



FORMULATION OF GIS BASED MASTER PLANS FOR AMRUT CITIES

Ground Verification of Base maps and Attribute data collection

National Remote Sensing Centre
Department of Space
Government of India

and

Town & Country Planning Organisation
Ministry of Housing & Urban Affairs
Government of India

July 2019

Introduction

Government of India has launched Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 2015 with the objective to (i) ensure that every household has access to a tap with assured supply of water and a sewerage connection; (ii) developing greenery and well maintained open spaces; (iii) reduce pollution by switching to public transport for non-motorised transport. During the Mission period, 11 reforms are being implemented, of which Preparation of GIS Based Master Plan for 500 AMRUT cities is one of the most important reforms. Ministry of Housing & Urban Affairs (MoHUA) has approved this reform as Sub-Scheme under AMRUT. TCPO/MoHUA is the nodal agency to monitor and coordinate this Sub-Scheme and the State Mission Directorates is the implementing agency. As per AMRUT Design & standards, 1:4000 scale Urban Geospatial Database from very high resolution satellite data is the basic input for Formulation of GIS based Master Plan.

National Remote Sensing Centre (NRSC), ISRO, Hyderabad is carrying out generation of 1:4000 scale Base map feature extraction from very high resolution satellite data for 242 cities out of 500 cities. Towards this, NRSC has established a dedicated outreach facility with 150 systems in a private cloud environment. For smooth and effective execution, NRSC has engaged private geospatial industry to work in two shifts to generate productivity of 300 man days per day.

1:4000 scale geospatial database generation shall be carried out in the following steps.

Step-1: GIS Base Map shall be generated from very high resolution satellite data by NRSC. To facilitate ground verification and attribute data collection, GIS Base Maps shall be provided to States in PDF format, to be printed at 1:1,000 scale on A0 size paper.

Step-2: Ground verification and Attribute data collection shall be carried out by the States. GIS Base map needs to be verified for correctness and completeness by carrying out field work and feature wise attributes to be collected from field and records as per AMRUT Design and Standards. Towards this, NRSC/ISRO and TCPO/MoHUA have developed the uniform presentation / document describing Standard Operating Procedures & prescribed excel sheet formats for attribute data. TCPO/MoHUA is also imparting training to the States. States have to complete this activity within one month from the date of supply of GIS Base maps and submit the field and attribute data back to NRSC.

Step-3: Based on the field and attribute data received from states, NRSC shall generate city-wise final geospatial database by incorporating spatial corrections & attaching the attribute data to the corresponding spatial features. This activity shall be completed within one month from the date of receipt of the field data from States. NRSC shall then submit the final urban GIS database to the concerned state.

AMRUT GEOSPATIAL DATABASE CONTENT

The spatial data content of Base map GIS database comprises of:

1. Road (Road centerline as line and width as polygon in Urban Land Use)
2. Rail (Each track as line and entire track area as polygon in Urban Land Use)
3. Bridges/ Flyovers (Only lines)
4. Water bodies (Mainly as polygons in Urban Land Use. Streams, Canal and Drain is represented as line, wherever it is narrow)
5. Building Footprints (Only polygons)
6. Urban Land use / Land cover (Mainly polygons, few as Points)

Note: Design & Standards can be referred for details of each layer.

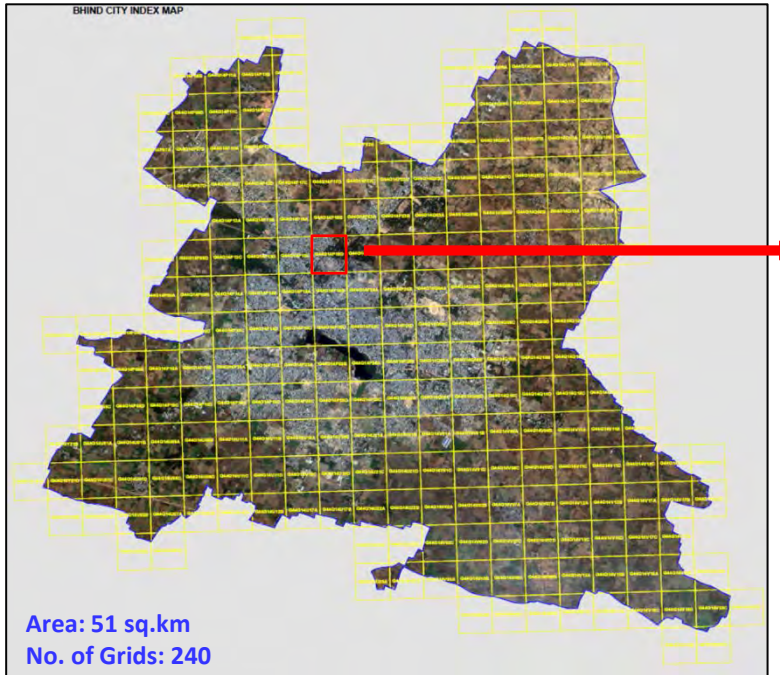
SI No	Spatial Layer	Spatial feature	Number of classes after classification based on attributes
1	Road		20
2	Rail		5
<i>For example</i>	<i>Rail</i>	<i>Railway track line</i>	<i>Broad Gauge</i>
			<i>Narrow Gauge</i>
			<i>Meter Gauge</i>
			<i>Metro/MRTS</i>
			<i>MMTS</i>
3	Bridges		9
4	Flyovers		1
5	Waterbodies		16
6	Urban Land Use		220
7	Buildings		144
Total	7	88	415

INPUTS FOR GROUND TRUTH AND ATTRIBUTE DATA COLLECTION

To facilitate ground truth and attribute data collection, city wise 500m x 500m local grid has been used with unique ID number for each grid. The following are made available

1. City Index Map
2. Grid wise (500m x 500m) Field maps in PDF format
3. Attribute data Proforma in Excel format- (1) Grid wise for All line features, (2) Grid wise for Buildings footprints & (3) For Points, feature wise sheet to be used for every grid
4. Code List for Base features, Urban Land use/Land cover & Building footprints for reference

