



DRAFT DEVELOPMENT PLAN

Area Around Shirdi Hub Airport (AASHA) Notified Area, Shirdi

REPORT

u/s 26 of MR & TP Act, 1966



CONTENTS

1.	INTRODUCTION	1
1.1.	HISTORY AND GROWTH OF AASHA NOTIFIED AREA.....	3
1.2.	CIVIC ADMINISTRATION WITHIN AASHA NOTIFIED AREA	3
1.3.	PLANNING HISTORY OF SHIRDI TOWN AND AASHA NOTIFIED AREA.....	4
2.	EXISTING PROFILE	1
2.1.	LOCATION AND REGIONAL SETTING	1
2.2.	GEOGRAPHICAL SETTING AND TOPOGRAPHY	3
2.3.	GEOMORPHOLOGY AND GEOLOGY	3
2.3.1.	Geology.....	3
2.3.2.	Ground Water Resources.....	4
2.4.	CLIMATE	4
2.4.1.	Temperature.....	4
2.4.2.	Rainfall	4
2.4.3.	Humidity	5
2.4.4.	Wind Direction.....	5
2.5.	DEMOGRAPHIC CHARACTERISTICS	6
2.5.1.	AASHA Notified Area	6
2.5.2.	Literacy Rate	8
2.5.3.	Working Population and Sectorial Composition	9
2.6.	ECONOMIC PROFILE	12
2.6.1.	Primary Sector: Agriculture and Allied Activities.....	12
2.6.2.	Secondary Sector: Manufacturing and Processing	12
2.6.3.	Tertiary Sector: Services, Tourism & Logistics.....	13
2.6.4.	Tourism	13
2.7.	TRAFFIC CHARACTERISTICS	14
2.7.1.	Connectivity and different modes of Transport.....	14
2.7.2.	Road Network	14
2.7.3.	Identification of Cordon Points/Locations	14
2.7.4.	Traffic Volume Survey	16
2.8.	PUBLIC UTILITIES AND SERVICES.....	18
	Power Supply and Electricity	20

3.	EXISTING LAND USE.....	22
3.1.	IMPORTANCE OF EXISTING LAND USE	22
3.2.	METHODOLOGY FOR PREPARATION OF EXISTING LAND USE MAP	22
3.3.	PREPARATION OF EXISTING LAND USE (ELU) FOR AASHA NOTIFIED AREA	24
3.3.1.	Feature Mapping	24
3.3.2.	Attribution	24
3.4.	EXISTING LAND USE	24
3.4.1.	Agricultural Land Use.....	25
3.4.2.	Water Bodies.....	25
3.4.3.	Barren Land	25
3.4.4.	Forest Land	25
3.4.5.	Residential Land Use	25
3.4.6.	Commercial Land Use.....	25
3.4.7.	Industrial Land Use	26
3.4.8.	Social Infrastructure	26
3.4.9.	Public Utilities.....	26
3.4.10.	Airport.....	26
3.4.11.	Transportation	26
3.5.	CHALLENGES IN AASHA NOTIFIED AREA.....	28
3.5.1.	Lack of Water Supply And Dependence on Groundwater.....	28
3.5.2.	Limited Access to Healthcare Facilities.....	28
3.5.3.	Inadequate Educational Opportunities	28
3.5.4.	Weak Economic Diversification	28
3.5.5.	Absence of Public Transport and Road Connectivity	28
3.5.6.	Lack of Infrastructure Amenities.....	28
3.5.7.	Conclusions.....	28
4.	VISION AND STRATEGY	30
4.1.	FACTORS INFLUENCING PLANNING AROUND AIRPORT	30
4.2.	VISION AND OBJECTIVES	30
4.2.1.	Vision	30
4.2.2.	Main Objectives.....	30
4.2.3.	Salient Features	30
4.3.	DEVELOPMENT STRATEGY.....	31

4.4.	STRATEGY.....	31
4.5.	CONCEPT/THEME	32
4.5.1.	Airport-Centric Development Approach.....	32
4.5.2.	Spiritual-Centric Development Approach	33
4.6.	CONCLUSION	33
5.	DEMOGRAPHIC PROJECTIONS.....	34
5.1.	POPULATION PROJECTION BASED ON CONVENTIONAL METHODS	34
5.1.1.	Inference and Other Options	36
5.2.	POPULATION PROJECTION BASED ON EMPLOYMENT GENERATED AT THE AIRPORT	36
5.2.1.	Employment Generation.....	37
5.3.	POPULATION PROJECTION BASED ON EMPLOYMENT GENERATED IN AIRPORT ALLIED ACTIVITIES ZONE	37
5.3.1.	Airport Allied Activities/ Services Zone	38
5.3.2.	Conclusion	38
6.	SOCIAL INFRASTRUCTURE	40
6.1.	PLANNING NORMS AND REQUIREMENTS	40
7.	HOUSING, RESETTLEMENT AND REHABILITATION	42
7.1.	INTRODUCTION	42
7.2.	EXISTING CONDITIONS.....	42
7.3.	HOUSEHOLD SIZE AND POPULATION ASSUMPTIONS.....	42
7.4.	HOUSING REQUIREMENT	42
7.5.	HOUSING PROVISION STRATEGY	42
7.6.	RESETTLEMENT AND REHABILITATION	43
8.	PHYSICAL INFRASTRUCTURE.....	44
8.1.	INTRODUCTION	44
8.2.	WATER SUPPLY	44
8.2.1	Applicable codes and Standards	44
8.2.2	Water Demand	44
8.2.3	Distribution Aspect	45
8.2.4	Sourcing of Water.....	46
8.2.5	Design of the Network	46
8.2.6	Distribution Network	47
8.3.	SEWERAGE SYSTEM.....	47

8.3.1.	Estimation of Sewage Generation.....	47
8.3.2.	Sewage Treatment Plant.....	47
8.3.3.	Recycled water supply to green area and flushing.....	48
8.3.4.	Recycled Water distribution system	48
8.3.5.	Intermediate Sewage Pumping Stations and Pumps	49
8.4.	STORM WATER DRAINAGE SYSTEM.....	49
8.4.1.	Proposed Drainage system	49
8.4.2.	Design Criteria	49
8.4.3.	Catchment.....	50
8.4.4.	Design Flows.....	50
8.4.5.	Coefficient of Runoff.....	50
8.4.6.	Time of Concentration	50
8.4.7.	Intensity of Rainfall.....	51
8.4.8.	Return Period	51
8.4.9.	Design Parameters.....	51
8.5.	RAINWATER HARVESTING	52
8.5.1.	Recharge Pits with borewells	52
8.6.	SOLID WASTE MANAGEMENT	52
8.6.1.	Legal framework.....	53
8.6.2.	Sources of Solid Waste Generation	54
8.6.3.	Quantification of Solid Waste	54
8.6.4.	Waste Characterization.....	55
8.6.5.	Hierarchy of solid waste Management	55
8.6.6.	Waste Minimization	56
8.6.7.	Storage and collection of waste	57
8.6.8.	Processing of waste	57
8.7.	Power Supply System.....	58
8.7.1.	Measures for Reducing System Demand.....	58
8.7.2.	Solar Power Potential.....	58
8.8.	Development of Physical Infrastructure	59
9.	TRAFFIC AND TRANSPORTATION.....	60
9.1.	INTRODUCTION	60
9.2.	APPROACH AND STRATEGY	60

9.2.1.	Integration with Regional Development.....	60
9.2.2.	Integration with Existing Network	60
9.3.	TRAVEL DEMAND ASSESSMENT AND NETWORK ANALYSIS	61
9.3.1.	AIRPORT PASSENGER GROWTH.....	61
9.3.2.	EXISTING TRAFFIC CONDITIONS (2025).....	61
9.3.3.	TRAFFIC PROJECTIONS (2045)	61
9.3.4.	Methodology.....	62
9.3.5.	Airport Traffic Growth Component.....	62
9.3.6.	Traffic due to employment in Airport and Airport Allied Activity Zone.....	63
9.3.7.	Residential Traffic	63
9.3.8.	National Highway (NH) Diversion.....	64
9.3.9.	TOTAL TRAFFIC DEMAND (2045).....	64
9.4.	PEAK HOUR TRAFFIC ASSIGNMENT FLOW – 2045.....	65
9.4.1.	Basis of Traffic Assignment.....	65
9.4.2.	Peak Hour Traffic Assignment – 2045.....	65
9.4.3.	Directional Traffic Distribution	65
9.5.	Volume-to-Capacity (V/C) Ratio Analysis	66
9.5.1.	Basis of Capacity Assessment	66
9.5.2.	V/C Ratio Assessment – 2045	67
9.6.	LANE CONFIGURATION ANALYSIS	67
9.7.	RECOMMENDED ROAD LAYOUT	68
9.7.1.	Existing Road Network	68
9.7.2.	Existing Bottlenecks	68
9.7.3.	Proposed major Road Network	68
9.7.4.	Rotaries.....	70
9.7.5.	The Light Rail Transit (LTR).....	70
10.	PROPOSED LAND USE	71
10.1.	IMPORTANT CONSIDERATIONS.....	71
10.1.1.	Economic Potential Around Shirdi Airport	71
10.1.2.	Access and Connectivity	71
10.1.3.	Constraints Due to Airport Operations.....	71
10.1.4.	Natural Features.....	71
10.1.5.	Existing Physical Infrastructure	72

10.2.	CONCEPTUAL DEVELOPMENT STRUCTURE	72
10.3.	LAND USE ZONING	72
10.3.1.	Residential Zone (36.46 Ha, 1.85%)	73
10.3.2.	Airport and Airport Allied Activities / Services Zone (708.24 Ha, 35.84%).....	73
10.3.3.	Industrial Zone (41.28 Ha, 2.09%).....	73
10.3.4.	Commercial Zone (399.37 Ha, 20.22%)	73
10.3.5.	Mixed Use Zone (495.01 Ha, 25.06%)	73
10.3.6.	Forest Zone (67.97 Ha, 3.44%)	73
10.4.	LAND FOR PUBLIC PURPOSES	74
10.4.1.	Transportation (137.02 Ha, 6.94%)	74
10.4.2.	Social Infrastructure (18.93 Ha, 0.96%)	74
10.4.3.	Public Utilities (31.93 Ha, 1.62%)	75
10.4.4.	Green/Open Spaces (33.79 Ha, 1.71%).....	75
11.	ENVIRONMENT, SUSTAINABILITY AND DISASTER MANAGEMENT	77
11.1.	INITIAL ASSESSMENT AND MITIGATION.....	77
11.2.	IMPACT ON EXISTING NATURAL FEATURES.....	77
11.2.1.	Impact on Region's Rivers, Streams and Drainage.....	77
11.2.2.	Natural Watercourses and Groundwater Recharge.....	77
11.2.3.	Vegetation, Green Cover and Forest Areas	77
11.2.4.	Environmental Concerns from Development	78
	Air Emissions & Noise	78
	Land-Use Impacts	78
	Water & Waste Management	78
11.3.	SUSTAINABILITY	78
11.3.1.	Water Conservation and Recycling	78
11.3.2.	Renewable Energy	78
11.3.3.	Non-Motorized Transport (NMT) & Smart Mobility	78
11.3.4.	Green Buildings & Low-Carbon Infrastructure	79
11.3.5.	Tree Plantation, Green Corridors and Biodiversity Enhancement	79
11.4.	DISASTER MANAGEMENT	79
11.4.1.	Development-Linked Risks.....	79
11.4.2.	Natural Disasters.....	79
11.5.	CONCLUSION	80

12. BLOCK COST ESTIMATE, PHASING AND FINANCING PLAN.....	81
12.1. INTRODUCTION	81
12.2. COST OF DEVELOPMENT	81
12.3. INSTITUTIONAL FRAMEWORK	81
12.4. PROJECT IDENTIFICATION AND PHASING	82
12.5. PROJECT IDENTIFICATION AND PHASING	82
12.6. MADC REVENUE WITHIN AASHA NOTIFIED AREA.....	84
12.7. COMMON FINANCIAL RESOURCES	85
12.7.1. Government of India Schemes Supporting Infrastructure and Urban Development.....	85

List of Tables

Table 1-1: Details of Area Around Shirdi Hub Airport (AASHA) Notified Area:	1
Table 2-1: Average Monthly Temperature Variations Shirdi	4
Table 2-2: Average rainfall Kopargaon, Sangamner and Rahata Blocks	4
Table 2-3 Demographic Characteristics of AASHA Notified Area	6
Table 2-4: Household Data	7
Table 2-5: Literacy Rate in AASHA Notified Area	8
Table 2-6: Working Population in 1991, 2001 and 2011	9
Table 2-7: Workers and Non-workers in AASHA Notified Area	10
Table 2-8: Sectoral engagement of working population	11
Table 2-9: List of Outer Cordon Locations	14
Table 2-10: Vehicular Composition in AASHA Notified Area	16
Table 2-11: Total Traffic in Passenger Car Unit (PCU) within in AASHA Notified Area	16
Table 2-12: Total Average Daily Traffic Vehicular Composition in AASHA Notified Area	17
Table 2-13: Total Traffic Volume with its Peak Hours	17
Table 3-1: Existing Land Use in AASHA Notified Area	24
Table 5-1 Demographic Characteristics - Decadal Population of Villages	34
Table 5-2: Summary of Population projection using various methods	36
Table 5-3: Traffic Passenger projection for Shirdi International Airport	37
Table 6-1: Social Infrastructure facilities in AASHA Notified Area	41
Table 8-1 Pump Details	46
Table 9-1: Total Traffic Demand for year 2045	64
Table 9-2: IRC Capacity Standards	67
Table 10-1: Proposed Land Use for AASHA Notified Area	75
Table 12-1: Cost of Physical Infrastructure	81
Table 12-2: Indicative Phasing Strategy for AASHA Notified Area	83
Table 12-3: Phase Wise Block Cost Estimate	84

List of Figures

Figure 1-1: Notified Area boundary Around Shirdi Hub Airport	2
Figure 2-1 Regional Setting of Shirdi Development Plan Area	2
Figure 2-2: Regional Connectivity Map of AASHA Notified Area	2
Figure 2-3: Sahyadri Range	3
Figure 2-4: Average annual rainfall for a period from 1998 to 2017 for Rahata	5
Figure 2-5: Decadal variation in Population	6
Figure 2-6 Village Wise Sex Ratio - AASHA Notified Area -2011	8
Figure 2-7: Working Population in 1991, 2001 and 2011	9
Figure 2-8 Agriculture/Crops in the AASHA Notified Area, Shirdi	12
Figure 2-9 Economic Activities (Dairy Farming and Poultry Farming) in the AASHA Notified Area, Shirdi	12
Figure 2-10 Stone Quarry/Crusher	12
Figure 2-11 Restaurant along major road in the AASHA Notified Area	13
Figure 2-12: Modal Split of all OC's (in Vehicles)	16
Figure 2-13: Total Inward and Outward Traffic of AASHA Notified Area	17
Figure 2-14: Modal Shift of peak hours at various cordon points i.e. OC 1 to OC 7 in AASHA Notified A	18
Figure 3-1: Methodology for Preparation of Existing Land Use (ELU)	23
Figure 3-2 (a) Structures/Buildings and Premises (b) High Tension Tower and Line	24
Figure 4-1: Strategies for AASHA Notified Area	32
Figure 8-1 Water Recharge Pit- Section	52
Figure 8-2 Hierarchy of Solid Waste Management	56
Figure 9-1: Peak Hour Traffic Assignment Flows &V/C Ratio for Peak Hour Flows in AASHA Notified Area, 2045	67
Figure 9-2: Proposed Transportation Network Map	69
Figure 9-3: Cross Sections of Different Proposed Right of ways (ROW).	70
Figure 10-1: Proposed Land use Map	76

1. INTRODUCTION

The Maharashtra Airport Development Company (MADC), has been constituted by the Government of Maharashtra (GoM) as a Special Purpose Company, plays a crucial role in fostering air connectivity between various district headquarters with the state capital and important cities across the country. Its mission is to develop, operate, and maintain airports across the state while ensuring planned development around these facilities.

Shirdi is one of the most important religious towns in the state of Maharashtra because it is home to the temple of the famous saint Sai Baba of Shirdi. It is recognized as a major pilgrimage destination on the world map of religious tourism and is considered one of the holiest places in India. The Shri Saibaba Temple is also known for receiving one of the highest amounts of donations among Indian temples, ranking after Tirumala Venkateswara Temple at Tirupati.



Shirdi, a Municipal Council located in western/central Maharashtra on the Ahmednagar-Manmad SH-10, in the Rahata Tehsil of Ahilyanagar District (Earlier known as Ahmednagar District), sits at coordinates 19.40N and 74.25E at an average elevation of 502.60 meters (1653 feet). As a major religio-spiritual tourist hub being the temple town associated with revered Sai Baba, Shirdi's connectivity is vital for its future growth and sustainability. The town is accessible by bus, rail and air from various cities and towns in Maharashtra and important destination in the country.

According to a study by Shri Saibaba Sansthan Trust (SSST), Over the past two decades, the number of tourists visiting Shirdi has risen significantly, with peak visits reaching up to 2,00,000 people during auspicious days, weekends, and public holidays. Strengthening air connectivity to Shirdi is critical to support this growing influx and ensure the town continues to thrive as a major destination for both pilgrims and travelers. To cater and provide better accommodation & infrastructure facilities to the tourists as well as the residents in & around the airport area with proper planning for future development is highly required.

Area Around Shirdi Hub Airport (AASHA) Notified Area:

Looking at the growing rate of pilgrimage at temple, Government of Maharashtra (GoM) entrusted MADDC to develop a greenfield airport at Shirdi vide GR dated 23rd July, 2008. Further, GoM in exercise of the powers conferred by sub section [1B] of Section 40 of Maharashtra Regional and Town Planning Act, 1966 has appointed MADDC as Special Planning Authority for Area Around Shirdi Hub Airport (AASHA) notified area of about 1975.53 ha vide notification dated 28th May 2009, 22nd November 2018, 11th January 2019 and 21st July 2023. The details of the area are given in the table below:

Table 1-1: Details of Area Around Shirdi Hub Airport (AASHA) Notified Area:

Sr. No.	Taluka	Name of the Villages	Notified area vide GR dated 28/05/2009	De-Notified area vide GR dated 22/11/2018	Notified area vide GR dated 22/11/2018	Notified area vide GR dated 21/07/2023	Total Notified area (in Ha)

1	Kopargaon	Kakdi	302.8	4.49	45.01	699.24	1042.56
		Malharwadi				46.05	46.05
2	Sangamner	Wadzari Khurd			5.56	95.88	101.44
		Kasare				183.75	183.75
3	Rahata	Kelwad			1.97	314.8	316.77
		Pimpri Lokai				74.84	74.84
		Korhale				210.12	210.12
		Total Area	302.8	4.49	52.54	1624.68	1975.53 Ha

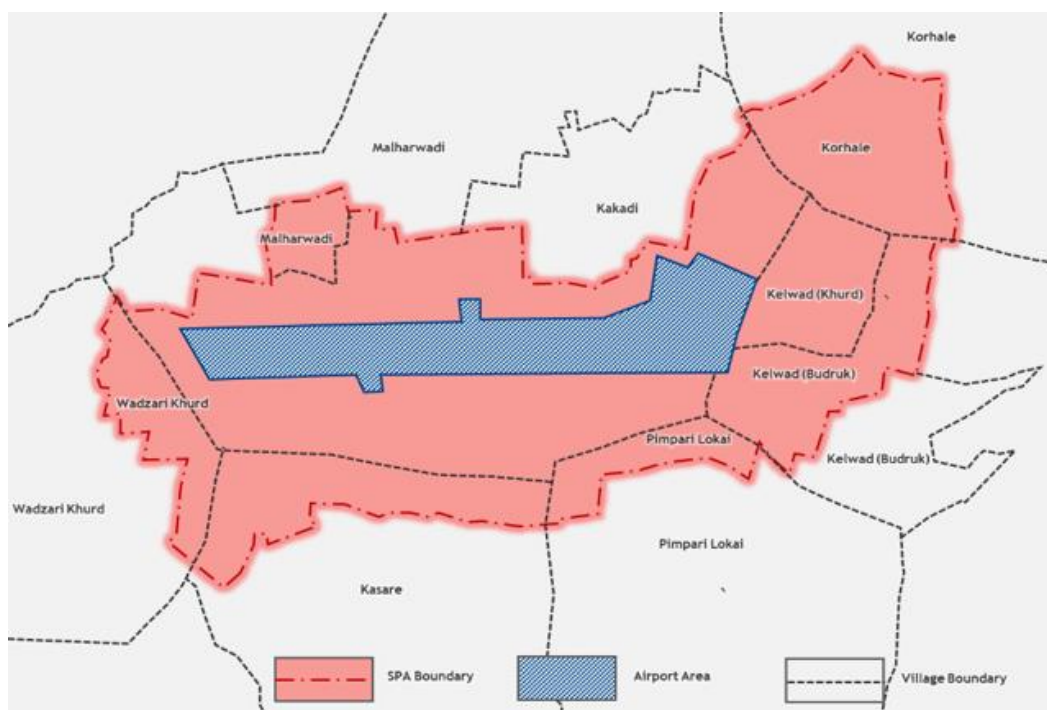


Figure 1-1: Notified Area boundary Around Shirdi Hub Airport

Need for Development Plan:

The Development Plan is necessary for planned and systematic development of the town. The Development Plan guides future growth by regulating land use and providing proper infrastructure and public amenities such as roads, water supply, drainage, transportation, schools, hospitals, gardens, and public utilities. It also helps in controlling unauthorized and haphazard development, protecting the environment, preserving important cultural and religious areas, and improving traffic management. For a rapidly growing pilgrimage town like Shirdi, the Development Plan is essential to manage increasing population and tourist inflow while ensuring balanced, sustainable, and organized urban development.

For SPA, it is mandatory to prepare Development Plan (DP) within 3 years from the date of its appointment as SPA under Section 21 of MR&TP Act, 1966 or within 2 years from the date of declaration of intention to prepare DP, whichever is earlier.

1.1. HISTORY AND GROWTH OF AASHA NOTIFIED AREA

Shirdi Town, known worldwide for its religious significance as the spiritual home of Sai Baba, one of the most revered saints in India, has evolved into a major religio-spiritual tourism destination attracting a substantial volume of domestic and international pilgrims annually. Historically, Shirdi was a small agrarian settlement with limited physical and social infrastructure; however, during the late 19th and early 20th centuries, the increasing inflow of devotees resulted in the gradual transformation of the settlement into a prominent pilgrimage centre. The establishment and expansion of the Shri Sai Baba Sansthan Trust after 1918 played a significant institutional role in managing pilgrimage activities and facilitating the development of religious, civic, and tourism-support infrastructure. Post-independence, the town experienced accelerated urbanization supported by progressive improvements in regional connectivity, transportation infrastructure, and public utilities. Major infrastructure interventions, including strengthening of the regional road network, establishment of the Shirdi railway station in 2004, and expansion of hospitality, healthcare, and commercial facilities, substantially enhanced the town's accessibility and tourism carrying capacity.

A major inflection point in the regional growth trajectory was the development of the Shirdi International Airport in 2017 by the Maharashtra Airport Development Company, which expanded the development influence beyond the municipal area into the surrounding airport influence zone and peri-urban villages. Urban expansion within the SPA area has predominantly occurred along the Ahilyanagar–Manmad State Highway and associated regional transport corridors, resulting in ribbon development and progressive integration of adjoining settlements such as Nimgaon, Korhale, Nighoj, and Rahata into the broader urban influence area. The conversion of agricultural land into residential, commercial, hospitality, and tourism-oriented uses has intensified since the 1990s due to sustained pilgrimage growth and infrastructure investments by the State Government.

The AASHA Notified area today represents a hybrid of peri-urban, and rural characteristics. While Shirdi town functions as the urban core, adjoining villages are increasingly being integrated into the larger economic and functional footprint of the town. Within the SPA, the agriculture including cattle rearing, poultry, horticulture remains the mainstay, however, the service sector—particularly religio-spiritual tourism, hospitality, retail, and transportation—has emerged as the key alternative employment generator.

1.2. CIVIC ADMINISTRATION WITHIN AASHA NOTIFIED AREA

The civic administration within the AASHA Notified Area comprises a multi-tier governance framework involving state, district, and local-level institutions responsible for planning, infrastructure provision, regulation, and service delivery.

The Government of Maharashtra has appointed the Maharashtra Airport Development Company (MADC) as the Special Planning Authority (SPA) for the AASHA Notified Area under the Maharashtra Regional and Town Planning (MRTP) Act, 1966, entrusting it with preparation of the Development Plan, land use proposals, and implementation of Unified Development Control & Promotion Regulations (UDCPR-2020).

The Ahilyanagar District Collectorate functions as the principal district-level administrative authority responsible for revenue administration, land acquisition, disaster management, implementation of development schemes, and inter-departmental coordination.

The Directorate of Town Planning and Valuation, Maharashtra, under the Urban Development Department, provides statutory planning support related to Regional Plans, Development Plans, Town Planning Schemes, land valuation, transportation planning, and implementation of provisions under the MRTP Act, 1966.

Rural administration within the notified area is managed through the Ahilyanagar Zila Parishad and the Gram Panchayats of Kakadi, Malharwadi, Wadzari Khurd, Kasare, Kelwad (Kh.), Kelwad (Bu.), Pimpari Lokai, and Korhale,

which are responsible for local infrastructure, water supply, sanitation, street lighting, public amenities, and implementation of rural development schemes.

In addition, Shree Saibaba Sansthan Trust plays a significant institutional role in the region through provision of pilgrim accommodation, healthcare, education, water supply, sanitation, and other public utility infrastructure catering to both pilgrims and local residents.

1.3. PLANNING HISTORY OF SHIRDI TOWN AND AASHA NOTIFIED AREA¹

The planning efforts for the Shirdi town, which is close to the AASHA Notified Area, have evolved significantly over the past few decades in response to rapid urbanization and increased pilgrimage activity.

The initial planning effort commenced in 1988 with the preparation of a Conceptual Development Plan under the guidance of the Assistant Director of Town Planning, Ahilyanagar; however, as the plan was not prepared under the provisions of the Maharashtra Regional and Town Planning (MRTP) Act, 1966, it lacked statutory status. Subsequently, the Government of Maharashtra authorized the Zilla Parishad, Ahilyanagar, as the Planning Authority under Section 2(15)(C) of the MRTP Act for preparation of a statutory Development Plan for Shirdi. Following the establishment of the Shirdi Municipal Council in 1990, the responsibility for plan preparation was transferred to the Municipal Council in accordance with Section 21 of the MRTP Act, and the Development Plan was subsequently sanctioned in 1992.

In view of changing urban dynamics, tourism growth, and infrastructure expansion, particularly after the commissioning of the Shirdi International Airport, a Revised Development Plan for Shirdi was prepared and brought into effect in 2017 under Section 26(1) of the MRTP Act, incorporating updated zoning regulations, land reservations, and infrastructure proposals.

Subsequently, the Maharashtra Airport Development Company (MADC) identified an area of approximately 1624.68 hectares surrounding the airport for planned development under the “Area Around Shirdi Hub Airport (AASHA)” initiative, and the present Development Plan is being prepared under the provisions of the MRTP Act, 1966.

2. EXISTING PROFILE

This chapter presents the existing profile of the AASHA notified area. It describes the location and regional context of the area and provides details of physiography including topography, geomorphology, climate, and demographic characteristics. The chapter also highlights the availability of social infrastructure such as educational, health, and socio-cultural facilities within the AASHA notified area. An overview of the major economic activities of the area is included. Further, the existing status of physical infrastructure such as water supply, sewerage, drainage, solid waste management, power supply, and electricity has been assessed to understand the present level of development and infrastructure services in the project area.

2.1. LOCATION AND REGIONAL SETTING

AASHA notified area is located in the Ahilyanagar District of Maharashtra, in the western/central part of India and is situated on the Deccan Plateau at an elevation of about 518 meters above mean sea level. The planning area lies between 19.76° N latitude and 74.47° E longitude at a distance of approximately 240 kilometers from Mumbai, the state capital. The notified Area has proximity to major regional hubs like Nashik, Pune & Aurangabad.

The notified area is easily accessible by air, rail, and road. The Sainagar Shirdi Railway station is the primary rail link for the notified area and is located at a distance of approximately 15 kms. The Shirdi Town and the Notified Area are well connected through a network of National Highways/State Highways. The National highway 160 passes through the Shirdi Town and provides linkages from Thane, Nashik, Shirdi, Ahilyanagar, Daund, Baramati in Maharashtra and further joins National Highway 48 at Sankeshwar in Karnataka. The National Highway 60 which connects Pune Dhule in Maharashtra also passes at a distance of approximately 25 kms on the western side of the Notified Area. The National Highway 160D (earlier SH45) further provides links to NH 160 and NH 60 from Kolhar Budruk to Nandur Shingote and passes along the western edge of the Notified Area. Apart from the above, the Samurdhi Mahamarg (Mumbai-Nagpur Expressway) is passing on the North of the Notified Area at a distance of about 16 kms and gets connected with the notified area through NH 160 as well as NH 160D. Proposed Surat Chennai Greenfield highway passes through the southern side of the Notified area. In view of the growing number of visitors from within the country and from foreign destinations, an international airport has been constructed which is part of the AASHA Notified Area. Other major airports close to Shirdi Town are Nashik airport (85 Kms) and Aurangabad Airport (125 kms). The Chhatrapati Shivaji Maharaj International Airport, Mumbai is approximately at a distance of 235 kms.

The combination of air, rail and good road networks like National Highways & Expressway connectivity provides a very strong transport infrastructure to boost the region's economy & growth.

