

#### 4. Steering Committee (17 August 2017)

## The Project on Improvement of Chennai Port Operation (Phase II )

### Steering Committee 11th Dispatch

17 August 2017  
JICA Study Team

1

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## I. Outline of the Technical Assistance Phase II

2

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## 1. Objectives of the Project “Phase II”

- To enhance the efficiency of the operation of Chennai port by reducing container movement lead times through following up the activities taken in Technical Assistance Phase I and entrenching congestion alleviation measures to the counterpart (ChPT)
- To examine the validity and effectiveness of possible port infrastructure projects (including IT related projects) for modernizing port operation

## 2. Dispatched Schedule

Number of Dispatch	Schedule completed
First (Ninth) Dispatch	Sunday, 12 <sup>th</sup> February – Saturday, 11 <sup>th</sup> March, 2017
Second (Tenth) Dispatch	Sunday, 23 <sup>rd</sup> April – Saturday, 20 <sup>th</sup> May, 2017
Third (Eleventh) Dispatch	Sunday, 23 <sup>rd</sup> July – Saturday, 19 <sup>th</sup> Aug., 2017

3

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## 2. Contents of the Project “Phase II”

### (1) Follow-up of Previous Measures for Improvement of Port Operation

The Study Team will follow-up the several surveys and activities conducted during Phase I for further improvement of port operation.

### (2) Modernization of Port Operation through Soft and Hard Measures

The Team will continue to promote operational improvement through utilization of an IT system and development/improvement of port facilities.

4

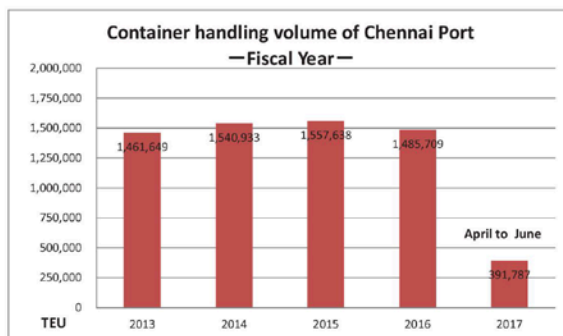
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## II. Follow-up of Previous Measures for Improvement of Port Operation

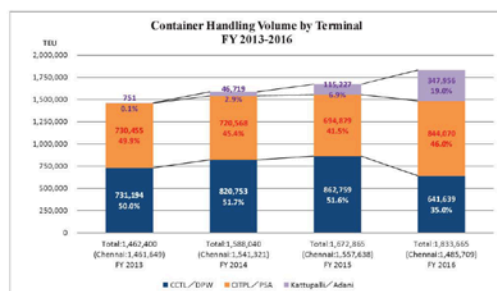
5

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### 1. Container Handling Volume Trends



Container handling volume has been fluctuating at around 1.5 M TEUs; however, the volume increased in the first quarter of FY 2017 by 4.3 % compared to the same period of the last FY.



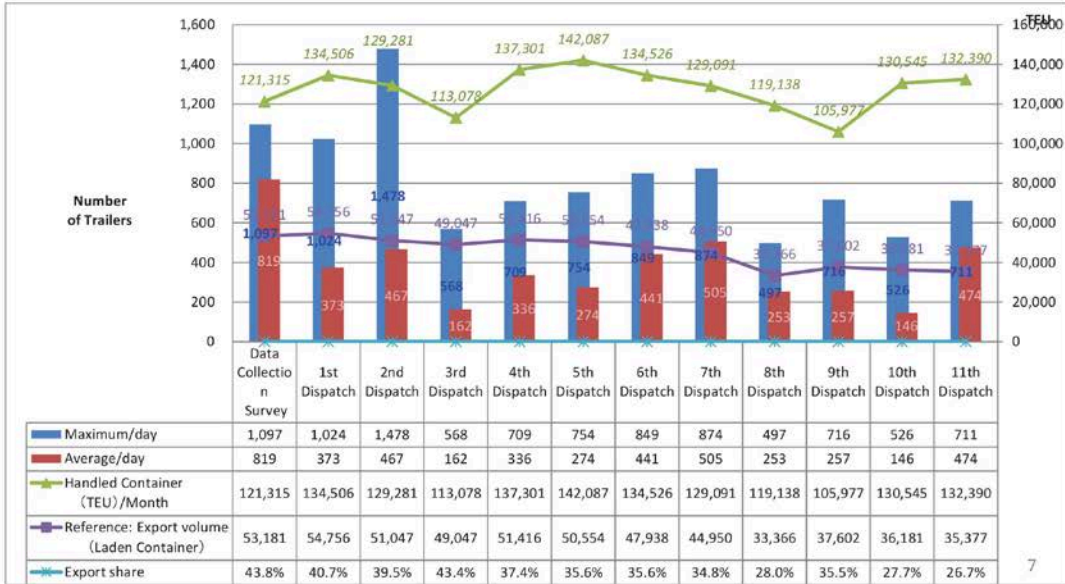
Trend of container handling volume in neighboring ports