1. AMRUT CITY (BHIND) INDEX MAP



2. GIS BASE MAP - BHI_106 (500m x 500m)

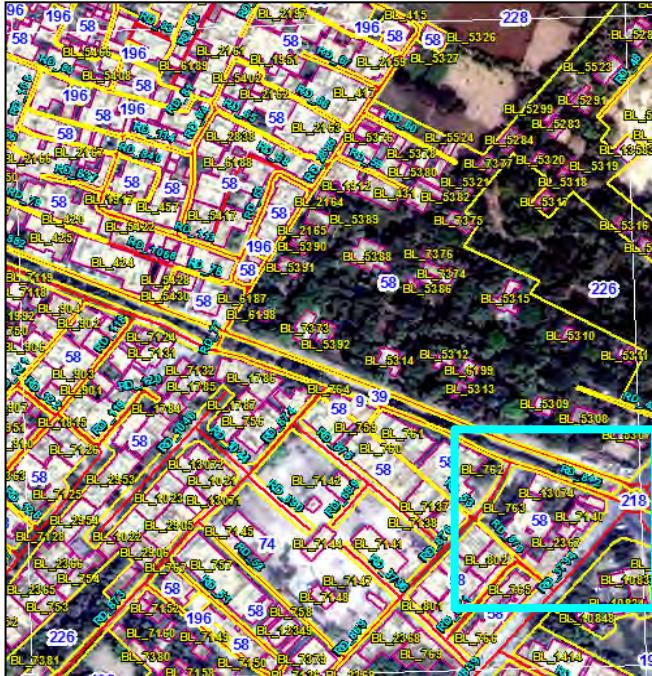


INPUTS FOR GROUND TRUTH AND ATTRIBUTE DATA COLLECTION

DETAILS OF FIELD MAP

- Unique ID given for all line features & building footprints and are prefixed as : Road center line – RD, Rail – RL, Bridges – BR, Flyovers – FL, Water bodies line – WB, Building – BL
- Urban Land use / Land cover Codes for all polygons as per Code list provided (*Codes are only for field work*)
- Urban Land use / Land cover polygon & Building footprints are separate layers, overlaid one over the other







GIS BASE MAP - For Field verification



GIS BASE MAP - For Field verification at 1:1,000 SCALE



Attribute data has to be collected with reference to IDs

Road center line		Road segment center line ID	 RD_842
Building		Building ID	 BL_2367
Urban Land Use/ Land cover		Urban Land Use/ Land cover Code	 58

INPUTS FOR GROUND TRUTH AND ATTRIBUTE DATA COLLECTION (Contd.)

Example: Building footprints GIS data Structure in Excel format for field work

BUILDING FOOTPRINTS GIS DATA STRUCTURE

Attribute Name	Attribute Field Name	Attribute Field Type	Attribute Field Width	Description/Value as in Design & Standards
Code	Code	Alphanumeric	10	Code as given in Table 11
Class	Class	Text	25	Class as given in Table 11
Sub-Class	Sub_Class	Text	50	Sub Class as given in Table 11
Ward Number	Ward_No	Alphanumeric	10	Ward Number
Road ID	Rd_ID	Alphanumeric	15	Road ID same as in Road_CLine
Road Name	Rd_Name	Text	30	Road Name same as in Road_CLine
Locality Name	Locality	Text	50	Locality Name
Colony Name	Colony	Text	50	Colony Name
Number of floors	No_floors	Numeric	5	Number of floors in a building
Construction Type	Cons_type	Text	15	Pucca/Semi Pucca/Kutchra
Area in sq. mt.	Area	Double	10 Up to 4 decimals	Area of corresponding building footprint
Description	Descr	Text	50	Name of building and Details, if any

BUILDING FOOTPRINTS GIS DATA STRUCTURE FIELDS IN EXCEL

Bldg_Id	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	Colony	No_floors	Cons_type	Area	Descr
BL_1707		6	Group of Houses									
BL_9744		6	House									
BL_9745		6	House									
BL_9746		6	House									
BL_9747		6	House									
BL_11778		6	House									

Unique Building ID

GIS Data Structure Attribute Fields

With reference to Building unique ID, all other required attributes may be collected and should be filled into grid wise excel sheet. Based on building Unique ID, attributes will be automatically attached to the GIS database

INPUTS FOR GROUND TRUTH AND ATTRIBUTE DATA COLLECTION (Contd.)

3. Similarly Grid wise Attribute data Proforma in Excel format for All line features, Building Footprints & All points are generated and provided as an input for field work

Proforma for All Line features (Road, Rail, Bridges, Flyovers, Waterbodies line) in excel format

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W		
1	Sl No	Class	Sub_Class	Code	Rd_Id	Rd_Leng_km	Rd_Name	Rd_ConMit	CW_Width	ROW_Width	Maintain	Footpath	FP_Width	FP_Cons_Ma	Rail_Id	Rly_Name	Br_Fly_Id	Br_FI_W	Br_FI_L	Br_FI_CMa	Br_FI_Year	Ward_No	Locality		
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									

Proforma for Building Footprints in excel format

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	OBJECTID	Bldg_Id	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	Colony	No_floors	Cons_type	Area	Descr	
2															
3															
4															
5															
6															
7															
8															
9															

Proforma for Urban Land Use points in excel format

	A	B	C	D	E	F	G	H	I	J	K
1	FEATURE NAME: ATM, Meteorological Station, Dairy Booth, Light House and Other if any										
2	SHEET NO:										
3	Sl No	Id	Pnt_ID	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	
4											
5											
6											
7											
8											
9											
10											

Building Bus Stop Communication Community Toilet Fire station Garb Collection Landfill Skm ULU pts

INPUTS FOR GROUND TRUTH AND ATTRIBUTE DATA COLLECTION (Contd.)

Three Separate Code list provided for Base features, Urban Land Use/Land Cover & Building footprints.

Codes are provided for ease of work. These are only for vetting & attribute data collection. It differs from Codes given in Design & Standards.