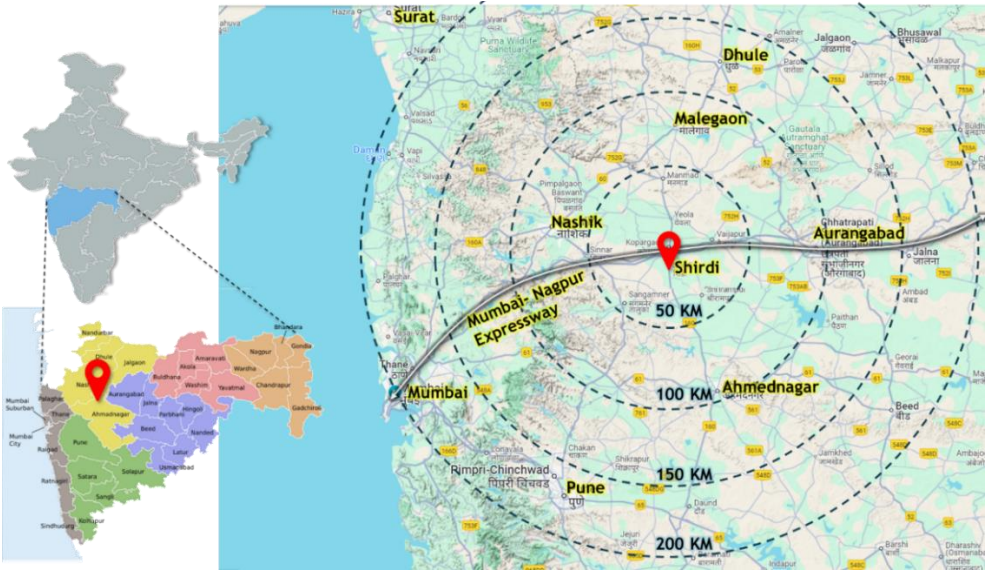


Figure 2-1 Regional Setting of Shirdi Development Plan Area

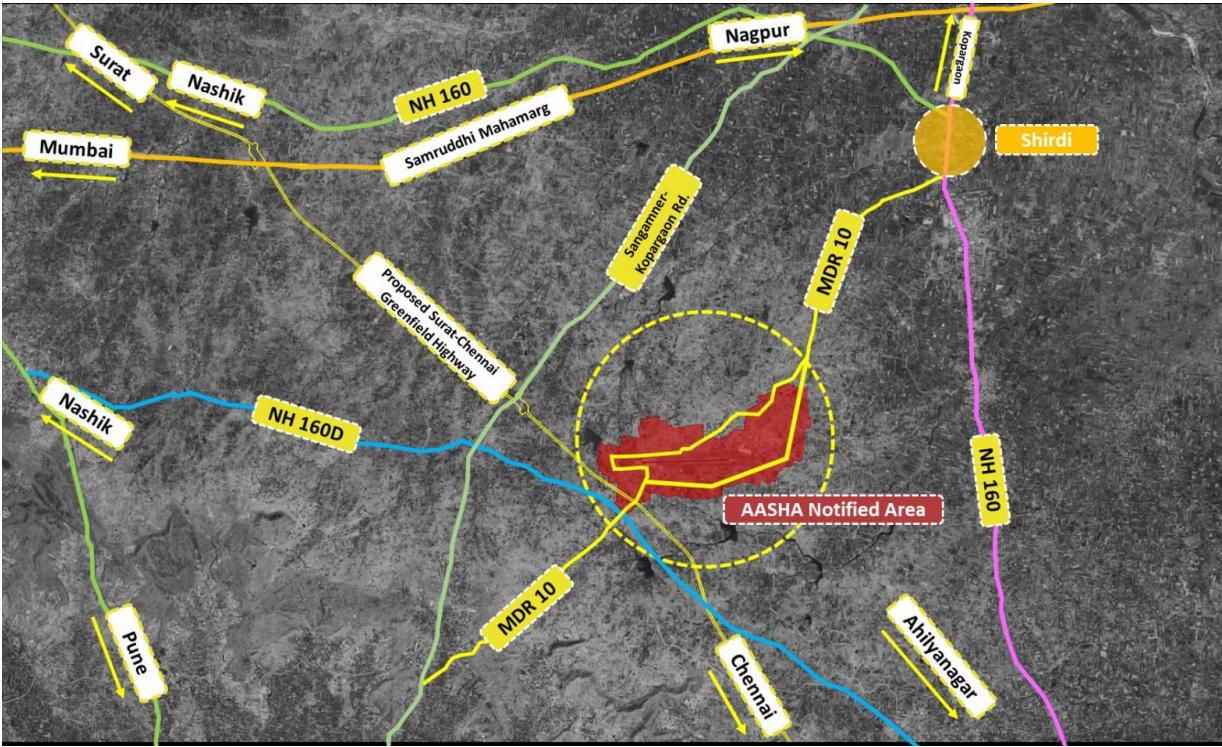


Figure 2-2: Regional Connectivity Map of AASHA Notified Area

2.2. GEOGRAPHICAL SETTING AND TOPOGRAPHY

Notified area is in Ahilyanagar District in the state of Maharashtra. Geographically, it lies on the Deccan Plateau, which is characterized by its elevated, flat terrain. The notified area is situated to the east of Palghar, a coastal area in the Thane district, and is positioned along a straight line. The Sahyadri Range, a mountain range that forms a natural boundary between Ahilyanagar and Thane districts, lies to the west of Shirdi; a narrow spur extending in the south also.

The region surrounding notified area is primarily a plateau, with the topography gradually becoming drier as you move from the Western Ghats towards the interior. While the western areas near the Ghats receive higher rainfall and have more humidity, notified area itself experiences a relatively dry climate, typical of plateau regions.

The area's elevation and location contribute to its distinct climate, which includes hot summers, mild winters, and a monsoon season that brings most of the annual rainfall. The surrounding landscape, with the Sahyadri Range adds to the scenic beauty and cultural significance of the region.

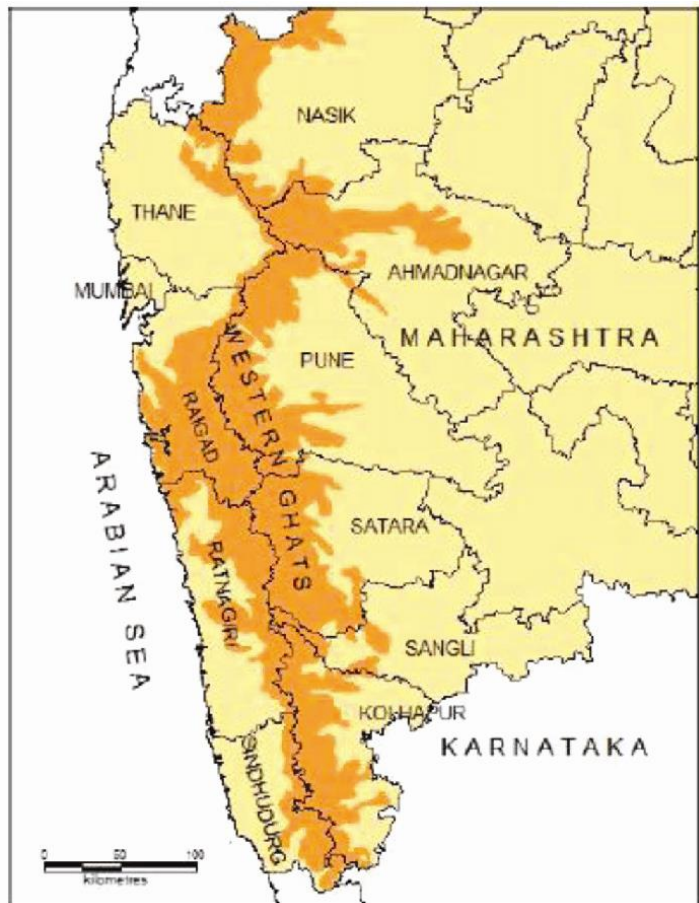


Figure 2-3: Sahyadri Range

2.3. GEOMORPHOLOGY AND GEOLOGY

The Notified Area is located within broader region of Deccan Plateau and is part of western/central Maharashtra region of the state of Maharashtra. Geomorphologically, the area is devoid of landforms like hills, mountains and valleys. The Sahyadri ranges are extension of western ghats and are located towards west and southwest of the study area as is visible in Figure 2-3. The topography is flat with a very gentle gradient from south, south-west to north-east and east. The highest contour is of 608 meters MSL in the southwest and the minimum is 558 meters MSL having a slope differential of 50 meters over a distance of 7 kms from west to east. The average gradient is 0.00714 (or 0.714%)². Overall, the area is part of larger Godavari basin, however, it is not drained by major streams and any river except few localized nallahs.

2.3.1. Geology

Geologically, the soil structure is sandy clay loam and gravelly sandy clay loam and is very brown/ red in colour. The maximum depth of top soils is about 1-2 meters deep (as visible in dug wells) except along the nallahs and depressions. After the top soil, the sub surface is of typical deccan trap i.e. the Basalt. This rock structure belongs to Cretaceous to Eocene geological epochs and in terms of years it translates to 145 million years to 35 million years.

² DGPS Survey, May, 2025

2.3.2. Ground Water Resources

The analysis of geological formations also requires the study of ground water resources. It becomes all the more important for a semi-arid climatic zone like Shirdi and its surroundings. The ever-growing water requirements for sustaining the increasing population and a very large number of tourists and pilgrims visiting the Sai baba Temple. The demand for water for drinking and domestic purposes, for community kitchens, sanitation etc. within the town and supporting livelihood of agriculture communities surrounding the town is steadily increasing. The study area primarily being agricultural heavily relies on ground water sources in the form of dug wells and borewells in the absence of adequate surface water.

2.4. CLIMATE

Climatically, the Notified Area is hot semi-arid within the broad tropical zone. The summers are hot to very hot, mild winters, mostly dry weather scanty rainfall. The climatic features are described below in detail:

2.4.1. Temperature

The average annual temperature is approximately 26°C, while the maximum annual average temperature reaches about 32°C. The study area experiences minimum temperature of 14-16°C during months of December to February; the minimum temperature may go below 10°C also on certain days. Whereas April and May are hottest months with average temperature around 38°C which may cross 40° on certain days. Rest of the year, the region experiences mild temperatures.

Table 2-1: Average Monthly Temperature Variations Shirdi

	January	February	March	April	May	June	July	August	September	October	November	December	Total (Annual avg.)
Avg. Temperature °C	21.3	23.8	27.4	30.9	30.9	27.5	25.1	24.5	24.7	25.2	23.7	21.6	25.78
Min. Temperature °C	14.2	16.2	19.5	22.9	23.9	23.9	23.1	22.4	21.6	19.9	17.6	15.0	20.02
Max. Temperature °C	28.4	31.1	34.7	38.5	38.6	32.7	28.4	27.7	28.9	30.8	30	28.6	31.53

Note: Data for year 1991-2021 (Min. Temperature °C, Max. Temperature °C)

Source: <https://en.climate-data.org/asia/india/maharashtra/shirdi-717429/> accessed on 27-06-2025

2.4.2. Rainfall

The analysis of rainfall data becomes very critically important as it allows to take informed decisions regarding water resource management, infrastructure design; specially the drainage, and to ensure sustainable urban development. Being the rain shadow zone of western ghats, the Ahilyanagar district in general and the notified Area in particular receives very scanty rainfall during monsoon months from June to September. Central Ground Water Board has carried out block wise analysis of rainfall in its Water Management Plan for Ahilyanagar District

Table 2-2: Average rainfall Kopargaon, Sangamner and Rahata Blocks

	Kopargaon	Sangamner	Rahata	Average
Normal Rainfall (mm)	486.1	478.6	519.2	494.63
Annual Rainfall (mm) (2017)	519.8	580.3	712.9	604.33

Source: Aquifer Maps and Ground Water Management Plan, Ahmednagar District, March 2021: CGWB

The above Table depicts the average annual rainfall in three Taluka (The Notified Area is located in these three Talukas) is 494.63mm, whereas the annual rainfall in the year 2017 is 604.33mm. Rahata is geographically closest to the Notified Area. The average annual rainfall for a period from 1998 to 2017 for Rahata is given in the Figure 2-4

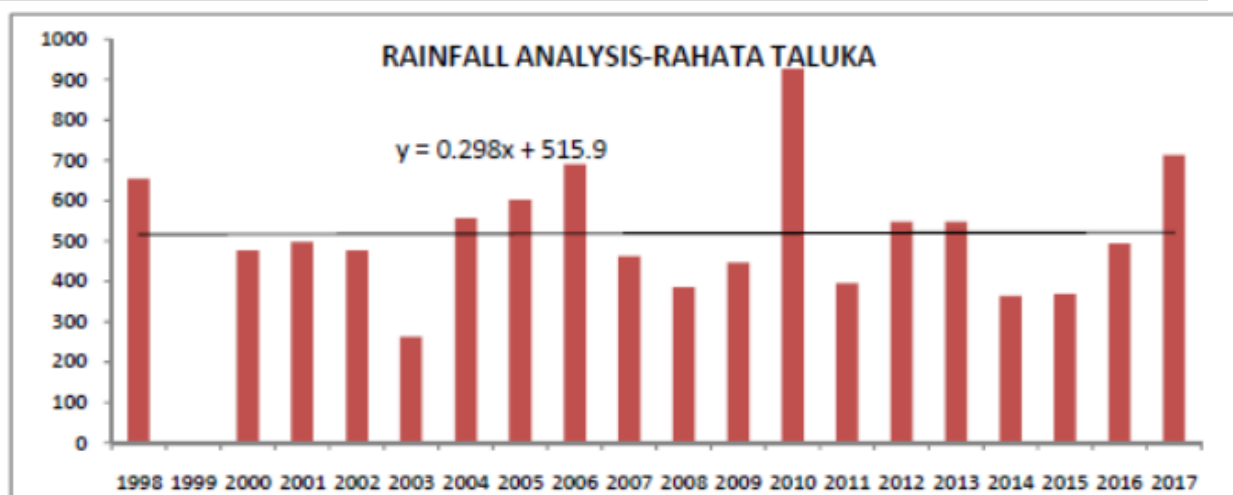


Figure 2-4: Average annual rainfall for a period from 1998 to 2017 for Rahata ³

The figure shows that the area has received highest rainfall of above 900 mm in the year 2010, and lowest of less than 300mm in the year 2003. Even normal average rainfall indicates drought like conditions.

Overall, the climate in Shirdi is characterized by hot summers, dry conditions, and a relatively mild winter, with insignificant monsoon rainfall.

2.4.3. Humidity

The climate in Notified area becomes increasingly dry as you move away from the coast. On the western side of the Sahyadri Range, the climate is more humid, but Notified area itself experiences lower humidity. The mean humidity ranges from 34% to 80% in the morning and from 17% to 64% in the evening, depending on the temperature.

2.4.4. Wind Direction

The wind direction during summer and monsoon months (March to September) is from southwest and west, whereas, during winters the wind direction changes from northeast-east and brings cooler dry air. The wind speeds are moderate between 10-13 kmph, however during summers and monsoons, it may experience gusty winds with a speed of 24-26kmph.

³ Aquifer Maps and Ground Water Management Plan, Ahmednagar District, March 2021: CGWB

2.5. DEMOGRAPHIC CHARACTERISTICS

2.5.1. AASHA Notified Area

At present the site area has a minimal population as there is no urban or rural settlement within the planning area boundary. The 08 villages falling under the planning area (partly) have a population ranging between 327 of Kelwad Kh to 4798 of Korhale. The total existing population of these rural settlements is 17,083 persons.

Table 2-3 Demographic Characteristics of AASHA Notified Area

Sr. No.	Taluka	Village	Population 1991	Population 2001	% Decadal Growth (1991–2001)	Population 2011	% Decadal Growth (2001–2011)
1	Sangamner	Wadzari Kh.	927	1,186	28%	1,148	-3%
2	Sangamner	Kasare	1,111	1,417	28%	1,761	24%
3	Kopargaon	Kakadi	1,403	1,481	6%	2,128	44%
4	Kopargaon	Malharwadi	749	949	27%	1,230	30%
5	Rahata	Kelwad Bk.	3,212	3,760	17%	4,394	17%
6	Rahata	Kelwad Kh.	198	257	30%	327	27%
7	Rahata	Pimpri Lokai	756	885	17%	1,297	47%
8	Rahata	Korhale	3,298	4,167	26%	4,798	15%
	Total		11,654	14,102	21.01%	17,083	21.13%

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India for 1991, 2001 & 2011

Between 1991 and 2001, the total population in these villages grew by 21.01%, rising from 11,654 to 14,102. In the subsequent decade (2001–2011), the population again increased by 21.13%, reaching 17,083. Villages like Pimpri Lokai (47%), Kakadi (44%), and Malharwadi (30%) experienced higher-than-average growth in the 2001–2011 decade, possibly due to their proximity to road networks, Shirdi Airport, or emerging service sector opportunities.

Only Wadzari Khurd saw a marginal decline of -3%, indicating possible outmigration or stagnation in development. Overall, the population growth in the 2001–2011 period has been slightly higher on average when compared to 1991–2001, though with noticeable variation across villages. It can be observed that the villages in Rahta and Kopargaon Taluka showed consistently high population increases in both decades, indicating steady development and increased demand for infrastructure and services.

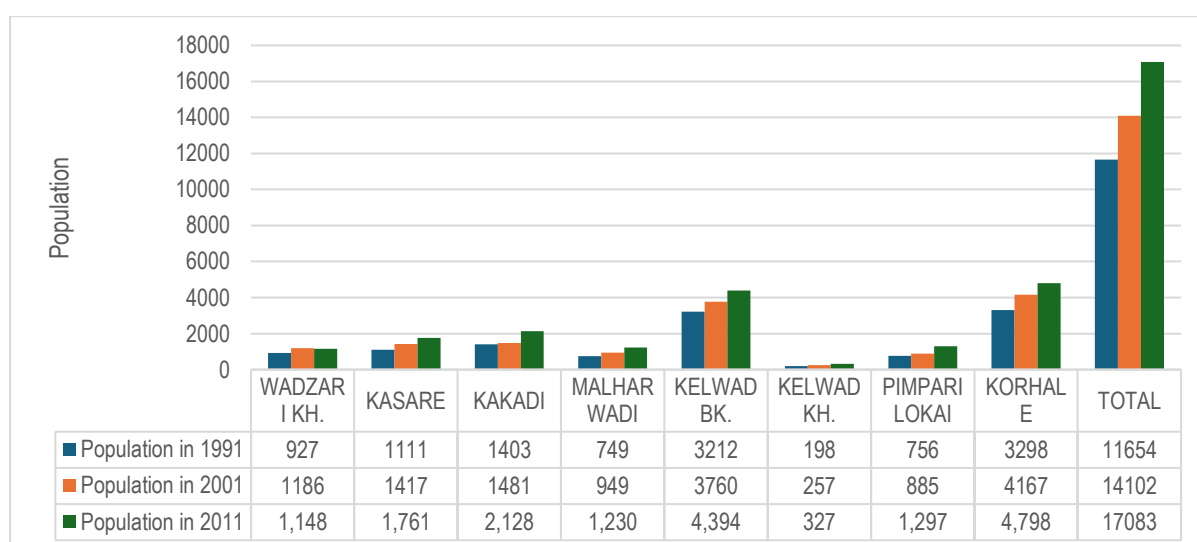


Figure 2-5: Decadal variation in Population⁴

⁴ District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India for 1991, 2001 & 2011.

Household Size

The average household size is an important demographic indicator that reflects family structure, living conditions, and housing needs in rural areas. Based on the 2011 Census data, the average household size across the eight villages representing the AASHA Notified Area is in the range of 4.73 persons per household in case of Kelwad Kh to 5.64 for Malharwadi village.

Table 2-4: Household Data

Village	Total Population	Household Number	Average Household Size
Wadzari Kh.	1,148	214	5.36
Kasare	1,761	339	5.19
Kakadi	2,128	414	5.14
Malharwadi	1,230	218	5.64
Kelwad Bk.	4,394	854	5.14
Kelwad Kh.	327	69	4.73
Pimpari Lokai	1,297	245	5.29
Korhale	4,798	970	4.96
Total	17083	3323	5.14

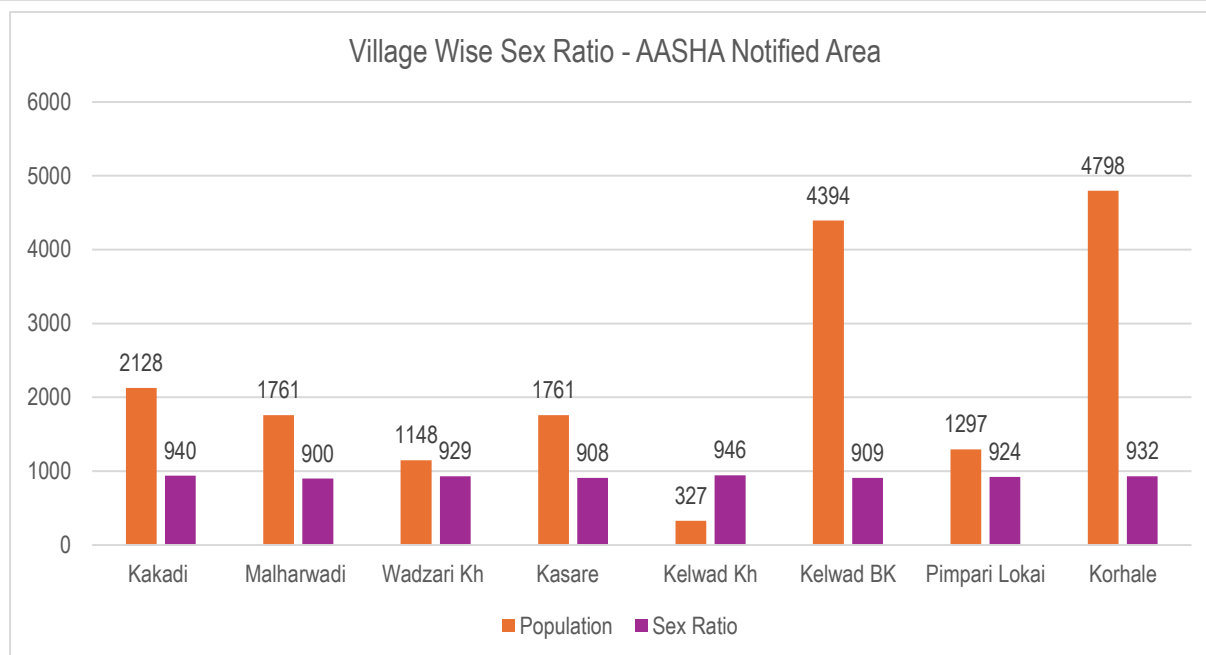
Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

The average household size for all the rural settlements representing Notified area is 5.14 persons per household, this is slightly higher than rural household size of state of Maharashtra which is 4.9.

Malharwadi recorded the highest average household size of 5.64 persons, suggesting a tendency toward larger joint or extended families. All other villages, including Wadzari Khurd, Kasare, Kakadi, Kelwad Bk., Kelwad Kh., Pimpari Lokai, and Korhale, report an average household size close to 5, indicating a relatively uniform pattern of family size in the region. The largest village in terms of population is Korhale, with a population of 4,798 spread across 970 households, while the smallest is Kelwad Khurd, with a population of 327 and 69 households. Despite the variation in population and number of households, the consistency in household size points to cultural and social uniformity in the region's rural family setup.

Sex ratio:

The chart below represents the total population and sex ratio (number of females per 1,000 males) across the eight villages within the AASHA Notified Area. While population values vary significantly from village to village, the sex ratio across all villages lies within the typical rural Maharashtra range of approximately 900–940 females per 1,000 males, with a few notable variations.

Figure 2-6 Village Wise Sex Ratio - AASHA Notified Area -2011⁵

Korhale, the most populous village with 4,798 residents, has a sex ratio of 932, indicating a balanced gender composition in line with the regional average. Kakadi, which has the second-largest population (2,128), shows a sex ratio of 940, the highest among the villages, suggesting a relatively favorable gender balance. Kelwad Khurd, despite being the smallest in terms of population (327), has a strong sex ratio of 946, the highest in the entire dataset, indicating a possibly aging or female-dominant population structure. Kasare and Malharwadi show lower sex ratios at 908 and 900, respectively, which may reflect localized gender disparities or male-dominant migration patterns. Wadzari Khurd and Pimpri Lokai also show moderate sex ratios of 929 and 924, respectively, both closely aligning with the state's rural average. Kelwad Bk., with a population of 4,394, has a slightly lower sex ratio of 909, which is notable considering its size and economic activity. Overall, some villages like Kelwad Kh. and Kakadi demonstrate commendable gender parity, others such as Kasare and Malharwadi may require targeted gender-sensitivity and inclusion measures.

2.5.2. Literacy Rate

As per Census 2011, the following table presents the village-wise distribution of total literates, along with the breakdown of male and female literates in the selected villages of Sangamner, Kopargaon, and Rahta talukas:

Table 2-5: Literacy Rate in AASHA Notified Area

Sr. No.	Village	*Total Population	Total Literates	% to total population	Male Population	Male Literates	% total male population	Female population	Female Literates	% to total female population
1	Wadzari Kh.	1,006	778	77.34	512	453	88.48	494	325	65.79
2	Kasare	1,538	1,028	66.84	801	601	75.03	737	427	57.94
3	Kakadi	1,837	1,356	73.82	949	793	83.56	888	563	63.40
4	Malharwadi	1,059	784	74.03	547	462	84.46	512	322	62.89
5	Kelwad Bk.	3,794	2,883	75.99	1,980	1,653	83.48	1,814	1,230	67.81
6	Kelwad Kh.	289	235	81.31	144	127	88.19	145	108	74.48
7	Pimpri Lokai	1,083	766	70.73	555	443	79.82	528	323	61.17
8	Korhale	4,193	3,304	78.80	2,152	1,865	86.66	2,041	1,439	70.50
	Total	14,799	11134	75.23	7,640	6397	83.73	7,159	4737	66.17

⁵ District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

*The total population represents school going population (excluding 0-6 years age group)

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

The villages representing the Notified area have overall literacy of 75.23% which is slightly lower than state average of 77% for Rural Maharashtra. The male literacy is 83.73% and female literacy is 66.17%. The Maharashtra state average for male and female literacy is 85% and 69% respectively. Kelwad Kh has literates ie 81.31% followed by Korhale 78.80%. Kasare has lowest literacy 66.84%. Kelwad Kh has highest female literacy of 74.48% and Kasare with 57.94% is at the bottom.

2.5.3. Working Population and Sectorial Composition

Analysis of the working population data from 1991, 2001, and 2011 for villages represented in the AASHA Notified Area reveals significant trends in employment participation and growth in workforce size over the decades.

Table 2-6: Working Population in 1991, 2001 and 2011

Sr. No.	Taluka	Villages	Working Population in 1991	Working Population in 2001	Growth %	Working Population in 2011	Growth %
1	SANGAMNER	WADZARI KH.	488	690	41%	658	-5%
2		KASARE	522	747	43%	1,023	37%
3	KOPARGAON	KAKADI	742	696	-6%	1,176	69%
4		MALHARWADI	431	500	16%	694	39%
5	RAHTA	KELWAD BK.	1365	1102	-19%	2,234	103%
6		KELWAD KH.	57	72	26%	137	90%
7		PIMPARI LOKAI	233	395	70%	720	82%
8		KORHALE	1430	1979	38%	2390	21%

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India for 1991, 2001 and 2011

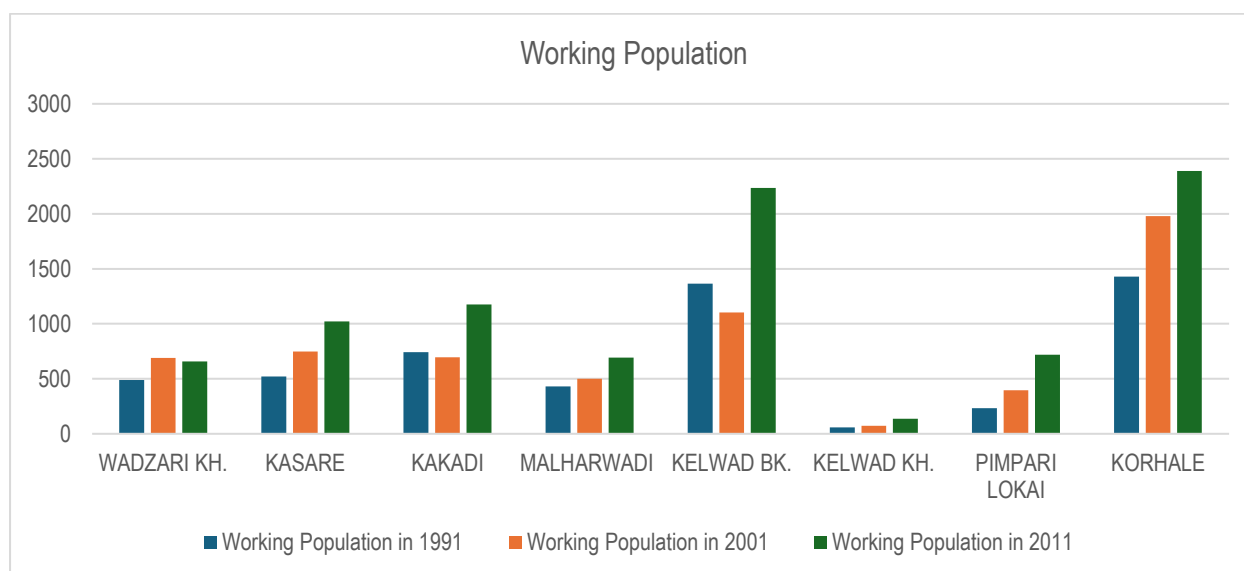


Figure 2-7: Working Population in 1991, 2001 and 2011

The perusal of Table above and the Figure 2-7 shows a steady to very high growth in the number of workers ranging from 21% in case of Korhale to 103% for Kelwad KH between 2001 and 2011 except for village Wadzari Kh. experiencing a negative growth of -5% in the workforce. Korhale stands out with the highest working population (2,390) as well as the highest non-working population (2,408). This results in a near-balanced economic

dependency, indicating a well-diversified population with both active workers and dependents (such as children and elderly). Kelwad Bk. also exhibits high workforce engagement with 2,234 working individuals and 2,160 non-working, which again reflects a strong labor force relative to total population. In contrast, Kelwad Khurd has a higher non-working population (190) compared to its working population (137), indicating a higher dependency ratio, which could be due to its small population base and a larger proportion of non-working age individuals. Kakadi and Kasare reflect healthy economic participation with working populations of 1,176 and 1,023, respectively, each making up more than 50% of their total population. Their non-working populations are relatively balanced, suggesting stable community structures. Pimpri Lokai and Malharwadi also show positive worker participation trends, with working-to-non-working ratios of 720:577 and 694:536, respectively both indicating a predominantly active workforce. Wadzari Khurd demonstrates a similar trend, with 658 working and 490 non-working, supporting the overall pattern of workforce dominance across the region.

