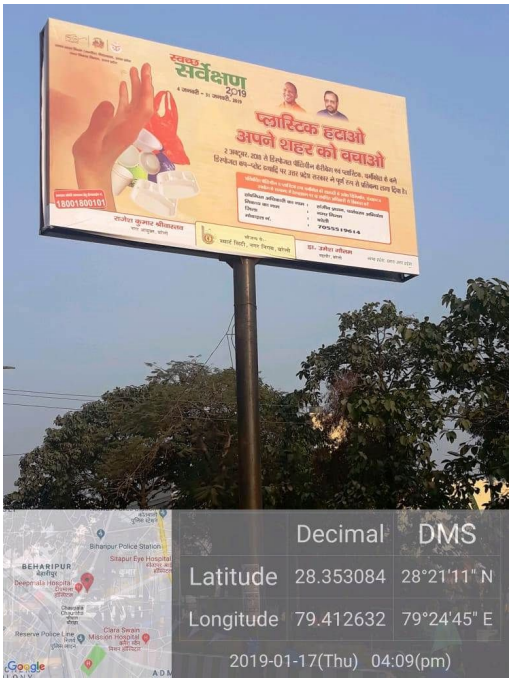
13	workshop	NGO/SNG									
14	Rally/Rangoli Competition/Nukad Natak	Nagar Nigam Compound (Kasturba Girls Inter College, Molana Azad Inter College, Tilak Inter College)									
15	SWM Workshop	All NGO/Hotels Association/Banquet Hall Association/Vyapaar Mandal Association/Hospital Association Etc									
16	Awareness Activities (Wall Painting, Holding, Banners, Pumplet Distribution	All Religues Places/Sabji Mandi/Commercial Areas/Residential Area/Slum Areas/All Parks/Bus Stand/Railway Station & Public Places									
17	Awareness Program Inter Ward Competition for sanitation Service Benchmark sensitision	All Religues Places/Sabji Mandi/Commercial Areas/Residential Area/Slum Areas/All Parks and Gardens/Bus Stand/Railway Station/All CT & PT/ Public Places									


Decimal DMS
Latitude 28.351097 28°21'3" N
Longitude 79.43879 79°26'19" E
2019-01-21(Mon) 03:02(pm)


Decimal DMS
Latitude 28.357311 28°21'26" N
Longitude 79.432369 79°25'56" E
2019-01-20(Sun) 05:10(pm)


21 & 5.4


एक कार्य हम करें भला
स्वच्छ रहे हर गली मुहल्ला।
स्मार्ट सिटी
नगर निगम, बरेली
17.5 & 5.2


स्वच्छ सर्वेक्षण
2019
प्लास्टिक हटाओ
अपने शहर को बचाओ
Decimal DMS
Latitude 28.353084 28°21'11" N
Longitude 79.412632 79°24'45" E
2019-01-17(Thu) 04:09(pm)


Decimal DMS
Latitude 28.33885 28°20'19" N
Longitude 79.401848 79°24'6" E
2019-01-17(Thu) 07:51(pm)

NB: Although, Rag picker mobilization and strengthening is extra part of SWM with convergence of NULM. Under the partnership, we will do the strengthening rag pickers and Kawbadis wala for the collection and segregation of SWM at HHs Level as well as at the waste sorting centre by giving them training and also their capacity development for their livelihood.

The format of communication material will be as follows**:-**

S.No.	Name of Format	Design Specifications	Standard Size
1.	Hoarding	12ft×8ft	Big Size
	Hoarding	8ft×5ft	Medium Size
	Hoarding	5ft×3ft	Small Size
2.	Banners	6ft×4ft	Big Size
	Banners	5ft×3ft	Medium Size
	Banners	3ft×2ft	Small Size
3.	Poster	2ft×3ft	Big Size
4.	Poster	1.6ft×2ft	Medium Size
5.	Poster	1ft×1.6ft	Small Size
6.	Pamphlet	5"×7"	4 Page fold
7.	Audio/video clipping	30 Sec spot	For Facebook/FM and other electronic communication
8.	Brochure on SWM	320mm×460mm	Half fold
9.	Slogan	One line to 5 line in local language/Hindi	In terms of key word slogan
10.	Folk	20 min	Local and target group (audience) specific

8.2. Segregation

The waste has to be segregated into two types:

Wet waste: food waste, bio-degradable waste etc.

Dry waste includes recyclables: Paper, plastics, rubber, wood, inorganic wastes etc.

8.3 Primary collection

The primary waste collection is to be taken under two heads:

A. **Street sweeping**:-ULBs provide separate Vehicular fleet for street sweeping as per requirements. 05 Street sweeping machine and 80 auto tipper (1 for each ward) and 400 pushcart (avg. 5 in each ward) and 02 compactor are required for cleaning the street & road. Main road of the city is swept daily basis throughout-sourced agency and mechanical sweeping machine. Other road are clean regular basis by the own ULB staff. All required resources are available in MCB except street sweeping machine. Tender/bidding already done and will available for work since June 2019. Street sweeping include following activities. :-

- ✓ Cleaning of silt accumulation along kerbs, meshes and shoulders of drain.
- ✓ Sweeping of road, streets and footpath.
- ✓ Cleaning of wild vegetation (grass and plants on the sides of road).
- ✓ Cleaning of desilting of open drains.
- ✓ Emptying of litter bins.

About 1900 sanitary workers had been deployed for cleaning the city regularly. They involve in all above activities for cleaning the city. Municipal Corporation Bareilly has propose to equipped them with all protective wear gears i.e. gloves, mask, apron, boot etc. for protecting them from contact of dust and garbage. The requirements of the protective wear and gears have been shown in table no. 11 for year 2019-20.

Table 11: Protective wear and gear for sanitary workers for year 2019-20

S.No.	Particulars of item/ equipment	Numbers
1	Hand gloves	4000
2	Masks	4000
3	Boots	2000
4	Florescent Aprons	3000

For providing dust free city ULB have to clean (sweeping) twice in a day at all commercial areas. For this purpose required Number of sanitation workers along with equipment has to outsource. Time-line

for ensuring dust-free of city is targeted by October, 2019.

B. **Door-to-door waste collection:**

B-1 Door-to-door collection for non slum house hold.

- Number of non slum house hold in the city in 80 wards = **130709** house hold.
- Total number of command area @ 05 each wards = **400**
- Requirement of auto tipper, tricycle, push cart required as per ward locations.

On an average 01 auto tipper is required per ward which could serve at least one thousand households.

Total households serviced by the auto tipper =**80,000**

Remaining non-slum households served by tri-cycle, pushcart = 130709-80000= 50709.

One Tricycle can serve 200 households per day and on an average 03 tricycles are required in each ward which can serve 600 households. Hence for 80 wards, 240 tri-cycles are required which can approximately serve 48000 households in the city.

For non-slum house hold requirement of

Auto tipper = 80 nos ,SHG or workers require = **160**

Tricycles = 240 nos ,SHG or workers require = **240**

Puch chart = 50 nos ,SHG or workers require = **50**

Total SHG or workers required for waste collection in non-slum house hold= **450**

Supervisory/user charge collector = **80**

Managerial staff 10 in each wards= **08**

Total manpower required for non-slum house hold = **450+80+8= 538.**

B-2 Door to door collection for slum house hold.

- Number of slum house hold in the city in **48 slums** = **33813 house hold**.
- Total number of command area @ 01 each slum = **48**
- Requirement of auto tipper, tricycle and pushcart required as per ward locations.

On an average @ 01 auto tipper required for 03 slum area. Which serve average one thousand house hold. Total household served by the auto tipper **16000(48/3=16)**

Remaining slum household served by tricycle, pushcart = **33816-1600=17816**

Tricycle served @ 200 house hold per day average require 01 in each slum. Which served 9600 house hold in slum area. Rest approximate 8200 household have to served by pushcart with @ 60 household each. Which required 136 pushcart.

For slum house hold requirement of

Auto tipper =16nos,SHG or workers require = **32**

Tricycles = 48nos,SHG or workers require = **48**

Push chart = 136nos,SHG or workers require = **136**

Total SHG or workers required for waste collection in non-slum house hold= 216

Supervisory /user charge collector = 08

Managerial staff 10 in each wards= 02

Total manpower require for non-slum house hold = **216+8+2= 226.**

B-3 Door to door collection for Shop, Commercial and others.

Total No. of shops commericial and others =23410

For this type of unit only auto tipper are used for collection of segregated waste. On an average one auto tipper use for 400 users. Total number of auto tippers required= **60.**

Total SHG or workers required for waste collection for Shop, Commercial and others. = **120**

Supervisory/user charge collector = **30**

Managerial staff 10 in each wards**= 06**

Total manpower require for Shop, Commercial and others. = **120+30+6= 156.**

B-4 Door to door collection for Bulk waste generators (BWG)

Total number of bulk waste generators =**127**

In city it can be assumed that @25 % of bulk waste generatorsi.e**32 nos** process their waste in-situ. **Remaining 95**BWGs need help from MCB for transportation & processing of waste on payment basis. Auto tipper required for collection & transportation of waste from bulk generators atleast1 for 10 BWGs which translates to 10 to cover all the BWGs.

Table 12: Resources required for door to door collection of waste in Bareilly City

S.No.	Door- to- door collection	No. of Auto tipper	No. of Tricycle	No. of Pushcart	Man power Engaged		
					SHG/ Sanitary worker	Super -viser	Manager
1	Door to door collection for non slum area /house hold	80	240	505	450	80	8
2	Door to door collection for slum area /house hold	16	48	136	216	08	02
3	Door to door collection for Shop, commercials & others	60	--	--	120	30	6
4	Door to door collection for Bulk waste generators	10	--	--	20	10	2
	Total	**166**	**288**	**186**	**806**	**128**	**18**

All auto tipper will equipped with GPS, for monitoring the service a control unit will work under the guidance of the municipal commissioner.

ULBs have to arrange all capital resources through 14th Finance Commission and its own fund. Time-line to complete **100% door-to-door collection is by September 2019.**

Table No. 12: Waste collection plan:

Type of waste	Frequency of waste collection

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday.
Wet waste collection from residential area 6:30 AM to 10:30AM	✓	✓	✓	✓	✓	✓	✓
Dry Waste collection from area including residential and commercial area. 10:00AM to 1:00 PM.	✓	✓	✓	✓	✓	✓	
Waste collection from bulb generator 2:30 PM to 4:30 PM.	✓	✓	✓	✓	✓	✓	✓

City map de marketing the command area for primary waste collection through SHG/workers in the non-slum house hold area.

B-5.Collection of construction and demolition waste and dead animal/carcass.

For collection of construction and demolition waste has to plan separately as per C&D waste rule-2016. For this request for proposal are invited for 11 points in different locations in the city as given in **annexure -4.** C&D waste collected from the different identified locations/places of the city are proposed to transfer to Swale Nagar ward no. 30 where C&D waste processing Unit is proposed. Total services have been planned to be out-sourced as per the C& D rules-2016. **Time-line for this service implementation will be August, 2019.**

In the case of dead animal/carcass disposal, both collection and disposal will be out-sourced as per rules.

B-6. Contingency plan for waste collection:-

The contingency plan for waste collection for emergency and additional work such as Mela, rally, local festivals etc. For this purpose a special gang with 20 workers with all equipment, bins and vehicles will be made available 24×7.

B-7.Placement of Litterbins:-

Dual-type Litterbins (for wet and dry wastes) having individual capacity of about 50 litres are placed at different parts of the city as per need and requirement. In commercial area bins are placed about 100 metres distance and other residential areas bins are placed as per requirement or about 500 etre distance. 1200 bins are planned tube placed, out of which about 500 bins are already placed. All the litter bins are equipped with color coded liner bags to avoid the direct contact of garbage. Approved quality PVC liner bags will be used in this process.

12.2 Secondary Storage

Waste collected from every door step is transported to different secondary points. Details of secondary points in the city are shown in this table.

Table 13: Table showing the different type of secondary storage

Type 'A' Pacca Dhalaw Ghar @ 40m^3 each	Type 'B' Community Bin @ 4.5 m^3	Type 'C' Community Bin @ 02 m^3	Type 'D' Community Bin @ 01 m^3
20	90	40	80

MCB is planned to eliminate that type of secondary storage point in phase-wise manner and proposed transfer station to collect the entire zone-wise waste generated. Following places are identified for the construction of transfer stations in the city:

01- Near C.I. Park. Ward no 08

02- Pilibhit road near Jagran office. Ward no 03

03- Swalley Nagar near railway track. Ward no 30

04- Budaun road. Ward no 12

Plan for construction of four transfer stations is prepared and work is proposed to begin from June 2019 and will be completed by august 2019. After construction of transfer stations, Pucca Dhalaw Ghar and other types of bins will be eliminated in a phase manner.

For collection of recycle waste material recovery facilities (MRF) are planned at 08 places, two in each zone of the city. At every transfer station a place will be provided for material recovery facilities from where recyclable material will be sorted out and be disposed according to provisions of SWM rules 2016. Local rag-pickers will be engaged for recovery of recyclable material. Time-line for starting the MRF is August, 2019 and proposed to complete up to October 2019. Place identify for construction of MRF are as follows-

Table 14: Place of Material recovery facility (MRF) and Decentralized Compost Unit

S. no	Zone nos	Place of Material recovery facility(MRF) and Decentralized Compost Unit		
1	1	Swalley Nagar near railway track W-30	Kunwarpur W-56	
2	2	Budaun road W-12	Indra Market W-20	Sarai khan W-64
3	3	Near C.I. Park. W-08	Delapeer W-67	Shahdana W-60
4	4	Pilibhit road near Jagran office. W-03	Bukharpura W-30	Badibihar W-10

12.3 Transportation of waste:-

Total waste generation of the Bareilly city from different sources are about 450 MTD. The wastes are collected from different secondary storage points and transported by the vehicle of Nagar Nigam. The available vehicle for transportation of waste is shown in the table.

Table 15: Vehicle Details

SI.No.	Type of Vehicle	Total No.	Each Capacity in m^3	No. of Trip	Total Waste transport in m^3
1.	Big Truck	06	10.5	4	252
2.	Mazda/Medium Truck	11	4	4	176
3	Tractor Trolley	40	3	3	360
4.	Compactor	02	10	2	40
5.	D.P. Vehicle	07	4.5	4	126
6.	R.C. Vehicle	03	8	3	72
	Total	**69**			**1026**

After construction of transfer station at identified locations following plan is proposed for transporting the waste.

Table 16: proposed vehicles deployment from the proposed Transfer station

SI.No.	Transfer station Location	Vehicle deployed Big Truck HIWA	Capacity of each vehicle in mT.	No. of Trip	Total waste Transport (inmT.)
1	Near C.I. Park.	03	10	04	120
2	Pilibhit road near Jagran office.	03	10	04	120
3	Swalley Nagar near railway track.	03	10	04	120
4	Budaun road.	03	10	04	120
	Total				**480 mT.**

At least 12 big trucks are required for transportation of entire waste collected from the city. Available small vehicle are used for transportation of waste upto the transfer station. Available two big trucks are used for standby arrangement. Two existing compactors are used for collecting wastes from outskirts of the city. All vehicles used for the transportation of wastes will be equipped with GPS for proper monitoring and controlling of the entire cycle. Route map of the primary and secondary waste collection and transportation is annexed in **annexure no.5**

12.4 Processing and disposal of waste:-

MCB has two land segments as detailed below:-

01- RajauParaspur:- Nagar Nigam has 21.2 acre of land for solid waste management plant. In this land a processing plant for converting the waste into compost and sanitary landfill has been made. Due to local hindrance and writ filed public interest of the nearby land holders, the Hon'ble NGT had temporarily closed this plant.

02- Bakarganj:-Nagar Nigam currently dumps entire collected waste of the city in Bakarganj processing plant. Nagar Nigam engaged a concessionaire AMAZO Waste Management Solution for processing the generated waste and legacy waste at the site for bio-remediation/conversion into a usable form. Detail of this site as given below.

a) Name of location : Bakarganj
b) Type of land : Nagar Nigam
c) Area : 7.182 Hectare. approximate 17 Acre.
d) Minimum distance from the city : 01 Km.
e) Maximum distance from the city : 09 Km.

f) Average distance : 5 Km.

g) Total Legacy Waste : Approx 06 lac tons.

h) Present status : Waste heaped upto 10-15 meter height.

At this plant concessionaire M/s AMAZO waste management solution established a processing plant of 100 mTD for converting the waste into fuel, sin gas and inert material. Concessionaires have planned to establish similar 06 parallel units for processing the entire generated waste of the city as well as legacy waste.

03- Decentralized Material recovery center and Compost Processing Unit

BMC had identified the 11 different locations in the municipal area as per above table no 13 for Decentralized Material recovery center and Compost Processing Unit.

BMC has also initiated the process for identifying other suitable land at the outskirts of the city with proper road access in order to establish a decentralized processing plant and sanitary landfill site for safe disposal in the near future.

Table 17: Daily activity chart for SWM.

Activities	**6.30 to 8.30**	**8.30 to 9.30**	**9.30 to 11.30**	**11.30 to 12.30**	**12.30 to 2.30**	**2.30 to 4.30**	**4.30 to 6.30**
Part A – Collection and Transportation						✓	✓
Street Sweeping	✓	✓	✓				
Door to Door Collection from Residents	✓	✓	✓	✓			
Waste collection from slums		✓	✓				
Collection from Bulk Generators	✓	✓				✓	
Transportation of wet waste				✓	✓		✓
Transportation of s street sweeping waste			✓	✓			✓
Collection and transportation of constructional waste						✓	✓
Cleaning of drains	✓	✓	✓			✓	
Part B – Processing and Disposal							
Processing and Disposal			✓	✓	✓	✓	✓

Time line (start and completion of different SWM activity) is annexed as annexure-6

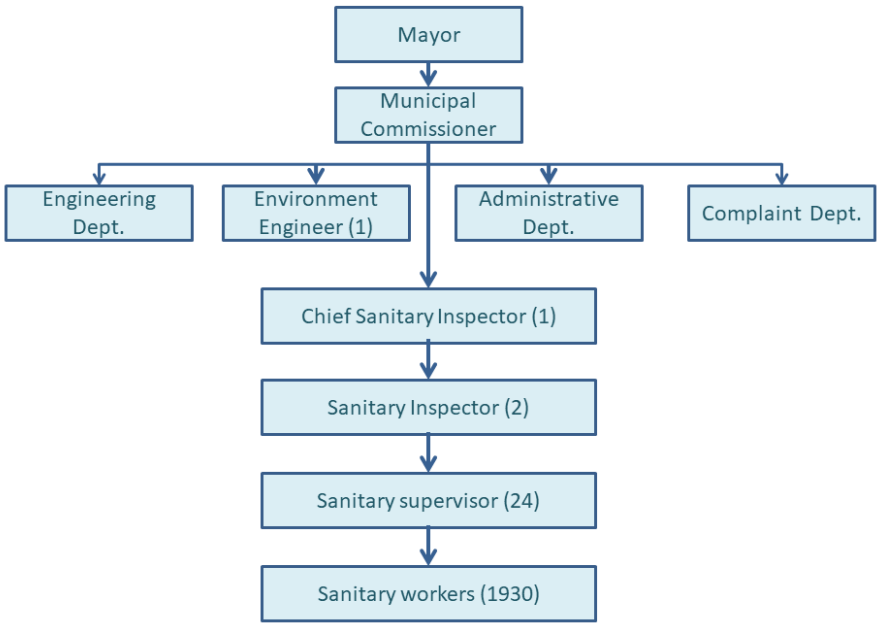
12.5 Institutional Arrangement:-

(A) Presently the following staff is working under SWM the table below given the details of the work that allotted presently.

Table 18: Institutional Arrangement

Present staff for SWM	Number	Work allotted presently
Sanitary workers (Permanent)	1318	Cleaning Activities
Workers (On contract wages)	634	Cleaning Activities
Drivers	22	Driving Activities
Cleaners	02	Assistance in transportation
Supervisior	24	Supervising Sanitary Workers
Inspector	08	Supervising SWM Activities.
Chief Sanitory Inspector	02	Supervising SWM Activities.
Environment Engineer	01	Monitoring overall SWM Activities

12.5.1 Organizational Structure of SWM



12.5.2 Financial Arrangement:-

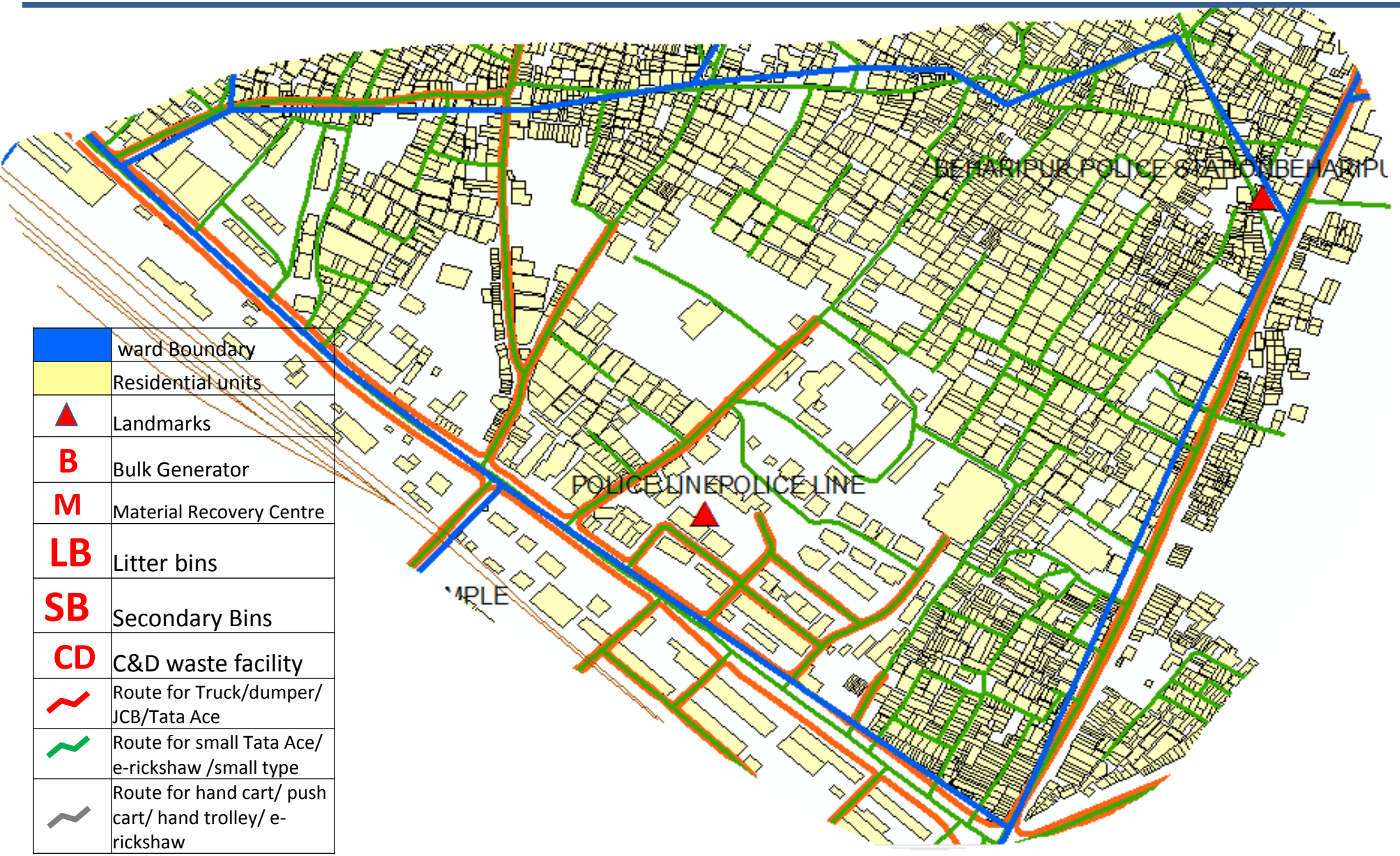
The financial requirements are proposed to be worked under two components.

1. Capital Cost
2. Recurring Cost.

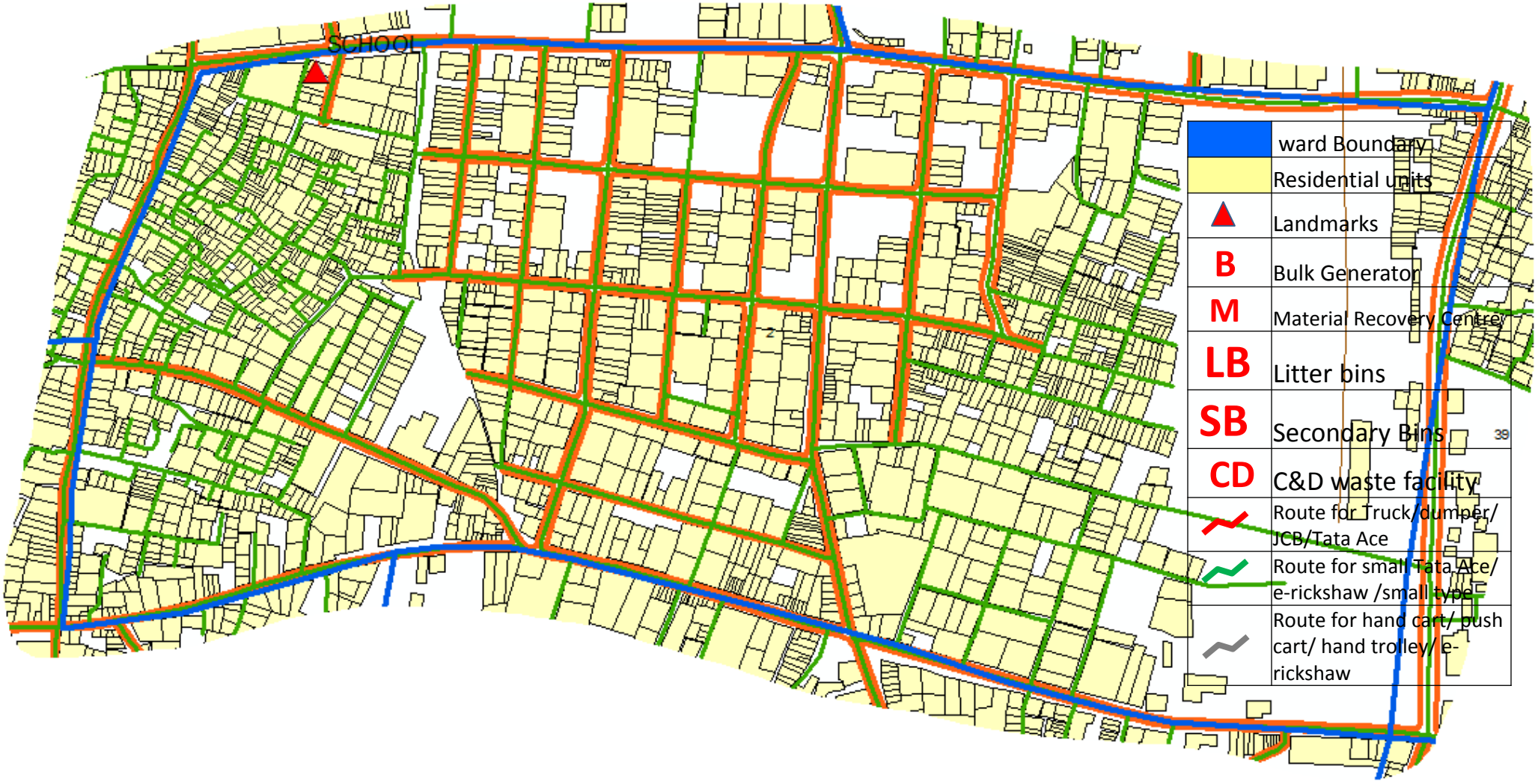
01-**Capital Cost**:- Nagar Nigam procure vehicles, equipment, tool, plants etc. All essential items for solid waste management can be made available under the 14th finance Commission grants to the ULB. Currently, Rs. 10 crore is approved under FFC for purchasing of essential vehicle for managing solid waste.

02- **Recurring Cost**:-Nagar Nigam allocated about 5% of the total yearly budget for recurring expenditure of solid waste management (SWM) in the last three years. This budget is used for door-to-door collection, transportation of waste, fuel expenditure, maintenance of vehicle and procurement of tools and equipment. As per commitment of the Nagar Nigam Board Rs. 10 crore will be further allocated in supplementary budget for improving the services of solid waste management as per MSW Rule-2016.

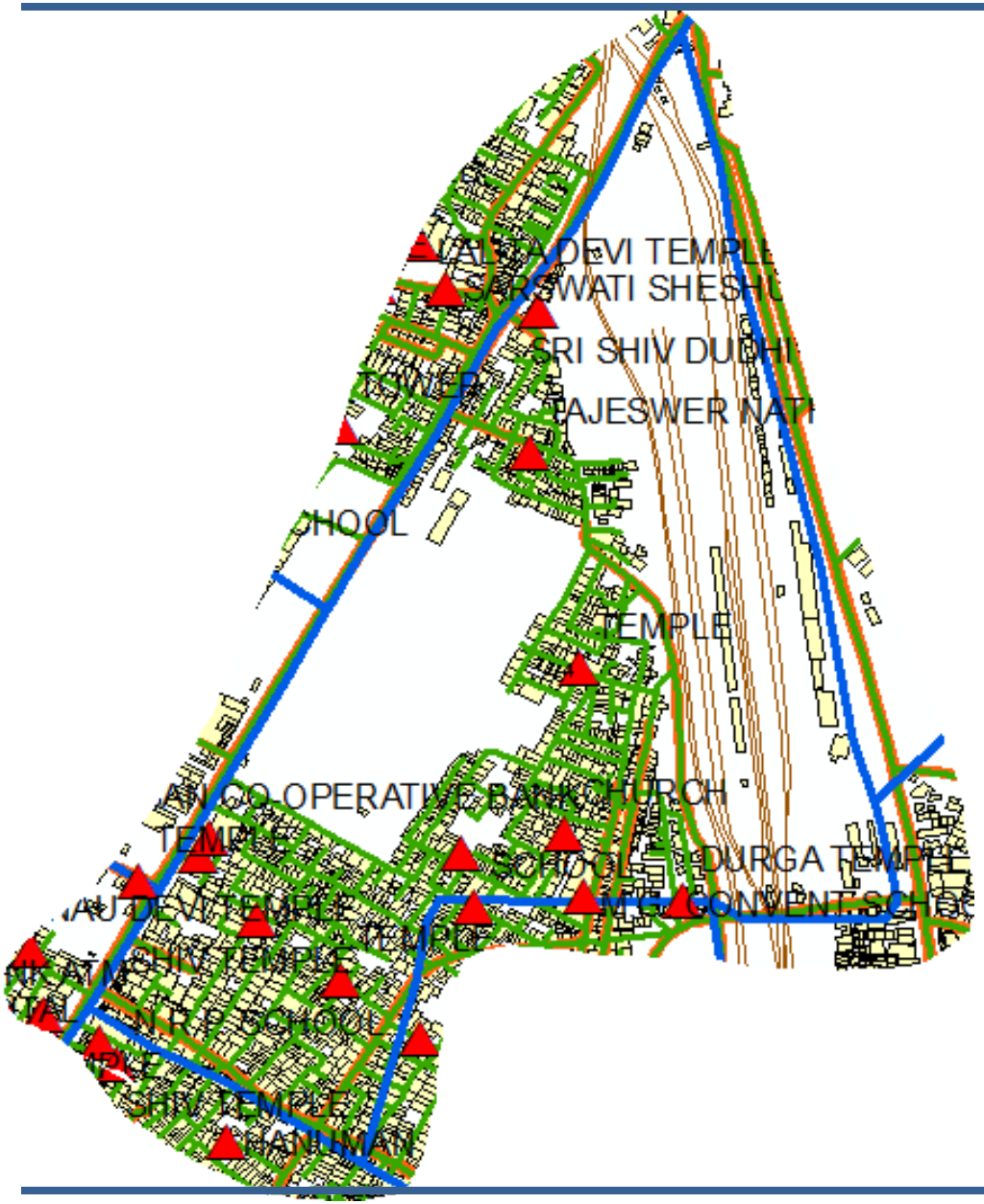
A Detailed DPR for Integrated solid waste management is mandatory for addressing all the issues related to solid waste management after a detailed survey and study of socio-economic and environmental conditions of the city aspiring to become Smart city. Remaining amount of the project cost (as per DPR) can be made available from VGF of Swachch Bharat Mission.