Base layers Code list

CLASS	SUB-CLASS	CODE
Road	National Highway	1
	State Highway	2
	Major District Road	3
	Other District Road	4
	Expressway	5
	Bypass	6
	Ring Road	7
	Service Road	8
	Major City Road#	9
	Minor City Road#	10
	Other Public Road	11
	Other Private Road	12
	BRTS	13
	Cycle Track	14
	Village road	15
	Foot path	16
	Cart track	17
	Ropeway	18
	Carriageway*	19
	Right of way*	20
Rail	Broad Gauge	21
	Narrow Gauge	22
	Meter Gauge	23
	Metro/MRTS	24
	MMTS	25

Urban Land Use/Land Cover Code list

CLASS	SUB-CLASS	CODE
Residential	Residential Area/Colony	58
	Township	59
Commercial	Housing scheme	60
	Retail	61
	Wholesale	62
	General Business	63
	Hotel / Lodge / Restaurant	64
	Shopping Centre / Mall	65
	Multiplex / Cinema	66
	Function Hall / Marriage Garden	67
	Warehouse	68
	Storage Godown	69
Industrial	Resort	70
	Petrol Pump / LPG filling station	71
	Informal Shop	72
	Hostel	73
	Market (Daily & Weekly) / Mandi	74
	Manufacturing	75
	Service	76
	Chemical	77
	Pharmaceutical	78
	Textile	79
IT Parks	80	
Industrial Estate / SEZ	Industrial Estate / SEZ	81
	Agro based & Food Processing	82

Note: Complete list of codes is made available as one of the field work inputs.

VETTING AND ATTRIBUTE DATA COLLECTION

Vetting of Base maps and Attribute data collection involves two major activities.

- 1. Spatial Data verification, corrections and additions on the hard copy field map-**
 - All spatial data corrections to be done on field map
 - Each Urban Land Use polygon and corresponding code to be verified, and corrections to be indicated legibly on the field map using marker pen
 - No attribute data proforma for Urban Land Use is provided and all corrections to be indicated only on field map
 - Every line feature and building footprint to be verified, if any correction or new feature is there, it is to be marked on the field map. Attribute data to be filled in corresponding proforma
 - All Point features have to be marked (not provided as layer) on the field map and attribute data to be filled in corresponding proforma

- 2. Attribute data collection as per Design & Standards in the provided attribute data proforma -**
 - Grid wise Attribute data Proforma in Excel format for All line features(Road, Rail, Bridges, Flyovers, Waterbodies line). This is a combined proforma including the specific and common attributes of all line features.
 - Grid wise Attribute data Proforma in Excel format for Building footprints
 - For Points (Bus stops, Communications, Community toilets, Fire station, Garbage Collection, Landfill sites, Slums, Urban Land use points), feature wise excel sheet is provided which is to be used for every grid.

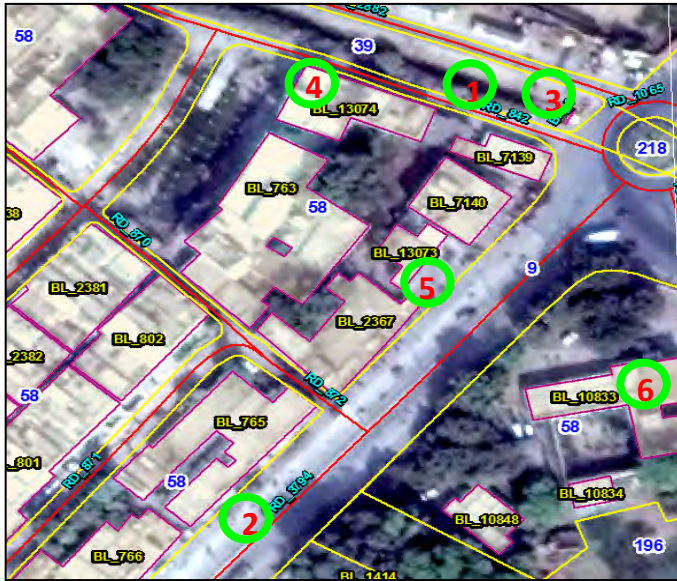
EXAMPLE - SPATIAL DATA CORRECTIONS IN FIELD



Note: All markings should be clearly legible and readable

- All spatial features are captured based on satellite data which needs to be verified on ground.
- Correction of Urban Landuse/land cover polygon boundary and corresponding Classification Code shall be marked on the field map. (Note: Most of the urban land use polygons has been given default Code value of 58 i.e Residential which may be corrected as per field).
- Any other feature (building, road, rail, bridges, canal, drain etc) missing/new additions/modifications shall also be marked on the field map.
- Building footprints captured as a group may be logically separated, if required. This shall be marked on the field map with a new unique ID and attribute data updated in the corresponding excel sheet.

EXAMPLE – ATTRIBUTE DATA COLLECTION



1	RD_842 : , Major Road, Ater-Bhind Road
2	RD_3794 : NH, Itawa-Bhind Road
3	BR_8 : Culvert
4	BL_13073 : Religious, Kundleshwar Mahadev Temple
5	BL_13074 : Commercial, Gupta Automobiles
6	BL_10833 : Public-Semipublic, Police Station

• All field data attributes collected are to be filled in the corresponding given excel format. For All lines it is a combined excel sheet.

All lines Excel Sheet

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
OBJECTID	line_ID	Class	Sub_Class	Code	Rd_Id	Rd_Leng_km	Rd_Name	Rd_ConMt	CW_Width	ROW_Width	Maintain	Footpath	FP_Width	FP_Cons	Rail_Id	Rly_Name	Br_Fly_Id	Br_FL_W	Br_FL_L	Br_FL_CM	Br_FL_Year	Ward_No	Locality
6270	RD_1046	1	Major Road	9																			
6464	RD_1065	1	Major Road	9																			
6484	BR_8	3	Culvert	26	RD_3794		Itawa Bhind road										BR_8	12	11	Concrete	1998	32	Mahavir Ganj
2566	RD_842	1	Major Road	9	RD_842	0.8	Ater Bhind road	WBM	From revenue records	R&R	No	-	-	-	-	-	-	-	-	-	1998	32	Mahavir Ganj
6495	RD_1068	1	Minor Road	10																			
17126	RD_2882	1	Major Road	9																			
17132	RD_2885	1	Major Road	9																			
22351	RD_3794	1	NH	1	RD_3794	1.1	Itawa Bhind road	WBM	From revenue records	NHAI	No	-	-	-	-	-	-	-	-	-	1998	32	Mahavir Ganj