However, the health of the economy is reflected in number of factors like sectoral participation of workforce, dependent people etc. These factors are analyzed below as per the data based on 2011 census.

Sectoral Composition

The economic profile of the AASHA Notified Area is largely defined by the occupational structure of its working population. As per Census 2011, the total workforce in the represented villages spans across four major sectors: Cultivators, Agricultural Laborers, Household Industry Workers, and Other Workers. This distribution provides key insights into the rural economy and land use patterns.

Classification of Workers

According to the Census of India, the working population is classified into:

- **Main Workers** (those who engaged in economically productive activity for more than six months a year)
- **Marginal Workers** (engaged for less than six months)

For this analysis, the focus is primarily on main workers, as they represent the core sectoral engagement within the village economy.

Sectoral Categories of Main Workers

The main workforce is further subdivided into the following occupational sectors:

- **Cultivators:** Individuals engaged in cultivation of land they own or lease.
- **Agricultural Laborers:** Individuals who work on land owned by others in return for wages.
- **Household Industry Workers:** Workers engaged in home-based production like handicrafts or small-scale industries.
- **Other Workers:** Workers involved in service sectors, trade, commerce, transportation, manufacturing industries, etc.

Table 2-7: Workers and Non-workers in AASHA Notified Area

Sr. No.	Taluka	Villages	Total Population	Workers					Non-Workers	% Non-workers
				Total	Main	%age	Marginal	%age		
1	Sangamner	Wadzari Kh.	1,148	658	648	98.48	10	1.52	490	42.68
2		Kasare	1,761	1,023	1000	97.75	23	2.25	738	41.90
3	Kopargaon	Kakadi	2,128	1,176	1060	90.14	116	9.86	952	44.73
4		Malharwadi	1,230	694	676	97.41	18	2.59	536	43.57
5	Rahata	Kelwad Bk.	4,394	2,234	2062	92.30	172	7.70	2,160	49.15
6		Kelwad Kh.	327	137	137	100.00	0	0.00	190	58.10

7		Pimpri Lokai	1,297	720	695	96.53	25	3.47	577	44.48
8		Korhale	4,798	2390	2012	84.18	378	15.82	2,408	50.18
Total			17083	9032	8290	91.78	742	8.22	8051	47.12

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

The table above indicates that the non-workers are about 47.12% of the population for the villages represented in the Notified Area and ranges between 41.90% in case of Kasare village to 50.18% for Korhale; the largest village. The higher %age of 58.10% in case of Kelwad Kh is non representative on account of very small sample size. The engagement of 52.88% of population in the employment is a healthy trend. This may be largely because of the agriculture economy on account of its labour-intensive nature. The data above further shows that the main workers constitute 91.78% of the workforce, therefore, there is insignificant casualization of the work force. This trend is visible in all the settlements as the main workers range between 84.18% in case of Korhale and 98.48% for Wadzari Kh and 100% for Kelwad Kh.

Table 2-8: Sectoral engagement of working population

Villages	Total Main Workers	Cultivators		Agricultural Labour		Household Industry		Other Workers	
		No.	%age	No.	%age	No.	%age	No.	%age
Wadzari Kh.	648	519	80.09	61	9.41	8	1.23	60	9.26
Kasare	1,000	781	78.10	59	5.90	9	0.90	151	15.10
Kakadi	1,060	505	47.64	455	42.92	10	0.94	90	8.49
Malharwadi	676	475	70.27	107	15.83	8	1.18	86	12.72
Kelwad Bk.	2,062	1,304	63.24	369	17.90	9	0.44	380	18.43
Kelwad Kh.	137	55	40.15	5	3.65	9	6.57	68	49.64
Pimpri Lokai	695	447	64.32	225	32.37	0	0.00	23	3.31
Korhale	2,012	1,167	58.00	420	20.87	23	1.14	402	19.98
Total	8290	5253	63.37	1701	20.52	76	0.92	1260	15.20

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

The sector wise workforce participation shows that majority of the workforce is engaged in the primary sector activities as 80.89% of the workers are cultivators and agriculture labour (20.52%) for the villages represented in the study area. Wadzari Kh has the highest ratio of primary sector workers and Kelwad Kh has lowest ie 43.80%. Kelwad Kh may not be representative sample on account of very low population base; for other villages, it ranges between 80-90%. Cultivators form the largest segment (60.37%) of the main workforce in most villages, particularly in Kelwad Bk., Korhale, and Kasare, indicating a high dependency on agriculture. Villages like Kakadi and Pimpri Lokai show a considerable number of agricultural labourers, highlighting income reliance on wage-based agricultural employment. Household industry workers constitute a negligible share of the workforce across villages, showing limited industrial diversification at the household level. The presence of non-agricultural sectors is strongest in Kelwad Bk. and Korhale, which may be attributed to proximity to Shirdi and its influence as a tourism and trade hub.

The study area, therefore, is predominantly dependent on agriculture which includes activities like, dairy, poultry and horticulture. This scenario was otherwise also visible during reconnaissance survey of the study area.

2.6. ECONOMIC PROFILE

The economic profile of the AASHA Notified Area is largely shaped by its rural character, agriculture-dependent population, and proximity to Shirdi – a significant religious and tourism hub. The notified villages such as Korhale, Kakadi, Kelwad (Kh. & Bk.), Malharwadi, Kasare, Pimpri Lokai, and Wadzari Kh. represent a typical rural economy of Maharashtra, with emerging linkages to urban and service-based sectors due to infrastructure developments, including the Shirdi Airport.

2.6.1. Primary Sector: Agriculture and Allied Activities

Agriculture remains the dominant economic activity in the AASHA area. A significant portion of the working population is engaged as cultivators and agricultural laborers, as evident from Census 2011 data. The region's fertile black cotton soil and availability of irrigation in parts (through wells, borewells, and seasonal nalas) support the cultivation of jowar, bajra, wheat, sugarcane and cotton, horticultural produce including onion, tomato and pomegranate. In villages such as Kelwad Bk., Korhale, and Kakadi, dairy farming, poultry are also in practice. However, dependence on monsoon, small landholdings, and low mechanization are challenges to farm productivity.



Figure 2-8 Agriculture/Crops in the AASHA Notified Area, Shirdi



Figure 2-9 Economic Activities (Dairy Farming and Poultry Farming) in the AASHA Notified Area, Shirdi

2.6.2. Secondary Sector: Manufacturing and Processing

The industrial base within the AASHA area is negligible, with no formal manufacturing or processing units. However, household-level activities such as: Agro-processing (e.g., jaggery making), Handicrafts or tailoring, Brick kilns or small workshops (in peripheral areas), exist in an unorganized and seasonal form. The availability of basalt rocks has potential for stone quarries. One such quarry is existing in the notified area itself.



Figure 2-10 Stone Quarry/Crusher

2.6.3. Tertiary Sector: Services, Tourism & Logistics

The service sector is gradually expanding, particularly in the villages close to Shirdi and along the airport corridor. Employment in the tertiary sector includes Transport services (e.g., auto-rickshaws, cabs to Shirdi), Retail shops and eateries, Construction labor, electricians, and plumbing work, jobs at the Shirdi Airport (security, housekeeping, administrative support). While the tourism economy of Shirdi generates substantial employment, spillover into the AASHA area is still limited, mostly restricted to Korhale and Kakadi which lie on important access routes. There is also scope for logistics and warehousing due to the presence of the airport, but current infrastructure is inadequate to support such operations.



Figure 2-11 Restaurant along major road in the AASHA Notified Area

2.6.4. Tourism

The AASHA Notified Area is strategically situated within the high-impact zone of Shirdi, one of India's foremost religious pilgrimage destinations. The economic dynamics of this region are significantly influenced by tourism-related footfall and the recent development of Shirdi International Airport. Together, these factors position the area as a potential node for religious tourism-led regional development.

Despite this substantial religious footfall, much of the AASHA Notified Area remains economically disconnected from the direct benefits of tourism and aviation growth. Visitors typically pass through rural settlements without contributing to local spending or economic retention, due to the lack of supporting commercial infrastructure and tourist-facing amenities.

a) Tourism Positioning and Comparative Significance

As per the Maharashtra Tourism Exit Survey, Shirdi ranks as the third most visited tourist destination in the state. It is the most preferred destination among domestic overnight visitors, accounting for 4.48% of this category. In total visitation (domestic day + overnight), Shirdi accounts for 6.84% of all tourists in Maharashtra surpassed only by Juhu Beach (15.51%) and Siddhivinayak Temple (8.15%). While international tourist inflow is minimal, Shirdi holds a dominant position within the domestic pilgrimage circuit, reinforcing its cultural and spiritual significance.

b) Projected Growth Areas

In light of the current tourism and aviation trends, several growth avenues emerge for the AASHA region:

- **Hospitality Sector Expansion:** Development of budget accommodations, guest houses, and mid-range hotels can cater to pilgrims and airport travelers who may seek to extend their stay.
- **Religious Tourism Infrastructure:** Establishment of shops selling pooja items, handicrafts, devotional music, and guided tour services can help tap into pilgrimage-linked demand.
- **Agricultural Value Addition & Logistics:** Given the proximity to the airport, agricultural producers can leverage logistics and cold-chain infrastructure for export-oriented perishable goods.
- **Rural Enterprise Development:** Creation of self-employment hubs, SHG-driven retail outlets, and skills training centers aligned with tourism and transport services can foster inclusive economic growth.

2.7. TRAFFIC CHARACTERISTICS

2.7.1. Connectivity and different modes of Transport

AASHA Notified Area is well-connected by air, rail, and road. The nearest railway station is Sainagar Shirdi Railway Station which serves as the primary rail link. The Shirdi Planning area is well connected with National Highway - 160, National Highway - 160 D & State Highway - 44 & Mumbai Nagpur Expressway. Shirdi town which is just 14 kms away from newly constructed Shirdi International Airport which is within the Shirdi Planning Area. The other major airports nearby Shirdi Town are Nashik airport 75 Kms & Aurangabad Airport is 150 kms away. Mumbai airport is 296 kms far from Shirdi Town. The combination of Air, Rail & good road networks like National Highways & Expressway connectivity provides a very strong infrastructure to boost the region's economy & growth.

2.7.2. Road Network

In AASHA Notified Area, there is only one Major District Road (MDR) passing through the area i.e. MDR 10 (locally known as Airport Road). There is also one State Highway (now designated as NH 160D) i.e. outside the Notified Area along the Southwest side boundary. The total area under road network in the Notified Area is 36.84 hectares which includes the area of MDR, Village Roads and other roads. As per the Public Works Department-Sangamner, right of way (ROW) of the State Highway is 30 meters (Now NH 160D) and the ROW of the Major District Road (MDR) is 15 meters.

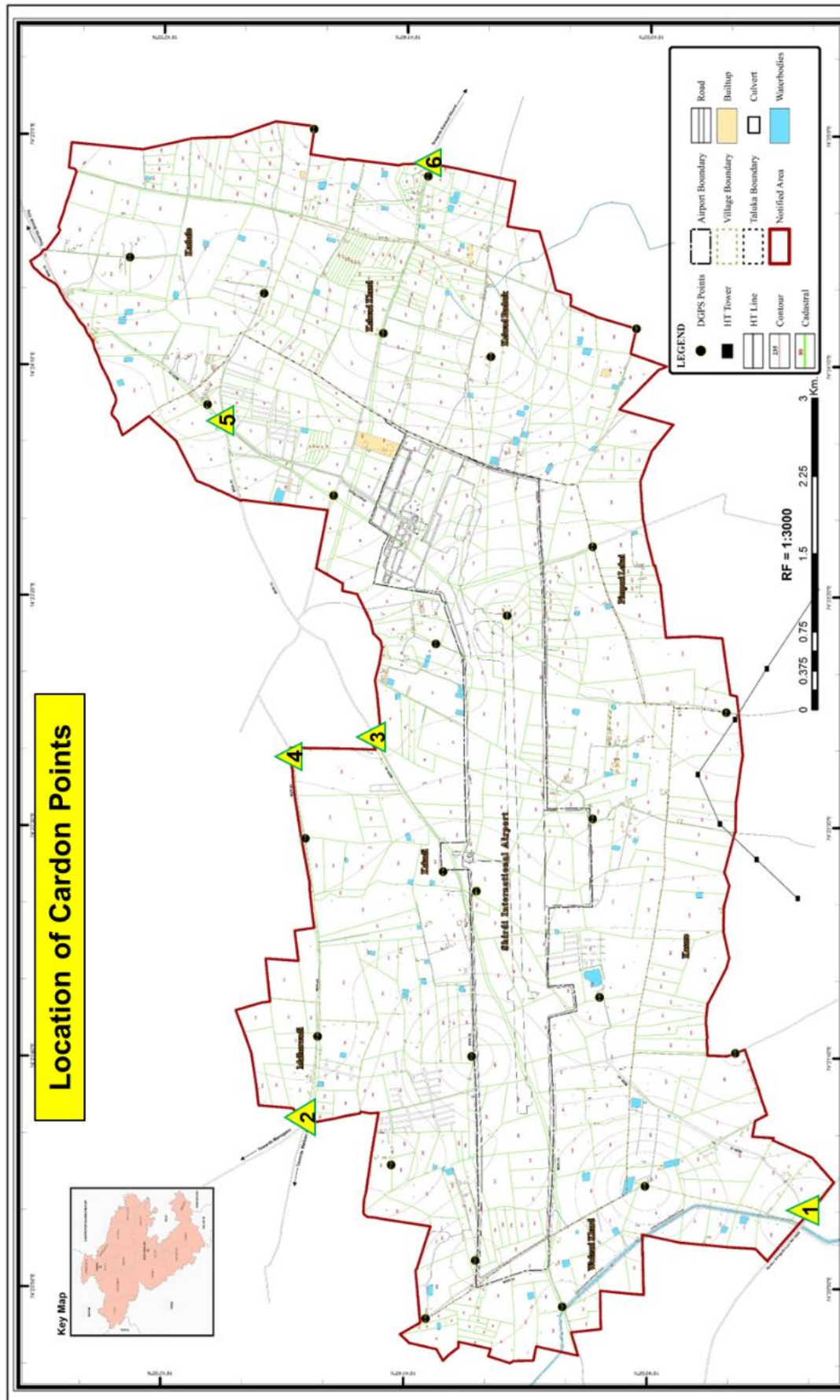
2.7.3. Identification of Cordon Points/Locations

Based upon the existing road hierarchy of AASHA Notified Area, six (6) locations were selected or identified for conducting of traffic volume survey within the Notified Area as shown in table and Map below.

Table 2-9: List of Outer Cordon Locations

Sr. No.	Cardon Point	Location
1	OC 1	Jambulwadi (Airport Road)
2	OC 2	Dangewadi (Malharwadi)
3	OC 3	Bangamner to Kakadi
4	OC 4	Malharwadi-Kakadi
5	OC 5	Kakadi to Korhale
6	OC 6	Kelwad Khurd

Source: Primary Survey, 2025



Map: Cordon Points (2025) in AASHA Notified Area

2.7.4. Traffic Volume Survey

Vehicular composition at all cordon locations of AASHA Notified Area

During the survey, it was observed that maximum numbers of trips were generated by two (2) wheelers (i.e. Motorcycles etc.) which comprise of 43% modal split. four wheelers i.e. Car/Jeeps comprise 38% of the vehicles followed by trucks i.e. 10%. The detailed modal splits of all outer cordon points are given in table and figure below.

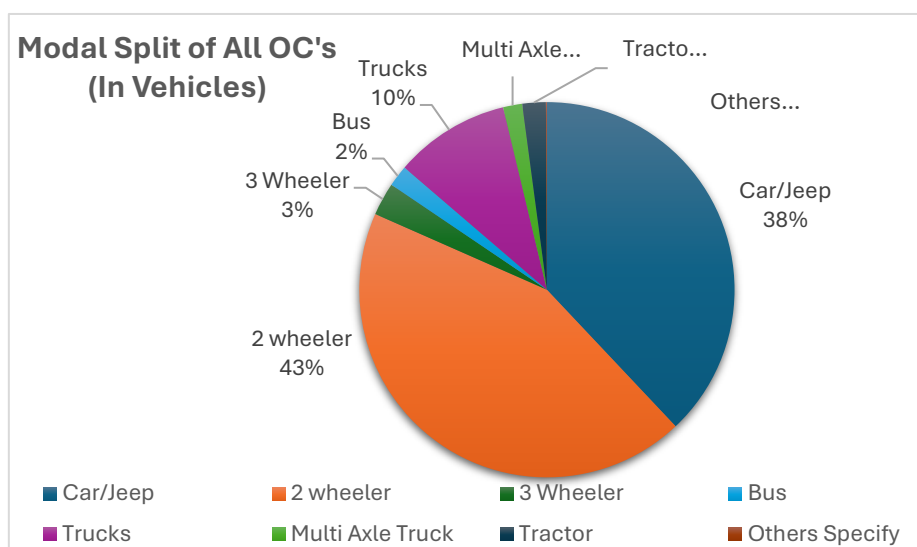


Figure 2-12: Modal Split of all OC's (in Vehicles)

Table 2-10: Vehicular Composition in AASHA Notified Area

	Car/Jeep	Two-wheeler	Three-Wheeler	Bus	Trucks	Multi Axle Truck	Tractor	Others	Total
Numbers	3157	3629	236	153	828	137	168	7	8315
% age	37.97	43.64	2.84	1.84	9.96	1.65	2.02	0.08	100

Source: Traffic Volume Survey, 2025

Table 2-11: Total Traffic in Passenger Car Unit (PCU) within in AASHA Notified Area

Cordon Point	Passenger Car Unit (PCU)								Total PCU's
	Car/Jeep	2-wheeler	3-Wheeler	Bus	Trucks	Multi Axle Truck	Tractor	Others Specify	
OC 1	914	341	29	106	899	128	88	0	2504
OC 2	166	338	31	2	96	44	140	0	817
OC 3	914	321	24	97	315	128	80	0	1878
OC 4	94	166	13	24	59	72	92	8	528
OC 5	800	302	146	70	1450	56	104	3	2932
OC 6	269	349	40	37	244	120	168	0	1227
Total	3157	1815	283	337	3064	548	672	11	9885

Source: Traffic Volume Survey, 2025

Total Average Daily Traffic In and Out of AASHA Notified Area

The table and figure reveals that the total average daily traffic is 8315 vehicles at all Cordon points. As the OC 5 with 1991 vehicles has the highest In and Out traffic followed by OC 1 i.e. 1964 vehicles in AASHA Notified Area.

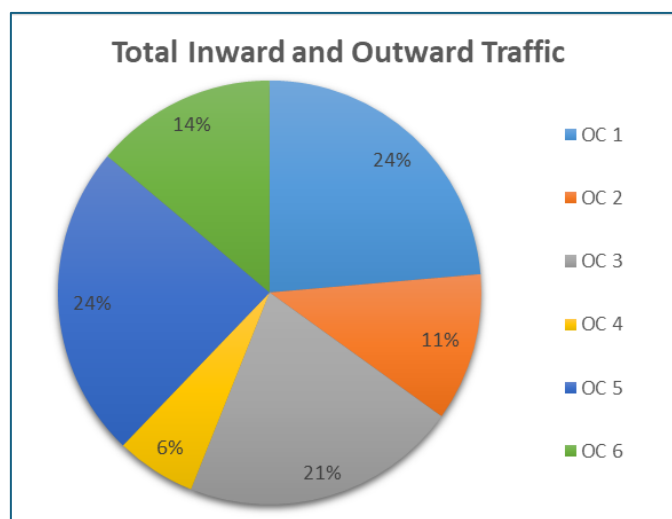


Figure 2-13: Total Inward and Outward Traffic of AASHA Notified Area

Table 2-12: Total Average Daily Traffic Vehicular Composition in AASHA Notified Area

Direction	OC 1	OC 2	OC 3	OC 4	OC 5	OC 6	Total
IN & OUT	1964	940	1757	509	1991	1154	8315

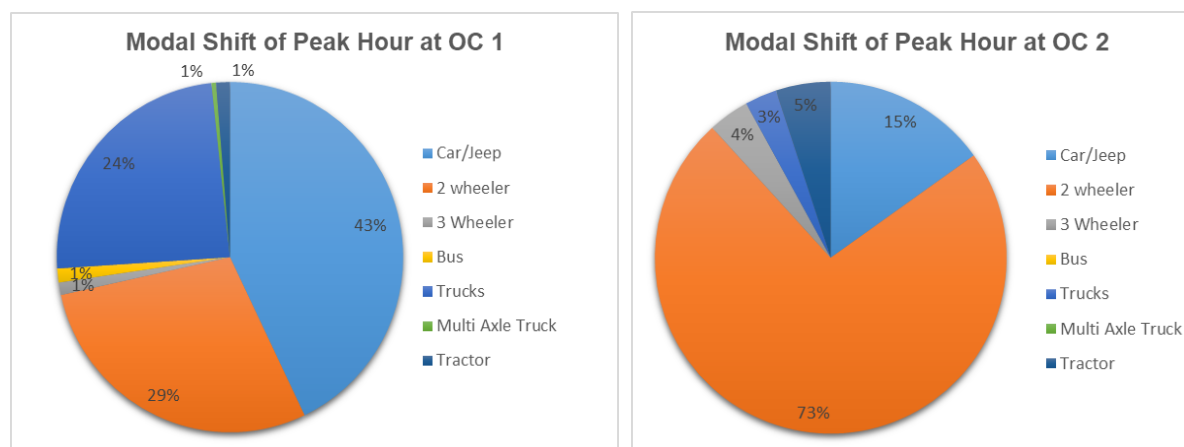
Source: Traffic Volume Survey, 2025

Table 2-13: Total Traffic Volume with its Peak Hours

Cordon Point	Location	Peak Hours	Total Traffic
OC 1	Jambhulwadi (Airport Road)	10:30am- 12:30pm	699
OC 2	Dangewadi (Manegaon-Malharwadi)	10:30am- 12:30pm	238
OC 3	Bangamner – Kakadi	10:30am- 12:30pm	546
OC 4	Manegaon-Malharwadi-Kakadi	10:30am- 12:30pm	123
OC 5	Kakadi to Korhale	4:30pm- 6:30pm	427
OC 6	Kelwad Khurd	12:30pm- 2:30pm	293

Source: Traffic Volume Survey, 2025

Above Table reveals that the total traffic volume of AASHA Notified Area during peak hours at six (6) cordon points. According to survey, maximum traffic is 699 vehicles during 10:30 am to 12:30 pm (peak hours) at cordon point OC 1 i.e. Jambhulwadi (Airport Road). Whereas during same peak hours, less traffic is recorded at cordon point OC 4 i.e. Manegaon-Malharwadi-Kakadi Road. However, following figures show the modal shift of peak hours at various cordon points i.e. OC 1 to OC 7.



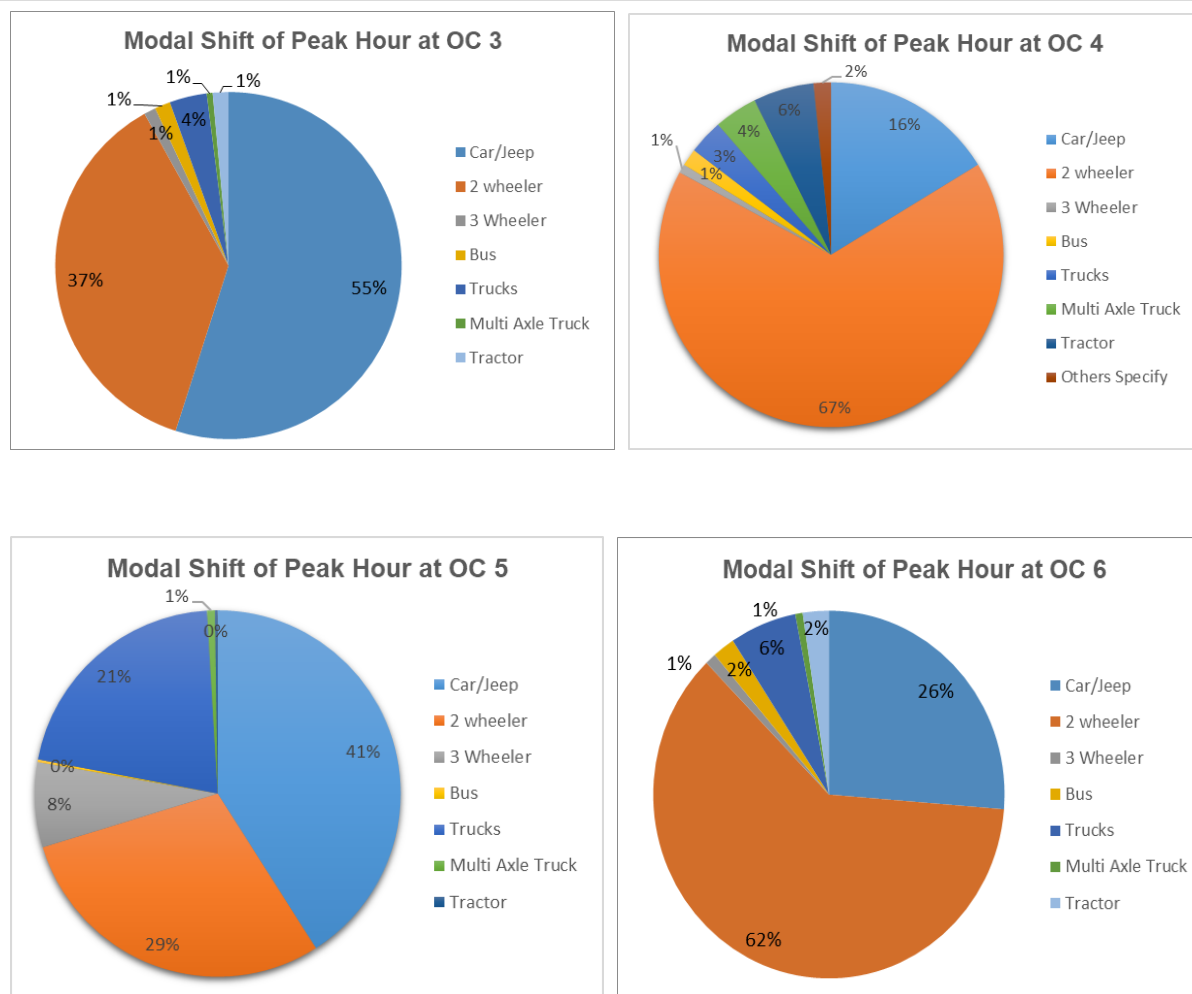


Figure 2-14: Modal Shift of peak hours at various cordon points i.e. OC 1 to OC 7 in AASHA Notified A

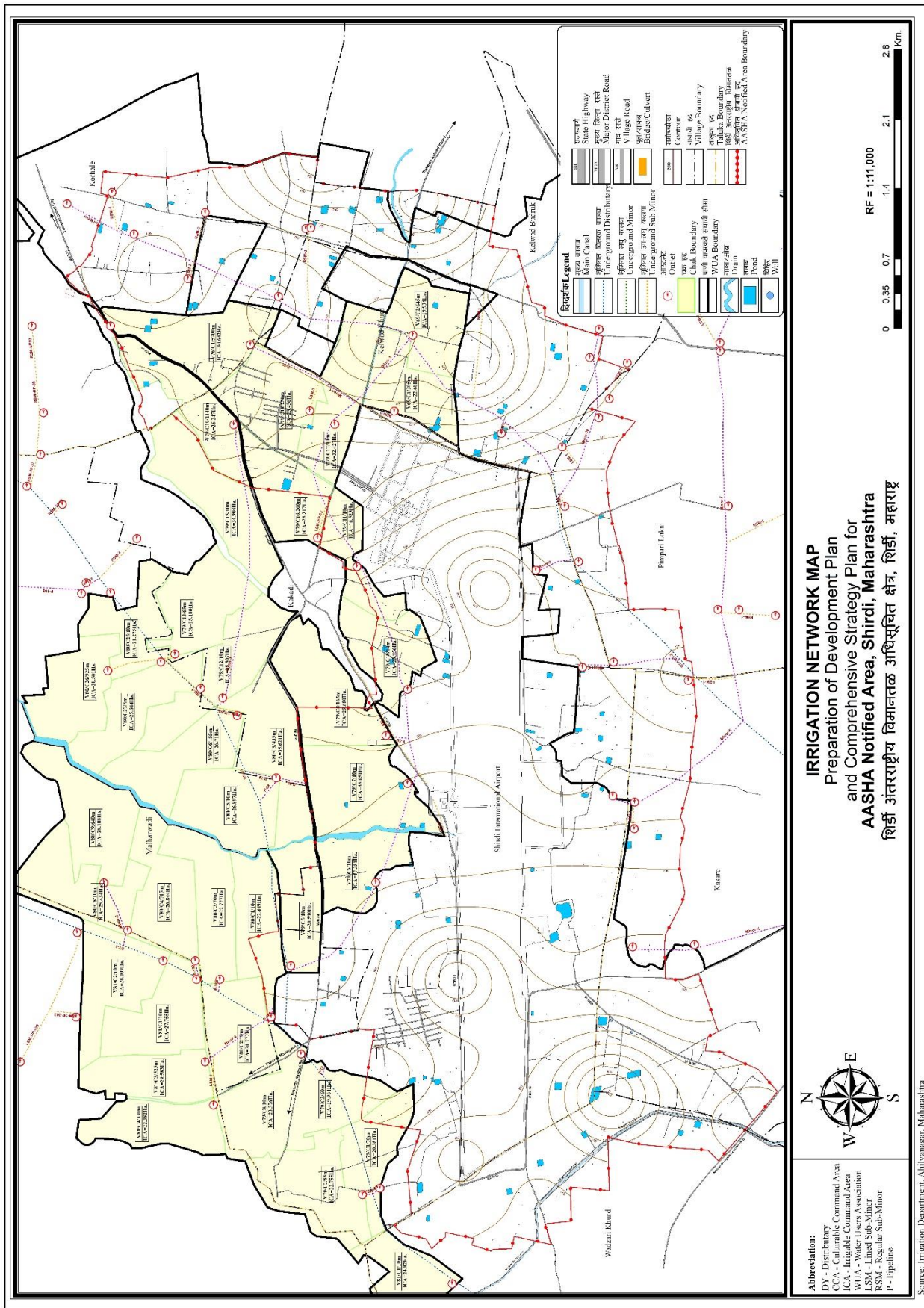
2.8. PUBLIC UTILITIES AND SERVICES

Water Supply

Although no major natural drainage channel is located within the area There is one canal on the western side flowing from south to north and it originates from Nilwade Dam built on the Pravara river. The other water bodies located in the area are small ponds/dug wells constructed by the farmers for irrigation purposes

The farmers also construct overground ponds by lining the surface of the ponds with plastic sheets to check the loss of water. Mostly these ponds are filled after drawing the water from the dug wells or from the local depressions.