6

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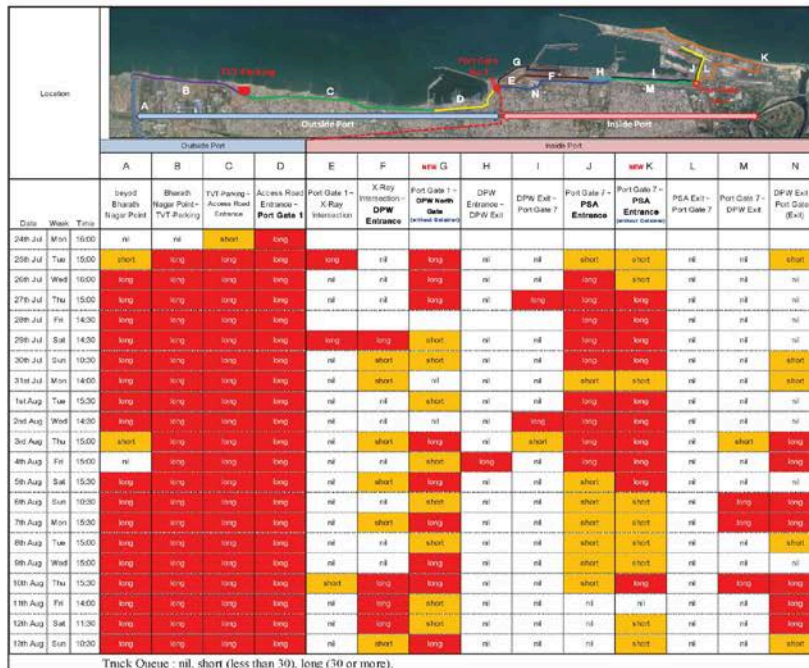
## 2. Congestion Status – Trends outside the Port

Based on the daily survey by the Team, the number of queuing trailers has increased this time.



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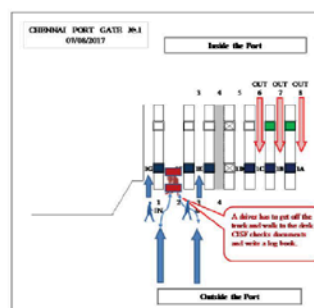
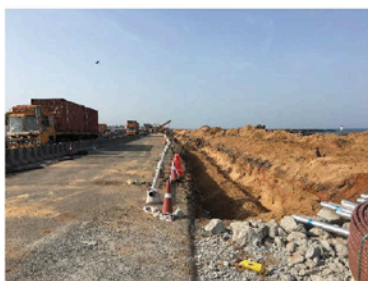
## 2. Congestion Status - inside/outside the Port



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## 2. Congestion Status - Summary

- Congestion outside the port became heavier compared to the previous dispatches.
- Congestion inside the port became relatively lighter.
- Major causes of heavy congestion outside the port are considered to be;
  - Increase of handling containers,
  - Pipeline burying works along SH114, and
  - Changes of operation procedures at Port Gate No.1.



9

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## 3. Following up of Demonstration Trials

### 1) Demo 1: Simplification of gate procedures at Port gate No.1

RFID system is not yet used for entry/exit control. Furthermore, the reception time became longer due to the changes in operation procedures at Port Gate No.1.

### 2) Demo 2: Utilization of TVT-Parking

Situation has not changed. The TVT-parking is not used as a parking lot although the issuance of HEP is still in operation.

### 3) Demo 3: Restriction of parking on internal roads

The traffic flow of trailers inside the Port this time seemed to be smoother as heavy congestion was not observed; however, a large number of parked trailers is still observed.

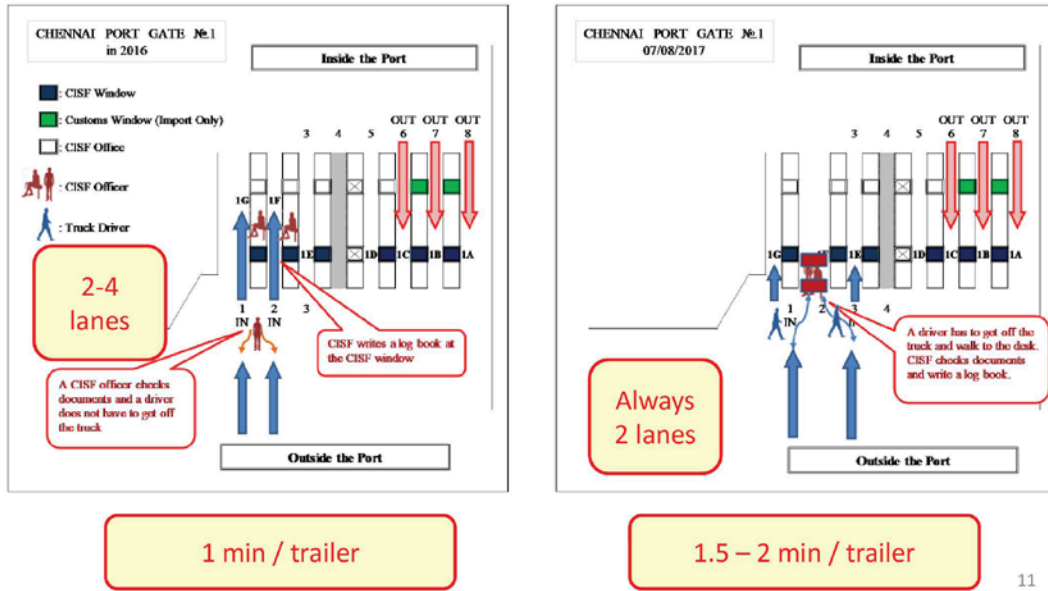
### 4) Demo 4: Allocation of traffic control persons at intersections together with introduction of traffic flow regulation