Building Excel Sheet

A	B	C	D	E	F	G	H	I	J	K	L	M	N
OBJECTID	Bldg_Id	Code	Class	Sub_Class	Ward No	Rd_ID	Rd Name	Locality	Colony	No_floors	Cons_type	Area	Descr
13073	BL_13073	145	Religious	Temple									
13074	BL_13074	61	Commercial	Retail									
765	BL_765	61	Commercial	Retail									
10833	BL_10833	117	Public & Semi-public	Police Station									
10834	BL_10834	117	Public & Semi-public	Police Station									

POINT FEATURE DATA COLLECTION IN FIELD

- During the field work, Point information is to be collected for (1)Bus stops (2)Communications (3)Community toilets (4) Fire station (5)Garbage Collection (6)Landfill sites (7) Slums (8) Urban Land use points.
- These points are to be marked on the field map with Unique IDs, as these cannot be captured from satellite data.
- Attribute data of each point layer shall be collected from field and filled in the corresponding excel sheet.
- The Unique IDs for each point layer shall be assigned by the field personnel with a prefix as given in the Table below:

Class	Prefix for Unique ID
Bus Stop	BS
Communications	COM
Community toilets	CT
Fire Station	FS
Garbage Collection	GC
Landfill sites	LF
Slums	SL
Urban Landuse points	U

Proforma for Urban Land Use points in excel format

	A	B	C	D	E	F	G	H	I	J	K
1	FEATURE NAME: ATM, Meteorological Station, Dairy Booth, Light House and Other if any										
2	SHEET NO:										
3	SI No	Id	Pnt_ID	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	
4		U1		15-31	Public& Semi- public	ATM					
5		U2		15-22	Public& Semi- public	Metrological Station					
6				33-14	Others	Dairy Booth					
7				33-15	Others	Lighthouse					
8											

Note: The proformas for each point layer is made available as one of the field work inputs.

DELIVERABLES OF GROUND TRUTH AND ATTRIBUTE DATA COLLECTION

The following are the post field work deliverables:

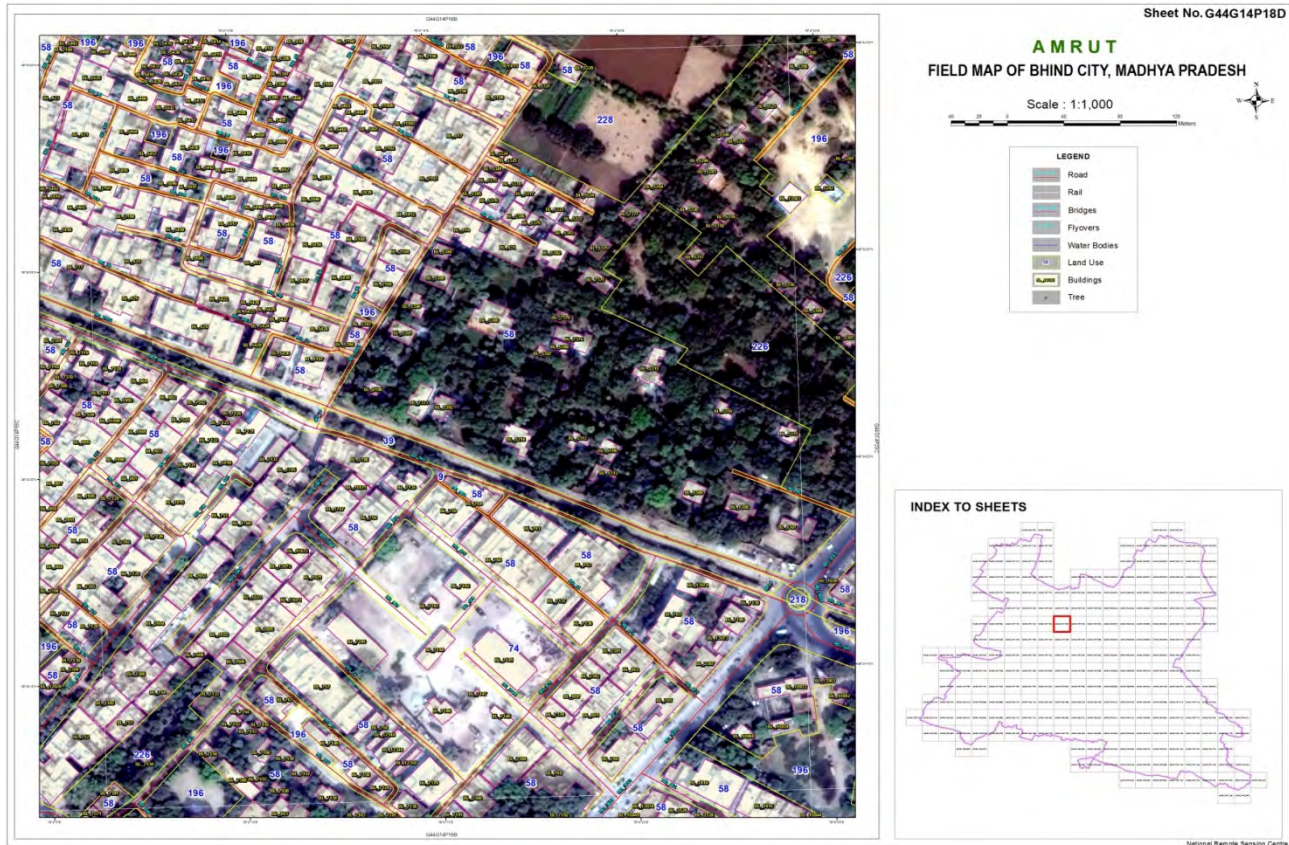
1. Scanned Post field maps (with urban Land Use corrections) in jpeg format.
2. Grid wise attribute field excel sheets for
 - a) Building footprints
 - b) All Line features
 - c) All Point features

POST FIELD WORK

1. Incorporation of spatial features corrections & modifications as per the post field maps.
2. Entry/updation of layer wise attribute data as per the excel sheets.
3. Quality check of spatial & attribute data and Finalisation of geospatial database.

STEP WISE PROCEDURES FOR GROUND TRUTH AND ATTRIBUTE DATA COLLECTION

Step 1: Take a print out of one field map, say BHI_106 at 1:1000 scale with “No scaling” option.



Step 2: Take a print out or soft copy of corresponding grid Proforma (excel format) for Buildings, All line features and All point features.