The Irrigation Department has prepared a detailed scheme for providing water for irrigation purposes for villages falling in the AASHA Notified Area by sourcing water from Talegaon Branch canal. The Department has proposed an underground system of water distribution through two major distributaries and few minors.



Map: Proposed Irrigation Network by Irrigation Department

Rural Water Supply

The Gothan of the villages represented in the notified area gets piped water supply through bore wells operated by the Rural Water Supply Department. However, no Gothan is existing within the notified area, therefore, the water supply network is absent. The scattered residential buildings have their own sources like hand pumps, dug wells/ borewells etc.

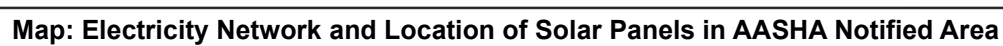
Power Supply and Electricity

The power supply in the AASHA Notified Area is provided through the Maharashtra State Electricity Distribution Company Limited (MSEDCL) network, with support from nearby 33/11 kV substations. The Shirdi International Airport is served through an Airport Express Line having a 33 kv sub-station within the boundary of the airport.

Most of the villages within the planning area are connected to regional substations located at Kopargaon, Rahata, Loni etc. Specifically, the villages of Korhale, Kasare, and Wadzari Khurd draw power from the Kopargaon substation, while Kelwad (Rahata) is serviced by the Rahata 33/11 kV substation. Pimpri Lokai receives electricity from the Loni substation, and Wadzari Budruk is connected to the Aswi substation. The village of Malharwadi, however, currently lacks a designated local substation connection, indicating a gap in direct power infrastructure access. This reliance on remote substations may affect voltage stability and load management, particularly during peak hours or agricultural irrigation cycles.

Solar Power Plant

Apart from above, as per information received from the MSEB, one renewable energy solar power project of 5MW is operational in gat number 328 of Kelwad Khurd village. The other project with a capacity of 1.78 MW is also proposed in gat number 129 of village Kakadi. Other than these the solar power projects are also proposed in the surrounding areas outside Notified Area like Dhondewali, Kelwad Khurd, Kelwad Budruk and Dehgav Korhale. The details are shown in the map.



3. EXISTING LAND USE

3.1. IMPORTANCE OF EXISTING LAND USE

Assessment of the existing land use pattern is essential for the preparation of the Development Plan, as it provides a clear understanding of how land within the AASHA Notified Area is currently utilized for residential, commercial, industrial, agricultural, institutional, and other purposes. The Existing Land Use (ELU) analysis helps identify development trends, economic activities, and their relationship with transportation networks, while also ensuring consideration of aviation safety, environmentally sensitive areas, and other planning constraints. A detailed ELU map serves as a basis for proposing future land uses, planning infrastructure and utility networks, minimizing land use conflicts, and promoting orderly and sustainable growth. It also facilitates informed decision-making regarding future expansion, land allocation, and regulatory compliance, ensuring that the Development Plan is aligned with existing ground conditions and stakeholder aspirations.

ELU is the prerequisite for taking up preparation of development plan. Considering its importance, it is specified as a mandatory step under section 25 of MR & TP Act, 1966. The exercise of surveys was undertaken to prepare Existing Land Use Map and report as explained below in the methodology. The exercise includes identification of existing uses, footprint of structures, transportation network and uses, public and semi-public activities, public facilities and utilities and other communication networks etc. ELU is prepared from primary and secondary surveys i.e. depiction of existing features from High Resolution Satellite Imagery, photographs and videos taken during site visits, village maps collected from Talukas, Land Records and other data collected from various other government departments. These features are also verified by site visits. The verified land use and physical features were incorporated into the base map, which was subsequently updated to prepare the Existing Land Use (ELU) Map for the AASHA Notified Area.

3.2. METHODOLOGY FOR PREPARATION OF EXISTING LAND USE MAP

Preparing an Existing Land Use (ELU) map or report is a systematic process involving surveys, mapping, classification, and analysis. It is the one step ahead after preparation of a final Base Map. A detailed methodology for preparation of Existing Land Use Map after final Base Map is shown in the figure below.

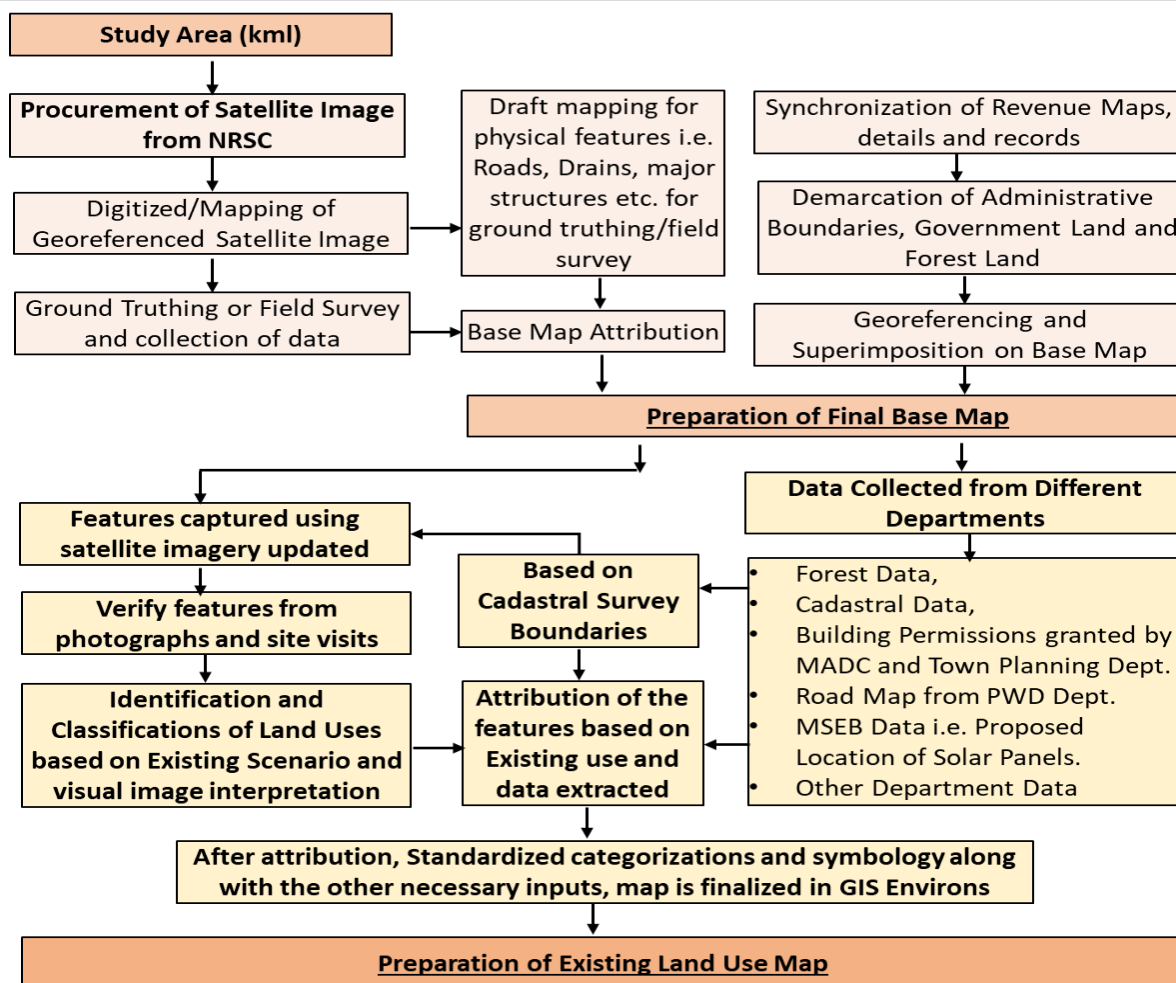


Figure 3-1: Methodology for Preparation of Existing Land Use (ELU)

1. Finalisation and demarcation of Study Area.
2. Procurement of Satellite Imagery from NRSC.
3. DGPS Survey
4. Data collection from various departments
5. Digitization of Geo-referenced Satellite Imagery
6. Synchronization of Revenue Maps, details and records.
7. Demarcation of Administrative Boundaries, Government Land and Forest Land
8. Georeferencing and superimposition on draft Base Map
9. Base Map Attribution based on ground truthing and data collection.
10. Preparation of Final Base Map after including of above all points.
11. After Base Map completion, those features captured from satellite imagery has been updated based on Cadastral survey boundaries and data collection from various line departments.
12. Verification of these Features and if there are any doubts or clarification, then it has to be crosschecked/verified based on the visual interpretation from satellite imagery during data collection, site visits, ground truthing and from the photographs and videos.
13. Then identification and classifications of land uses were finalised based on the existing scenario and standard categorizations such as Residential, Commercial, Industrial etc.
14. Based on which attribution of the features has been filled and completed after incorporation of all the existing uses and data collected from the field and line departments (overlay data from various sources for cross verification and incorporation).

15. After compilation of all data, for preparation of Existing Land use Map in GIS. Check for inconsistencies between satellite data and ground survey has been completed along with the classification accuracy using sample checks. Also, topological errors have been checked.
16. After above all, Preparation of Existing Land Use Map with legend (based on Standardized categorizations and symbology along with the other necessary inputs), scale and coordinates has been finalized in GIS Environs.
17. Then after preparation of Existing Land Use Map, an analysis has been done in which a land use table showing area and percentage of each category is prepared and explained in a report.

3.3. PREPARATION OF EXISTING LAND USE (ELU) FOR AASHA NOTIFIED AREA

3.3.1. Feature Mapping

The features visible on the satellite imagery were digitized by referring the mosaicked georeferenced satellite image during preparation of Base Map. While capturing features various other sources were also referred, e.g. open-source images etc. Field survey was conducted to verify the features and their attributes as shown in the figure below.

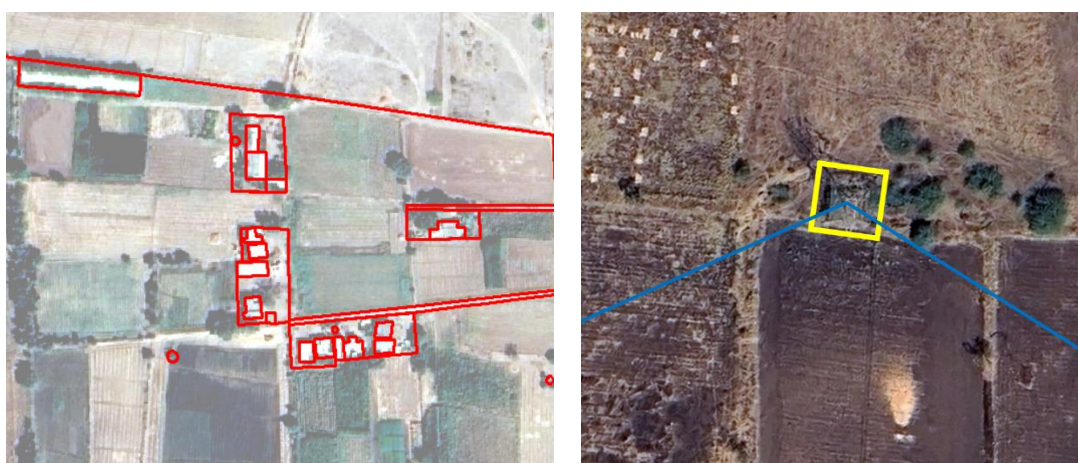


Figure 3-2 (a) Structures/Buildings and Premises (b) High Tension Tower and Line

3.3.2. Attribution

Using the field notes, photographs and coordinated stored photographs with coordinates, tabular information is generated, which is transferred to the map by attachment of attributes to the features in the map.

3.4. EXISTING LAND USE

The Existing Land Use (ELU) study is limited to AASHA Notified Area. The area is predominantly rural, with a very few scattered structures in the notified area. Most of these structures are being used for residential use. Poultry farms, farm house, eatery/restaurant, existing Shirdi International Airport, existing and proposed site for Solar Panels that belongs to MSEB Department are few major activities to mention. The Existing Land Use has been quantified category-wise. The existing land use of AASHA Notified Area is given in the table below.

Table 3-1: Existing Land Use in AASHA Notified Area

SL NO	LAND USE CATEGORY	AREA IN HECTARES	PERCENTAGE OF DEVELOPED AREA	PERCENTAGE OF TOTAL AREA
1	Residential	61.33	12.76%	3.10%
2	Commercial	21.99	4.57%	1.11%
3	Industrial	1.62	0.34%	0.08%

4	Social Infrastructure	0.31	0.06%	0.02%
5	Public Utilities	7.86	1.63%	0.40%
6	Airport	350.85	72.97%	17.75%
7	Transportation	36.84	7.67%	1.87%
	Total Developed Area (A)	480.80	100.00%	24.33%
8	Agriculture	1325.34		67.09%
9	Water Bodies	20.27		1.03%
10	Barren Land	81.15		4.11%
11	Forest	67.97		3.44%
	Total Undeveloped Area (B)	1494.73		75.67%
	Total Area (A+B)	1975.53		100.00%

Source: Primary Survey, 2025

3.4.1. Agricultural Land Use

Agricultural land use is predominant in the AASHA Notified Area as an area of 1325.34 hectares i.e. 67.09% of total notified area is being utilised under agriculture. The agricultural use includes area under cultivation, horticulture and plantation. In addition to this primary agriculture activity, cattle sheds, poultry farms, green house and farm sheds are also integral as supplementary economic activity.

3.4.2. Water Bodies

There is one canal passing in the southwest side of the notified area in village Wadzari Khurd. The area under water bodies as shown in cadastre maps as well as in the satellite image in the form of drains and nallas have been as such. In some cases, the water bodies have been indicated in cadastre maps although may not be as visible in the satellite image. This may be on account of diversion of these under other uses. These have been retained under water bodies. Several ponds are maintained for agriculture activity. The total area under waterbodies use is 20.27 hectares i.e. 1.03% of AASHA Notified Area. This includes canal, drains/nallas, ponds on farmland, well etc.

3.4.3. Barren Land

An area where no evidence of active cultivation was observed and after its collation with the revenue record obtained from Revenue Department is referred as barren land. The total area of barren land is 81.15 hectares which is 4.11% of the total notified area.

3.4.4. Forest Land

The land parcels recorded as forest in the official record of the Deputy Conservator, Forest Department, Ahilyanagar and located within the Notified area have been depicted in the ELU map. The total area of Forest Land is 67.97 hectares which is 3.44 % of the notified area.

3.4.5. Residential Land Use

There are scattered residential houses constructed in the Notified Area to oversee the agriculture. In Kakadi village boundary, there are few locations of residential layouts approved by MADC and Town Planning & Valuation Department. The total area under residential land use is 61.33 hectares i.e. 3.10% of the Notified Area.

3.4.6. Commercial Land Use

There is no major commercial activity that can be considered as commercial are identified in AASHA Notified Area. Only small eateries in Kasare and Kakadi village along MDR 10 are identified as restaurants/kiosk. Apart from the

existing commercial area, there are few approved commercial layout in Kakadi village boundary. The total area under commercial use is 21.99 hectares i.e. 1.11% of the Notified Area.

3.4.7. Industrial Land Use

The Notified Area has negligible industrial activity. The existing units under the category of Industry are warehouse and stone quarry/crusher having an area of 1.62 hectares i.e. 0.08% of total notified area. The warehouse is located in village Korhale and the stone crusher in village Wadzari Khurd near Airport boundary.

3.4.8. Social Infrastructure

Social Infrastructure is negligible in AASHA notified area. There are only schools and religious structures found within the Notified Area. The total area under these uses is 0.31 hectares i.e. 0.02% of the total notified area.

3.4.9. Public Utilities

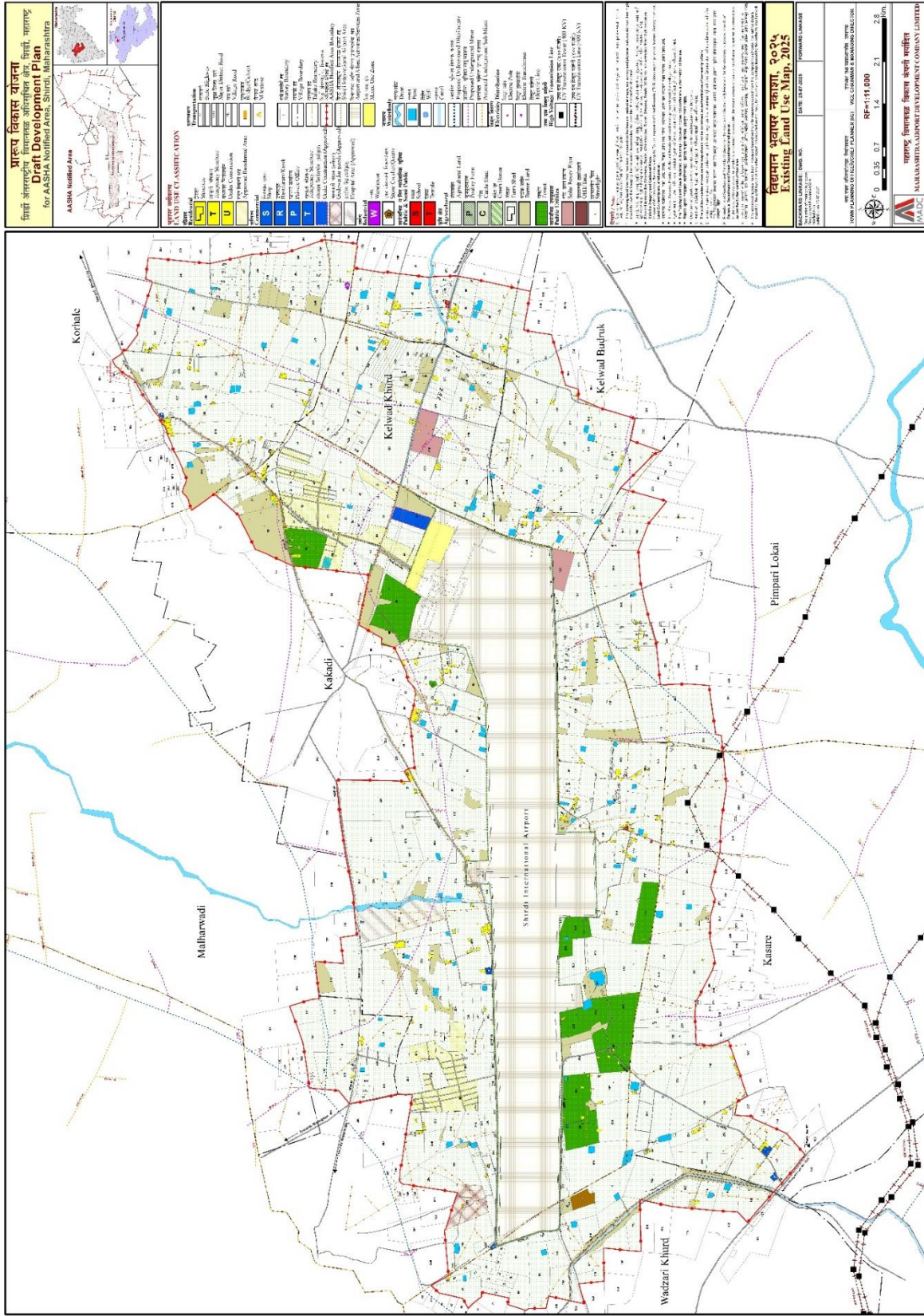
Only Over Head Tanks (OHT) and water tanks are identified within AASHA Notified Area under the category of Public Utilities and facilities. Apart from this, there are two sites for Solar panels. Total area under this category is 7.86 hectares i.e. 0.40% of total notified area.

3.4.10. Airport

Shirdi International Airport consists of Airport and Allied Activities/Services Zone (AZ) and Mixed-Use Zone (MUZ) having an area of 350.85 hectares. Planning proposal of this area has been earlier prepared and approved.

3.4.11. Transportation

Transportation network in notified area includes the area under road network, bridges, median/divider and airport area. Major roads include MDR that pass through Notified Area. Other village roads, private roads and airport access road are spread over entire Notified Area. Total area under these categories are 36.84 hectares i.e. 1.87% of total notified area.



Map: Existing Land Use Map 2025 For AASHA Notified Area

3.5. CHALLENGES IN AASHA NOTIFIED AREA

3.5.1. LACK OF WATER SUPPLY AND DEPENDENCE ON GROUNDWATER

The AASHA Notified Area lacks water availability. The region lies within a semi-arid climatic zone, receiving an average annual rainfall of only around 494 mm, which is considerably low. This limited rainfall, coupled with the lack of surface water infrastructure, has led to a heavy dependence on groundwater. There is network of underground irrigation system through pipes developed by irrigation department.

According to the Central Ground Water Board (CGWB) 2017 data, the Rahata block is classified as over-exploited, with a groundwater extraction rate of 112.5%, while other surrounding blocks are listed under the critical category.

As a result, many villages within the notified area rely entirely on dug wells and borewells, which are not sufficient for future developments. This situation leads to acute water scarcity, particularly during the dry summer months, posing a major challenge to both daily life and planned development.

3.5.2. LIMITED ACCESS TO HEALTHCARE FACILITIES

The AASHA area lacks any hospitals within its boundaries. Residents depend on healthcare facilities in Shirdi, Rahata, and Kopargaon, located 10–20 km away. Primary Health Sub-Centres (PHSCs) in villages like Kakadi and Korhale are functioning but poorly equipped. No secondary or tertiary care options exist within the notified area.

3.5.3. INADEQUATE EDUCATIONAL OPPORTUNITIES

Although Zilla Parishad primary schools exist in most villages, access to secondary and higher education is limited to larger villages like Korhale and Kelwad Bk. No colleges or technical institutes exist within the immediate area; students must travel to Shirdi, Kopargaon, or Rahata for higher education.

3.5.4. WEAK ECONOMIC DIVERSIFICATION

Major workforce is engaged in primary sector activities (farming, agri-labor). Very few people are involved in household industries and limited involvement in the service or industrial sector.

Tourism-related opportunities are limited to the areas closer to Shirdi town, with little spillover into the rural settlements despite proximity to the airport. Though the AASHA Notified Area lies in close proximity to Shirdi town—one of the most significant pilgrimage destinations in India—and directly adjoins the Shirdi Airport, the adjoining rural settlements have not reaped the economic or infrastructural benefits of this regional significance.

3.5.5. ABSENCE OF PUBLIC TRANSPORT AND ROAD CONNECTIVITY

Many villages are located 5–20 km away from the nearest highway or rail connection. Lack of regular public transport within the planning area affects mobility for education, employment, and healthcare.

3.5.6. LACK OF INFRASTRUCTURE AMENITIES

No solid waste management, sewerage, or drainage systems exist within the villages.

3.5.7. CONCLUSIONS

The AASHA Notified Area is a typical Central Maharashtra deccan plateau landscape devoid of any rural or urban settlement. The Development Plan formulation for this area proposes to develop a strategy and the land use plan emphasizing on:

- Being a rain deficit drought prone region, emphasis needs to be laid on optimum use of the overground/underground available water resources especially in view of the critical status of the ground water resources. The methodologies for water harvesting, water harnessing and creating appropriate water storage facilities need to be deployed.
- To create a retail marketing infrastructure for the rural economy in the form of specialized rural hats/theme-based bazaars around the airport.
- To promote Agri-logistic hub to cater to the needs of not only the surrounding area but for the broader region. In order to facilitate export-oriented trade of perishable Agri-products. Further to promote the cold storages/cold chains to reduce the post harvesting losses.
- Tourism being the mainstay of Shirdi; promotion of airport related hospitality/service apartment, to create plug and play infrastructure so as to develop AASHA as a Pilgrim-Commercial-Airport corridor. This will require the focus on budget hotels, budget health resorts promoting traditional medicine system like ayurveda/yoga, unani centric treatments.
- The commercial clusters in the form of plazas, dealing with the religious product markets, specialized zones for local handicrafts.
- Development of informal sector to create skill-based self-employment by deploying NULM infrastructure to provide capacity building programs to the self-help groups and farmer producer organizations especially in the fields like dairy, poultry and local transport.

4. VISION AND STRATEGY

The Development Plan for the Area Around Shirdi Hub Airport (AASHA) envisions creating a well-connected, sustainable and vibrant growth hub that complements Shirdi's cultural importance. The strategy focuses on balanced urbanization, tourism-led economic opportunities, modern infrastructure, and inclusive community development.

4.1. Factors Influencing Planning around Airport

The Shirdi Hub Airport is positioned to play a transformative role in regional development. Secondary airports located near major hubs often command high growth potential due to advantages such as availability of free airspace and reduced congestion. Examples include Juhu near Mumbai, Safdarjung near Delhi, and Vadodara near Ahmedabad. Similarly, Shirdi Airport benefits from strategic proximity to Mumbai and Pune, while offering operational advantages that encourage both passenger and cargo traffic.

Planning must therefore address critical factors: circulation and access infrastructure, airport-facing development potential and regulatory limitations tied to flight operations. Additionally, sustainable environmental management—covering noise impacts, ecological preservation and responsible energy usage—remains essential for long-term success.

4.2. Vision and Objectives

4.2.1. Vision

The vision for the AASHA notified area is to create a sustainable and well-integrated airport-centric growth hub, maximizing the unique opportunities presented by Shirdi's functional airport. The project aims to reinforce Shirdi's cultural and spiritual identity, while positioning the area as a regional economic engine.

4.2.2. Main Objectives

1. Building modern infrastructure and logistics frameworks around the airport.
2. Facilitating tourism-driven growth and allied economic activities.
3. Promoting mixed-use land development that balances commercial, residential and hospitality needs.
4. Integrating sustainable and environmentally conscious planning principles.

4.2.3. Salient Features

- 1) **Airport-Centric Development:** Dedicated economic clusters around the airport including logistics, hospitality, MRO (maintenance, repair & overhaul), and allied industries.
- 2) **Tourism & Pilgrimage Integration:** Seamless connectivity between Shirdi town, temple precinct, and the notified area with facilities for pilgrims, hotels, and cultural centres.
- 3) **Compact Urban Form:** Efficient land use with mixed-use neighborhoods, central commercial districts, and supporting social infrastructure.
- 4) **Affordable Housing:** Special emphasis on housing for local population, service sector workers, and industrial employees.

- 5) **Mobility & Connectivity:** Integrated mobility plan with bus services, cycle tracks, pedestrian pathways, and regulated IPT (Intermediate Public Transport).
- 6) **Green & Sustainable Development:** Green buffers along canals and natural drainage, preservation of open spaces, and sustainable water and waste management systems.
- 7) **High Containment Ratio:** Balanced land use to ensure employment opportunities within the notified area, reducing travel demand outside the city.
- 8) **Flexible Land Use Policy:** To adapt to changing market and aviation-driven demands.
- 9) **Cultural & Social Identity:** Development of public plazas, community spaces, and cultural centres that reflect Shirdi's religious significance and global recognition.
- 10) **Smart Infrastructure:** Provision of Information and Communication Technology (ICT) based urban services, renewable energy integration, and efficient public utilities.
- 11) **Integration with Villages:** Gradual upgradation and inclusion of existing villages within the planning framework to ensure inclusive development.

4.3. Development Strategy

The strategy underlines airport-centric development as the guiding principle, as the entire notified area's growth trajectory will be shaped by presence of operational Shirdi Airport.

