

## **5. Draft Final Report Presentation (24 October 2017)**

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

## **Draft Final Report 12th Dispatch**

**24 October 2017  
JICA Study Team**

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## **I. Follow-up of Previous Measures for Improvement of Port Operation - Examination of Waiting Area only**

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## Waiting Area for Terminals

Purpose of Introducing Waiting Areas

- 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

Basic Configuration of a Waiting Area

Import / Export	Usage	Lane width	# of passing lanes	Capacity (# of trailers)
Export	For trailers ready for gate reception	4m	0	40
	For trailers waiting for the documents or CY open date	4m	1	40
	Over dimension cargo	6m		20
Import (Empty)	For trailers ready for gate reception	4m	0	40
	For trailers waiting for the documents or CY open date	4m	1	60

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## Waiting Area at Kattupalli Port

A waiting area is located with a capacity of 80 - 90 trailers before the terminal gate.

Document checks and other procedures are conducted here. This reduces the time spent at the terminal gate.

In future, the port will construct an additional waiting area with a capacity of 200-300 more trailers.

Kamarajar port also has a plan to develop a waiting area for trailers and has reserved an 8 Acre area of land.

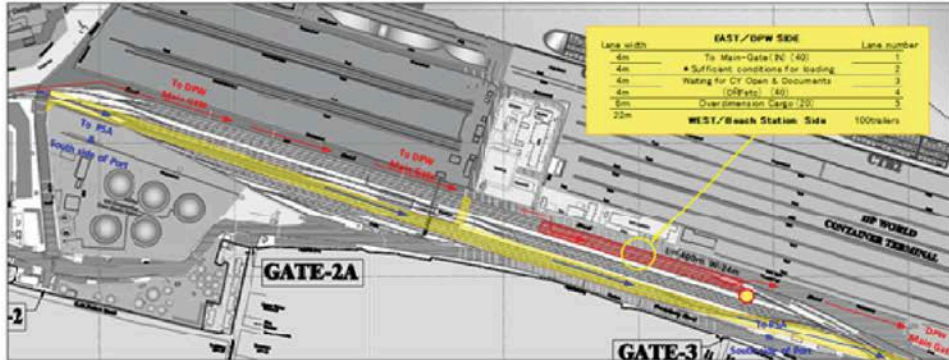


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## Waiting Area for DPW Terminal

### Waiting Area for Export Containers



### Operation Procedure

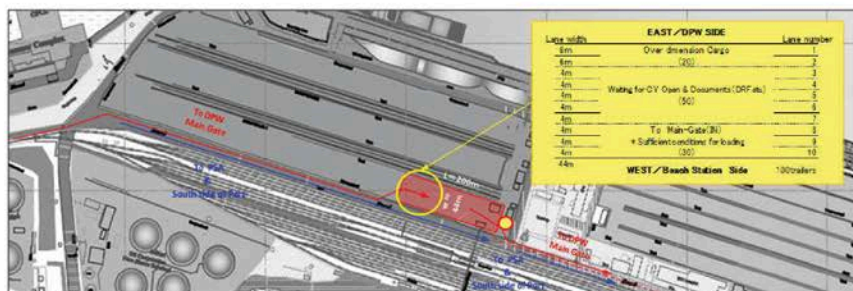
- Traffic control persons have to be allocated at the entrance and exit of the waiting area.
- Trailers will be allowed to proceed to the terminal gate after traffic control person confirm that the required conditions have been satisfied.

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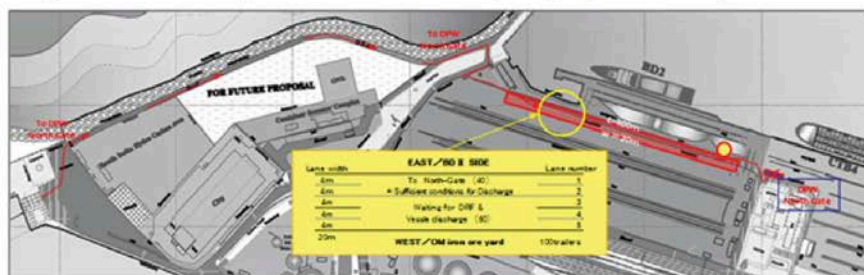
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## Waiting Area for DPW Terminal