Corresponding Grid Proforma for Buildings – BHI_106

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	OBJECTID	Bldg_Id	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	Colony	No_floors	Cons_type	Area	Descr
2	1707	BL_1707												
3	9804	BL_9744												
4	9805	BL_9745												
5	9806	BL_9746												
6	9807	BL_9747												
7	11847	BL_11778												
8														

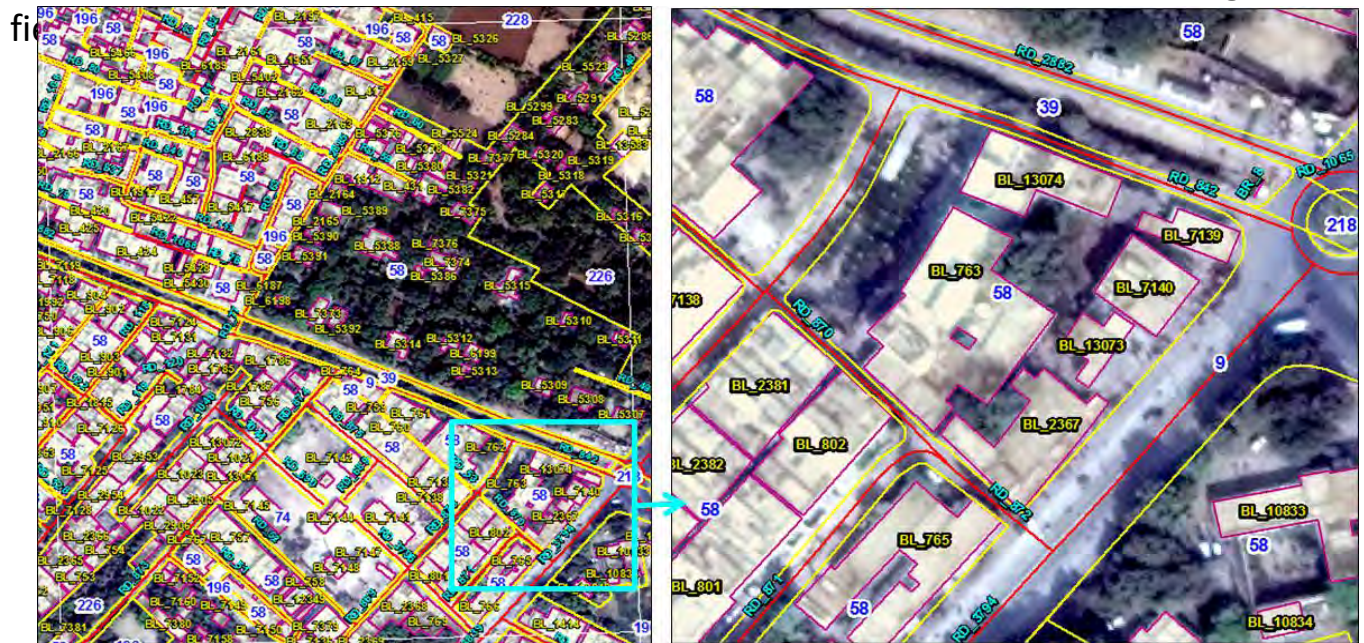
Corresponding Grid Proforma for All lines - BHI_106

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	FEATURE NAME: All Line features																							
2	SHEET NO:																							
3	OBJECTID	Line_ID	Class	Sub_Class	Code	Rd_Id	Rd_Leng_km	Rd_Name	Rd_ConM	CW_Width	ROW_Width	Maintain	Footpath	FP_Width	FP_Cons_Ma	Rail_Id	Rly_Name	Br_Fly_Id	Br_FL_W	Br_FL_L	Br_FL_CMa	Br_FL_Year	Ward_No	Locality
4	6270	FD_1046	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
5	6464	FD_1065	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
6	6484	BR_8	3	Culvert	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
7	2566	FD_842	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
8	6495	FD_1068	1	Minor Road	10											NA	NA	NA	NA	NA	NA	NA		
9	17126	FD_2882	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
10	17132	FD_2885	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
11	22351	FD_3794	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
12	22352	FD_3795	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
13	22353	FD_3796	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
14	182	FD_48	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
15	195	FD_49	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
16	203	FD_51	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
17	207	FD_52	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		
18	210	FD_53	1	Major Road	9											NA	NA	NA	NA	NA	NA	NA		

Proforma for Urban Land Use points in excel format

	A	B	C	D	E	F	G	H	I	J	K
1	FEATURE NAME: ATM, Meteorological Station, Dairy Booth, Light House and Other if any										
2	SHEET NO:										
3	Sl No	Id	Pnt_ID	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	
4											
5											
6											
7											
8											
9											
10											

Step 3: Choose a particular area (say a corner) on the field map and Start the Ground truth and attribute data collection. Use a Marker Pen for markings on the fi



Step 4: Identify the polygons(symbol is yellow outline with no fill) and its Urban Land Use/Landcover Code (shown in Blue colour). Verify its correctness.

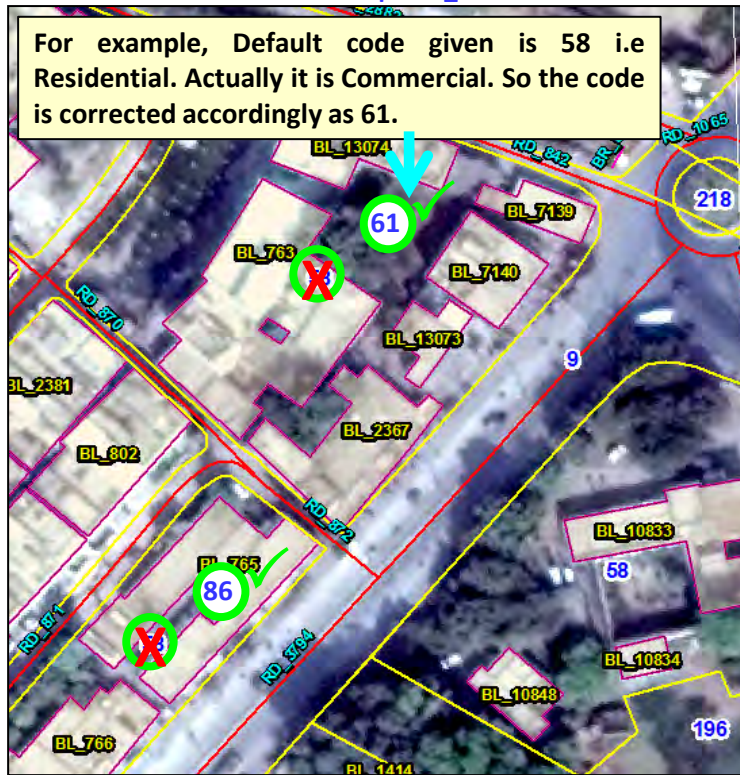
Step 5:

(A) If the polygon boundary is correct but the Code is wrong, strike off the Code and write the Correct Code beside it.