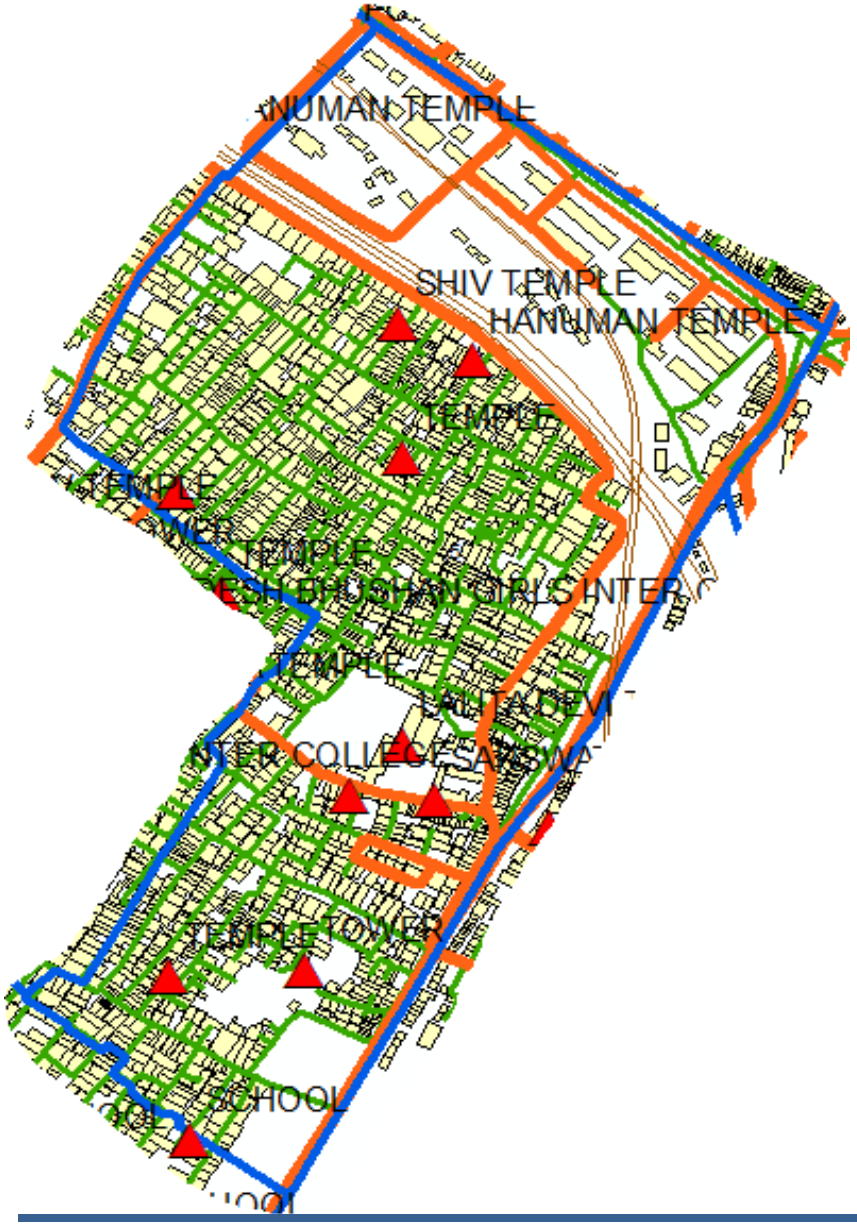
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw


SCHOOL
ward Boundary
Residential units
Landmarks
B
Bulk Generator
M
Material Recovery Centre
LB
Litter bins
SB
Secondary Bins
CD
C&D waste facility
Route for Truck/dumper/ JCB/Tata Ace
Route for small Tata Ace/ e-rickshaw /small type
Route for hand cart/ push cart/ hand trolley/ e-rickshaw

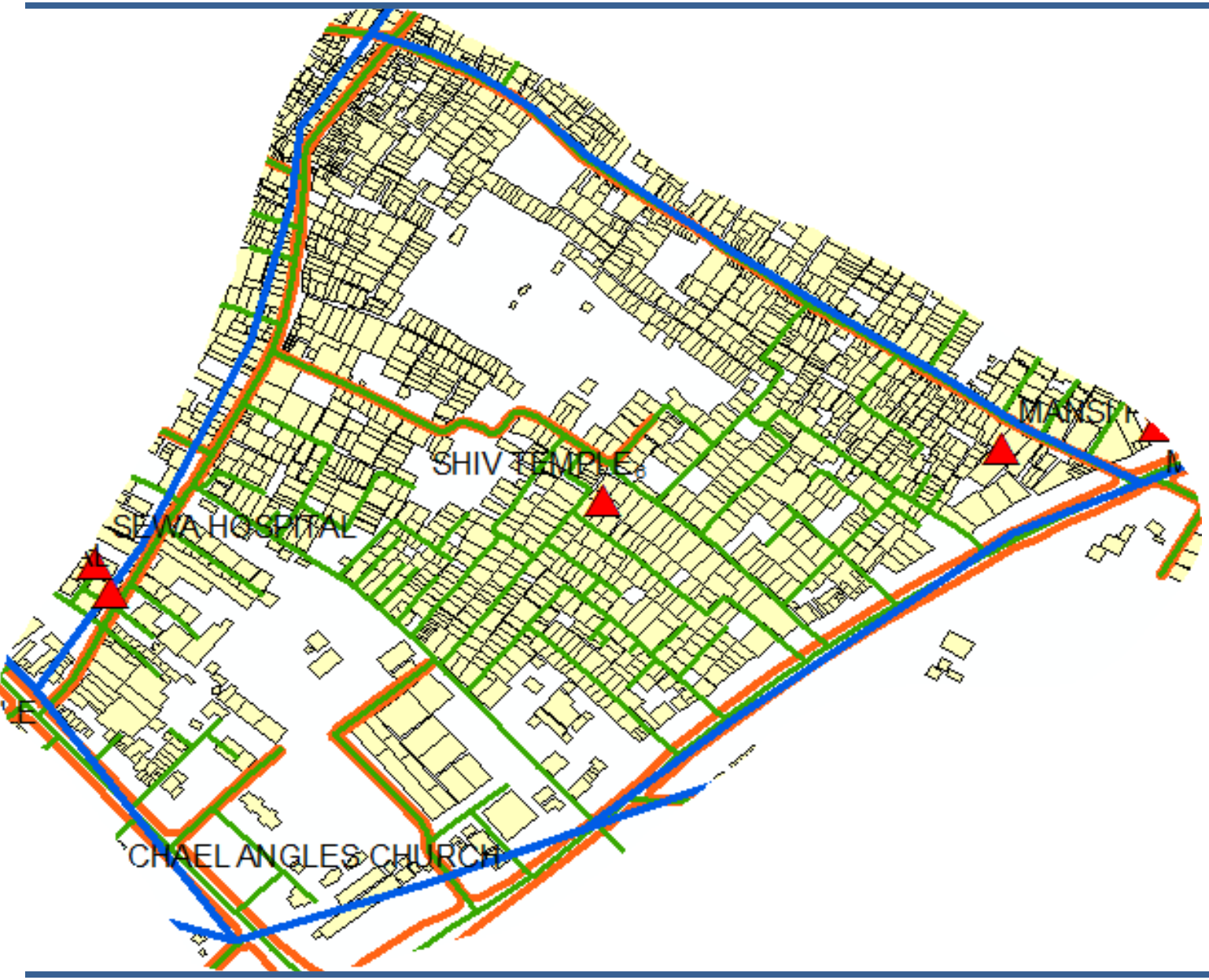
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



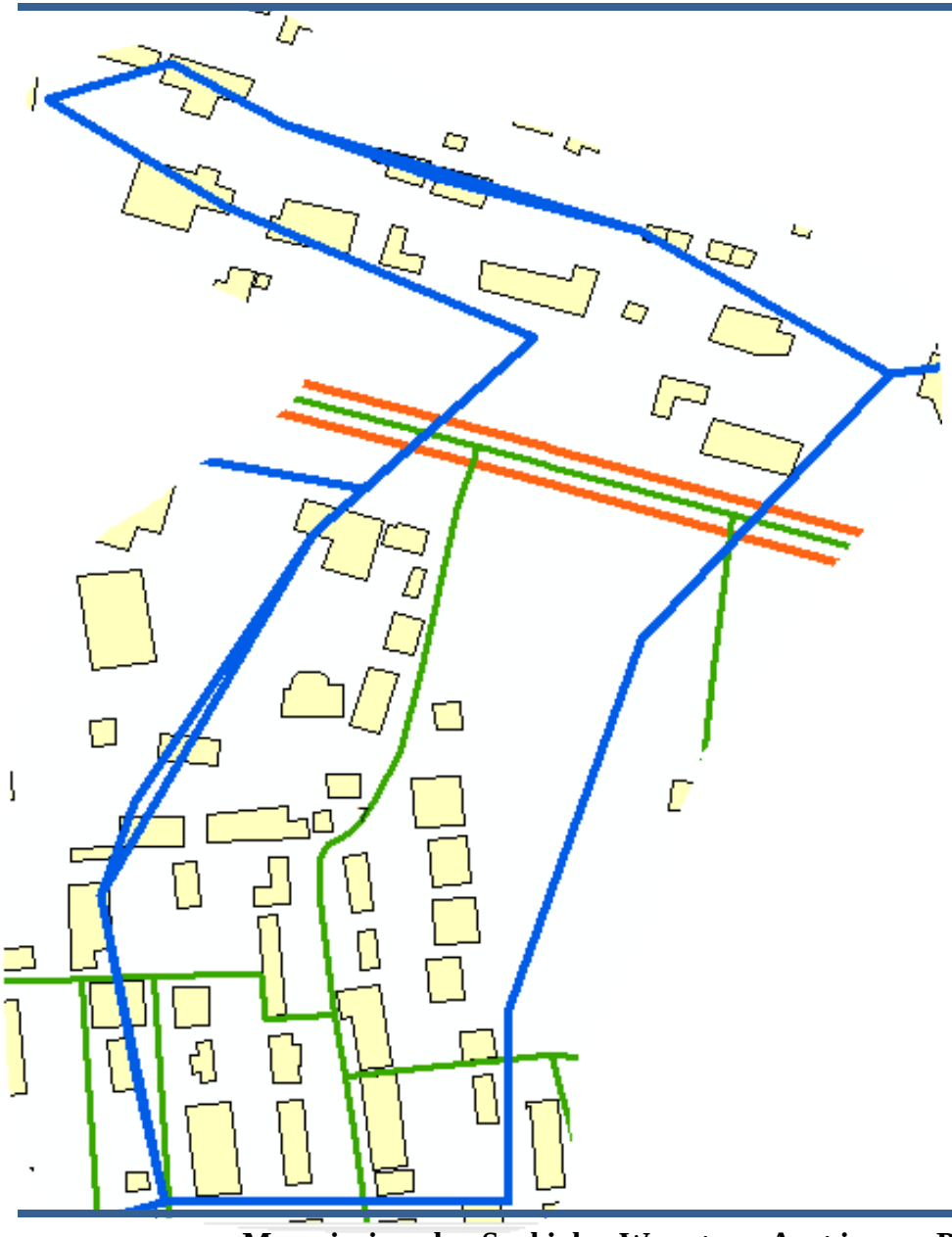
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



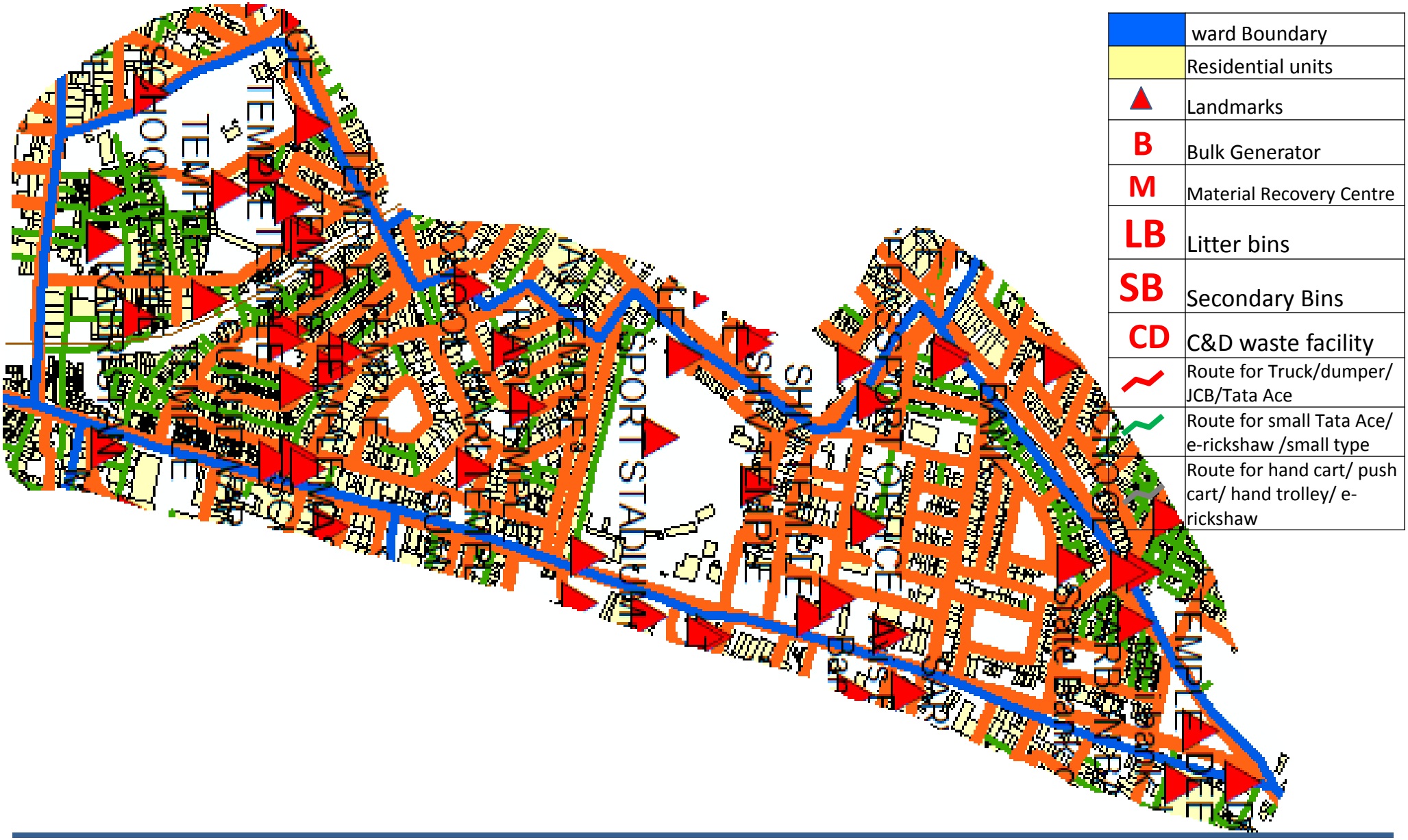
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



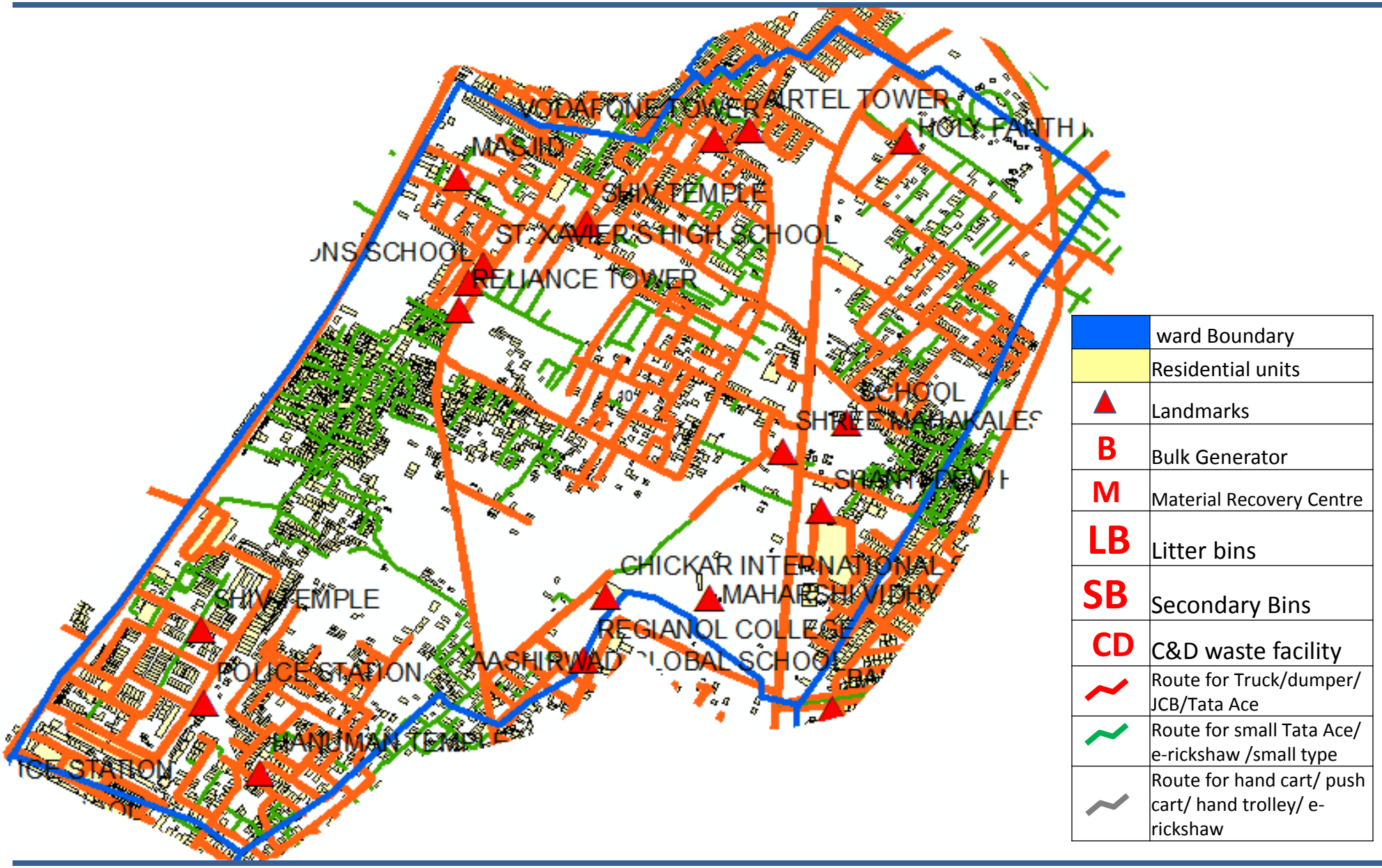
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

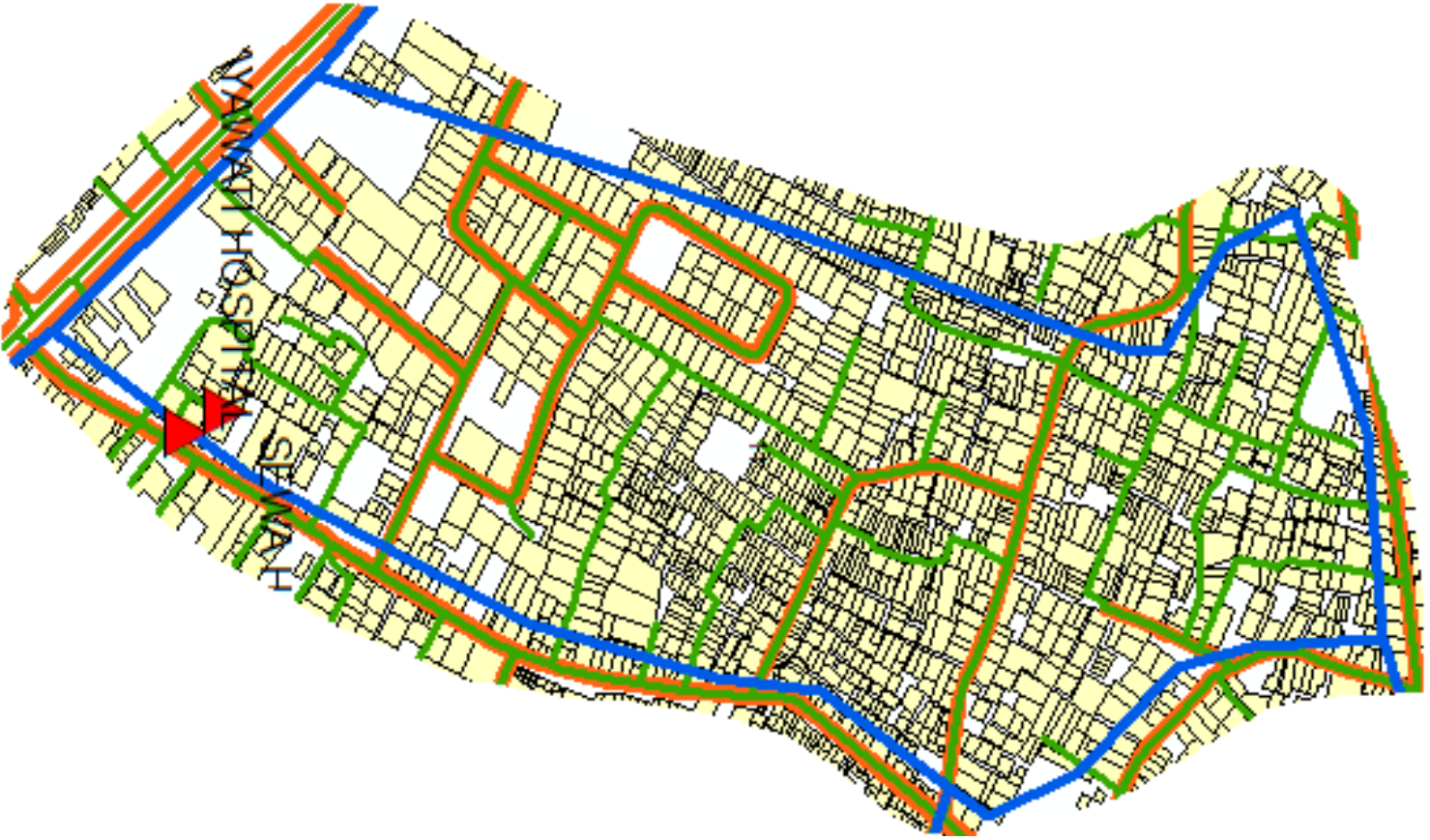


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

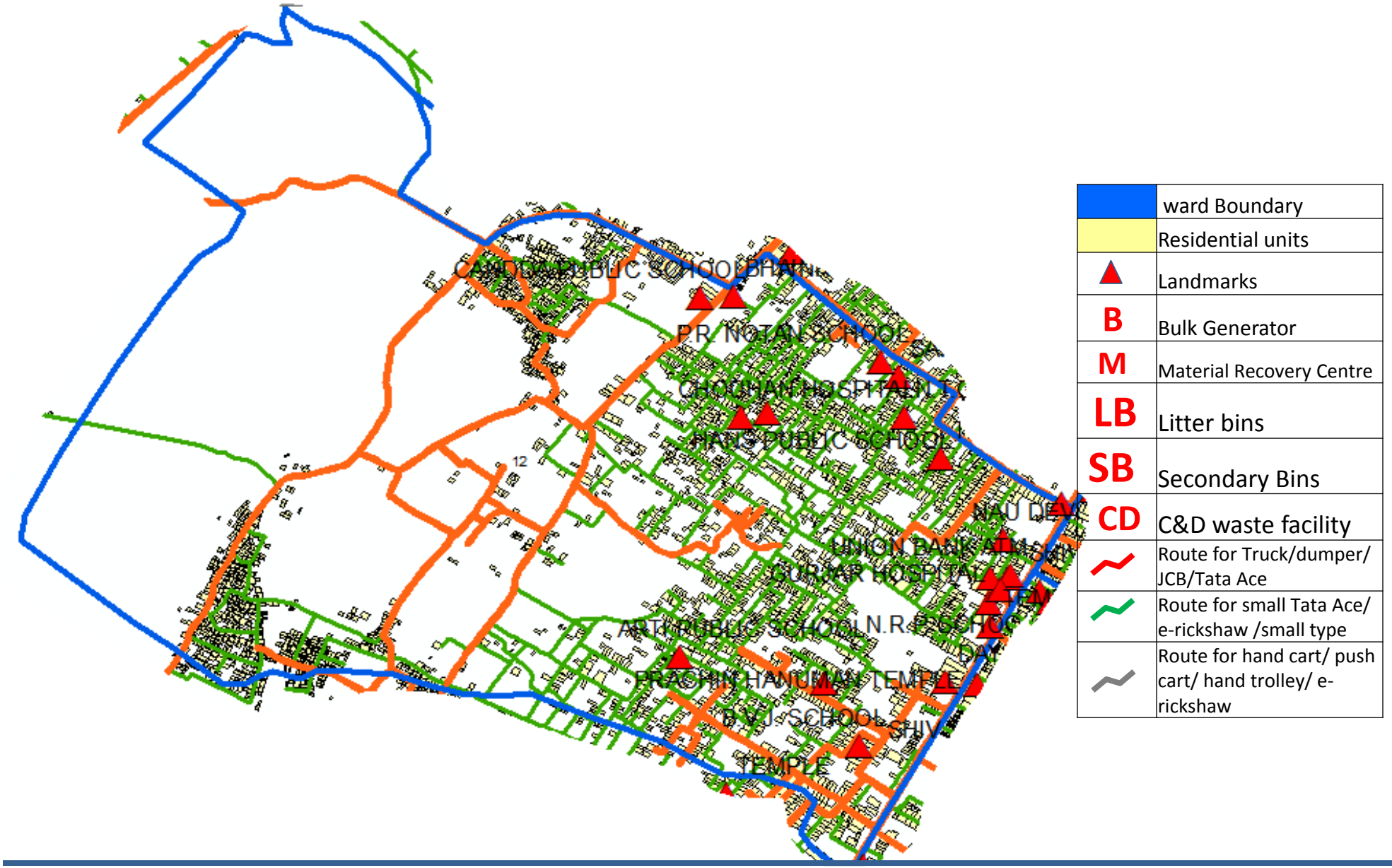

ward Boundary
Residential units
Landmarks
B Bulk Generator
M Material Recovery Centre
LB Litter bins
SB Secondary Bins
CD C&D waste facility
Route for Truck/dumper/ JCB/Tata Ace
Route for small Tata Ace/ e-rickshaw /small type
Route for hand cart/ push cart/ hand trolley/ e-rickshaw
TEMPLE ROAD
SHIVALAYA TEMPLE
STATION ROAD
BANK ROAD
State Bank

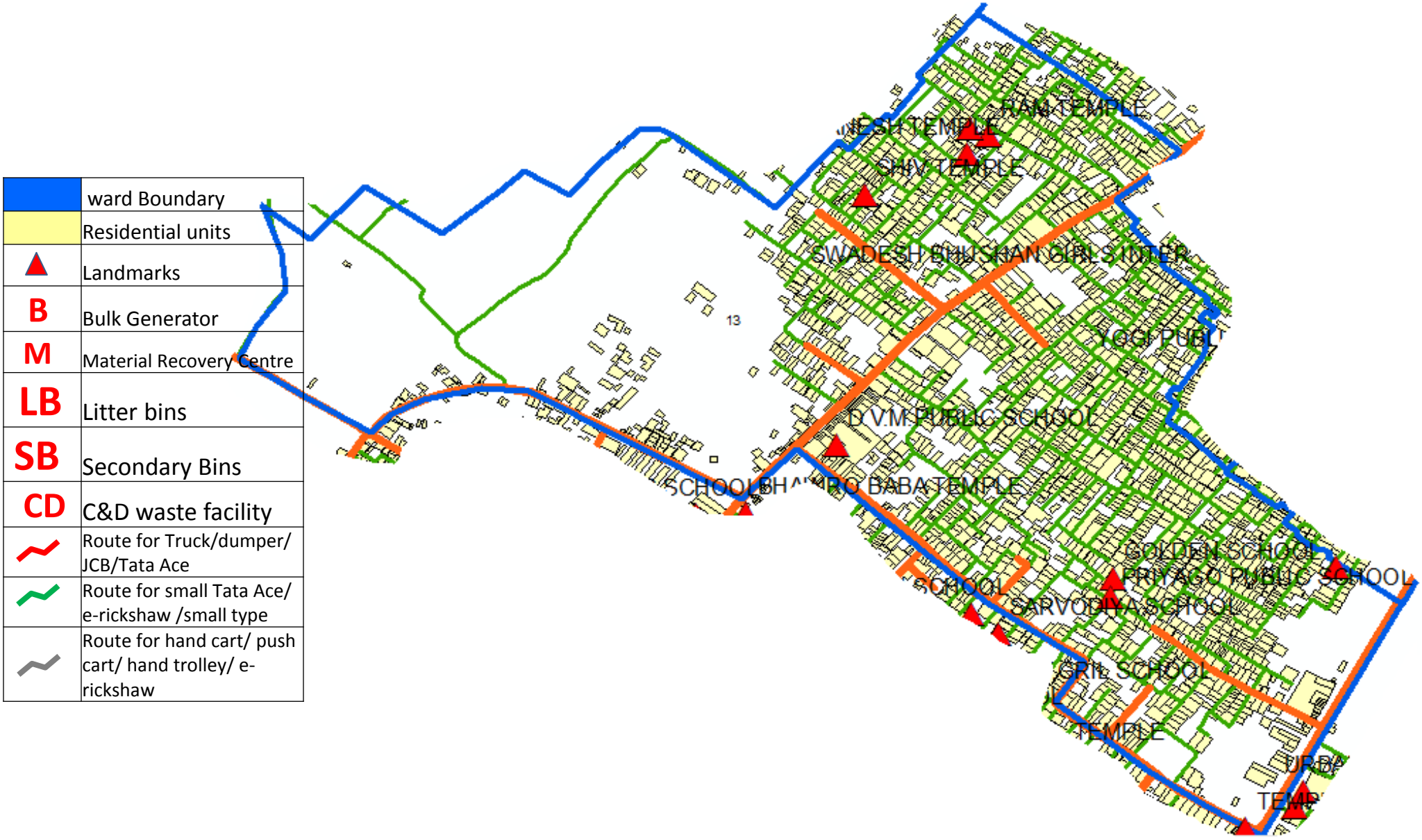
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw


VODAFONE TOWER
AIRTEL TOWER
HOLY FAITH
MASJID
SHIV TEMPLE
ST. XAVIER'S HIGH SCHOOL
RELIANCE TOWER
SCHOOL
SHREE MAHAKALES
CHICKAR INTERNATIONAL
MAHARSHI VIDHY
REGIANOL COLLEGE
SHIV TEMPLE
POLICE STATION
HANUMAN TEMPLE
ward Boundary
Residential units
Landmarks
B Bulk Generator
M Material Recovery Centre
LB Litter bins
SB Secondary Bins
CD C&D waste facility
Route for Truck/dumper/ JCB/Tata Ace
Route for small Tata Ace/ e-rickshaw /small type
Route for hand cart/ push cart/ hand trolley/ e-rickshaw