Trailer drivers have a greater awareness of the no parking rule at the intersections and traffic control persons were allotted more frequently; however, the instructions by traffic control persons are still required.

10

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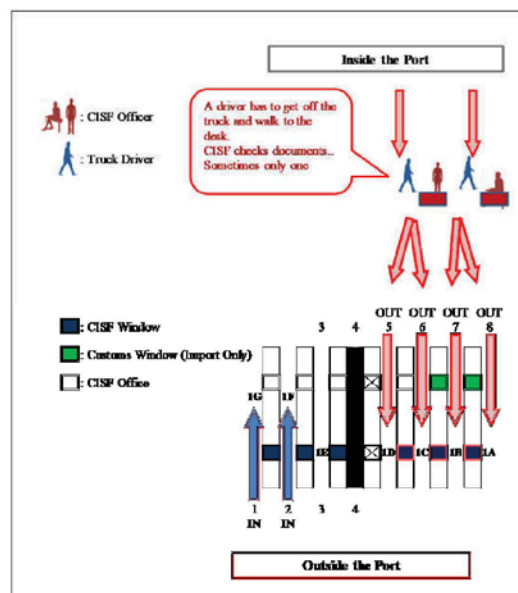
## 4. Changes in the Operation System at Port Gate1 - Incoming Trailers -



11

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## 4. Changes in the Operation System at Port Gate1 - Outgoing Trailers -



12

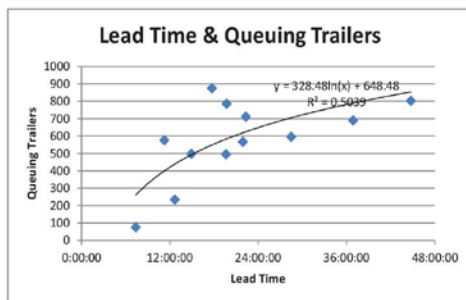
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## 4. Lead Time Analysis

**Lead Time:** Lead time has decreased to around 10 to 20 hours from around 40 hours recorded during the 2nd dispatch. However, Lead Time is still fluctuating.

Lead Time & Queuing Trailers

Lead Time	Phase I of the Project					Phase II of the Project						
	2nd Dispatch		7th Dispatch		8th Dispatch	9th Dispatch		11th Dispatch				
	3-Oct-14	18-Oct-14	19-Oct-14	12-Feb-16	13-Feb-16	1-Jun-16	2-Jun-16	28-Feb-17	2-Mar-17	4-Mar-17	2-Aug-17	4-Aug-17
Average (hrs)	28:29:00	44:45:00	36:54:00	17:43	19:43	7:22	14:55	11:16	21:56	19:38	22:20	12:40
Number of Queuing Trailers outside the port	595	803	689	874	785	75	497	575	566	494	711	234
Number of Survey Trailers	155	96	104	327	398	351	129	200	200	200	400	312

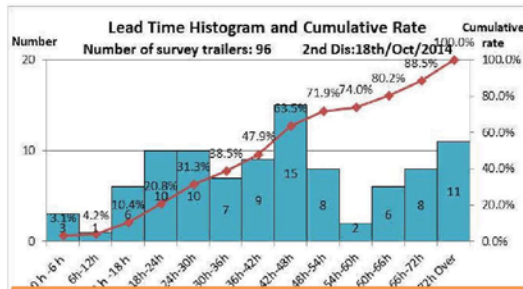


Lead time, in general, is considered to become shorter as the number of queuing trailers decreases.

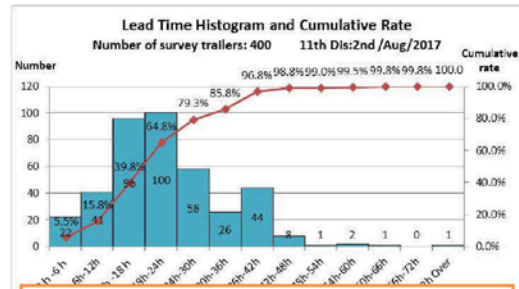
13

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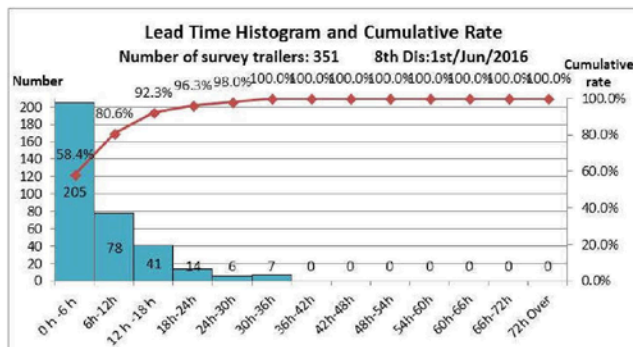
## 5. Lead Time Analysis



Three years ago. Hope never be observed



One of the latest surveys. Less than ideal.