### Waiting Area for Export Containers



### Waiting Area for Import Containers (Empty Trailers)



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## Waiting Area for PSA Terminal



Trailer flows around a Waiting Area at PSA Terminal

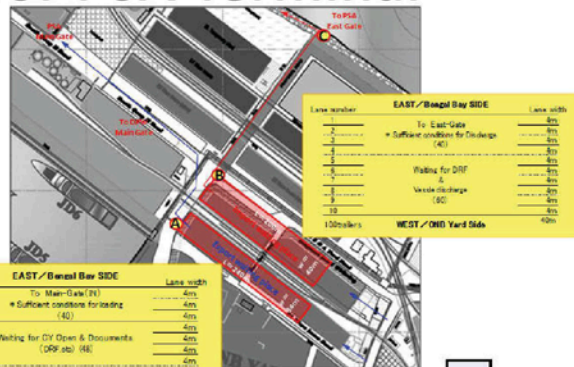
- All the trailers for PSA go to the end of ONV area and turn left along the Radio Road and then proceed to the Waiting Area.
- Trailers coming from PSA should proceed in the reverse direction as the above to Port Gate No.1.

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## Waiting Area for PSA Terminal

Waiting Area for Export Containers and Empty Trailers



### Operation Procedures

- Person A: allows a few export trailers to exit for PSA after confirming that the queue is moving forward.
- Person B: releases empty trailers in coordination with Person C. A trailer queue should not be generated between the Waiting Area and the seaside access road in order to secure the traffic flow of bulk cargoes.
- Person C: checks the number of trailers available on the access road to the East Gate and reports it to Person B.

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## II. Outcome (Evaluation) and Challenges of the Project

### Evaluation

#### 1. Periodical holding of the Steering Committee (S/C)

S/C should be held periodically to promote the improvement of port operation.

#### 2. Periodical survey of the status of congestion

Item	Measure	Evaluation	Challenge
Traffic control at Manali junction	Traffic control by traffic police	Not sufficient	To secure traffic flow responding to congestion status
Setting of blocks for trailer lanes	Securing dedicated lanes for trailers	Sufficient	
Utilization of TVT-Parking	Waiting area for drivers without proper documents	Not utilized	To consider the utilization and to develop running rules
Adjustment of traffic flow by traffic police	/ Prohibition of parking at intersections, narrow section of roads, residential areas, etc. / Instructions to drivers who do not move forward despite there being space in front	Not sufficient	/ To introduce means for traffic police to communicate each other / Strict enforcement of the no parking regulation / Continuous patrol and warnings to drivers
Improvement and widening of access Roads	Development of dedicated lanes for trailer along the access roads	In progress	Work needs to be completed as soon as Possible

## Evaluation

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### 3. Efficient operation at Port Gate No.1

ChPT has to introduce a system which enables to grasp any changes in operational procedure in order to solve issues generated by these changes.

### 4. Improvement of traffic flow inside the Port

Area	Issues	Countermeasures
North side	Import trailers for X-Ray inspection have to cross another trailer flow at the intersection near the inspection area	To implement a new X-Ray inspection area dedicated for import containers along the traffic flow of import trailers
	Two empty trailer flows towards DPW merge	To unify empty trailer flow so that empty trailers coming from PSA join the flow at Port Gate No.1
Central	Too many types of truck and vehicle flow are mixed on a narrow road	To implement realignment/development of internal roads
South side	The access road for coastal cargoes is occupied by empty trailers towards PSA East Gate	To establish a new waiting area for empty trailers and change the empty trailer flow accordingly

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## Evaluation

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### 5. On-street parking ban inside the Port and establishment of a new Waiting Area

Measures should be introduced to reduce the number of parked trailers.

