

Jawaharlal Nehru Port Trust

Comprehensive Land Use Plan – Final Report



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Mumbai



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1 Executive Summary

1.1 Project Background and Context:

Leasing of lands under the control of all the major ports in India is done as per the guidelines and policies issued by Central government from time to time.

Since April 1997, the lease rate of port lands is subject to the approval by TAMP. Prior to which the land lease rates were prescribed by the port itself and the allocation process was according to the guidelines of major port trust act, 1963 and guidelines by central government.

The 1995 guidelines by Government has stated that every port trust should have comprehensive land use plan for the next 30 years and stated that the plan should be revised every 5 years with approval from ministry

The subsequent guidelines of 2004 and 2010 also stated that land use plan should be prepared by the port and communicate the same to the centre but does not specify the frequency of review. The 2014 guidelines reiterate the need for land use plan and the land use plan should be reviewed every 5 years.

The previous guidelines and policies, even though provided a very good framework for leasing out port lands, has some scope for ambiguity when interpreting the directives given. This is highlighted in the recent CAG report of 2016.

It was also observed that the guidelines on fixing the lease rate and terms has made it difficult for JNPT to be as competitive as CIDCO for attracting various stake holders to establish industries within its premises. The coming Major ports act 2016 is expected to remove all these ambiguities and help JNPT to optimally utilize the land parcels available for developing industries thereby ensuring increase of traffic and revenues to the port.

JNPT has earlier prepared a land use plan in 2006 and now intends to review the land use plan and prepare a revised land use plan considering the present scenario.

1.2 Project objective and key activities performed

As a part of review of the systematic development of JN Port in a phased manner ensuring optimal utilization of its land resources, waterfront and water spread areas; the report aims to update the existing land use Plan covering a minimum period of 20 years. This will cover Land Use Plan for the unutilized lands inside and outside the JN Port. The land use of the port needs to be reviewed and further synchronised with the upcoming projects and developments

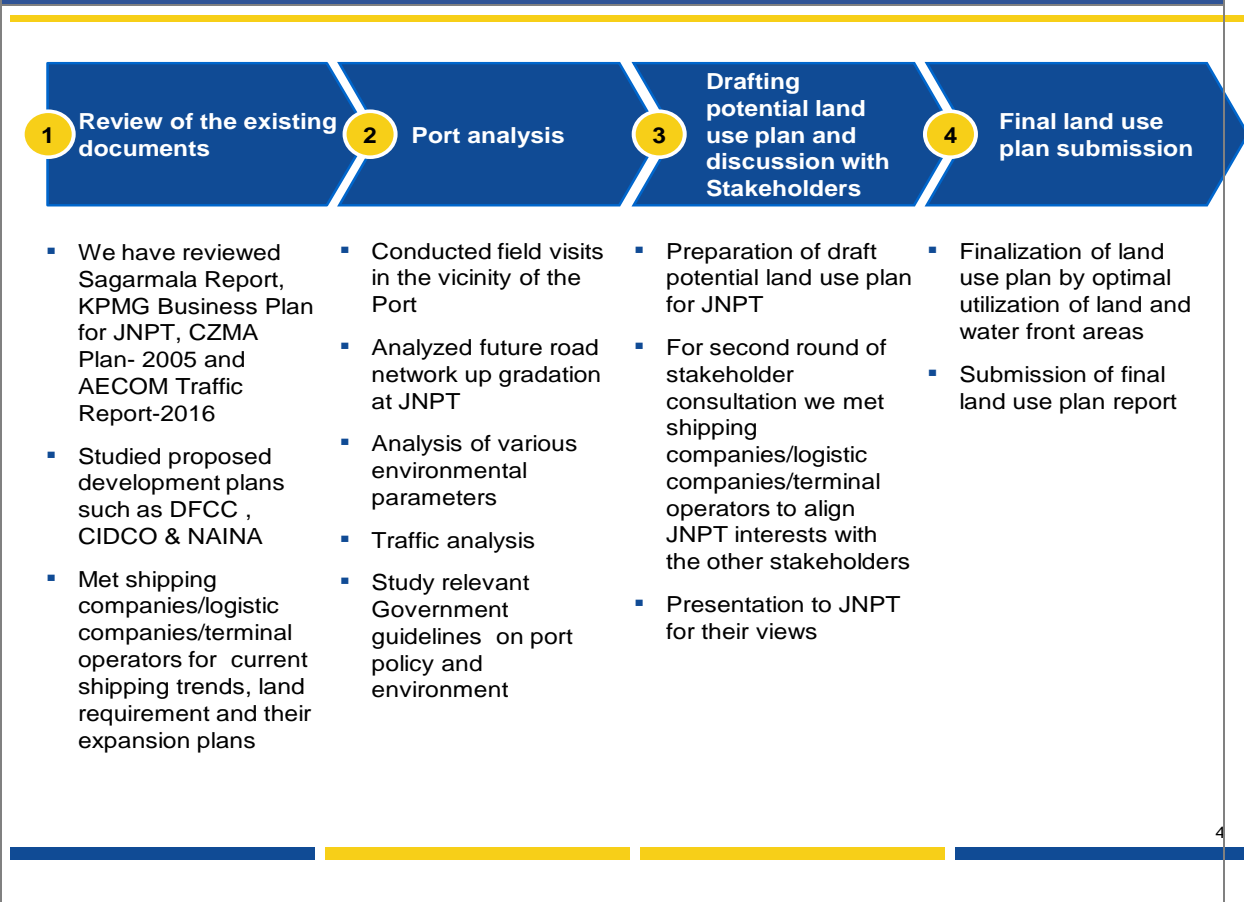
The key activities followed in preparing the Report are:

- **Review of existing documents:** We have reviewed existing documents and also went through all the reports and other documents for study and keeping backup information such as Sagarmala Report, KPMG Business Plan for JNPT, CZMA Plan- 2005 and AECOM Traffic Report-2016.
- **Field visits:** We made several visits in the vicinity of the Port to understand the ground situation and potential measures that can be taken. Several technical team members including our experts in environmental management and other expert visited the port area.
- **Undertook study of proposed development plans of other development authorities:** We have considered and studied the Dedicated Freight Corridor (DFC) which is under development by Railways and Delhi Mumbai Industrial Corridor (DMIC) development of SEZs.
- **Preparation of existing land use pattern:**After completing the above set of activities we prepared the existing land use plan map.
- **Meeting with key stakeholders:** Detailed consultations was conducted with various stakeholders like JNPT, concern Government departments,

industries, companies, importers, exporters, potential investors/BOT operators of JNPT and key people who have the background of in the sector, etc. with specific deliberations on project proposals and receive opinions. We also discussed the opportunities and constraints for the present and future development and operation of the port and ascertain the present and future industrial and commercial needs with reference to traffic, methods for handling, stores, transportation and land requirement.

- **Studied other development projects of JNPT:** We studied various development projects like Development of Eco parks, road network up gradation and development of road based industries. This has helped understand the current situation and what JNPT wants to develop in near future.
- **Traffic analysis:** We did traffic analysis through secondary data sources such AECOM traffic report, Sagarmala report et.. and through them did our own traffic projection till year 2035.
- **Studied Government guidelines:** We had studied all the relevant guidelines issued by Pollution Control Board, Government of Maharashtra and other departments regarding safety control, coastal zone regulation, handling & storage of cargo terminals and land use.
- **Finalization of land use plan:** We have finalized land use plan for optimal utilization of land and water front areas by applying zoning principles of national and international standards for allocating areas for hazardous, non-hazardous liquid bulk, dry bulk etc. We also complete effective and profitable use of land with safety measures.

Exhibit 1: Key steps undertaken to prepare the report



1.3 Port Analysis

- JNPT being one of the premium major ports in India, handles 40% of EXIM Container traffic in India. As per the business report of JNPT it could handle up to 23 million TEUs per annum by 2025, which is 5 times the existing throughput.
- Even though JNPT continues to handle bulk of India's container volume, its share of the container volumes has shown a decline since 2009 due to diversion of traffic to Gujarat because of lesser waiting time at these locations.
- Waiting time at JNPT has increased due to congestion. At present, port could contain this congestion problem by implementing measures like

automated gate systems, inter terminal truck transfers and central parking facility and rationalization of customs processes.

- At present, JNPT is serving ICDs which are present in North India. These ICDs are bound to be connected by the proposed dedicated freight corridor. The dedicated freight corridor is supposed to be completed from Delhi to Vadodara in one year time. The connection of DFC up to Mumbai is expected to take an additional two to three years. This delay in connection of DFC to Mumbai might cause some loss of traffic to Gujarat ports which will be closer to ICDs in North India.
- It is expected that the proposed 4th container terminal shall increase the container traffic to around 10 million TEU per annum which will add a significant stress to the existing infrastructure. So, the augmentation of available infrastructure like existing roads and parking spaces is required for smooth operation of the port. In addition, measures to improve the share of container transport to/from the port by rail is crucial for the sustenance of traffic at JNPT.
- Terms of lease within JNPT limits are significantly higher than the areas outside, which has led to establishment of CFSs associated with JNPT outside JNPT limits.
- Due to sluggish growth of container volumes handled by JNPT from past three years, the CFSs dependent on JNPT volumes are struggling to achieve break even volumes.
- To ensure sustenance of traffic at JNPT, industries can be planned in the vacant plots available within JNPT.
- Major chunk of the available vacant land parcels within JNPT falls under mangrove areas. The mangrove and green area shown in the figure--- above falls under CRZ-1 as per the CZMP map. A portion of this area can be utilized for establishment of storage of non-hazardous cargo which

needs approval from MOEF as per the clause 8-I-ii (c) given in 2011 CRZ notification.

- Leasing out the available vacant land parcels to warehousing can solve JNPT congestion problems permanently problem and at the same time fulfil MOEF norms.

1.4 Existing land use

- The total land available with JNPT is around 3402 hectares. Of this, the filled vacant land is around 386.5 hectares and the sparse mangroves are around 617.5 hectares. Of the 671.7 hectares of vacant land, 386.5 hectares is filled land and 285.2 hectares is unfilled land.
- The port will witness an increase of 5 million TEUs per annum in coming 5 years with the construction of 4th terminal and port based SEZ, this would call for optimal land use planning.
- Large land area around 233.3 hectares that falls under hilly terrain is unviable to have any commercial developments. This area is reserved as green zone.
- In the year 2000 the total mangrove area within JNPT was around 406 hectares and the same grew to 885 hectares by 2014 and 913.6 hectares by 2016 due to a breach in the bund which was abutting the dense mangroves on the Nhava creek side.
- JNPT port for sustaining its position as one of the major hub port in western India, must develop industries which will act as a catalyst in generating additional revenues, attaining sustainability of port. These industries also have a lot of employment generation potential. Towards this purpose JNPT must make optimum use of the all the land parcels available.

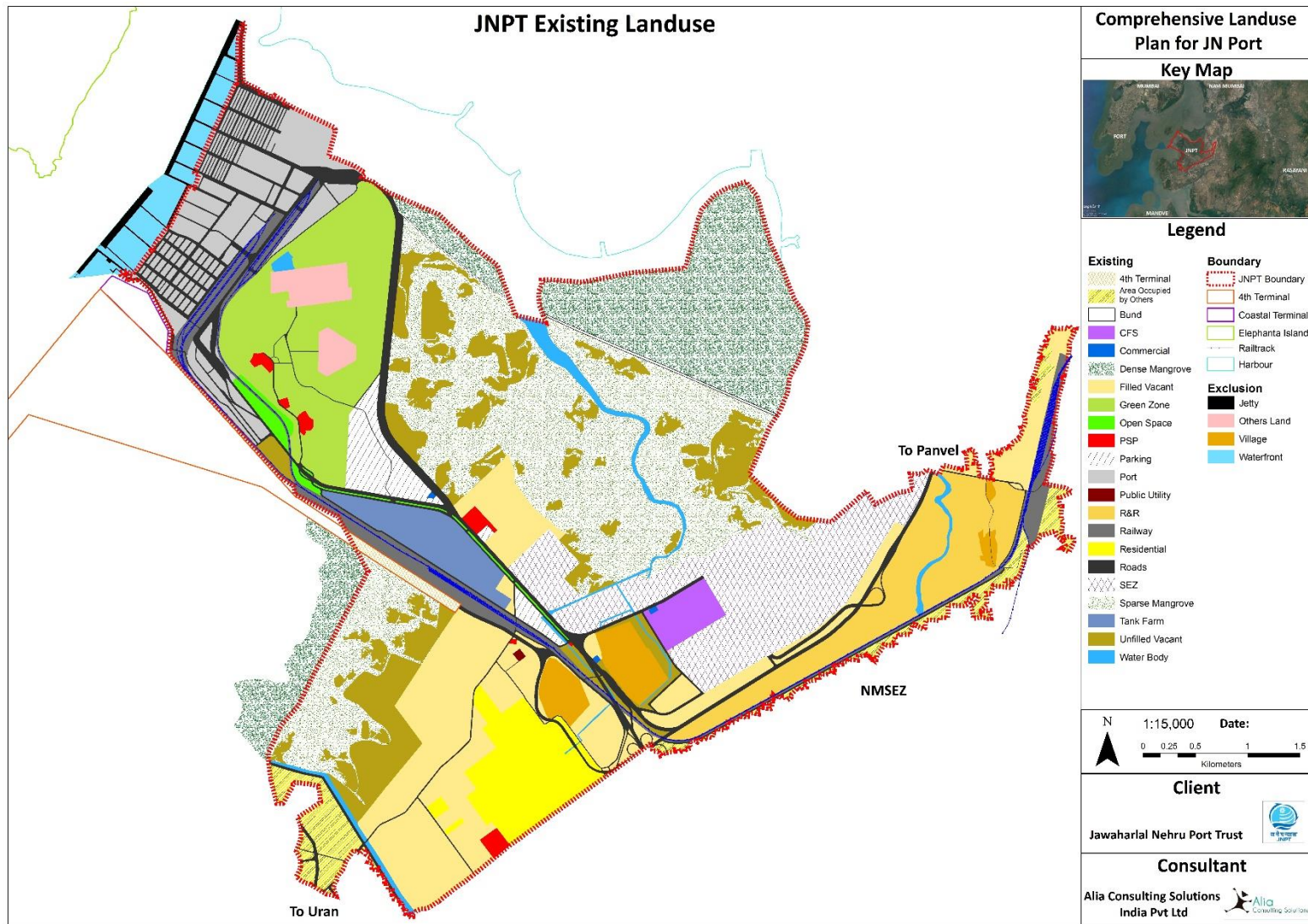
- To leverage the available land optimally, JNPT must reclaim the lands which has been occupied by the sparse mangroves after year 2000 due to breach in the bund. Instead of removing the sparse mangroves entirely, some part of the land area occupied by the sparse mangroves can be utilised to rehabilitate the mangroves removed thereby making the mangrove free area suitable for development of industries.

The existing land use is as follows:

Landuse	Area in hectares	%
Dense Mangrove	295.7	8.69%
Sparse Mangrove	617.9	18.16%
Bund	7.09	0.21%
Filled Vacant	386.5	11.36%
CFS	27.33	0.80%
Parking	53.68	1.58%
PSP	14.11	0.41%
SEZ	270.5	7.95%
Area Occupied by Others	157.17	4.62%
Railway	123.7	3.64%
R&R	159.8	4.70%
Unfilled Vacant	285.2	8.38%
Residential	111	3.26%
Public Utility	0.78	0.02%
Open Space	17.29	0.51%
Tank Farm	60.48	1.78%
Commercial	1.06	0.03%
Port	176.9	5.20%
Green Zone	233.3	6.86%
Roads	214.2	6.29%
4th Terminal	62.32	1.83%

Area under berthing	82.77	2.43%
Water Body	44.17	1.30%
Total	3402.95	100.00%

FIGURE 1-1 JNPT EXISTING LANDUSE



1.5 Proposed land use

- The entire land area of JNPT i.e. both custom bond areas and non-custom bond areas except the SEZ area is divided into the different zones for ease of administration.
 - .1. Zone 1: custom bond areas are included in Zone-1
 - .2. Zone 2: Green zone
 - .3. Zone 3: existing Oil storage
 - .4. Zone 4A: proposed industries
 - .5. Zone 4B: proposed industries and proposed eco park
 - .6. Zone 5: existing CFS
 - .7. Zone 6: Township area
 - .8. Zone 7: villages and land allocated for R&R purpose
 - .9. Zone 8: Mangroves
- The total area available in zone 4A and zone 4B is around 1173.81 hectares, of this area, 205.61 hectares are proposed to be left out for Eco Park Excluding these areas from the available area leaves 968.2 hectares for industries and associated facilities development.
- The development is proposed to happen in three phases
 - .1. Phase-1 (2017 – 2025)
 - .2. Phase-2 (2026 -2030)
 - .3. Phase-3 (2031 -2045)
- For ensuring free movement of the traffic within the proposed development, three different types of roads are proposed.
 - .1. Main arterial roads in the 70m corridor
 - .2. Sub arterial roads in 50m corridor

.3. Collector roads in 30m corridor

- The whole area is divided into 2 hectare plots such that every plot is at least served by a sub arterial road. These corridors are expected to accommodate the roads, utility corridor and drains. These corridors are provided to help the port in accommodate any future requirements of the proposed units without disrupting their operations.
- Some of the land area has three small branches of creek. To allow the exchange of water during high and low tides and prevent the area getting filled up with water, it is proposed that these small branches should be widened and create two holding ponds with green belt abetting the length of these ponds

Phase -1 land use is given below

Area Statement of Phase-1A		
S.No	Activity	Area in Hectares
1	Agro Based Storage	5.99
2	Bio Diesel	15.35
3	Car Storage	6.26
4	Cement Silo	2.46
5	Cold Storage	38.00
6	Container Repair	9.19
7	Container Scanner	5.68
8	Parking	27.51
9	Port User Residential	13.80
10	PSP	8.84
11	Public Utility	35.28
12	Research Labs	8.59
13	Retail Warehousing	64.89
14	Petrol Pump	4.62
15	Social Commercial	8.79
16	Waterbody	2.73
17	Green Buffer	5.88
18	Roads	59.72

Area Statement of Phase-1A		
S.No	Activity	Area in Hectares
	Total	323.58

Area Statement of Phase-1B		
S.No	Activity	Area in Hectares
1	Eco Park	205.61
2	Open Space	11.59
3	Waterbody	16.87
4	Roads	54.16
5	Green Buffer	12.79
	Total	301.02

Phase-2 land use is given below

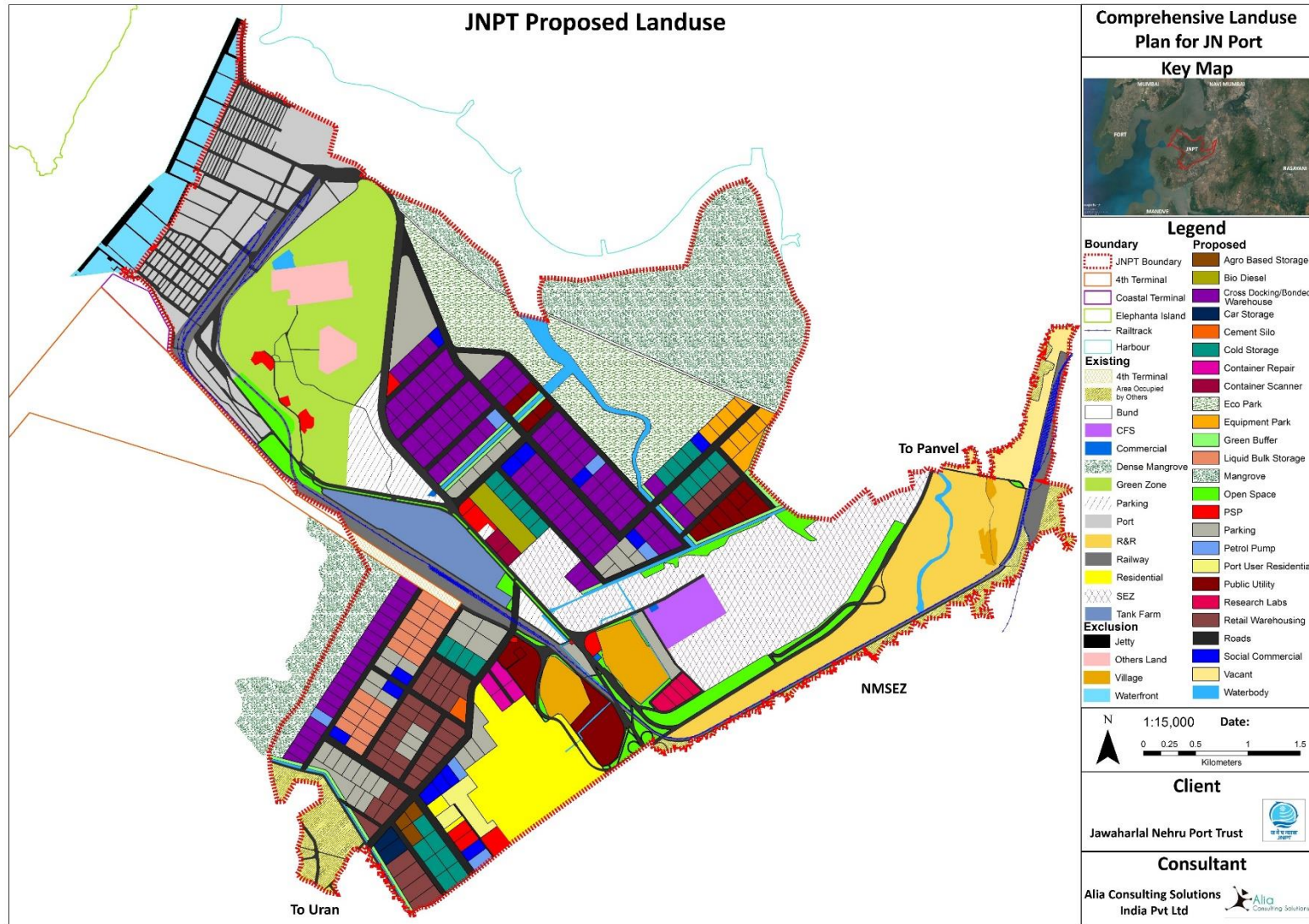
Area Statement of Phase-2		
S.No	Activity	Area in Hectares
1	Cross Docking/Bonded Warehouse	66.76
2	Petrol Pump	3.89
3	Parking	30.59
4	Public Utility	18.09
5	Social Commercial	6.81
6	Roads	10.62
7	Green Buffer	3.95
8	Waterbody	1.29
	Total	142.00

Phase-3 land use is given below

Area Statement of Phase-3		
S.No	Activity	Area in Hectares
1	Cross Docking/Bonded Warehouse	162.32

Area Statement of Phase-3		
S.No	Activity	Area in Hectares
2	Petrol Pump	4.00
3	Cold Storage	18.00
4	Equipment Park	23.22
5	Liquid Bulk Storage	42.00
6	Parking	70.76
7	PSP	1.53
8	Public Utility	8.12
9	Retail Warehousing	24.00
10	Social Commercial	11.67
11	Roads	41.48
12	Total	407.10

FIGURE 1-2 JNPT PROPOSED LANDUSE



1.6 Conclusion

- Growth of container traffic at JNPT has been moderate since 2013 when compared to the previous years. While overall slowdown of world economy is a factor, other factors like congestion at JN port might have contributed to this.
- Some of the container traffic growth witnessed in Gujarat ports is at the expense of JNPT.
- These losses in container traffic might continue in the near future because of the factors like low percentage of transport of containers to/from JN port using railway or higher time taken to connect DFC up to Mumbai when compared to Gujarat.
- Even though JNPT has been able to reduce traffic congestion by measures like gate automation, inter terminal transfer and rationalization of customs procedures and central parking space, Stress on the road network is likely to increase with the commissioning of the 4th container terminal.
- A long-term solution like promoting various port related activities within the available vacant lands within JNPT is a necessity to reduce the expected stress on the port infrastructure and sustenance of the port.
- The” Central Port Authority act 2016” which is likely to be passed this year will give JN port freedom in making the lease rates of port lands more competitive and thereby attract interested parties to port related industries within JNPT.
- A large chunk of the vacant lands available within JNPT falls in CRZ-1 wherein only port related activities like warehousing is permitted.
- To leverage the available land optimally, JNPT must reclaim the lands which has been occupied by the sparse mangroves after year 2000 due

to breach in the bund. Instead of removing the sparse mangroves entirely, some part of the land area occupied by the sparse mangroves can be utilised to rehabilitate the mangroves removed thereby making the mangrove free area suitable for development of industries

- The activities proposed to be permitted as part of the land use plan are selected with the view that they cater to the two requirements of reduction of stress on the JNPT infrastructure and fall within guidelines of MOEF while generating revenue for the Port.
- It is proposed that the following industries be allowed within the Vacant lands
 - Cold storage facilities and associated activities
 - Retail distribution centres
 - Container cross docking and bonded warehousing
 - Container repair and rehabilitation
 - Liquid bulk storage
- An eco-park along holding ponds were proposed in the land use plan for rehabilitation of sparse mangroves and control of flooding.
- Entire developable land in zone 4A and zone4B is divided 2 hectare plots and the for ease of movement of increased traffic due to these facilities new roads have been proposed to ease the movement of traffic to/from the traffic.
- For ensuring free movement of the traffic within the proposed development, three different types of roads are proposed. Arterial roads with 70m corridor, Sub arterial roads with 50 m corridor and collector roads with 30m corridor. These corridors are proposed so as accommodate utilities and drainages with the roads. It is ensured that

each and every industrial plot is connected with at least sub arterial road.