Ideal distribution . Continuous efforts should be made to realize this distribution .

14

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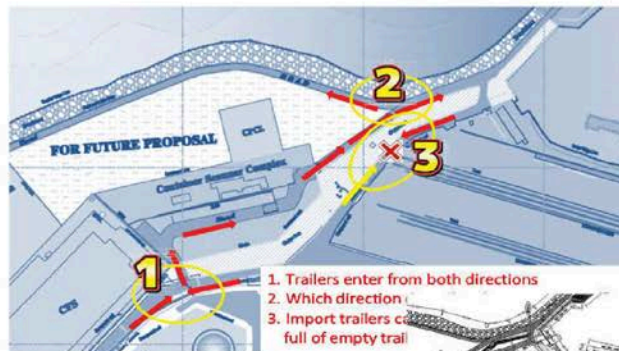
## 6. Trailer Flow inside the Port

Area	Issues	Measures
North Side	Import trailers for X-Ray Inspection have to cross another flow	To establish a new X-Ray Inspection Center for Import
	Two empty trailer flows mixed	To unify the empty traffic flow To DPW North Gate
Central Area	Too many types of trailer flows mixed	To realign / develop internal road
South Side	Empty trailers for PSA North Gate occupy the access road for the coastal terminal	To establish a new Waiting Area near PSA terminal

15

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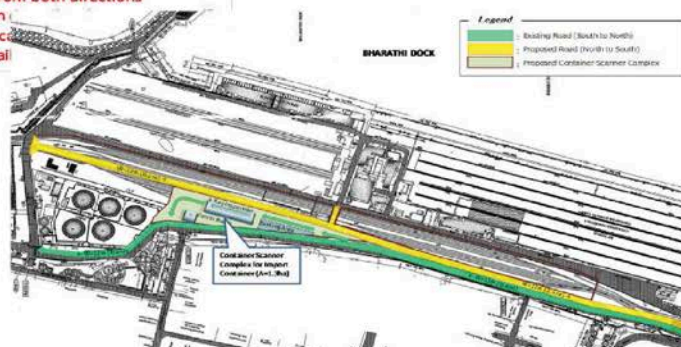
## 6. Trailer Flow inside the Port Issues & Proposal



Issues to be resolved

1. Trailers enter from both directions
2. Which direction do trailers have to proceed?
3. Import trailers cannot proceed due to plenty of empty trailers

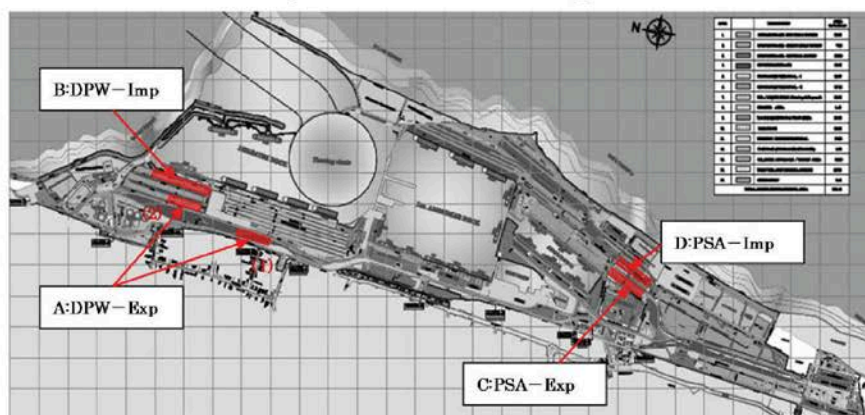
Proposed site for X-ray Inspection Center for Import Containers





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## 6. Trailer Flow inside the Port Proposal - Waiting Area



- To alleviate the traffic congestion outside the Port
- To secure road safety including regular vehicles
- To eliminate street parking inside the Port
- Each Waiting Area has the capacity of about 100 trailers.

17

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## III. Modernization of Port Operation through Soft and Hard Measures

18

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## Priority Projects: Sagarmala Report

### Traffic Projections and Capacity/Demand

Traffic Projections in the Chennai Region

Port	2014/15	2020	2025	2035
Chennai	1.55	0.9	1.2 - 1.4	2.0 - 2.4
Kamarajar	0.0	0.8	1.1 - 1.3	1.8 - 2.1
Kattupalli	0.1	-	-	-
Krishnapatnam	0.08	0.1 - 0.12	0.15 - 0.19	0.25 - 0.34
Chennai Cluster	1.7	2.32	3.0	-
		2.4	3.2 - 3.7	-

Unit: Million TEU  
 Source: Final Report on Cargo Traffic Projections & Logistics Bottlenecks, Ministry of Shipping, July 2016

The capacity of Chennai port is estimated to exceed the demand. However, because of insufficient space for cargo handling and storage, inefficient operation of cargoes, the berth occupancy rates are relatively high. Chennai port should make efforts to improve the productivity and efficiency of operations.