4.4. STRATEGY

"The strategy for the AASHA Notified Area focuses on creating a self-sustaining development model, where airport-driven growth, efficient connectivity, and sustainable planning combine to enhance urban quality of life. The key strategic pillars are:"

1. Optimal Utilization of Economic Potential of Land
2. Access, Connectivity, and Circulation
3. Development Constraints Imposed by the Airport
4. Green and Sustainable Development



Figure 4-1: Strategies for AASHA Notified Area

4.5. Concept/Theme

4.5.1. Airport-Centric Development Approach

The concept for AASHA is firmly airport-centric, recognizing that the airport acts as the nucleus around which urban, economic and infrastructure growth will be structured. The plan emphasizes maximizing the functional value of the airport through surrounding land-use planning tailored to logistics, tourism, and hospitality.

1. Key Components:
 - a) Efficient access roads and integration with highways.
 - b) Strategic land parcel identification and zoning for commercial, residential and institutional uses.
2. Concept Proposals:
 - a) Dedicated airport access road and smooth circulation.
 - b) Zoning high-potential economic land parcels.
 - c) Balanced land use aligned with airport regulations.
 - d) Road network ensuring seamless regional connectivity.

4.5.2. Spiritual-Centric Development Approach

The AASHA concept envisions the area as a Spiritual Gateway, highlighting Sai Baba's legacy and Shirdi's cultural heritage. It focuses on blending cultural tourism with heritage-sensitive growth to enhance the pilgrim experience.

1. Key Components:
 - a) Spiritual landscapes, meditation spaces, and wellness centers.
 - b) Pilgrim-friendly infrastructure with easy access and amenities.
2. Concept Proposals:
 - a) Design green corridors and thematic spaces reflecting Sai Baba's teachings.
 - b) Develop hospitality and cultural centers supporting local traditions.
 - c) Prioritize eco-friendly, inclusive development involving local communities.
 - d) Enhance connectivity and facilities tailored for pilgrims.

4.6. Conclusion

The AASHA Development Plan positions Shirdi Airport not only as a transportation hub but also as a catalyst for regional economic prosperity. By emphasizing airport-centric development / Spiritual-Centric Development Approach, optimizing economic potential, and adopting sustainable principles, the notified area is poised to emerge as a well-structured and vibrant growth hub.

5. DEMOGRAPHIC PROJECTIONS

The demographic landscape of Shirdi is defined by its role as a global pilgrimage hub. As per census of India 2011, the town's permanent population was 36,004, with a religious composition primarily consisting of Hindus (82.78%) and Muslims (12.23%). The town's growth is inextricably linked to the Sai Baba Temple, which attracts a massive floating population. On a regular day, the town sees 50,000 visitors, a number which surges to 2,00,000 during peak festivals (as per data received from Shri Saibaba Sansthan Trust).

At present AASHA Notified Area has a minimal population as there is no urban or rural settlement within the planning area boundary.

The population projection for the AASHA Notified Area is carried out based on the assumption that future growth will be driven by airport-centric development, including increased passenger traffic, employment generation, and associated commercial and service activities in the surrounding area, rather than being limited to conventional trend-based methods.

5.1. POPULATION PROJECTION BASED ON CONVENTIONAL METHODS

Conventional methods of population projection use past decadal population data and time-series analysis. In these methods, population is considered the dependent variable, while time serves as the independent variable.

The projections can follow either a linear (arithmetic) or non-linear (geometric/exponential) trend, depending on the observed growth pattern. The linear method assumes a constant numerical increase over time, whereas the geometric method assumes a constant growth rate, reflecting proportional increases in population.

The AASHA Notified Area comprises parts of 8 villages. However, Gaothans are situated outside the SPA boundary. The combined population of these villages is 17,083 (as per census 2011). This area has maintained a consistent growth rate of approximately 21% over two consecutive decades (1991–2011). Development is not uniform; villages like Pimpri Lokai (47%) and Kakadi (44%) have seen accelerated growth, likely due to their proximity to the Shirdi Airport and major road networks.

Table 5-1 Demographic Characteristics - Decadal Population of Villages

Sr. No.	Taluka	Village	Population 1991	Population 2001	% Decadal Growth (1991–2001)	Population 2011	% Decadal Growth (2001–2011)
1	Sangamner	Wadzari Kh.	927	1,186	28%	1,148	-3%
2	Sangamner	Kasare	1,111	1,417	28%	1,761	24%
3	Kopargaon	Kakadi	1,403	1,481	6%	2,128	44%
4	Kopargaon	Malharwadi	749	949	27%	1,230	30%
5	Rahata	Kelwad Bk.	3,212	3,760	17%	4,394	17%
6	Rahata	Kelwad Kh.	198	257	30%	327	27%
7	Rahata	Pimpri Lokai	756	885	17%	1,297	47%
8	Rahata	Korhale	3,298	4,167	26%	4,798	15%
	Total		11,654	14,102	21.01%	17,083	21.13%

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India for 1991, 2001 & 2011

Household Data

Village	Total Population	Household Number	Average Household Size
Wadzari Kh.	1,148	214	5.36
Kasare	1,761	339	5.19
Kakadi	2,128	414	5.14
Malharwadi	1,230	218	5.64
Kelwad Bk.	4,394	854	5.14
Kelwad Kh.	327	69	4.73
Pimpari Lokai	1,297	245	5.29
Korhale	4,798	970	4.96
Total	17,083	3,323	5.14

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts Tables, Census of India for 1991, 2001 & 2011.

Literacy Rate

Sr. No.	Village	*Total Population	Total Literates	% to total population	Male Population	Male Literates	% Total male population	Female population	Female Literates	% to Total female population
1	Wadzari Kh.	1,006	778	77.34	512	453	88.48	494	325	65.79
2	Kasare	1,538	1,028	66.84	801	601	75.03	737	427	57.94
3	Kakadi	1,837	1,356	73.82	949	793	83.56	888	563	63.40
4	Malharwadi	1,059	784	74.03	547	462	84.46	512	322	62.89
5	Kelwad Bk.	3,794	2,883	75.99	1,980	1,653	83.48	1,814	1,230	67.81
6	Kelwad Kh.	289	235	81.31	144	127	88.19	145	108	74.48
7	Pimpari Lokai	1,083	766	70.73	555	443	79.82	528	323	61.17
8	Korhale	4,193	3,304	78.80	2,152	1,865	86.66	2,041	1,439	70.50
	Total	14,799	11,134	75.23	7,640	6,397	83.73	7,159	4,737	66.17

*The total population represents school going population (excluding 0-6 years age group)

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

Economic Profile: Agriculture and Sectoral Shifts

Villages	Total Main Workers	Cultivators		Agricultural Labour		Household Industry		Other Workers	
		No.	%age	No.	%age	No.	%age	No.	%age
Wadzari Kh.	648	519	80.09	61	9.41	8	1.23	60	9.26
Kasare	1,000	781	78.10	59	5.90	9	0.90	151	15.10
Kakadi	1,060	505	47.64	455	42.92	10	0.94	90	8.49
Malharwadi	676	475	70.27	107	15.83	8	1.18	86	12.72
Kelwad Bk.	2,062	1,304	63.24	369	17.90	9	0.44	380	18.43
Kelwad Kh.	137	55	40.15	5	3.65	9	6.57	68	49.64
Pimpari Lokai	695	447	64.32	225	32.37	0	0.00	23	3.31
Korhale	2,012	1,167	58.00	420	20.87	23	1.14	402	19.98
Total	8290	5253	63.37	1701	20.52	76	0.92	1260	15.20

Source: District Census Handbook- Ahmednagar District 2011 and Primary Census Abstracts tables, Census of India 2011

Considering the similar rural characteristics of all eight villages within the Notified Area and their relatively small population size, it is appropriate to treat the AASHA Notified Area as a single unit for population projection purposes, rather than projecting for each village individually. Therefore, the population of these villages has been aggregated for the projection exercise.

The population projection has been made by 3 methods, i.e. Arithmetic, Geometric and Exponential Method. Summary of all the projections is given in Table 5-2.

Table 5-2: Summary of Population projection using various methods

Year	Arithmetic Method	Geometric Method	Exponential Method
2021	19,798	20,683	20,683
2031	22,512	25,041	25,041
2041	25,227	30,318	30,318
2045	26,312	32,728	32,728
Average Population for year 2045			30,589

Based on the census data, the average decadal increase has been calculated as 2,715 persons. The Compound Annual Growth Rate (CAGR) has been determined as 1.93% and continuous growth constant, calculated as $k = 0.01912$ for exponential method.

This approach has been adopted for understanding the surrounding growth dynamics and infrastructure requirements of the entire settlement area. It is assumed that surrounding village population will spill over into the AASHA Notified area.

5.1.1. Inference and Other Options

The population growth of the eight villages in the AASHA Notified Area, based on conventional projection methods, does not show any significant increase. This is because traditional methods do not account for the anticipated change in economic activity due to the airport and development of AASHA Notified area. With the development of the airport, the economic profile of the region is expected to shift from primarily primary sector activities (current economic activity) to secondary and tertiary sector activities (future economic activity). This transformation is likely to accelerate population growth significantly, making traditional projection methods insufficient.

It is important to consider that very few settlements fall within the Notified Area, and therefore, the population increase will primarily result from employment generation in the airport, airport-allied activities/services zones, and commercial areas. Employment, being a direct function of economic activity, can be assessed based on projected passenger growth at the airport. Using this employment estimate, the corresponding population is derived from the help of average household size.

The methodology and estimates for this augmented projection are discussed in the following sections.

5.2. POPULATION PROJECTION BASED ON EMPLOYMENT GENERATED AT THE AIRPORT

Employment at airports has a strong correlation with passenger and freight traffic and is typically classified into direct, indirect, and induced employment. Direct employment refers to jobs generated by activities taking place at the airport itself, such as operations, maintenance, and airport services. Indirect employment includes jobs created in the surrounding region due to economic activities linked to the airport, including logistics, hospitality, retail, and allied services. Induced employment arises from spending by those engaged in direct and indirect employment, generating further economic activity in the region.

For calculating employment at airport, direct employment at the airport has been considered. The following analysis is based on traffic forecast.

5.2.1. Employment Generation

The projections for passenger growth presented in the report are given in Table 5-3. As population growth in this context is driven by employment generation due to heavy passenger footfall at the airport. Employment is estimated based on projected passenger traffic.

Table 5-3: Traffic Passenger projection for Shirdi International Airport.

Year	Total Passengers	Total Passenger s/Day	Domestic Passengers/Day	International Passengers/Day	PHP (Domestic)	PHP (International)	PHP (Total)
2022-2023	5,86,272	1,606.22	1,284.98	321.24	449.74	112.44	562.18
2023-2024	6,57,589	1,801.61	1,441.29	360.32	504.45	126.11	630.57
2024-2025	7,37,582	2,020.77	1,616.62	404.15	565.82	141.45	707.27
2025-2026	8,27,306	2,266.59	1,813.27	453.32	634.65	158.66	793.31
2026-2027	9,27,944	2,542.31	2,033.85	508.46	711.85	177.96	889.81
2027-2028	10,40,825	2,851.57	2,281.26	570.31	798.44	199.61	998.05
2028-2029	11,67,436	3,198.46	2,558.76	639.69	895.57	223.89	1,119.46
2029-2030	13,09,450	3,587.53	2,870.03	717.51	1,004.51	251.13	1,255.64
2030-2031	14,68,739	4,023.94	3,219.15	804.79	1,126.70	281.68	1,408.38
2031-2032	16,47,405	4,513.44	3,610.75	902.69	1,263.76	315.94	1,579.70
2032-2033	18,47,804	5,062.48	4,049.98	1,012.50	1,417.49	354.37	1,771.87
2033-2034	20,72,581	5,678.30	4,542.64	1,135.66	1,589.93	397.48	1,987.41
2034-2035	23,24,701	6,369.04	5,095.24	1,273.81	1,783.33	445.83	2,229.17
2035-2036	26,07,491	7,143.81	5,715.05	1,428.76	2,000.27	500.07	2,500.33
2036-2037	29,24,681	8,012.82	6,410.26	1,602.56	2,243.59	560.90	2,804.49
2037-2038	32,80,456	8,987.55	7,190.04	1,797.51	2,516.51	629.13	3,145.64
2038-2039	36,79,509	10,080.85	8,064.68	2,016.17	2,822.64	705.66	3,528.30
2039-2040	41,27,105	11,307.14	9,045.71	2,261.43	3,166.00	791.50	3,957.50
2040-2041	46,29,149	12,682.60	10,146.08	2,536.52	3,551.13	887.78	4,438.91
2041-2042	51,92,265	14,225.38	11,380.31	2,845.08	3,983.11	995.78	4,978.88

Source: Study report of passenger traffic, Shirdi airport

Growth trend of annual passenger traffic studied up to 2042, which is around 12.16%. Same growth rate is applied for projection for 2045, accordingly, projected total passenger for the years 2042–2043, 2043–2044, and 2044–2045 are 58,23,644, 65,31,800, and 73,26,066, respectively.

Employment Generation Assumption -

- As per study by ACI Europe, 2015: 1,000 jobs per 1 million passengers
- For 73,26,066 passengers (2045) = ~7,330 jobs
- Population linked to Employees in airport
 $7,330 \times 4 = 29,320$ persons (by 2045) (4 = Average Household size).

5.3. POPULATION PROJECTION BASED ON EMPLOYMENT GENERATED IN AIRPORT ALLIED ACTIVITIES ZONE

Airport-allied activities include support infrastructure such as cargo, logistics, MRO (Maintenance, Repair and Overhaul), parking, hospitality, commercial, and transport-related facilities associated with airport operations. These activities are essential for smooth functioning of airport and are expected to develop in the vicinity of the airport. Population projection based on airport allied activities is a significant method, as it incorporates employment estimation

within the Airport Allied Activities / Services Zone. Employment generated in other zones such as commercial and mixed-use zones is assumed to be catered to by the population of nearby villages as well as the future projected population of the AASHA Notified Area.

For estimation purposes, the area required for the Airport Allied Activities / Services Zone is considered, based on planning experience and expected development trends, to be approximately equivalent to the operational airport area.

Airports are infrastructure projects with long gestation periods, which implies that the pace of development is generally slow. For the purpose of population and employment estimation, since Shirdi International Airport is operational, it is assumed that the AASHA Notified Area will achieve a development level in the range of 60% to 70% by the horizon year 2045. Accordingly, for estimation purposes, a development level of 70% has been assumed for the horizon year 2045.

5.3.1. Airport Allied Activities/ Services Zone

The area under airport allied activity is about 364.97 Ha.

- It is assumed that 20% area will be utilized for physical infrastructure and social facilities (roads, utilities, public amenities). Developable Land:

$$364.97 \times 80\% = 291.97 \text{ ha}$$
- By the horizon year 2045, only 70% of the total land is expected to be developed.

$$291.97 \times 70\% = 204.38 \text{ ha}$$
- Being prime land, it is assumed that:
 - 75% of the developable area will be used for non-residential purposes (commercial + industrial).

$$204.38 \times 75\% = 153.29 \text{ ha}$$
- Distribution of economic activities area:
 - 75% Industrial activity = 114.96 ha
 - 25% Commercial activity = 38.32 ha
- Employment generation (assuming FSI 1.1, 30 m² per worker for industry, 15 m² per worker for commercial):
 - Industrial: $114.96 \times 1.1 \times 10,000/30 = 42154$ employment
 - Commercial: $38.32 \times 1.1 \times 10,000/15 = 28102$ employment
- Thus, total employment in the Airport Allied Activities/ Services Zone = 70256 Employment.

It is assumed that only 50% of the projected employment, i.e., 35,128 jobs, is catered within the AASHA Notified Area and the remaining 50% employment is absorbed by the population residing in the surrounding catchment area.

Assuming family size of 4, the total projected population due to Airport Allied Activities will be 140512.

5.3.2. Conclusion

The total projected population for the Horizon Year 2045 shall comprise the following:

1. Population Projection Based on Conventional Methods (8 villages) - 30,589
2. Population Projection Based on employment generated at the airport – 29,320
3. Population Projection Based on employment generated in Airport Allied Activities – 1,40,512

Total = 30,589 + 29,320 + 1,40,512 = 2,00,421 persons

Thus, the total projected population for the horizon year 2045 is estimated at 2,00,421 persons, say 2,00,000 persons.

The demographic projection for the AASHA Notified Area adopts a composite approach, where total population is derived as the sum of natural growth of the 8 villages, population from airport-generated employment, and population from airport allied zone activities.

With 80.89% of the workforce currently engaged in primary activities, the region has a predominantly agrarian base. However, the operational Shirdi Airport is expected to drive a structural shift in the economic profile. This trend is already visible in nearby villages such as Kakadi (44%) and Pimpari Lokai (47%), which have experienced higher growth rates.

By incorporating employment generation and allied economic activities into the estimation framework, the methodology reflects the transition toward trade, transport, and service sectors, ensuring that the population projection reflects the anticipated economic transformation of the area.

The zoning pattern is proposed to accommodate projected population of approx. 2,00,000 persons with adequate provision of social and physical infrastructure, public utilities, and other supporting amenities in accordance with planning standards.

6. SOCIAL INFRASTRUCTURE

Social infrastructure plays a critical role in shaping the quality of life and well-being of residents in urban areas. Adequate provision of educational institutions, healthcare facilities, community centers, and recreational spaces is essential for sustainable and inclusive urban growth. One of the primary objectives of the Development Plan for the AASHA Notified Area is to designate land for such public purposes, ensuring that essential social services are available to meet the needs of the future and existing population of surrounding villages.

6.1. PLANNING NORMS AND REQUIREMENTS

The planning norms for social infrastructure are guided by the Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, 2015, issued by the Ministry of Urban Development, Government of India. These guidelines specify the standard requirements for various social amenities based on population, which in the case of the AASHA Notified Area is projected to be 2,00,000 by the year 2045.

The AASHA Notified Area has very few settlements, with very limited existing social infrastructure. At the village level, basic amenities such as Zila Parishad Primary Schools are present in some of the surrounding villages. There is a noticeable absence of secondary or tertiary healthcare facilities within the immediate boundaries of the Notified Area. Residents of villages such as Kakadi, Malharwadi, Kelwad, and Wadzari Kh. currently need to travel significant distances to access specialized or emergency medical services. Even primary health sub-centers are located outside the Notified Area, highlighting a critical gap in healthcare provision within the proposed development boundary. Consequently, the planning requirements are calculated assuming zero pre-existing infrastructure.

Due to spatial constraints, it is not possible to provide all social amenities in full accordance with planning norms. Therefore, the Development Plan prioritizes essential facilities for immediate needs, while assuming that higher-order services such as advanced healthcare, higher education, and specialized recreational facilities will be accessed in nearby areas. Additionally, certain amenities are expected to be facilitated through private sector initiatives.

Gardens, community parks, and multi-purpose playgrounds have been proposed in accordance with the URDPFI Guidelines. In addition, green buffers and school playgrounds shall form part of the overall open space system within the notified area.

Further, the Airport and Allied Activities / Service Zone is proposed as a low-density zone with minimal built-up development and occupancy, thereby making a significant contribution towards the overall open space provision of the notified area. As per the ICAO Airport Planning Manual – Land Use and Environmental Control, land use in the vicinity of airports should be planned to discourage bird-attracting activities, including recreational uses. Moreover, to minimize potential risks associated with aircraft accidents, developments and activities involving large congregations of people should be avoided within the airport influence zone.

Table 6-1: Social Infrastructure facilities in AASHA Notified Area

S. No.		Facilities	Proposed area in Ha	Remarks
1	Recreational Open space	Garden – 01	2.15	Total area of open spaces is 29.71 Ha, if the green Buffer of 4.08 Ha is added, it becomes 33.79 Ha.
2		Garden – 02	2.25	
3		Garden – 03	2.15	
4		Garden – 04	2.16	
5		Garden – 05	2.12	
6		Garden – 06	2.17	
7		Garden – 07	2.18	
8		Community Park - 01	5.14	
9		Community Park - 02	5.15	
10		Community level Multipurpose ground - 01	2.11	
11		Community level Multipurpose ground - 02	2.13	
		SUB-TOTAL	29.71	
12	Social Infrastructure	Integrated School without Hostel Facility (I to XII)	3.50	
13		Integrated School with Hostel Facility (I to XII)	3.93	
14		Polyclinic - 01	0.20	
15		Polyclinic - 02	0.20	
16		Intermediate Hospital (Category B)	1.00	
17		Meditation and Spiritual Centre	0.50	
18		Police Station - 01	1.50	
19		Police Station - 02	1.50	
20		Fire Station	1.00	
21		Community Centre with Service Centre	5.00	
22		Bank with locker, ATM and other banking facilities	0.25	
		SUB-TOTAL	18.58	
		TOTAL	48.29	

7. HOUSING, RESETTLEMENT AND REHABILITATION

7.1. INTRODUCTION

Housing is one of the most fundamental human needs and plays a critical role in shaping urban life. In the AASHA Notified Area, rapid development driven by the upcoming airport and allied commercial and industrial activities is expected to significantly increase the demand for housing.

The area currently consists predominantly of undeveloped Greenfield land with scattered rural settlements. As development progresses, it is essential to provide well-planned residential neighborhoods, supported by adequate access roads, social infrastructure, and public utilities, to ensure a high quality of life.

The pace and pattern of housing construction in AASHA will be influenced by factors such as availability of serviced land, affordability, accessibility of building materials, and the economic profile of prospective residents.

7.2. EXISTING CONDITIONS

The AASHA Notified Area is largely rural, with small village settlements and minimal existing housing infrastructure. Most current structures are small, scattered, and primarily used for residential or agricultural purposes.

7.3. HOUSEHOLD SIZE AND POPULATION ASSUMPTIONS

Based on regional demographic trends and the expected urbanization patterns around the airport, the average household size is assumed to be 4 persons. This accounts for the anticipated shift toward nuclear family households as the area urbanizes, reflecting broader trends in emerging urban centers of Maharashtra.

7.4. HOUSING REQUIREMENT

The total population expected in the AASHA Notified Area by the end of the planning period is approximately 2.0 lakh people. Using the household size assumption, the total housing units required can be estimated as:

$$\text{Number of Housing Units} = 200000/4 = 50000 \text{ units}$$

Housing Demand

Sr. No.	Housing Category		Percentage	No. of Units
f1	Affordable Housing	EWS	10%	12,500
		LIG	15%	
2	MIG		45%	22,500
3	HIG		30%	15,000

These units will accommodate residents across dedicated residential zones, mixed-use developments, and areas supporting airport-related activities.

7.5. HOUSING PROVISION STRATEGY

The housing demand will be met through a balanced mix of public and private sector initiatives:

- **Private Sector:** The majority of housing units, including apartments, row houses, and mixed-use residential developments, are expected to be delivered by private developers.

- **Government Initiatives:** Housing for economically weaker sections (EWS) and low-income groups (LIG) will be provided through targeted programs, such as Pradhan Mantri Awas Yojana (PMAY) or state-level housing schemes.

7.6. RESETTLEMENT AND REHABILITATION

The Resettlement and Rehabilitation of eligible Project Affected Persons (PAPs) shall be carried out as per relevant Act and Government Policy.

8. PHYSICAL INFRASTRUCTURE

8.1. INTRODUCTION

A broad framework to guide detailed proposals for the Development Plan. It integrates infrastructure planning in a manner that promotes airport-centric growth while maintaining sustainable urban development is envisaged with the provision of strategic objectives infrastructure for wet utilities and Solid waste management.

This chapter describes the design basis and philosophy for the development of project components and relevant applicable standards and codes for the design. Following are the components of physical infrastructure envisaged for the AASHA Notified Area.

1. Water Supply System
2. Sewerage System
3. Sewage Treatment plant
4. Recycled water supply to green area
5. Storm water drainage system
6. Rainwater harvesting
7. Solid waste management
8. Power Supply System

8.2. WATER SUPPLY

There is currently no piped water supply in and around the project area. Currently water tankers and ground water are the only sources of potable water for the AASHA. Reconnaissance survey has been conducted at site which indicate that the ground water at site is at a shallow depth. For future requirements, it is understood that water will be sourced from River Godavari Canal located around 10 km away from the project site.

8.2.1 Applicable codes and Standards

Standards and Specifications which are used for the Design and laying potable water supply network for amenity areas as well as industrial areas for AASHA are given in this section. The design criteria for the design of water supply scheme for the development of external infrastructure for proposed AASHA is framed as per the guidelines prescribed by the CPHEEO, Ministry of Urban Development, Government of India and the relevant I.S. codes.

8.2.2 Water Demand

The water network system is designed to fulfil the water demand for domestic and industrial areas. Plot wise demand shall be based on estimated population for the plot and its use. Demand calculations are based as per the CPHEEO manual/ National Building Code norms/ as per Development Plan.

a) Domestic water demand

The CPHEEO (Central Public Health and Environmental Engineering Organisation) Manual provides for a minimum water supply of 135 lpcd for residential areas.

b) Commercial and Industrial water demand

Water demand for commercial area has been computed based on the population. Total water demand for commercial and Industrial areas has been considered as 45 lpcd.

c) Fire demand

As per the CPHEEO recommendations, a provision of water based on the formula of $100\sqrt{P}$ Kiloliters per day (where p=population in thousands) is required to be made in large systems. For smaller areas, provision of storage of 3.0 MLD litres of water in the fire tanks is to be made, as per norms. Fire station has been planned as part of the utilities.

d) Unaccounted for Water (UFW)

As per CPHEEO manual, a maximum provision of 10% towards losses / unaccounted for water is allowable in the system. But with usage of better construction materials and improved O&M, it is envisaged that the water losses will be less. Hence, for the present development 10% losses have been considered.

e) Horticulture

The water demand for irrigation of green areas is estimated at 25,000 litres/Ha/day of the area under soft landscape.

f) Water demand

Based on above norms, potable water requirement is estimated to be 54.6 MLD. It is estimated that about 39.5 MLD shall be made available through recycling and can be utilized for fire-fighting, flushing and horticulture water demand.

8.2.3 Distribution Aspect

a) Peak Factor for Distribution System

Though the water supply system will receive flow throughout the day, there will be some duration in which maximum demand will be generated. Following Peak factors for domestic flow have been adopted for sizing the network, as per guidelines given in the CPHEEO Manual:

Contributing Population	Peak Factor
Up to 50,000	3.00
From 50,000 to 2,00,000	2.50
Above 2,00,000	2.00

Since the population of an individual clusters fed from the underground tank is in between 50,000 -200,000, The peak factor of 2.5 shall be adopted based on the contributory population load.

b) Minimum Pipe Size

The minimum pipe size for distribution network is 100mm as per CPHEEO manual for population less than 50,000. Hence, it is recommended considering minimum diameter of 100 mm in the distribution network and house tapping of min 25 mm (PVC or GI).

8.2.4 Sourcing of Water

It is proposed to source the required raw water from nearby river / canals (duly filtered and treated) and pumped directly to the WTP. The raw water quality from the river shall be tested by an independent testing laboratory to design the water treatment plant ensuring that domestic water supply shall meet minimum WHO standard for drinking purpose. In addition to this, required number of borewell shall also be considered as spare for emergency purpose.

8.2.5 Design of the Network

A complete, effective and economical water supply system for transmission of underground water to individual Plot has been proposed. There would be five basic components of the water supply system, like Water sourcing from Canal/ borewells, Raw Water Network, Water treatment Plant, Distribution Centres & Distribution Network.

a) Water treatment plant

The river/canal water shall be pumped after passing through the sedimentation tank to the central underground reservoir/Tank. Based on the actual water quality report the necessary water treatment system shall be designed to ensure compliance with IS10500:2012.

b) Bore Wells (Spare for emergency purpose only)

In the short-term water may be sourced from tubewells for which Hydrogeological test shall be conducted at site to assess the yield of tube wells. In the long term, Proposed Source for Future Water Supply is through an intake point located on the Godavari Right Bank Canal near Nandurkhi village, approximately 11 km from Shirdi Airport and 5 km from Shirdi town. Detailed studies should be carried out to establish the sustainability of this source.

c) Raw Water Network

Raw water shall be pumped from the River / Canal / Bore wells and water shall be transmitted to the distribution centralized underground raw water Tank.

d) Clear Water Reservoirs

Storage in the service reservoirs must be provided considering balancing of inflows and outflows. The total service storage is worked out presuming a 24-hour water supply. Total 1 day storage of water has been considered in the WTP. This storage shall be divided into underground and overhead storage. The capacity of OHT has been decided by Mass Curve Method. A mass diagram is the plot of accumulated inflow (i.e. supply) or outflow (i.e. demand) versus time. The summation of the cumulative surplus and deficit gives the capacity of OHT.

e) Distribution Centers

All the distribution centres will be designed for total 20 hours of operation and it will be used to pump water directly from UGT to OHT. The details of pumps are as follows:

Table 8-1 Pump Details

Sl. No.	Description	Number of Pumps	Pump Duty Condition	
			Head in m	Discharge in lps
1	FROM WTP to OHT	4W+2S	60m approx.	210
2	At OHT to ALL PLOT	Under gravity	As per Actual Site	

8.2.6 Distribution Network

Based on the topography, 2 water distribution zones are proposed. We have considered 2 nos. OHTs with capacity of 9.0 MLD each of min. 15 m Height at specific locations to cater 8-hour water demand for the entire area. It is proposed to provide the water supply to the individual plots at min. of 0.7 Bar water pressure (in Gravity flow). Min. 25 mm metered house connection shall be provided to each plot. Additional on-line Booster pumps may be provided in the system to ensure sufficient desired pressure is achieved in all case.

8.3. SEWERAGE SYSTEM

Provision of sewerage network in any residential and/or industrial area is essential to ensure the safe disposal of wastewater and maintain the hygienic conditions. The project area of AASHA is provided with adequate sewerage network in phase 1 as well as phase 2 of the master plan. Every residential, industrial & commercial as well as amenity plot shall be connected with the sewerage network to ensure 100% sewage collection. Based on the topography of the area, the entire zone has been divided into 3 catchment zones. The outfall for each zone shall terminate in the respective sewage treatment plant.