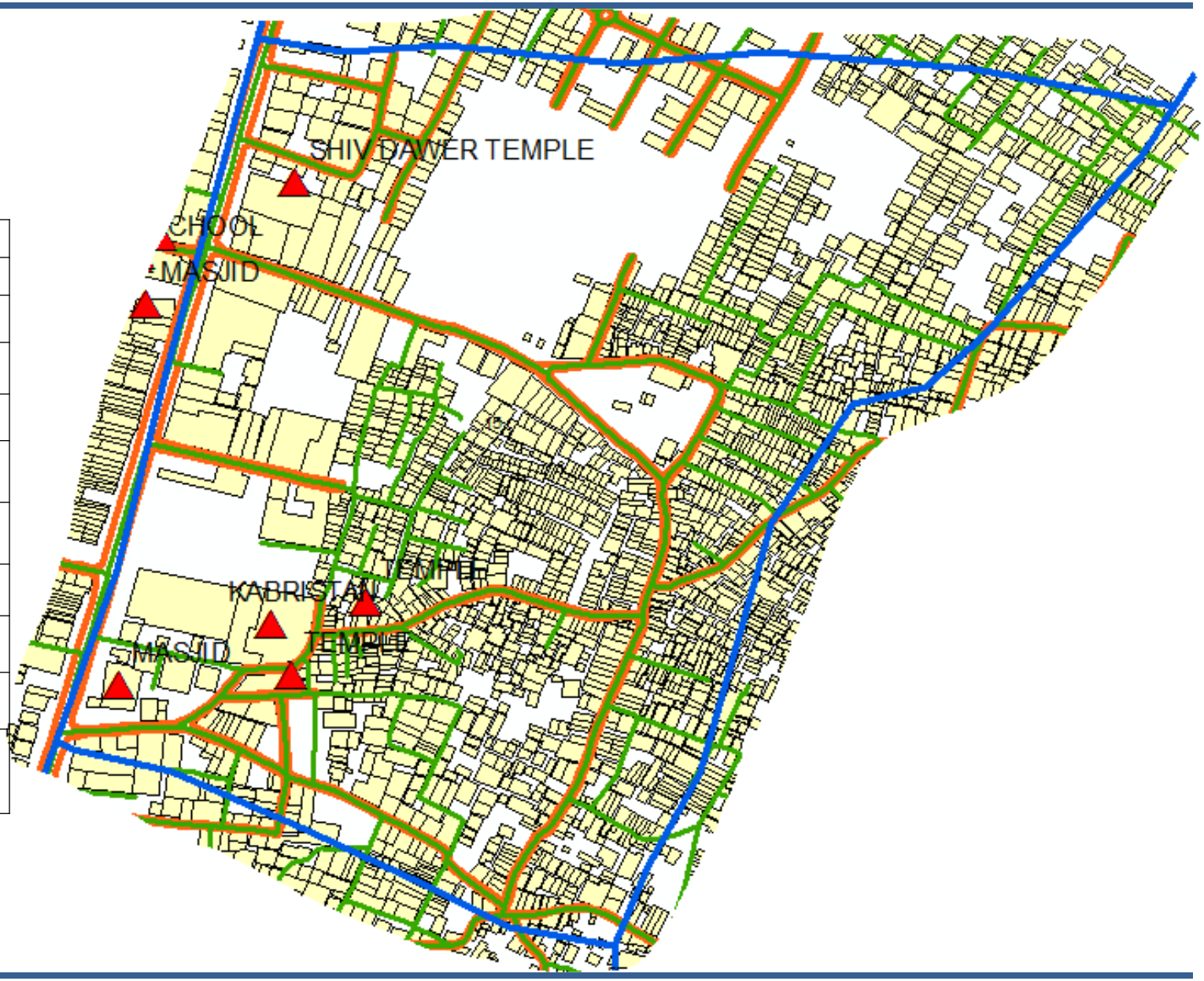
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw


CAMBRIDGE PUBLIC SCHOOL BHAT
PR. NOTAN SCHOOL
CHOUHAN HOSPITAL N.T.C
PIANS PUBLIC SCHOOL
12
NAU DEVI
UNION BANK ATM
GURJAR HOSPITAL
ATM
ART PUBLIC SCHOOL
N.R.P.G. SCHOOL
PRACHIN HANUMAN TEMPLE
B.V.J. SCHOOL SHIV
TEMPLE
ward Boundary
Residential units
Landmarks
B Bulk Generator
M Material Recovery Centre
LB Litter bins
SB Secondary Bins
CD C&D waste facility
Route for Truck/dumper/ JCB/Tata Ace
Route for small Tata Ace/ e-rickshaw /small type
Route for hand cart/ push cart/ hand trolley/ e-rickshaw


ward Boundary
Residential units
Landmarks
B Bulk Generator
M Material Recovery Centre
LB Litter bins
SB Secondary Bins
CD C&D waste facility
Route for Truck/dumper/ JCB/Tata Ace
Route for small Tata Ace/ e-rickshaw /small type
Route for hand cart/ push cart/ hand trolley/ e-rickshaw
13
RAM TEMPLE
SHIV TEMPLE
SWADESH BHUSHAN GIRLS INTER
DVM PUBLIC SCHOOL
BABA TEMPLE
GOLDEN SCHOOL
PRIYAGO PUBLIC SCHOOL
SARVODAYA SCHOOL
TEMPLE

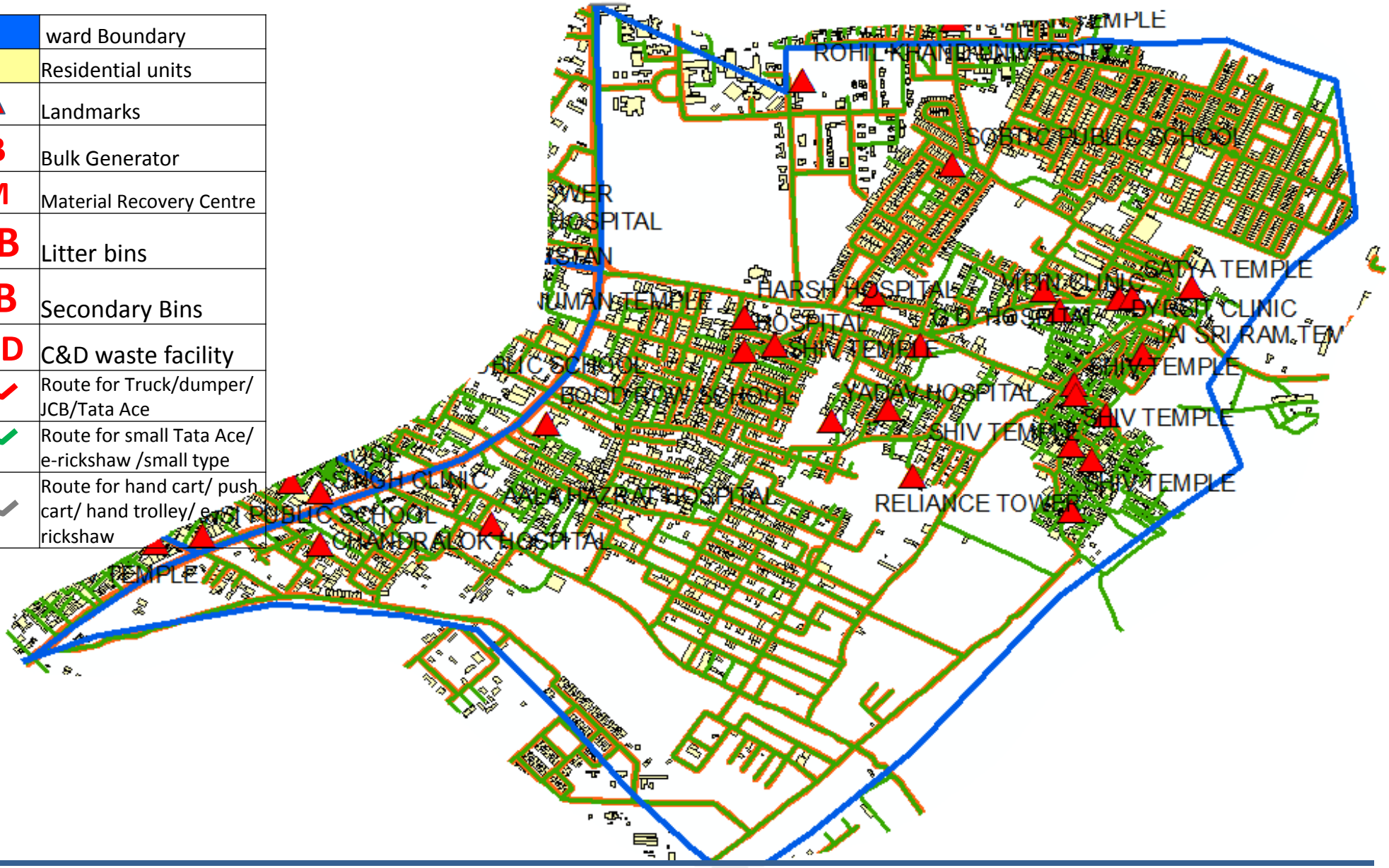
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

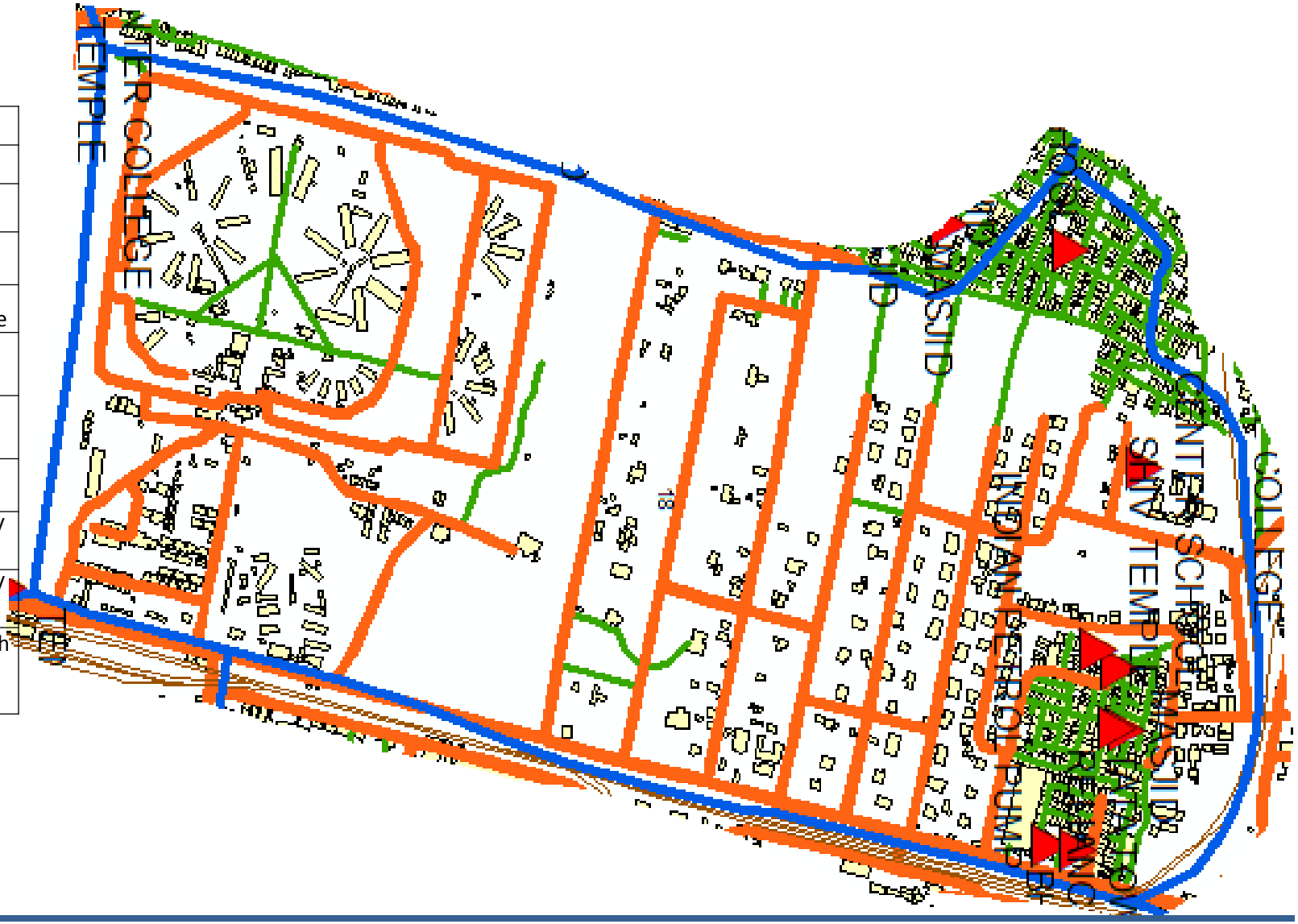


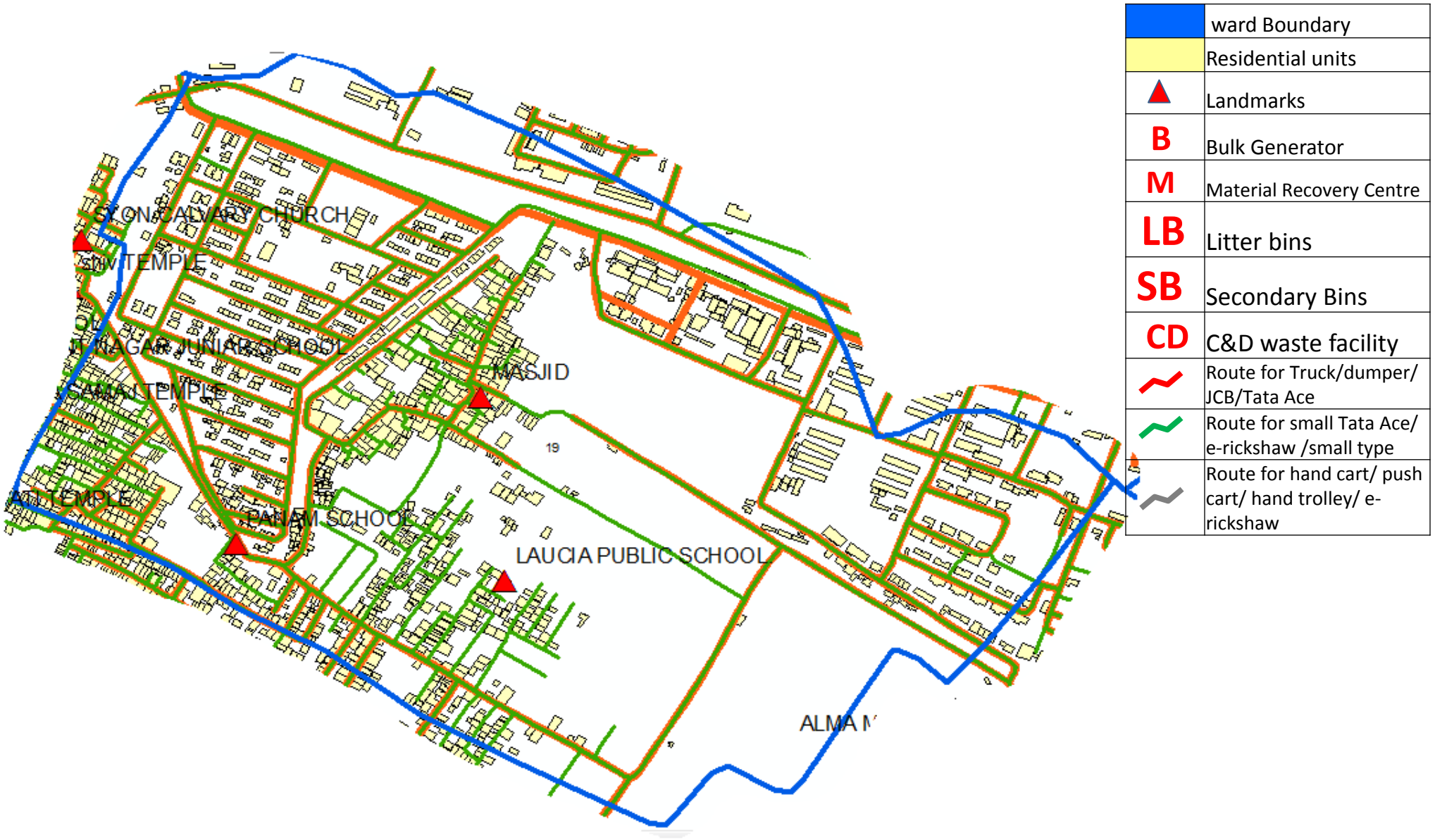
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



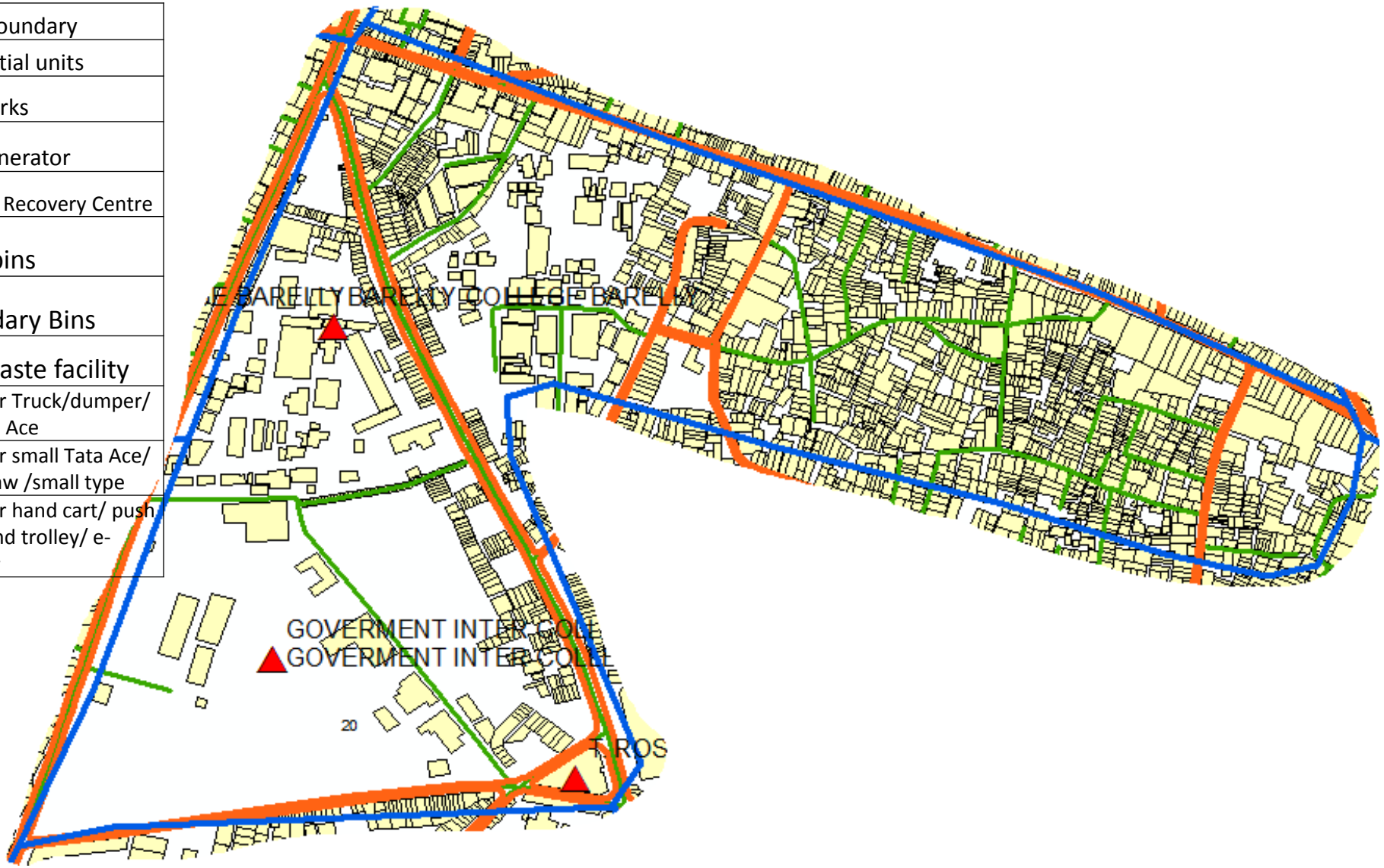
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

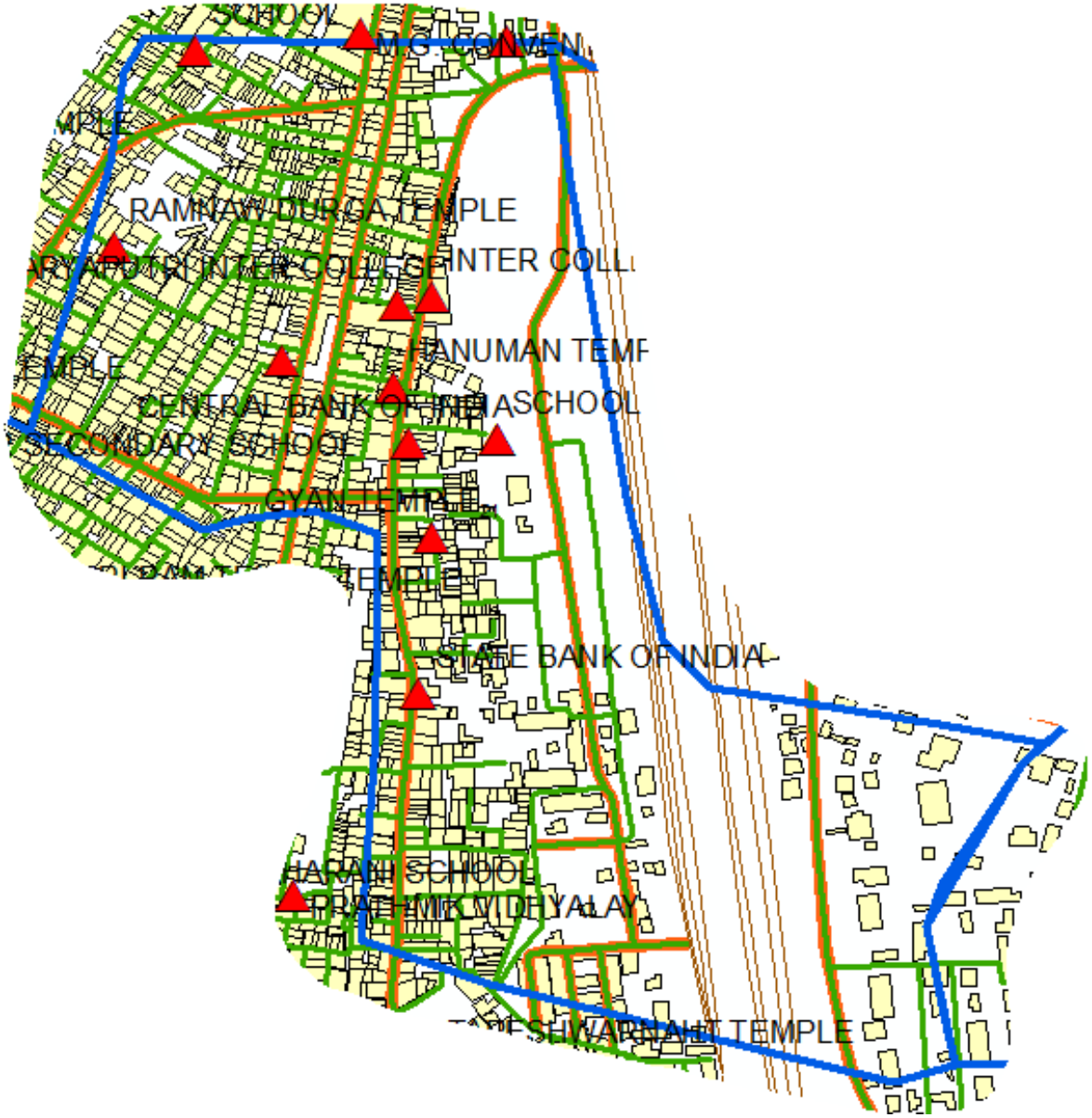




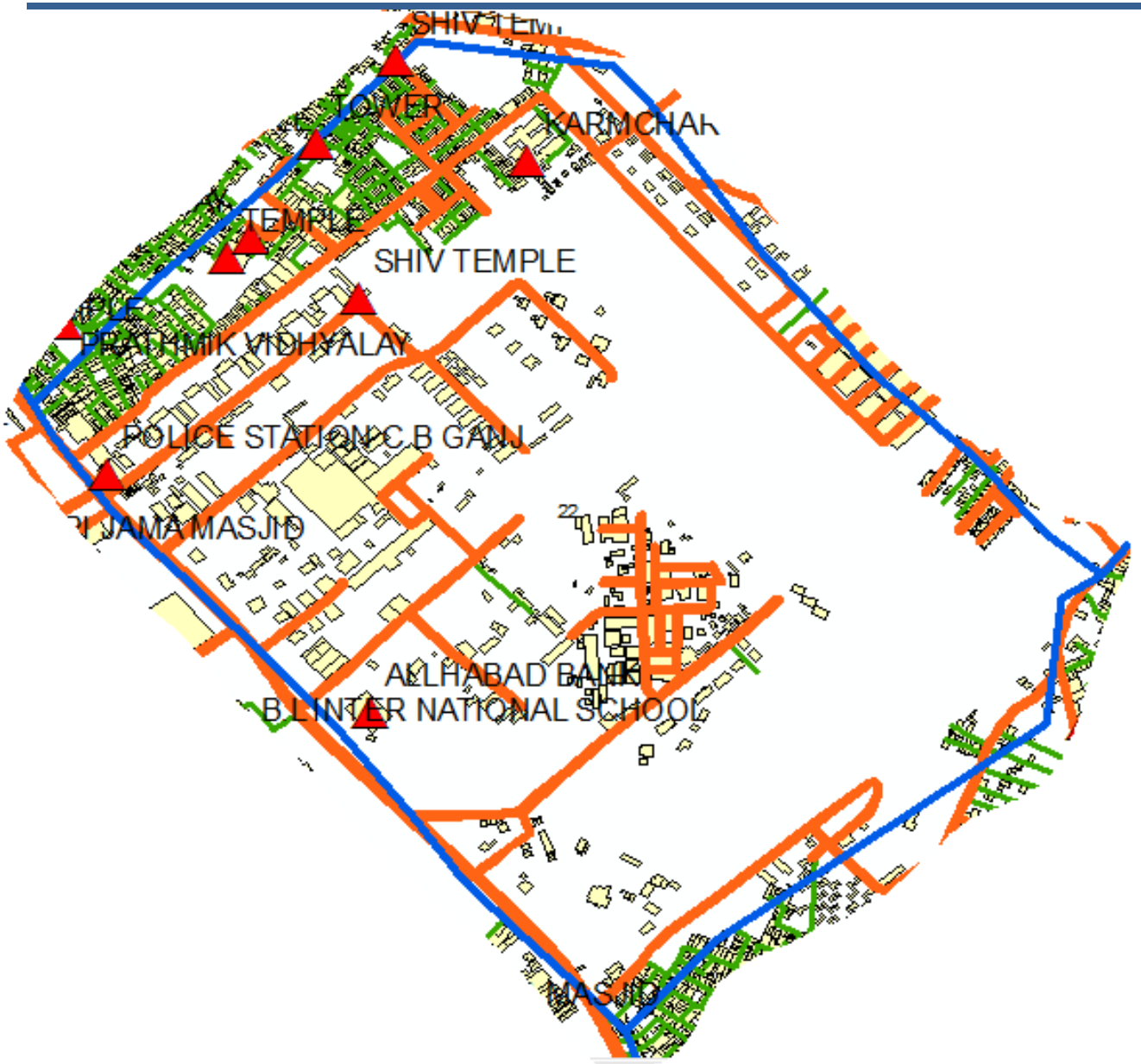
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

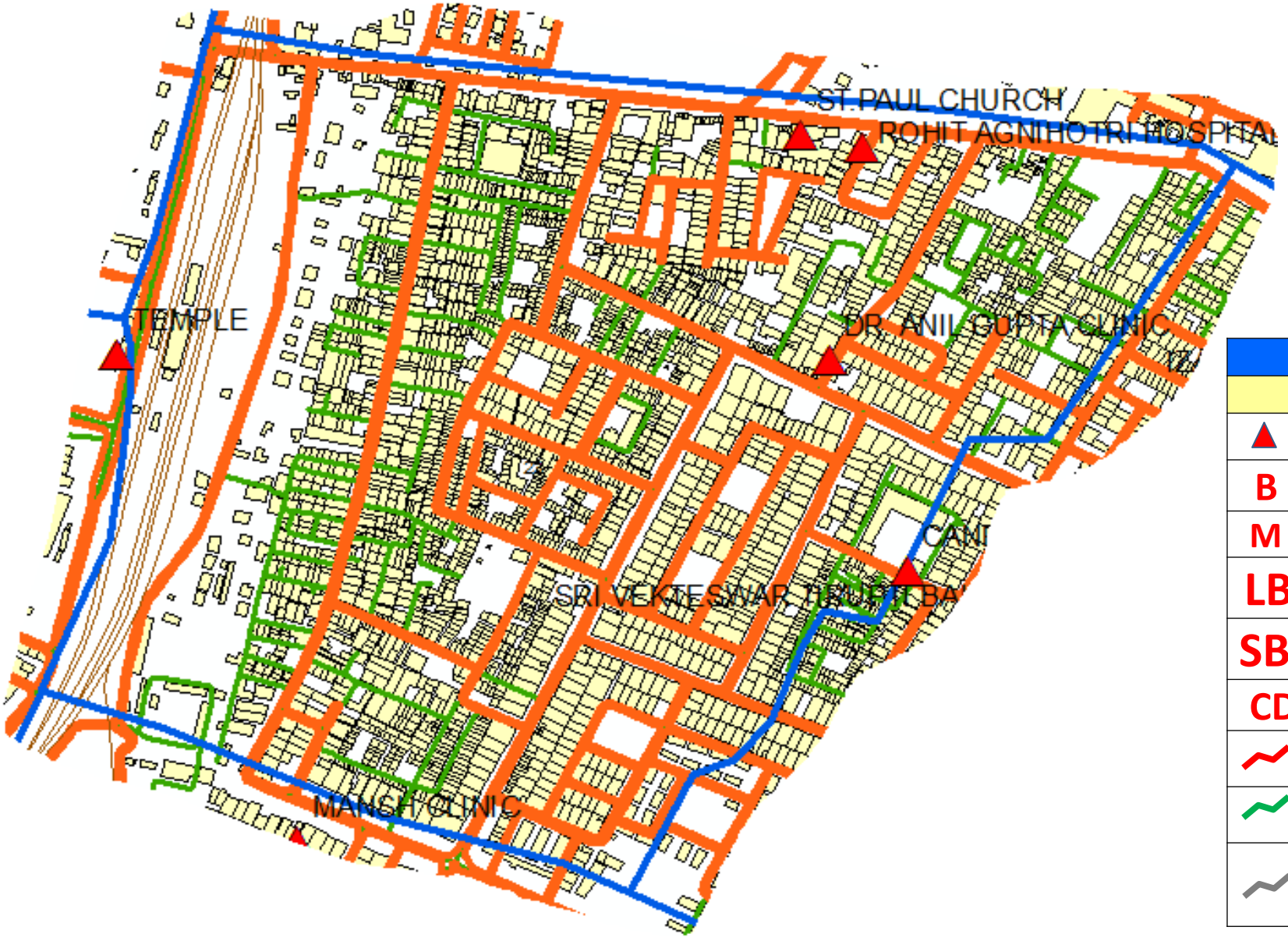




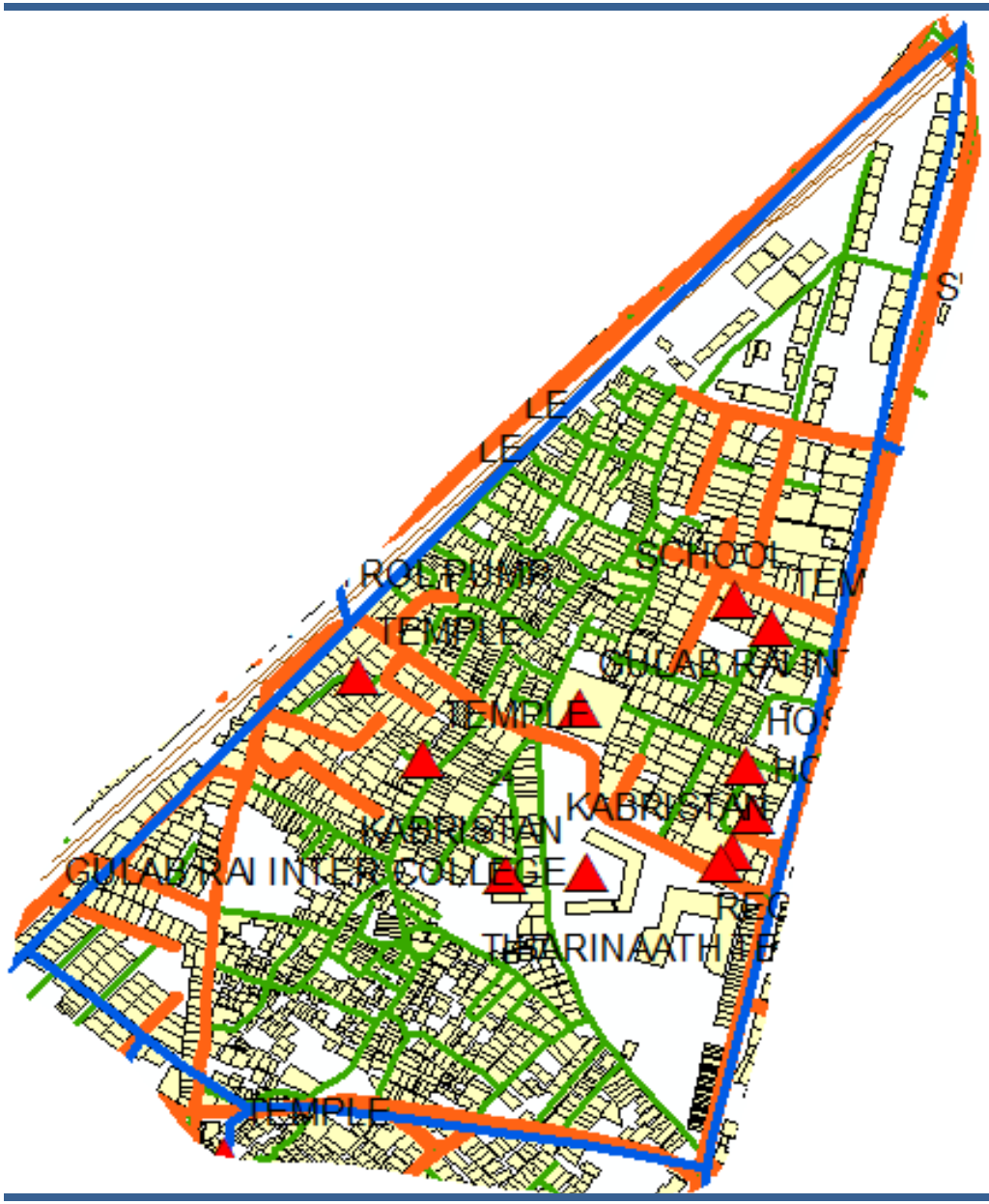
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