Number of Parked Trailers along major traffic flows

Survey on Parked Trailers inside the Port		3rd Dispatch	4th Dispatch	5th Dispatch	6th Dispatch	7th Dispatch	8th Dispatch	9th Dispatch	10th Dispatch	11th Dispatch	AVE
		9Feb-15Feb 15	15Apr-20Apr 15	9Jul-25Jul 15	3Oct-13Oct 15	29Jan-16Feb 16	22May-10Jun 16	13Feb-5Mar 17	24Apr-14May 17	24Jun-13Aug 17	
Port Gate 1~X-Ray Intersection	Maximum	49	15	9	10	26	17	37	34	40	26.3
	Average	15	15	2	6	9	6	18	15	18	11.6
X-Ray Intersection~DPW Entrance	Maximum	59	87	44	45	52	32	78	65	42	56.0
	Average	22	71	9	41	25	15	46	35	24	32.0
DPW Exit ~Port Gate 1	Maximum	165	95	101	249	176	125	170	117	110	145.3
	Average	89	90	57	119	102	82	110	78	65	88.0

### 6. Allocation of traffic control persons

Allocation of traffic control persons has still continued.

Places to be allocated must be continuously examined and re-evaluated.

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# Evaluation

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## 7. Introduction of RFID system

- The RFID system could simplify the entry/exit procedure at Port gates and terminal gates.
- Neither the container terminals nor ChPT utilize the RFID system.
- Both terminals should link their Terminal Operating System (TOS) with the RFID system for improving terminal gate efficiency.
- How to use the RFID data should be examined based on the demonstration trial of the Web Portal System

## 8. Improvement of road infrastructure inside/outside the Port

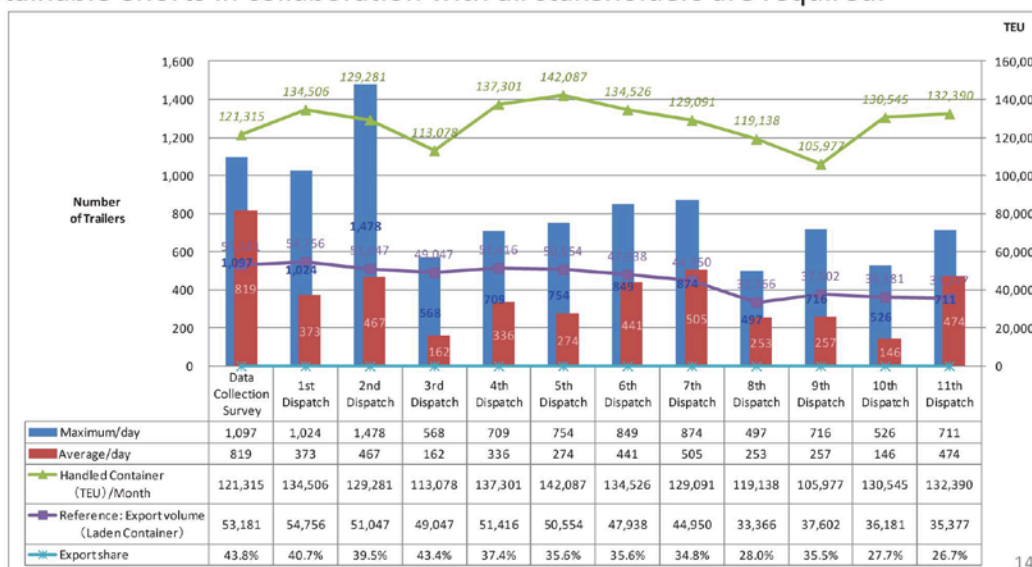
The road improvements and enhancement has to be continuously conducted inside/outside the Port.

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# Objective Evaluation

## 1. Evaluation of measures for congestion alleviation and challenges

Many port users feel that the congestion status of Chennai port has significantly improved. However, the traffic congestion still exists outside the port. Sustainable efforts in collaboration with all stakeholders are required.