- Locations have been identified within the land use plan for establishing facilities like STP, Parking and refreshment centres.
- Phase wise development of land for establishment of industries is proposed. In total three phases are proposed. Phase -1 is supposed to be taken up during 2017-2025, Phase-2 is proposed to be taken up during 2026- 2030. Phase-3 is proposed to be taken up during 2031-2045.
- In phase-1 proposed activities are Cold storage, retail distribution centres and associated utilities
- In phase-2 proposed activities are Container cross docking facilities and bonded warehouses, eco-park , Holding ponds and associated utilities.
- In phase-3 proposed activities are Container cross docking facilities and bonded ware houses, retail distribution centres, Oil storage and associated utilities.
- The latest initiative, direct port delivery scheme(DPD) which has been taken up by the port has been taken into consideration to propose the future development.
- The plotting and the transport corridors provided in the land use plan are given so that enough flexibility to accommodate the variations in the demand estimates which are likely to crop up in the future.

- This flexibility is provided with the view that JNPT can allocate plots to a different industrial use as per the prevailing requirements in the future.
- This proposed land use plan should be revised after 5 years so that adjustments can be made to the land use plan based on the progress in implementing land use plan, prevailing market conditions and policy changes if any.

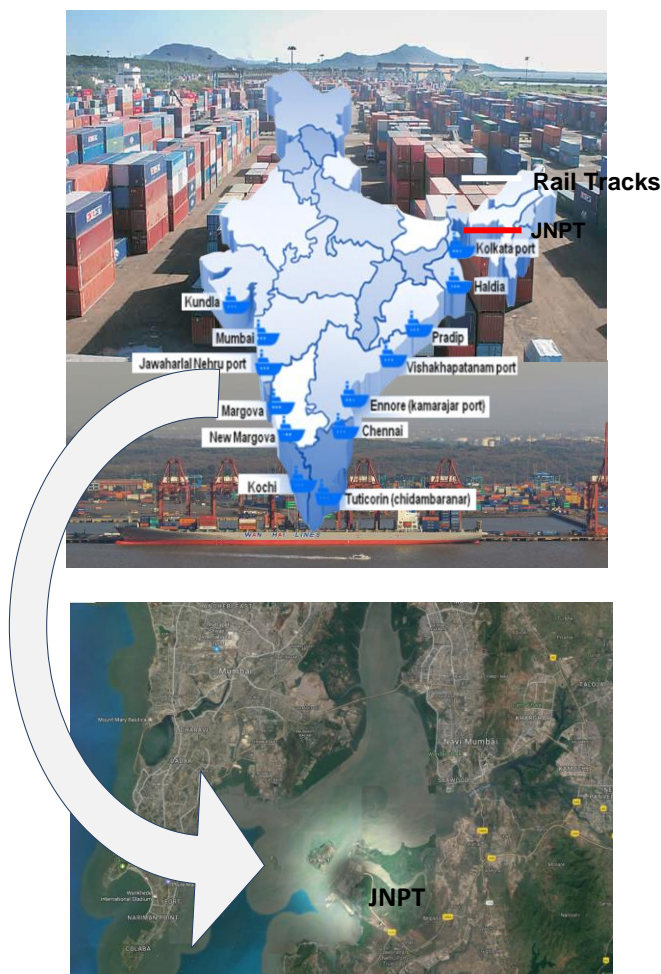
2 Project Background and Context

2.1 Context

Introduction to JNPT Port

The Jawaharlal Nehru Port Trust (JNPT) at Navi Mumbai (formerly known as the Nhava Sheva Port) located within the Mumbai harbour on the west coast of India, was commissioned on 26th May 1989. It occupies a place of prominence among the major Indian ports. It is the second youngest and one of the most modern major ports of the country. Though it was initially planned to be a “satellite port” to the Mumbai Port with the purpose of decongesting traffic at the latter, eventually it was developed as an independent port on its own right and it became the country’s largest container port.

FIGURE 2-1 JNPT MAP



Being one of the oldest ports in India, the Mumbai port was proving to be structurally inadequate to meet the requirements of modern cargo handling. Shallowness of the channel, congestion of roads and railways through the Mumbai city linking the port to its hinterland, as well as labour problems, including over-manning, were among the major problems ailing the Mumbai Port in the pre-reform days. As a result, the Port was simply incapable of handling the expanding volume of modern cargo directed to the west coast and there was an urgent need for a new port in the Mumbai region, which eventually led to the birth of JNPT in 1989.

The construction project of the port is considered to be one of the technical marvels in the country, which was completed in a record time of just three-and-half years on the marshy soil and, to upkeep the beauty of nearby historical Elephanta Caves and surroundings, the management made use of contemporary sophisticated instruments while doing away with rock blasting. The land area in possession of the JNPT measures to 2,987 hectares with enough back-up area ideally suited for developing additional facilities for future maritime requirements of the country.

It was built with an investment of Rs.1,109 crores, out of which Rs.956.97 crores were obtained as loans from various funding agencies, with the World Bank being one of the major contributors. Today JN Port is fully mechanised port which uses latest technology in handling of cargo at the terminals and presently handles about 40% of India's container cargo.

Equipped with one of the most modern cargo handling facilities, JNPT has been a pioneer in running its day-to-day operations with the help of information technology (IT), including Electronic Data Interchange (EDI) and Vessel Traffic Management System (VTMS).

JNPT enjoys very good road and rail linkages with its hinterland as well as important business centres like Thane, Nashik and Ahmedabad, which facilitate excellent port-industry interface. It is also characterized by highly

automated and round-the-clock operations and has demonstrated enough potential and capacity to develop India's first major hub port.

Ever since its inception, JNPT has chartered India's international trade to a glorious course of success and achievements, breaking all records and creating new benchmarks. It handled 64.03 million tonnes of total cargo during the financial year 2015-16. The operating income for FY 2015-16 amounts to Rs.1,508 crores compared to Rs.1,345 crores during FY 2013-14. The port handled about 4.49 million TEUs in the FY 2015-16.

Today JN Port has already established itself as the major catalyst for the trade & commerce in the country with a strong commitment to provide seamless service to the customers & as the India's prime facilitator of international trade & logistics.

Port Highlights

- Certified with Environmental Management System ISO 14001:2004, Information Security Management System ISO 27001:2013, Occupational Health & Safety Management System OHSAS 18001:2007 and Quality Management System ISO 9001:2008
- Port has formulated Safety Operation Procedure for Handling of Project & Bulk Cargoes, safe handling of hazardous cargoes through flexible hoses from vessels/ships berthed at Shallow Water Berths and to ensure that reefer containers and atmosphere of the job are made safe and free from any dangerous condition for safe completion of job which is being carried out.
- Formulated Integrated Management System Policy
- Ranks 31st among the top 100 Container Ports in the world
- Handles 56% of India's total containerized cargo
- Highly automated and computerized operations with Single Window System

- Equipped with the latest Vessel Traffic Management System (VTMS) to track/monitor vessel movements ensuring safe navigation
- Spread over a land area of 2,584 hectares
- Served by 16 Container Freight Stations and over 23 Inland Container Depots
- Well connected by National Rail/Road network
- India's No-1 Container Port
- 4.49 million TEUs handled in fiscal year 2015-16
- Quick turnaround time of 1.27days per ship.
- Aim to handle 10Million TEUs by 2022
- Aligning with the vision of eco-consciousness of the Ministry of Shipping, JNPT is setting up a 25MW Solar Plant.
- Fourth Container Terminal garnered the largest FDI in India
- Port Based SEZ would be developed at an investment of 4000 crores.

Context for the project

Port trusts historically have used land available with them to establish various activities which aid in increasing the efficiency or sustainability of the port operations. The available land with the port is divided into inside custom bond area and outside custom bond area. Land which is used for port operations and for other activities which aid operations is treated as custom bond area and all other lands are treated as outside custom bond area. The policy framework of the Indian government regarding port lands have evolved over the years to help major ports of the country to increase their income through the lease, sale or licencing of port lands for commercial use. Time to time changes in the policies were made to ensure course correction according to the ground scenario.

At the time of inception of JNPT in 1989, the land use of the ports was governed by the section 34 of the major Port trusts act, 1963. As per the act, any major port cannot lease or license land under its control for a period more than 30 years without the approval of central government. The Schedule of Rates (SOR) for the port lands was set by the committee formed by the port as per the parliament public accounts committee 175th report of 1975. In the notes of these schedules, there were some guidelines which were followed by the ports for preparing the lease/license agreements.

Later, central government issued guidelines with respect to the land policy on 30th March 1992. The major aspects of the guidelines were:

- Lease rent of the port lands should be decided based on competitive tender
- Provisions should be made in the lease agreement providing for increase in rent at a uniform rate every year with an option of revising the base after every 5 years. The fixed percentage increase every year may vary from Port to port depending upon factors like rate of appreciation of land values in the particular port.

Subsequent government guidelines of 1995 on land management specified a minimum of 5% escalation of lease rent every annum should be adopted. JNPT has adopted an escalation of 10% in the leases granted by JNPT for various private parties like RIL, IMC, GBC etc. for establishment of tank farms within the port area. The following are some of the major aspects of these guidelines

- The land within the custom bond area can be allotted on lease up to maximum period of 30 years.
- The lease rent is to be charged based on the SOR with a provision to change the base rate every 5 years.

- A premium of 1 year rental has to be paid to the port at the time of allotment.
- Lease rates were prescribed by the port itself based on the guidelines of major port trust act, 1963.
- Every port should have a comprehensive land use plan for the next 30 years and should be forwarded to the ministry for approval. This land use plan should be revised every five years or whenever necessary with approval from ministry.

Then in 2004 government issued land policy for major ports which was applicable to all major port trusts except Mumbai and Kolkata. The policy was silent on the preparation of land use plan by the port for allocation of lands. The policy stated that

- Port trusts can make fresh allotment of lands within the custom bound areas for activities directly related to port operations only on license basis for a maximum period of 11 months.
- For custom bound areas, the port can change the base rate of lease every five years.
- Allotment outside the custom bound areas can be made only on tender basis up to a maximum duration of 30 years subject to board approval. However, land allotments to government departments/CPSUs/SPSUs can be made on nomination basis.
- Allotment of lands outside custom bound areas can be made for both port related and non-port related activities.
- Any allotment which leases land for a period more than 30 years can be done only upon approvals from central government.
- The lease/license rates should be as per the SOR issued by TAMP and is to be reviewed every 5 years. The SOR should be arrived at by taking 6 percent of the market value of the plot as rent per annum.

- The purpose of the land use should reflect in the SOR rates.
- Leasing should be done based on payment of upfront fee. In case this is not possible, annual fee basis may be allowed. In case of annual lease, port was required to keep 5 years rent (or) 25% of total lease rent for duration of lease as security whichever is lower.
- The lessee is expected to remove all structures at his own cost after expiry of license.

A new port land use policy 2010 was issued by government which was applicable to all the major ports and Ennore port except to land related to Gandhidham township of Kandla port trust. It is also applicable to all BOT projects taken up by these ports. The important aspects of the policy which are different from the 2004 policy are as follows

- Every major port trust should have a land use plan approved by board and the same should be communicated to Government of India.
- Allotment of land within custom bond areas for permanent structures is not allowed. Chairman can allow medium term lease for 10 years for temporary structures.
- If the land outside custom bond areas are licenced, the same shall be governed by the conditions used for custom bond areas.
- Allotment of land outside custom bond areas on nomination basis for institutions other than government departments, CPSUs/SPSUs should be made with ministry's approval.
- Fresh leases and renewals beyond 30 years and for a maximum period of 99 years, to be finalised by an Empowered Committee comprising Secretary (Shipping), AS&FA (Shipping), JS, Ministry of Finance and concerned Adviser of Planning Commission
- The lease agreement to have a clause which allows the lessee to surrender the lease with a prior notice of three months.

Port land policy guidelines for major ports 2014 was issued by government which was applicable to all the major ports and Kamarajar port limited except to land related to townships of Kandla, Mumbai and Kolkata ports. The important aspects of the policy which are different from the 2010 policy are as follows.

- Land should be leased only in accordance with the Land use plan and the land use plan prepared for every port should be reviewed once in five years
- Land allotment within the custom bond areas for duty free shops, communication centres etc. can be given for 5 years by board.
- In custom bond areas allotment, should be made by inviting competitive tenders, resorting to nomination basis only in exceptional cases.
- Outside custom bond areas allotment should preferably be made on lease basis. However, licencing can also be allowed after recording the reasons for the same.
- Land outside custom bond areas can be allocated to joint ventures of CPSUs/SPSUs with private parties on nomination basis, provided that the CPSUs/SPSUs, state authorities have majority shareholding in the JV.
- The allotment to private parties should be made on tender basis only with a reserve price worked out by land allotment committee of the port and approved by port trust board and by TAMP.
- The policy does not speak anything on whether the leasing should be done on upfront fee or annual fee basis.
- The policy does not mention anything on the duration after which the port can change the base of the lease rent.

Comptroller and Auditor general of India has conducted performance audit on land management in Major ports and the report was issued in 2015. The audit was conducted to ascertain the adherence of the ports to various policies and

guidelines issued by the government from time to time. In the report, it was stated that there is some ambiguity in implementing the policies and guidelines due to some instances as given below

- Methodology to regulate allotment involving construction of permanent structures in the custom bond area
- Absence of defining end-use of land to fix the lease rate in various zones of the port.
- Unauthorised occupancy was not clearly defined
- in cases where approval for renewal of leases after its expiry were pending with the Ministry, the policy guidelines did not indicate how the period of lease after expiry would be treated till the approval is obtained.
- policy guidelines did not stipulate whether execution of lease agreement was essential in all cases to ensure legal enforceability of port's rights.
- policy guidelines did not insist on standardized format for lease to ensure uniformity and satisfy that all essential terms and conditions were factored in the agreement.
- The policy guidelines of 2004 did not indicate whether it superseded the guidelines of 1995.
- Ministry did not indicate the period within which the policy guidelines will be reviewed.
- A revised policy guideline was issued in January 2014 elaborating the procedures relating to allotment of land, but it did not specify whether it superseded 2010 policy or not. To this the ministry has clarified that covering letter sent to the ports clearly mentions that the new guidelines superseded the earlier guidelines and in future this would be covered in the preamble of new guidelines.

JNPT, by its position as the premier container port in India with vast hinterland connectivity is a very suitable place for establishment of CFSs and other

logistics based units within its premises. But, over the years, majority of CFSs which serve JNPT have been established outside JNPT in the immediate neighbourhood in places like Uran, Panvel etc. where land is allocated by CIDCO and is favoured by companies because of the following reasons

- CIDCO allocates land on nomination basis.
- CIDCO can award lands for a lease period of more than 30 years. For allocating land for 30 years JNPT must get permission from the central ministry which causes huge delays which are generally not acceptable to the interested party.
- The lease rent of CIDCO is lesser than that of JNPT as JNPT cannot go below the rates of CIDCO as directed by TAMP.

To overcome shortcomings in the existing land use policies, government is planning to bring in “The port authorities act of 2016” to replace the major port trusts act of 1963. This act is expected to give the major ports more autonomy and flexibility in their governance. If properly administered, such a policy can help ports to leverage the value of lands available with them to sustain themselves in the present competitive environment.

The new initiative “Sagarmala” by the central government is expected to bring the focus on the ports as the growth engines and drivers of economic activity in the coastal region.

In this context, JNPT intends to revise its earlier land use plan of 2005 and prepare a new land use plan that abets the port in the optimum realization of the demand for the land which arises due to new policy initiatives mentioned above.

2.2 Objectives of the present report:

In view of the above context, following key objectives have been addressed in the report:

- Study of the existing land use and vacant land
- Identification of port related activities/industries which can help develop a sustainable port
- Having consultation with all the stakeholders such as terminal operators, industries, JNPT port officials,
- To establish land use development priorities for the Port Trust, and to provide a road map to capitalize on the use of the port's land and identification of area for various cargo storage, Industries and other purposes, including additional land requirement if any, based on the traffic projections in the business report.
- Preparation of detailed Land Use plan covering the above aspects to enable the port for effective utilization of land under its control.

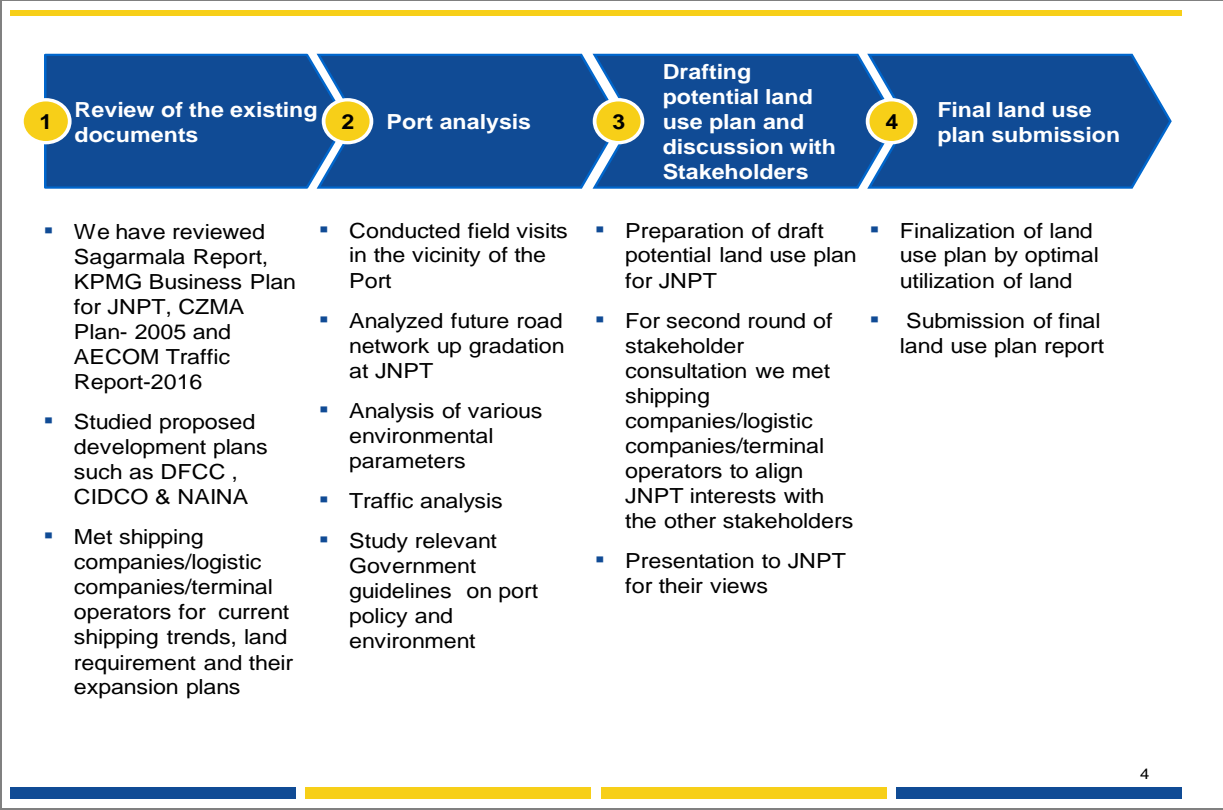
2.3 Activities performed in preparation of the report:

The key activities followed in preparing the Report are:

- **Review of existing documents:** We have reviewed existing documents and also went through all the reports and other documents for study and keeping backup information such as Sagarmala Report, KPMG Business Plan for JNPT, CZMA Plan- 2005 and AECOM Traffic Report-2016.
- **Field visits:** We made several visits in the vicinity of the Port to understand the ground situation and potential measures that can be taken. Several technical team members including our experts in environmental management and other expert visited the port area.
- **Undertook study of proposed development plans of other development authorities:** We have considered and studied the Dedicated Freight Corridor (DFC) which is under development by Railways and Delhi Mumbai Industrial Corridor (DMIC) development of SEZs.
- **Preparation of existing land use pattern:** After completing the above set of activities we prepared the existing land use plan map.

- **Meeting with key stakeholders:** Detailed consultations was conducted with various stakeholders like JNPT, concern Government departments, industries, companies, importers, exporters, potential investors/BOT operators of JNPT and key people who have the background of in the sector, etc. with specific deliberations on project proposals and receive opinions. We also discussed the opportunities and constraints for the present and future development and operation of the port and ascertain the present and future industrial and commercial needs with reference to traffic, methods for handling, stores, transportation and land requirement.
- **Studied other development projects of JNPT:** We studied various development projects like Development of Eco parks, road network up gradation and development of SEZ. This has helped understand the current situation and what JNPT wants to develop in near future.
- **Traffic analysis:** We did traffic analysis through secondary data sources such AECOM traffic report, Sagarmala report et.. and through them did our own traffic projection till year 2035.
- **Studied Government guidelines:** We had studied all the relevant guidelines issued by Pollution Control Board, Government of Maharashtra and other departments regarding safety control, coastal zone regulation, handling & storage of cargo terminals and land use.
- **Finalization of land use plan:** We have finalized land use plan for optimal utilization of land and water front areas by applying zoning principles of national and international standards for allocating areas for hazardous, non-hazardous liquid bulk, dry bulk etc. We also complete effective and profitable use of land with safety measures.

Exhibit 2: Key steps undertaken to prepare the report



3 Port Analysis

JNPT port currently has 2322 metres Quay length for container berth (NSICT, NSIGT, JNPCT, and GTICT), 445 metres Quay length for feeder container (JNPCT SWB), and 390 metres for twin berth liquid cargo terminal (BPCL). With 165.8 Ha back up area (container yard). Further 4th terminal with 2000 metres Quay length and 168 Ha reclamation of land is under construction. Out of which 1km Quay length and 90 Ha reclamation of land will be completed in phase-1.

These 3 container terminals are capable of handling 5.3 million TEUs per annum. And the liquid terminal handles 6.5 million tonnes per annum. Whereas the 4th terminal itself can handle 4.8 million TEUs per annum. The backup area in the port operational area has all the basic modern infrastructure. There are 9 Railway siding tracks for ICD. There are total number of 11 berths at present. Overview of the berthing facilities and commodities handled by JNPT are given in next sections.

FIGURE 3-1 PORT ANALYSIS

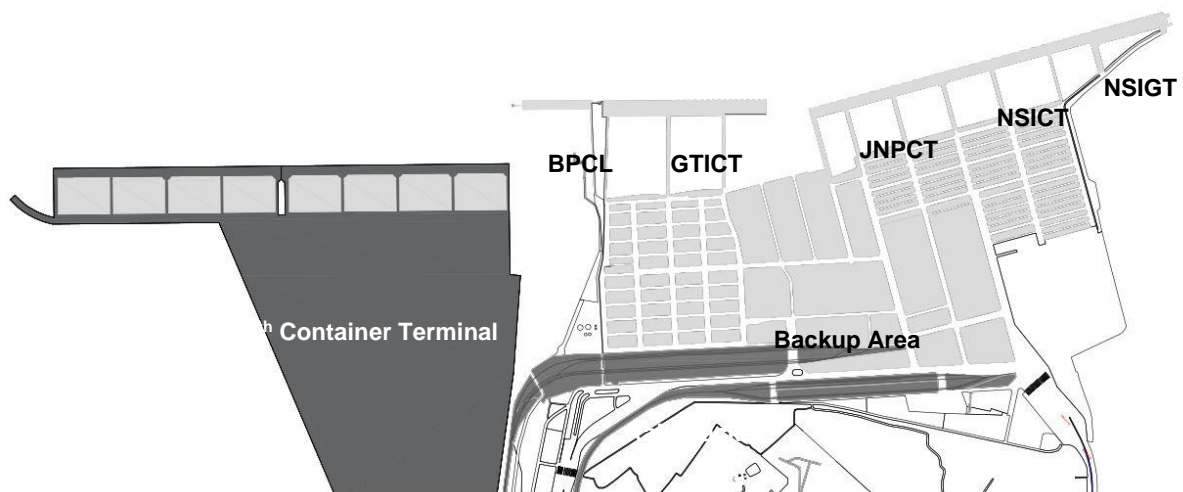
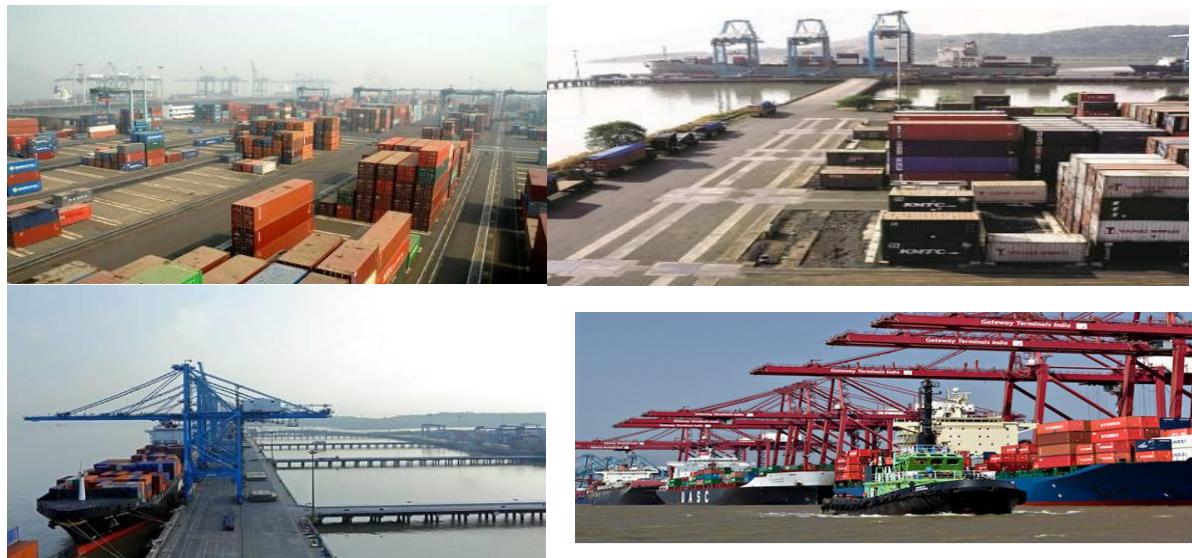


Table 1: Port Analysis	
Terminal	Berths
NSIGT	1
NSICT	2
JNPCT	3
JNPCT SWB	1
GTICT	2
BPCL	2
TOTAL	11

Exhibit 3:



3.1 Berthing

Berthing

Within JNPT, there are three operational container terminals, which are currently operational

1. Nhava Sheva International Container Terminal (NSICT- DP World)
- 1(a) Nhava Sheva (India) Gateway Terminal Pvt. Ltd. (NSIGT- DP World)
2. JNP container terminal (JNPCT),
3. Gateway Terminals India Private Limited (GTIPL).