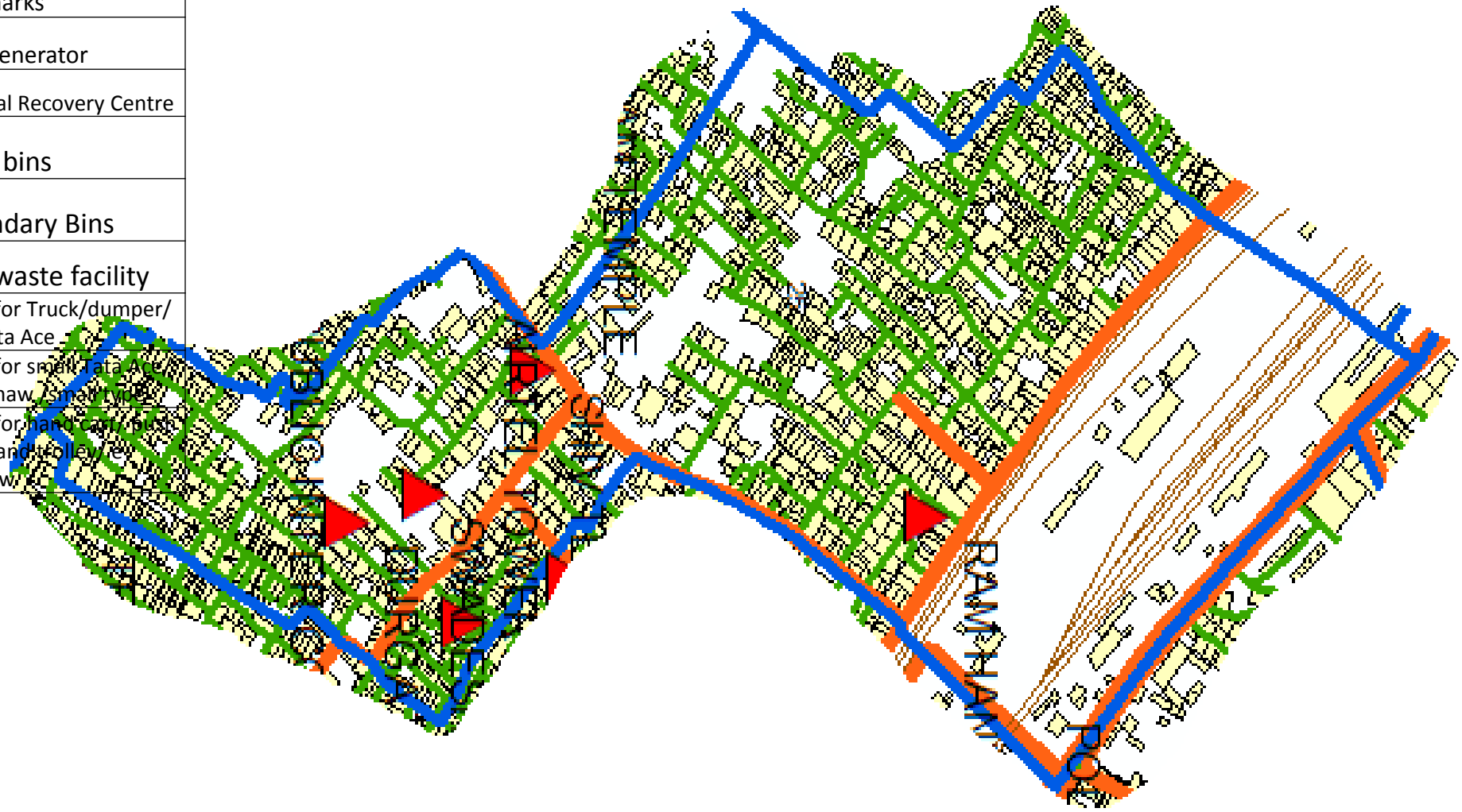


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

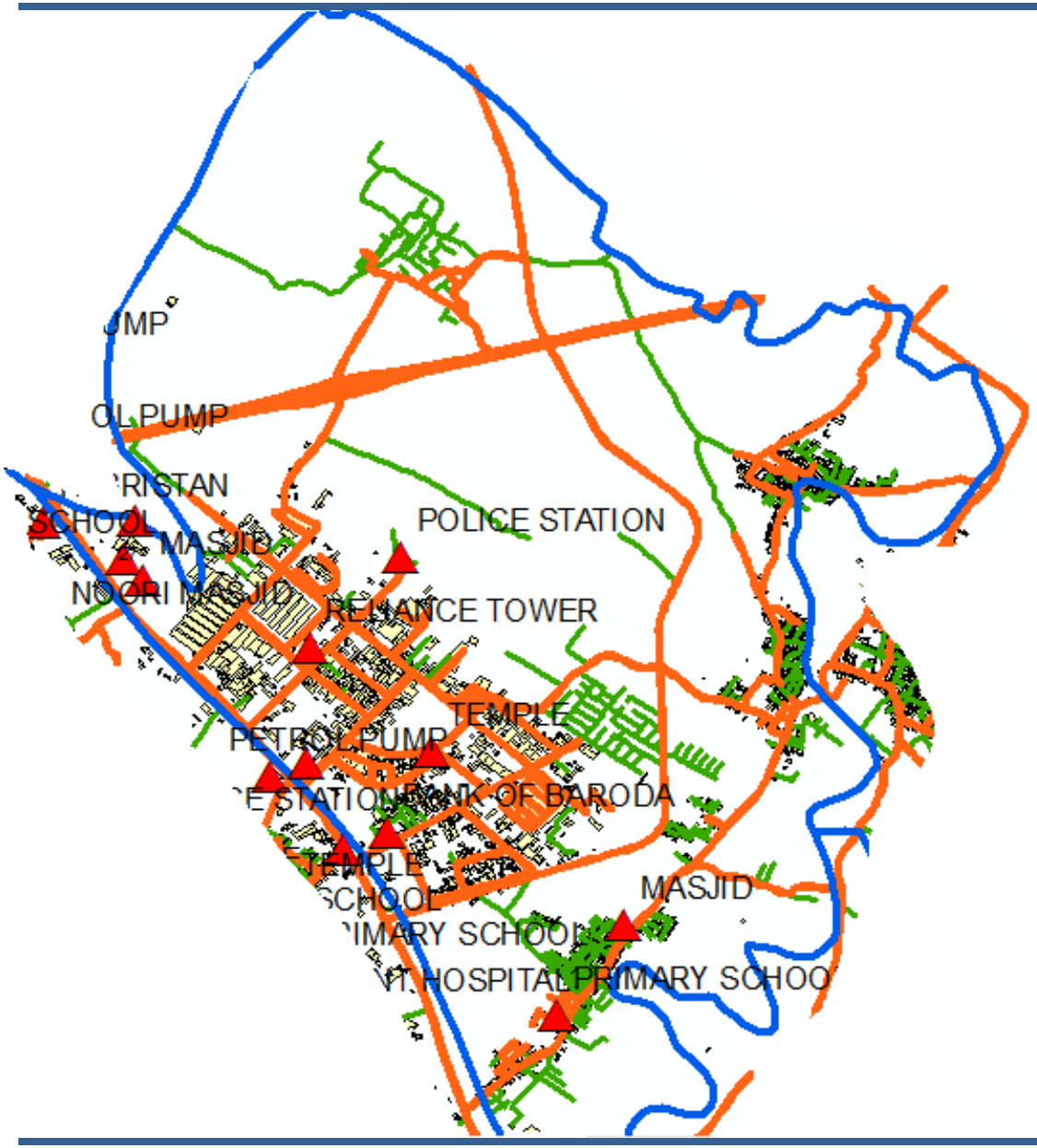


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small tipper
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

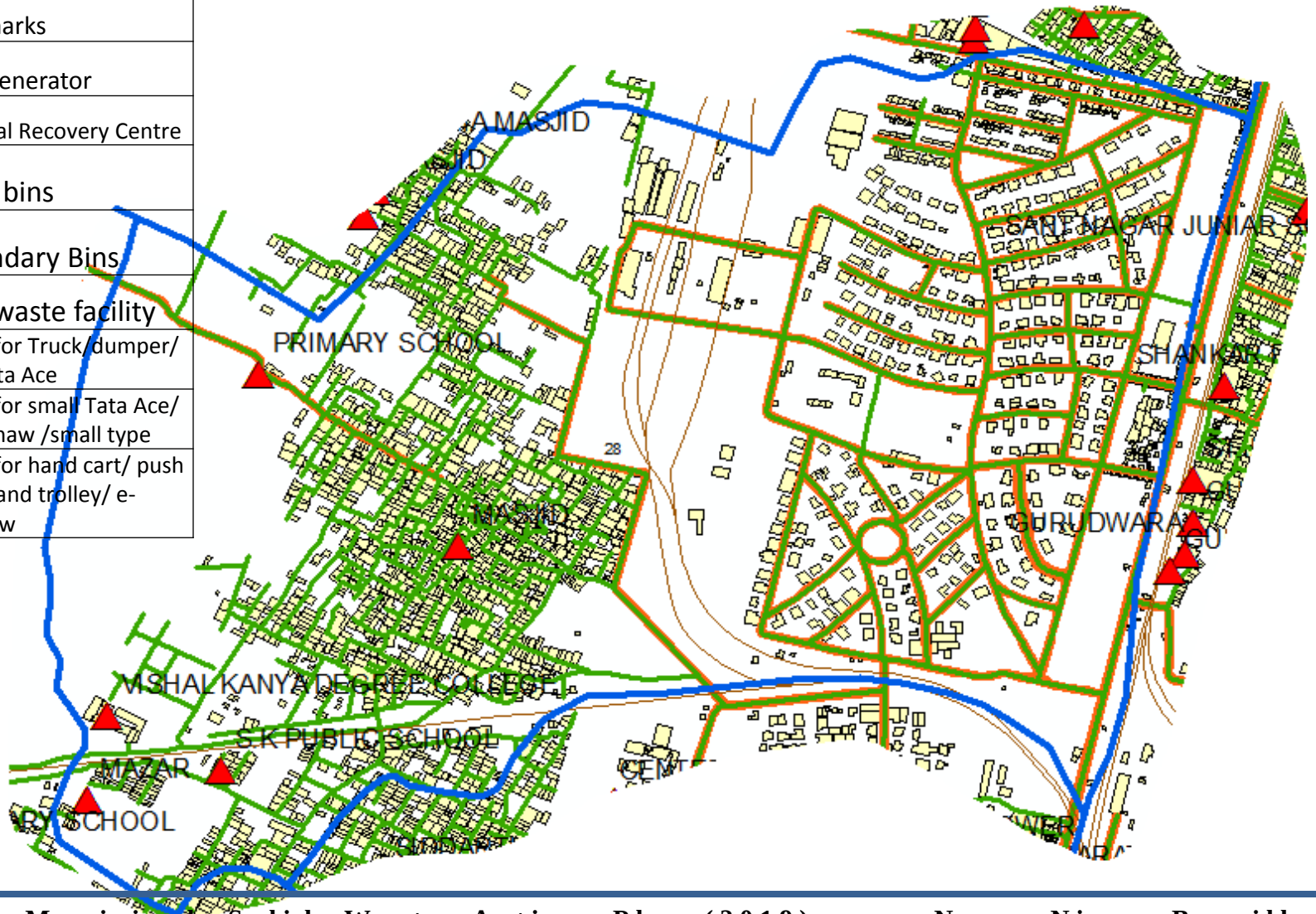


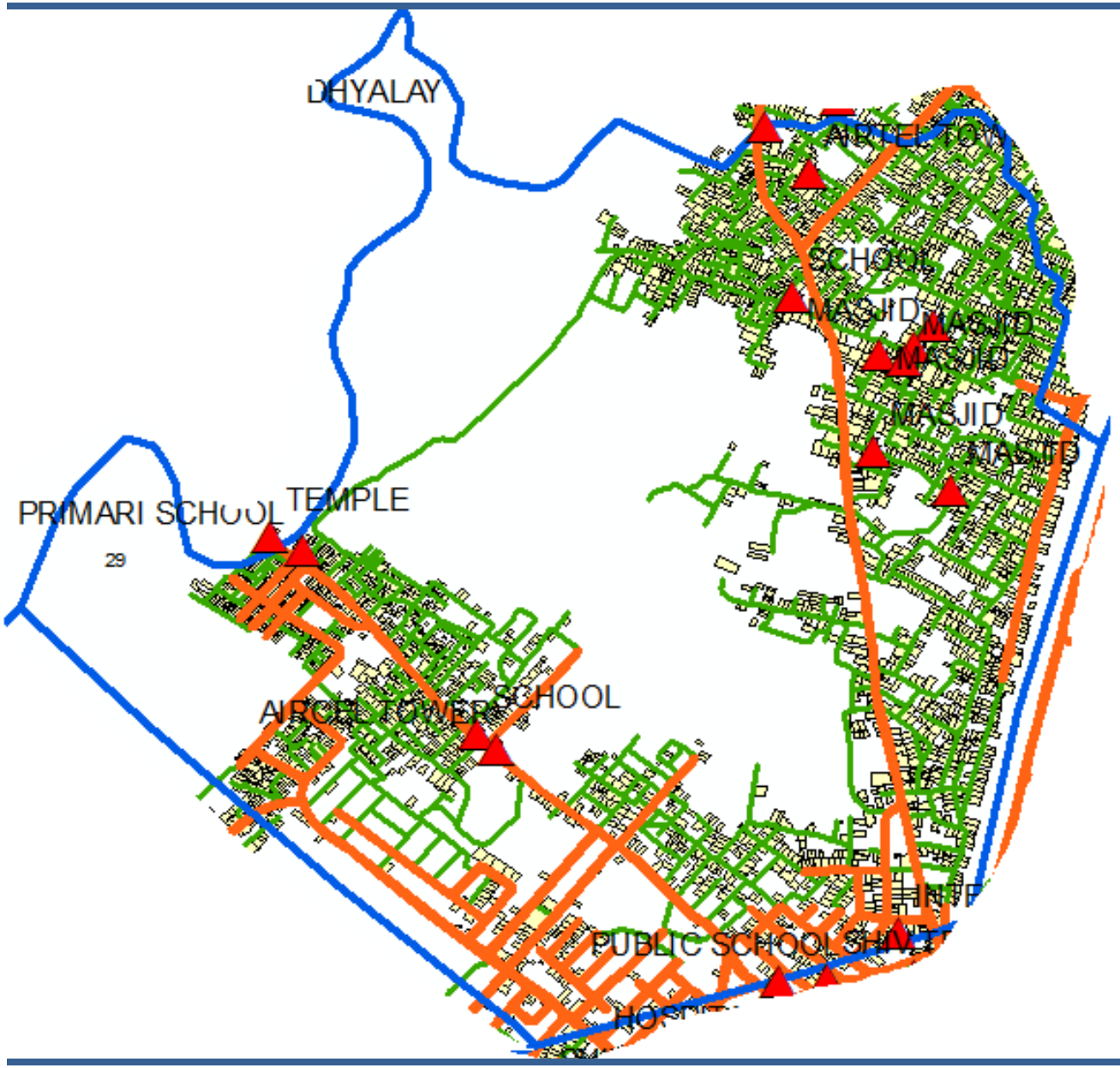
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

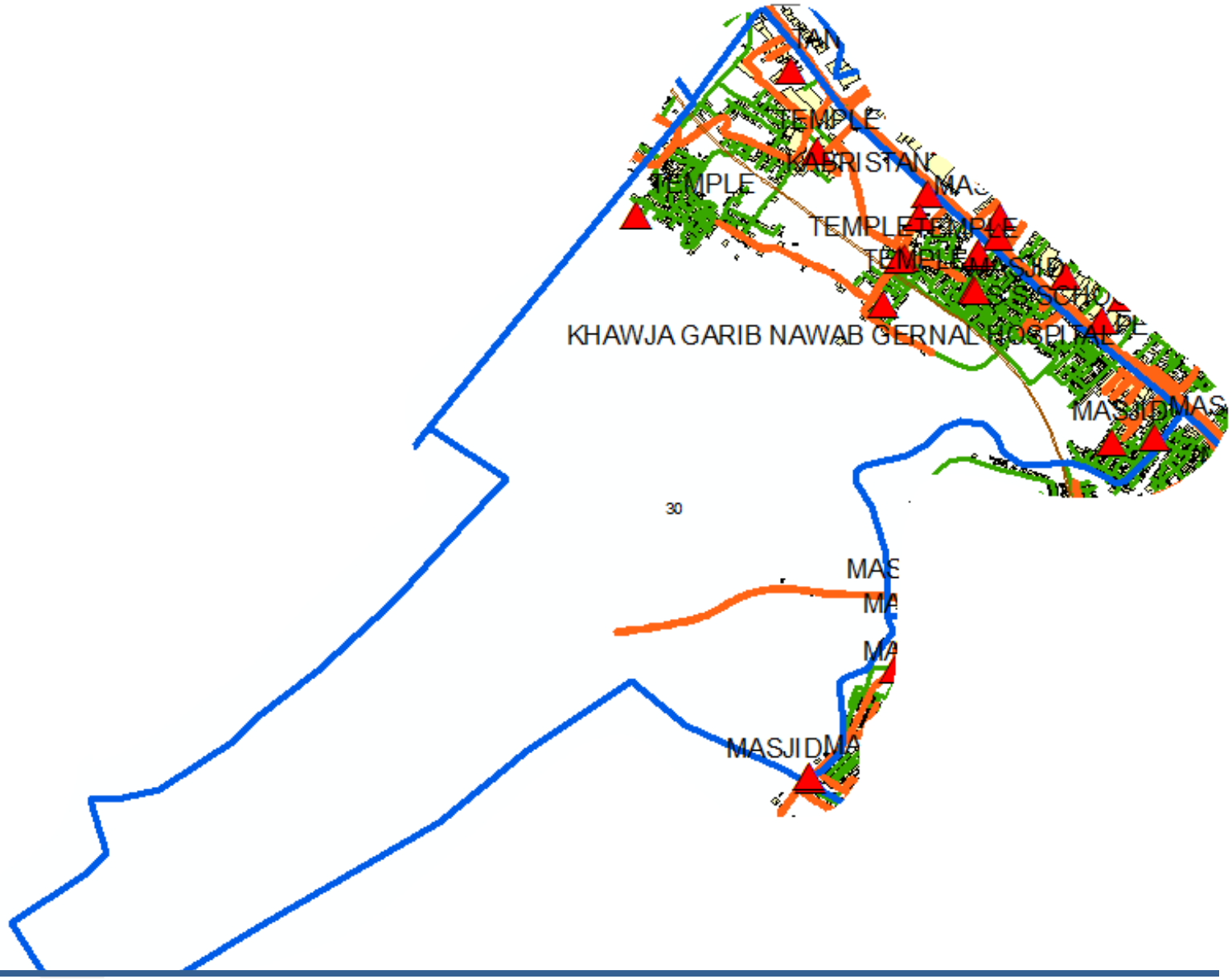
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw





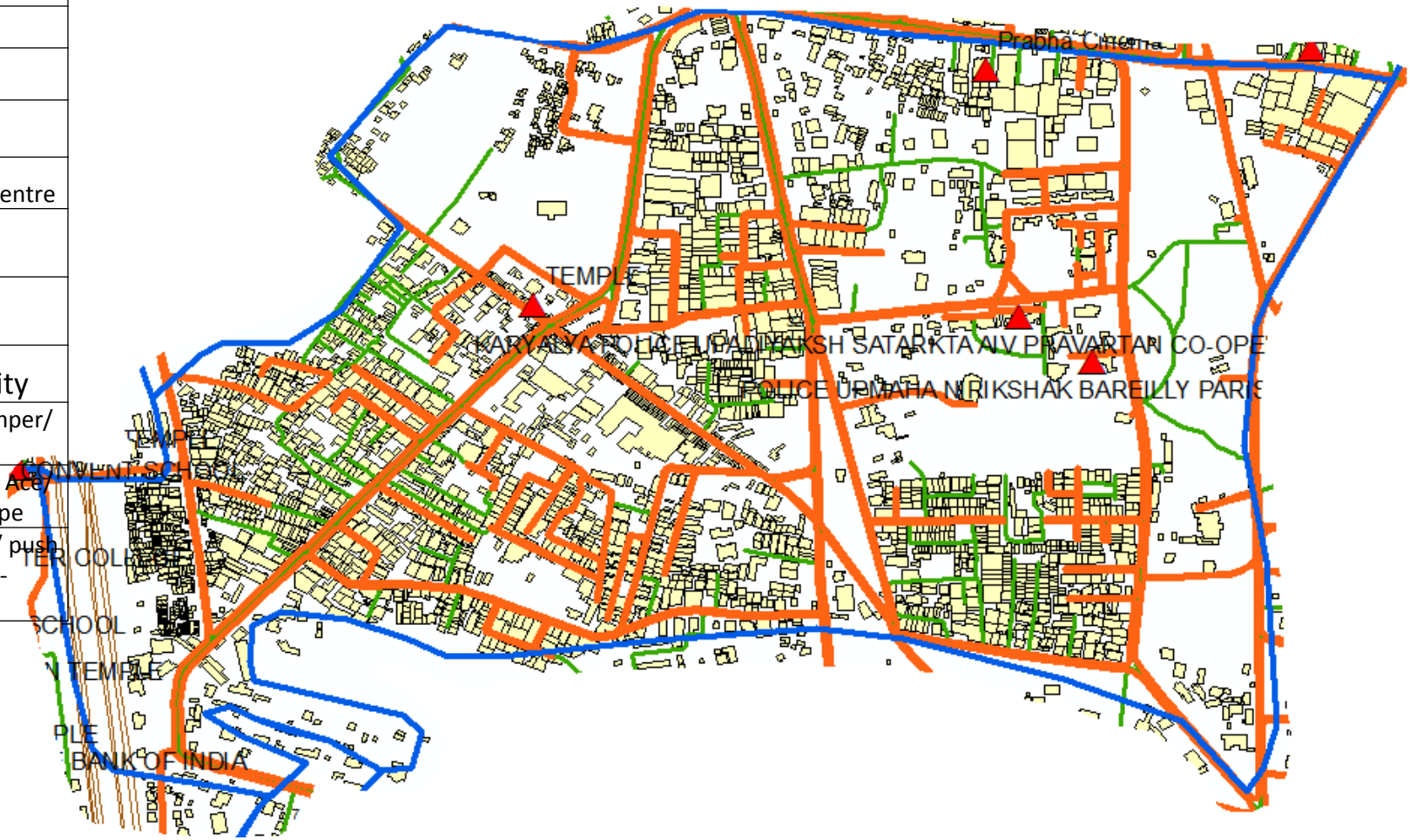
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

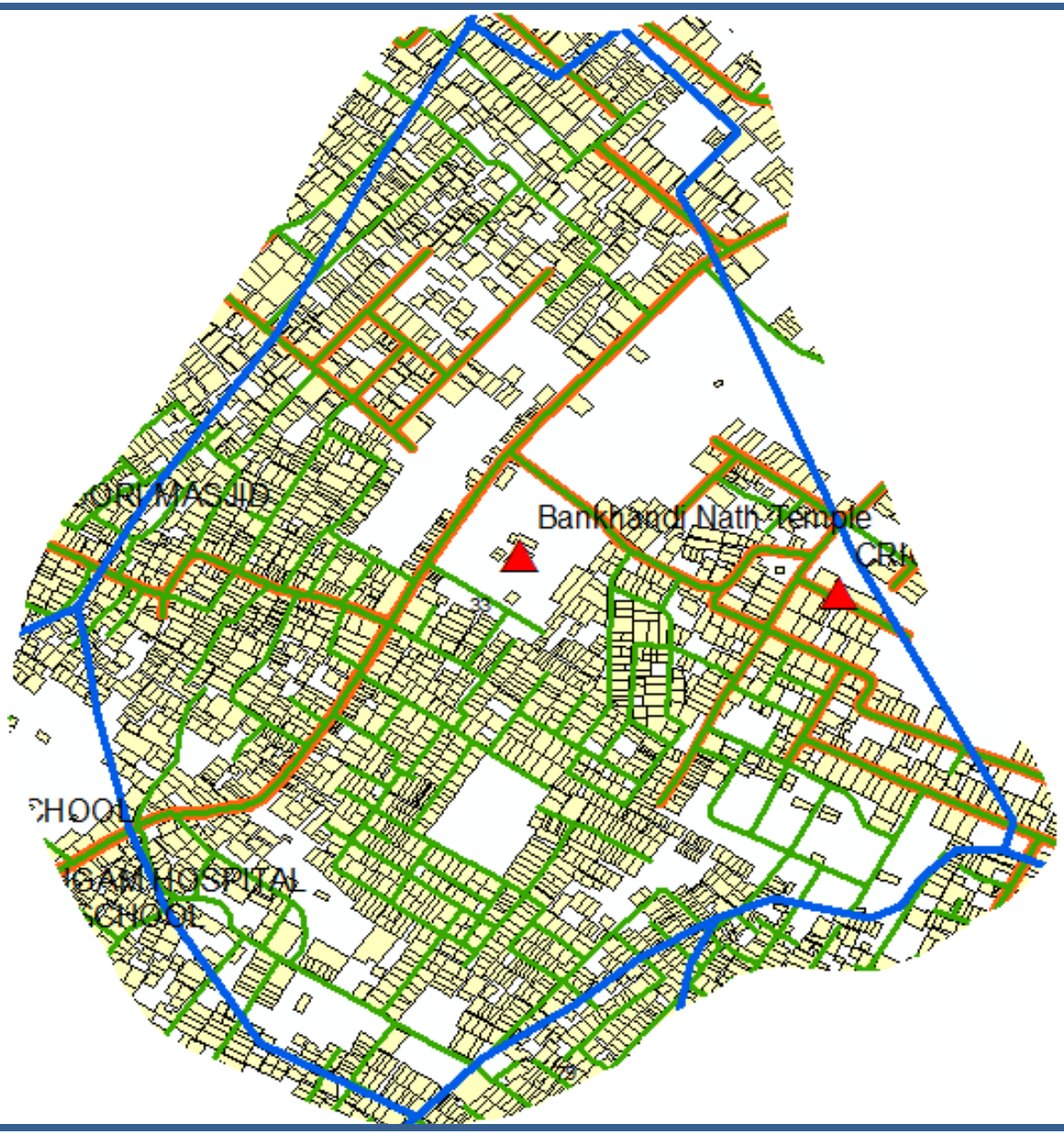


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

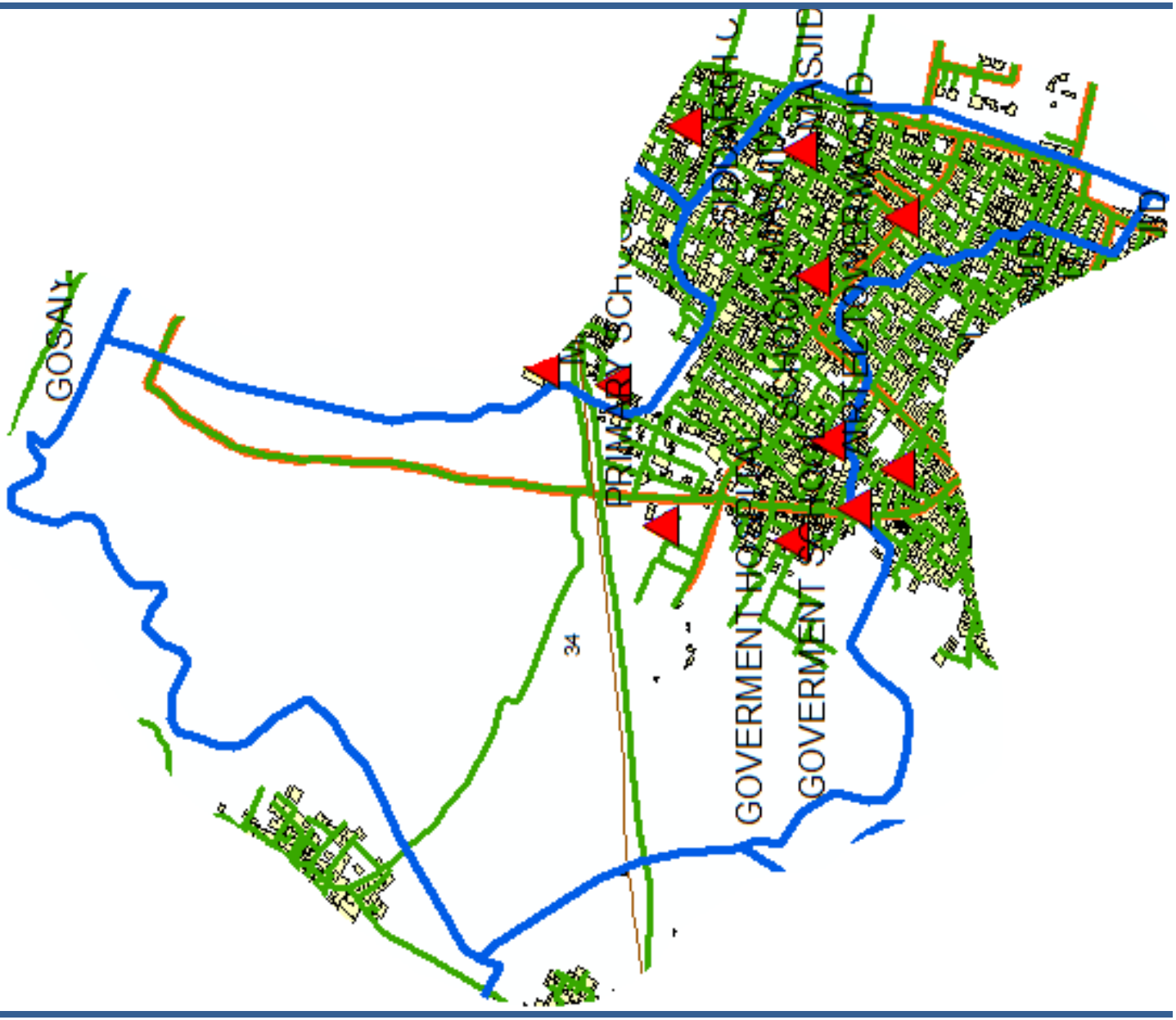
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