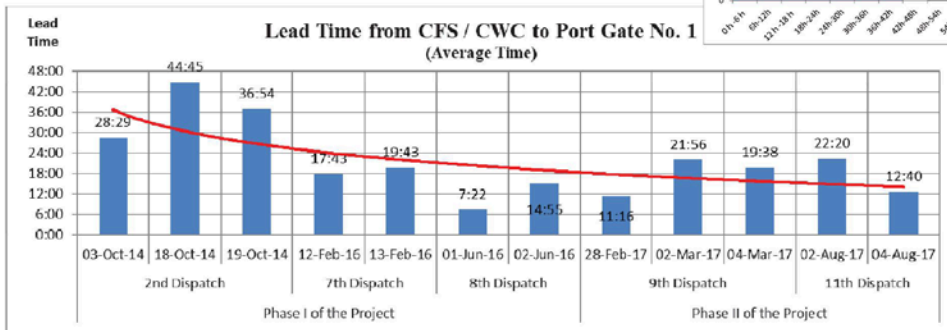
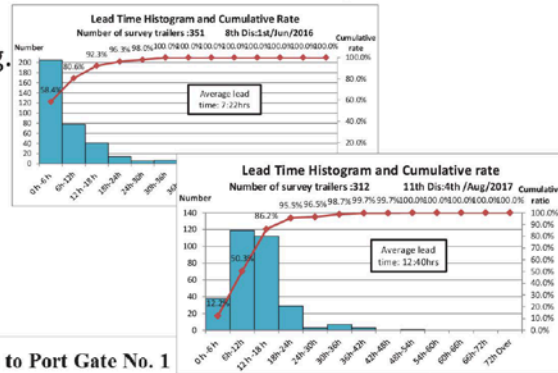


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# Objective Evaluation

## 2. Evaluation of the lead time results and its challenges

Lead time has been steadily decreasing. Measures should be continuously conducted. A sustainable system should be established to tackle congestion and improve port operations.



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# Objective Evaluation

## 3. Evaluation of Introducing Web Portal System and its Challenges

To provide the Lead Time identical to the survey conducted by the team  
 Lead time information published on ChPT Homepage

Weekly Average of Lead Time : **11:47** from CFS to Port Gate  
**03:27** from Port Gate to Terminals

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	#Cases	Ave	#Cases	Ave	#Cases	Ave
09/10/2017 (Mon)	145	04:02	260	01:23	191	03:52	451	02:26
10/10/2017 (Tue)	1031	11:32	504	01:48	530	02:00	1034	01:54
11/10/2017 (Wed)	1024	14:51	499	02:36	681	03:37	1180	03:11
12/10/2017 (Thu)	572	13:44	338	05:00	717	05:29	1055	05:20
13/10/2017 (Fri)	742	12:41	520	04:35	916	04:19	1436	04:25
14/10/2017 (Sat)	1270	12:27	613	02:12	920	03:17	1533	02:51
15/10/2017 (Sun)	868	06:43	485	04:28	656	02:38	1141	03:25

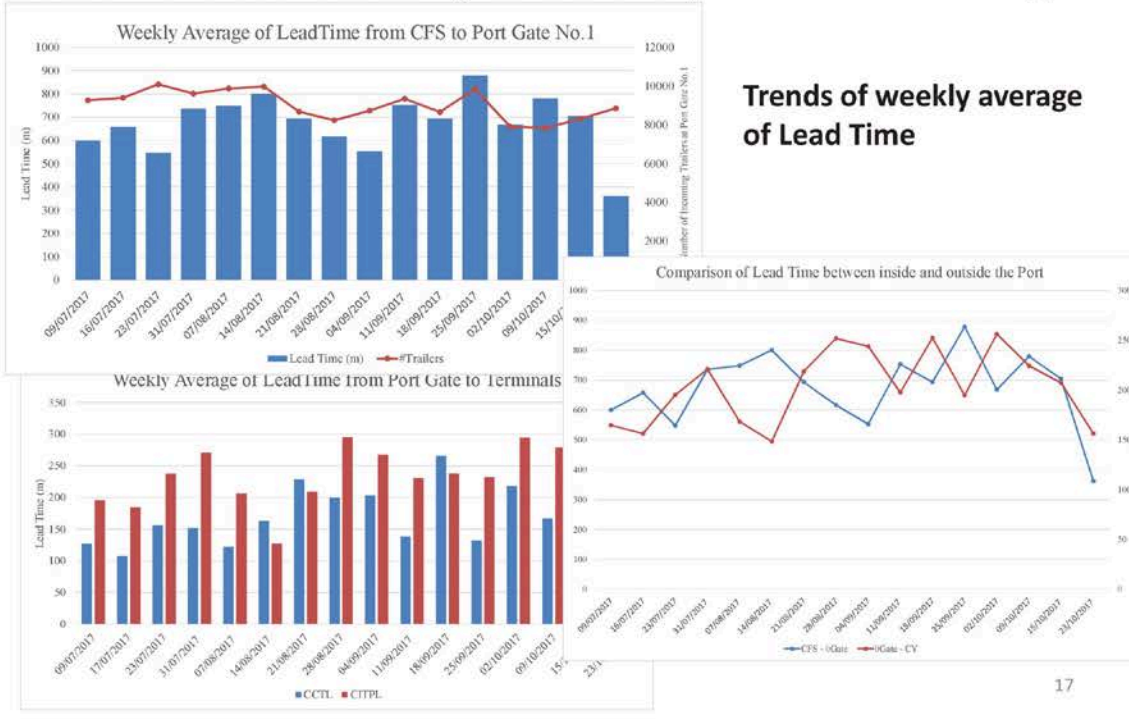
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# Objective Evaluation