Besides these three terminals JNPT has 1 liquid terminal

1. Bharat Petroleum Corporation Limited(BPCL)

Fourth Container terminal is under construction. Singapore's PSA International Pte Ltd is setting up a new container loading facility with a capacity to handle 4.8 million standard containers a year with an investment of Rs 7,915 crore.

Table 2: Berthing						
Sl.No	Container Terminal	JNPCT+ SWB	NSICT	GTICT	NSIGT	TOTAL
1	Quay Length (Mtrs)	680+445	600	712	330	2,322
2	Draft (Mtrs)	14	14	14	14	14
3	Capacity (In Million TEUs)	1.5	1.2	1.8	0.8	5.3
4	Reefer Plugs (Nos)	576	778	840	336	25.3
5	RMQCs (Nos)	12	8	10	4	34
6	RTGCs (Nos)	18	29	40	12	99
7	RMGCs (Nos)	5	3	3	NIL	11
8	Tractor Trailers	148	110	130	30	418
9	Backup Area - In Hectares (Container Yard)	61.8	25	52	27	165.8
10	Reach Stackers	8	3	2	1	14
11	Railway Siding Tracks for ICD	4	2	3	NIL	9

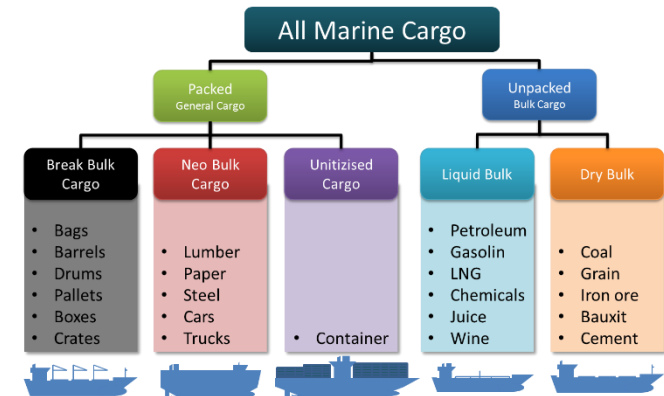
Recently Jawaharlal Nehru Port (JNPT) created history by hosting the largest ever Container Vessel to ever call at India's premier container gateway. The newly-opened Nhava Sheva (India) Gateway Terminal (NSIGT) hosted MSC

Francesca with a length of 363 metre, deployed on the Himalaya Express (HEX) Service.

In addition a shallow draft berth of 445 meters which is commissioned in september 2002 handles feeder container vessels, dry bulk vessels and general cargo vessels. Handling capacity of this berth is around 1.5 lakh TEU per annum and 0.9 million tonnes of bulk cargo.

3.2 Key Commodities

There are five commodities—coal, petroleum, oil and lubricants (POL), iron ore, fertilizers, and containers—that contribute around 80 percent of the total export import (EXIM) freight movement with dynamic origin and destination points across the country. JNPT has played a critical role in transporting commodities to different part of country. Simpler registration and self-sealing processes for factory stuffing; installation of container scanners at major ports and ICDs (currently only at JNPT and Mundra) helps in fast processing. JN Port handled 64.03 million tonnes of total cargo during the financial year 2015-16 against 63.80 million tonnes of cargo handled during the financial year 2014-15. The total traffic during the financial year 2015-16 was grown by 0.35% over the previous year. The containerized cargo was 56.79 million tonnes (88.70%), liquid cargo was 6.50 million tonnes (10.16%) & remaining 0.73 million tonnes (1.14%) was miscellaneous types of Dry Bulk Cargo (Cement) & Break Bulk.



Bulk traffic

The total Bulk cargo handled during the year 2015-16 was 7.24 million Tonnes as against 6.87 million tonnes handled in the previous year. The growth in Bulk Traffic is 5.37% over previous year. Commodity wise percentage variation w.r.t. previous year is given below:

Updated on 15th July 2016

Table 3: Commodity wise classification & break up of import – export of bulk cargo							
in tonnes				in millions tonnes			
Commodity wise classification				The break-up of Import-export of bulk cargo			
Commodity	2014-15	2015-16	% Variation over previous year	Bulk Traffic		2014-15	2015-16
Liquid Bulk	6,189,644	6,504,656	5.09	IMPORT		4.43	4.88
Cement & Other Dry Bulk Cargo	652,584	674,064	3.29	EXPORT		2.43	2.36
Break Bulk	25,709	58,109	126.03	TRANSHIPMENT		--	--
Total Bulk	6,867,937	7,236,829	5.37	TOTAL		6.87	7.24

COMMODITY-WISE TRAFFIC HANDLED BY JN PORT: 2010-2011 TO 2015-16

Updated on 05-May-2016 (Traffic in Tonnes)

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16							
Commodities	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
1 FERTILIZER							

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	AMMO.SULPHATE							
	AMONIAN NITRATE		3,820					
	CAL.NITRATE							
	DAP							
	KCL							
	MOP							
	SOAP/MAP/NPK							
	URIA							
	SUB TOTAL (1)	0	3,820	0	0			
2	FER.RAW MATERIAL							
	ROCK PHOS.	8,708						
	SULPHUR							
	SUB TOTAL (2)	8,708	0	0	0			
3	FOODGRAIN							
	CHECK PEAS							
	MAIZE							
	WHEAT (I)							
	WHEAT/RICE (E)							
	YELLOW PEAS		19,300	0	12,100			
	SUB TOTAL (3)	0	19,300	0	12,100			

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
4	CEMENT (Consider as Dry Bulk-Apr 2006)	861,978	684,998	593,556	688,877	652,584	674,064	3.29%
	CEMENT (Handled at Anchorage)							
DRY BULK		870,686	708,118	593,556	700,977	652,584	674,064	3.29%
5	BREAK BULK							
	BORAX							
	CEMENT							
	COIL (E)							
	COPPER							
	DRI/HBI							
	IOP/IOL							
	PIG IRON							
	PROJECT/GEN. CARGO (E)	4,284	14,811	61,632	83,267	13,268	35,497	167.54%
	PROJECT/GEN. CARGO (GTIPL)							
	PROJECT/GEN. CARGO (I)	210,580	117,007	42,391	32,674	12,441	22,612	81.76%
	PROJECT/GEN. CARGO (TP)							

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	SBM (E)							
	SUGAR (E)							
	SUGAR (I)							
	VEHICLES							
	VEHICLES (Nos.)							
	WOOD PULP							
BREAK BULK		214,864	131,818	104,023	115,941	25,709	58,109	126.03%
6	LIQUID BULK & SHALLOW BERTH(JNPT)							
	A.F.STOCK							
	C.B.F.S.							
	DIESEL (BUNKAR) At Anchorage	136,385	80,844	0	0		49,936	
	FURNANCE OIL (E)							
	FURNANCE OIL (I)							
	H.S.DIESEL (I)							
	H.S.DIESEL (Bunker)					26		
	LUB OIL							
	NAPTHA (E)							
	NAPTHA (I)							

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	PARAXYLENE							
	SKO (E)							
	SKO (I)							
	TOTAL POL – JNPT	136,385	80,844	0	0	26	49,936	
	A. ACID (E) / ANE (E)							
	A. ACID (I)				28,053	105,469	104,719	-0.71%
	ACETONE					11,899	5,937	-50.10%
	ANILINE OIL					3,449	2,759	-20.00%
	BASE OIL				4,486	12,652	6,320	-50.05%
	BITUMEN					1,740		-100.00%
	BUTYL ACETATE					524	2,952	463.27%
	BUTYL ACRYLATE						1,630	
	C.HEXAN							
	CAUSTIC SODA							
	CHOLOFORM					1,784	790	-55.72%
	CRUDE GLYCOL				2,577	4,294	11,052	157.38%
	CUMENE						1,051	
	DEG (E)							
	EDC						3,107	
	EDIBLE OIL					85,311		

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	EX. HEXAN							
	IPA						1,644	
	LAB (E)							
	MDC						12,535	
	MEG (E)							
	MEG (I)				76,647	150,411	70,156	-53.36%
	MIBK						1,047	
	MOLASSES					9,240		
	MIX XYLENE					1,026		-100.00%
	N BUTANOL					2,788	3,130	12.28%
	PEGASOL							
	PHENOL					4,872	7,139	46.53%
	PH.ACID						23,461	
	SM					19,601	28,993	47.92%
	STYRINE							
	TEG (E)							
	TOULENE					12,686	6,692	-47.25%
	VINYL ACETIC MONOMOR				3,499	14,078	10,269	-27.06%
	XYLENE (E)							
	TOTAL CHEMICALS - JNPT	0	0	0	115,262	441,824	305,383	-30.88%

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	EDIBLE OIL (I)					8	130,144	
	EDIBLE OIL (E)							
	EDIBLE OIL (TP)							
	MOLASSES (E)						52,450	
	TOTAL OTHER LIQUID - JNPT	0	0	0	0	8	182,594	
TOTAL LIQUID JNPT		136,385	80,844	0	115,262	441,858	537,913	283.35%
7	LIQUID BULK (BPCL)							
	AF STOCK	145,210	153,248	147,684	134,182	146,190	113,976	-22.04%
	AHE 70							
	ALKYLATE	28,461						
	ANILINE OIL				2,891	1,647		-100.00%
	AROMEX							
	ATF	6,995	7,032				1,618	
	BASE OIL				112,941	106,509	121,217	13.81%
	C.B.F.S.	84,634	100,165	104,449	128,791	86,296	76,766	-11.04%
	CRUDE OIL (E)	2,623,252	3,041,093	2,121,235	1,734,847	1,568,333	1,515,002	-3.40%
	DIESEL (BUNKAR)							
	DIESEL (E)	7,341	2,500	9,937	14,799	7,571		-100.00%
	DIESEL (I)	704,367	500,794	375,664	557,240	362,146	703,950	94.38%

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	FURNANCE OIL (E)	457,591	134,193	43,947	384,782	168,450	37,988	-77.45%
	FURNANCE OIL (I)	162,930	26,773	13,630	33,917			
	H.S.DIESEL (I)							
	H.S.DIESEL (E)							
	LDO							
	LPG		10,248	291,151	311,674	699,017	675,249	-3.40%
	LUB OIL	138,430	173,508	141,282				
	LUB OIL (E)	4,910						
	MOTAR SPIRIT (E)							
	MOTAR SPIRIT (I)	4,308				6,153	36,838	498.70%
	NAPHTHA (E)	538,170	637,421	831,309	964,182	649,806	556,232	-14.40%
	NAPHTHA (I)		58,528	45,207	34,197	216,278	195,598	-9.56%
	SKO (E)							
	SKO (I)						3,438	
	TOTAL POL – BPCL	4,906,599	4,845,503	4,125,495	4,414,443	4,018,396	4,037,872	0.48%
	ACETIC ACID (I)	107,731	100,932	182,027	139,029	63,597	57,836	-9.06%
	ACETONE	1,004	1,004		1,001	8,011	4,611	-42.44%
	AMONIA			7,000	129,713	111,408	67,073	-39.79%
	ANILENE OIL						1,069	
	BASE OIL							

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	BUTYL ACETATE						859	
	BUTYL ACRYLITE	11,867	14,013	17,199	16,113	16,888	18,964	12.29%
	CAUSTIC SODA			30,447				
	CHLOFORM				525	1,002		90.86%
	COSTIC SODA	5,784						
	CR. GLYCOL	21,461	15,756	19,502	19,784	10,143	3,356	-66.92%
	DEG			1,197	512			
	ETHYL ACETATE (E)			951				
	E G					429		
	ETHANOL					9,063	9,095	
	ETHANOL ALCOHOL						5,094	
	ETHANOL HEXONOL					2,574		
	LAB (E)	45,677	26,030	18,875	10,844	4,146		
	LAB (I)			6,123	3,705			
	MEG (E)			1,500				
	MEG (I)	388,404	340,787	340,625	225,671	182,347	27,569	-84.88%
	MENTHANOL		3,701					
	META XYELENE		2,954	985				
	MITHYL DICHLORIDE		5,508	6,969	9,127	6,122	4,624	-24.46%
	MTBE			1,978				

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
	N BUTANOL					1,003	2,785	177.64%
	ORTHO XYLENE						880	
	PARAXYLENE (E)						72,019	
	PARAXYLENE (I)	15,077	7,396			4,136		
	PH.ACID	58,938	73,797	73,759	108,987	26,519	59,054	122.68%
	PHENOL				1,000	13,166	9,438	-28.32%
	STYRINE	36,154	35,324	32,523	26,952	24,156	16,748	-30.67%
	TOULENE	3,968	2,006		2,000	12,605	14,563	15.53%
	VINYL ACETIC MONOMOR		9,057	7,105	5,389	9,663	9,151	-5.30%
	XYLENE (E)							
	TOTAL CHEMICALS - BPCL	696,065	638,265	748,765	700,352	506,978	384,788	-24.10%
	EDIBLE OIL (I)	842,737	1,010,607	946,926	987,515	1,191,267	1,453,506	22.01%
	MOLASSES (I)							
	MOLASSES (E)	223,235	82,194	58,168	64,084	31,153	90,577	190.75%
	TOTAL OTHER LIQUID - BPCL	1,065,972	1,092,801	1,005,094	1,051,599	1,222,420	1,544,083	26.31%
	TOTAL LIQUID (BPCL)	6,668,636	6,576,569	5,879,354	6,166,394	5,747,794	5,966,743	3.81%
	TOTAL LIQUID (JNPT+BPCL)	6,805,021	6,657,413	5,879,354	6,281,656	6,189,652	6,504,656	5.09%
	TOTAL BULK	7,890,571	7,497,349	6,576,933	7,098,574	6,867,945	7,236,830	5.37%

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

Commodities		2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
8	CONTAINER (JNPCT)							
	TONNAGE	12,137,331	14,530,258	16,031,668	16,724,073	15,946,985	17,977,342	12.73%
	TEUs	876,368	1,027,951	1,208,133	1,312,715	1,294,002	1,429,277	10.45%
9	CONTAINER (NSICT)							
	TONNAGE	21,012,710	19,461,342	14,941,313	13,189,163	14,133,771	12,055,150	-14.71%
	TEUs	1,537,240	1,401,847	1,044,105	969,458	1,160,219	999,680	-13.84%
10	CONTAINER (GTIPL)							
	TONNAGE	23,276,077	24,241,516	26,938,409	25,321,082	26,852,628	24,294,531	-9.53%
	TEUs	1,856,203	1,891,104	2,007,076	1,879,528	2,012,474	1,860,283	-7.56%
11	CONTAINER (NSIGT)							
	TONNAGE						2,463,588	
	TEUs						202,328	
	TOTAL CONTAINER TONNEAGE (JNPCT+NSICT+GTIPL)	56,426,118	58,233,116	57,911,390	55,234,318	56,933,384	56,790,611	-0.25%
	TOTAL TEUs	4,269,811	4,320,902	4,259,314	4,161,701	4,466,695	4,491,568	0.56%

Table 4: Commodity-Wise Traffic Handled By JN Port: 2010-2011 To 2015-16

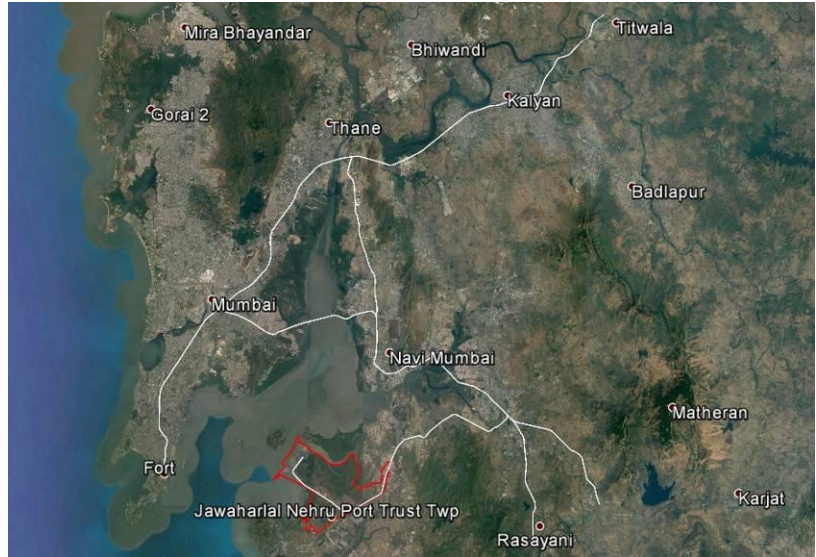
Commodities	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	%Change Over Prev. Year
(JNPCT+NSICT+GTIPL)							
GRAND TOTAL	64,316,689	65,730,465	64,488,323	62,332,892	63,801,329	64,027,441	0.35%

Exhibit 5:



3.3 Rail Connectivity

The Port is connected to the national network of the Railways through the Panvel-Uran section of the Central Railway. Panvel is further connected to the Kokan Railway, Diva on Central Railway & Vasai (Bassein Road) on the Western Railway. JNPT at present acts as gateway to 34 inland container terminals. At present, JNPT has the capacity to transport 2430 TEU by rail every day and 20-22% of



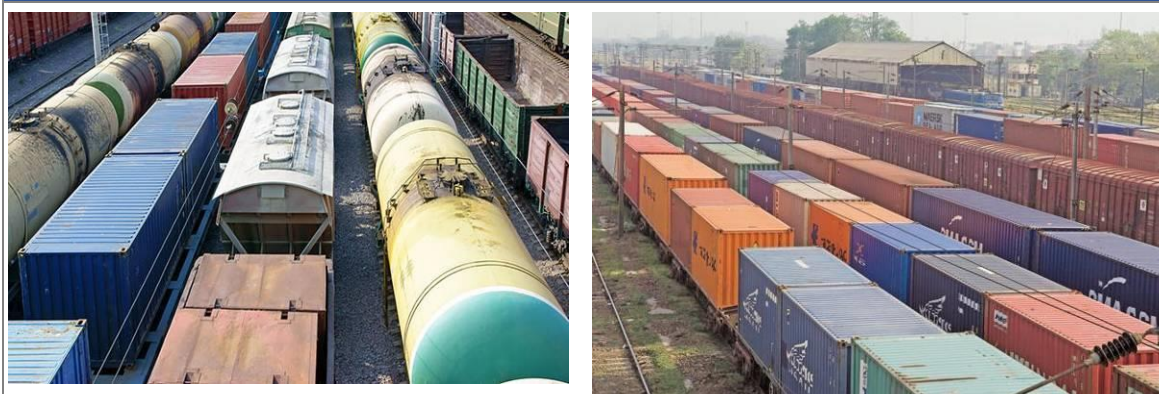
The railway link between JNPT and Panvel has been converted into a double line to meet the requirements of increasing container traffic through ICDs. The Ministry of Railways has planned for a Dedicated Freight Corridor (DFC) connecting JN Port with the Northern Hunter-land. The work is being taken up by the Dedicated Freight Corridor Corpn. of India Ltd.

FIGURE 3-2 RAIL CONNECTIVITY (A)

FIGURE 3-3 RAIL CONNECTIVITY (B)



Exhibit 6



3.4 Road Connectivity

Every year 78% - 80% of the transport of containers to and from JNPT JN Port is done by road. Jnpt is well connected by National Highway-4B to Mumbai-Pune Highway/Expressway (NH-4) and Mumbai-Goa Highway (NH-17). JN Port is also connected through the State Highway-54 & Amra Marg to Navi Mumbai area, Thane, Nashik & Ahmedabad.

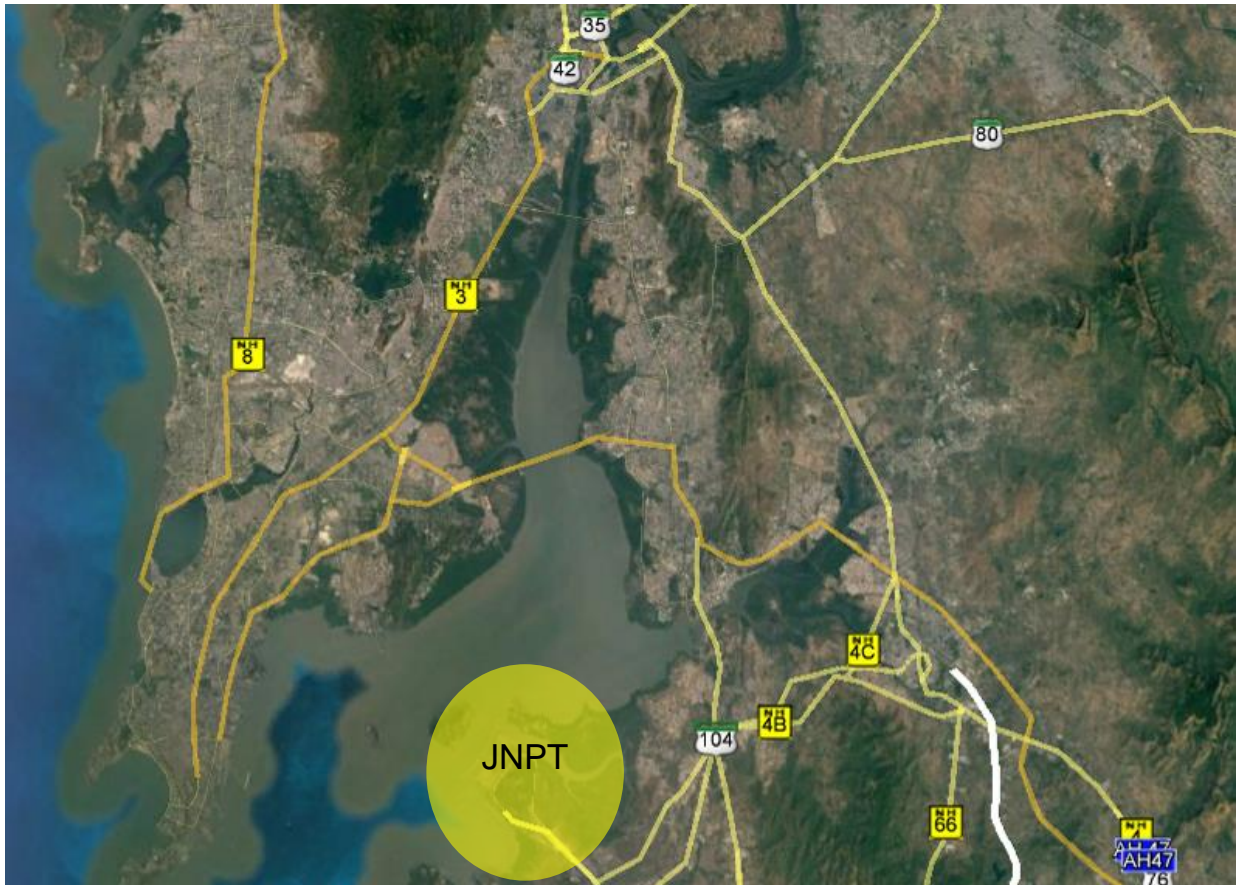


FIGURE 3-4 ROAD CONNECTIVITY

JN Port is easily accessible via Mumbai as well as Thane and connectivity is further boosted with the National Highway 4B and State Highway 54. 44 kms of National Highway 4B to be expanded from 4 lanes to 6/8 lanes. This road connectivity project is being implemented by a Special Purpose Vehicle (SPV) called JNPT Port Road Company Ltd., formed by JNPT, NHAI and CIDCO with NHAI being the implementing agency. The project is to be executed in EPC mode in four packages which have been awarded. Pre-construction activities are in progress.