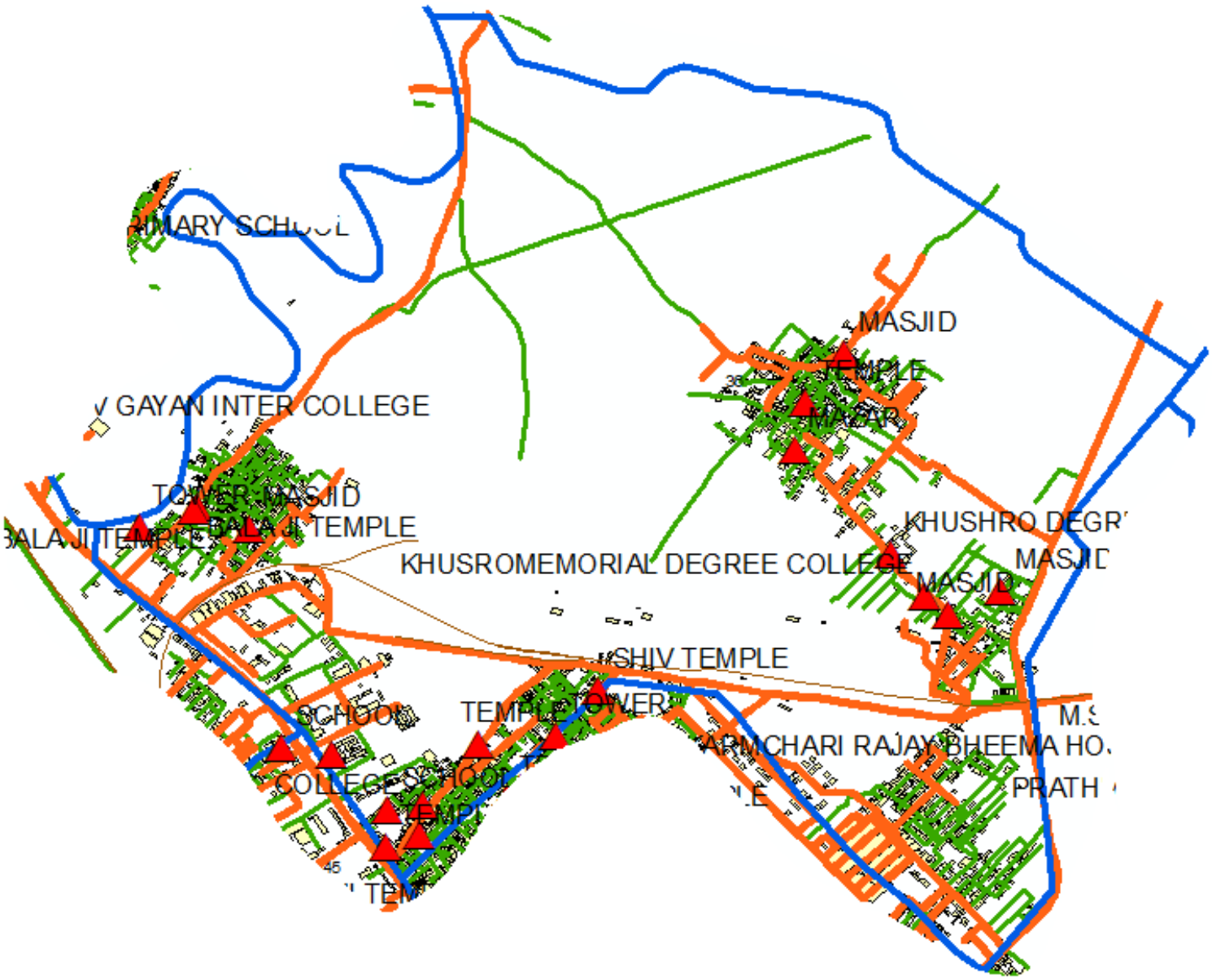


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

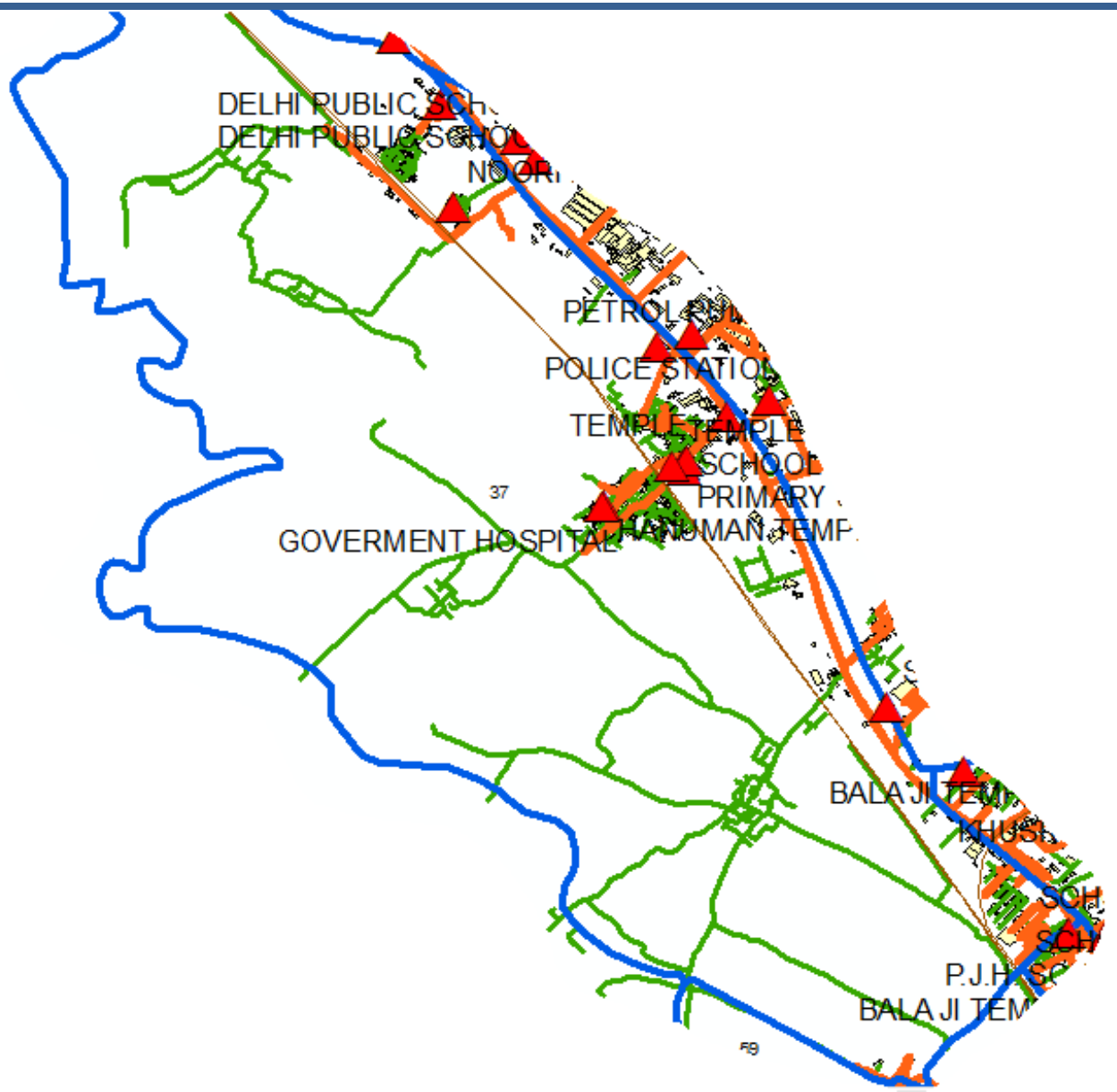


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

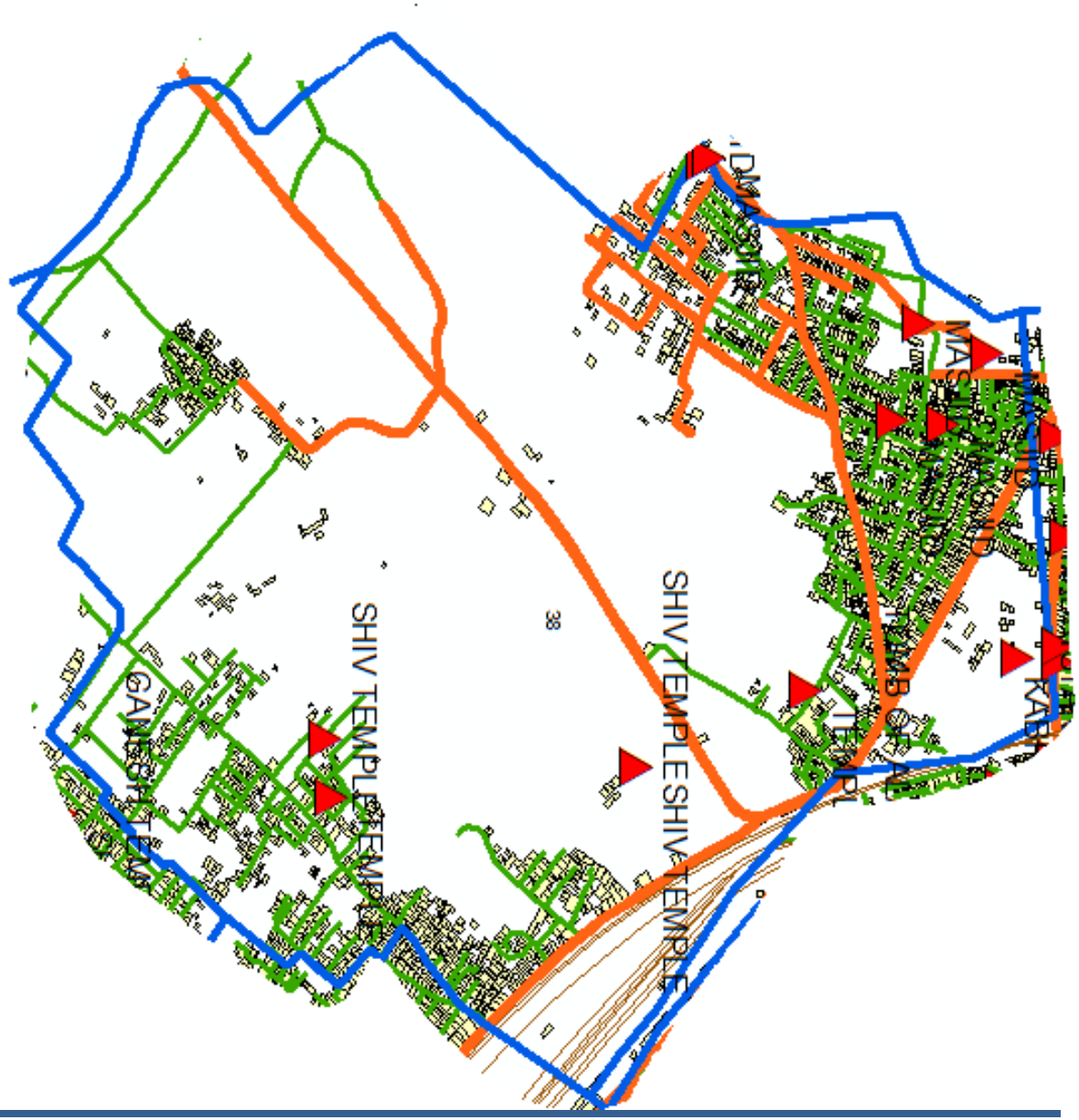
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



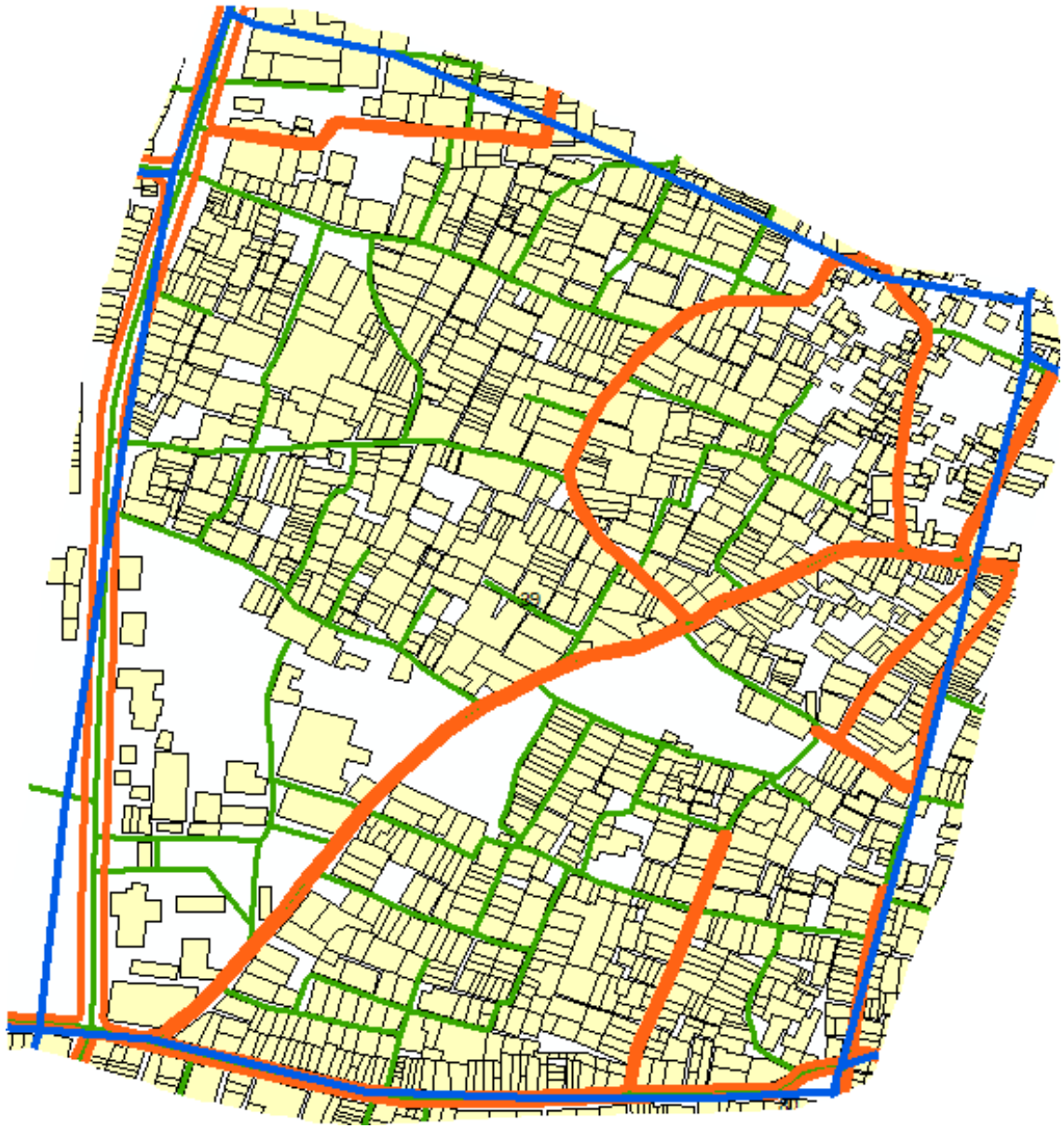
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

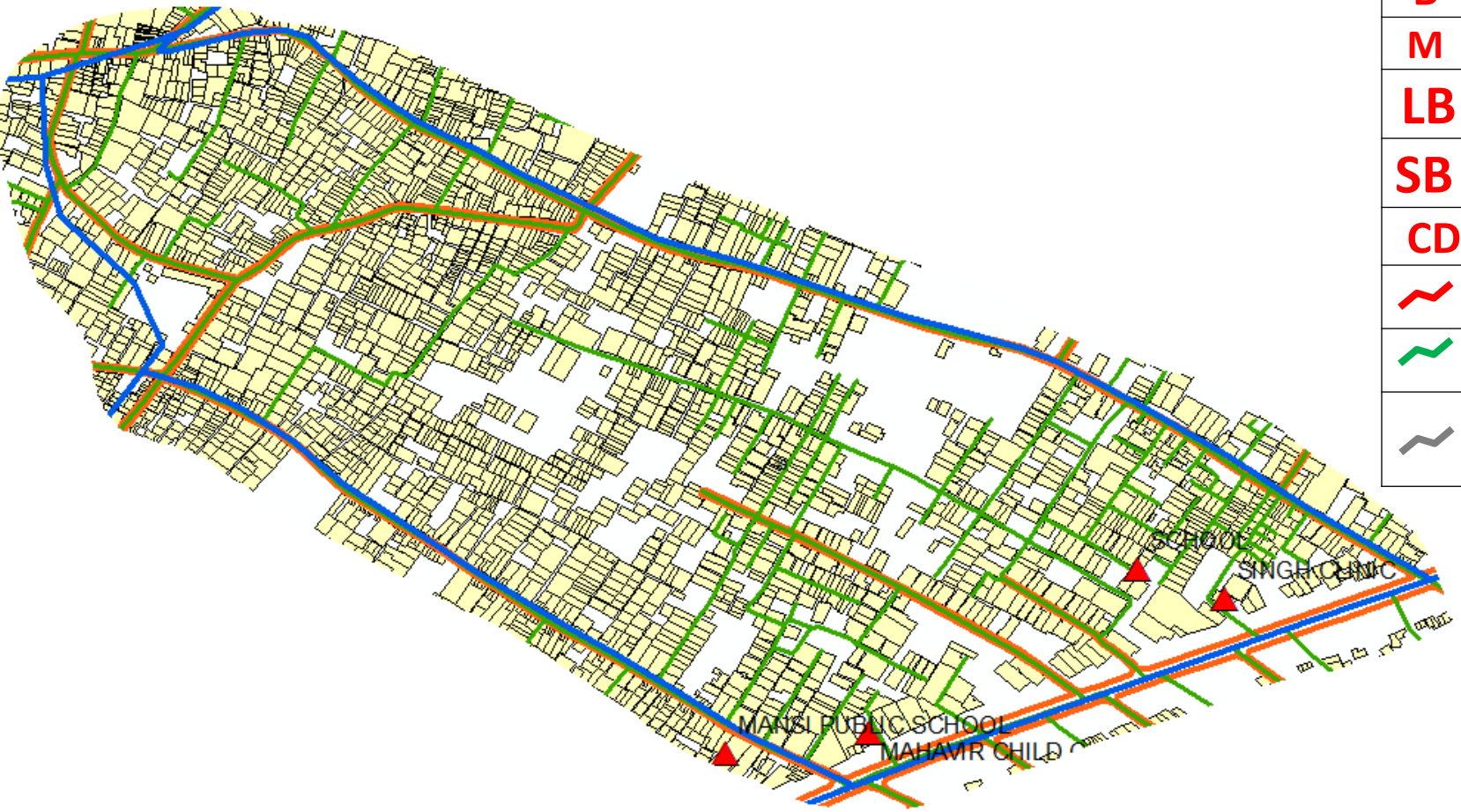


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



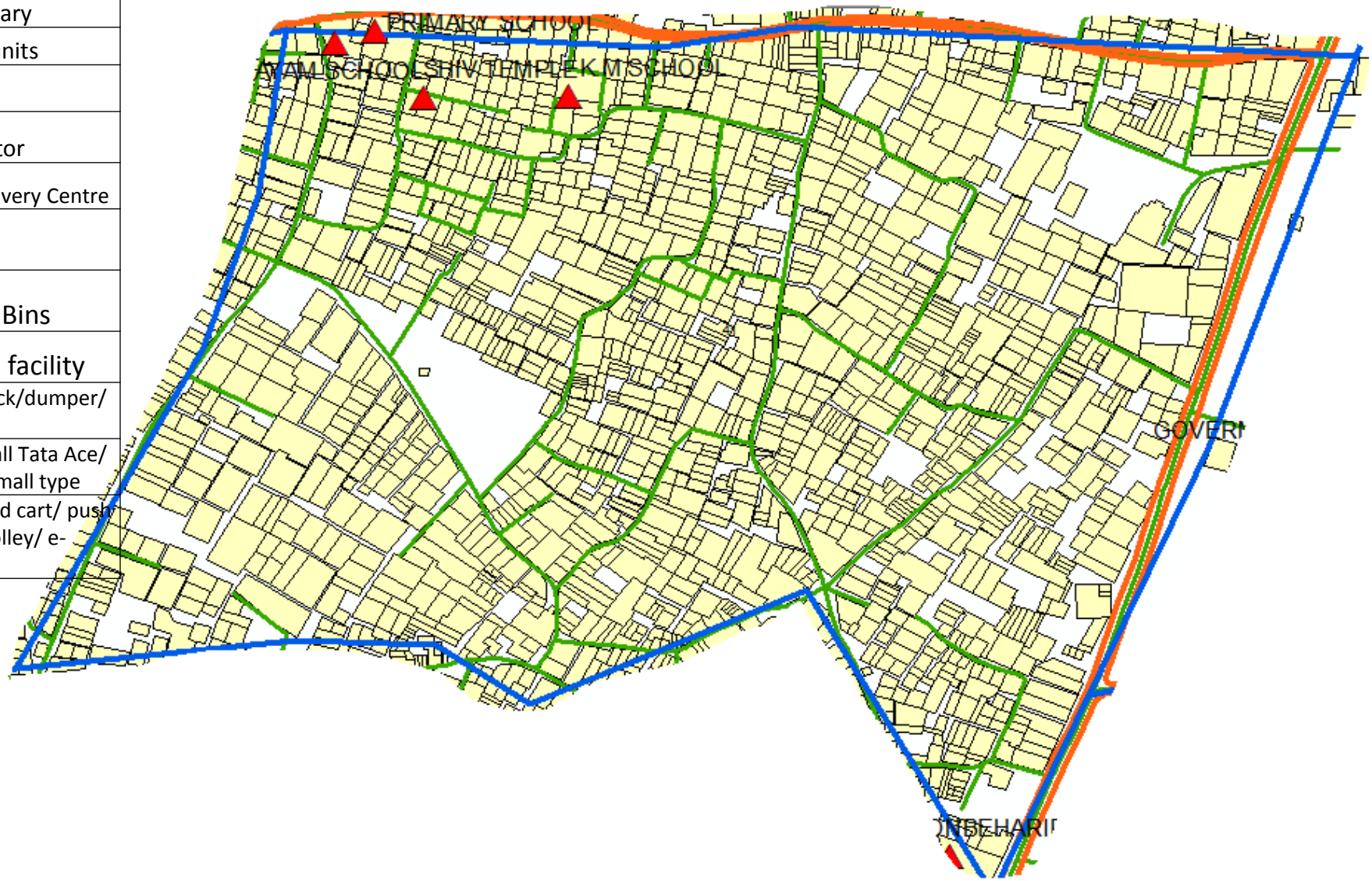
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