Due to the emerging ports in the vicinity of Chennai port, container volume handled at Chennai port is forecast to fall from about 1.55 million TEUs in 2015 to 0.9 million TEUs in 2020 but will then begin to increase again towards 2025 and beyond.

Cargo Handled	Berths Assigned	I/E	Current Capacity (MTPA)	2020		2025		2035	
				Projected Traffic (MTPA)	Capacity Augmentation Required (MTPA)	Projected Traffic (MTPA)	Capacity Augmentation Required (MTPA)	Projected Traffic (MTPA)	Capacity Augmentation Required (MTPA)
Crude & POL	BD1, BD 2, BD 3	I	15.00	13.30	0.00	13.10	0.00	14.30	0.00
Dry & Breakbulk	NQ, WQ1 to 3, JD1 to 3, CPB	VE	17.50	16.30	0.00	12.20	0.00	17.10	0.00
Fertilizers	SQ1 & SQ 2	I	2.50	0.70	0.00	0.80	0.00	1.00	0.00
Containers	CTB1 to 4, SCB1 to 3	VE	58.00	17.37	0.00	23.16	0.00	38.60	0.00
Total		VE	93.00	47.67	0.00	49.26	0.00	71.00	0.00

Source: Sagarmala Final Report

19

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## Priority Projects: Voices from Port Users

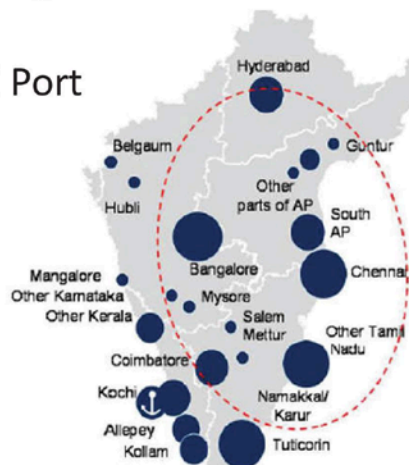
- Berth occupancy rates are relatively high. This means either volume might be high or handling efficiency is low. Port System should be modernized
- Smooth traffic flow inside the port is the biggest hurdle in the growth of Chennai port.
- Waiting space should be provided nearby the traffic route.
- Port facilities and cargo handling equipment are old and insufficient.
- Environment of the cargo handling area is not good due to severe dust and the narrow handling area.
- Others

20

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## Priority Projects: Hinterland

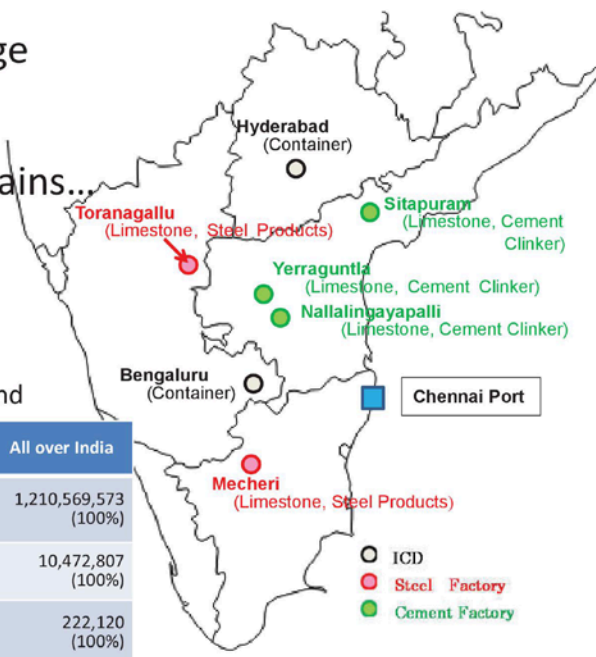
- Chennai Port handled ...
  - 71.9% of containers departing/arriving Tamil Nadu
  - 43.7% of containers departing/arriving Karnataka
  - 26.0% of containers departing/arriving Andhra Pradesh
- Not only Tamil Nadu where Chennai Port is located, but most containers departing/arriving Karnataka are handled at Chennai Port
- A widespread area is dependent on Chennai Port



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## Priority Projects: Hinterland

- Chennai Port also has a large hinterland for bulk cargoes
- Hinterland of the port contains...
  - 20% of national population
  - 20% of GDP
  - 40% of factories



Socio-Economic Indicators of Hinterland

	Tamil Nadu	Karnataka	Andhra Pradesh	Telanga na	All over India
Population (2011)	72,147,030 (6.0%)	61,095,297 (5.0%)	84,580,777 (7.0%)		1,210,569,573 (100%)
Nominal GDP (2013-14) Crone Rs.	854,238 (8.2%)	614,607 (5.9%)	464,184 (4.4%)	391,751 (3.7%)	10,472,807 (100%)
No. of Factories (2012-13)	36,869 (16.6%)	11,753 (5.3%)	15,358 (6.9%)	13,656 (6.1%)	222,120 (100%)

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## Priority Projects

### 1. Basic Policy for Priority Projects

- Chennai port plays a vital role on supporting the economy of both the region and India as a whole and this roll will remain in future.
- However, Chennai port faces a variety of pressing issues and competitors have been expanding their business in recent years.
- To overcome the facing issues, Chennai port has to improve the efficiency of port operation, modernize facilities and enhance the port's competitiveness.