3.5 Storage

At present, for handling container traffic the port is served by 33 container freight stations of which one is owned by JNPT. Except for one CFS all the others are located outside JNPT. The total capacity of CFSs is around 1.19 million TEUs. A tank farm with a storage capacity of 750000 tonnes is run by

various operators within JNPT boundaries. This tank farm stores various liquid bulk products like POL, edible oil and chemicals.

FIGURE 3-5 STORAGE

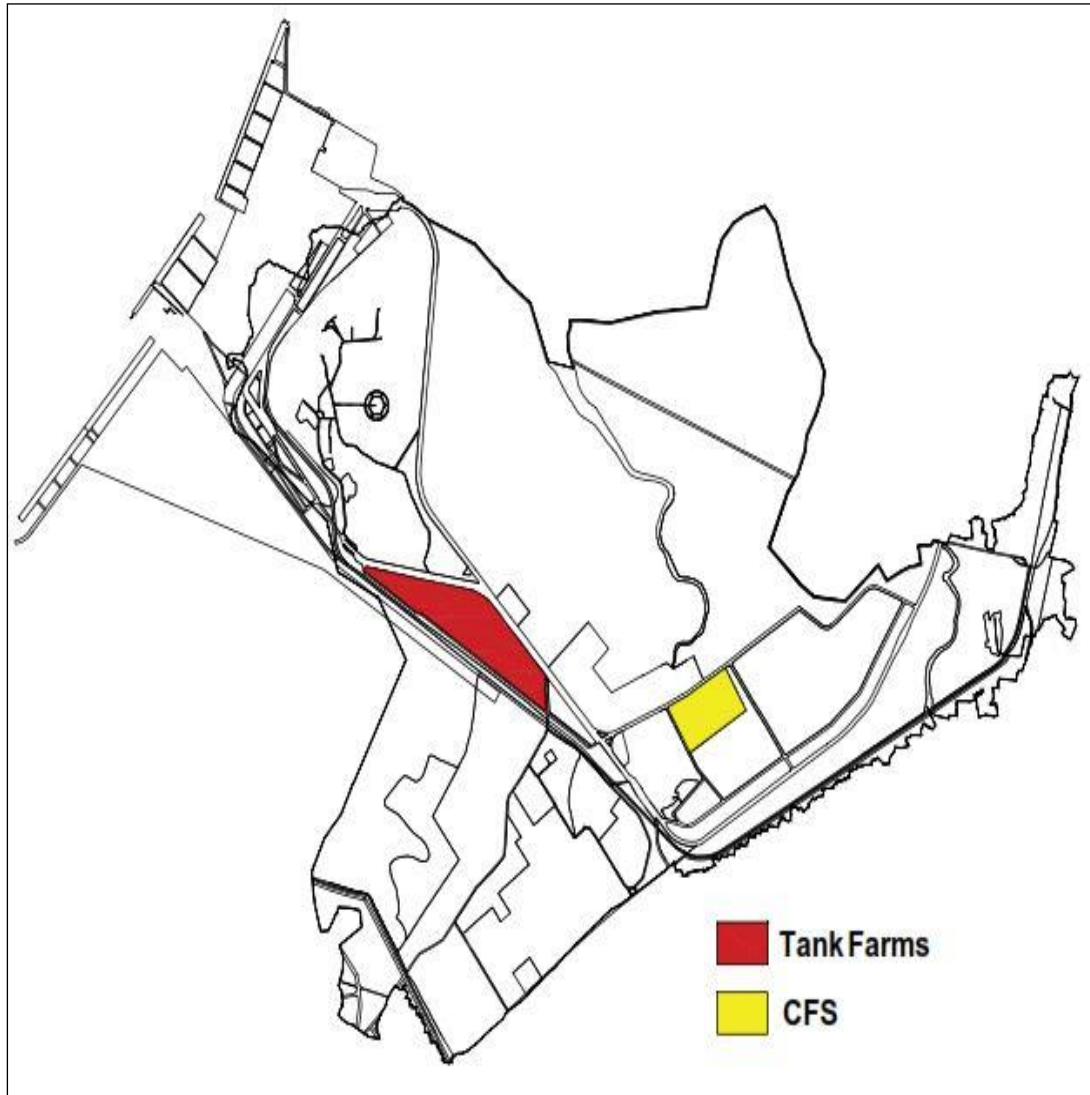


FIGURE 3-6 SATELLITE IMAGE SHOWING TANK FARMS



FIGURE 3-7 MAP SHOWING LOCATION OF CFS WITHIN JNPT



3.6 Observations from Port Analysis:

Some observations on the present status of port operations are given below

- JNPT being one of the premium major ports in India, handles 40% of EXIM Container traffic in India. As per the business report of JNPT it could handle up to 23 million TEUs per annum by 2025, which is 5 times the existing throughput.
- Even though JNPT continues to handle bulk of India's container volume, its share of the container volumes has shown a decline since 2009 due to diversion of traffic to Gujarat because of lesser waiting time at these locations.
- Waiting time at JNPT has increased due to congestion. At present, port could contain this congestion problem by implementing measures like automated gate systems, inter terminal truck transfers and central parking facility and rationalization of customs processes.
- At present, JNPT is serving ICDs which are present in North India. These ICDs are bound to be connected by the proposed dedicated freight corridor. The dedicated freight corridor is supposed to be completed from Delhi to Vadodara in one year time. The connection of DFC up to Mumbai is expected to take an additional two to three years. This delay in connection of DFC to Mumbai might cause some loss of traffic to Gujarat ports which will be closer to ICDs in North India.
- It is expected that the proposed 4th container terminal shall increase the container traffic to around 10 million TEU per annum which will add a significant stress to the existing infrastructure. So, the augmentation of available infrastructure like existing roads and parking spaces is required for smooth operation of the port. In addition, measures to improve the share of container transport to/from the port by rail is crucial for the sustenance of traffic at JNPT.

- Land lease rates within JNPT limits are significantly higher than the areas outside, which has led to establishment of CFSs associated with JNPT outside JNPT limits.
- Due to sluggish growth of container volumes handled by JNPT from past three years, the CFSs dependent on JNPT volumes are struggling to achieve break even volumes.
- To ensure sustenance of traffic at JNPT, industries can be planned in the vacant plots available within JNPT.
- Major chunk of the available vacant land parcels within JNPT falls under mangrove areas. The mangrove and green area shown in the figure--- above falls under CRZ-1 as per the CZMP map. A portion of this area can be utilized for establishment of storage of non-hazardous cargo which needs approval from MOEF as per the clause 8-I-ii (c) given in 2011 CRZ notification.
- Leasing out the available vacant land parcels to warehousing for the products that can use the EXIM facilities at JNPT will help in increasing and sustaining the traffic and can solve JNPT congestion problems permanently and at the same time fulfil MOEF norms.

4 Existing Land Use

This chapter describes the existing land use of the JNPT. The description in the chapter also captures the changes that have occurred subsequent to the land use plan under CZMA-2005. The existing land use is categorised as given below:

4.1 Port Area

The existing Port Area of JNPT is 176.9 ha. This zone includes container yards, container railway yards and Line, connectivity roads, Berthing area and passenger Jetty. Also, some of the Port area lies within the Green Zone.

4.1.1 Container Yard

Located just behind berthing area, a container yard of the existing port is utilized for stacking several goods containers which are imported as well as those to be exported.

4.1.2 Railways

Railways land is located just behind the container yard area between the Green Zone and the link road. The railway yard has multiple lines for stationing freight trains for loading and unloading of containers.

4.1.3 Roads

Roads for internal connectivity within the Port area are linked from Berth to the link road which carries container freight to the other parts of Port or outside the Port, which passes through the container yards.

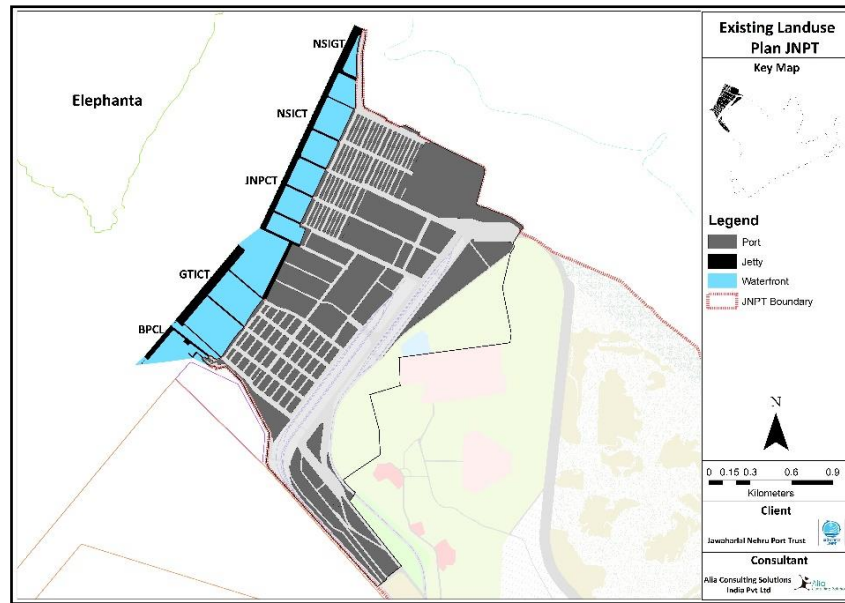


FIGURE 4-1 MAP SHOWING PORT AREA OF JNPT

4.1.4 Berthing and Container Terminals

Port Berths are located outside the JNPT Boundary within waterfront so its area is not considered for the Existing Land use area. The significance of Berths is that it is the station point for Container ships for loading and unloading of containers so it is necessary to address Berths as a crucial part of Port Area. Within JNPT, there are three operational container terminals.

- Nhava Sheva International Container Terminal (NSICT- DP World)&Nhava Sheva (India) Gateway Terminal Pvt. Ltd. (NSIGT- DP World). NSIGT-DP World terminal was formed by extension of the NSICT-DP World berth by 330 m.
- JNP container terminal (JNPCT),
- Gateway Terminals India Private Limited (GTIPL).

4.1.5 Liquid cargo terminal

At present there is one twin berth liquid jetty developed by M/s Bharat Petroleum corporation and IOC limited on BOT basis which handles 6.5 million tonnes per annum

4.1.6 Passenger Jetty

Passenger Jetty is extensively used to provide water commuting for passengers coming in and leaving JNPT from that direction. It is located next to BPCL Terminal.

4.2 Green Zone

Some part of the Green zone is under Port area which runs adjacent to the Railway Land below the Port area. Based on use that portion is covered in the Green Zone itself.

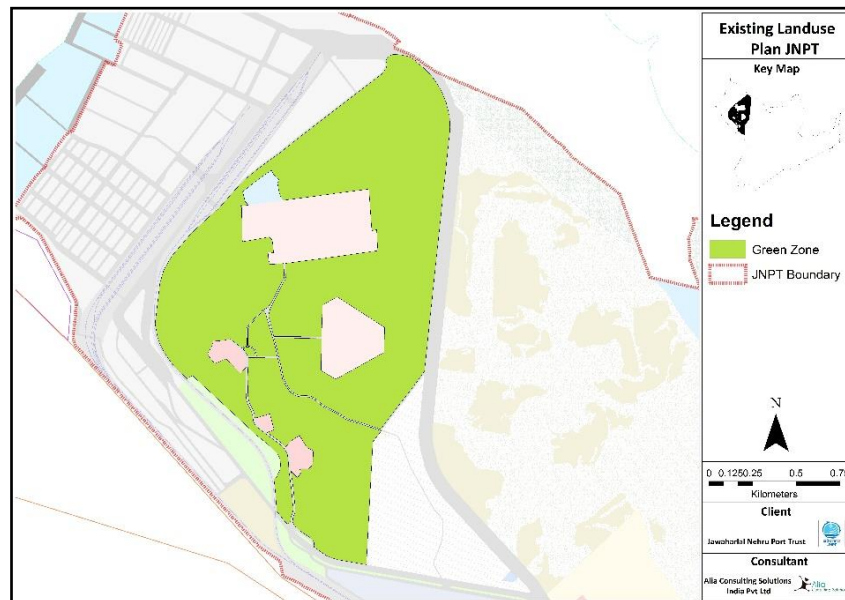


FIGURE 4-2 MAP SHOWING GREEN ZONE IN JNPT

The green zone within the JNPT port is a hill with an area of 233.30 ha. Considering the geographical feature of this area the land use assigned to this feature will remain as Green Zone and it is assumed that no Port Operational activity would take place in this area in the future.

4.3 Tank Farm & CFS

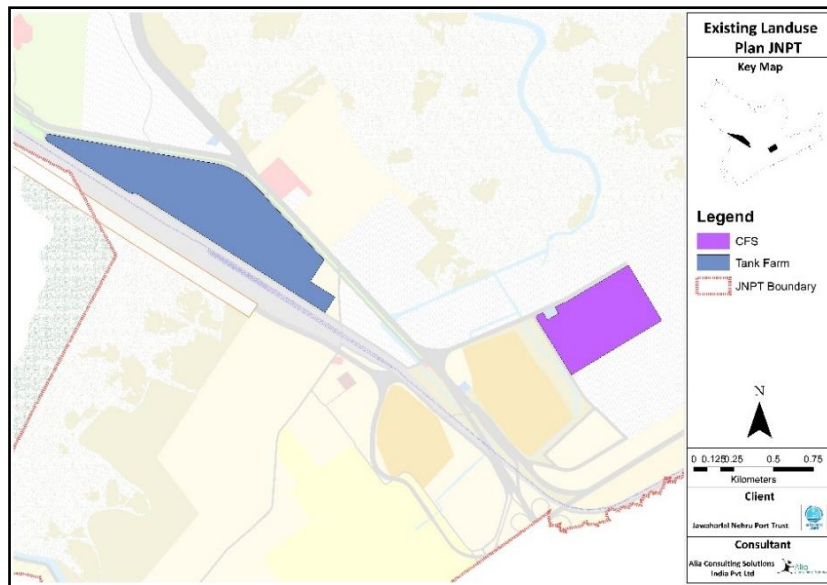


FIGURE 4-3 MAP SHOWING TANK FARM AREA AND CFS WITHIN JNPT BOUNDARY

As per existing scenario a tank farm with a storage capacity of 750,000 tonnes is run by various operators within JNPT boundaries. This tank farm stores various liquid bulk products like POL, edible oil and chemicals. It covers an area of 22.33 ha within JNPT boundary. Apart from the tank farm present JNPT caters to a Container Freight Station (CFS) within the Port for storage of containers. The land for this use is located besides JNPT-SEZ with a total area of 60.48 ha.

4.4 JNPT SEZ

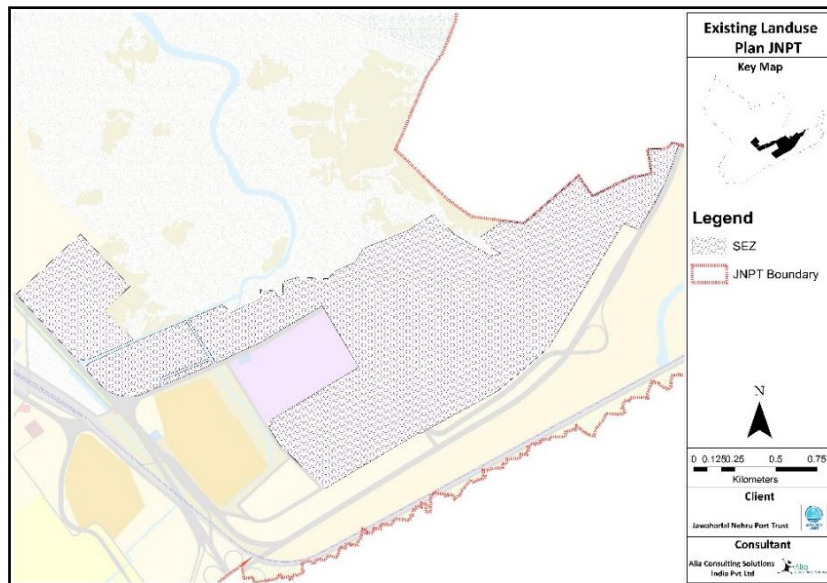


FIGURE 4-4 MAP SHOWING PROPOSED SEZ WITHIN JNPT BOUNDARY

JNPT Special Economic Zone area has been kept out of scope of study since it's a predefined self-operational unit. Hence, its area has been excluded from the JN Port. The area of this zone is 270.5 ha.

4.5 Residential, Area Occupied by Others and Resettlement & Rehabilitation Scheme Area

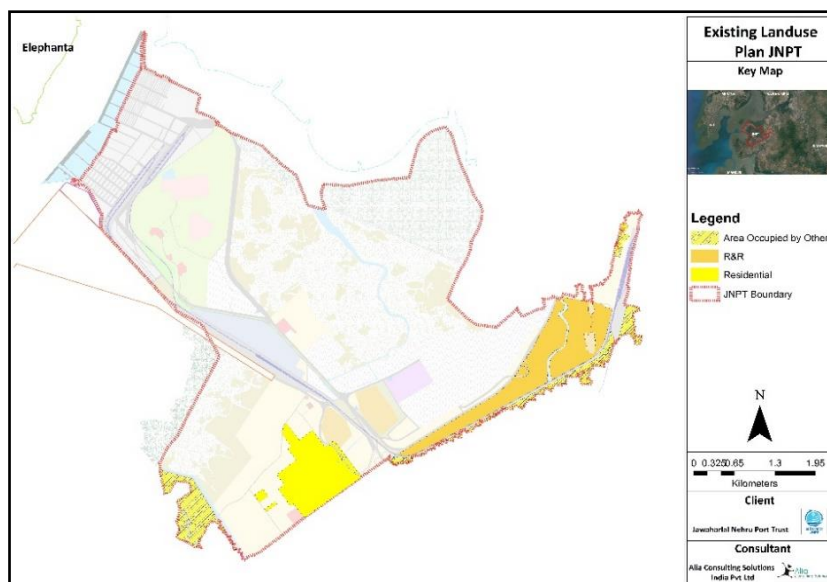


FIGURE 4-5 MAP SHOWING RESIDENTIAL AREA, R&R SCHEME AND OCCUPIED AREAS IN JNPT

Few land patches located along the boundary of JNPT are occupied by others which add up to a total of 355.13 ha. Apart from this, there is a prior proposed 12.5% R&R Scheme within JNPT boundary for LIG & EWS housing as per the new development policy by government. There is a residential township for JNPT itself. The township has amenities like: Commercial plaza, Parks, Auditorium, Hospital etc. apart from residential units which are self sufficient and meant to be for the township residents usage.

4.6 Commercial, P&SP, Parking and Public Utility

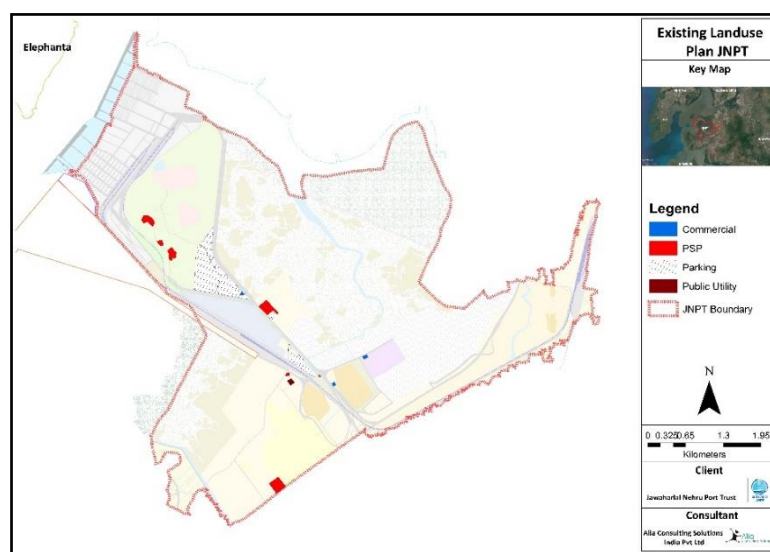


FIGURE 4-6 FIGURE 6 MAP SHOWING COMMERCIAL, P&SP, PARKING AND UTILITY LAND DISTRIBUTION IN JNPT.

Landuse under Public & Semi-public category has existing area of 14.11 ha. This includes the JNPT Administration office, Guest house within the Green Zone. Apart from this there is a prior proposed Custom Office area next to proposed Bio Diesel Plant, A police station is also present in the area. Another PSP is a school located next to JNPT residential township. commercial activity present in JNPT is as follows. There are 3 petrol pumps currently functional within area. They are strategically located near existing parking areas. Hence, proposed parking should also cater to petrol pumps. The existing area occupied by them is 1.06 ha.

At present there are 2 parking lots within JNPT, out of which 1 is functional and the other one is proposed which would cater to the Port's parking needs in forthcoming time. These 2 parking lots have the cumulative area of 53.68 ha and are sufficient for the present use. For new development further parking requirements will come up.

4.7 Village & Others Land

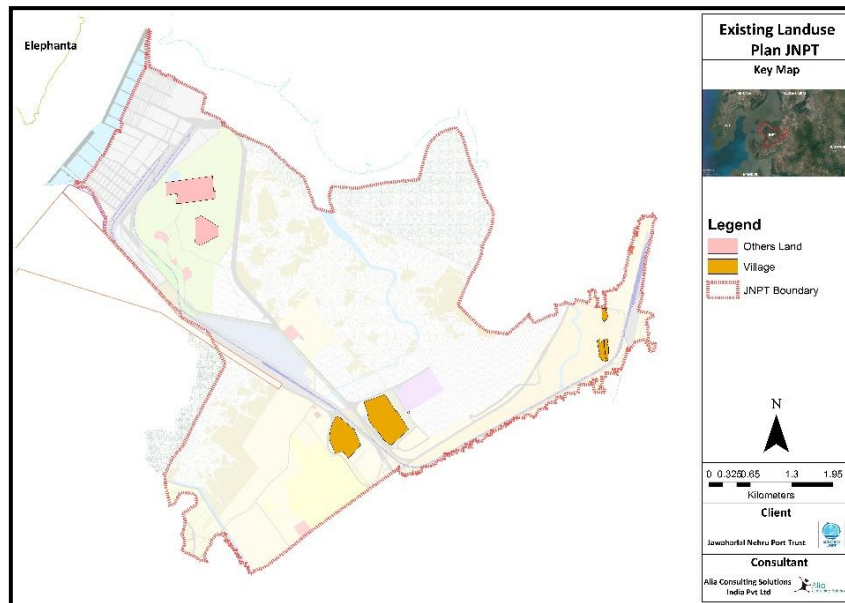


FIGURE 4-7 MAP SHOWING AREAS TO BE EXCLUDED FROM STUDY AREA.

The areas that are to be excluded from area calculation are 4 villages and land belonging to other jurisdiction within Green Zone. These have not been included within the JNPT boundary but they are shown in map for their location.

4.8 Filled and Unfilled Vacant Land

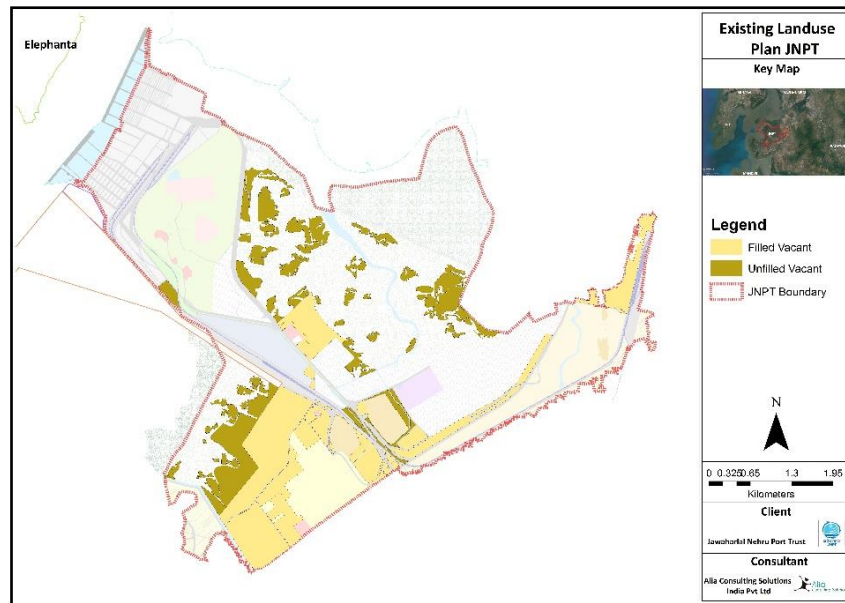


FIGURE 4-8 MAP SHOWING FILLED & UNFILLED VACANT LAND PATCHES AVAILABLE IN JNPT.