8.3.1. Estimation of Sewage Generation

The estimation Design flows (Peak flow) for the residential sewerage scheme will be estimated by using the formula which is given below.

Sewage Generation = (Population x Water Demand x Return Factor x Peak Factor)

Design flows (Peak flow) for the Industrial sewerage scheme will be estimated by using the formula which is given below.

The return factor for the above case is taken as 0.8.

The Project area is divided into different land uses. The population or the number of employees under various land uses are considered as per applicable guidelines and are as mentioned in the Potable water supply section of this report.

The total estimated domestic sewage generation is about 65 MLD. The detailed estimates are given in the Water Supply Section.

The tentative details of the sewerage system with minimum requirements are as follows:

Sr. No.	Description	Value
1	Sewer Pipe Diameter	200 mm- 1200 mm
2	Sewer Pipe Material along road	DWC
3	Sewer Pipe Material across road	RCC NP-3
4	Total Length of Primary collection network	Approx 20 kms

Property connections - Service pipes for the property connections should be laid up to plot boundaries in the Project area. The service pipe shall be RCC/DWC with the property chamber.

8.3.2. Sewage Treatment Plant

Decentralised treatment plants have been proposed for the AASHA area to treat the sewage generated in its catchment. 3 nos STPs, 1 in each zone, totalling 65 MLD are proposed. It is proposed to treat the sewage to tertiary

levels to bring it to quality standards of reuse for horticulture and flushing. The STPs shall be built in a modular fashion to match the growth of the AASHA area.

The Central Pollution Control Board has issued directions on 21st April 2015 under 18 (1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 regarding treatment and utilization of sewage and prescribed the following standards for sewage treatment and are listed in Table below Standards will be applicable for discharge in water resources as well for land disposal.

The operator shall guarantee the performance of sewage treatment plant to treat the sewage to achieve the desired effluent standard mentioned in above table. The observation of these parameters must be stringent.

A number of treatment systems have been applied for wastewater treatment under many infrastructures development projects in India. The treatment systems that have been used are mostly biological and have their own merits and demerits. The strategy for wastewater treatment is to provide appropriate cost-effective treatment with a robust process that takes into account local conditions. To meet the required effluent standards for the discharge of wastewater, a biological treatment plant must be constructed.

8.3.3. Recycled water supply to green area and flushing

Tertiary treated water from the STP has been envisaged to cater the non-potable water requirements such as flushing, road cleaning and horticulture. As per the master plan a green area of about 34 Ha is proposed. Its water requirement of about 2.70 MLD shall be catered by recycled water, reducing the freshwater requirement. 31.50 MLD treated water shall be used for flushing purposes. Any excess treated water shall be discharged to public sewers or nearby drains.

A RCC sump of 40 ML capacity is proposed at the STP location and recycled water distribution network of approx. 32 km is considered. The pumping arrangement of suitable requirement as per design is provided. Arrangement for filling of water tankers at the sump location shall be provided, which shall cater the water supply to the median and avenue plantation as well as road cleaning.

8.3.4. Recycled Water distribution system

The recycled water from the outlet of the STP will be stored in the proposed RCC sump as mentioned above and will be supplied to green area by pumping.

The implementation limit for this distribution system will be from the outlet of the RCC sump to the adjoining green area plot.

The storage capacity of underground RCC Sump is proposed for 24 Hours capacity which shall be constructed in RCC with RCC roof. The recycled water from this tank shall be pumped to recycle water distribution system for various non potable uses such as flushing, gardening, irrigation, non-domestic industrial purpose etc. This tank shall have two compartments from the point of view of O&M. Necessary appurtenances such as inlet, outlet, overflow, vent pipes etc. shall be provided.

Pumping station will be provided adjacent to the storage tank which will have horizontal split casing pumps with VFD motors. Initially the demand for recycled water will be less and pumping hours are to be planned accordingly. All pumps shall be provided with variable frequency Drive.

The scope for this item includes designing and construction of RCC sump, Designing, providing, supplying, lowering, laying and jointing of pipes & Valves to be provided at appropriate spacing as per CPHEEO guidelines for easy

operation and maintenance of distribution network, Bulk flow Water meters including all specials, excavation, backfilling, bedding, Construction of valve and water meter chambers of appropriate sizes as per CPWD specification, and other accessory structures and fixtures, actuator for valves with provision for future SCADA integration, All the electro-mechanical installations and physical infrastructure of the distribution network shall be PLC/SCADA compatible. The scope of services includes supply of water for hydraulic testing and carrying out hydraulic tests for distribution systems

8.3.5. Intermediate Sewage Pumping Stations and Pumps

Intermediate sewage pumping stations will be provided to take care of local depression as per site requirement.

The pump houses shall be of adequate size to house the pumps with macerators of required capacity and other allied electrical and mechanical equipment, also designing and providing all PLC/SCADA/Automation requirements for required components. However, minimum size of the pump house shall not be less than 100 sq.m with sufficient height to house Gantry and pulley arrangement. The RCC sump has been considered as the pumping station.

The pumps shall be of non-clog solids handling submersible type suitable to pump required amount of sewage to the nearest gravity manhole. The scope shall include all required appurtenances for completion of the work. The pumping main will be of HDPE PN-6 class.

To ensure that nearby inhabitation does not get affected by the foul smell, a dedicated Ventilation system with CO and NOX filtration system shall be provided.

8.4. STORM WATER DRAINAGE SYSTEM

Storm water drainage system shall be provided for the collection and disposal of runoff from rooftop, roads, plots and other permeable area of the project area. Stormwater drain along the road has been proposed between service road and main carriageway and at the edge of carriageway for roads of required size on both sides of carriageway, which would be helpful for collection & disposing of surface runoff water over the road surface & nearby plot and finally outfall / disposed of to the nearby stream / water bodies.

8.4.1. Proposed Drainage system

The total project area of AASHA Area is about 1975 hectares. Numerous small Nallas and drains are crossing the project area, out of which 3 predominant have been identified for final outfall. Accordingly, the entire area shall be divided into 2 drainage catchment zones.

The project area is broadly divided into three catchments. The upper northside catchment shall be provided with the outfall at natural stream at north border of area. The runoff from catchment area of another area is also envisaged to be drained off towards the East.

The road surface runoff will be directed to road side catch basin get into the nearest drain. The runoff from plots shall be discharged into road drains through pipe/box drains of suitable size.

8.4.2. Design Criteria

Storm water drainage network for entire area shall be designed based on the topographic survey inputs and integration to proposed development. Existing water bodies and primary drains / channels will be considered proper gravity flow / outfall structure of entire storm water drainage network. Drains adjacent to roads shall be in reinforced concrete of M20 grade minimum. The storm water drainage system is designed to cater the run-off from road as well as the existing plot

areas and structures. The outfalls are proposed considering the topography of the Area, availability of government land, location of river and natural streams etc.

The storm water runoff from plot drains and roads gets collected via catch basins located at the curb of roads which in turn gets collected in the storm water drains. The design follows the guidelines recommended in CPHEEO manual on storm water drainage system and other relevant codes with proper justification.

The design of the drainage system requires following:

- Calculating the total discharge that the system requires to drain off
- Fixing the slope & dimensions of the drain to have adequate capacity to carry the discharge and afford proper maintenance.

Above methodology process including calculation of Runoff and its parameters is described in detail as follows.

8.4.3. Catchment

Project area shall be divided into the different catchments as per the approved master plan, topography and envisaging the proposed development that will occur.

8.4.4. Design Flows

Design flows (Peak Runoff) for the drainage scheme shall be estimated using the conventional rational method. Guidelines on urban drainage provide the rational formula to estimate the peak Runoff at a catchment outlet; the peak runoff at any given point is calculated using the following rational formula.

$$Q = [C \cdot i \cdot A] / 360$$

where,

Q: Discharge/ Runoff at that point in m³/sec C: Coefficient of Runoff

i: Intensity of Rainfall in mm/hr.

A: Area of Sub-catchment in hectare.

8.4.5. Coefficient of Runoff

As runoff is directly proportional to the value assigned to “C”, the proper selection of this value is critical for storm water runoff calculations. Care has to be exercised in selecting this value as it incorporates all the hydrological extractions, surface imperviousness and antecedent conditions. Typical values are assigned for runoff coefficient. Those are estimated using ‘Surface Drainage Design Manual by U.S Department of Transportation’ and ‘CPHEEO’ Manual.

8.4.6. Time of Concentration

Time of concentration is the time required for the rainwater to flow over the ground surface from the extreme point of the drainage basin and reach the point under consideration. Its significance is in the assumption that for a given design storm frequency; peak flow at the catchment outlet will result from a storm of duration equal to the time of concentration. There are different ways to calculate or estimate the time of concentration. Kirpich formula below has been widely used for computing the time of concentration.

As per Kirpich formula, time of concentration (in minutes):

$$t_c = 0.0078 S^{(-0.385)} L^{(0.77)}$$

t_c : Time of concentration in min S : Slope of catchment area

L : Flow length in feet

8.4.7. Intensity of Rainfall

It has been observed that the shorter the duration of critical rainfall, the greater would be the expected average intensity during that period. The critical duration of rainfall will be which produces maximum runoff. The duration is equal to the time of concentration, since shorter period do not allow the whole area to contribute water, and longer duration will give smaller average rainfall intensity.

A rainfall intensity of 75mm/hr shall be considered for design of storm water drainage system

8.4.8. Return Period

As per the CPHEEO manual on Storm water drainage system, vol. I, 2019, Table 4.1; design return period for industrial catchments is taken as once in 2 years (2-year return period flood).

Hydraulic Design of Drain

Hydraulic design of the concept drainage scheme or in other words sizing and gradient (bed slope) of the drains will be determined using the conventional Manning's Equation.

The adequacy of drain or hydraulic analysis will be done by using Manning's equation as below.

$$V = \frac{1}{n} R^{(2/3)} S^{(1/2)} \text{ Where, } n = \text{Manning's } n \text{ defined by material used}$$

R = Hydraulic Radius S = Slope

All the other design parameters included in storm water design are tabulated in table give below:

8.4.9. Design Parameters

Sr. No.	Design Parameters	Value
1	System	Gravity System
2	Velocity	Minimum - 0.60 m/s
		Maximum - 3m/s
3	Coefficient of Runoff	As per IRC 42 and CPHEEO guidelines
4	Method for Computing Flow	Manning's Formula
5	Manning's n value	0.013 (RCC Box structure and RCC pipes)
6	Material for conduits	RCC box structure and RCC HPC NP-3
7	Catch Basins	At 50m c/c distance under footpath
8	Kerb Inlet with grating	At 3-5m c/c distance
9	Plot Connections	RCC pipes with chambers for plot connections
10	Drain sizes	300 x 300mm to 1000 x 1000 mm
11	Length of network	Approx 45 kms

8.5. RAINWATER HARVESTING

In absence of any specific guidelines for retention of storm water runoff, it is proposed to provide storage volume due to a rainfall intensity of 75mm/hr. The roof top rainwater harvesting and storages, water bodies inside the premises will be considered for runoff calculations however the excess water will be discharge to the nearby natural streams / water bodies etc.

8.5.1. Recharge Pits with borewells

Recharge pits shall be provided in all buildings to capture the storm water from the roofs. In addition, all green areas shall also be equipped with recharge pits.

Several recharge pits are proposed for project area as per the site condition and requirements. Number of recharge pits required in the project site will depend upon the size of the recharge pit and percolation rate of the soil. However, in absence of any percolation rate/test results, size of recharge pit is calculated for the retention of flow due to a rainfall intensity of 75mm/hr. rainfall considering the actual rate of percolation/infiltration of soil. The rate of percolation of soil is required at several locations at site to design the accurate size of recharge pits.

The capacity of the pit can be designed on the basis of catchment area, rainfall intensity and recharge rate of soil. The recharge pit provided is of size 2.0x3.0x3.0m (standard) and has a borewell in it with the depth up to 13-15m. The calculation for number of recharge pits required in the project site shall be calculated accordingly. Following figure shows the typical diagram of recharge pit with borewell.

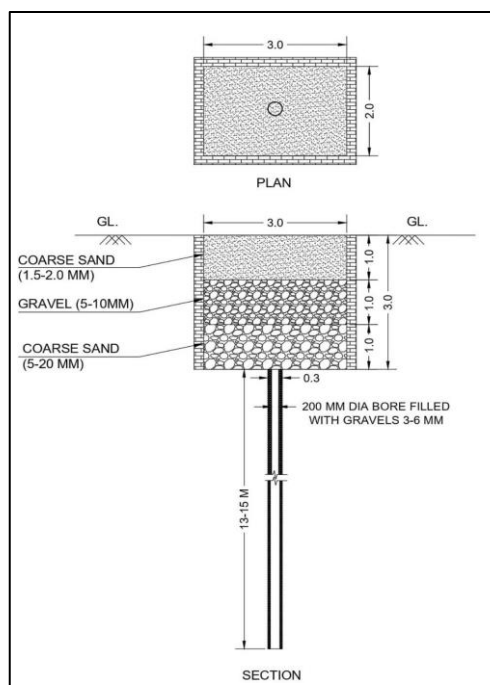


Figure 8-1 Water Recharge Pit- Section

8.6. SOLID WASTE MANAGEMENT

Municipal Solid Waste (MSW) is the trash or garbage that is discarded day to day in a human settlement. According to MSW Rules 2000, MSW includes commercial and residential wastes generated in municipal or notified areas in either

solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes. Waste generation encompasses activities in which materials are identified as no longer being of value (being in the present form) and are either thrown away or gathered for disposal.

Most urban areas in the country are plagued by acute problems related to solid waste. Due to lack of serious efforts by town/city authorities, garbage and its management have become a tenacious problem and this notwithstanding the fact that the largest part of municipal expenditure is allotted to it. It is not uncommon to find 30-50% of staff and resources being utilized by Urban Local Bodies for these operations. Despite this, there has been a progressive decline in the standard of services with respect to collection and disposal of municipal solid waste including hospital and industrial wastes, as well as measures for ensuring adequacy of environmental sanitation and public hygiene. In many cities, nearly half of solid waste generated remains unattended, giving rise to insanitary conditions especially in densely populated slums which in turn results in an increase in morbidity especially due to microbial and parasitic infections and infestations in all segments of population, with the urban slum dwellers and the waste handlers being the worst affected.

8.6.1. Legal framework

Solid waste management practices can never reach the desired level of efficiency until the public participates and discharges its obligation religiously. The system therefore, can only be improved by modernizing the solid waste management system by the Municipality and ensuring public participation through very serious motivational efforts along with adequate legislative support for taking punitive measures.

For improving solid waste management practices in city, the Supreme Court Committee has given wide ranging recommendations defining the roles and responsibilities of the citizens, NGOs, local bodies, etc. After the aforesaid report, the Government of India, Ministry of Environment has notified municipal solid waste (Management & Handling) Rules 2016 under the Environment Protection Act 1986 which have been changed time to time, these rules have clearly laid down the measures to be taken by the administrative agencies. It is necessary to incorporate suitable provisions in the state law to ensure public participation and for providing for minimum level of service. Local law also needs to provide for punishment on the spot to those who do not adhere to the directions given for maintaining appropriate solid waste management system in the city giving adequate power to the administrative body to punish the offenders.

The following legal provisions may be incorporated by the State Governments in the law governing Municipality.

2016	Municipal waste (Management and Handling Rules)
2016	The Plastic Waste Management Rules, 2016
2016	Guidelines on Co-processing in Cement/Power/Steel Industry
2016	Bio- Medical Waste Management Rules, 2016
2016	E-waste (Management) Rules, 2016
2016	The Hazardous and other Waste (Management and Transboundary Movement) Rules 2016
2016	Construction and Demolition Waste Management Rules, 2016
2011	E waste (Management and handling) Rules
2009	Plastics (Manufacture, Usage and Waste Management) Rules, [17.09.2009], S.O. 2400(E)
2008	Hazardous Wastes (Management, Handling and Trans boundary Movements) Rules, S.O.2265 (E)
2003	Amendment to the Recycled Plastic Manufacturing and Usage Rules, 1999, S. O.705 (E)
1998	Bio Medical Waste (Management and Handling) (Amendment) Rules, 17.9.2003], S.O.1069 (E)

2001	Batteries (Management and handling) Rules
2000	Municipal waste (Management and Handling Rules), [25.9.2000], S.O. 908(E) I cities in India
1999	Recycled plastic (manufacture and usage) rules, S.O. 2400(E)
1999	Solid waste management in class Guidelines by Supreme Court of India
1998	Bio medical waste (management and handling) rules, [20/7/1998], S.O.630 (E)
1989	Hazardous waste management and handling rule
1986	Environment protection Act (Umbrella act)
1986	Environment (Protection) Rules amended in 2003
1981	Air (Prevention and control of pollution) Act amended in 1987

8.6.2. Sources of Solid Waste Generation

Solid Waste generated from urban areas generally comprises of Municipal Solid Waste (MSW), Construction & Demolition waste and hazardous solid waste. The various source of solid waste generation would be:

- **Residential:** Waste generation from residential area.
- **Commercial:** Waste from commercial spaces like shops, offices, malls, banks, community centre, cinema hall etc.
- **Institutional:** Waste from educational institutes
- **Biomedical:** Waste from the hospitals, clinics and nursing homes, Veterinarian etc.
- **Industrial:** Waste generated from the industry as a part of their industrial process.
- **Hazardous:** Waste that is hazardous in nature and can be generated from residential, as well as industrial area
- **Street Sweeping & Garden waste:** Waste generated from street sweeping and landscaping. This also includes sewerage sludge etc.
- **Construction and Demolition Waste:** Construction and demolition waste consists mainly of concrete, asphalt, stone and wood, metals, ceramics, glass, tiles etc. Typically, the quantity will be varying with phase of the development. It is very high during the construction stage and low during operational phase.
- **Sludge from STP/ETPs:** This also includes sewerage sludge, chemical sludge etc.
- **E-waste:** E-waste shall be generated from offices, commercial buildings, institutional building and various industrial activities.

Hazardous waste shall be generated from industries, sludge from CETP, hospitals etc. Other area would generate municipal solid waste.

8.6.3. Quantification of Solid Waste

The knowledge of quantity and density of solid waste generation is essential to estimate the capacity of storage, type of collection vehicle, optimum size of crew and frequency of collection.

The composition and characteristics of municipal solid waste depends on number of factors such as location, climate, habits of the citizens etc. Municipal solid waste is very heterogeneous in nature and consists of a number of different materials derived from various types of activities.

As waste generation is a factor of population, lifestyles and level of urbanization, the quantification process has been linked with population multiplied by the waste generation factor of the urban area. The factor of waste generation in turn has been calculated by monitoring 'total waste generation' to the population of the city at a given Time (Total Waste Generation / Population). Following Are the Assessment of Per Capita Waste.

As per study conducted by NEERI, the quantity of waste produced in Indian context vary between 0.2 - 0.6 kg/capita/day, with 0.6 kg/capita/day generation rate observed for metropolitan cities.

A broad estimated solid waste generation for AASHA notified area will be about 1,67,465 Kg/Day. A site for Solid Waste Management has been proposed in north-west of Notified Area with area of 4.73 Ha.

8.6.4. Waste Characterization

The quantity and composition of MSW generated is essential for determining collection, processing and disposal options that could be adopted. They are dependent on the population, demographic details, principal activities in the city/ town, income levels and lifestyle of the community.

As per MSW rules 2016, solid waste can be categorised into following per the nature of waste.

- Biodegradable Waste: Food and kitchen waste, green waste (vegetables, flowers, leaves, fruits) and paper.
- Recyclable Material: Paper, glass, bottles, cans, metals, certain plastics, etc.
- Inert Waste Matter: C&D, dirt, debris.
- Composite waste: Waste clothing, Tetra packs, waste plastics such as toys.

Domestic Hazardous Waste (also called "household hazardous waste") and toxic waste: Waste medicine (expiry or not used), e-waste, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish etc.

MSW in India has approximate 40–60% compostable, 30–50% inert waste and 10% to 30% recyclable. Analysis carried out by NEERI reveals that in totality Indian waste consists of Nitrogen content (0.64 ± 0.8 %), Phosphorus (0.67 ± 0.15 %), Potassium (0.68 ± 0.15 %), and C/N ration (26 ± 5 %).

There have been tremendous changes in solid waste composition with time, and these changes are expected to continue with changing lifestyle and standard of living. Compared to countries in the high-income group, waste generated in India has a higher share of bio-degradable and inert items. However, the composition of municipal waste in India has seen a marked change over the last two decades,

8.6.5. Hierarchy of solid waste Management

The waste management hierarchy is a nationally and internationally accepted guide for prioritizing waste management practices with the objective of achieving optimal environmental outcomes. It sets out the preferred order of waste management practices, from most to least preferred. Hierarchy of Solid Waste Management is shown in figure below-

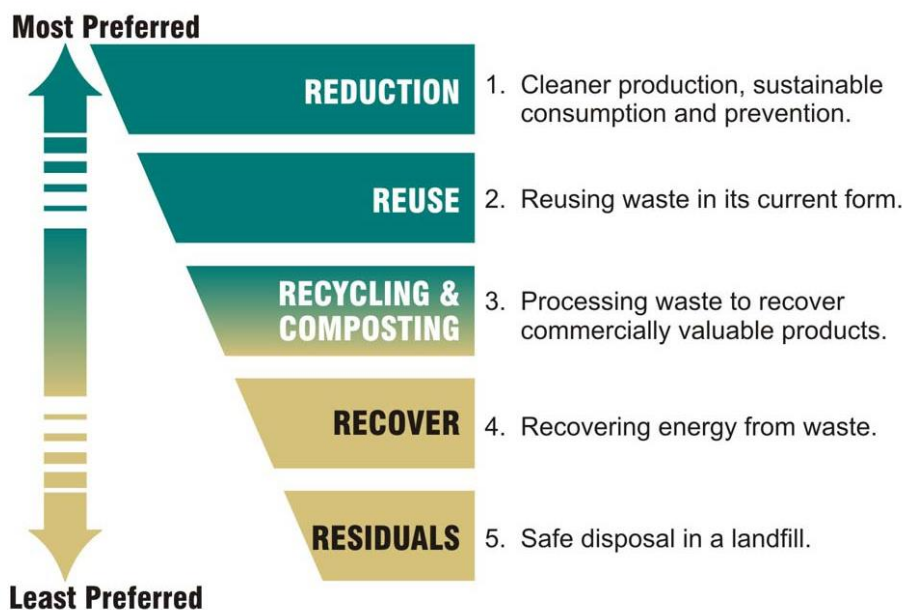


Figure 8-2 Hierarchy of Solid Waste Management

Source reduction, also known as waste prevention, implies reducing waste at the source, and is the most environmentally preferred strategy. Source reduction can help in achieving

- Save natural resources,
- Conserve energy,
- Reduce pollution,
- Reduce the toxicity
- Save cost of sweeping, collection & transportation and processing of waste

Reuse, reduce and recycle is another effective waste management strategy, in which the waste is not allowed to enter the disposal system. The waste generated shall be reused or recycled as raw material to generate another end product. This process helps in minimizing the amount of waste generated as end product, saves the natural resources and reduces the costs associated with the production and manufacturing.

The energy recovery process is also called waste to energy conversion. In this process, the wastes that cannot be recycled are being converted into usable forms of energy such as heat, light and electricity etc.

This helps in the saving of various natural resources.

The disposal process holds the last position in the waste management hierarchy. Landfills are the common form of waste disposal.

8.6.6. Waste Minimization

As per the SWM Rules, 2016, effort should be made to create public awareness for minimizing waste generation and reusing waste to the extent possible. Source reduction is the most preferred tier in the ISWM hierarchy because of its potential to directly reduce the quantity of waste generated and hence reduce associated financial and environmental costs.

Following are some of the steps to initiate source reduction program.

- Promoting and implementing awareness and education programmes addressing different stakeholders e.g., residential, commercial and industrial educational programmes that increase public awareness and participation,
- Developing and promoting at source reduction programmes in the community, e.g. domestic composting programmes that reduce the volume of food waste, leaves and garden trimmings entering the collection system.
- Bans through replacing disposable materials and products with recyclables and reusable materials and products (e.g. banning the use of plastic bags).
- Local businesses should be encouraged to reward consumers for returning recyclable products or products which are toxic (e.g. batteries). EPR programmes by manufacturers are one of the examples
- Educational and on-site business and industry assistance programmes should be promoted that advise businesses on how to use materials more efficiently and reduce waste generation.

8.6.7. Storage and collection of waste

MSW should be stored at the source of waste generation till it is collected for disposal. It is essential to segregate waste into different fractions. Waste should be segregated by waste generators into three fractions: wet (green container) and dry (black container) and hazardous waste (yellow container). This system is referred to as the 2-bin system. The wet fraction should preferably be disposed off through composting and as many fractions as possible from the dry waste should be sent for recycling.

In residential areas, each premise will be required to keep bins or containers in which dry and wet waste shall be separately stored by the residents. Such bins may be placed at easily approachable locations to facilitate convenient collection by the SWM staff. The waste from these community bins/containers shall be collected through auto tippers on a daily basis.

In Airport & allied activities / service zone and industrial areas, a three-bin system is proposed to collect wet (green container), dry (Black container) and hazardous waste (Yellow or Red container). At least the wet waste from these bins/containers shall be collected through auto tippers, on a daily basis. The dry waste and horticulture waste may be collected on alternate days.

8.6.8. Processing of waste

It is estimated that approx. 167 tonnes of solid waste will be generated in the AASHA area upon full development. The waste shall be collected in two categories, namely dry and wet waste. Typically, MSW comprises of 60% of wet waste. However, in case of Airport Allied Activities/ Services Zone/Industrial area, a significant contribution of waste will be generated. So, gross wet waste is considered about 50% of waste for the purpose of treatment facilities. Thus, composting (windrow composting) provision for around 80 Tonnes Per Day waste shall be considered along with maturation platform.

For dry waste of about 80 Tonnes Per Day, material recovery facility shed with office and scale room, weighing bridge, mechanical equipment for waste processing shall be provided. The inorganic waste, after segregation, shall be sent as RDF.

Also, for the street sweeping, 2 mechanized truck mounted street sweeping machine provision shall be considered.

Any inert material (5-10%) generated shall be sent to sanitary landfill.

8.7. POWER SUPPLY SYSTEM

The power demand of the AASHA Notified Area primarily depends on the type of land use distribution. The major power demand is expected to arise from Airport and Airport Allied Activities, Commercial, and Residential zones.

The total estimated power demand for the AASHA Notified Area is approximately 1100 MW. This excludes the power for proposed airport terminal which shall be assessed and designed separately.

A dedicated Electric Sub-Station (ESS) of 132 KV shall be required for this demand. This will be followed by 33KV and 11 KV Electrical sub-stations at various locations.

8.7.1. Measures for Reducing System Demand

To ensure sustainability and reduce dependence on the conventional grid-based power supply system, several energy-efficient and renewable energy strategies are proposed for the AASHA Notified Area. These include the development of a Solar Park integrated with the existing grid network to harness renewable energy on a large scale, along with the installation of rooftop solar systems on public, institutional, and commercial buildings to promote decentralized power generation. In addition, waste-to-energy generation through the utilization of biodegradable solid waste and sewage sludge is proposed to support sustainable waste management while generating power. The use of energy-efficient infrastructure, such as LED street lighting and automated lighting control systems, is also envisaged to reduce overall energy consumption. Further, the adoption of green building norms and energy conservation standards for all future developments is proposed to encourage sustainable construction practices and improve long-term energy efficiency within the notified area.

8.7.2. Solar Power Potential

- As per the National Renewable Energy Laboratory (NREL) solar irradiation maps, the Shirdi region receives an average Global Horizontal Irradiance (GHI) of 5.5–6.0 kWh/m²/day, indicating significant solar potential.
- Rooftop solar installations will be mandated for all public and semi-public buildings.
- Private developers will be encouraged to adopt rooftop solar power systems through Development Control Regulations (UDCPR-2020).
- The generated solar power will feed into the grid during daytime peak load, thereby reducing the dependency on conventional supply.

A 400 kV high-voltage (HV) transmission line passes through the notified area in south-west direction. Apart from this, one renewable energy-based solar power project of 5 MW capacity is operational at Gat No. 328, Kelwad Khurd village, while another 1.78 MW project is proposed at Gat No. 129, Kakadi village. Additionally, solar projects are proposed in surrounding villages outside the Notified Area such as Dhondewali, Kelwad Khurd, Kelwad Budruk, and Dahegaon Korhale.

8.8. DEVELOPMENT OF PHYSICAL INFRASTRUCTURE

The details area provided for physical infrastructure proposed in AASHA Notified Area are as follows:

Table 8-2 Details of Public Utilities

Sr. No.	Infrastructure Facilities	Proposed Area in Ha
1	Electric Sub-Station - 01	1.62
2	Electric Sub-Station - 02	2.02
3	Overhead Tank - 01	0.13
4	Overhead Tank - 02	0.13
5	Sewerage Treatment Plant - 01	5.05
6	Sewerage Treatment Plant - 02	4.01
7	Sewerage Treatment Plant - 03	4.10
8	Water Treatment Plant	9.86
9	Solid Waste Management	4.73
	TOTAL	31.65

The development of physical infrastructure can be taken up by concerned Government Authorities. In some of the cases, Planning Authority may provide land to these Government Authorities and request them to take up work related to their field. Water supply and sanitation including water treatment plants, sewage collection, treatment and recycling system can be carried out by Maharashtra Jeevan Pradhikaran. Solid waste management for AASHA Notified Area can be taken up in coordination with local Municipal Authorities in the vicinity. Power may be supplied by MSDDL & MSETCL.