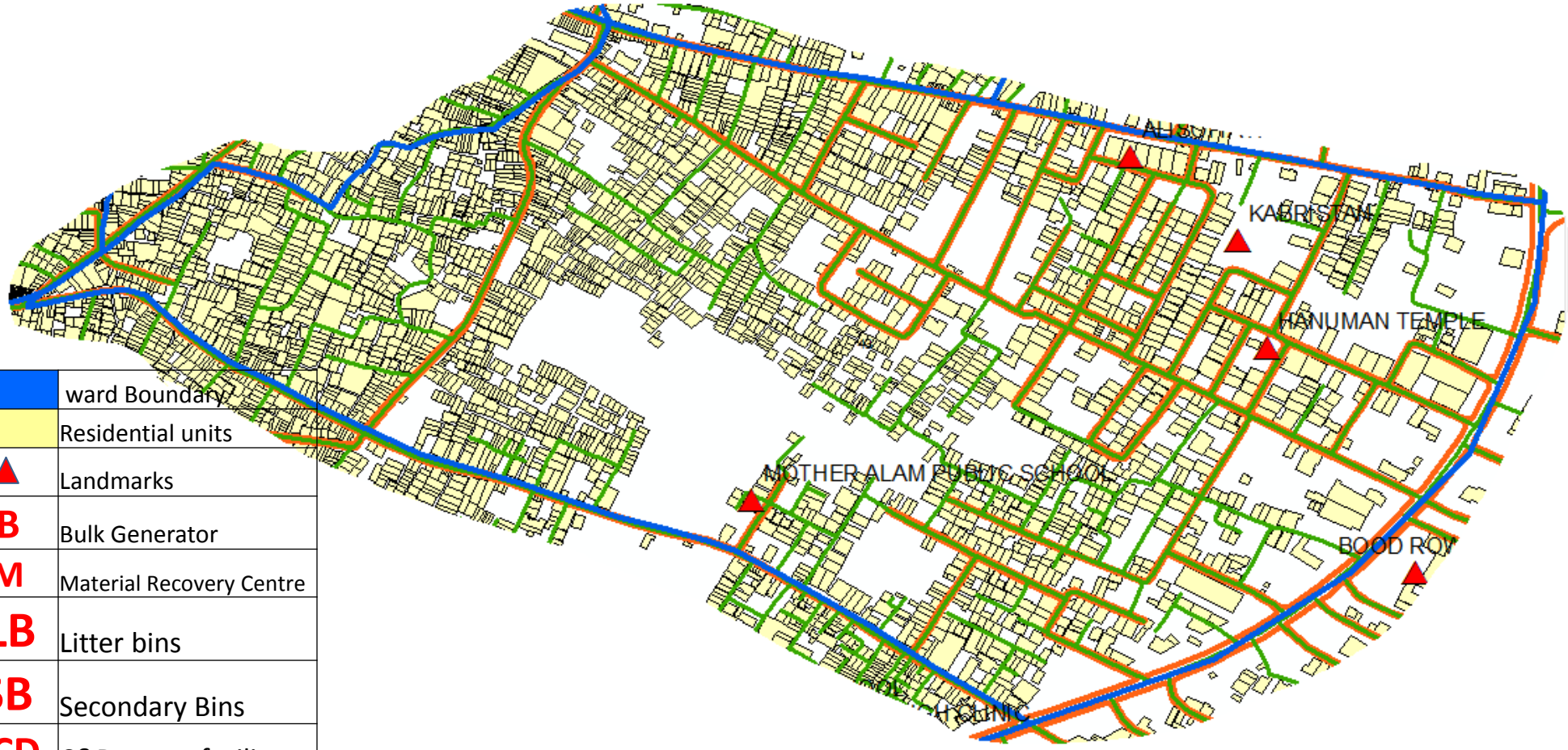


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

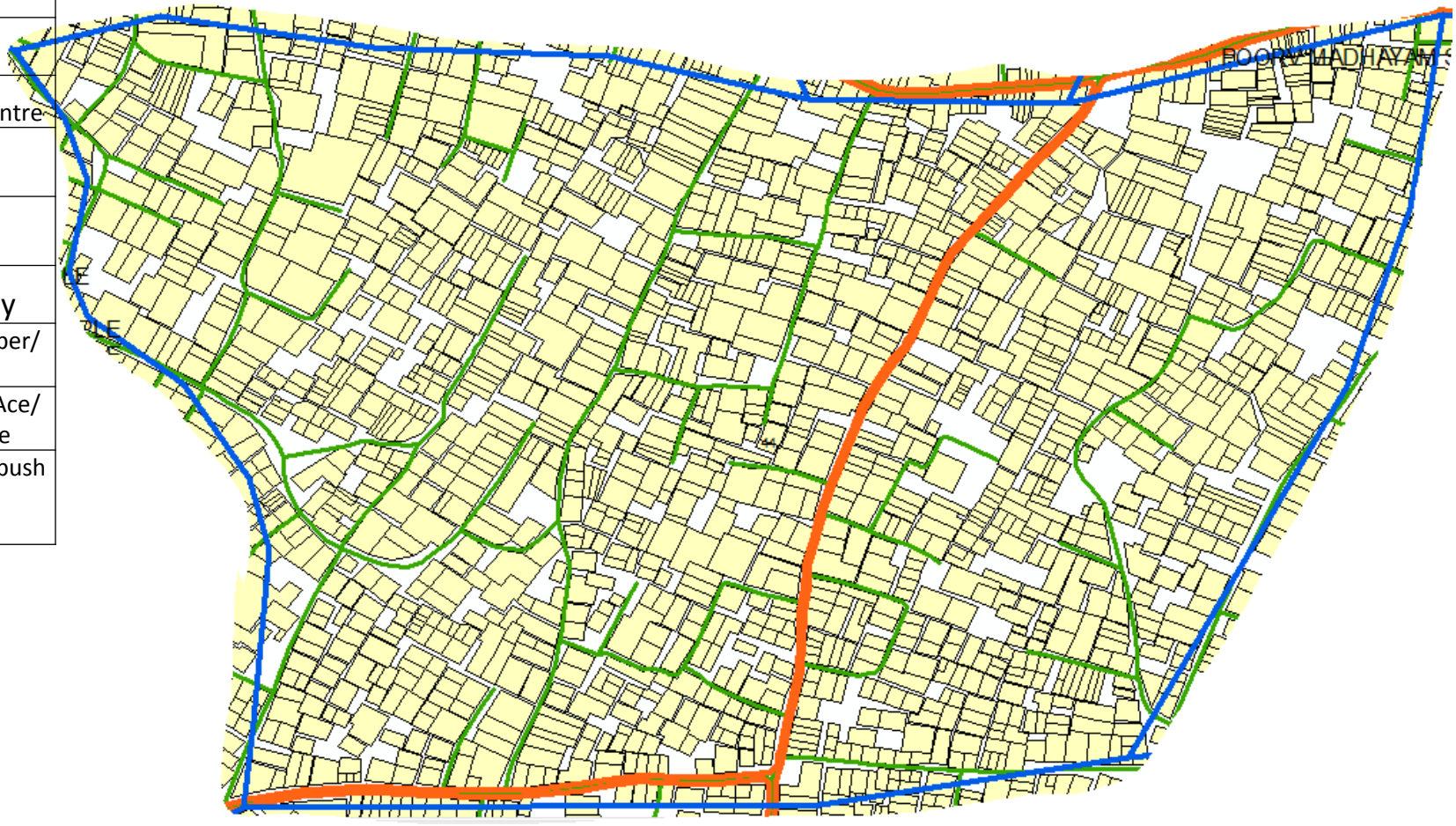


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

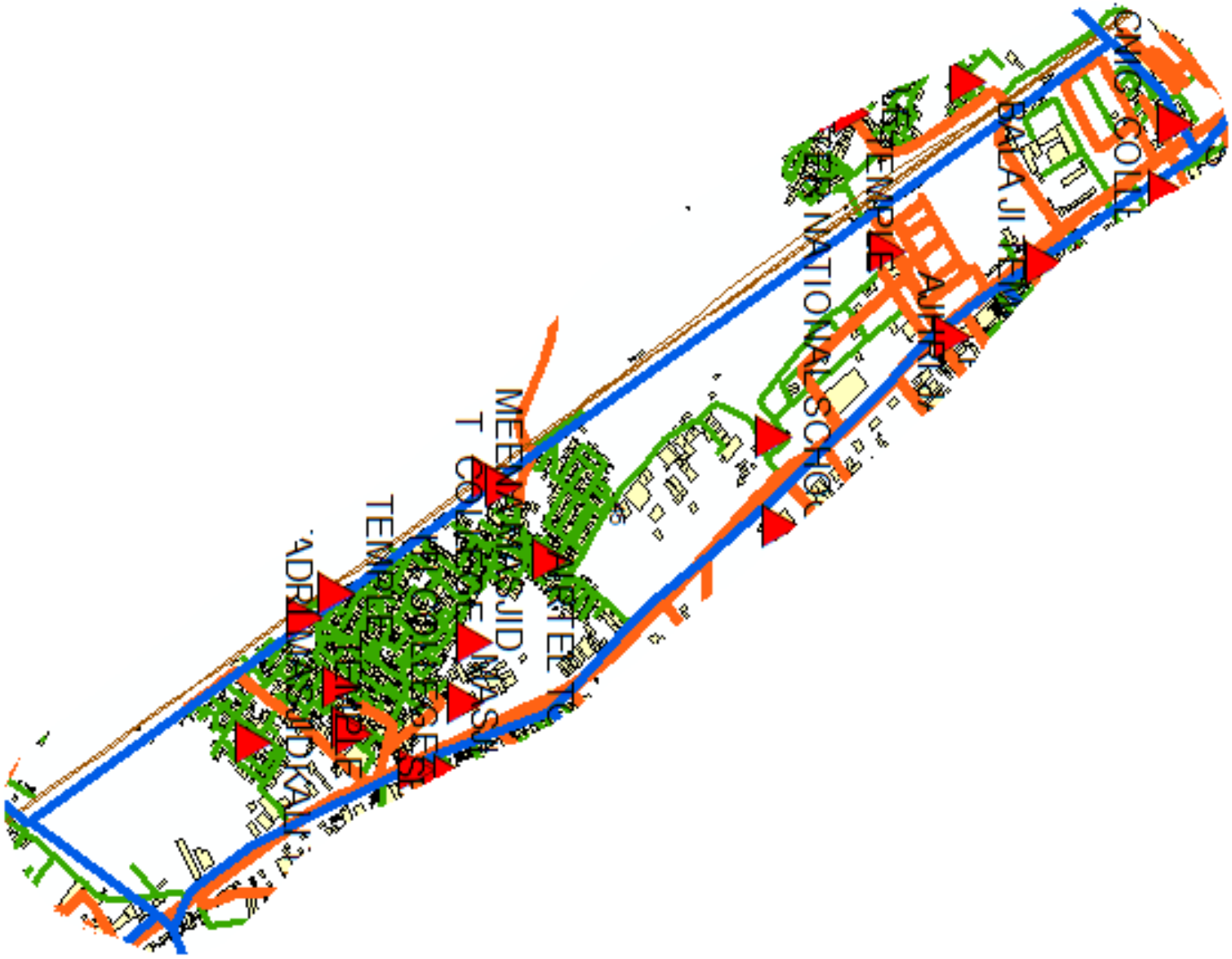


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



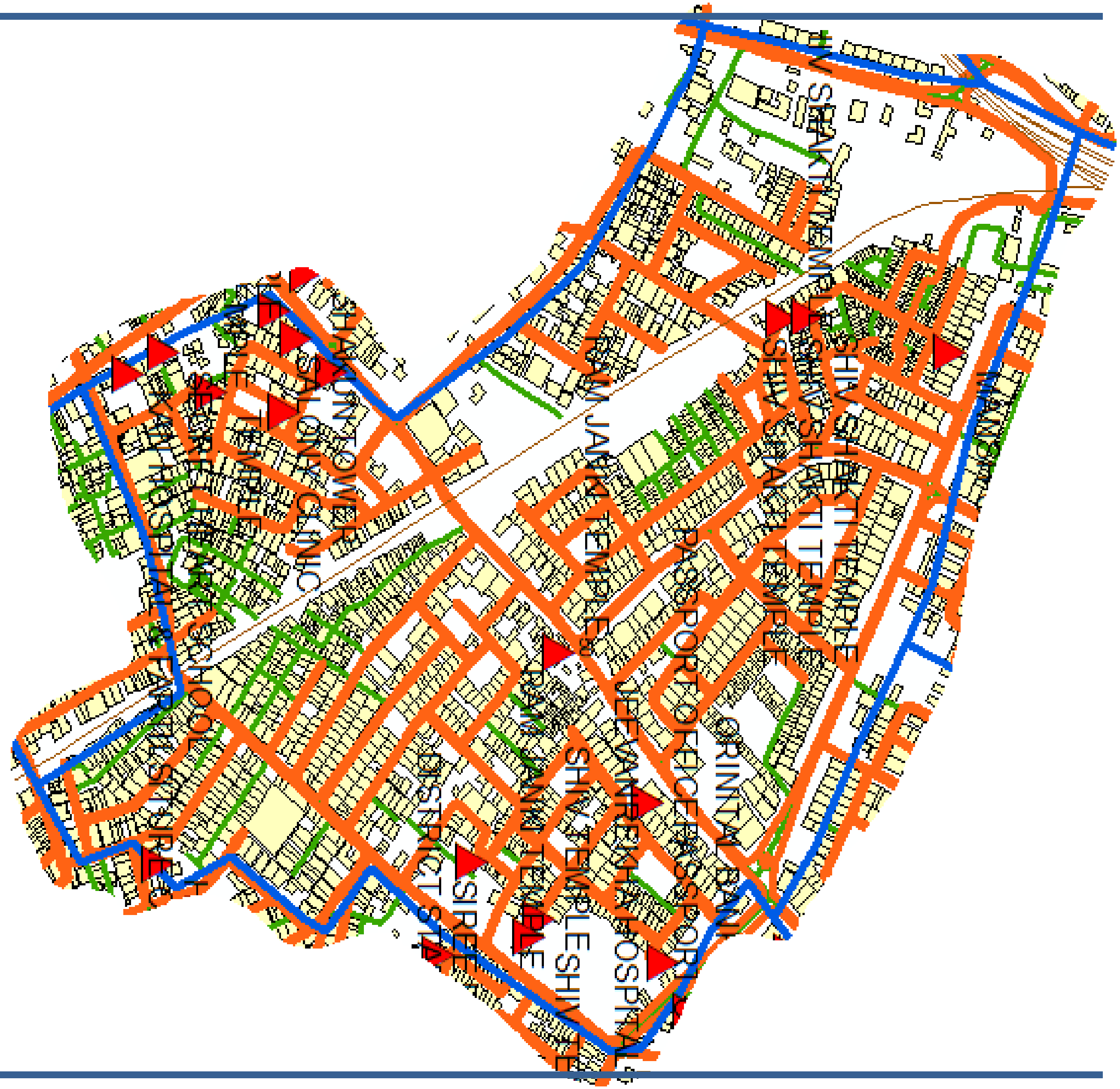
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

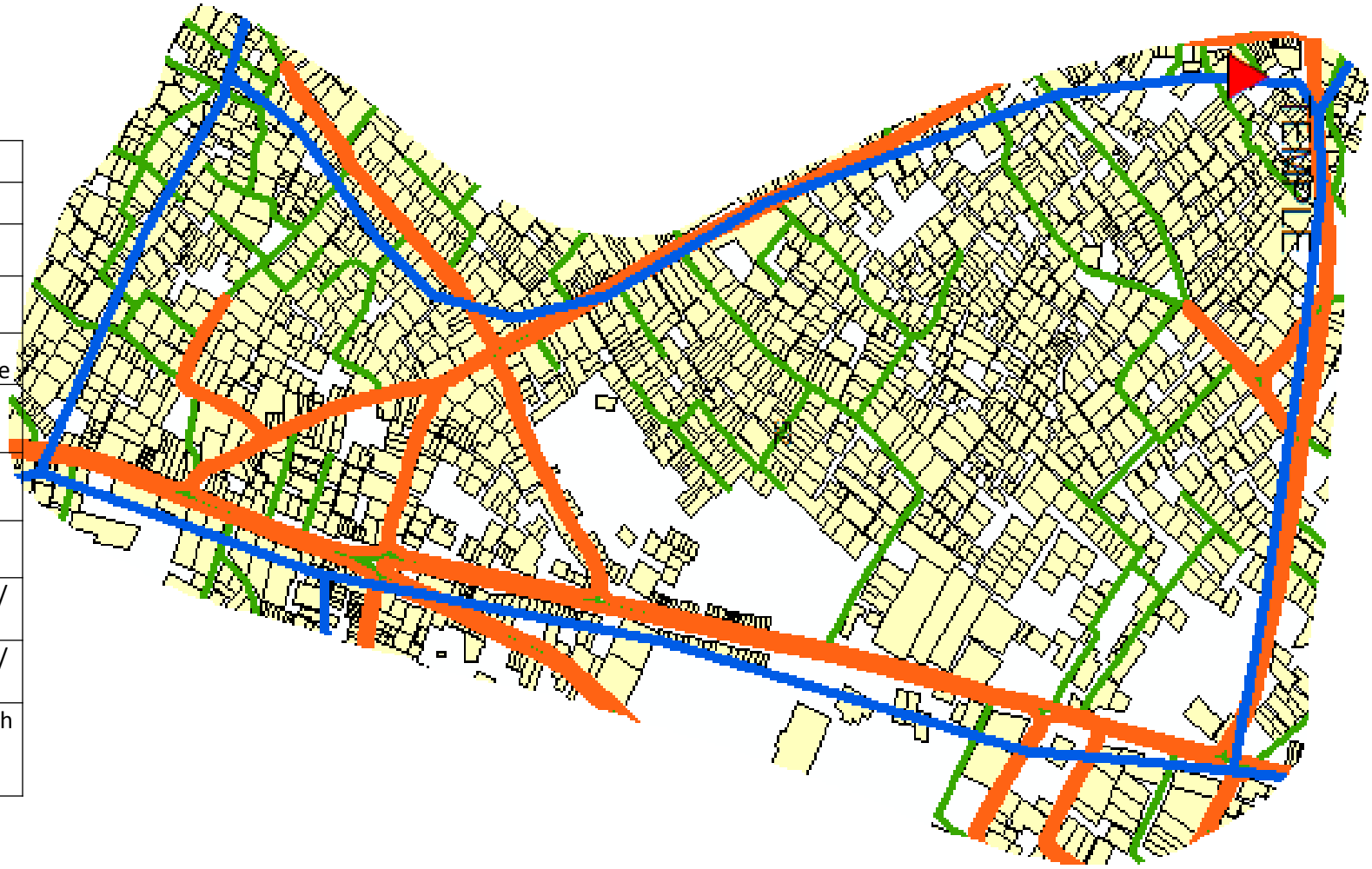
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

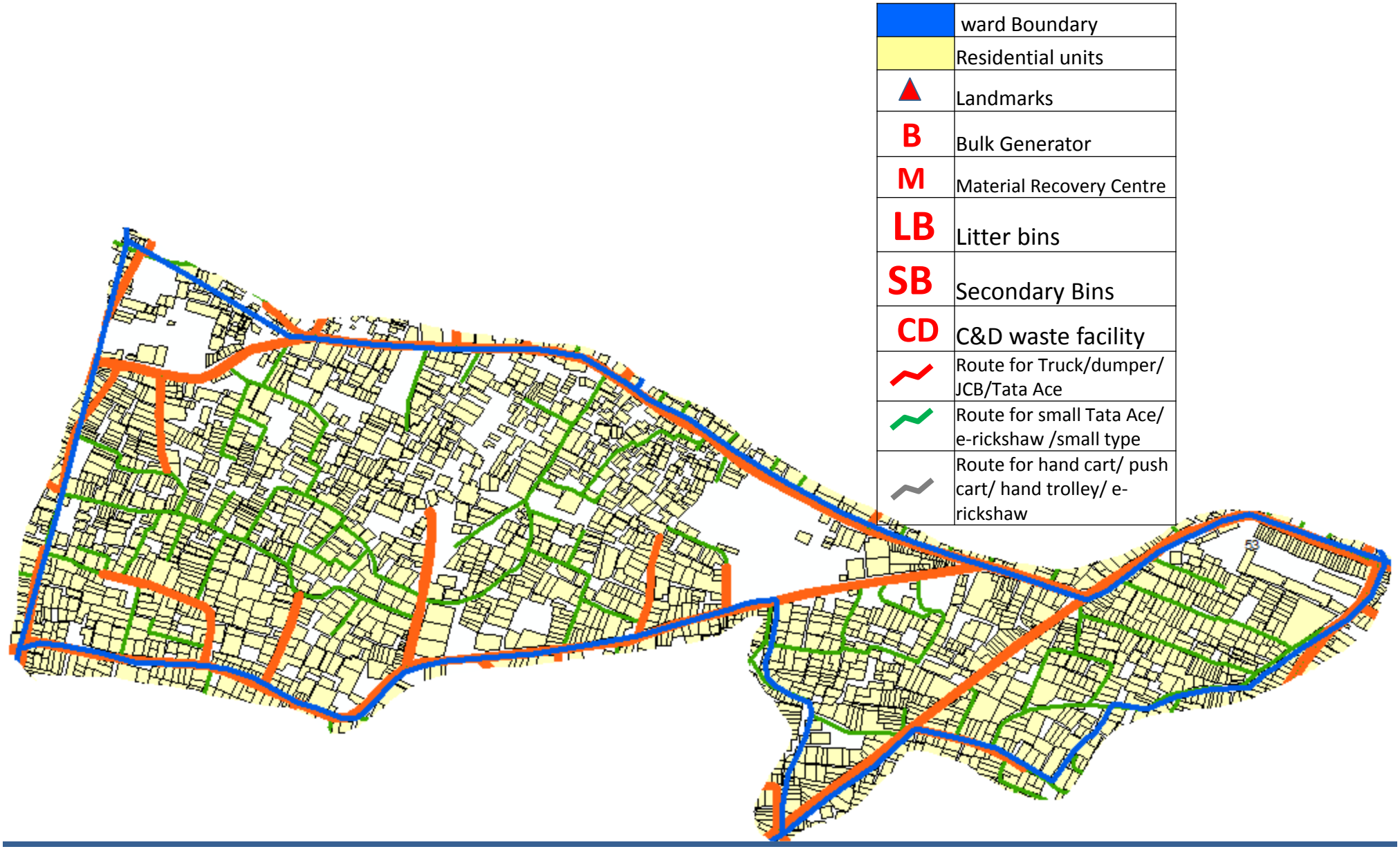
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



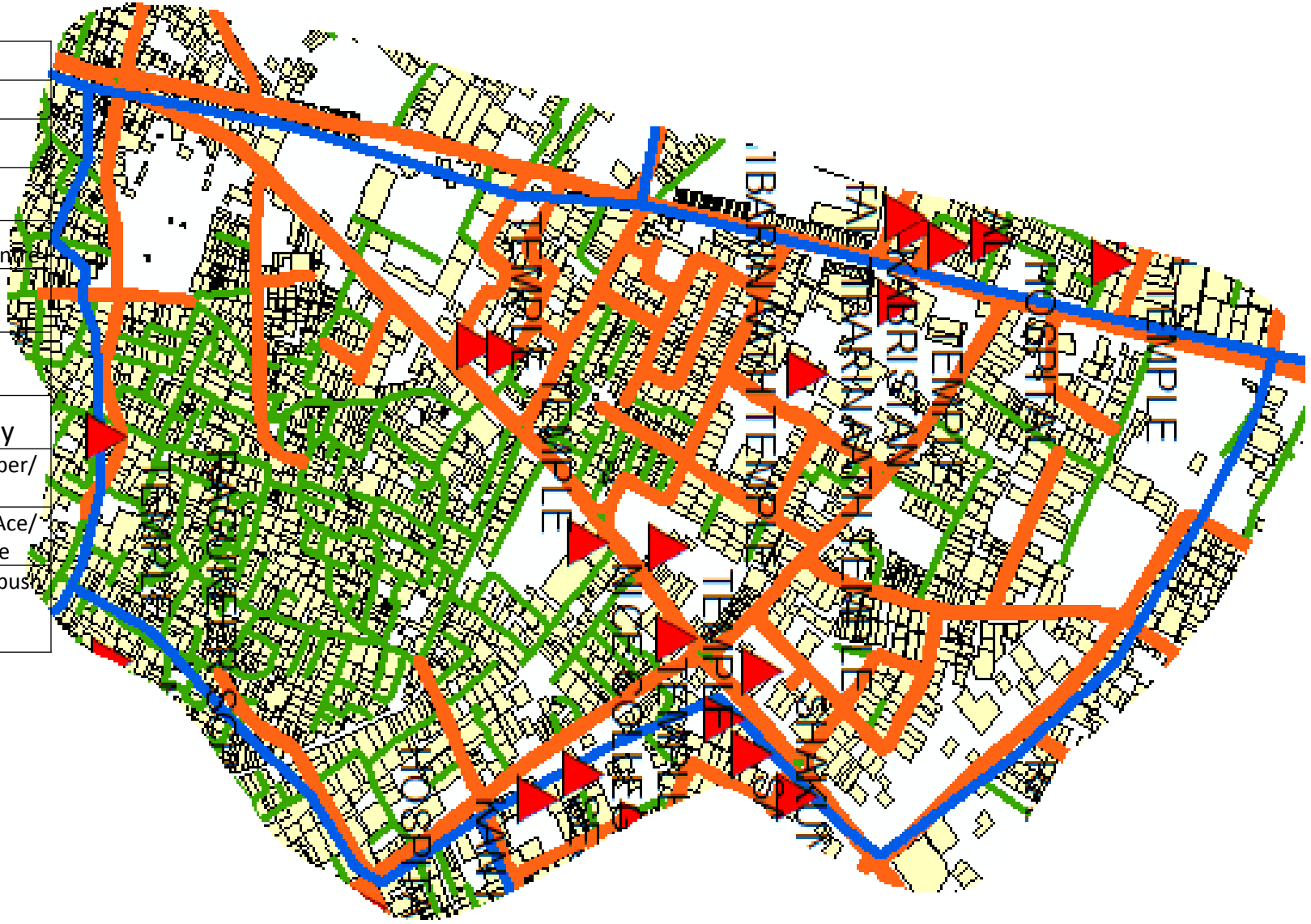
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

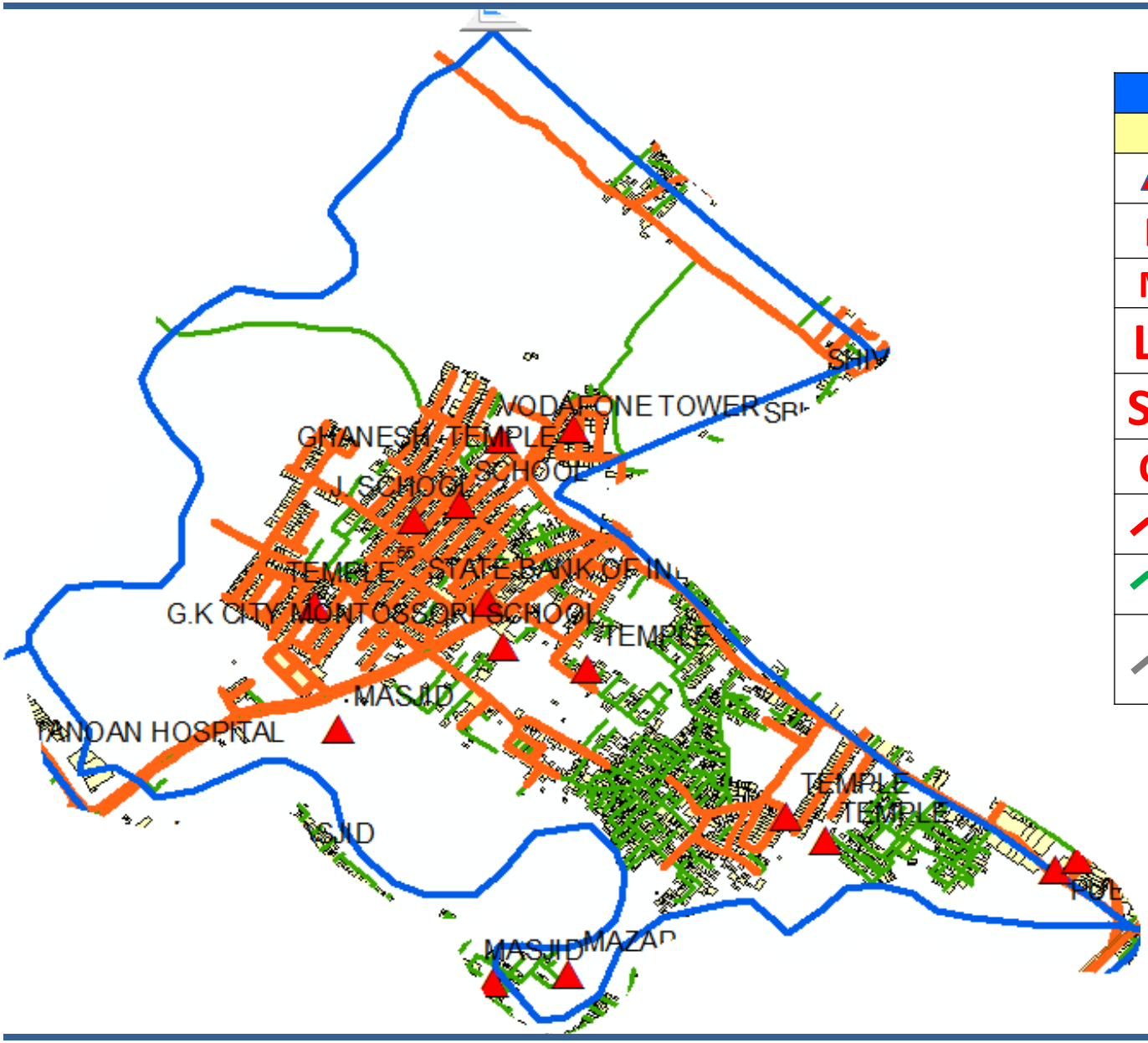
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw




ward Boundary
Residential units
Landmarks
B
Bulk Generator
M
Material Recovery Centre
LB
Litter bins
SB
Secondary Bins
CD
C&D waste facility
Route for Truck/dumper/ JCB/Tata Ace
Route for small Tata Ace/ e-rickshaw /small type
Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

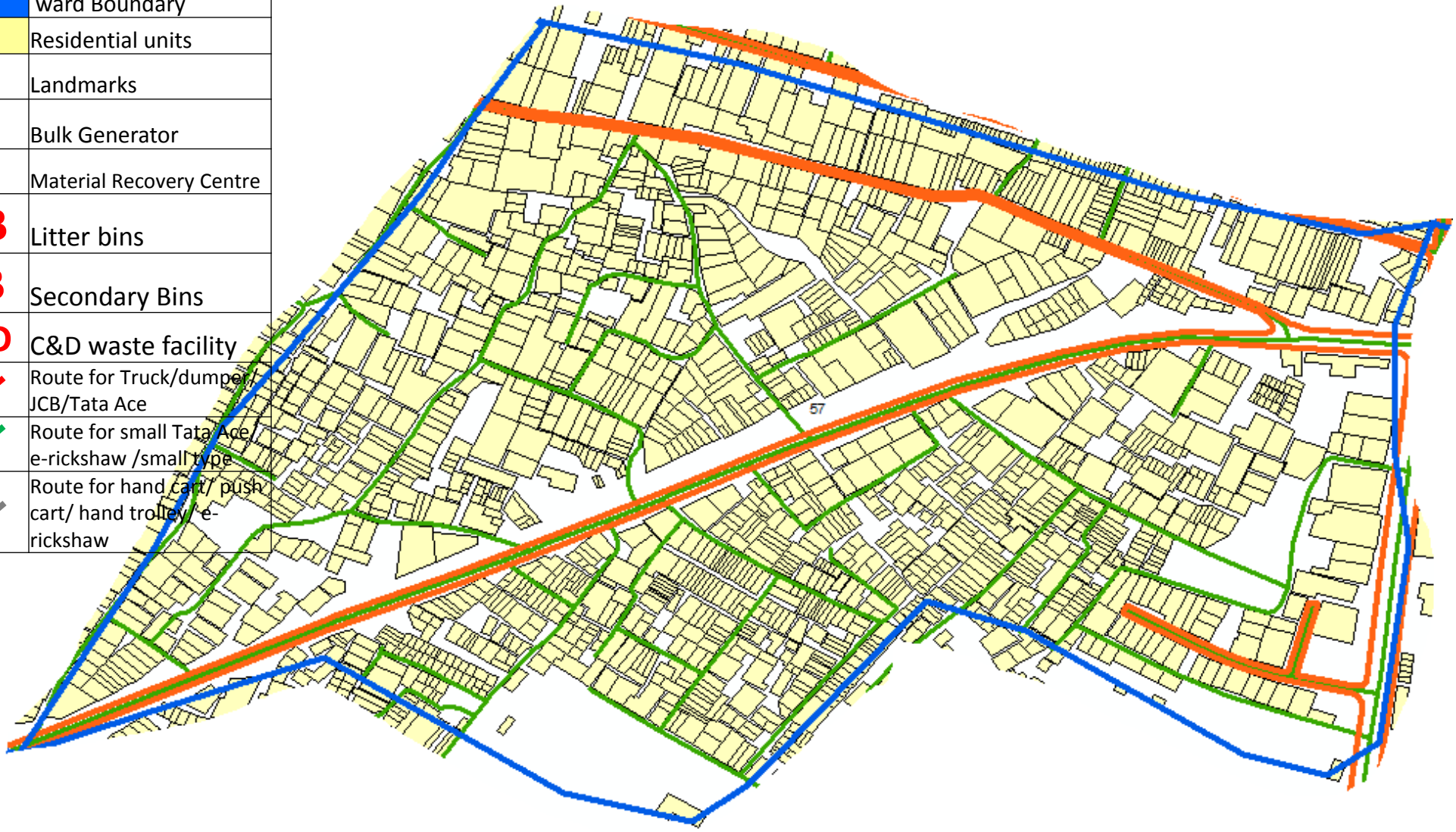


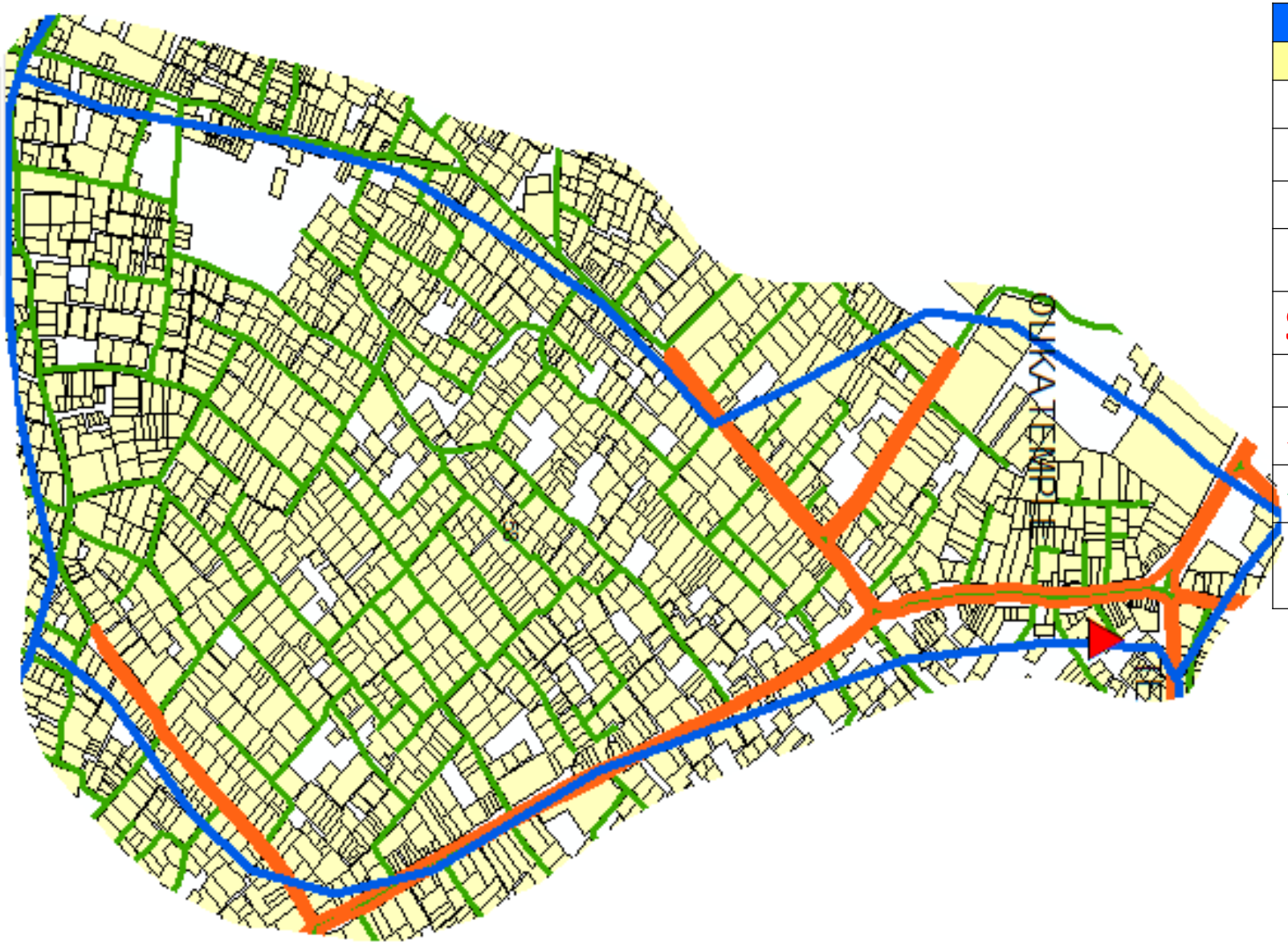


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

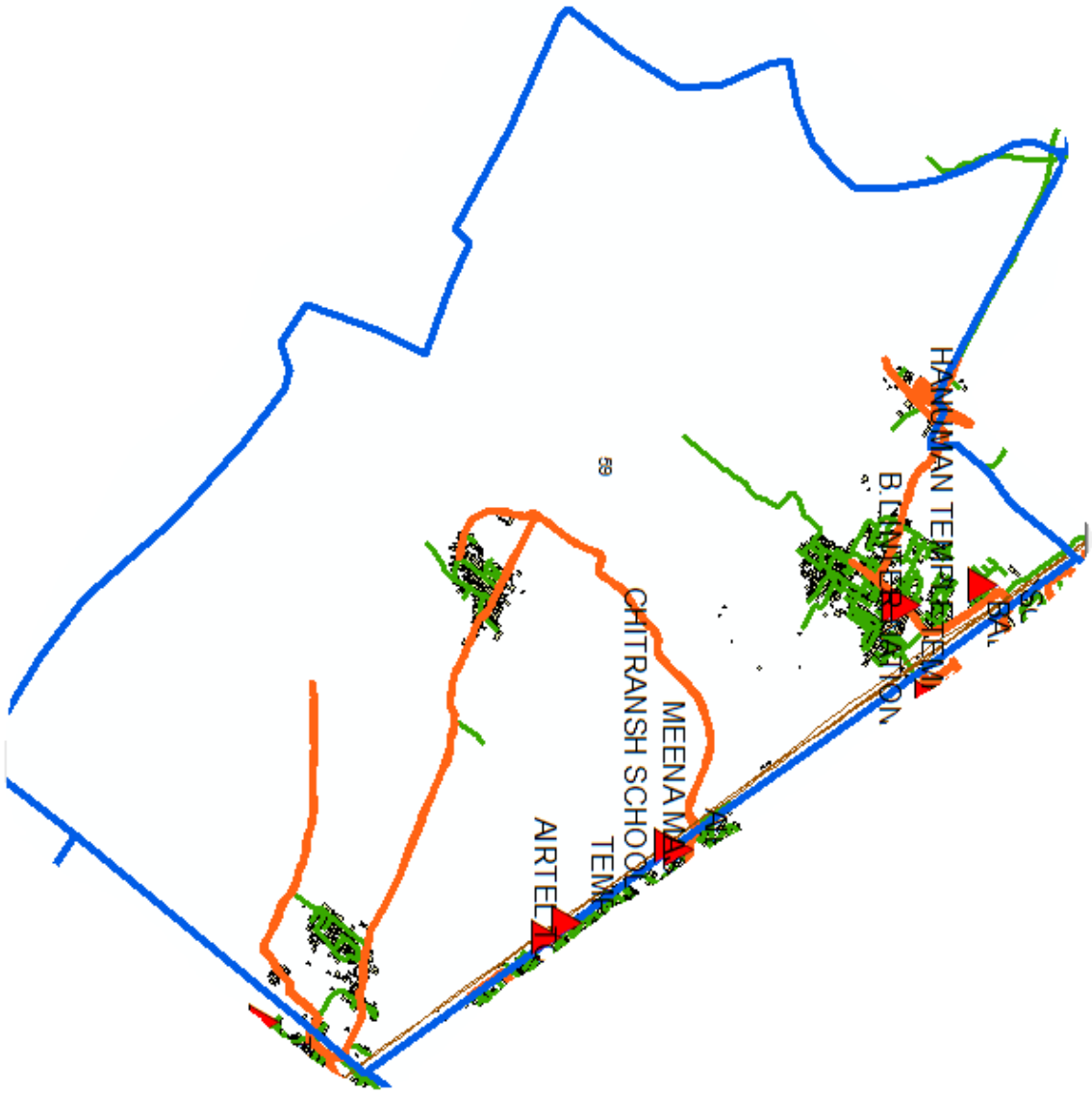
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