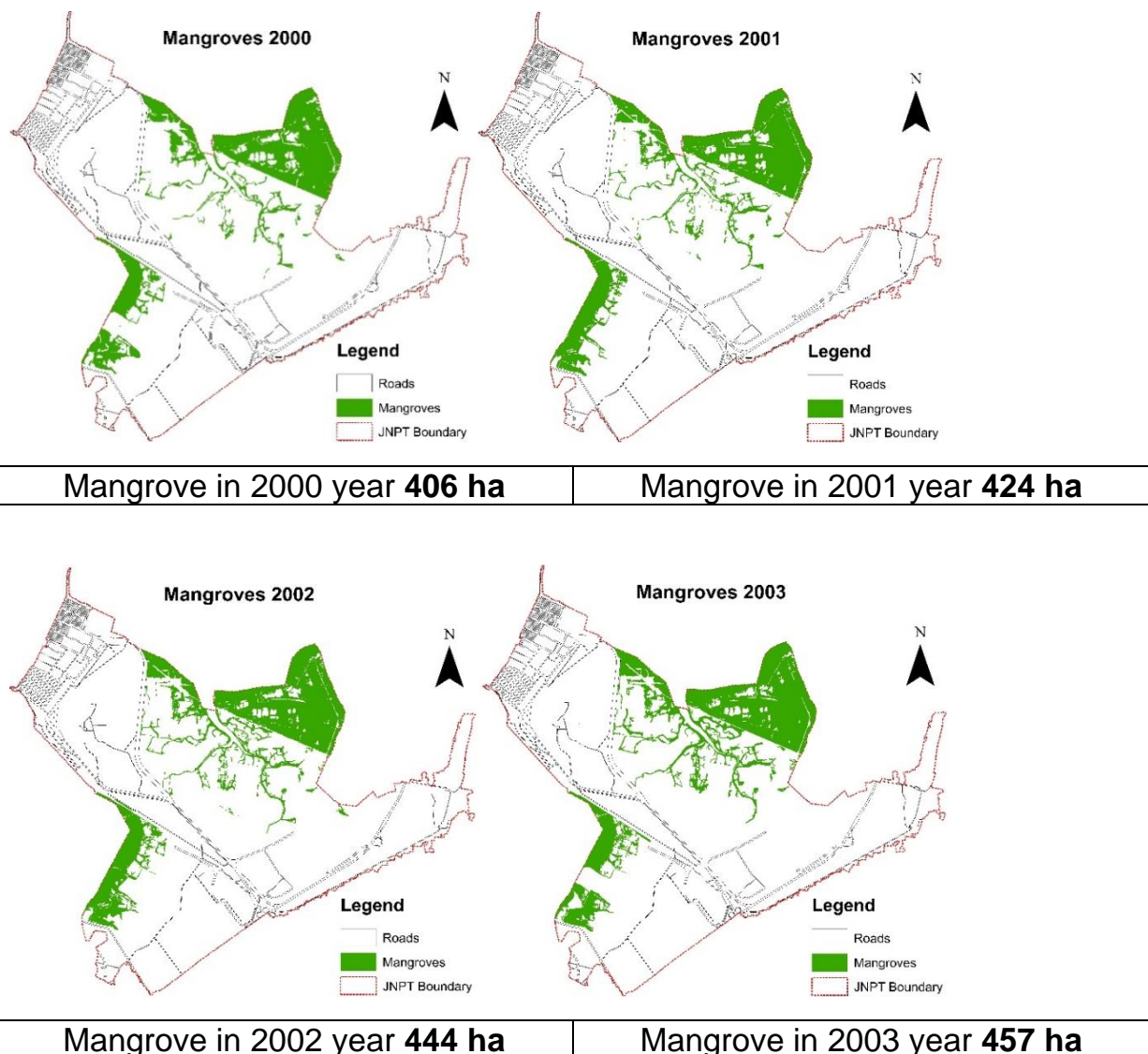
Filled Vacant land are the land parcels considered to be vacant levelled land patches where development can take place without land adjustments. Whereas Unfilled Vacant land parcels are at present in state of unlevelled land which are mostly found in scarce mangrove regions. They require few adjustments but could be considered for future expansions. So, both the vacant categories of land have cumulative area of 671.70 ha and are considerable lands for proposals.

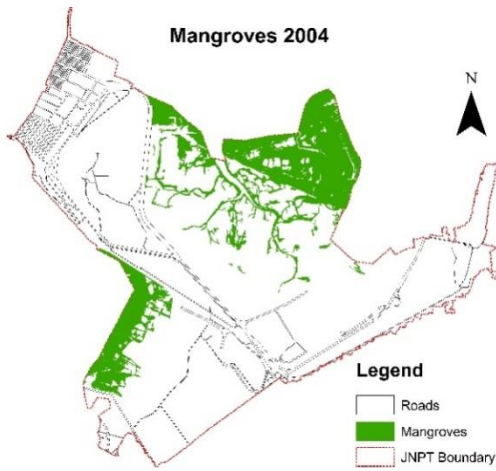
4.9 Mangroves

Within JNPT boundary there are significant number of Mangroves. These mangroves have grown in due course of time in the past decade. There are 2 types of mangroves that we have observed and categorized them as per their density. One is dense mangroves that are there for more than past 2 decades and are of significant ecological importance. The other ones are sparse mangroves which came up later and have unfilled vacant land parcels in between them.

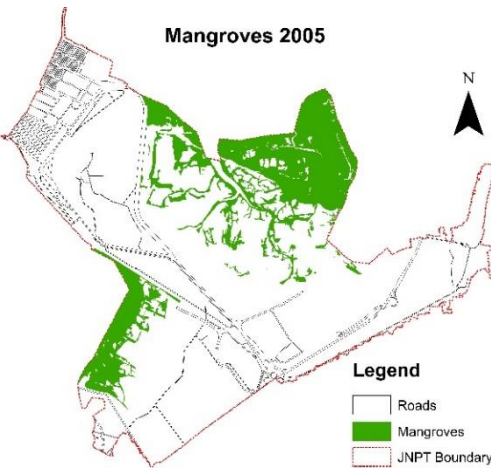
In the year 2000 the total mangrove area within JNPT was around 406 hectares and the same grew to 885 hectares by 2014 due to a breach in the bund which was abutting the dense mangroves on the Nhava creek side. This breach in the bund caused sea water to come into previously dry areas and caused the mangroves to sustain in the previously developable land. As part of this study we have established the existence of sparse mangroves as a temporal increment.

The maps showing increasing mangroves within time course are as follows:

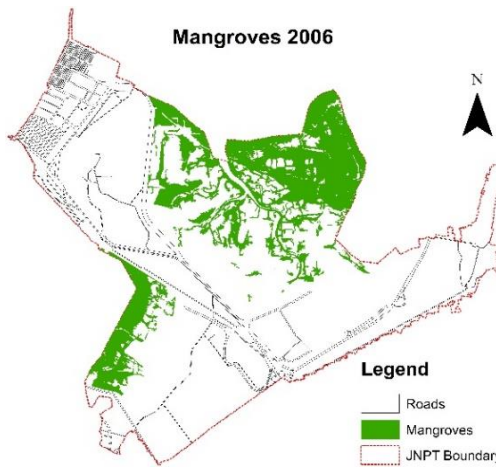




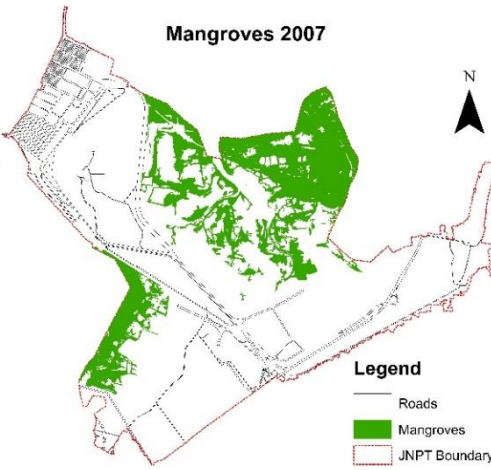
Mangrove in 2004 year **487 ha**



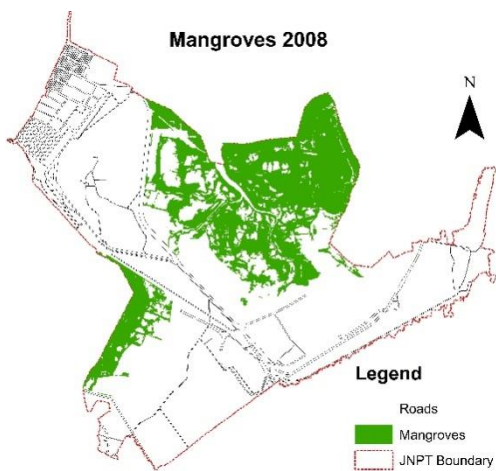
Mangrove in 2005 year **532 ha**



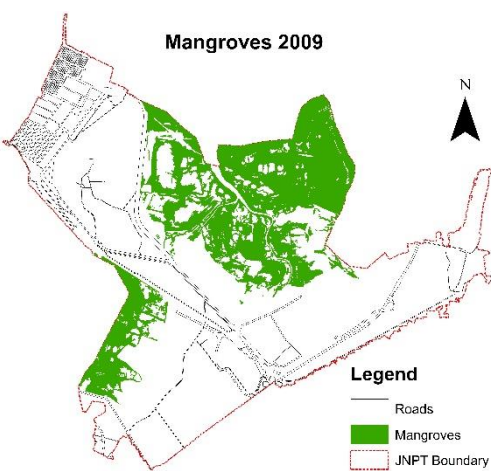
Mangrove in 2006 year **566 ha**



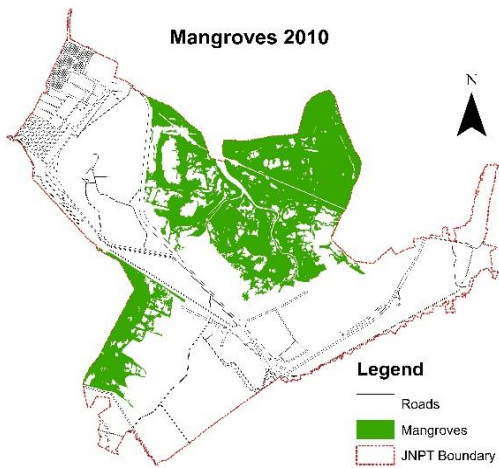
Mangrove in 2007 year **577 ha**



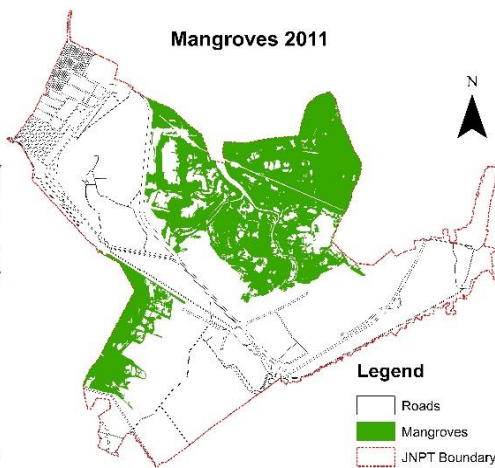
Mangrove in 2008 year **718 ha**



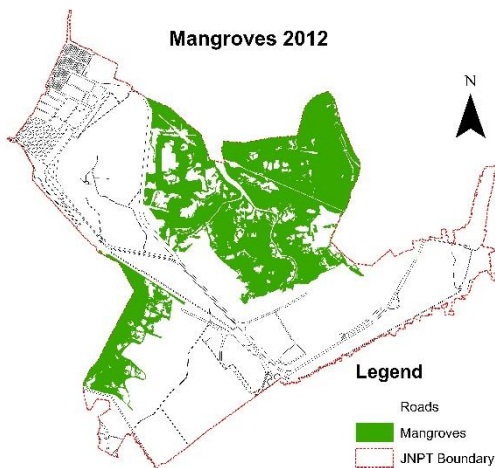
Mangrove in 2009 year **748 ha**



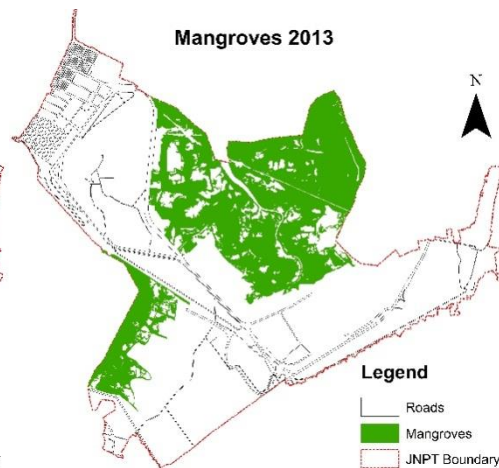
Mangrove in 2010 year **823 ha**



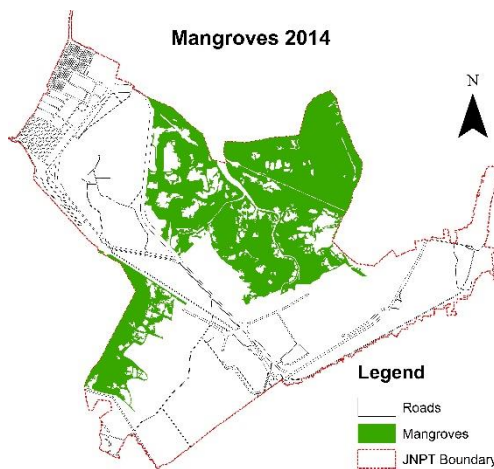
Mangrove in 2011 year **854 ha**



Mangrove in 2012 year **870 ha**



Mangrove in 2013 year **879 ha**



Mangrove in 2014 year **885 ha**

Year	Mangroves (ha)
2000	406
2001	424
2002	444
2003	457
2004	487
2005	532
2006	566
2007	577
2008	718
2009	748
2010	823
2011	854
2012	870
2013	879
2014	885

Table showing Mangrove area throughout years.

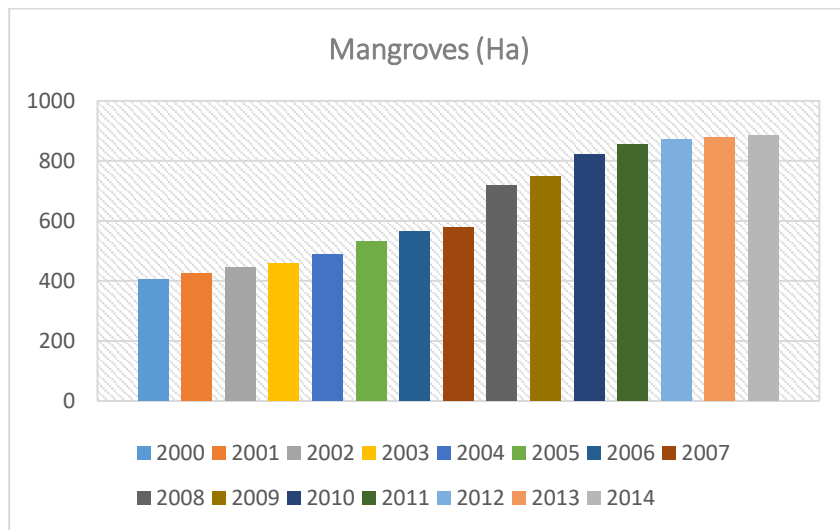


FIGURE 4-9 GRAPH SHOWING INCREASE IN MANGROVE AREA

The above maps depict that in due course of time mangroves have spread within JNPT boundary and seems to be an established feature. At present the area coming under total mangroves within JNPT is 913.6 ha.

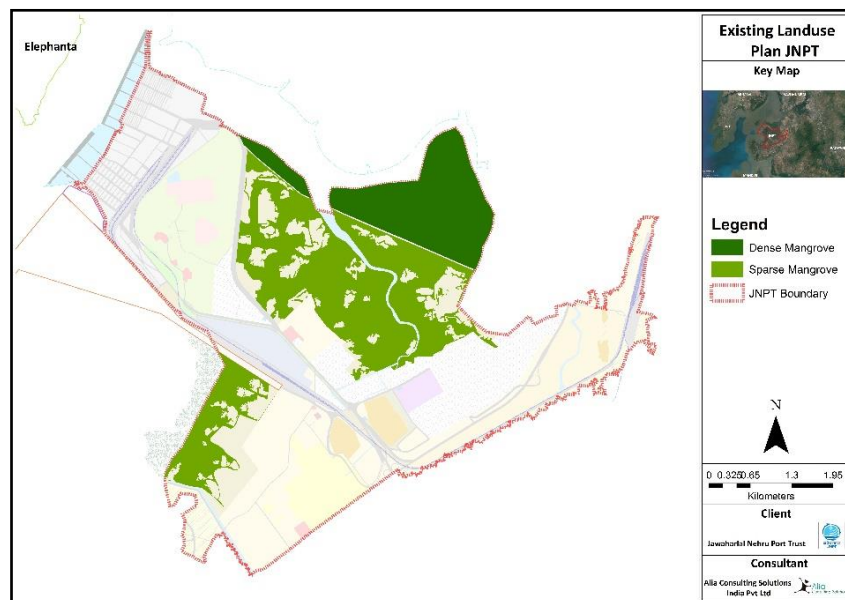


FIGURE 4-10 MAP SHOWING PRESENT STATUS OF MANGROVES

Thus, to leverage the available land optimally, JNPT must reclaim the lands which has been occupied by the sparse mangroves after year 2000 due to breach in the bund. Instead of removing the sparse mangroves entirely, some

part of the land area occupied by the sparse mangroves can be utilised to rehabilitate the mangroves removed thereby making the mangrove free area suitable for development of industries

4.10 Roads and Railway

At present, there are 2 major roads that are serving the port from the port's end to the water front area. Also, there are internal connecting roads which are catering to existing CFS, Tank Farm and other JNPT areas. The total area of roads is 214.2 ha.

For railways, an aligned railway network is running from water front to port end which have several stations for container holding trains. The total land under the railway is 123.7 ha.

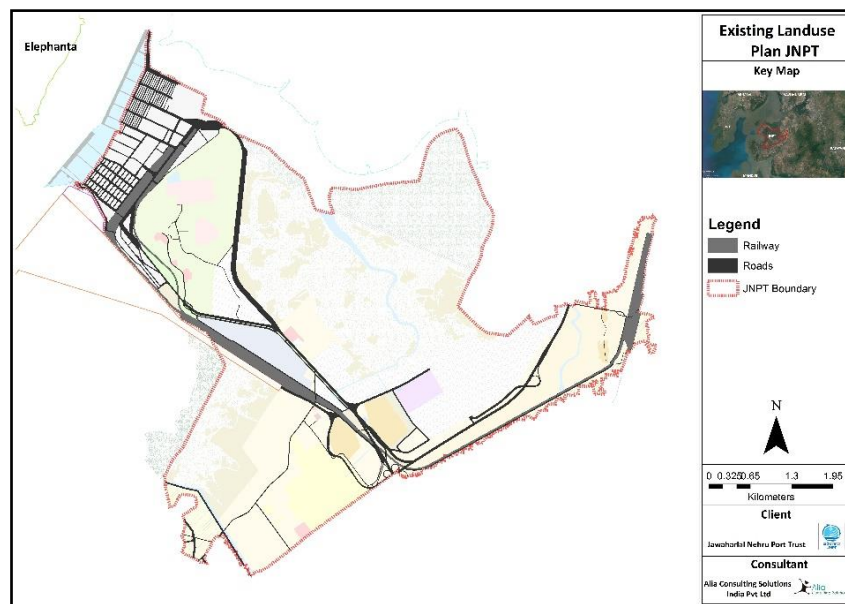


FIGURE 4-11 MAP SHOWING ROADS AND RAILWAY LAND IN JNPT

4.11 Developable Land

In total, 14 land parcels were identified for proposed development in JNPT. The details are given in figure 4-12. The total area is given in table 4-1.

Parcel no.06 and 07 are combination of sparse mangroves and unfilled land which would be developed at a later stage. Parcel no.01, 02, 03, 04, 05, 08,

09, 11, 12 and 13 are filled vacant land which are readily available for development. In these parcels, we infer that an initial phase development can be proposed. Parcel no. 10 and 14 are unfilled vacant land pockets which can be used at later stage along with parcel no. 06 and 07.

FIGURE 4-12 MAP SHOWING TOTAL DEVELOPABLE LAND POCKETS

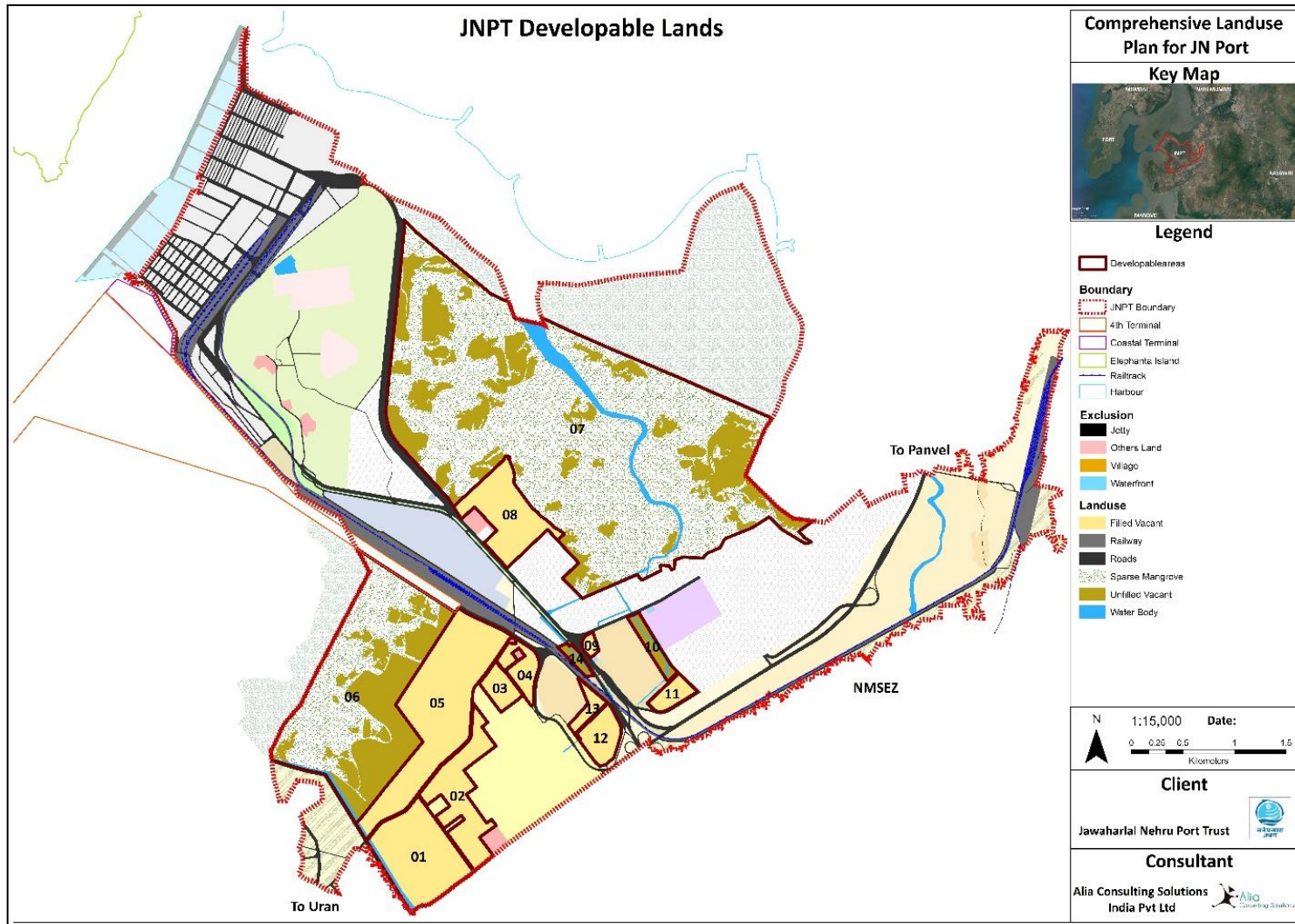


TABLE 4-1 AVAILABLE LAND PARCELS IDENTIFIED FOR PROPOSED DEVELOPMENT.