The block cost estimate of all above physical infrastructure is given in chapter no 12.

9. TRAFFIC AND TRANSPORTATION

9.1. INTRODUCTION

Efficient traffic and transportation planning is a key component for sustainable development of the AASHA Notified Area. With Shirdi International Airport acting as the major driver of urban growth, traffic demand is expected to increase significantly by 2045. The planning of internal and external road networks, access roads, and supporting infrastructure is essential to ensure smooth circulation for airport passengers, employees, residents, and freight movement, while maintaining connectivity with surrounding regions.

9.2. APPROACH AND STRATEGY

9.2.1. Integration with Regional Development

The AASHA Notified Area is strategically connected to the regional transportation network through major highway and expressway corridors comprising National Highway-160 (NH-160), National Highway-160D (NH-160D), State Highway-44 (SH-44) and the proposed Surat–Chennai Expressway, the alignment of which passes through the area.

NH-160 and NH-160D serve as the primary regional mobility corridors facilitating connectivity between Shirdi, Nashik, Ahilyanagar, Pune, and adjoining urban centres, while SH-44 provides important linkage to surrounding settlements and regional growth nodes.

Further, the proposed Surat–Chennai Expressway passing through the AASHA notified area is expected to substantially strengthen north-south regional connectivity by integrating the notified area with major industrial, commercial, and logistics corridors across western and southern India.

9.2.2. Integration with Existing Network

The proposed transportation framework for the AASHA Notified Area has been planned in integration with these regional corridors to ensure seamless airport accessibility, efficient traffic dispersal, and improved regional mobility. The availability of multi-modal regional connectivity is expected to support airport-oriented economic development, tourism growth, logistics activities, commercial investments, and future urban expansion within the notified area and its surrounding influence region.

While planning the transportation network for the Development Plan of the AASHA (Area Around Shirdi Hub Airport) Notified Area, due consideration has been given to the existing settlement pattern, including gaothans, villages, and the prevailing road network within and surrounding the notified area. The proposed road hierarchy has been formulated by integrating the existing transportation corridors to the maximum extent possible, thereby minimizing land acquisition requirements and reducing overall infrastructure development costs.

The proposed road network and infrastructure projects planned by various Government agencies such as the Public Works Department (PWD), Maharashtra State Road Development Corporation (MSRDC), National Highways Authority of India (NHAI), and other regional authorities have been carefully studied and incorporated in the planning framework.

The alignment of existing major district roads, state highways, village roads, and access routes connecting nearby settlements has been retained and upgraded wherever feasible to ensure continuity of movement and efficient regional integration. The planning approach also emphasizes improving connectivity between the proposed airport influence zone, industrial and logistics areas, tourism nodes, and surrounding settlements.

Further, available traffic studies, regional mobility proposals, and transportation planning inputs from relevant authorities and secondary sources have been considered to ensure that the proposed transport network supports future traffic demand, promotes seamless regional accessibility, and facilitates balanced urban development within the AASHA Notified Area.

9.3. TRAVEL DEMAND ASSESSMENT AND NETWORK ANALYSIS

9.3.1. AIRPORT PASSENGER GROWTH

The traffic assessment for the AASHA Notified Area has been undertaken considering the projected growth of passenger traffic at the Shirdi Hub Airport and the corresponding urbanization expected within the AASHA Notified area. Airport passenger traffic is projected to increase from approximately 8.27 lakh passengers in 2025 to 73.20 lakh passengers by 2045, indicating a Compound Annual Growth Rate (CAGR) of approximately 12.1 percent during the planning period.

This substantial increase in passenger movement is expected to generate significant travel demand on the regional and internal road network, particularly on the primary airport access corridor, the proposed central spine road, feeder roads, and major collector roads within the AASHA Notified Area. The projected growth in traffic has therefore been incorporated as a key determinant in assessing the future transportation infrastructure requirements and determining the appropriate roadway configuration for the proposed development framework.

9.3.2. EXISTING TRAFFIC CONDITIONS (2025)

A traffic volume assessment was undertaken on the primary access corridor leading to the airport, identified as OC-1, to establish the baseline traffic characteristics for future projections. The observed peak hour traffic volume on the corridor is approximately 699 vehicles per hour, corresponding to approximately 2,504 Passenger Car Units (PCU) per hour.

The observed modal composition indicates a diversified traffic mix dominated by private vehicles and freight movement. Cars and jeeps constitute approximately 36.5 percent of the total traffic, followed by trucks at 35.9 percent. Two-wheelers account for 13.6 percent, while buses contribute approximately 4.2 percent of the traffic stream. Multi-axle trucks and tractors contribute approximately 5.1 percent and 3.5 percent respectively, whereas three-wheelers constitute approximately 1.2 percent of the total traffic.

The existing traffic profile reflects the current operational characteristics of the airport access corridor and forms the basis for forecasting future travel demand associated with airport expansion, Aerocity development, residential growth, and regional traffic redistribution.

9.3.3. TRAFFIC PROJECTIONS (2045)

Traffic projections for the horizon year 2045 have been prepared considering the anticipated development potential of the AASHA Notified Area and the projected increase in airport activity. The traffic forecasting exercise incorporates multiple demand-generating components including airport passenger growth, employment generation within airport and airport-allied activities, residential population growth, and diversion of regional traffic from the adjoining National Highway network.

The projections have been estimated in terms of Passenger Car Units per hour (PCU/hr) by considering peak hour travel demand, modal split characteristics, vehicle occupancy assumptions, and IRC-recommended PCU conversion

factors. The methodology adopted is consistent with the guidelines and principles prescribed in IRC:106-2019 for urban roadway planning and capacity assessment.

9.3.4. Methodology

Traffic projections have been prepared using the airport passenger CAGR-based forecasting method, in line with IRC:106:2019 design standards.

The traffic forecasting methodology has been developed using an airport-led urban growth model wherein future travel demand is linked to projected airport passenger growth and associated economic activities. The following parameters have been considered for estimation of future traffic demand:

- Base Year: 2025
- Horizon Year: 2045
- Airport passenger growth trends
- Employment generation within Airport and Airport Allied Activity Zones (AAZ)
- Residential population projections based on holding capacity
- Diversion of through traffic from NH-160D and adjoining regional corridors
- Peak hour traffic characteristics
- Modal share distribution and vehicle occupancy
- IRC-based Passenger Car Unit (PCU) equivalency factors

The total projected traffic demand has been estimated for the design year considering directional distribution and roadway capacity requirements for both carriageway and service road systems.

9.3.5. Airport Traffic Growth Component

The airport traffic component has been projected based on the anticipated increase in passenger traffic during the planning horizon. The existing peak hour airport-generated traffic in the base year 2025 is estimated at approximately 350 PCU/hr.

Based on projected passenger growth from 8,27,306 passengers in 2025 to about 73,20,000 passengers in 2045, the overall growth factor works out to approximately 8.85.

- **Base Year Peak Hour Traffic (2025):** 350 PCU/hr
- **Airport Passenger Growth Factor (2025–2045):**

$$\text{Growth Factor} = 73,20,000 / 8,27,306 = 8.85$$

Accordingly, the projected airport-generated peak hour traffic for the horizon year 2045 is estimated as:

- **Projected Airport related Traffic (2045):** $350 \times 8.85 = 3092$ PCU/hr

Thus, airport-related passenger movement is expected to generate approximately 3,092 PCU/hr during peak operational periods.

9.3.6. Traffic due to employment in Airport and Airport Allied Activity Zone

The proposed Aerocity and Airport Allied Activity Zone (AAZ) are expected to emerge as major employment hubs accommodating airport operations, logistics, hospitality, commercial establishments, business parks, institutional uses, and ancillary services.

The total projected employment within the Airport and AAZ is estimated at approximately 77,586 persons by 2045, comprising approximately 7,330 employees associated with airport operations and approximately 70,256 employees associated with allied economic activities.

For traffic estimation purposes, it has been assumed that approximately 30 percent of the workforce will travel during the morning and evening peak periods spread over four peak hours, resulting in approximately 23,276 employee trips during peak duration. Considering an average vehicle occupancy of 2.5 persons per vehicle, the estimated vehicle generation during peak periods is approximately 9,310 vehicles.

The modal split has been derived based on observed travel characteristics along the existing airport access corridor (OC-1). After applying IRC-recommended PCU conversion factors, the employee-related traffic generation is estimated as follows:

- Car/Jeep: $65.8\% \times 1.0 \text{ PCU} = 6122 \text{ PCU}$
- Two-wheeler: $24.5\% \times 0.4 \text{ PCU} = 914 \text{ PCU}$
- Three-wheeler: $2.1\% \times 1.0 \text{ PCU} = 194 \text{ PCU}$
- Bus: $7.6\% \times 3.0 \text{ PCU} = 2130 \text{ PCU}$

The total employee-generated traffic during peak duration is estimated at approximately 9,360 PCU over four peak hours, which translates to approximately 2,340 PCU/hr.

This traffic component represents a major contributor to future travel demand within the AASHA Notified Area and highlights the importance of providing high-capacity urban mobility infrastructure.

9.3.7. Residential Traffic

The proposed development framework for the AASHA Notified Area envisages substantial residential growth to support airport-led urbanization and economic development. The projected residential population for the horizon year 2045 is estimated at approximately 2,00,000 persons.

For traffic generation assessment, it has been assumed that approximately 40 percent of the daily trips will occur during the morning and evening peak periods. Accordingly, approximately 80,000 person trips are expected during peak travel duration.

Considering an average occupancy of 2.2 persons per vehicle, the estimated vehicle generation is approximately 36,364 vehicles. The trips are assumed to be distributed over an 18-hour operational period, resulting in an average traffic generation of approximately 2,020 vehicles per hour.

The modal composition has been assumed consistent with the observed airport corridor travel pattern. Based on PCU conversion factors, the residential traffic component has been estimated as follows:

- Car/Jeep: = 23,911 PCU/hr
- Two-wheeler: = 3,568 PCU/hr
- Three-wheeler: = 759 PCU/hr
- Bus: = 8,319 PCU/hr

The overall residential traffic generation is estimated at approximately 36,557 PCU, translating to approximately 2,031 PCU/hr.

The residential traffic component is expected to intensify progressively with phased urban development and will substantially contribute to internal circulation demand within the Aerocity influence zone.

9.3.8. National Highway (NH) Diversion

In addition to internally generated traffic, a portion of the regional through traffic from NH-160D and surrounding road corridors is expected to divert towards the proposed central spine road due to improved connectivity, reduced travel time, and enhanced accessibility offered by the proposed urban road network.

For assessment purposes, a conservative diversion factor of 10 percent of the combined airport, employee, and residential traffic has been considered.

The projected diverted traffic is estimated as follows:

$$(3,092 + 9,271 + 2,031) \times 0.10 = 1,439 \text{ PCU/hr}$$

Accordingly, approximately 746 PCU/hr of additional traffic is expected to be accommodated on the proposed arterial road system due to regional traffic diversion.

9.3.9. TOTAL TRAFFIC DEMAND (2045)

Based on the cumulative assessment of all traffic-generating components, the total projected peak hour traffic demand for the horizon year 2045 is estimated at approximately 8,210 PCU/hr for both directions.

Table 9-1: Total Traffic Demand for year 2045

Component	PCU/hr	Calculation Method
Airport Passenger Growth	3,092	Airport passenger CAGR-based growth
Employee Traffic	2340	Airport and AAZ employment generation
Residential Traffic	2,031	Residential holding capacity and modal split
NH Diversion	746	10% diversion from regional traffic
TOTAL (Both Directions)	8210	Combined projected traffic demand

The directional traffic distribution results in approximately 4,105 PCU/hr per direction during peak periods.

- Traffic per Direction: $8210 \div 2 = 4105 \text{ PCU/hr}$

The projected traffic demand indicates the necessity for a high-capacity divided urban roadway system supported by service roads to ensure efficient traffic circulation, operational safety, and long-term network performance.

9.4. PEAK HOUR TRAFFIC ASSIGNMENT FLOW – 2045

9.4.1. Basis of Traffic Assignment

The Peak Hour Traffic Assignment for the horizon year 2045 has been carried out based on the traffic volume survey conducted at six (6) identified outer cordon locations within the AASHA Notified Area. The assignment methodology considers the observed peak hour traffic distribution pattern, proposed road hierarchy under the Draft Development Plan, anticipated airport-induced development, regional traffic movement, and future land use distribution.

The projected peak hour traffic demand for the year 2045 has been estimated as 8,210 PCU/hr considering airport passenger growth, employee trips, residential development, and regional traffic diversion from surrounding corridors.

The projected traffic has been proportionately distributed based on the observed peak hour traffic recorded at each cordon point during the primary traffic survey. The observed peak hour traffic at all cordon points is summarized below:

Cordon Point	Existing Peak Hour Traffic
OC-1	699
OC-2	238
OC-3	546
OC-4	123
OC-5	427
OC-6	293
Total	2,326

The percentage share of each cordon point was derived using the observed peak hour traffic volumes and applied to the projected 2045 peak hour demand.

9.4.2. Peak Hour Traffic Assignment – 2045

The assigned peak hour traffic for the horizon year 2045 is presented in the following table.

Cordon Point	Share (%)	Assigned Traffic 2045 (PCU/hr)
OC-1	30.05	2,468
OC-2	10.23	840
OC-3	23.47	1,927
OC-4	5.29	434
OC-5	18.36	1,508
OC-6	12.60	1,033
Total	100	8,210

The analysis indicates that the highest traffic concentration is expected along the OC-1 corridor followed by the OC-3 corridor. These corridors are anticipated to function as the primary airport access routes and major traffic carriers within the AASHA Notified Area.

9.4.3. Directional Traffic Distribution

For the purpose of roadway planning and directional flow assessment, the assigned traffic has been further distributed into inbound and outbound movements. Based on the anticipated airport-oriented traffic pattern, a directional split of 60% inbound and 40% outbound has been adopted.

- Inbound Traffic: Traffic moving towards the Airport Influence Zone/Core Activity Area.

- Outbound Traffic: Traffic moving away from the Airport Influence Zone/Core Activity Area.

The directional traffic distribution for the horizon year 2045 is presented below.

Cordon Point	Total Assigned Traffic (PCU/hr)	Inbound (60%)	Outbound (40%)
OC-1	2,468	1,481	987
OC-2	840	504	336
OC-3	1,927	1,156	771
OC-4	434	260	174
OC-5	1,508	905	603
OC-6	1,033	620	413
Total	8,210	4,926	3,284

The directional traffic analysis indicates that approximately 4,926 PCU/hr traffic is expected to move towards the Airport/Core Activity Area during peak hours, while 3,284 PCU/hr traffic is expected to move outward from the influence zone.

9.5. Volume-to-Capacity (V/C) Ratio Analysis

9.5.1. Basis of Capacity Assessment

The Volume-to-Capacity (V/C) ratio analysis has been carried out to assess the operational efficiency and adequacy of the proposed transportation network for the horizon year 2045.

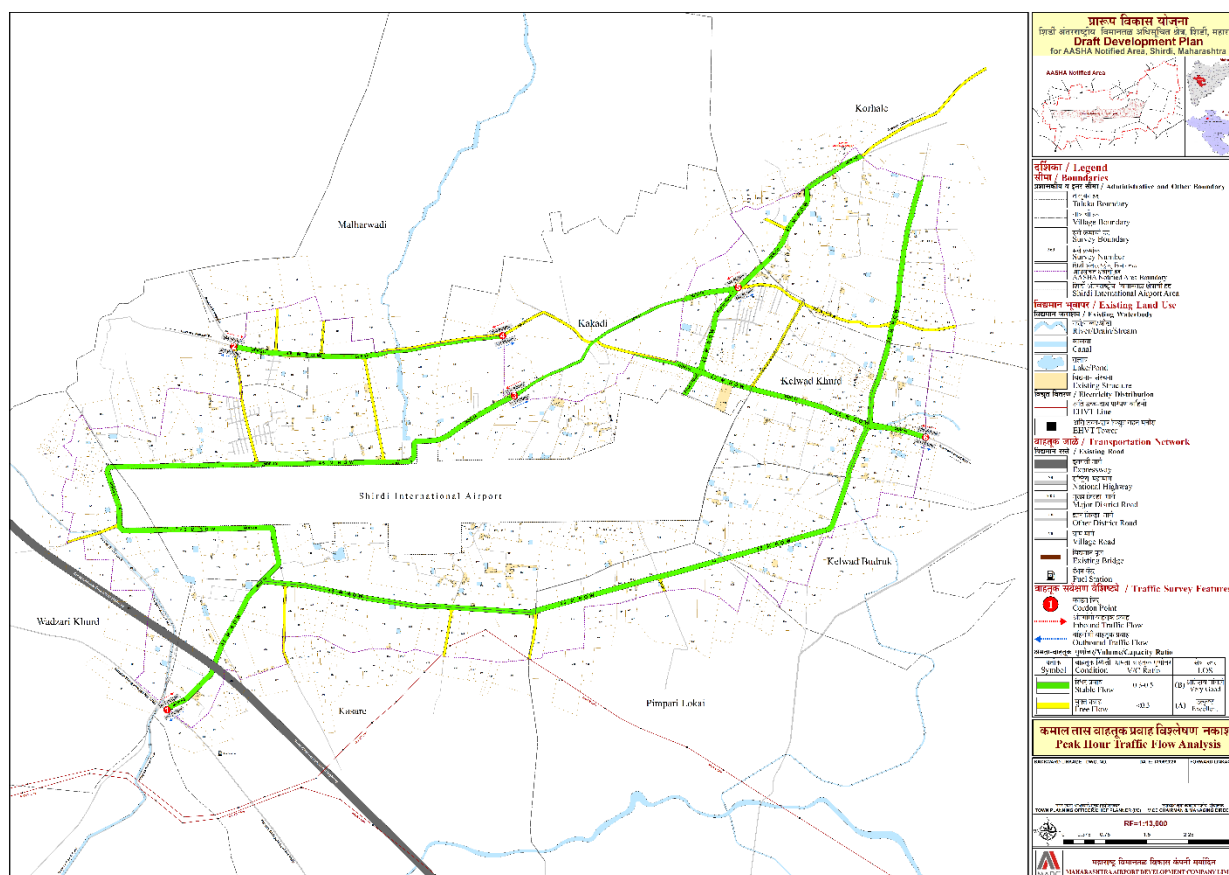
The assessment has been undertaken considering the proposed road hierarchy under the Draft Development Plan, which includes:

- 45 m wide arterial corridors,
- 24 m wide sub-arterial roads,
- internal collector roads and village connectors.

The practical roadway capacities adopted for the analysis are summarized below.

Road Category	Proposed ROW	Assumed Configuration	Capacity (PCU/hr – Both Directions)
Arterial Corridor	45 m	6-Lane Divided Urban Road	7,200
Sub-Arterial Corridor	24 m	4-Lane Divided Road	4,800
Internal Collector Road	12–18 m	2-Lane / 4-Lane Collector	2,400

Cordon Point	Assigned Traffic (PCU/hr)	Adopted Capacity (PCU/hr)	V/C Ratio	Level of Service
OC-1	2,468	7,200	0.34	LOS B
OC-2	840	4,800	0.18	LOS A
OC-3	1,927	4,800	0.40	LOS B/C
OC-4	434	2,400	0.18	LOS A
OC-5	1,508	7,200	0.21	LOS A/B
OC-6	1,033	4,800	0.22	LOS A/B



9.6. LANE CONFIGURATION ANALYSIS

The comparative capacity analysis indicates the following roadway capacities under urban divided carriageway conditions:

67

Configuration	Capacity per Direction (PCU/hr)	Both Directions (PCU/hr)
6-Lane Divided	5,100	10,200
8-Lane Divided	6,800	13,600
10-Lane Divided	8,500	17,000
12-Lane Divided	10,200	20,400

In addition to the main carriageway, provision of service roads on both sides contributes additional handling capacity of approximately 1,700 PCU/hr per direction and significantly improves local accessibility and traffic segregation.

Service Roads: Additional 1,700 PCU/hr per direction.

9.7. RECOMMENDED ROAD LAYOUT

9.7.1. Existing Road Network

The ASHAA notified area represents the rural landscape sans any rural or urban settlements, hence is devoid of any major road network. MDR 10 is passing through the notified area; providing linkage from NH160D to Shirdi town. Part of MDR 84 linking MDR10 and Wadzari BK is also in the notified area is other than that, few village link roads are passing through the notified area.

9.7.2. Existing Bottlenecks

- The notified area linkages with surrounding major settlements like Nashik in the north, Ahilyanagar (District Headquarter) in south, Mumbai in the west and Chattarpati Sambhajinagar in the east and rest of the state (through different NHs and Mumbai Nagpur expressway) are mainly through NH160D; a two-lane highway.
- The International airport is served through a 12 mts wide village link road. Part of this linkage is passing through a proposed township; where this road is proposed as 24mts wide. Therefore, access to the airport requires major upgradation/ alternative linkage.
- The notified area is linked with the Shirdi town through 15mts wide MDR 10, which is grossly inadequate.

9.7.3. Proposed major Road Network

In order to cater to the projected traffic demand of the International Airport, the traffic generation on account of land use proposals and proposed activities, the following hierarchy of road network is being proposed:

1. It is very important that the International Airport and the proposed town in the notified area have very strong and efficient linkage with Shirdi town, hence the MDR 10 & MDR 84 needs to be upgraded to a 45 mts wide.
2. Presently access to the airport is through 12 mts wide Kakadi- Korhale Road (widening to 24mts within approved township area. In view of the existing approvals, further widening upto 45 m has been provided outside the approved township adjoining the proposed 24m road).
3. Integration of NH 160D through a 45 mts wide bye-pass taking off from the southwest boundary of the notified area and along Nilwande Canal, along western airport boundary, merging with the existing MDR 84 and finally joining with the 45 mts road proposed at (i) above. This proposed road will cater to the traffic from Nashik, Sinnar, Sangamner, in west and north, traffic from Mumbai Nagpur expressway, Srirampur, Ahilyanagar in south and will provide bye-pass for Shirdi avoiding through traffic within the proposed town. Part of this proposal is outside the notified area.

- The hierarchical system of road network is supported through a scientifically devised cross section allowing provision for service ducts including water supply, sewerage, drainage, data cables, electricity cables etc and the pedestrian/cyclist movements are depicted below:

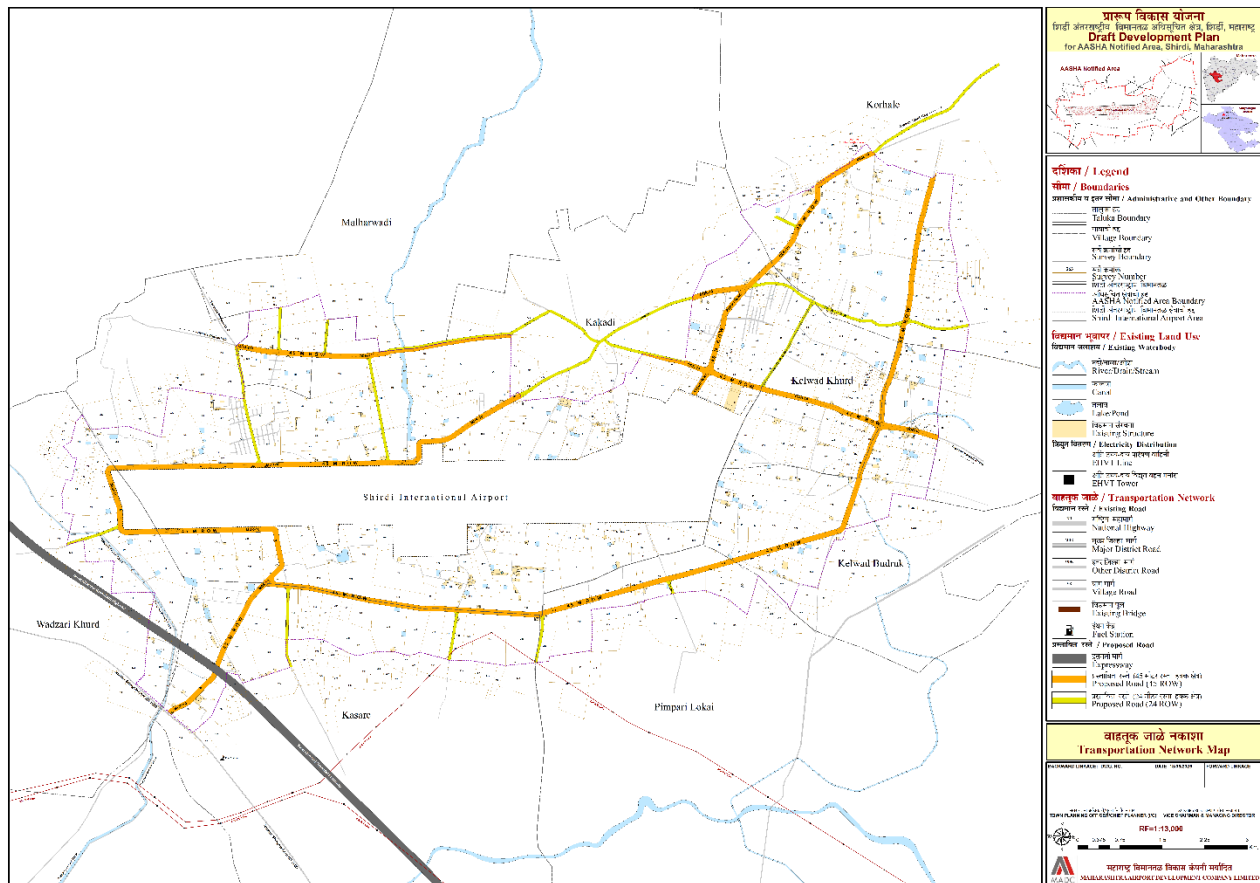
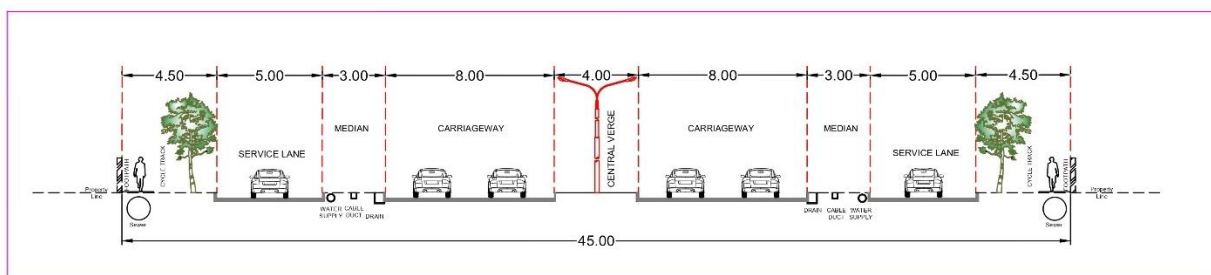
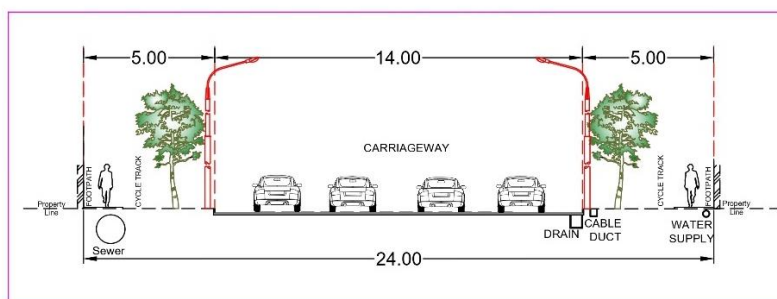


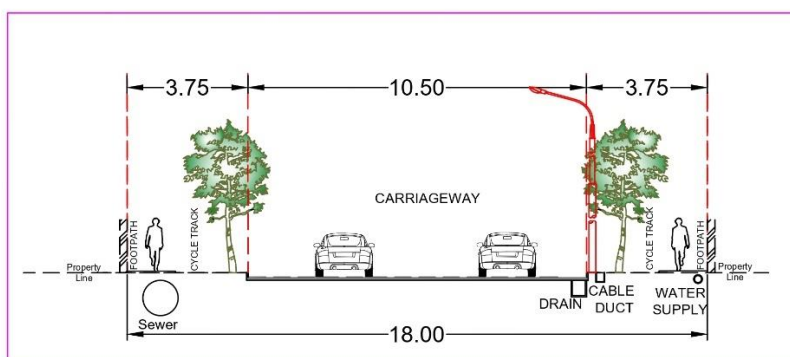
Figure 9-2: Proposed Transportation Network Map



CROSS-SECTION OF 45 M ROW



CROSS-SECTION OF 24 M ROW



CROSS-SECTION OF 18 M ROW

Figure 9-3: Cross Sections of Different Proposed Right of ways (ROW).

The proposed road network will ensure smooth connectivity for airport passengers, employees, residents, and freight, while maintaining flexibility for future upgrades if traffic exceeds projections.

9.7.4. Rotaries

The traffic will be managed through well designed rotaries at major road junctions for smooth flow of traffic and avoiding use of traffic lights during the perspective plan period. However, at a later stages, the traffic lights and over-passes may be used to cater the increased traffic.

9.7.5. The Light Rail Transit (LTR)

Futuristic traffic planning requires introduction of rail-based transit at later phases of development; however, it is imperative to make provisions at the initial planning stage.

10. PROPOSED LAND USE

This chapter deals with the transformation of the Vision and Strategy for the AASHA Notified Area, Shirdi, as envisaged in Chapter 3.1 of this report, into an implementable framework through the Development Plan— i.e., the Proposed Land Use Plan. Based on the Vision Statement, this chapter elaborates on the manner in which the proposed land use for the AASHA Development Plan has been derived. The plan builds on the strategic intent of establishing Shirdi Airport and its surrounding area as an airport-led economic growth centre that integrates aviation, logistics, tourism, commercial, and residential functions in a sustainable and resilient manner.