Pre field Map: BHI_106



Post field Map: BHI_106



Note: All markings should be legible and readable

Step 5:

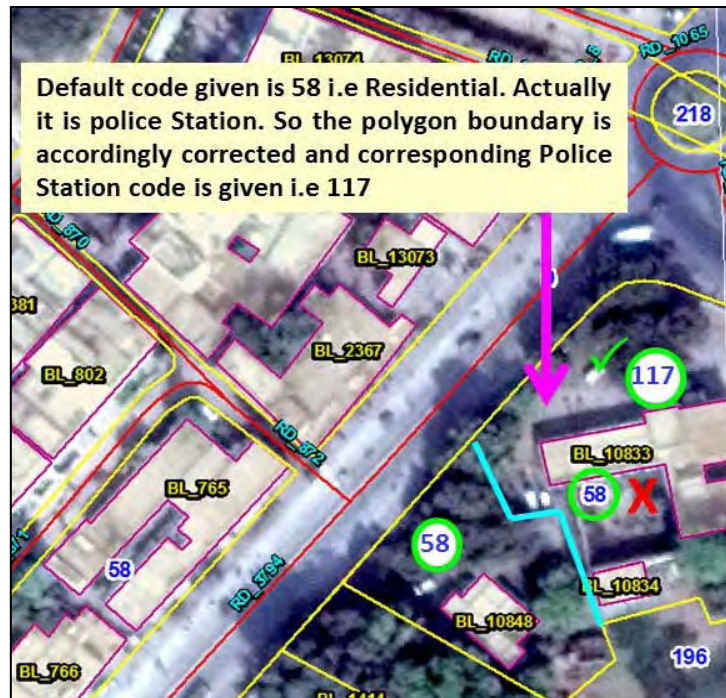
(B) In case the polygon boundary is incorrect or has to be split into two or more polygons, mark the correct boundary on the field map and write the corresponding code for all the polygons.

Note: Refer the Code list for this exercise.

Pre field Map: BHI_106



Post field Map: BHI_106



Note: All markings should be legible and readable

Step 6: Carry out ground truth & attribute data collection for the buildings in the chosen area. For this, Identify a Building ID on the map and enter its Code, Class, Sub-Class & Description information in the corresponding grid proforma as shown below.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	OBJECTID	Bldg_Id	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	Colony	No_floors	Cons_type	Area (sq.m)	Descr
2	13073	BL_13073	145	Religious	Temple	12	RD_842	Ater-Bhind Road	Mahavir Ganj	Shivbagh	1	Pucca	134	Mahadev Temple
3	13074	BL_13074	61	Commercial	Retail	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	3	Pucca	416	Gupta Automobiles
4	765	BL_765	61	Commercial	Retail	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	3	Pucca	730	Alok Complex
5	10833	BL_10833	117	Public & Semi-public	Police Station	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	2	Pucca	580	Bhind City PS
6	10834	BL_10834	117	Public & Semi-public	Police Station	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	1	Pucca	65	Bhind City PS
7	10848	BL_10848	117	Public & Semi-public	Police Station	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	2	Pucca	166	Bhind City PS
8	800	BL_800												
9	801	BL_801												
10	802	BL_802												
11														

Step 7: If any new/missing buildings are there, mark it on the field map and give a unique ID say BL_N1, BL_N2 etc., where N indicates new/missing. Enter these new building IDs in the proforma and give the Class, Sub-Class and Description information.