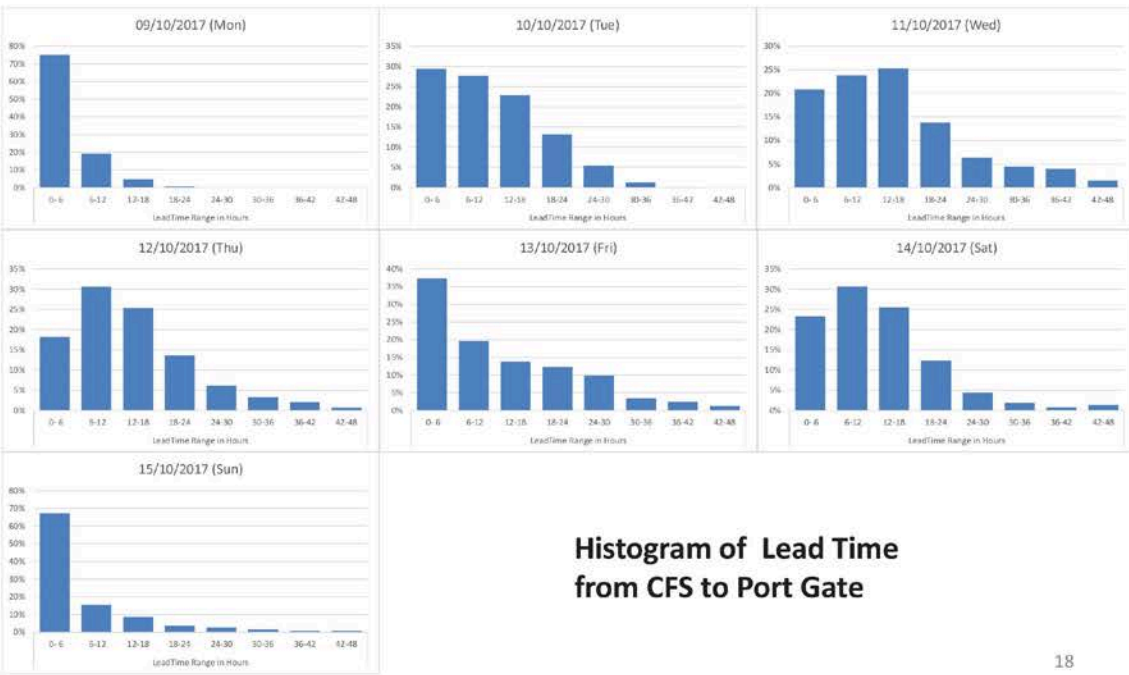
## 3. Evaluation of Introducing Web Portal System and its Challenges