The important considerations guiding the proposed land use plan include existing natural features, existing infrastructure, development constraints, proposed airport connectivity, and regional economic linkages.

10.1. IMPORTANT CONSIDERATIONS

10.1.1. Economic Potential Around Shirdi Airport

Airports often act as catalysts for regional economic development by generating direct, indirect, and induced employment. Shirdi Airport's operationalization has already led to the emergence of tourism-based commercial activities and logistics support functions. The area surrounding the airport presents a unique opportunity to evolve into a multi-sectoral economic zone, encompassing hospitality, aviation logistics, light manufacturing, and business services.

The proposed land uses have therefore been structured to facilitate and support this airport-driven growth, ensuring synergy between employment nodes, residential catchments, and tourism flows.

10.1.2. Access and Connectivity

As elaborated in earlier chapters, the AASHA Notified Area is well connected through Shirdi–Manmad Highway (NH 160) and other regional road links connecting Kopargaon, Rahata, and Kakadi. Strengthening these corridors and establishing dedicated airport approach roads are crucial. The proposed plan also integrates internal circulation to reduce traffic conflicts between local and airport-bound movement.

Suitable land uses have been proposed along these approach routes to encourage linear commercial development and ensure orderly urban growth.

10.1.3. Constraints Due to Airport Operations

Planning in the vicinity of the airport must consider operational constraints, particularly:

- Height restrictions within the flight funnel as per DGCA norms.
- Noise contours that influence the location of sensitive land uses.
- Safety and security buffer requirements around the airside zone.

Land uses such as educational institutions, hospitals, and high-rise developments are avoided within the immediate airport influence zone. Prohibited uses such as landfills, slaughterhouses, or tall chimneys are excluded in accordance with MoCA guidelines.

10.1.4. Natural Features

The notified area includes existing forest cover, minor water bodies, and natural drainage channels. These features are retained and integrated into the development structure to maintain ecological continuity.

Appropriate green buffers and waterbody protection zones are incorporated to promote sustainable land management and improve microclimate.

10.1.5. Existing Physical Infrastructure

The area is traversed by transmission lines, solar farms, and village access roads. These utilities are considered while formulating the land use plan. Where necessary, realignment or undergrounding may be proposed in consultation with relevant authorities to minimize interference with airport operations and proposed Development activities

10.2. CONCEPTUAL DEVELOPMENT STRUCTURE

The Conceptual Development Structure for the AASHA Notified Area has been framed to realize the vision of transforming the Shirdi Airport region into a multifunctional aerotropolis, combining economic productivity, tourism infrastructure, and sustainable urban living.

The objectives guiding the conceptual structure include:

- Promoting airport-led economic growth and employment generation.
- Ensuring balanced distribution of land uses in relation to accessibility, topography, and environmental features.
- Establishing a robust mobility network linking airport facilities, commercial areas, and residential neighborhoods.
- Segregating local and airport-bound traffic for operational efficiency.
- Providing for adequate social and physical infrastructure as per URDPFI norms.
- Conserving natural resources and ecological assets.

The land use zoning therefore emphasizes:

- Airport and Allied Activities as the primary functional zone.
- Commercial and Mixed-Use belts adjoining major corridors.
- Residential and social infrastructure in environmentally suitable and accessible locations.
- Green/open spaces and forest areas as environmental buffers.

The Airport-led Economic Zone is positioned as the primary growth driver and includes airport-allied functions, logistics, MROs, and industrial-supportive activities. Adjacent to this belt, the Commercial and Mixed-Use Zone acts as an interface layer facilitating economic integration, tourism infrastructure, and high employment-generating uses. The Residential Zone is located further away from high noise exposure, benefiting from buffer areas and improved urban comfort conditions. Green and natural reserves retain the ecological balance of the region, while public and utility areas ensure essential infrastructure provisioning.

10.3. LAND USE ZONING

The proposed land use structure for the AASHA Notified Area has been formulated keeping in view its economic positioning as an airport-led regional growth hub, while ensuring balanced social, environmental and mobility considerations. Based on planning considerations following broad land use zones are proposed:

1. Residential Zone
2. Airport and Airport Allied Activities / Services Zone
3. Industrial Zone

4. Commercial Zone
5. Mixed Use Zone
6. Forest Zone

The FSI permissible in these zones will be as per UDCPR-2020.

10.3.1. Residential Zone (36.46 Ha, 1.85%)

The residential zone is planned as low to medium density clusters strategically located to ensure easy public transport access. This quantum has been kept moderate as the AASHA Notified Area is positioned primarily as a workforce-based, airport-linked employment and logistics zone rather than a residential township. Housing is envisaged predominantly for airport staff, industrial workforce, logistics personnel, and service sector employees working in the area.

10.3.2. Airport and Airport Allied Activities / Services Zone (708.24 Ha, 35.84%)

This zone forms one of the core drivers of regional economic transformation. It encompasses Airport, MRO facilities, cargo handling and logistics terminals, warehousing complexes, aircraft maintenance zones, aviation training centres, fueling and ground support infrastructure. This zone is planned to operate as a high-intensity economic cluster generating large-scale employment both direct and indirect.

10.3.3. Industrial Zone (41.28 Ha, 2.09%)

This zone is allocated for non-polluting, modern manufacturing units, aerospace component assembly, food processing and cold-chain-based industries that directly benefit from airport connectivity. The industrial development is envisaged in cluster format to promote facilities such as logistics yards and loading/unloading grids.

10.3.4. Commercial Zone (399.37 Ha, 20.22%)

This component of the land use zoning reflects the positioning of AASHA as a regional economic-commercial hub. The commercial allocation integrates transit-oriented development (TOD), recreation-based retail, tourism-support services, hospitality corridors, corporate offices, and airport-facing commercial estates. This large proportion is justified by the economic anchor function of the airport and its tourism spillover from Shirdi's religious tourism economy.

10.3.5. Mixed Use Zone (495.01 Ha, 25.06%)

Mixed Use zones are proposed as transitional areas enabling work-live-visit typologies. These typically include ground-floor commercial and upper-floor residential/office/service activity integrated with walkable public realms. These areas serve as spines connecting commercial activity with social infrastructure and supporting 24x7 economic vibrancy around airport influence areas.

10.3.6. Forest Zone (67.97 Ha, 3.44%)

Forest areas have been fully retained without alteration to preserve ecological balance and comply with environmental statutory frameworks. These also function as carbon sinks and biodiversity support areas within the growth zone.

10.4. LAND FOR PUBLIC PURPOSES

Land designated for public purposes primarily encompasses areas required for the provision of social and physical infrastructure essential for the orderly development of the notified area. It also includes land identified for the widening of existing roads and the development of the proposed transportation network, aimed at ensuring efficient internal circulation and enhanced regional connectivity.

The categories of land reserved for public purposes in the Development Plan are as follows:

- **Transportation Infrastructure:** Comprising the proposed and widened road network to facilitate efficient passenger and cargo movement and improve regional connectivity.
- **Open and Recreational Spaces:** Including gardens, playgrounds, and other open areas intended to serve as green lungs and recreational amenities for the local population.
- **Social Infrastructure:** Encompassing essential community facilities such as schools, healthcare centres, police and fire stations, and other public service institutions.
- **Physical Infrastructure:** Covering essential utility installations such as Electric Substations (ESS), Master Balancing Reservoirs (MBR), Clear Water Reservoirs (CWR), and Sewage Treatment Plants (STP), which are critical to the efficient functioning of urban services.

10.4.1. Transportation (137.02 Ha, 6.94%)

The proposed transportation infrastructure includes proposed roads, widening of existing roads, and proposed public parking for ease of passenger and cargo movement. The proposed road network is described in details in chapter 9 of this report.

Land reserved for mobility infrastructure including arterial roads, circulation roads, and major right-of-way improvements. The road hierarchy ensures seamless movement between industrial, airport-related, and commercial districts.

10.4.2. Social Infrastructure (18.93 Ha, 0.96%)

The provision of social infrastructure within the AASHA Notified Area has been planned in accordance with the Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, ensuring an equitable and need-based distribution of amenities. The detailed assessment of these facilities, along with planning norms and standards, is described in chapter 6 of this report.

Social infrastructure in the notified area comprises educational institutions, healthcare facilities, safety and emergency services, and community-level amenities that cater to the residents. The relatively low proportion of land allocated for social infrastructure is deliberate and contextually appropriate, as larger city-level facilities such as hospitals, colleges, and major community centres already exist within Shirdi and Rahata, located in close proximity to the notified area.

10.4.3. Public Utilities (31.93 Ha, 1.62%)

These areas are reserved for essential infrastructure — water supply facilities, STPs, ETPs, solid waste management, electrical substations, and telecom utility nodes. The number of utilities and planning norms adopted are discussed in Chapter 8 of this report.

10.4.4. Green/Open Spaces (33.79 Ha, 1.71%)

This land use includes landscaped public gardens, playground & recreational spaces, green buffers, and neighbourhood-level open spaces to create visual relief and improve environmental health.

Table 10-1: Proposed Land Use for AASHA Notified Area

SL NO	LAND USE CATEGORY	AREA IN HECTARES	PERCENTAGE OF DEVELOPED AREA	PERCENTAGE OF TOTAL AREA
1	Residential	36.46	1.92%	1.85%
2	Commercial	399.37	21.00%	20.22%
3	Mixed use Zone	495.01	26.03%	25.06%
4	Social Infrastructure	18.93	1.00%	0.96%
5	Industrial	41.28	2.17%	2.09%
6	Transportation	137.02	7.20%	6.94%
7	Garden, Playground & Recreation	33.79	1.77%	1.71%
8	Airport & Airport Allied Activities / Services	708.24	37.23%	35.84%
9	Public Utilities	31.93	1.68%	1.62%
	Total Developed Area (A)	1902.03	100.00%	96.29%
10	Water Bodies	5.53		0.27%
11	Forest	67.97		3.44%
	Total Undeveloped Area (B)	73.50		3.71%
	Total Area (A+B)	1975.53		100.00%



11. ENVIRONMENT, SUSTAINABILITY AND DISASTER MANAGEMENT

Environmental sustainability is an important aspect of the Development Plan as it directly influences the quality of life and long-term resilience of the AASHA Notified Area. Being predominantly a greenfield development, the area provides an opportunity to adopt a holistic and sustainable planning approach through appropriate land use planning and environmental considerations. This chapter outlines the environmental context of the notified area and emphasizes the protection of natural systems, while also addressing disaster management through risk reduction, preparedness, mitigation measures, and resilient infrastructure planning to ensure safe and sustainable development.

11.1. INITIAL ASSESSMENT AND MITIGATION

Initial planning considerations for the AASHA Notified Area have focused on minimizing potential environmental impacts arising from the proposed airport-linked and mixed-use development. The Development Plan promotes environmentally sensitive and sustainable development through measures such as alignment of infrastructure with natural drainage patterns, protection of existing vegetation, minimization of site disturbance, and provision of landscaping and green buffers to maintain ecological balance and environmental sustainability.

11.2. IMPACT ON EXISTING NATURAL FEATURES

11.2.1. Impact on Region's Rivers, Streams and Drainage

The AASHA Notified Area falls within the broader basin of the Godavari River and contains a few seasonal streams and natural drainage channels connected to larger regional watercourses. Although the proposed development is not expected to directly affect major perennial rivers, improper development activities may influence downstream water quality, natural flow patterns, sedimentation, and local flooding conditions.

11.2.2. Natural Watercourses and Groundwater Recharge

Although the site may lack sizeable perennial watercourses, the presence of minor seasonal channels makes it critical to safeguard natural hydrology. Measures proposed include prohibition of construction within specified buffer zones along watercourses, retention of natural drainage corridors and riparian buffers, and provision of protective buffer distances of 9 m for minor channels and 15 m for major channels. The plan also proposes retention/detention basins, infiltration features, and integrated storm-water management strategies to support groundwater recharge, moderate flash runoff, and ensure controlled release of storm water. Landscaping and native vegetation along drainage lines have also been considered to stabilize banks, reduce runoff velocity, and promote ecological balance.

11.2.3. Vegetation, Green Cover and Forest Areas

While the Notified Area may not contain large contiguous forest blocks, there will be existing tree cover, plantations, scrubland and agricultural fields whose loss should be minimised. Best practice measures include:

- Minimising tree-clearing
- Undertaking compensatory plantation (often 1:3 or greater) for any trees removed;
- Creating urban green corridors, buffer belts and enhanced landscaping
- Using locally-appropriate native species to support biodiversity and micro-climate improvement.

11.2.4. Environmental Concerns from Development

The proposed airport and associated development bring three broad environmental impact categories: (a) emissions & noise; (b) land-use change; (c) water, wastewater & waste management.

Air Emissions & Noise

Airport operations, vehicular movement, and support activities may generate air and noise pollution affecting surrounding areas. Measures such as green buffers, traffic segregation, use of low-emission vehicles, zoning of sensitive land uses away from high-noise areas, and monitoring of pollution levels have been considered to minimize impacts.

Land-Use Impacts

Proposed development may alter natural land conditions and increase risks such as erosion and heat-island effects. To minimize impacts, the plan promotes compact development, retention of green/open spaces, slope and erosion management, and use of permeable surfaces where feasible.

Water & Waste Management

The proposed development may generate wastewater, stormwater runoff, and solid waste during construction and operation phases. Measures such as sewage treatment and reuse, storm-water management systems, waste segregation, recycling, and safe disposal practices have been proposed to support sustainable environmental management.

11.3. SUSTAINABILITY

Sustainability should be a cross-cutting theme across planning, design, construction and operation. The following components are recommended:

11.3.1. Water Conservation and Recycling

Considering the projected increase in water demand, the Development Plan proposes water conservation measures such as rainwater harvesting, groundwater recharge, wastewater treatment and reuse, dual-pipeline systems for potable and non-potable water supply, and utilization of treated water for landscaping and other non-potable purposes, in accordance with relevant UDCPR provisions for rainwater harvesting and wastewater treatment.

11.3.2. Renewable Energy

The Development Plan promotes the use of renewable energy through installation of solar photovoltaic (PV) systems on rooftops, parking areas, and open spaces within the airport precinct. Installation of Solar Assisted Water Heating (SWH) Systems and Roof Top Photovoltaic (RTPV) Systems shall be encouraged/provided as per relevant UDCPR provisions. Incorporation of passive solar design, energy-efficient building systems, and other feasible renewable energy options has also been encouraged to support sustainable energy management.

11.3.3. Non-Motorized Transport (NMT) & Smart Mobility

The Development Plan promotes sustainable and environmentally friendly mobility through provision of pedestrian-friendly streets, continuous footpaths, cycle tracks, and improved public transport accessibility. Mixed-use development patterns and walkable neighbourhoods have been encouraged to reduce travel distances and dependence on fossil-fuel-based vehicles. Provision for electric vehicle (EV) charging infrastructure and other low-emission transport facilities has also been considered.

11.3.4. Green Buildings & Low-Carbon Infrastructure

The Development Plan encourages adoption of green building practices in line with relevant UDCPR provisions and green building standards such as IGBC and GRIHA. Measures including energy-efficient building systems, water conservation and recycling, use of environmentally friendly materials, natural lighting and ventilation, and waste management practices have been encouraged to promote sustainable and resource-efficient development.

11.3.5. Tree Plantation, Green Corridors and Biodiversity Enhancement

The Development Plan promotes enhancement of green cover through tree plantation, development of green buffers along roads and airport periphery, and landscaping using native species. Provision of parks, open spaces, and landscaped buffer areas has also been considered to improve the microclimate, ecological balance, and overall environmental quality within the notified area.

11.4. DISASTER MANAGEMENT

Disaster-management plans must cover both the airport/industry-linked risks and natural hazards.

11.4.1. Development-Linked Risks

- **Aircraft Accident / Crash Risk:** Areas within approximately a 5 km radius of the airport are exposed to higher risks of aircraft mishaps or runway excursions. Joint preparedness by airport authority, fire & rescue, police, ambulances and local hospitals is essential.
- **Fire Hazards:** From aircraft ground operations, fuel-handling, maintenance, ancillary logistics, warehouses etc. The plan should provide for fire-water systems, hydrants, foam-systems, isolation zones and emergency access roads.
- **Hazardous Goods Handling:** Storage and transit of dangerous goods (fuel, aviation chemicals, cargo) must comply with DGCA/airport regulations, have separate containment, emergency response plan (ERP) and buffer zones.

11.4.2. Natural Disasters

The AASHA Notified Area lies in a moderate seismic zone (as per Indian Standard seismic-zone map) and is subject to floods/flash-floods during heavy monsoon rains due to its undulating terrain and seasonal streams. Key measures include:

- **Flood Management:** Design of integrated stormwater-drainage network, retention/detention basins, diversion channels for seasonal flows, road and site-grading to ensure safe drainage, and flood-plain avoidance for critical infrastructure.
- **Earthquake / Seismic Resistance:** All buildings and infrastructure should conform to the latest National Building Code of India and IS 1893/IS 13920 standards for seismic-resistant design. Periodic monitoring and emergency drills should be incorporated into operations.
- **Emergency Response & Evacuation Planning:** Identify emergency-shelter zones, evacuation routes, assembly areas, first-aid centres and integrate with airport/municipal disaster-management authority.

11.5. CONCLUSION

The AASHA Notified Area's Development Plan has built-in strong safeguards for environment, sustainability and disaster resilience. Through incorporation of mitigation measures at planning/design stage, prioritisation of renewable energy, recycling, non-motorised mobility, green-building incentives and disaster-ready infrastructure, the plan aims to create a modern, resilient, low-impact built environment.

12. BLOCK COST ESTIMATE, PHASING AND FINANCING PLAN

12.1. INTRODUCTION

This Chapter deals with the block cost estimates for various components of the Development Plan and the Phasing plan. The block estimates include the block costs of development for Social Facilities and Reservations, Transportation Infrastructure, Water supply Infrastructure, Sewerage Infrastructure, Storm Water drains and Solid waste management.

12.2. COST OF DEVELOPMENT

Cost of developing physical infrastructure is calculated and as described in Table 12-1.

Table 12-1: Cost of Physical Infrastructure

Sr. No.	DESCRIPTION	Unit	Cost in INR (Cr)
1	Road works	30.51 kms	140.0
2	Water sourcing	MLD	33.49
3	Rising Main from Intake to WTP - 9 Kms	KM	24.9
4	Water Treatment Plant (WTP) - 55 ML	ML	121.0
5	Clear Water Reservoir (CWR)	ML	132.0
6	Over Head Tank (OHT) - 2 nos of 6 ML each and 1 of 7ML	ML	66.5
7	Water Distribution Network - 30.5 kms	KM	40.1
8	Collection Sewer Network - 30.5 kms	KM	60.2
10	Sewage Treatment Plant (STP) - 65 MLD	MLD	195.0
11	Recycled water Tank	ML	96.0
12	Recycled water Distribution Network	KM	40.1
13	Drainage Network - 30.5 kms	KM	80.3
15	Solid Waste Management	KM	60.2
16	Electrical works		200.7
Total			1240.9

12.3. INSTITUTIONAL FRAMEWORK

The implementation of the Development Plan for the *Area Around Shirdi Hub Airport (AASHA) Notified Area* shall be undertaken through a defined institutional framework to ensure coordinated, transparent, and efficient realization of the proposed development strategies and projects.

The Shirdi Airport has already been developed and is operational under the management of the Maharashtra Airport Development Company (MADC).

The MADC, acting as the Special Planning Authority (SPA) for the AASHA Notified Area under the provisions of the Maharashtra Regional and Town Planning (MRTP) Act, 1966, shall be responsible for the implementation, regulation, and monitoring of the Development Plan. The SPA shall ensure that the development within the notified area takes place in a planned, phased, and sustainable manner in conformity with the approved land use and UDCPR-2020.

To facilitate efficient execution, the SPA shall establish a structured institutional mechanism comprising dedicated departments or units with clearly defined roles and responsibilities. These may include units for Urban Planning, Infrastructure Development, Land and Estate Management, Project Finance, and Monitoring and Evaluation.

The key functions of the institutional framework shall include:

- Regulation of new development proposals in accordance with the Development Plan and UDCPR;
- Coordination with State and local agencies such as MIDC, PWD, MSRDC, and local governing bodies for infrastructure development;
- Facilitation of public–private partnerships and stakeholder participation in implementation of key projects;
- Preparation of detailed implementation plans, project phasing, and financial structuring;
- Ensuring transparency, accountability, and efficiency in project execution through systematic monitoring and reporting mechanisms.

The establishment of a robust institutional framework under the leadership of MADC will ensure the effective realization of the vision and objectives of the Draft Development Plan, leading to well-regulated, sustainable, and integrated regional growth around Shirdi Airport.

12.4. PROJECT IDENTIFICATION AND PHASING

The financing plan is a strategic plan, which sets out in detail the policy and investment options. The plan sets out baseline for the performance of the MADC, its priorities and aims for future. The financing plan is a tool to implement comprising of projects and reforms to be undertaken by the MADC in a planned way.

The financing plan broadly aims to satisfy the following objectives:

1. Identifying the essential projects across sectors.
2. Phasing and scheduling investments in a sustainable manner to avoid fiscal deficit scenarios
3. Prioritization of needs and capital investment phasing.

12.5. PROJECT IDENTIFICATION AND PHASING

The development of the AASHA Notified Area is strategically aligned with the continued growth and operational expansion of the Shirdi Airport. The airport acts as the primary economic driver for the region, catalyzing development in sectors such as logistics, hospitality, industry, and institutional services. Accordingly, the implementation of the Development Plan shall be undertaken in phases, ensuring that infrastructure and land development correspond proportionately to the evolving demand and regional investment climate.

The phasing strategy aims to:

- Promote balanced and sequential development.
- Optimize utilization of public investment and resources.
- Avoid premature development of infrastructure in low-demand areas.
- Ensure timely provision of physical and social infrastructure facilities.
- Encourage private participation in later stages as the area matures.

The facilities and land use proposals indicated in the Development Plan will be developed in successive stages, each with defined priorities and focus areas.

Table 12-2: Indicative Phasing Strategy for AASHA Notified Area

Phase	Period (Indicative)	Focus Areas	Key Components / Interventions	Responsible Agency
Phase I – Foundational Development	Years 1–5	Establishment of basic infrastructure and enabling framework	<ul style="list-style-type: none"> Development of primary access and circulation roads (arterial & sub-arterial network) Provision of essential physical infrastructure (water supply, power, sewerage, stormwater) Operationalization of utility services (ESS, MBR, STP, CWR) Demarcation and servicing of airport allied and logistics zones Institutional setup for SPA operations and governance 	<p>PWD will be responsible for Road works.</p> <p>MADC will be responsible for Demarcation and servicing of airport allied and logistics zones</p> <p>MADC will also be responsible for Institutional setup for SPA operations and governance</p>
Phase II – Growth and Consolidation	Years 6–10	Industrial, commercial, and workforce housing development	<ul style="list-style-type: none"> Expansion of internal roads and connectivity to state and national highways Development of commercial and mixed-use corridors Establishment of small and medium-scale industries and logistics parks Construction of workforce housing and dormitory-type residential clusters Strengthening of social infrastructure including schools, clinics, police and fire stations 	<p>PWD will be responsible for Road works.</p> <p>MADC with PPP partners will be responsible for Establishment of small and medium-scale industries and logistics parks and Construction of workforce housing and dormitory-type residential clusters</p> <p>MADC will be responsible for strengthening of social infrastructure including schools, clinics, police and fire stations</p>
Phase III – Maturation and Expansion	Years 11–20	Integrated township and regional integration	<ul style="list-style-type: none"> Development of higher-order social infrastructure and community facilities Expansion of recreational and open space networks 	MADC with PPP partners will be responsible for social, recreational facilities, institutional, research and training centres, premium

			<ul style="list-style-type: none"> Establishment of institutional, research and training centres Development of premium residential and hospitality projects 	residential and hospitality projects.
--	--	--	--	---------------------------------------

Table 12-3: Phase Wise Block Cost Estimate

Sr. No.	DESCRIPTION	Cost in INR (Cr)	Cost in INR (Cr)	Cost in INR (Cr)	Total Cost in INR (Cr)
		Phase-I	Phase-II	Phase-III	
1	Road works 30.51 kms	56.0	42.0	42.0	140.0
2	Water sourcing (Intake Works)	33.5			33.5
3	Rising Main From Intake to WTP - 12 Kms @1200 mm	24.6			24.6
4	Water Treatment Plant (WTP) - 55 ML @2.2 per ML	44.0	44.0	33.0	121.0
5	Clear Water Reservoir (CWR) - 55 ML	48.0	48.0	36.0	132.0
6	Over Head Tank (OHT) - 2 nos of 6 ML each and 1 of 7ML	24.5	29.8	26.2	80.4
7	Water Distribution Network - 30.5 kms	16.9	15.0	13.8	45.7
8	Collection Sewer Network - 30.5 kms	19.8	17.1	15.8	52.8
10	Sewage Treatment Plant (STP) - 65 MLD	75.0	60.0	60.0	195.0
11	Recycled water Tank	48.0	24.0	24.0	96.0
12	Recycled water Distribution Network	9.1	7.0	6.1	22.2
13	Drainage Network - 30.5 kms	35.5	27.0	23.9	86.4
14	Rain Water Harvesting Pits				0.0
15	Solid Waste Management	30.1		30.1	60.2
16	Electrical works	80.3	60.2	60.2	200.7
Total		545.2	374.2	371.0	1290.5

12.6. MADC REVENUE WITHIN AASHA NOTIFIED AREA

The revenue income sources of MADC within AASHA Notified Area can broadly be categorized as development charges and revenue through leasing land in the Developable Zone, Development Charges received through Development Permission etc.

The project has significant long-term revenue generation potential. The approximate cost of land acquisition for land under Airport and Airport Allied Activities & Service Zone is Rs. 350 Cr. Through planned leasing and development of this land as per base rate for land side development in Shirdi Airport, MADC is expected to generate revenues exceeding Rs. 1,100 Cr. Additionally, development permissions within the AASHA Notified Area are projected to generate approximately Rs. 60 Cr in revenue. Further, Shirdi Airport is a successfully operational airport with a number

of commercial establishments and allied business activities within its premises. These commercial developments generate additional revenue streams, which contribute towards meeting infrastructure development of AASHA Notified Area.

12.7. COMMON FINANCIAL RESOURCES

12.7.1. Government of India Schemes Supporting Infrastructure and Urban Development

Several Government of India initiatives provide financial and institutional support for infrastructure development, urban services, tourism promotion, and environmental management. **The Atal Mission for Rejuvenation and Urban Transformation 2.0** focuses on improving urban infrastructure by ensuring universal access to water supply, sewerage and septage management, stormwater drainage, and development of green spaces in cities. **The Smart Cities Mission** promotes sustainable and technology-driven urban development through improved mobility, digital governance, efficient energy use, waste management, and development of quality public spaces. **The Swachh Bharat Mission (Urban) 2.0** supports sanitation and scientific solid waste management systems in urban areas, including waste processing facilities and faecal sludge management infrastructure.

The Jal Jeevan Mission (Urban) aims to provide universal functional household tap connections in urban areas along with sustainable water resource management and reuse of treated wastewater. Infrastructure connectivity and coordinated planning are supported through the PM Gati Shakti National Master Plan, which integrates infrastructure development across sectors such as roads, railways, ports, airports, waterways, and logistics through a GIS-based digital platform. The National Infrastructure Pipeline further promotes large-scale infrastructure investment across sectors including energy, transport, and urban development.

Financial assistance for economically justified but financially unviable projects can be accessed through **Viability Gap Funding Scheme**, which provides capital grants to encourage private sector participation in public infrastructure projects under the Public-Private Partnership (PPP) framework. Infrastructure development is also supported through the **Central Road and Infrastructure Fund**, which is financed through a cess on petrol and diesel and utilized for development of national highways, state roads, railways, waterways and other infrastructure projects. Furthermore, the Government of India provides financial assistance to states through **Special Assistance to States for Capital Investment**, which offers long-term interest-free loans to support infrastructure development aligned with national priorities such as the PM Gati Shakti framework.

The Jal Jeevan Mission (Urban) aims to provide universal functional household tap connections in urban areas along with sustainable water resource management and reuse of treated wastewater. Infrastructure connectivity and coordinated planning are supported through the PM Gati Shakti National Master Plan, which integrates infrastructure development across sectors such as roads, railways, ports, airports, waterways, and logistics through a GIS-based digital platform. The National Infrastructure Pipeline further promotes large-scale infrastructure investment across sectors including energy, transport, and urban development.

Tourism and pilgrimage-based development in the Shirdi region can be leveraged through schemes such as the **Swadesh Darshan Scheme**, which focuses on thematic tourism circuits, and the **PRASHAD Scheme**, which aims to enhance infrastructure at pilgrimage destinations. Industrial and economic growth can be supported under the Make in India initiative, promoting investment and job creation in emerging growth centres.

Affordable housing development may be aligned with the **Pradhan Mantri Awas Yojana Urban**, which provides financial assistance for housing for economically weaker sections. Transport and road infrastructure projects can be funded through the Central Road and Infrastructure Fund, while port-led and logistics-based development linkages (where applicable) can be explored under the Sagarmala Programme.

Financial viability and private sector participation in infrastructure projects can be enhanced through the Viability Gap Funding Scheme, which provides capital grants for PPP projects. Additionally, states are supported through the Special Assistance to States for Capital Investment, offering long-term interest-free loans for infrastructure development aligned with national priorities. Renewable energy and sustainability initiatives within the AASHA Notified Area can also be integrated with schemes of the Ministry of New and Renewable Energy, promoting solar energy adoption and energy-efficient infrastructure.