### 2. Feature of the Priority Projects

Mainly redevelopment projects which will improve and realign the existing facilities.

### 3. Phase of the Projects

- I. Short-term projects
  - Infra related projects (Project A to F)
  - IT related projects (Project IT-1 & IT-2)
- II. Long-term projects (Project G & H)

**Further study will be done.**

23

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## Priority Projects: Short-tem project A



Traffic Flow Separation between DPW and PSA

<b>Project Name</b>	<b>A</b> Realignment/Development of Internal Roads
<b>Purpose</b>	/To improve the traffic flow and ease congestion inside the Port

<b>Project Effects</b>	<b>Quantitative Effect</b>	/Reduction of time cost by elimination of congestion: maximum value of 42.4 Crore Rs/year
	<b>Quantitative Effect</b>	/More reliable transport /Shortening of transport time (benefit of trucking company) /Improvement of the environment
<b>Issues for Implementation</b>		/Congestion alleviation at specific points is important. /Further study is needed because of the progress of improvement of the internal roads /Careful execution plan is needed in order to avoid further congestion

24

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### Priority Projects: Short-term project B



<b>Project Name</b>	<b>B</b> Redevelopment of Dr. Ambedkar Dock (West Wharf)
<b>Purpose</b>	/To modernize the West Wharf of Dr. Ambedkar Dock and the water area



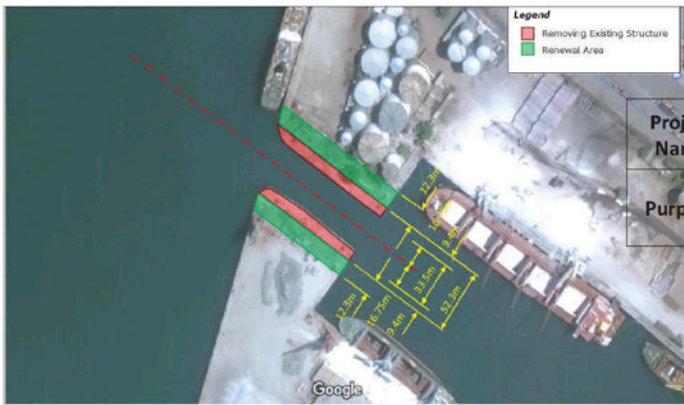
<b>Project Effects</b>	<b>Quantitative Effect</b>	/Income from the use of the West Wharf: 65.0Crore Rs/year
	<b>Quantitative Effect</b>	/Improvement of cargo handling efficiency /productivity /Decrease of damaged cargo /Expansion of business opportunities /Improvement of navigational safety /Improvement of the environment
<b>Issues for Implementation</b>		/Detailed use plan of berth is needed /Execution plan to avoid shortage of berths is needed /User's opinion is important /Introduction of warehouses and equipment should be considered in connection with fund raising

**Steel Plate Cellular Method**

25

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### Priority Projects: Short-term project C



<b>Project Name</b>	<b>C</b> Widening of Jawahar Dock Entrance
<b>Purpose</b>	/To improve superannuated facilities and to accommodate larger vessels

<b>Project Effects</b>	<b>Quantitative Effect</b>	/Loss of income by collapse of the entrance: 13.83Crore Rs/year
	<b>Quantitative Effect</b>	/Improvement of safety
<b>Issues for Implementation</b>		/Safe and realistic execution plan should be studied further to avoid negative effects to the tanks located behind the entrance /Securing navigational safety during execution works is important / Execution works should be done from the land side /To make fund raising easier, this project should be combined with others

26

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## Priority Projects- Short-term project D



<b>Project Name</b>	<b>D</b> Reclamation/Redevelopment of Timber Pond (including a base for tug boats)
<b>Purpose</b>	/To secure space for cargo and storage, improve the efficiency of cargo handling and to help the traffic flow be normalized

<b>Project Effects</b>	<b>Quantitative Effect</b>	/Savings of expenditure for improvement of handling efficiency: 7.23Crore Rs/year
	<b>Qualitative Effect</b>	/Improvement of cargo handling efficiency / productivity /Normalization of the traffic flow /Improvement of the environment
<b>Issues for Implementation</b>		/Use request from ICG should be considered /Integrated use with AD and JD should be considered /Reconstruction of buildings necessary for future use is required /Measures to mitigate impact on the environment are needed during demolishing works