Step 7- Example: New/Missing Building

Pre field Map: BHI_106



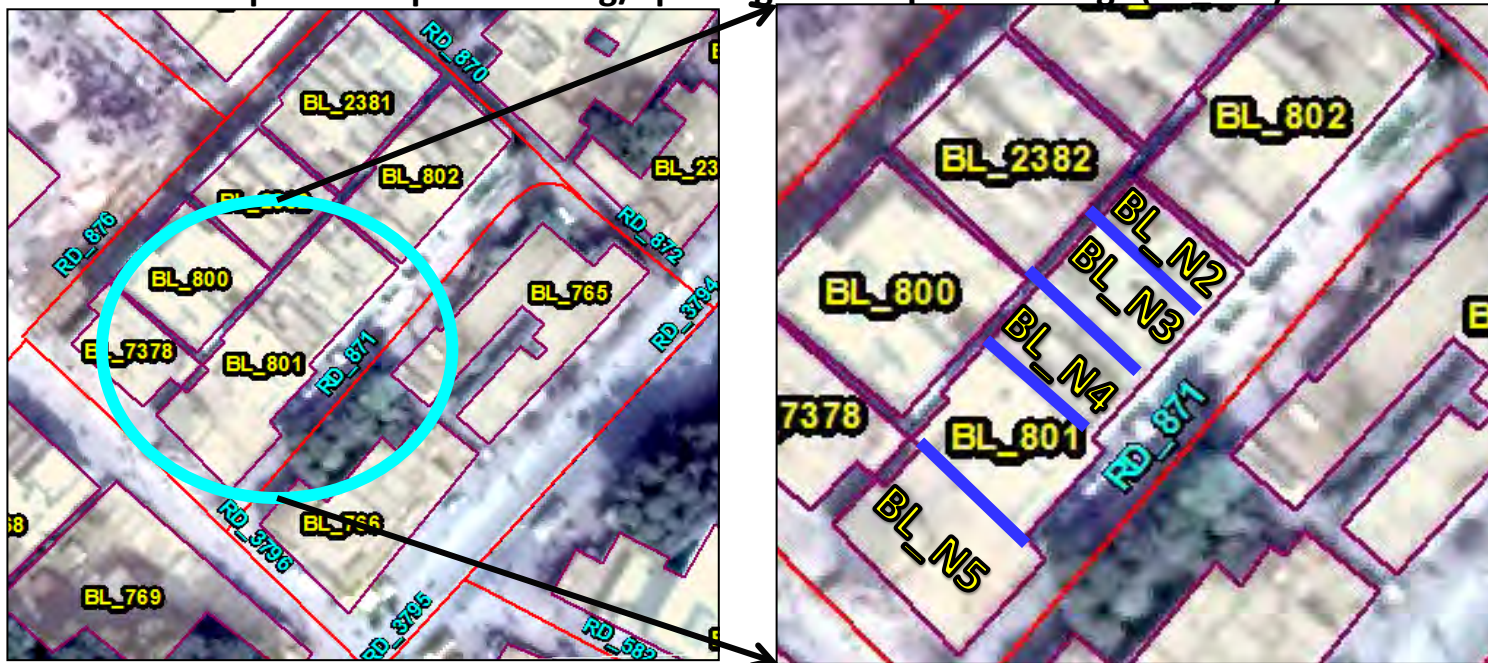
Post field Map: BHI_106



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	OBJECTID	Bldg_Id	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	Colony	No floors	Cons_type	Area (sq.m)	Descr
2	13073	BL_13073	145	Religious	Temple	12	RD_842	Ater-Bhind Road	Mahavir Ganj	Shivbagh	1	Pucca	134	Mahadev Temple
3	13074	BL_13074	61	Commercial	Retail	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	3	Pucca	416	Gupta Automobiles
4	765	BL_765	61	Commercial	Retail	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	3	Pucca	730	Alok Complex
5	10833	BL_10833	117	Public & Semi-public	Police Station	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	2	Pucca	580	Bhind City PS
6	10834	BL_10834	117	Public & Semi-public	Police Station	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	1	Pucca	65	Bhind City PS
7	10848	BL_10848	117	Public & Semi-public	Police Station	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	2	Pucca	166	Bhind City PS
8	800	BL_800												
9	801	BL_801												
10	802	BL_802												
11		BL_N1	61	Commercial	Retail	12	RD_3794	Itawa-Bhind Road	Mahavir Ganj	Shivbagh	1	Pucca	40	Chandrabanu Sarees

Step 8: If multiple buildings are represented as single building footprint, they need to be divided/split as per the ground truth. Accordingly mark it on the field map and give unique ID say BL_N1, BL_N2 etc., where N indicates new/missing. Enter these new building Ids in the proforma and give the Class, Sub-Class and Description information.

Step 8- Example: Dividing/Splitting of Group of buildings (BL 801)



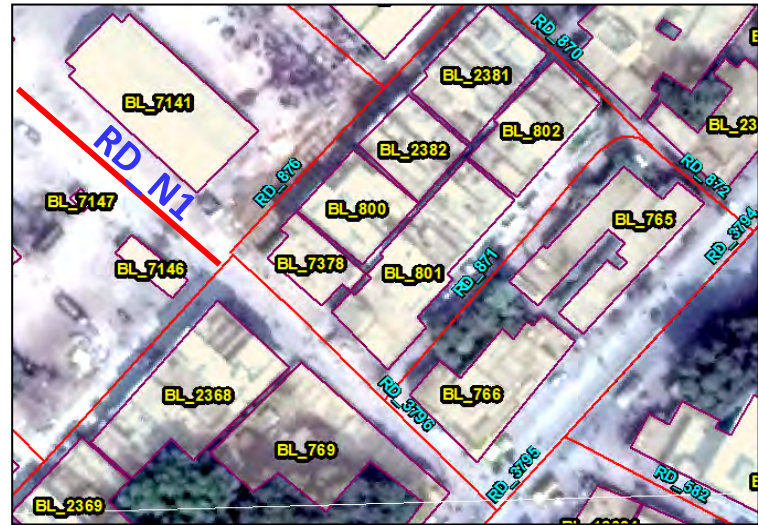
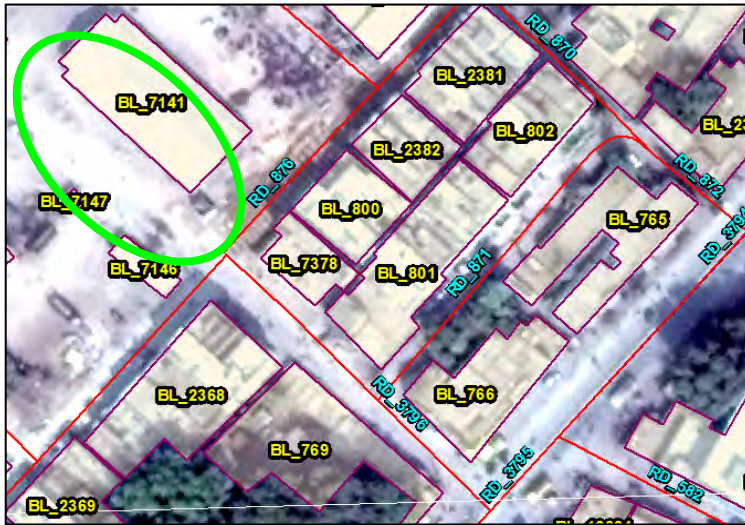
A	B	C	D	E	F	G	H	I	J	K	L	M	N
OBJECTID	Bldg_Id	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	Colony	No_floors	Cons_type	Area (sq.m)	Descr
13073	BL_13073	145	Religious	Temple	12	RD_842	Ater-Behind Road	Mahavir Ganj	Shivbaagh	1	Pucca	134	Mahadev Temple
801	BL_801												
802	BL_802												
	BL_N1	61	Commercial	Retail	12	RD_3794	Itawa-Behind Road	Mahavir Ganj	Shivbaagh	1	Pucca	40	Chandrabanu Sarees
	BL_N2	64	Commercial	Retail	12	RD_871	Parklane street	Mahavir Ganj	Shivbaagh	3	Pucca	80	Anil Textiles

Step 9: Carry out ground truth & attribute data for the line features in the chosen area. For this, Identify a Line ID on the map and Correct its Code, Class, Sub-Class & Description information in the corresponding grid proforma.