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# Objective Evaluation

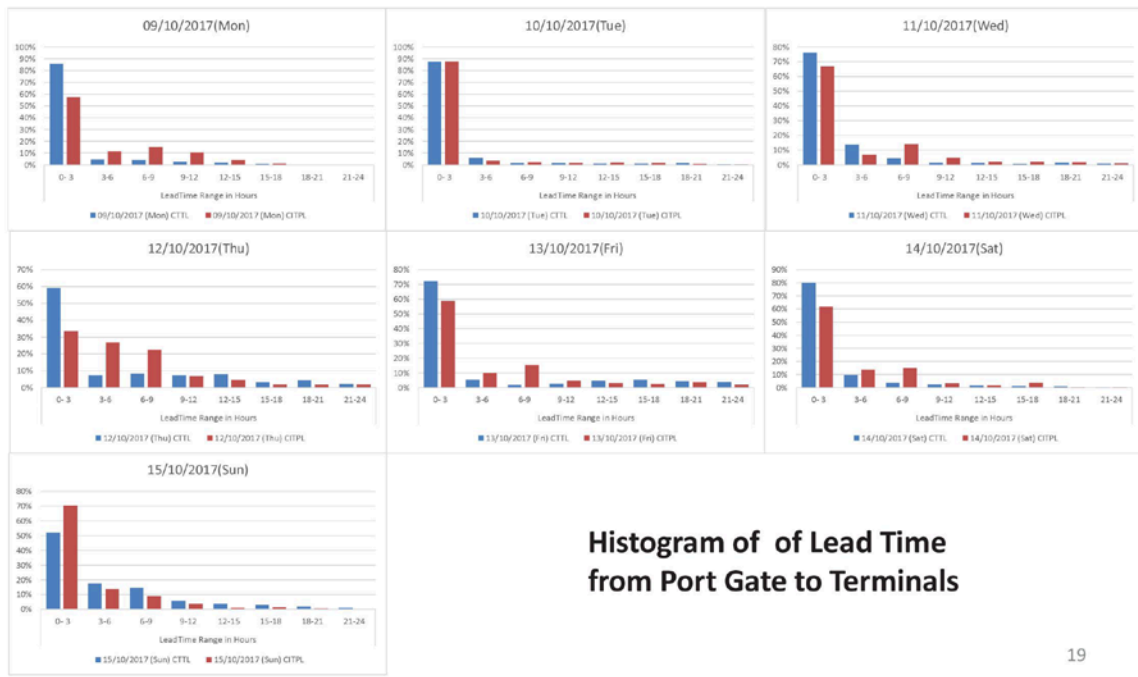
## 3. Evaluation of Introducing Web Portal System and its Challenges



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# Objective Evaluation

## 3. Evaluation of Introducing Web Portal System and its Challenges



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# III. Additional Studies on Priority Projects

## IT Related Project

- Introduction of Web Portal System -

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**Issued for Implementation**

1. Method of publishing live pictures of traffic congestion
2. Examination of information to be published
3. Automation of a procedure to publish information

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## IT Related Project

- Introduction of Web Portal System -

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Weekly Average of Lead Time : 11:47 from CFS to Port Gate  
 03:27 from Port Gate to Terminals

Date	CFS to ZeroGate		ZeroGate to CCTL		ZeroGate to CITPL		ZeroGate to Terminal	
	#Cases	Ave	#Cases	Ave	#Cases	Ave	#Cases	Ave
09/10/2017 (Mon)	145	04:02	260	01:23	191	03:52	451	02:26
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Time	CFS	ZeroGate	CCTL	CITPL	Terminal
6:00	44	36	16	5	21
7:00	66	38	15	16	31
8:00	84	44	25	18	43
9:00	77	32	22	13	35
10:00	124	33	15	22	37
11:00	129	60	24	23	47
12:00	132	47	30	25	55
13:00	109	31	21	5	26
14:00	105	43	22	11	33
15:00	120	14	23	17	40
16:00	164	14	15	8	23
17:00	161	13	10	9	19
18:00	157	30	7	1	8
19:00	161	36	0	9	9
20:00	139	6	6	1	7
21:00	211	14	4	6	10
22:00	181	8	6	14	20
23:00	185	5	8	8	16
0:00	187	6	15	8	23
1:00	153	10	19	10	29
2:00	119	6	15	3	18
3:00	103	24	17	10	27
4:00	101	17	20	12	32
5:00	94	8	19	9	28
Total	3106	575	374	263	637
Average	129.4	24.0	15.6	11.0	26.5
Max	211	60	30	25	55

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## IT Related Project

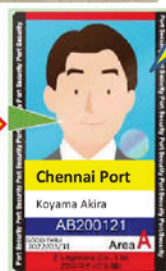
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### - Introduction of RFID based Harbor Entry Pass System -



Issued for Implementation

1. Examination and evaluation of the operational procedure



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## Challenges in IT Utilization


- 1) Examination of the leading examples
  - The applied technology
  - The development process and its schedule
  - Operational procedure
  - Development organization, etc.
- 2) Establishing the sustainable system
  - ChPT itself must develop a sustainable system which supports the operation of the system continuously.