27

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## Priority Projects- Short-term project E

Comprehensive Redevelopment around Jawahar Dock



<b>Project Name</b>	<b>E</b> Integrated Redevelopment of Jawahar Dock and Surrounding Area
<b>Purpose</b>	/To redevelop the JD entrance and handling yard of surrounding area and to convert RO-RO function from AD west wharf to contribute to the alleviation of congestion

<b>Project Effects</b>	<b>Quantitative Effect</b>	/Loss of income by collapse of the entrance: 13.8Crore Rs/year /Normalization of traffic flow between car carriers and trailers: 3.4Crore Rs/year
	<b>Qualitative Effect</b>	/Improvement of safety /Improvement of cargo handling efficiency / productivity /Improvement of the environment
<b>Issues for Implementation</b>		In addition to the issues of Project C & D, /Discontinuation of the use of the road between the JD yard and ONB /Further examination of introduction of multilayer car pool and integrated use with ONB yard

28

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## Priority Projects: Short-term project F

Project Name: Improvement of the Environment inside the Port



Dust Prevention Zone



Development of "Eco-Zone"



Measures	Basic Idea
i) Improvement of cargo handling	To generate less dust and prevent dust dispersion by introducing equipment, materials and so on
ii) Securing of water and power resources	To obtain water and electricity necessary for maintaining the quality of the environment from natural surroundings.
iii) Introduction of Greenery	To develop a greenery plan and plant trees and grasses
iv) Improvement of the outdoor working conditions	To install necessary equipment such as sun shade and toile, etc. which are helpful to prevent diseases
v) Notification of and compliance with the rules for using port	To prepare general rules for the usage of the port in order to keep the port in environmentally sound condition

29

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## Priority Projects- Short-term project F

### Draft Guidance for the Port Users

#### Preface

This guidance is prepared for the port users to use the facilities in comfortable manner. The ChPT has to be committed to provide the good conditions of the work place. . . . .

#### Chapter 1. General Application (General Application)

All the users should understand and obey the rules of Chennai port.

#### Chapter 6. Environment and Safety Issues (Attending at the Environment and Safety meeting)

The meetings to improve the Environment and the Safety of Operation will be held periodically.

The users of the port should attend the meetings to discuss about the issues on the Improvement of the Environment and Safety, upon the invitation of the ChPT.

#### (Air Emissions and Dust)

ChPT is committed to reducing the dust that is generated by cargo handling operations. Implementing of dust reduction measures is encouraged.

The users of the port should cooperate to the initiative of the ChPT for reducing of dust in the port.

30

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## Priority Projects- Short-term project IT-A

<b>Project Name</b>	IT - A Introduction of Web Portal System
<b>Purpose</b>	To foster cooperation among stakeholders by sharing the common indicator which shows the degree of congestion and its improvement



**Project Effects**

- 1) Effects of measures on traffic congestion can be evaluated objectively among stakeholders
- 2) Cooperation among stakeholders is obtained
- 3) Image of Chennai Port is improved

- Scope**
- 1) Computer Server ( Web/Database/Application, etc.)
    - To apply redundant fault tolerant hardware configuration
    - To include the necessary system software such as OS, DB, WEB, etc.
    - The implementation cost may be reduced by more than 50 % if these functions are implemented in the existing ChPT Homepage.
  - 2) Cameras and data communication equipment, etc.
    - To link the existing CCTV system and obtain live pictures inside the Port
    - To implement Web cameras at key congestion points outside the Port.
  - 3) Application Software
    - Connection with external systems
    - Publishing live pictures at congestion points
    - Publication of trailer movement statistics in real time, etc.
    - Publishing the statistics of traffic congestion inside and outside the Port.
    - Statistical functions currently provided in ChPT Homepage can be enhanced in the Web Portal System.

31

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## Priority Projects: Short-term project IT-A

LeadTime among CFS/Port Gate/Terminals

Date	Outside Port				Inside Port				
	CFS to ZeroGate		ZeroGate to CCTL		ZeroGate to CITPL		ZeroGate to Terminal		
	#Cases	Ave. < 9Hrs	#Cases	Ave. < 3Hrs	#Cases	Ave. < 3Hrs	#Cases	Ave. < 3Hrs	
07/08/2017 (Mon)	591	05.50	83%	218	01.45	85%	224	01.03	95%
08/08/2017 (Tue)	1026	12.35	40%	370	01.45	89%	337	02.00	83%
09/08/2017 (Wed)	1352	14.00	39%	490	02.11	82%	472	02.22	84%
10/08/2017 (Thu)	904	14.01	42%	369	07.02	8%	326	02.08	86%
11/08/2017 (Fri)	885	14.23	30%	453	06.03	26%	279	01.45	82%
12/08/2017 (Sat)	1438	14.28	36%	509	02.46	75%	461	01.18	92%
13/08/2017 (Sun)	1188	14.22	41%	292	02.43	67%	257	01.52	85%

Summary for 12/08/2017 (Sat)