Developable Land Area Statement	
Land Parcel	Area (ha)
01	61
02	44
03	10
04	13
05	106
06	213
07	671
08	44
09	3
10	8
11	9
12	16
13	7
14	4
Total	1,209

4.12 Cumulative Existing Landuse

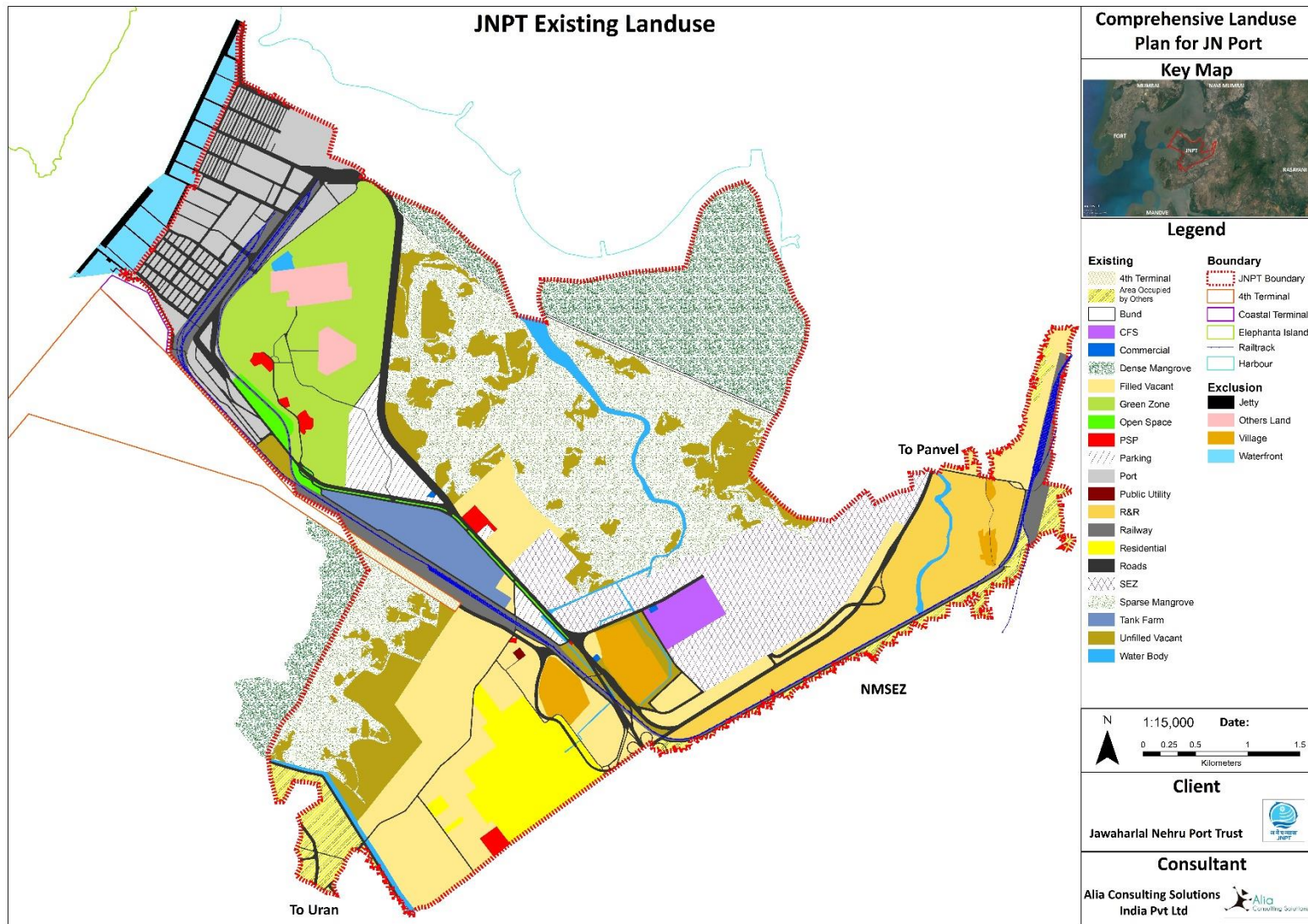
The total land available with JNPT is around 3402 hectares. Of this, the filled vacant land is around 386.5 hectares and the sparse mangroves are around 617.5 hectares. The total land use statement is given in table 4-2. The existing land use map is as given in figure 4-13.

TABLE 4-2 EXISTING LAND USE AREA STATEMENT

Landuse	Area in hectares	%
Dense Mangrove	295.7	8.69%
Sparse Mangrove	617.9	18.16%
Bund	7.09	0.21%
Filled Vacant	386.5	11.36%
CFS	27.33	0.80%
Parking	53.68	1.58%
PSP	14.11	0.41%

Landuse	Area in hectares	%
SEZ	270.5	7.95%
Area Occupied by Others	157.17	4.62%
Railway	123.7	3.64%
R&R	159.8	4.70%
Unfilled Vacant	285.2	8.38%
Residential	111	3.26%
Public Utility	0.78	0.02%
Open Space	17.29	0.51%
Tank Farm	60.48	1.78%
Commercial	1.06	0.03%
Port	176.9	5.20%
Green Zone	233.3	6.86%
Roads	214.2	6.29%
4th Terminal	62.32	1.83%
Area under berthing	82.77	2.43%
Water Body	44.17	1.30%
Total	3402.95	100.00%

FIGURE 4-13 JNPT EXISTING LAND USE



5 Proposed Land Use

The key hinterland of JNPT as per the traffic report submitted by AECOM in July 2016 is Maharashtra, NCR, Punjab, Uttar Pradesh, Uttarakhand, Rajasthan and Gujarat. The above hinterland is also served by Mundra and Pipavav in Gujarat. As per the report, the current trends show that some container traffic from north and North West India has been diverted to Mundra and Pipavav. The reasons for this are:

- Congestion at JNPT
- Proximity of Gujarat ports to north and north west India

Even though the congestion problem at JNPT is likely to be eased after the commissioning of the fourth container terminal, Gujarat ports might still be competitive because of lesser distance from North and North West India. The report also states that the trend of losing traffic to other ports is likely to continue in the future. To overcome these hurdles in container traffic growth and increase and sustain revenues, JNPT must achieve agglomeration of port related activities within the boundaries of the port through establishment of industries within the port boundaries. The proposed SEZ is a significant step in this direction. To unlock its full potential, JNPT needs to develop facilities in the available empty land pockets other than the designated SEZ lands within its boundary. Types of industries which can come up within these empty parcels of land are described in the following sections.

5.1 Zoning of the Land area of JNPT

One of the main objective of preparing the Land use plan is to enable the port to

- 1.) Assign rate of the lease as per the location and intended function.
- 2.) Easily manage land parcels in the computerised inventory management system.

3.) Revise the land use plan as and when required in the future with ease.

4.) Easy Communication with all the stakeholders about leasing and development activities taken up in different areas of the available land parcels.

These above objectives can be met by assigning different zones to the various parts of the entire port. The entire port i.e. both custom bond areas and non-custom bond areas are divided into the following zones

Zone 1: custom bond areas are included in Zone-1

Zone 2: Green zone

Zone 3: existing Oil storage

Zone4A: proposed industries

Zone 4B: proposed industries and proposed eco park

Zone 5: next to special economic zone

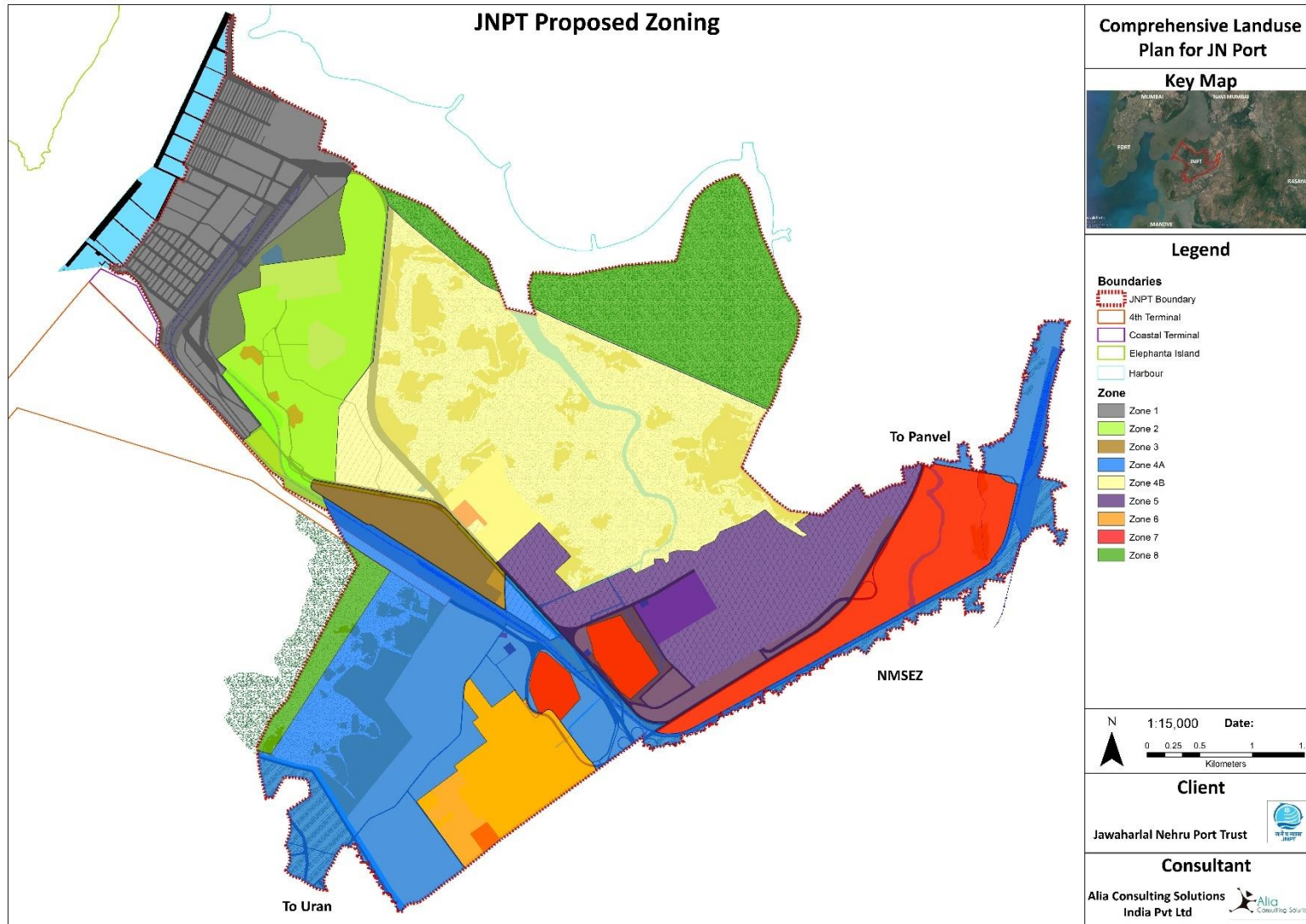
Zone 6: Township area

Zone 7: villages and land allocated for R&R purpose

Zone 8: Mangroves

It should be noted that SEZ is excluded from the zoning as it is deemed to be a separate entity governed by trade laws different from those which are prevalent in the country. The details of the proposed zoning are given in figure-5.1

FIGURE 5-1 PROPOSED ZONING OF ENTIRE JNPT AREA



5.2 Industries proposed in Zone 4A and Zone 4B

The available land parcels are given in figure 4-12. Total land area under zone 4A and zone 4B is 1173.8 Hectares. Of this area, 205.6 Hectares is proposed to be left out for Eco Park. Excluding this available area from the available area leaves 968.2 hectares for development of Industries and associated facilities. The proposed industries in these parcels of land were recommended based on the following parameters.

- Requirement of the units to be near the port
- Ability of the units to add to the exports/imports of the port
- Has good growth potential
- Environmentally friendly

Keeping these requirements in view, following types of usage are proposed for the available land parcels.

- 1) Cold storages
- 2) CFS and bonded ware houses.
- 3) Retail warehouses
- 4) Liquid bulk storage facilities
- 5) Container repair and rehabilitation units
- 6) Environmental rehabilitation
- 7) Recreational facilities and trauma centre
- 8) Road infrastructure
- 9) Open spaces

5.3 Phasing of the development

Some of the above industries proposed do not have immediate demand. For example, demand for establishment of CFS and bonded warehouses might not be realized within next 10 years as the CFSs dependent on JNPT volumes are struggling to achieve break even volumes and there are around 15 proposed CFSs which has been granted permission. So, this existing and proposed CFSs shall be enough to absorb the increase in container throughput in the next few years.

Also, some vacant land available within JNPT is filled and can be used for establishment of industries with less cost. Other parts of the land which are closer to the creeks need higher cost for making them suitable for establishment of industries.

These above considerations necessitate a phase wise approach in the development of land for optimum capital usage and returns. Hence, it is recommended to adopt the following phasing for development.

Usage proposed for phase-1(2017-2025)

- Cold storage
- Agricultural products storage
- Retail warehouses and distribution centres
- Container repair and rehabilitation units
- Eco Park
- Bio Diesel Storage
- Cement storage
- Car sheds

- Port User residential
- Social commercial usage
- Public semi-public space
- Parking spaces
- Public Utility
- Material testing labs
- Roads
- Green buffer zone
- Water bodies
- Container scanner
- Petrol pumping stations

Usage proposed for phase-2 (2026 – 2030)

- CFS and bonded warehousing
- Roads
- Public Utility
- Green buffer
- Social commercial
- Parking spaces
- Open space
- Petrol pumping stations

Usage proposed for phase-3 (2031-2045)

- CFS and bonded warehousing
- Cold storage
- Equipment park
- Liquid storage
- Retail warehousing
- Public and semi-public usage
- Public Utility
- Social commercial
- Parking spaces
- Roads

5.4 Land use in Phase-1

The demand estimation and the location of the industries proposed in Phase-1 are given below. This phase-1 development is proposed to happen over the next 8 years. The total area to be developed under phase-1 is around 624.6 hectares. The proposed phase-1 development is spread over the zones 4A, 4B, 5 and 6. This phase is Further divided into Phase-1A and Phase-1B. Phase-1A covers the industries proposed in the filled vacant lands and Phase-1B covers the facilities to be provided in the sparse mangrove areas.

5.4.1 Cold storages

India is leading producer of fresh fruits and second largest producer of vegetables in the world. As per agriculture ministry, post-harvest wastage of fruits and vegetables is around 25-30%. Department of industrial policy and promotion stated that at least 57% of this wastage can be prevented by

providing adequate cold chain facilities. It is frequently stated in various reports that 5%-25% fruits get wasted due to lack of cold storage facilities. Cold chain is a means of connecting far away perishable goods production centres with the major consumption centres and foreign markets thereby giving farmers fair price on their produce. Government of India has identified cold chain infrastructure as a thrust area for development in the coming years.

The produce collected at the farm can reach the retailer either by regular supply chain or by cold chain. In regular chain, the produce from the farmer is collected and aggregated at a local mandi which then is sent to wholesale hub using open/dry transport. From the wholesale hub, it reaches the city mandi and gets segregated from where it is supplied to the retail shop. In contrast to the regular chain, in a cold chain, the farm collected produce is first sorted, washed, cleaned and graded before packing. After packing/ conditioning of the produce, the produce is subjected to pre-cooling after which it is sent using reefer transport to either cold storage at export hubs or cold storage near demand centres. The produce is then either exported or sold at domestic retail market. Advantage of cold chain is that it ensures that the perishable produce lasts for longer time when compared to regular supply. For some products like onions, potatoes and meat it extends shelf life to months which ensures year-round supply without loss of quality.

The various components of the cold chain are as follows

- a.) Pack houses
- b.) Buffer cold storage/Bulk cold storage
- c.) Reefer truck transport
- d.) Hub cold storage
- e.) Ripening chambers
- f.) Storage at retail centres

The demand for Cold storages at JNPT is of two types. One type of demand originates from the fact that EXIM operations of perishable goods handled by JNPT will be greatly benefitted by the availability of cold storage facilities at JNPT. In case of exports, using cold storage at port as a bulk cold storage shall prove economical for the exporter as it reduces cost in reefer transport and containerisation. In case of imports of perishable products, the immediate availability of cold storage along with other value added services like repacking, ripening chambers etc. helps the importer in reducing costs of transportation. These types of facilities available within the port helps JNPT to sustain and improve exports and imports of perishable products.

Second type of demand for cold storage originates from the proximity of the port to major consumption centre like Mumbai. Cold storage facilities established at the port can act as distribution centres from where some value-added services can be performed on the perishable goods and distribute the same to the retail locations within Mumbai metropolitan region.

One of the significant costs for running these type of facilities is electricity consumption charges. Having larger size facilities can help these types of units to reduce operating costs. JNPT with the existing infrastructure can assure continuous power supply to these types of units. So, investors investing in these types of facilities may opt for larger size units mentioned above to increase their profitability.

5.4.1.1 Demand for cold storages at JNPT led by EXIM operations

Details of various categories of perishable goods handled by JNPT were collected from APEDA for the past 8 years. The trends for all these categories were analysed over this period and the category of products which have shown increasing trend in the total EXIM volumes handled were selected and the same were used for estimating demand for cold storage at JNPT over the next five years.

The capacity of the cold storages required is calculated basis the assumption that these cold storages shall serve only the increase in volumes handled between now and 2022. In the calculation of the total volume required for storage per annum, assumptions are made on the storage time for each type of product. The details of the estimation are given in table 10. The total storage required in MT is estimated to be around 87558 MT.

TABLE 5-1 CALCULATIONS FOR ESTIMATION OF COLD STORAGE DEMAND

Estimation of cold storage demand in MT up to 2021-22 for EXIM operations							
Product	Export+ import quantity in 2015-16	Export+ import quantity in 2008-09	average per annum growth in MT	2021-22 estimated quantity	Increase in annual throughput by 2021-22	number of days required for storage	required storage space in MT by 2022
Buffalo Meat	529342.5	442958.2	10798.0	583332.6	53990.2	15	2218.77
Fresh Onions	789718.0	714575.4	9392.8	836682.2	46964.2	45	5790.10
Fresh Grapes	143053.9	70329.6	9090.5	188506.6	45452.7	7	871.70
Cocoa Products	65845.9	12253.8	6699.0	99340.9	33495.1	7	642.37
Other Processed Fruits & Vegetables	139152.0	98833.0	5039.9	164351.4	25199.4	7	483.28
Pulses	1530519.0	859057.4	83932.7	1950182.5	419663.5	60	68985.78
Cereal Preparations	99719.1	88892.0	1353.4	106486.1	6767.0	15	278.09
Other Fresh Fruits	423113.4	201997.5	27639.5	561310.8	138197.4	7	2650.36
Miscellaneous Preparations	163812.4	64392.1	12427.5	225950.1	62137.7	30	5107.21
Other Fresh Vegetables	125474.4	97907.8	3445.8	142703.6	17229.1	7	330.42
Fruits & Vegetables Seeds	15239.9	13070.6	271.2	16595.8	1355.9	7	26.00
Floriculture	1942.6	1647.9	36.8	2126.7	184.2	7	3.53
Walnuts	4688.4	2414.6	284.2	6109.5	1421.1	30	116.80
Albumin(Eggs & Milk)	2071.6	143.4	241.0	3276.7	1205.1	15	49.52
Other Meat	440.1	267.7	21.5	547.8	107.7	15	4.43
Total	4034133.0	2668740.8	170674.0	4887503.2	853370.1375		87558.38

5.4.1.2 Demand for cold storages at JNPT led by consumption of Mumbai metropolitan area

National centre for cold chain development (NCCD) had prepared a report in 2015 on the status of cold storage for agricultural produce in India. The report

has identified that the gap in various components of the cold chain mentioned above. The report has estimated requirement of cold storage infrastructure in each state up to 2020. The report has given estimates separately for onion storage and hub cold storage.

The hub cold storage requirement for Maharashtra up to 2020 is given as 123509 MT. This demand is estimated based on the urban population of Maharashtra which is taken as 5.453 crores. Population of Mumbai metropolitan region is around 38% of this. Using proportionality, it can be estimated that the demand for hub cold storage facilities for Mumbai is around 46933 MT by 2022.

The value for 2022 was obtained by assuming the growth of population of Mumbai metropolitan region is around 3% per annum. Assuming 50 % of the total hub cold storage requirement of Mumbai is going to be established in JNPT, the demand for hub cold storage is around 23,466.5 MT per annum by 2022.

5.4.1.3 Total area requirement for establishment of cold storage facilities at JNPT in phase-1

The total area is estimated by adding the EXIM led demand and consumer hub led demand which is equal to 111024.9 metric tonnes per annum.

Multicommodity cold storage is most suitable for this kind of product mix. For the calculation of area required “technical standards and protocol for the cold chain in India” document published by national horticulture board is referred where a typical layout for a 5000 MT multi commodity storage is given. The report gives an area of 4205.5 square metres. The same value is adopted for calculation of the total covered area required for the establishment of 111025 MT is calculated and is equal to 93372 square metre. The uncovered areas in a cold storage plant is taken as 3 times the covered area to facilitate space for movement of trucks, internal roads treatment plants, future expansion etc.

Thus, the total area required for cold storages is $93372+3*93372 = 373488$ square meters or say 37.5 hectares.

This proposed area is expected to handle only food and plant products. The pharmaceutical industry demand for cold storage facilities is not accounted for in this calculation as the pharmaceutical exports have fallen by 10% and is expected to further fall in the coming years as per rating agency crisil.

5.4.2 Retail warehouses and distribution centres

Retail warehousing industry in India has grown by leaps and bounds in the past decade. The focus of the logistics industry has changed from just managing transport and Godowns to integrated supply chain management system. Warehousing facilities play a very important role in achieving this integrated management system by providing buffer zones in the supply chain. Another factor which paved way this type of integrated management system is the rise of the companies providing third party logistics (3PL) services which specialize in outsourced management of the entire supply chain or part of the supply chain for other companies. 3PL companies typically provide transportation and warehousing services which can be scaled and customized based on service requirements. A typical warehouse which is part of these integrated supply chains now focuses on areas efficient inventory management systems along with value added services like consolidation, packaging, repackaging, labelling, bar coding, custom clearance, distribution. The warehousing units with all these facilities act as distribution centres in the supply chain.

Growth drivers of retail warehousing industry in India

- Growth of e-tailers like Flipkart and amazon
- Permission for FDI in multi brand and single brand retailers
- Change of tax structure to GST
- Growth of 3PL companies in India

- Dedicated freight corridors

Challenges for warehousing industry in India

- Availability of required infrastructure like highway and state highway connectivity
- Land availability
- Unorganised activity
- Power outages

GST tax regime will remove the need to establish warehouses in different states in the supply chain to avoid central sales tax and cause the companies to build fewer and larger warehousing facilities at strategic locations. JNPT which is a major hub for logistic activities in western India will be a very attractive location to establish these type of large scale distribution centres. In addition, the proposed western dedicated freight corridor starting from JNPT to Dadri in Uttar Pradesh will increase attractiveness of JNPT for establishing these types of large distribution centres which can exploit the multi modal facility offered by JNPT for goods movement.

As per Knight Frank report of 2014, the demand for the warehousing by 2019 in India due to retail consumption oriented operations is estimated 362 hectares. This is retail consumption warehousing is mainly driven by urban population. The population growth per annum is 2.38 per annum. The demand for retail consumption ware housing can also be expected to grow at the same percentage. So, by 2022 the demand for retail consumption can be expected to grow to 379 hectares. By 2035, the demand for retail consumption warehousing can be expected to grow to 526 hectares.

Share of Mumbai metropolitan region in total retail consumption of India is around 28.9%. so, the total area of warehousing demand of Mumbai area due to retail consumption by 2022 can be around $379 \times 29.8\% = 113$ hectares. Assuming JNPT is well suited for at least 25% of these operations, there will

be demand for 28 hectares storage space for this retail consumption driven warehousing at JNPT by 2022. Similarly, by 2035, Mumbai warehousing demand by 2035 can be expected to grow to 157 hectares of storage space of which JNPTs share can be around 40 hectares. Hence, between 2022 and 2035 an additional demand for 12 hectares of storage space can be expected to be generated at JNPT.

These types of warehouses can be established for servicing a single company or multiple companies. These warehouses can be used for storing and handling of products and provide value added services like packing, sorting, labelling, tagging etc. These warehouses can even act as distribution centres by providing cross docking services and by direct shipping of goods to retail shops. Max land requirement for these types of units can be around 1.5 hectares but sometimes may go up to 2.5 hectares or more. Fulfilment centres for e-tailers come into this category. If these firms find that existing and proposed railway lines in JNPT are crucial for their transporting of goods, then the area of each of the warehouse can be much larger than given above.

For establishing these types of units an estimated additional 1.4 hectares of open space is required for every 1 hectare of storage space. Hence, it is proposed that 67.2 hectares of vacant land be allocated for establishing these retail warehouses/distribution centres by 2025. This land can cater to a storage space of around 28 hectares. An additional 29 hectares of land can be allocated for establishment of retail distribution centres between 2025 and 2035. These 29 hectares of land can cater to a storage space of around 12 hectares.

5.4.3 Eco-park

One of the key principles of JNPT is to address the environmental balance by providing an eco-Park and maintaining the natural habitat of Mangrove forest. An area of 205.61 hectares is proposed to be converted to an eco-park.

At present, the location where the eco park is proposed and the vacant land next to the proposed eco-park up to the existing main road of JNPT is interspersed with mangroves. As mentioned in the section 4.9, these mangroves are a result of the break in bund and to restore the location to the earlier times, the sparse mangroves needs to be removed and ensure that they do not grow back. The proposed eco park can be used as an effective barrier to ensure that the mangroves do not creep back into the developed land and at the same time act as an additional green zone. The proposed shall also act as a buffer zone in conjunction with the proposed holding ponds between the Nhava creek and developed land during floods

As per the CRZ guidelines of 2011, page -10, clause number 8. I. ii. (f), allows for storage of non-hazardous goods in notified ports if the areas are not ecologically sensitive and if proper safety measures are adopted. The eco-park shall function as one such safety measure.

As per the CRZ guidelines of 2011, page -12, clause number 8.V.A(ii), 5 times the number of mangroves removed should be replanted for the construction of roads. The eco-park shall be used for this purpose

5.4.4 Container repair and rehabilitation units

Units can be setup within the terminal for repair and rehabilitation of containers which pass through JNPT. Based on data available at similar ports to JNPT where such units are established, it is proposed that JNPT provide 10 hectares of land within the port for container repair and rehabilitation purpose. This should be enough to cater to the demand up to 2035 when the throughput of the port is estimated to be 18.3 million TEU. Services like Inspection of containers, Steam, chemical and water washing of the containers, Refurbishment of containers, plate renewals, reefer repairs, and reefer pre-cooling can be offered at this location. It should also stock spares for repair of regular and reefer containers.