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## Jawahar Dock Entrance Widening

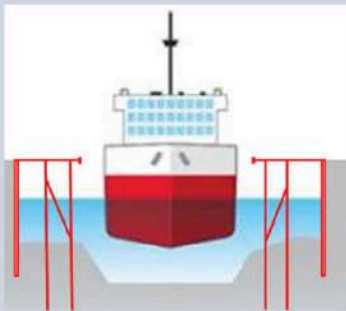
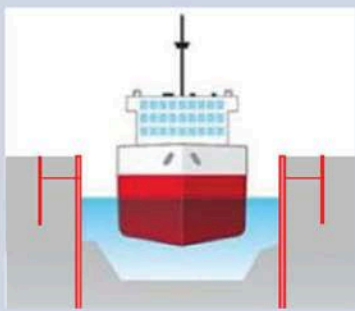
- The Study team proposes the following two measures in order to achieve successful renovation of JD and simultaneously addressing safety concerns.

1. Steel Pipe Pile instead of Concrete Pile	2. Steel Pipe Sheet Pile Method
	

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## Jawahar Dock Entrance Widening


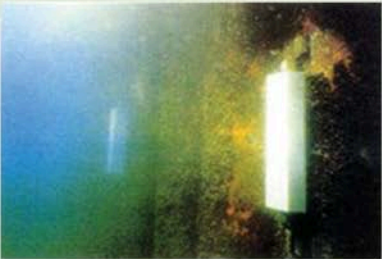
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	1. Steel Pipe Pile instead of Concrete Pile	2. Steel Pipe Sheet Pile Method
Layout		
Procedure	<p>i) construct the earth retaining walls behind the existing aging walls                      ii) construct piers in front of the walls                      iii) demolish the superannuated walls from the land side                      iv) remove soil around the constructed piers</p>	<p>i) construct steel pipe sheet piles in a row behind the existing aging walls                      ii) demolish the superannuated walls from the land side</p>

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<h2>Jawahar Dock Entrance Widening</h2>		Draft Final Report
	1. Steel Pipe Pile instead of Concrete Pile	2. Steel Pipe Sheet Pile Method
Findings	<ul style="list-style-type: none"> <li>- Collision of vessels might cause severe damage to the facilities.</li> <li>- Construction of diaphragm walls might entail technical difficulties.</li> <li>- The horizontal force caused by vessels should be considered in the design process.</li> </ul>	<ul style="list-style-type: none"> <li>- The construction period might be shorter.</li> </ul>
Period	- Approximately 32 months	- Approximately 26 month
Cost	(difficult to be determined without precise data such as soil test)	- Approximately 36.4 Million USD

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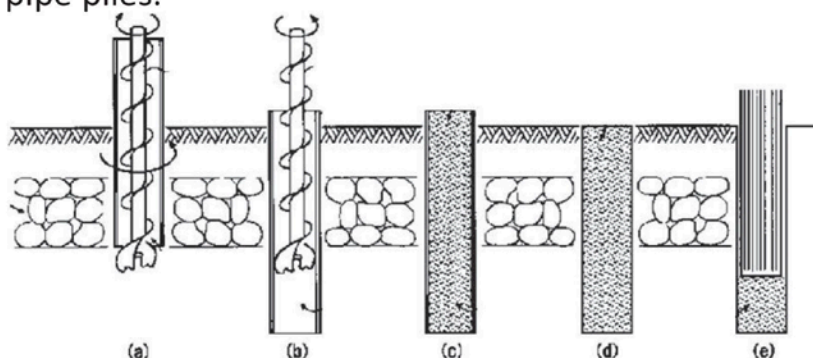
<h2>Jawahar Dock Entrance Widening</h2>		Draft Final Report
<h3>- Corrosion Prevention Methods</h3>		
Coating Method	Electric Method	
<p>Physically blocks factors such as water and oxygen which cause corrosion with coating</p> <ul style="list-style-type: none"> <li>- Applicable from the air to seawater</li> <li>- Several types of methods can be applicable according to conditions.</li> <li>- Effective for mid and long term</li> </ul>	<p>Generate electronic currents to prevent ionization of steel which causes corrosion</p> <ul style="list-style-type: none"> <li>- Applicable from tidal zone to seawater</li> <li>- Effective for corrosion caused by friction such as sand erosion</li> <li>- Effective for long term</li> </ul>	
		