Time	CFS	ZeroGate	CCTL	CITPL	Terminal
6:00	93	79	23	13	36
7:00	119	100	40	33	73
8:00	125	108	47	31	78
9:00	122	89	45	31	76
10:00	143	72	51	31	82
11:00	139	82	40	33	73
12:00	171	69	56	38	94
13:00	146	63	39	24	63
14:00	157	78	28	23	51
15:00	146	97	42	24	66
16:00	170	83	39	31	70
17:00	212	96	33	37	70
18:00	148	36	38	22	60
19:00	152	75	13	10	23
20:00	125	50	31	25	56
21:00	146	43	19	11	30
22:00	114	75	20	21	41
23:00	142	59	36	25	61
0:00	153	75	43	21	64
1:00	111	84	6	26	32
2:00	96	76	0	18	18
3:00	95	74	0	32	32
4:00	66	76	3	22	25
5:00	89	44	41	20	61
Total	3180	1783	733	602	1335
Average	132.5	74.3	30.5	25.1	55.6
Max	212	108	56	38	94

Demonstration trial of a Web-Portal system on Chennai HP is ongoing.

32

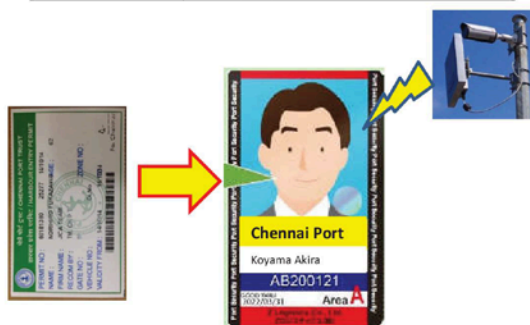


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## Priority Projects- Short-term project IT-B

<b>Project Name</b>	<b>IT - B</b>
	Introduction of RFID based Harbor Entry Pass System
<b>Purpose</b>	To expedite port entry / exit procedure as well as improve port Security

<b>Project Effects</b>	1) To strengthen Port entry / exit control
	2) To utilize RFID based HEP for other purposes



<b>Scope</b>	1) Card issuing machine - A machine which issues HEP cards, etc.
	2) Kiosk for entry /exit at Port gate - RFID reader for Port entry card, RFID reader for truck, etc.
	3) Port entry card for persons x 10,000 - Passive RFID tag, photo of holder, etc. - FeliCa type RFID technology, which is commonly used in Japan and very reliable, is recommended.
	4) RFID tags for trailers x 8,000 - To be attached on a front panel of a trailer - It must be examined whether RFID tag of container trailer used in NACFS RFID system can be also utilized for this application.
	5) Computer servers - Cloud environment may be applied
	6) Application software - To issue HEP and associate with RFID tag, etc. - To extend validity period of HEP - Reception function at Port Gate No.1 - 10 - To output statistical reports - Connection with external systems
	7) Operational support - On site support for a few months after commencement of operation, etc.

33

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## Priority Projects: Long-term project G



<b>Project Name</b>	<b>G</b>
	Expansion toward the Northern Area
<b>Purpose</b>	/To expand the northern area of the port as a strategic project for securing competitiveness, attracting port users and leading to the future generation of the port

<b>Project Effects</b>	<b>Quantitative Effect</b>	/Income from handling container (under the assumption that one of target cargoes is containers)
	<b>Qualitative Effect</b>	/Strengthening of competitiveness /Making the port more attractive to users /Expansion of business opportunities
<b>Issues for Implementation</b>		/This project is proposed from the long term point of view; therefore preparations should start from now. /Grasping the timing and volume of potential cargo is important /Further technical study is needed (specifically to grasp wave conditions) /Future direction of development and the intention of the Navy should be considered

34

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## Priority Projects: Long-term project H

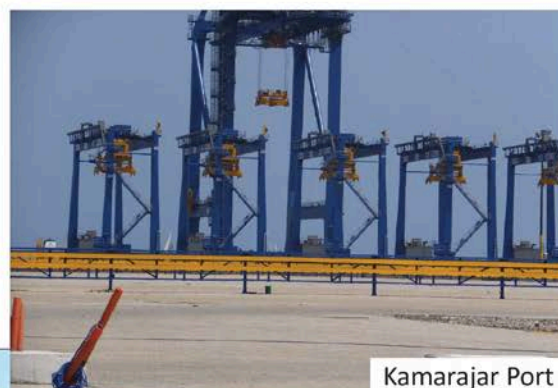


	<b>H</b>
<b>Project Name</b>	Inter-connection of internal roads with the Maduravoyal elevated road project
<b>Purpose</b>	/To improve the traffic flow and ease congestion inside the Port (Furthermore to ease congestion outside the port)

<b>Project Effects</b>	<b>Quantitative Effect</b>	(refer to Project A)
	<b>Qualitative Effect</b>	/Normalization of the traffic flow /Reduction of congestion outside the port
<b>Issues for Implementation</b>		In addition to the issues of Project A, /Further study on project effects and implementation scheme is needed

35

# Thank you for your Attention



Kamarajar Port

Kattupalli Port



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36