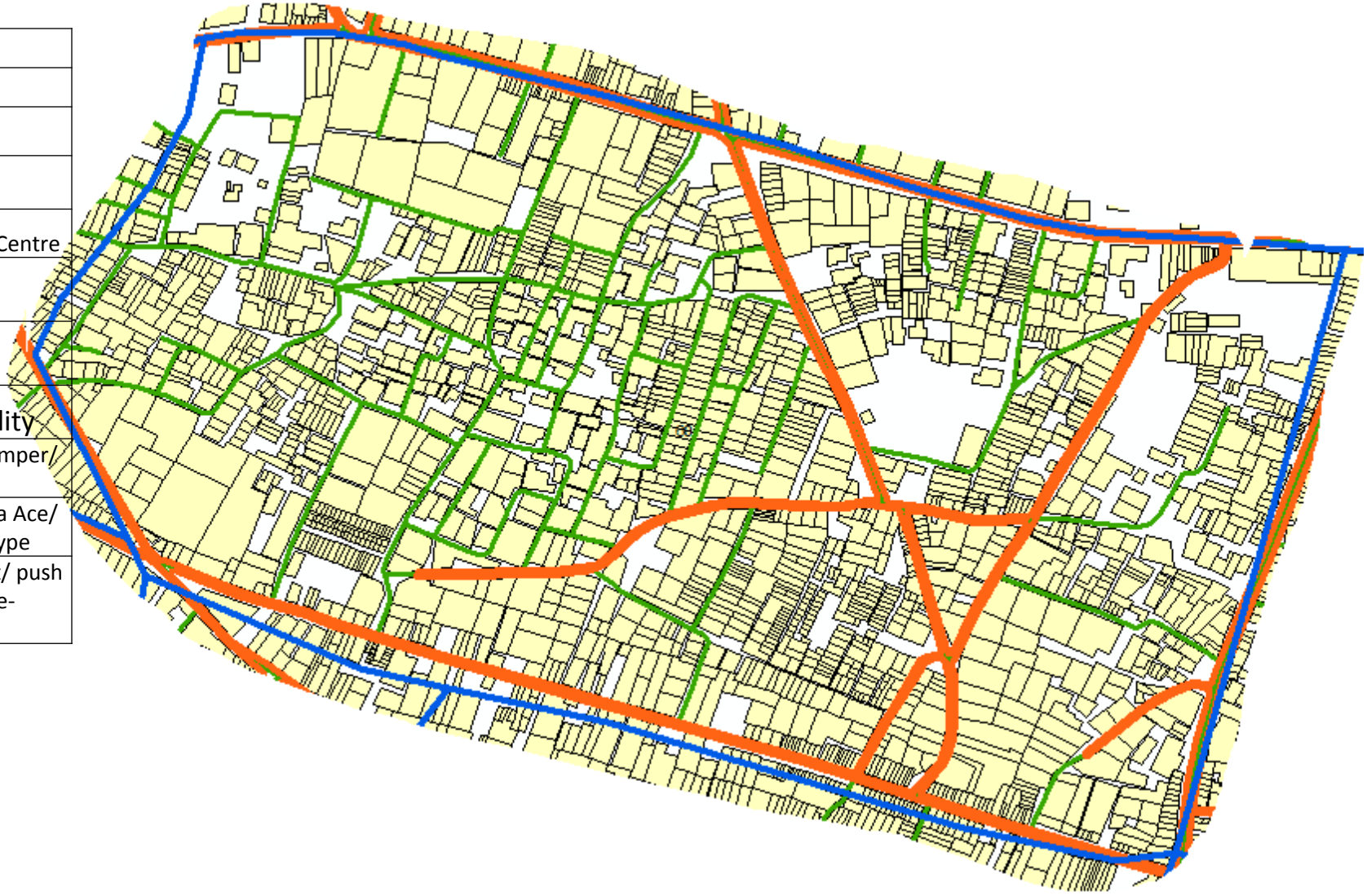


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

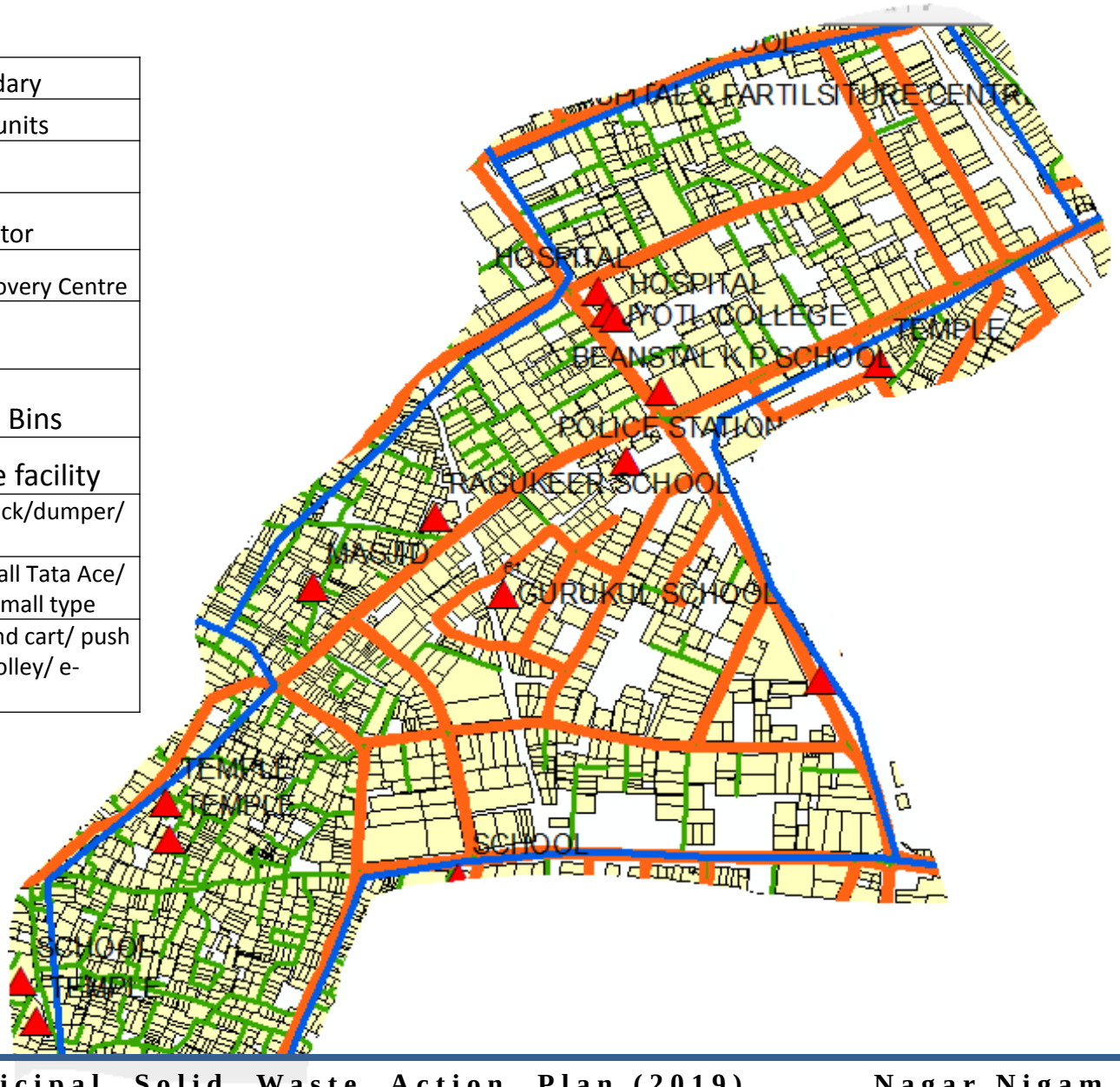
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



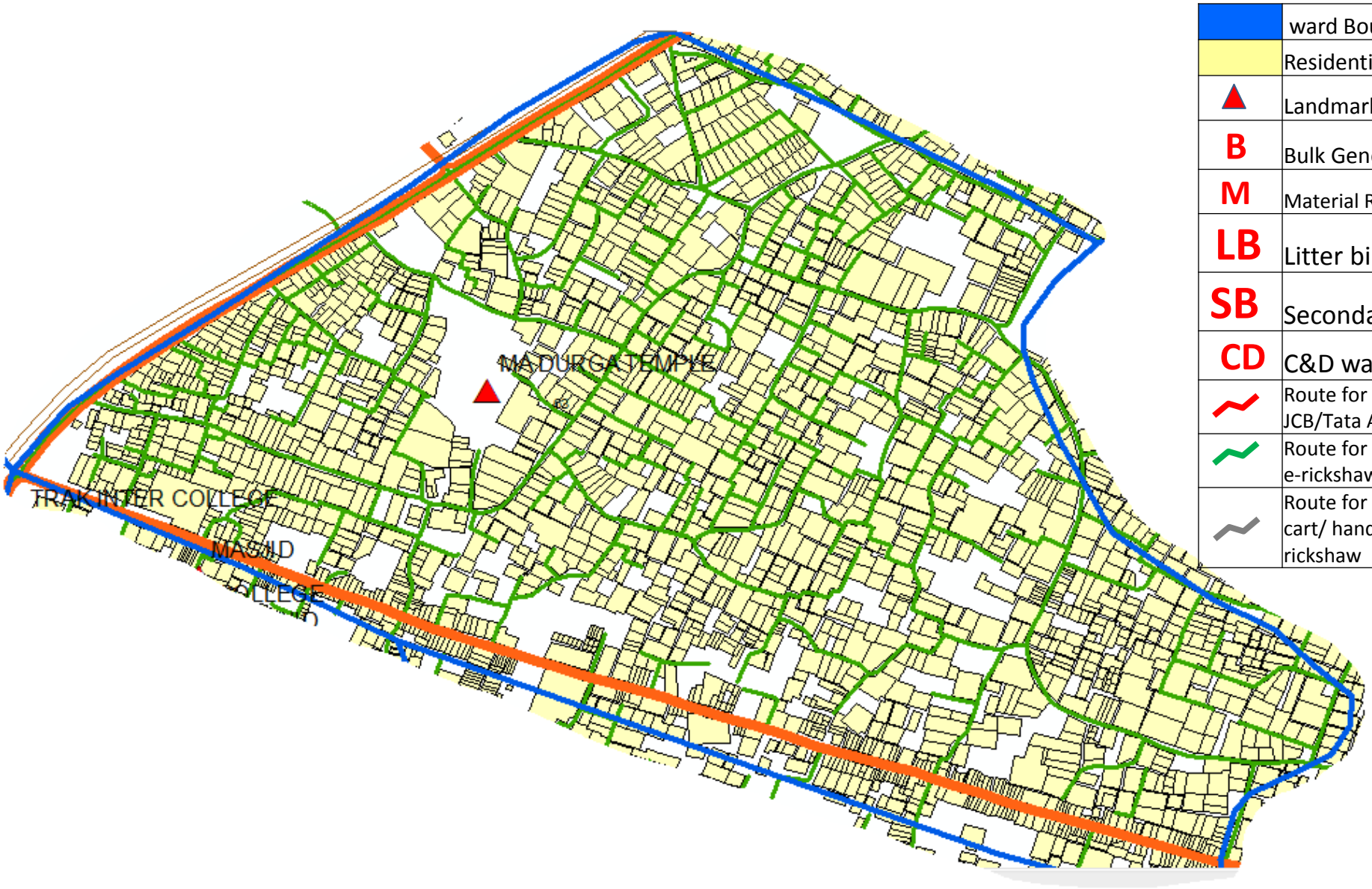
	ward Boundary
	Residential units
	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



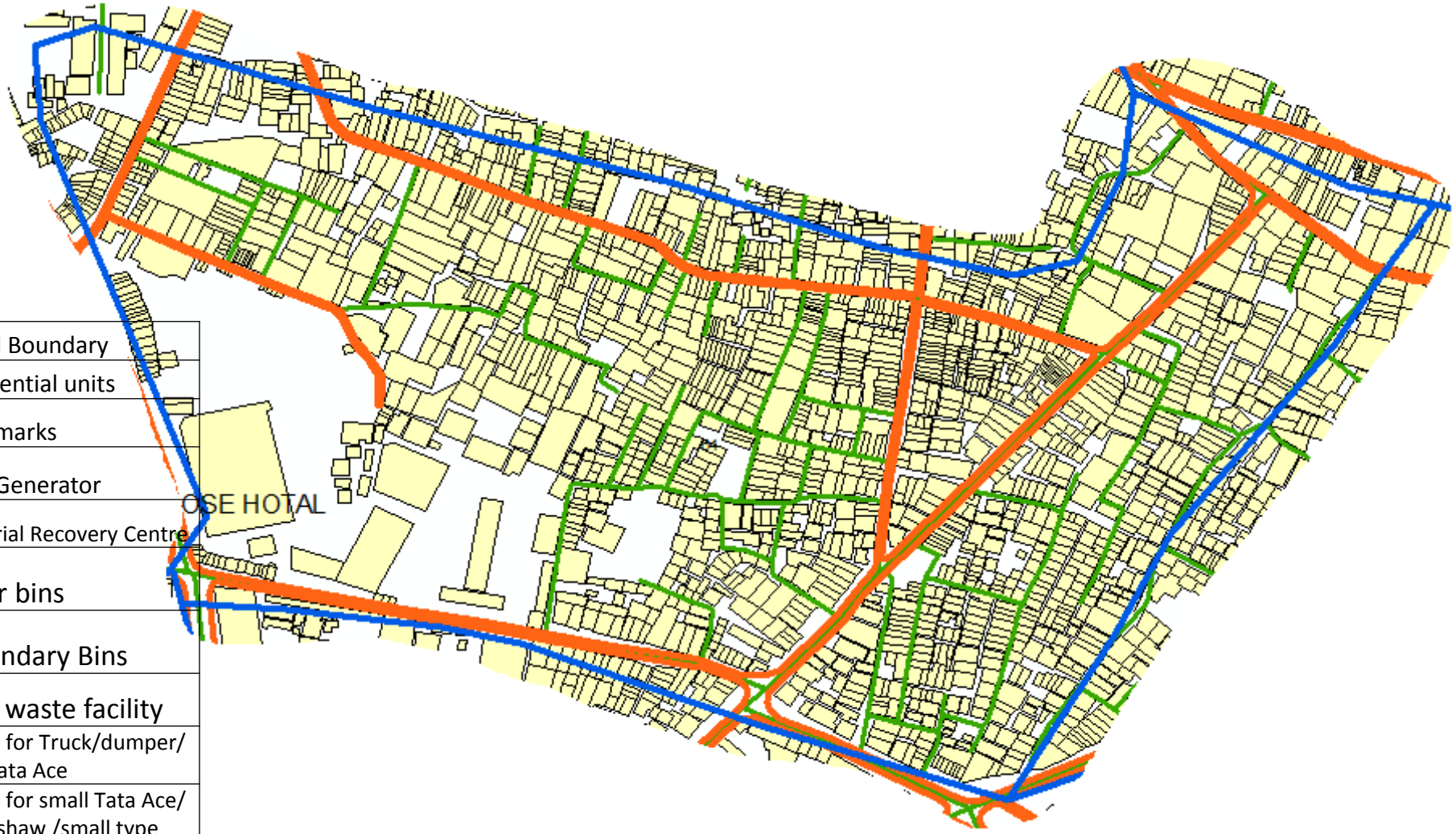
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

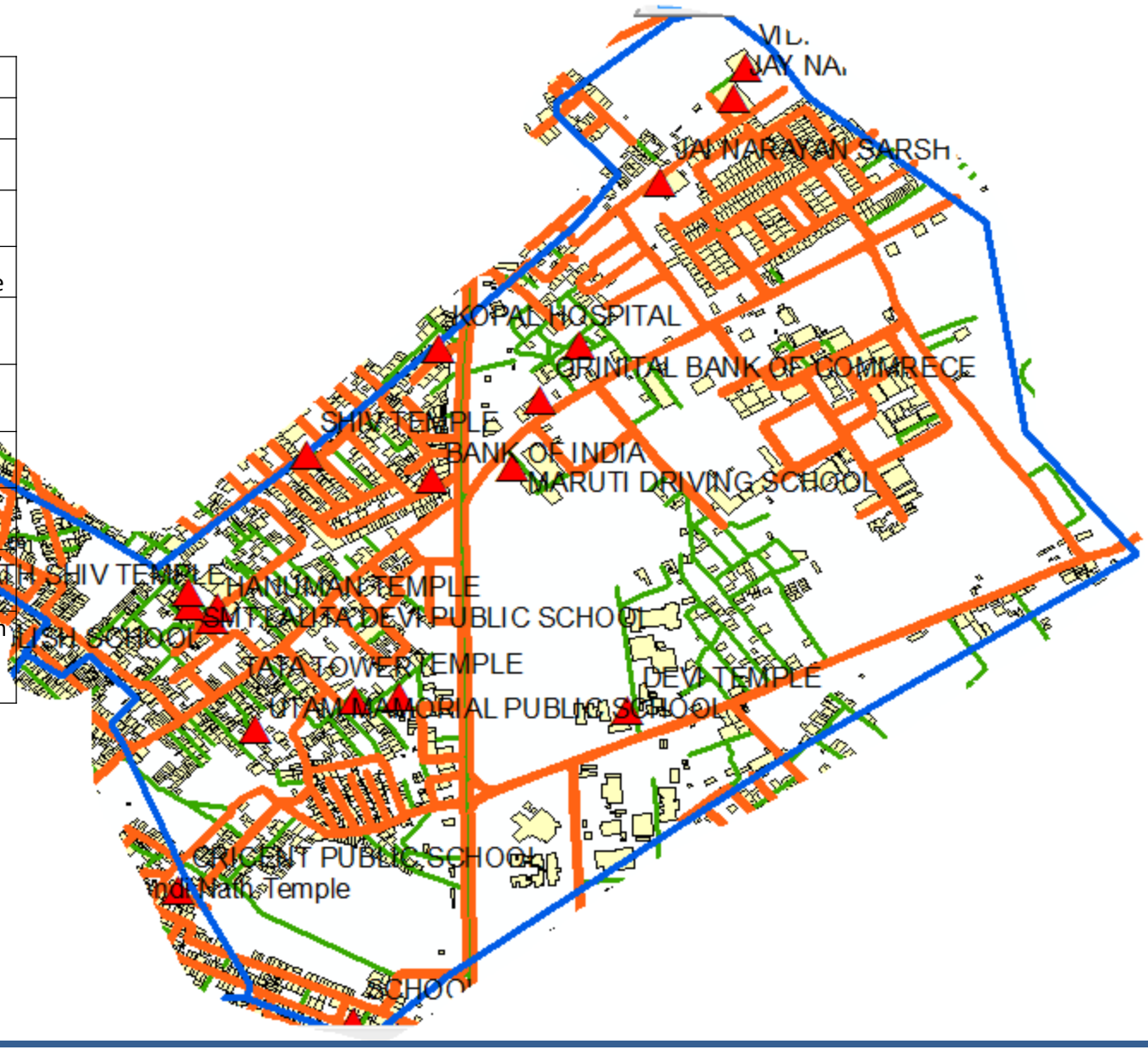


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
	Route for Truck/dumper/ JCB/Tata Ace
	Route for small Tata Ace/ e-rickshaw /small type
	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

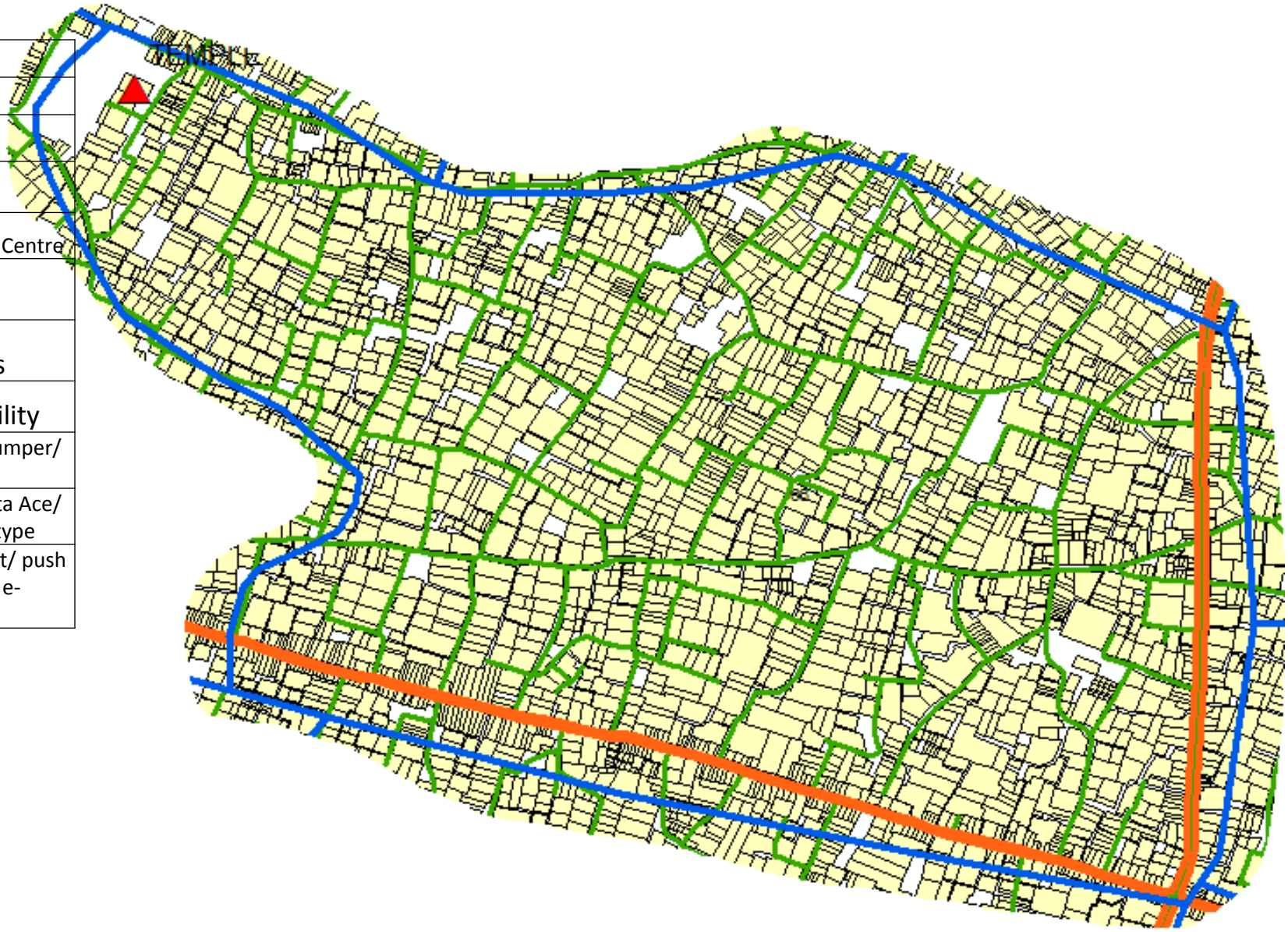


	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

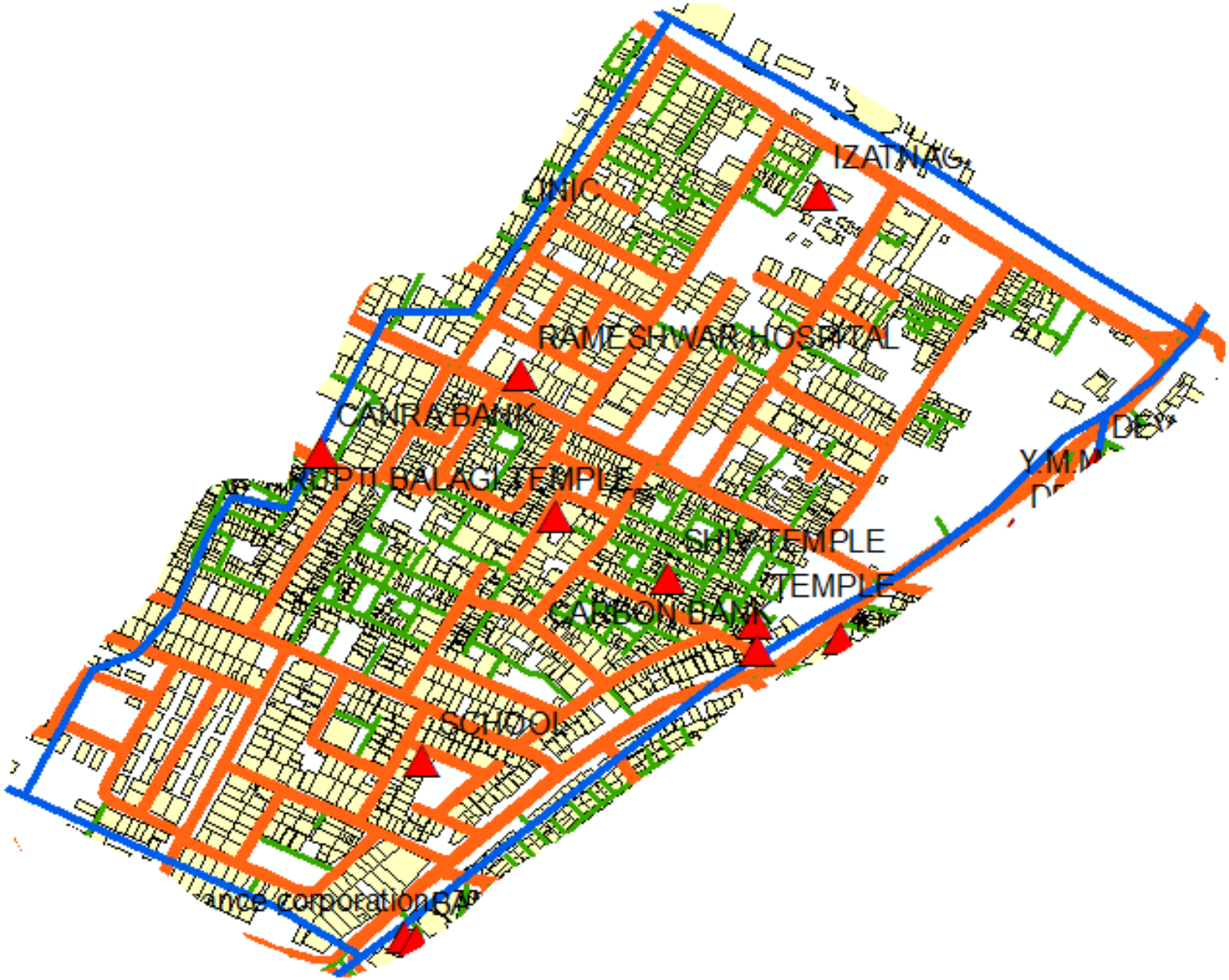
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



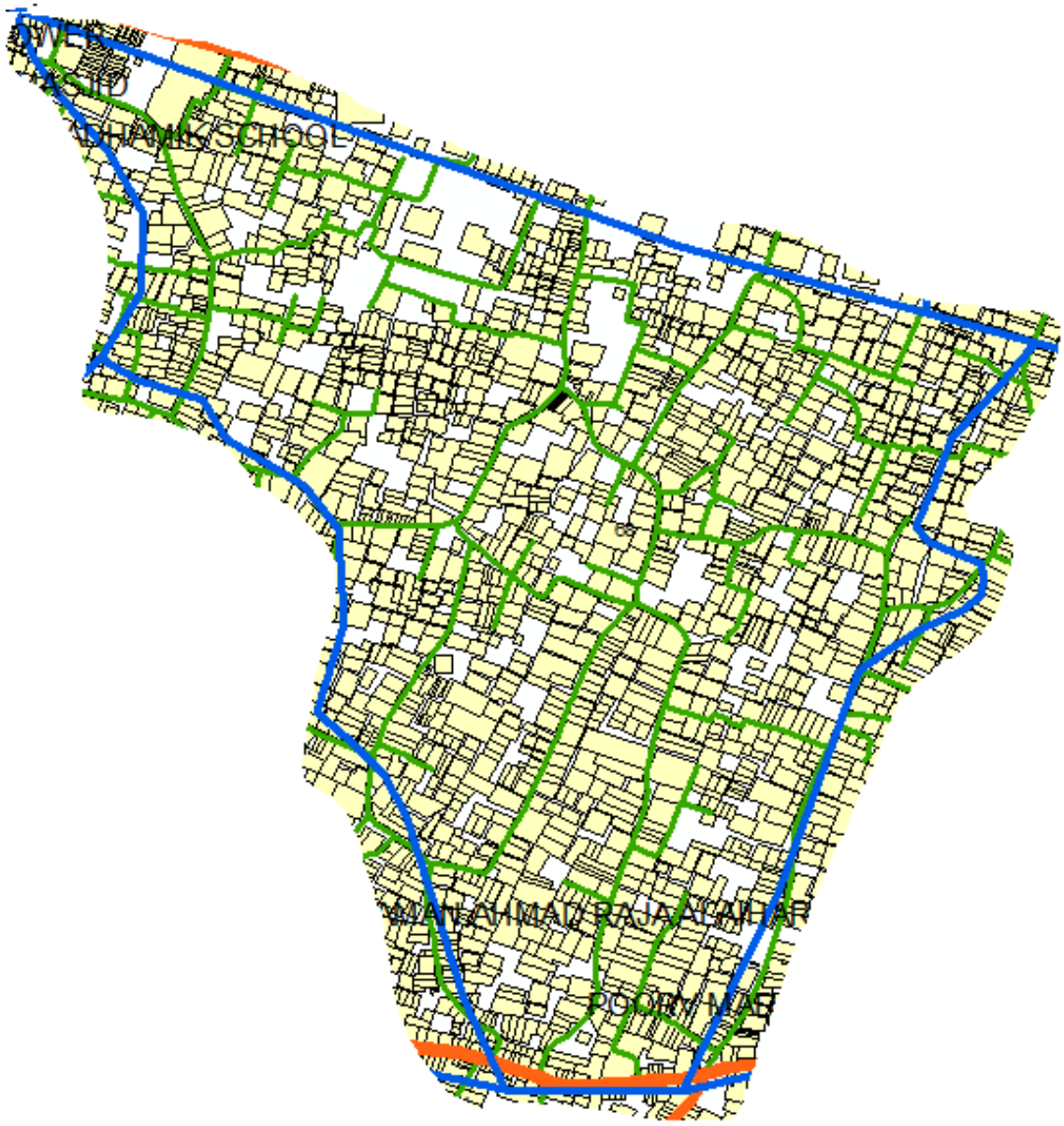
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