5.4.5 Container scanner

An area of 5.68 hectares is proposed to be used for setting an additional container scanning facility and associated parking space required. This facility is proposed to be setup next to the existing customs building.

5.4.6 Other industries

Apart from the industries mentioned in the previous sections, it is proposed that land should be allocated for other industries which are likely to come up at JNPT. This allotment is proposed based on the requests which were received by JNPT from time to time. Only industries which will add to the EXIM cargo of JNPT were considered.

Agriculture products open storage:

In addition to the agricultural produce which require cold storage some products like onions which might not require cold storage are grown majorly in the neighbouring districts of JNPT. If any government agency which promotes export and distribution of these commodities can be allocated land for establishing storage facilities for such products. This will immensely help the farmers in the neighbouring districts to find market for their produce. An area of around 6 hectares was earmarked in the land use plan for establishment of such units.

Bio Diesel Storage:

Government of India has been promoting bio diesel by giving tax benefits for companies which are involved in the production and distribution of bio diesel. It is generally accepted that India has the potential and resources to successfully deploy second generation bio fuels as alternative to its burgeoning demand for diesel. JNPT will be an ideal location for interested entrepreneurs to setup units which will help them in distribution and perform minor value addition services. An area of 15 hectares is earmarked for these types of industries. If it is found at a later stage that there is lack of interest in

the market for establishment of these type of units, it is suggested that JNPT allocate this land to either cold storage or retail warehouses

Car storage:

An area of around 6.25 hectares is earmarked for leasing out for establishment of storage for used cars. JNPT has been getting requests from various interested parties who want to setup units which will convert these old cars into scrap and market the scrap metal. Since this will add to the imports of the port, the above-mentioned area is earmarked for leasing to parties which are interested in establishing these units.

Cement storage:

JNPT has received queries from interested parties for establishing cement product storage within JNPT. Hence, an area of 2.5 hectares was demarcated for establishing cement silos within JNPT as it has a potential to help in sustaining JNPT EXIM traffic.

Research Labs:

Quality certification laboratories are proposed to be land for lease within JNPT premises, as these labs help in certification for the agricultural produce and food products exported from JNPT. These labs go a long way in creating a complete eco system for the agricultural products and food products exporters at JNPT. An area of 8.6 hectares is earmarked for this purpose.

Petrol Pumps:

Fuel pumping stations were proposed in this phase to meet the fuelling needs of the vehicles coming to JNPT. An area of 4.62 hectares was provided for this purpose.

5.4.7 Social commercial

Social commercial facilities like departmental stores, recreational centres, food kiosks, Toilets, dormitories, small gardens, trauma care centre and other facilities are proposed to be developed in the first phase to cater to the

employees and the visitors of JNPT. An area of around 35.3 hectares is proposed to be provided for these facilities.

5.4.8 Public utility (phase-1)

An area of around 35 hectares demarcated for public utility in the map can be used for creating utilities to cater to the proposed industries. This area can cater to various facilities like STP, solid waste management, Electric substation, water sump for firefighting, overhead water tank and pump house. Within this area, a provision needs to be made for recycling plants of both sewage and solid waste which will ensure that some percentage of the sewage water is recovered and can be used for general usage.

It should be noted that the proposed industries are not expected to have any metallic or poisonous effluents coming out of them. The sewage generated by these proposed industries will be organic in nature and can be recycled with less cost.

5.4.9 Public and semi-public usage

An area of around 8.85 hectares was earmarked for allocation of Public and semi Public (PSP) usage. Buildings for accommodating administration personnel, customs officials, security and other associated services like landscaping, car parks, bus shelters, open gardens, entertainment, etc. are proposed to be setup here.

5.4.10 Parking

An area of around 27.5 hectares is allocated for parking of the trucks coming to the proposed industries. The parking shall also accommodate 4th container terminal traffic.

5.4.11 Waterbodies and green buffer

An area of around 8.6 hectares is left along the road which goes to Panje village near the boundary of JNPT in Zone 4A is proposed to be kept for

drainage of the creek and rain water and the associated green strip on both sides of the drain.

5.4.12 Port user residential area

An area of around 13.8 hectares is identified within the township area of JNPT which is presently lying vacant. It is proposed that this land can be used by JNPT for developing commercial activities.

5.4.13 Roads

For ensuring free movement of the traffic within the proposed development, three different types of roads are proposed.

Main arterial roads in the 70m corridor

Sub arterial roads in 50m corridor

Collector roads in 30m corridor

The whole area is divided into 2 hectare plots such that every plot is at least served by a sub-arterial road. These corridors are expected to accommodate the roads, utility corridor and drains. These corridors are provided to help the port in accommodate any future requirements of the proposed units without disrupting their operations. In zone 4A, the road connecting uran-sheva, road adjoining southern boundary of the township are proposed to be extended into 70m corridors and four other small length roads 50m corridors were proposed for easy movement of vehicles. In zone 4B, one major arterial road with a corridor of 70 meters is proposed which stretches between the north-western edge of the eco-park and the western face of the proposed SEZ. This road runs along the Southern boundary of the proposed Eco park and is connected to one more road with 50m corridor on the northern periphery of the proposed eco-park which runs along the periphery of the proposed eco-park and extends from a location just before the Y-junction to

the proposed SEZ exit. The total area earmarked for the proposed corridors in phase-1 is around 113.88 hectares.

Total area to be developed and the sub division of the land according the utility in phase-1A from 2017 – 2025 is given in table 5-2. Similarly, development proposed as part of Phase-1B is given in table 5-3. The areas provided in the table below might be little different from the demand calculation given in the above sections. This is due to the shape of the land pockets available and their distribution. The demarcation of Phase-1A and Phase-1B is given in figure 5-2. The locations of all the activities proposed are given in figure 5-3 and figure 5-4.

TABLE 5-2 AREA STATEMENT OF PHASE-1A

Area Statement of Phase-1A		
S.No	Activity	Area in Hectares
1	Agro Based Storage	5.99
2	Bio Diesel	15.35
3	Car Storage	6.26
4	Cement Silo	2.46
5	Cold Storage	38.00
6	Container Repair	9.19
7	Container Scanner	5.68
8	Parking	27.51
9	Port User Residential	13.80
10	PSP	8.84
11	Public Utility	35.28
12	Research Labs	8.59
13	Retail Warehousing	64.89
14	Petrol Pump	4.62
15	Social Commercial	8.79
16	Waterbody	2.73
17	Green Buffer	5.88
18	Roads	59.72
	Total	323.58

TABLE 5-3 AREA STATEMENT OF PHASE-1B

Area Statement of Phase-1B		
S.No	Activity	Area in Hectares
1	Eco Park	205.61
2	Open Space	11.59
3	Waterbody	16.87
4	Roads	54.16
5	Green Buffer	12.79
	Total	301.02

FIGURE 5-2 JNPT PROPOSED PHASE 1A AND PHASE-1B

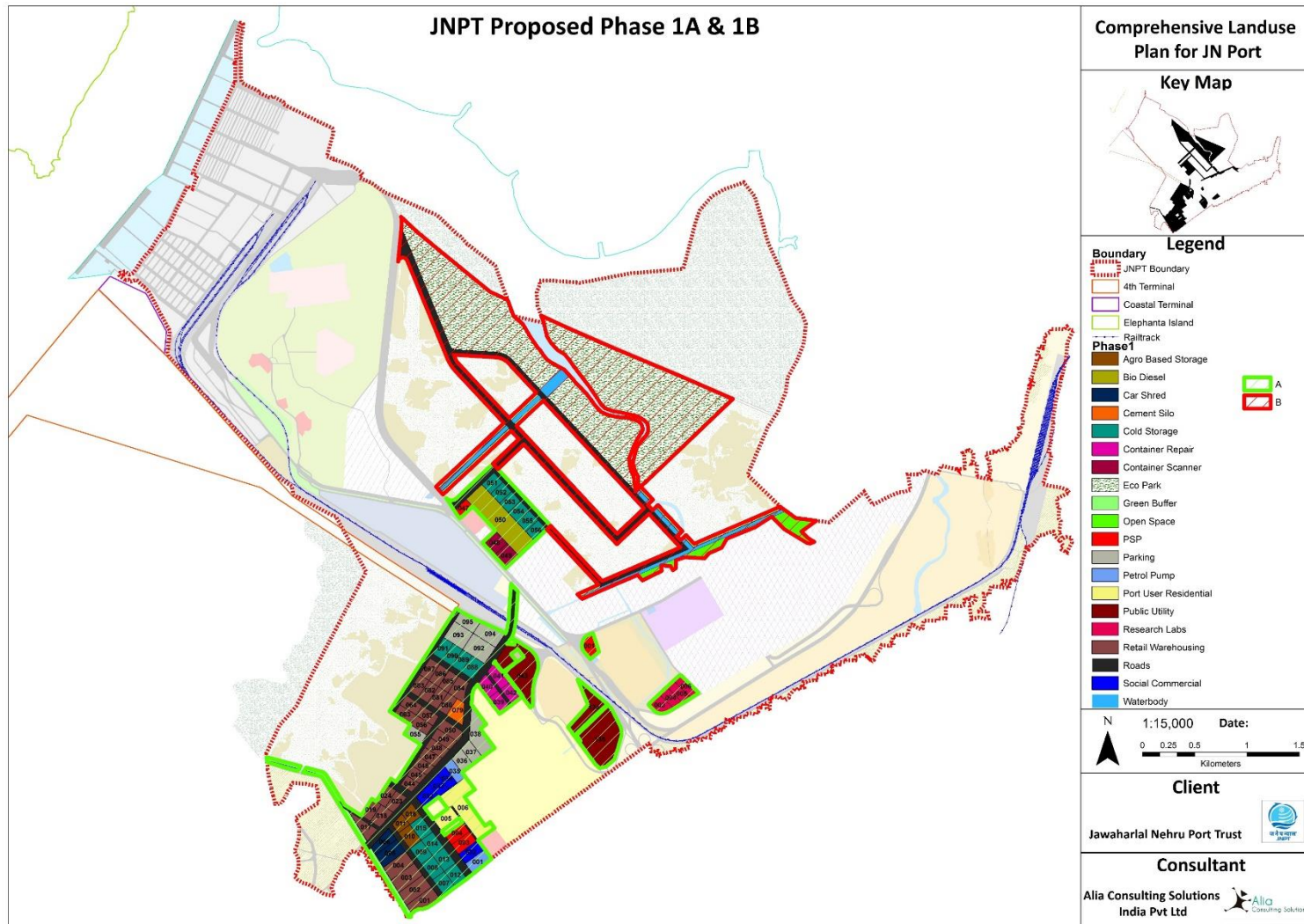


FIGURE 5-3 PROPOSED PHASE 1A DEVELOPMENT

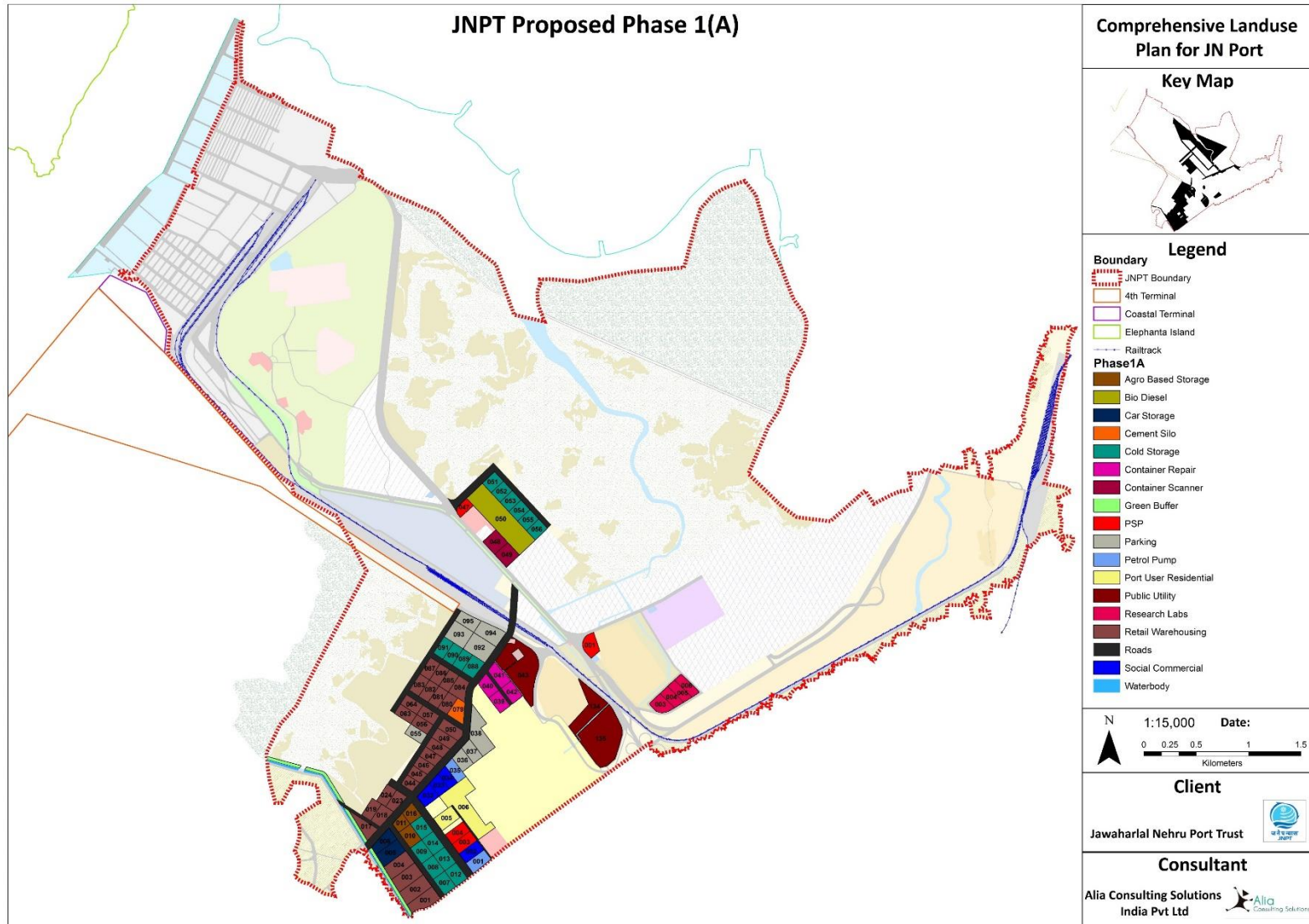
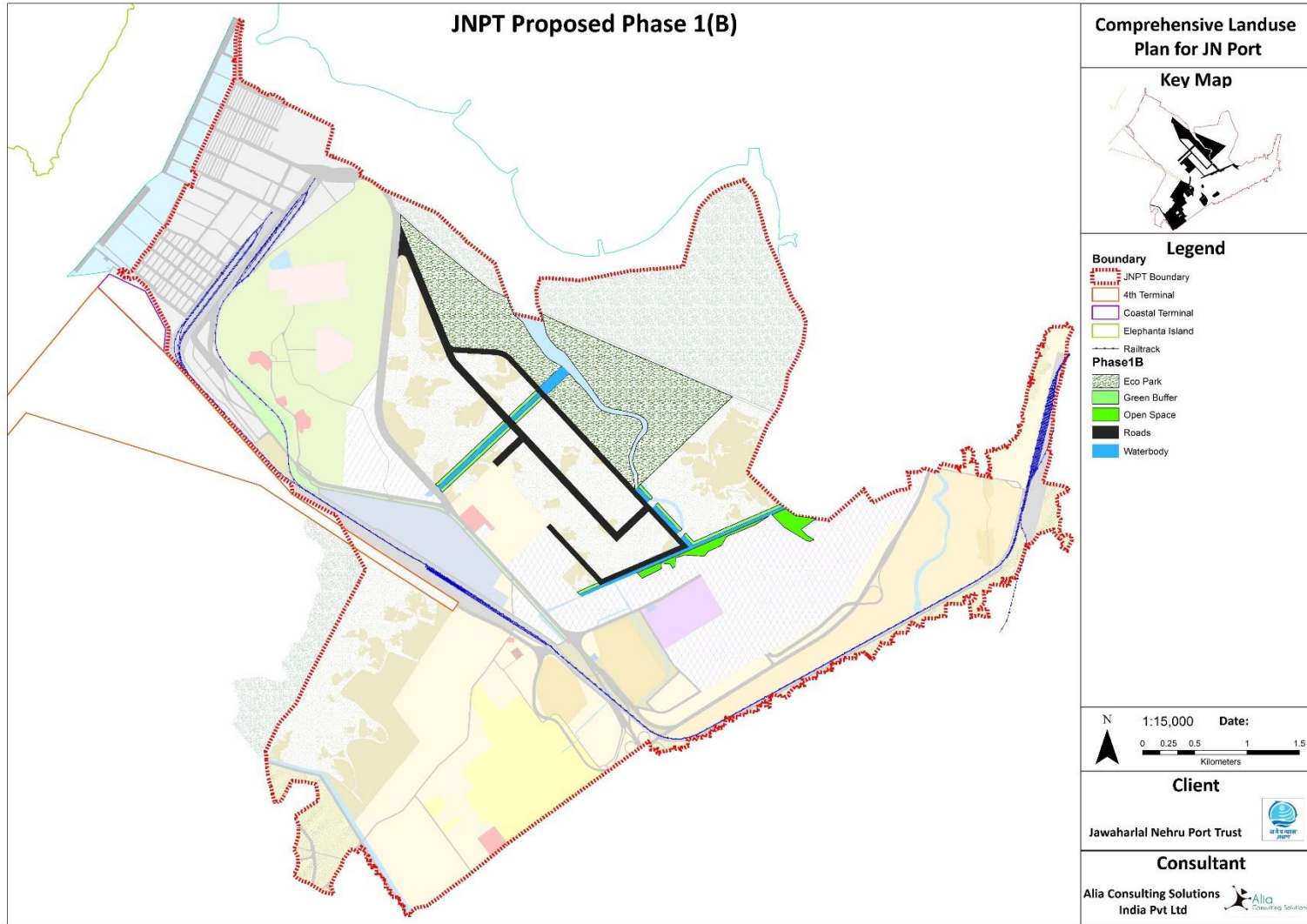


FIGURE 5-4 PROPOSED PHASE 1B DEVELOPMENT



5.5 Land use in Phase-2

The details of land use in Phase-2 is given below. The area demarcated under phase-2 is proposed to be developed during the period 2026-2030. The total area to be developed under phase-2 is around 443 hectares. The phase-2 development is proposed entirely in zone 4B.

5.5.1 Cross docking facilities and bonded warehousing

Container freight stations provide services like handling, storage of Exim laden and empty containers, customs clearance along with value added services like stuffing, De-stuffing, and consolidation of less than container load cargo. The maximum land requirement for each of these unit can go up to 10.1 Hectares.

Bonded warehouses can be allowed within or outside the premises of a CFS in conjunction with duty free shops. This type of warehousing enables the importers to defer the payments to the customs and at the same time release containers. These units within JNPT allows the importer to move goods at virtually no cost to the nominated warehouse. These facilities ensure that the port stays attractive to the importers.

JNPT handled 4.5 million TEU in 2015. As per AECOM traffic report of July 2016, the container traffic at JNPT is projected to be 18.3 million TEU by 2035. At present, total capacity of CFS within JNPT and in its vicinity, is around 1.12 million TEU. By 2035, the demand for CFS warehousing will go up to 4.56 million TEU. The area required for establishing 4.56 million TEU is around 462 hectares. Existing CFS and bonded warehouses area is around 114 hectares.

The demand for CFS area to cater to the projected traffic will be around 349 hectares by 2035. It is proposed that land to be allocated within JNPT for catering to around 70% of this demand (around 237 hectares) due to the direct to port delivery (DPD) initiative. It is proposed to allocate these 237 hectares to establish container cross docking facilities or temporary storage

facilities along with bonded warehouses instead of CFS's. Even though DPD scheme does not require CFS operations, there will be demand for cross docking operations or temporary storage for containers due to factors like lack of availability of storage space at the customer's location and cash flow constraints to clear the customs duty. This will translate into demand for space required for segregation of containers for efficient operation of DPD scheme which cannot be provided within the yards itself due to space constraints.

These facilities are proposed to be provided in phase-2 and phase-3 as the CFSs outside JNPT, at present, are not running to their full capacity and further 15 CFSs are likely to come up in the near future and these CFSs are expected to absorb the projected growth in container throughput at JNPT. Hence it is proposed that cross docking facilities and bonded warehouses within JNPT should be established after 2025. It is proposed that in phase-2, around 67 hectares of land should be used for establishment of cross docking facilities and bonded warehouses. The final areas which are proposed to be allocated to these facilities are given in table 5-4.

TABLE 5-4 DEMAND ESTIMATION FOR CROSS DOCKING AND BONDED WAREHOUSES

Cross docking facilities and bonded warehousing				
year	Traffic in MMT	Capacity of CFSs required in M. TEU	Storage area required in hectares for CFS	Additional space demand at JNPT in hectares
2015	4.5	1.1	114	0
2020	6.8	1.7	172	0
2025	10.2	2.6	258	71
2035	18.3	4.6	463	166

It should be of note here that the discrepancy between the calculated and the allocated land is due to numerous factors like land availability and shape of the land parcels.

5.5.2 Public utility and social commercial

An area of 18.1hectares is proposed to be used various utilities like STP, water recycling unit, electrical substation, overhead tank for portable water supply and pump house to cater to the industries coming up in phase-2. In addition, an area of 6.81 hectares is proposed to be earmarked for various social commercial purposes like restaurants, plaza, food courts etc.

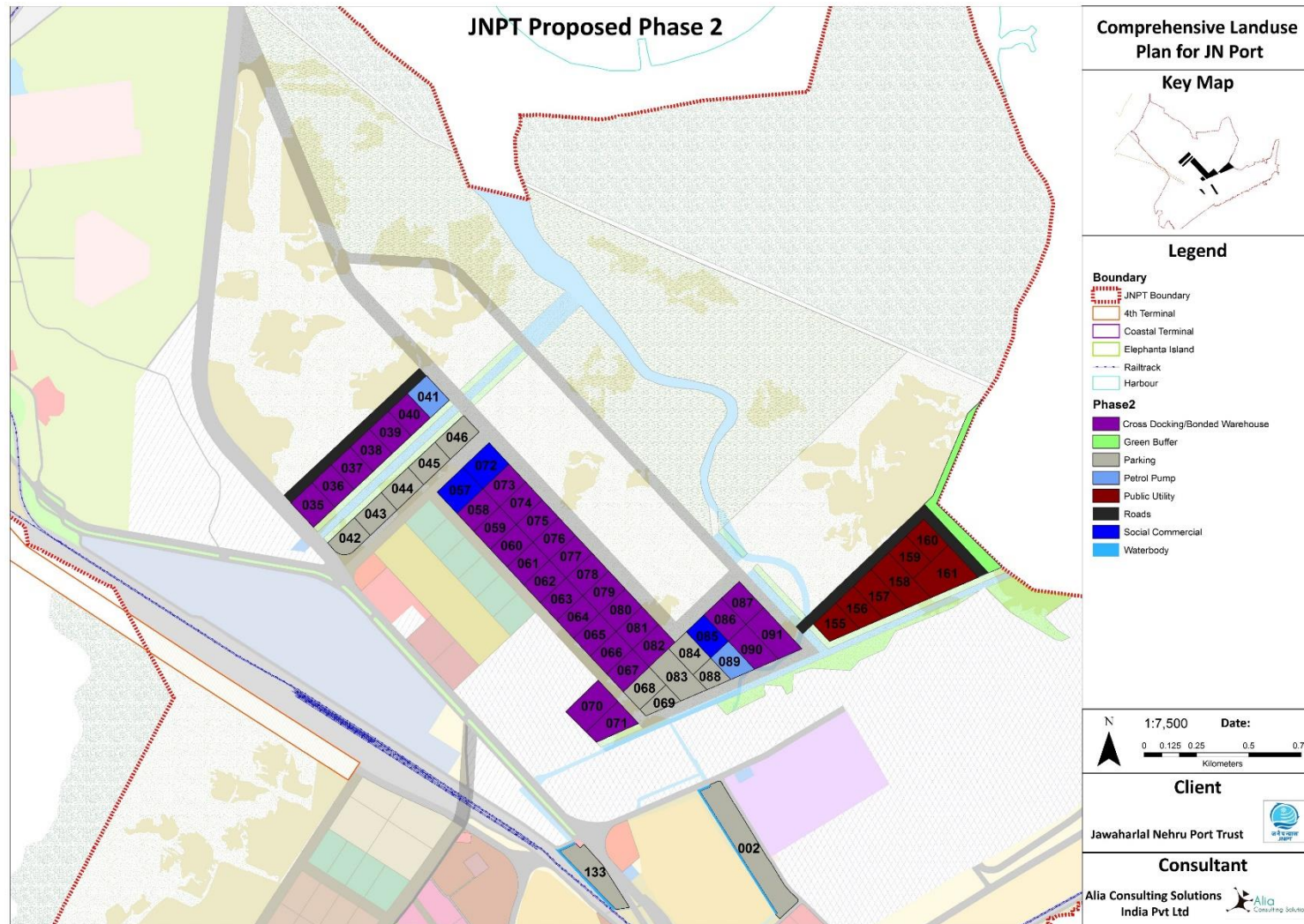
5.5.3 Parking

An area of around 30.6 hectares is proposed to be earmarked for parking in the phase-2 layout.