OBJECTID	Line_ID	Class	Sub_Class	Code	Rd_Id	Rd_Leng_km	Rd_Name	Rd_ConM	CW_Width	RDW_Width	Maintain	Footpath	FP_Width	FP_Cons_Ma	Rail_Id	Rly_Name	Br_Fly_Id	Br_Fl_W	Br_Fl_L	Br_Fl_CMa	Br_Fl_Year	Ward_No	Locality	
6270	FD_1046	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA			
6464	FD_1065	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA			
6484	BR_8	3	Culvert	26	RD_3794	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	BR_8		12	11	Concrete	1998	32	Mahavir Garj
2566	FD_842	1	Major Road	9	NA	0.8	Ater Bhind Road	WBM		From revenue records	R&B	No			NA	NA	NA	NA	NA	NA	NA		32	Mahavir Garj
6495	FD_1068	1	Minor Road	10	NA										NA	NA	NA	NA	NA	NA	NA			
17126	FD_2882	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA			
17132	FD_2885	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA			
22351	FD_3794	1	Major Road NH	1	NA	1.1	Ilawa Bhind road	WBM		From revenue records	NHAI	No			NA	NA	NA	NA	NA	NA	NA		32	Mahavir Garj
22352	FD_3795	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA			
22353	FD_3796	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA			

Step 10: If any new/missing road, canal, drain ,bridge etc are there, mark it on the field map and give a unique ID say RD_N1, BR_N1 WB_N2 etc. Enter these new feature Ids in the proforma and give the Class, Sub-Class and Description information.

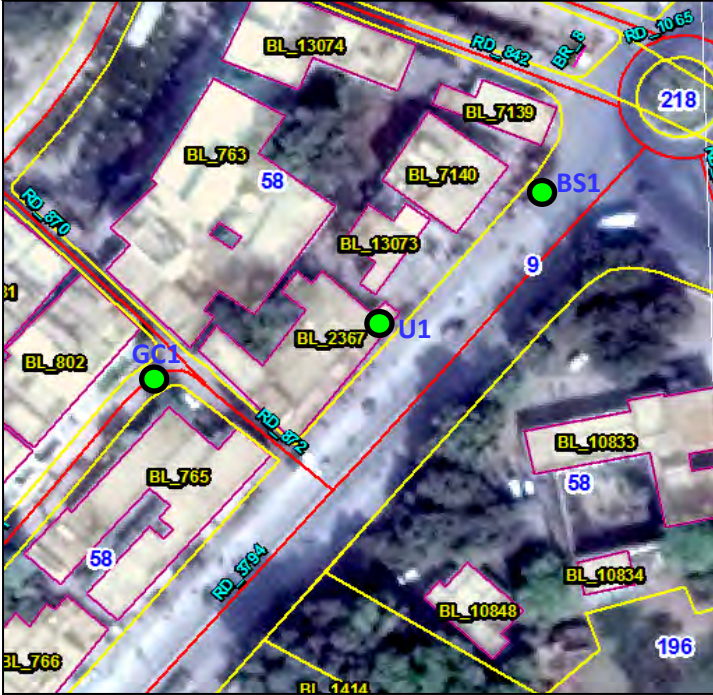
Example: New/Missing line features (Road, Rail,Bridge, Canal etc.)



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
OBJECTID	Line_ID	Class	Sub_Class	Code	Rd_Id	Rd_Leng_km	Rd_Name	Rd_ConM	CW_Width	RDW_Width	Maintain	Footpath	FP_Width	FP_Cons_Ma	Rail_Id	Rly_Name	Br_Fly_Id	Br_FL_W	Br_FL_L	Br_FL_CMa	Br_FL_Year	Ward_No	Locality
6270	PD_1046	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA		
6484	PD_1065	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA		
6484	BR_8	3	Culvert	26	PD_3794	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	BR_8		12	11	Concrete	1998	32 Mahavir Ganj
2566	PD_842	1	Major Road	9	NA	0.8	Ater Behind Road	WBM	From revenue records	R&B	No				NA	NA	NA	NA	NA	NA	NA		32 Mahavir Ganj
6495	PD_1068	1	Minor Road	10	NA										NA	NA	NA	NA	NA	NA	NA		
17126	PD_2882	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA		
17132	PD_2885	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA		
22351	PD_3794	1	Major Road	9	NA		11 Itawa Behind road	WBM	From revenue records	NHAI	No				NA	NA	NA	NA	NA	NA	NA		32 Mahavir Ganj
22352	PD_3795	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA		
22353	PD_3796	1	Major Road	9	NA										NA	NA	NA	NA	NA	NA	NA		
	RD_N1	1	Minor Road	10	NA	0.3	Market road	WBM	From revenue records	Municipa	No				NA	NA	NA	NA	NA	NA	NA		32 Mahavir Ganj

Step 11: Carry out ground truth & attribute data collection for the point features in the chosen area. For this, Identify all the point features on ground in the chosen area (Bus stops, Communications, Community toilets, Fire station, Garbage Collection, Landfill sites, Slums & Urban Land use points). Mark the location of the points on the field map and give a unique ID (Unique ID format as mentioned in Slide 9). Enter the Grid number & necessary attribute information for the respective feature in the proforma.

Point features marking on field map





1	FEATURE NAME: Garbage Collection point									
2	SHEET NO: BH_106									
3	SI No	GC_Pnt_ID	Code	Ward_No	Rd_ID	Rd_Name	Locality	Garb_Type	Status	Cov_area
4	1	GC_1	182	32	RD_872	Market Road	Mahavir Ganj	Domestic	Permanent Collection point	400

1	FEATURE NAME: ATM, Meteorological Station, Dairy Booth, Light House and Other if any									
2	SHEET NO: BH_106									
3	SI No	Pnt_ID	Code	Class	Sub_Class	Ward_No	Rd_ID	Rd_Name	Locality	
4	1	U1	143	Public & Semi- public	ATM	32	RD_3794	Itawa-Bhind Road	Mahavir Ganj	
5										
6										

Step 12: Move to the next area in the field map and repeat Steps 4-10. Ground truth & attribute data collection for all the field maps shall be done in this method.

PRINTING OF PRE-FIELD MAPS

GIS Base Map PDFs are generated at 1:1000 scale, so while printing the maps, ensure the following points.

- Prints should be on A0 size paper
- 'No scaling' (it should be 100%) to be applied while printing