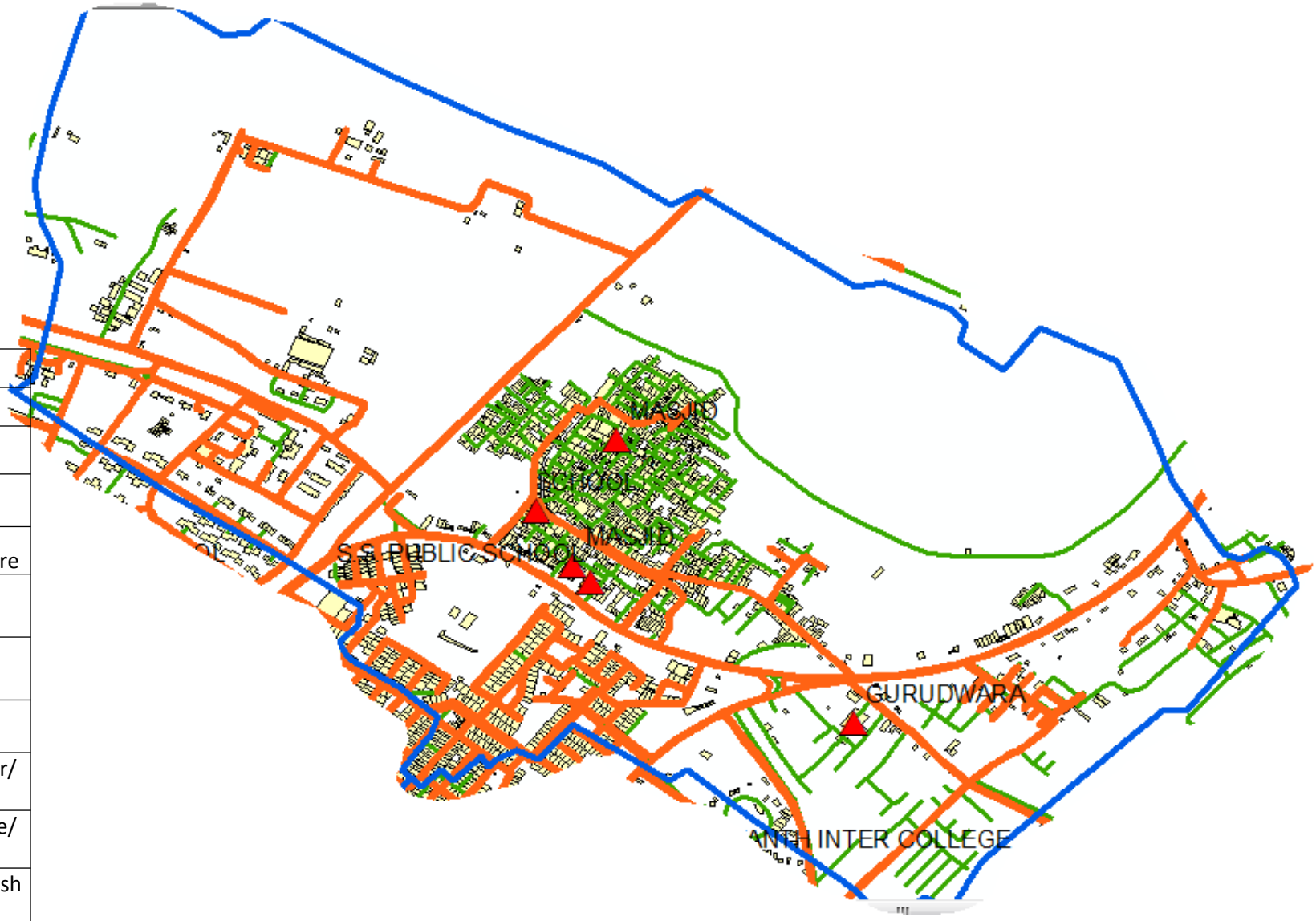
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

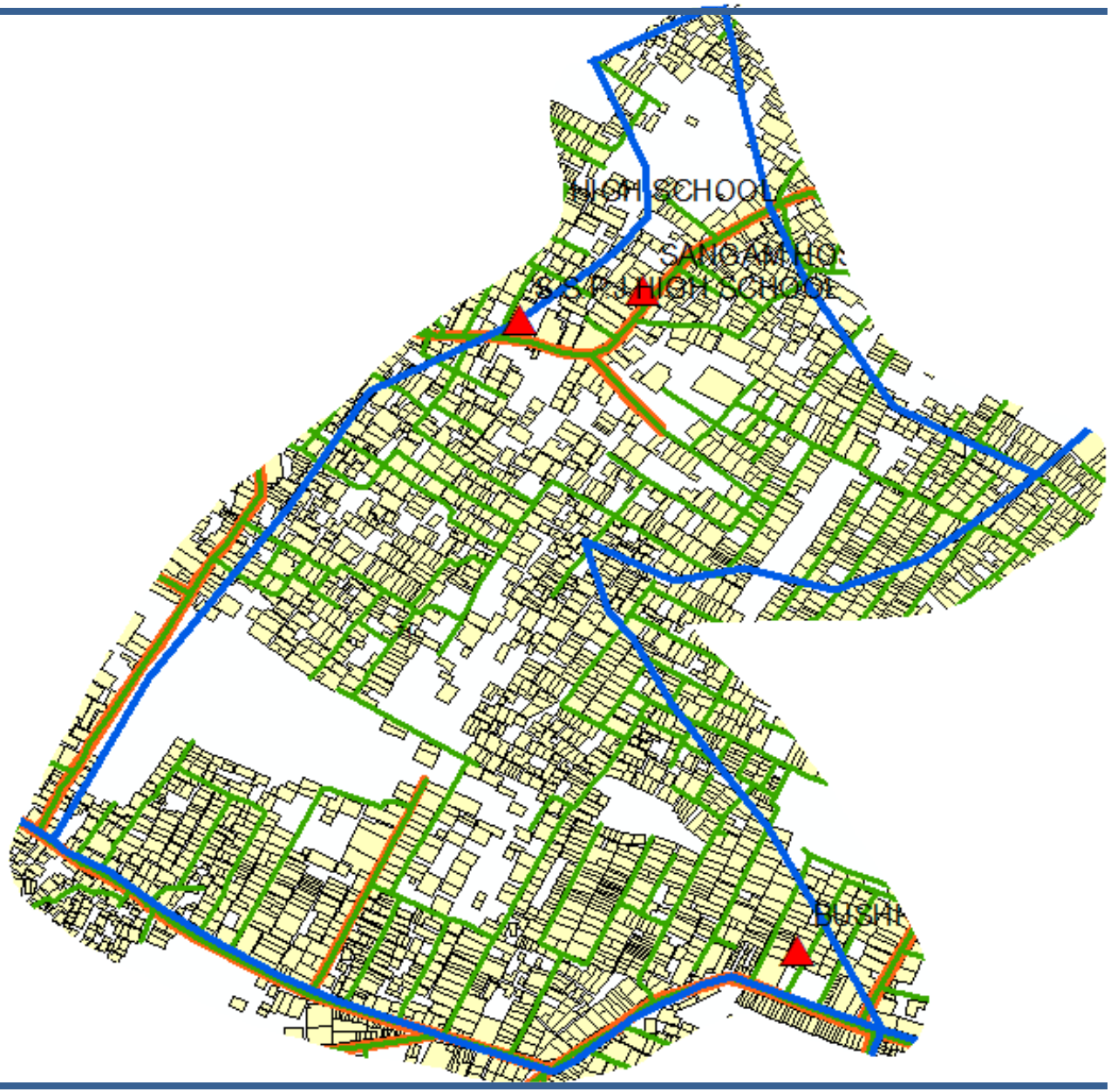


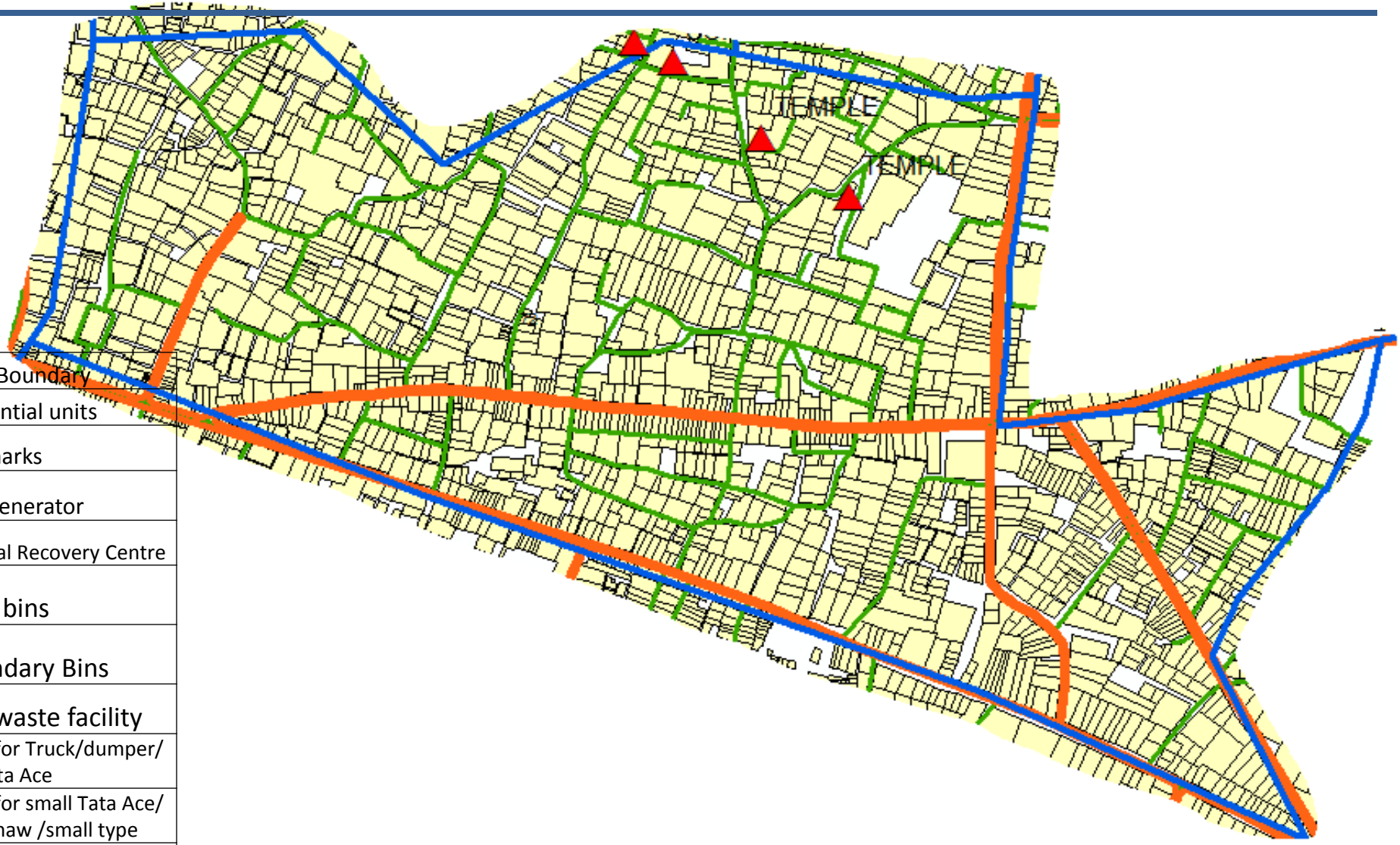
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

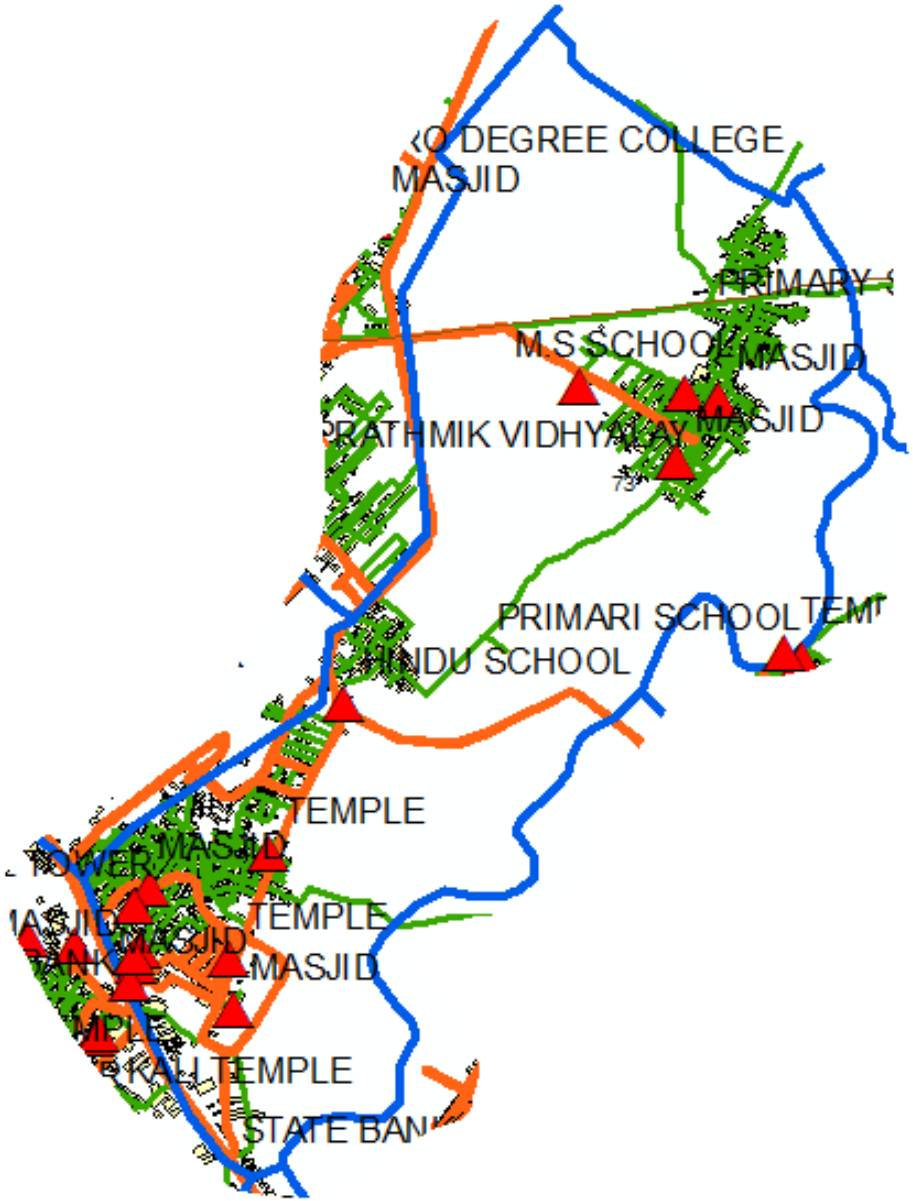
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw





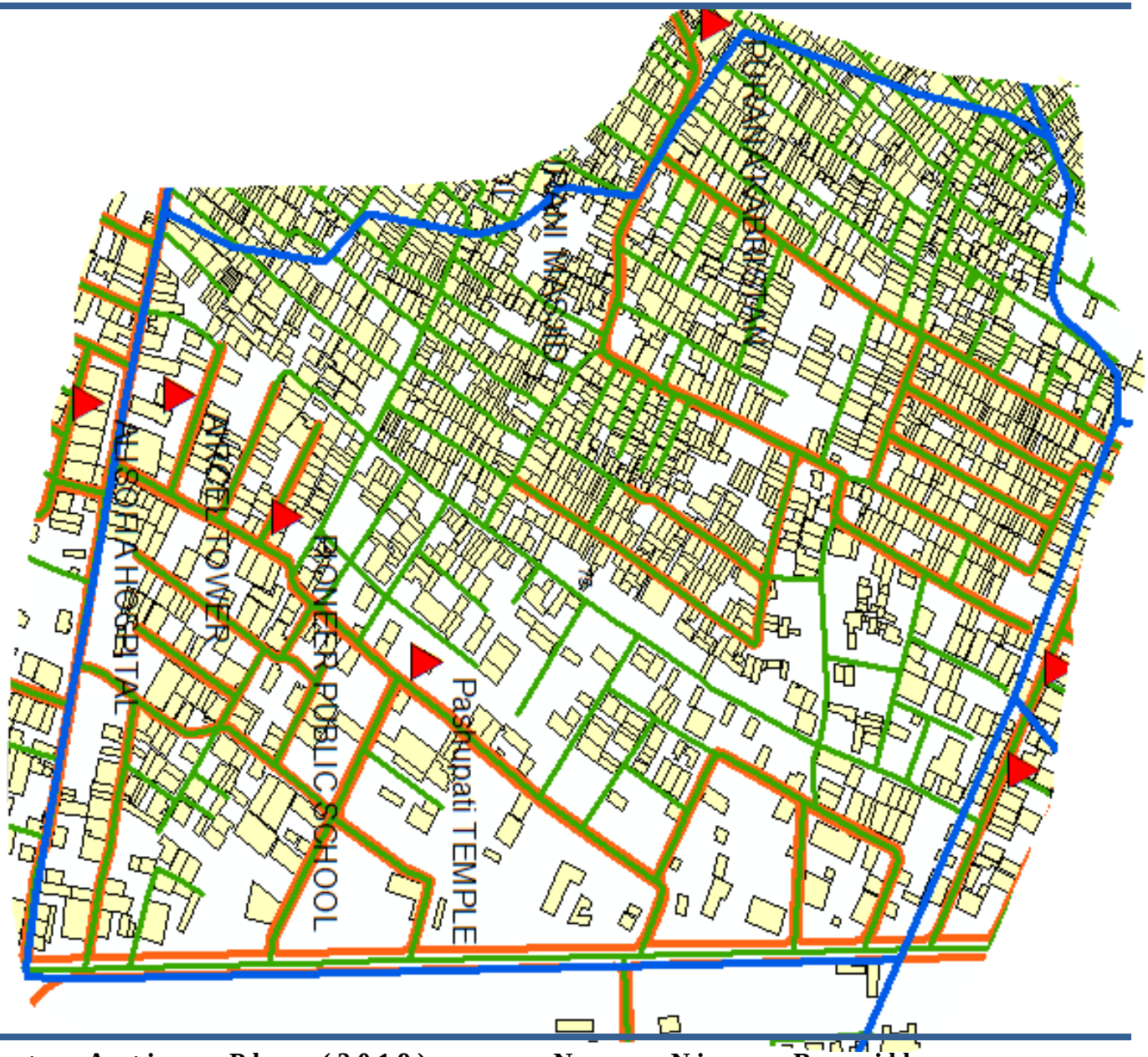
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

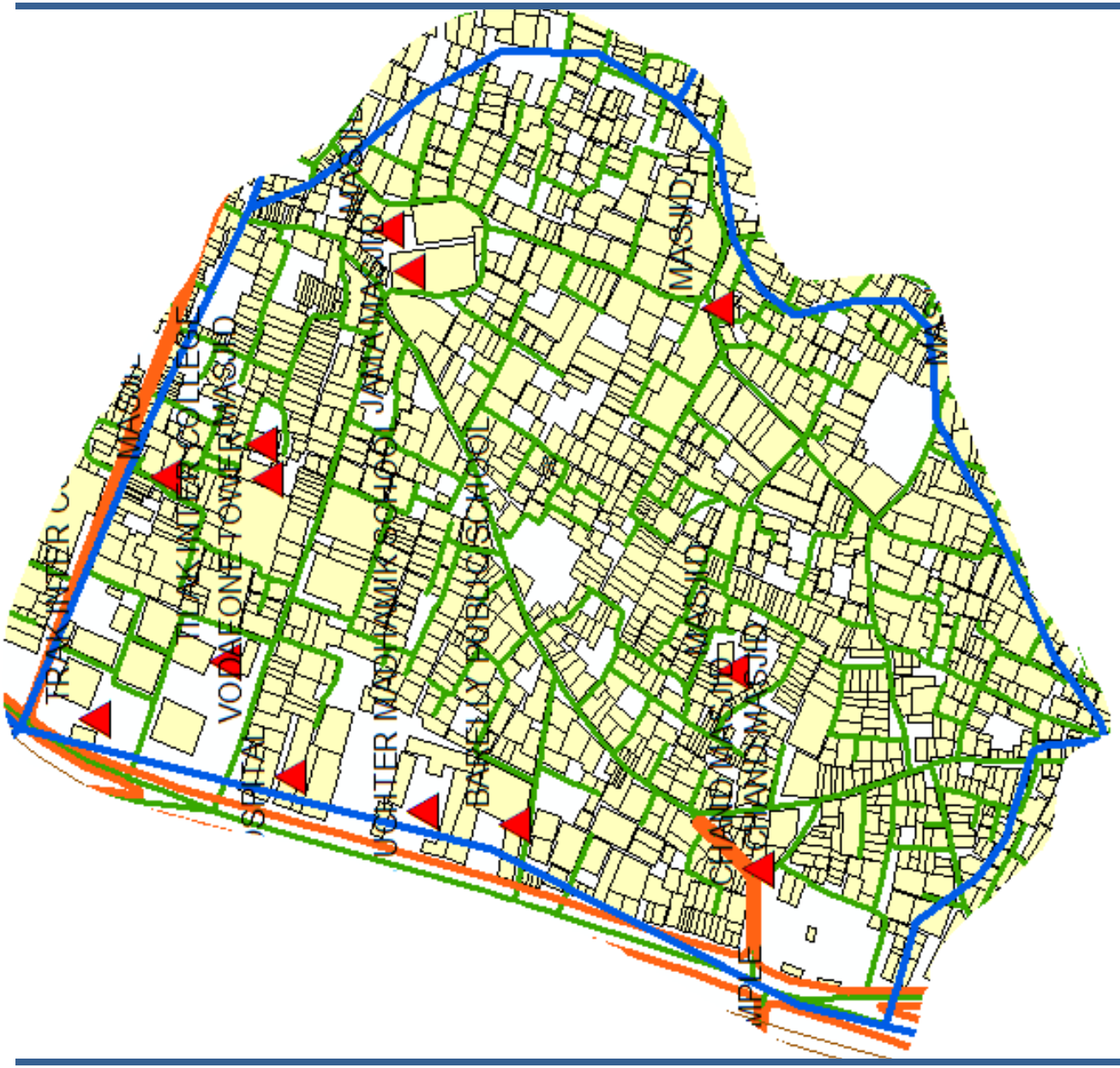
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

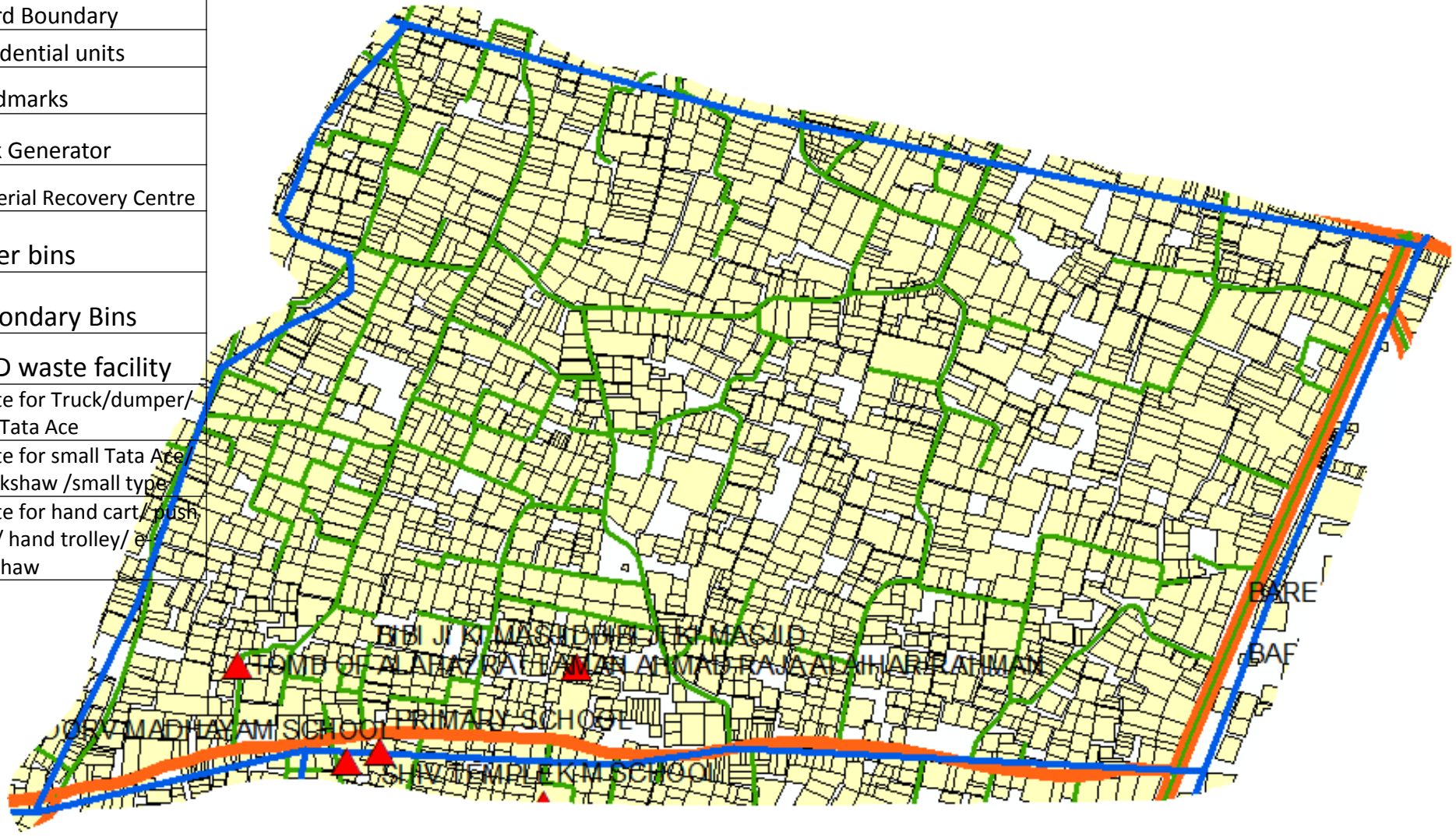
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw





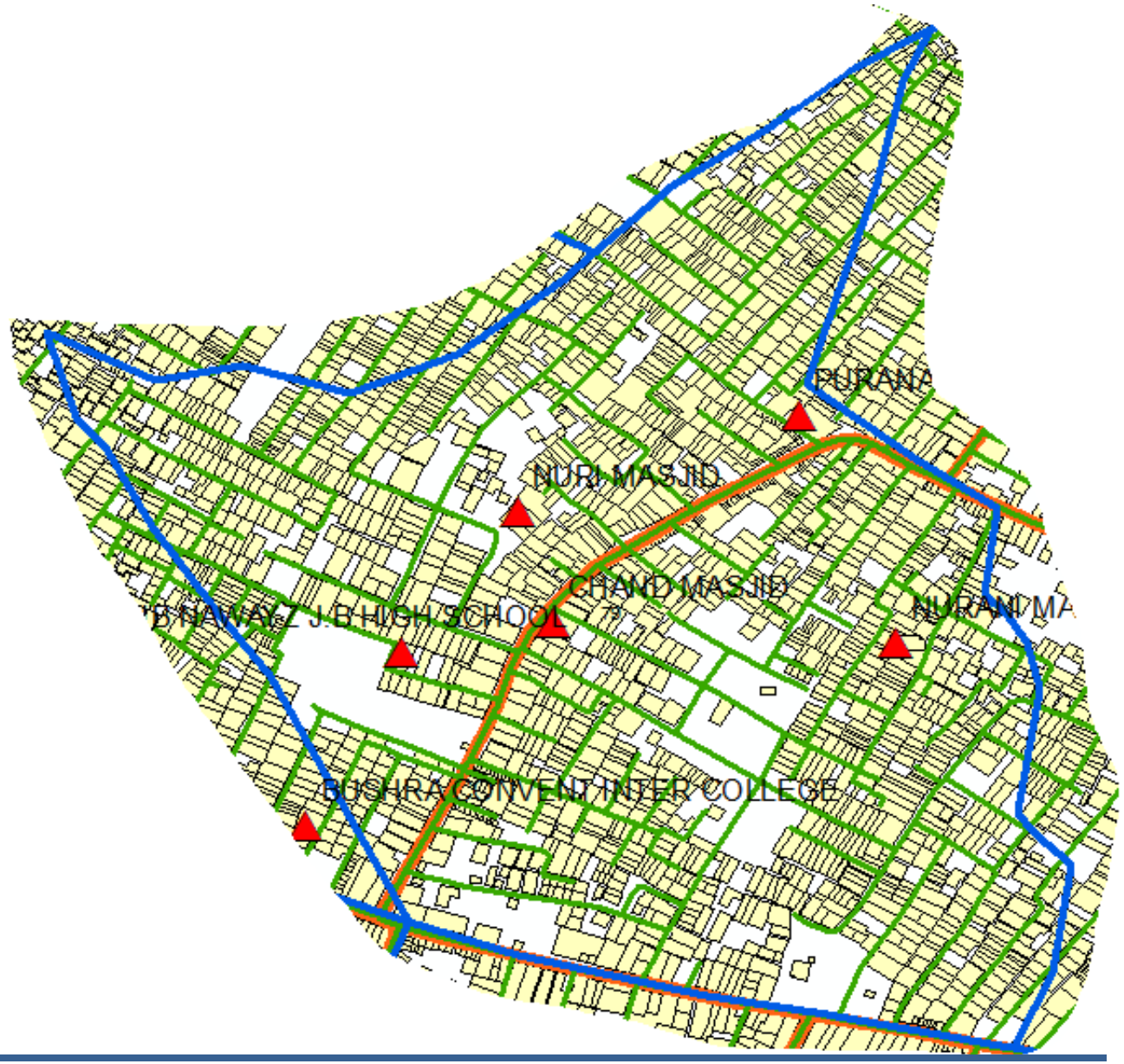
	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw

	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw



	ward Boundary
	Residential units
▲	Landmarks
B	Bulk Generator
M	Material Recovery Centre
LB	Litter bins
SB	Secondary Bins
CD	C&D waste facility
~	Route for Truck/dumper/ JCB/Tata Ace
~	Route for small Tata Ace/ e-rickshaw /small type
~	Route for hand cart/ push cart/ hand trolley/ e-rickshaw