TABLE 5-5 AREA STATEMENT FOR PHASE-2

Area Statement of Phase-2		
S.No	Activity	Area in Hectares
1	Cross Docking/Bonded Warehouse	66.76
2	Petrol Pump	3.89
3	Parking	30.59
4	Public Utility	18.09
5	Social Commercial	6.81
6	Roads	10.62
7	Green Buffer	3.95
8	Waterbody	1.29
	Total	142.00

TABLE 5-5 AREA STATEMENT FOR PHASE-2



5.6 Land use in phase-3

The details of land use in phase-3 is given below. The area demarcated under phase-3 is proposed to be developed during the period 2031-2045. The phase-3 development is distributed over zone 4A and Zone 4B.

5.6.1 Cross docking facilities and bonded warehousing

The demand calculation for the period between 2031-2045 for these facilities at JNPT is given in section 5.5.3. It is proposed that an area of around 162 hectares be provided for the cross docking or temporary container storage and bonded warehousing in third phase.

5.6.2 Retail warehouses and distribution centres

The demand calculation for these facilities is given in section 5.4.2. It is proposed that an area of 24 hectares to be used for establishment of retail warehousing and distribution centres in phase-3.

5.6.3 Cold storage

The demand estimation for these facilities up to 2022 is given in section 5.4.2. After 2022, the demand for these facilities might come down as enough facilities to cater to the farm products can be expected to be created within next 8 years all over India as this is one of the thrust area of GOI. So, after 2025, it is realistic to assume that the growth in demand for these facilities will come down. Assuming a growth rate of one fourth of the demand up to 2022, The calculations show that the demand for cold storages at JNPT shall be around 22 hectares. Based on the plot sizes and geometry of the land available, 18 hectares of land is earmarked for allocation for cold storages in phase-3.

5.6.4 Liquid Bulk storage

As per the AECOM traffic report of July 2015, the total liquid cargo imports are likely to grow from 5.9 million metric tonnes to 16.3 million metric tonnes by the year 2035. Present storage capacity is around 0.75 million metric tonnes.

The storage requirement by 2035 for liquid bulk can be expected to grow to 2.1 million tonnes. An additional storage space for around 1.32 million tonnes might be required by 2035 in addition to the existing tank farms. This would require an additional 75.53 hectares of land.

It should be noted that the existing liquid bulk terminal at JNPT is working at its peak efficiency and the available storage is catering to the throughput of the existing liquid berths. At present, JNPT is not envisaging any development of a new liquid berth within the next 10-years which means that the storage at present suffices for the next 10 years.

Keeping the above scenario in perspective, even though the AECOM report projects an increase in the traffic of liquid bulk, the proposed liquid storage to be built only after 2028. It is proposed that 42 hectares land be earmarked for the liquid bulk storage in the plots which are proposed to be developed to the west of the existing LNG pipeline in zone 4A.

5.6.5 Public Utility, PSP and social commercial

Public space of around 8.12 hectares is proposed for public utility in phase-3. This area is proposed to cater to the various facilities like water storage, electric sub-station, sewage treatment plant, water treatment plant.

It is also proposed that 1.53 hectares be used for Public and semi-public facilities in Phase-3. It is proposed that administration buildings, customs offices etc. be established in this area.

It is proposed that 11.67 hectares be allocated for social commercial uses which consist of various restaurants, entertainment, garden spaces and departmental stores etc. to come up within this area.

5.6.6 Parking space and utilities for phase-3

An area of 70.76 hectares is proposed to be used for parking and utilities for phase-3. It is proposed that fuelling facilities, food kiosks, shelters etc. should be allowed within this parking area for convenience of the truck drivers and other personnel.

5.6.7 Equipment park

An area of around 23.2 hectares is proposed to be earmarked for establishing equipment park. The proposed industries in JNPT described in the previous are bound to have some requirement of spares for various equipment which needs maintenance from time to time. The facilities also require various large machinery to move various components to be moved around for maintenance and installation purpose. It is proposed that these equipment parks to maintain such machinery and spare parts to lease out to the various farms within JNPT from time to time. This type of equipment park shall act as a very important supporting system for the industries proposed within JNPT, making JNPT more attractive for establishment for of these types of industries.

5.6.8 Roads

One arterial road with 70m corridor branching off from the uran Sheva road arterial road is proposed to be extended in phase-3. Apart from the arterial one more road with 50 m corridor is proposed along the length of the zone-4A connecting Panje road and the 4th container terminal road. The total area of the corridor left for development of roads is around 41.5 hectares in phase-3.

TABLE 5-6 AREA STATEMENT FOR PHASE-3

Area Statement of Phase-3		
S.No	Activity	Area in Hectares
1	Cross Docking/Bonded Warehouse	162.32
2	Petrol Pump	4.00
3	Cold Storage	18.00
4	Equipment Park	23.22
5	Liquid Bulk Storage	42.00
6	Parking	70.76
7	PSP	1.53
8	Public Utility	8.12
9	Retail Warehousing	24.00
10	Social Commercial	11.67
11	Roads	41.48
12	Total	407.10

TABLE 5-7 PROPOSED LAND USE PLAN

Landuse	Area	%
Dense Mangrove	341.70	10.04%
Bund	7.09	0.21%
Existing CFS and proposed cross docking and bonded warehouses	256.41	7.53%
Parking	182.54	5.36%
PSP	24.48	0.72%
SEZ	270.50	7.95%
Area Occupied by Others	157.17	4.62%
Railway	123.70	3.64%
R&R	159.80	4.70%
Residential	111.00	3.26%
Public Utility	62.27	1.83%
Open Space	84.30	2.48%
Tank Farm	60.48	1.78%
Commercial	1.06	0.03%
Port	176.90	5.20%
Area under berthing	82.77	2.43%
Green Zone	233.30	6.86%
Roads	375.30	11.03%
4th Terminal	62.32	1.83%
Research Labs	8.59	0.25%
Vacant	34.26	1.01%
Port User Residential	13.80	0.41%
Liquid Bulk storage	42.00	1.23%
Social Commercial	27.27	0.80%
Retail Warehousing	88.89	2.61%
Cement Silo	2.46	0.07%
Cold Storage	56.00	1.65%
Agro Based Storage	5.99	0.18%
Car Storage	6.26	0.18%
Container Repair	9.19	0.27%
Green Buffer	22.62	0.66%
Eco Park	205.60	6.04%
Equipment Park	23.22	0.68%
Bio Diesel	15.35	0.45%
Container Scanner	5.68	0.17%
Petrol Pump	12.51	0.37%

Landuse	Area	%
Waterbody	50.17	1.47%
Total	3402.95	100.00%

TABLE 5-8 FINAL LAND USE AREA STATEMENT

Land use category	Existing land use (in Ha)	Proposed land use(in Ha)		
		Phase 1	Phase 2	Phase 3
Port Use (Own)	653.84	194.3	66.11	133.56
Port Use (Leased)	358.31	161.03	70.65	273.64
Residential	111	13.8	0	0
Green Areas and Water Bodies	672	243.88	5.24	0
Other Uses	434	11.59	0	0
Total usage under each stage	2229.15	624.6	142	407.2
Cumulative total usage	2229.15	2853.75	2995.75	3402.95
Percentage Land usage of total land	65.51	83.86	88.03	100.00
Total JNPT Land	3402.95	3402.95	3402.95	3402.95
Mangrove area remaining	913.6	653.83	517.07	341.71
Mangrove area to be diverted for development	0	54.16	136.76	228.82

FIGURE 5-6 JNPT PROPOSED PHASE 3

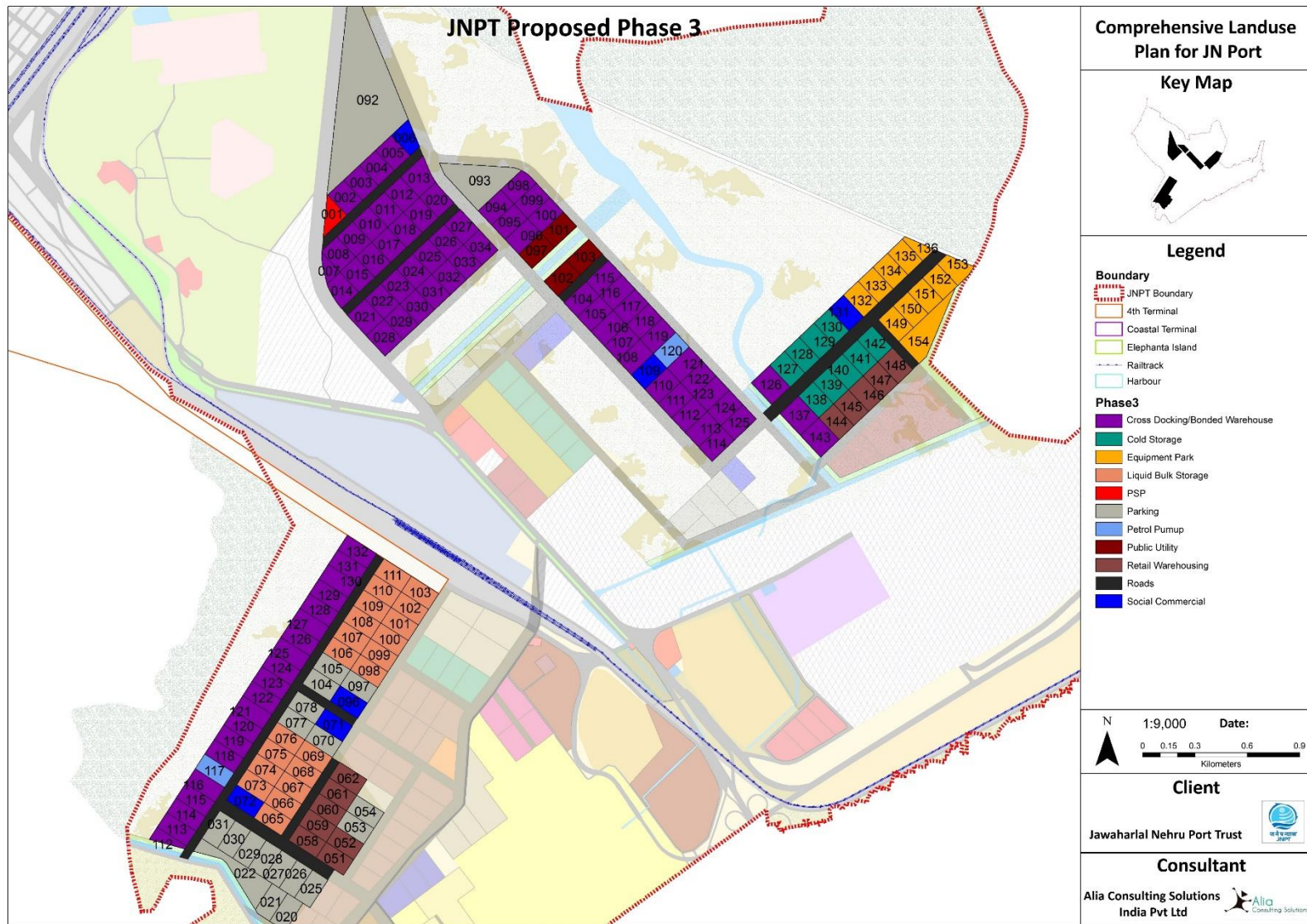


FIGURE 5-7 JNPT PROPOSED ZONING AND PLOTTING

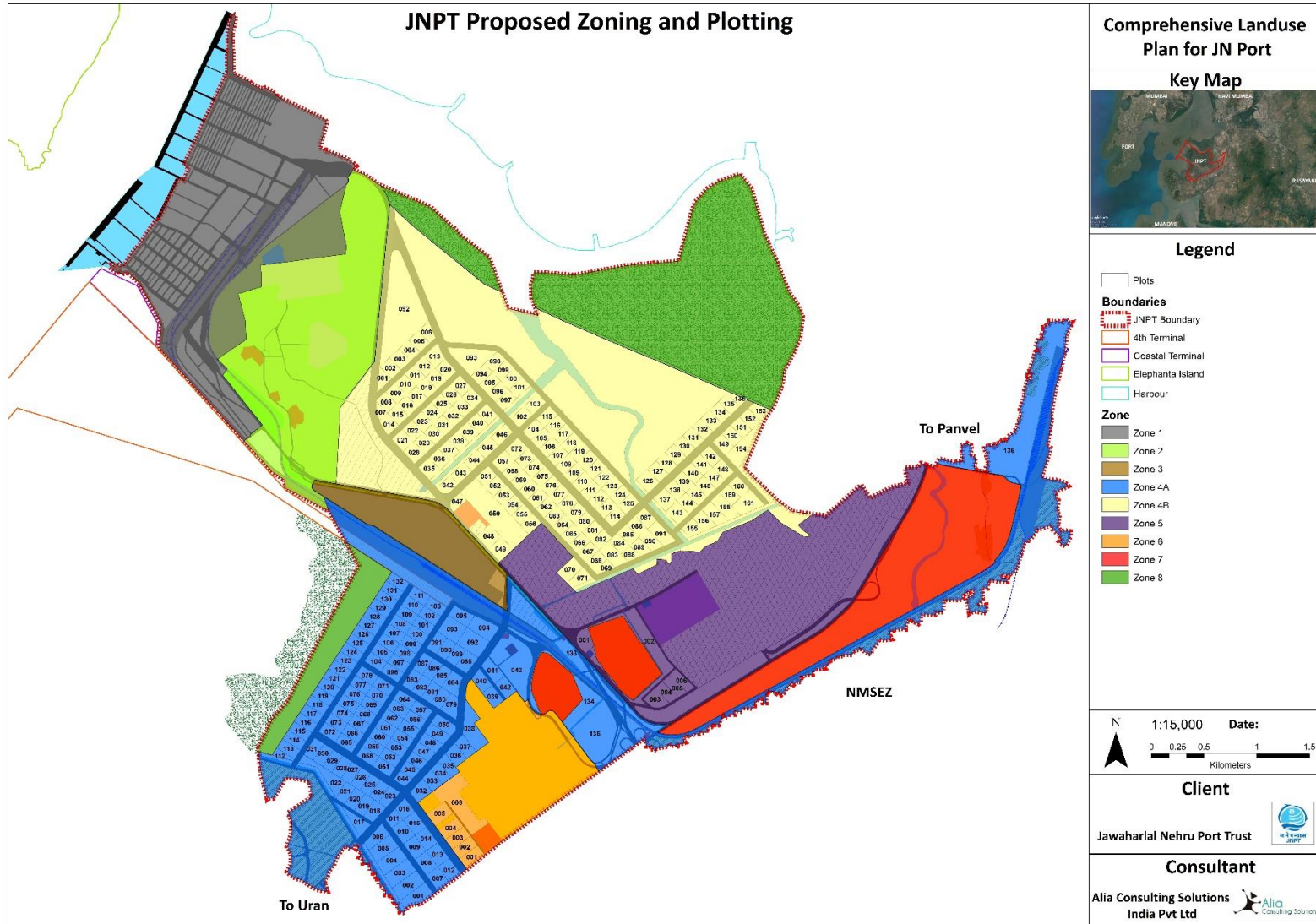
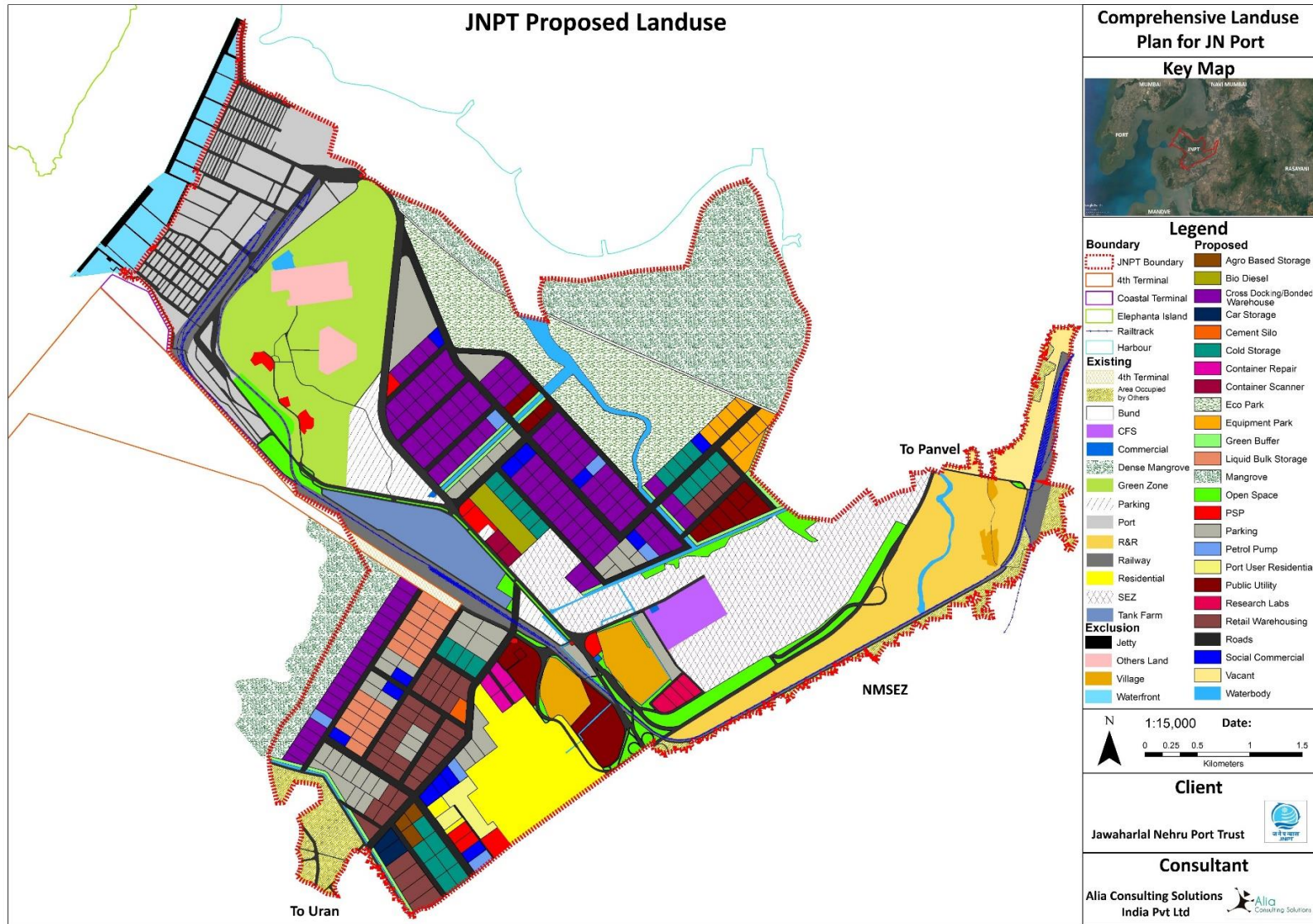


FIGURE 5-8 JNPT PROPOSED LAND USE



5.7 Container throughput increase due to the proposed industries

The industries proposed in the previous sections can be divide into two types

- 1.) Industries which serve port generated traffic and the proposed industries. Container cross docking facilities and bonded warehouses, container repair centre, equipment park, quality testing labs, container scanner come under this category.
- 2.) Industries which generate traffic for the port. Retail distribution centres, cold storage and agro product storage, car shredding units come under this category.

The first category industries help JNPT to create a complete eco system of support systems required by the customers of JNPT thereby increasing competitiveness of JNPT. These industries help in increasing the throughput at JNPT at the expense of ports which do not have this sort of eco system established within their premises. The total container throughput of all the ports in India is around 9.75 Million TEU in the year 2010 which has increased to 12.54 Million TEU in the year 2015. During the same period JNPT throughput has increased from 4.27 Million TEU in 2010 to 4.49 Million TEU in 2015.

The statistics show that even though there is a slight increase in the container through put, JNPTs' share in country throughput has decreased from 43.8% to 35.8%. This reduction of share of JNPT with respect to the overall national throughput is due to the competitiveness of the other ports. The facilities available within the port due to type one industries proposed shall enhance the competitiveness of JNPT and can be instrumental in increasing the share of the port.

Indian container traffic has grown at an average rate of 4 percent per annum in the past 5 years from 2010 to 2015. Assuming the same average growth

will hold in the next 30 years, the projected container throughput by the country by 2045 is going to be 41.14 Million TEU.

In the thirty-year period, the proposed type one type industries shall be instrumental in JNPT increasing its share in the country's overall through put, which can be around say from 35.8% to 40%. This translates to around to a minimum of 1.7 Million TEU throughput per annum increase in traffic by 2045. This will be in addition to the added capacity of 5 million TEU due to fourth container terminal.

The total area provided for the second type of industries is around 89 hectares for retail warehousing in all the three phases, 56 hectares for cold storages and 12.25 hectares for other industries like car shredding and agro products storage. In retail warehouses/distribution centres on an average for each hectare of area there can be around 10 TEU handled per day. This gives around 324850 TEU traffic per annum by 2045.

The 56 hectares of cold storage can handle around 3244520 metric tonnes by 2045, and assuming on an average 10 tonnes filled in each reefer, the container traffic generated due to cold storages can be around 324452 TEU per annum.

Assuming the other 12.25 hectares also generate container traffic in the same order as the retail warehouses and distribution centres, the amount of container traffic generated will be in the order of 44713 TEU per annum.

Thus, the total traffic generated by the second type of industries can be around 0.7 million TEU. Thus, the total minimum traffic potential for both the first type and second type industries is around 1.7 Million TEU+ 0.7 Million TEU = 2.4 Million TEU per annum.

6 Conclusion

- Growth of container traffic at JNPT has been moderate since 2013 when compared to the previous years. While overall slowdown of world economy is a factor, other factors like congestion at JN port might have contributed to this.
- Some of the container traffic growth witnessed in Gujarat ports is at the expense of JNPT.
- These losses in container traffic might continue in the near future because of the factors like low percentage of transport of containers to/from JN port using railway or higher time taken to connect DFC up to Mumbai when compared to Gujarat.
- Even though JNPT has been able to reduce traffic congestion by measures like gate automation, inter terminal transfer and rationalization of customs procedures and central parking space, Stress on the road network is likely to increase with the commissioning of the 4th container terminal.
- A long-term solution like promoting various port related activities within the available vacant lands within JNPT is a necessity to reduce the expected stress on the port infrastructure and sustenance of the port.
- The” Central Port Authority act 2016” which is likely to be passed this year will give JN port freedom in making the lease rates of port lands more competitive and thereby attract interested parties to port related industries within JNPT.
- A large chunk of the vacant lands available within JNPT falls in CRZ-1 wherein only port related activities like warehousing is permitted.

- To leverage the available land optimally, JNPT must reclaim the lands which has been occupied by the sparse mangroves after year 2000 due to breach in the bund. Instead of removing the sparse mangroves entirely, some part of the land area occupied by the sparse mangroves can be utilised to rehabilitate the mangroves removed thereby making the mangrove free area suitable for development of industries
- The activities proposed to be permitted as part of the land use plan are selected with the view that they cater to the two requirements of reduction of stress on the JNPT infrastructure and fall within guidelines of MOEF while generating revenue for the Port.
- It is proposed that the following industries be allowed within the Vacant lands
 - Cold storage facilities and associated activities
 - Retail distribution centres
 - Container cross docking and bonded warehousing
 - Container repair and rehabilitation
 - Liquid bulk storage
- An eco-park along holding ponds were proposed in the land use plan for rehabilitation of sparse mangroves and control of flooding.
- Entire developable land in zone 4A and zone4B is divided 2 hectare plots and the for ease of movement of increased traffic due to these facilities new roads have been proposed to ease the movement of traffic to/from the traffic.

- For ensuring free movement of the traffic within the proposed development, three different types of roads are proposed. Arterial roads with 70m corridor, Sub arterial roads with 50 m corridor and collector roads with 30m corridor. These corridors are proposed so as accommodate utilities and drainages with the roads. It is ensured that each and every industrial plot is connected with at least sub arterial road.
- Locations have been identified within the land use plan for establishing facilities like STP, Parking and refreshment centres.
- Phase wise development of land for establishment of industries is proposed. In total three phases are proposed. Phase -1 is supposed to be taken up during 2017-2025, Phase-2 is proposed to be taken up during 2026- 2030. Phase-3 is proposed to be taken up during 2031-2045.
- In phase-1 proposed activities are Cold storage, retail distribution centres and associated utilities
- In phase-2 proposed activities are Container cross docking facilities and bonded warehouses, eco-park , Holding ponds and associated utilities.
- In phase-3 proposed activities are Container cross docking facilities and bonded ware houses, retail distribution centres, Oil storage and associated utilities.
- The latest initiative, direct port delivery scheme(DPD) which has been taken up by the port has been taken into consideration to propose the future development.
- The plotting and the transport corridors provided in the land use plan are given so that enough flexibility to accommodate the variations in the demand estimates which are likely to crop up in the future.

- This flexibility is provided with the view that JNPT can allocate plots to a different industrial use as per the prevailing requirements in the future.
- This proposed land use plan should be revised after 5 years so that adjustments can be made to the land use plan based on the progress in implementing land use plan, prevailing market conditions and policy changes if any.

7 Annexures – Land use Policy docs – 2004, 2010 & 2014