Polyethylene coating	Aluminum Anode	

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## Jawahar Dock Entrance Widening

### - Replacement Methods

- Regarding the installation of steel pipe piles at the former breakwaters site, it is assumed that plenty of rocks exist which will hinder the installation.
- The team proposes the replacement of the rocks and stones with sand for easy installation. The procedure is as follows; a) remove rocks and stones with the installation of the casing, b) leave the casing; c) Fill the casing with sand,; d) extract the casing; e) install steel pipe piles.

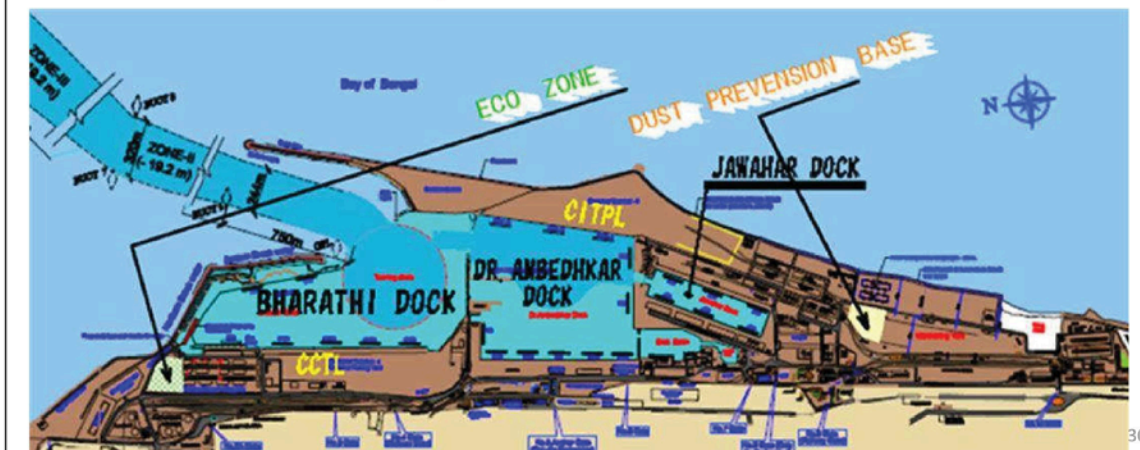


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## Improvements of Environment

The team proposes the following two measures

- i) Eco Zone: An area where greenery is promoted in a planned and intensive manner
- ii) Dust Prevention Base: An area where certain functions are installed in order to prevent dust generated from cargo handling, and where cargo such as stones are stored.



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## Improvements of Environment

### i) Eco Zone



A) Green Pavement





C) Shed with Solar Panels on the Roof



B) Desalination Device



D) Wind Generator



E) Flyover


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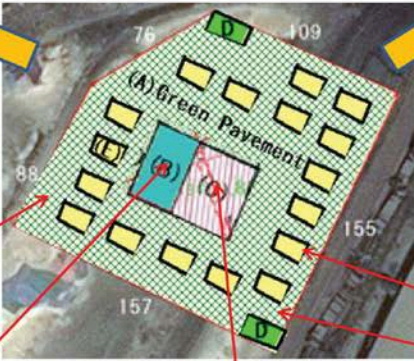
## Improvements of Environment


### ii) Dust Prevention Zone

- In order to clean roads and aprons, a maintenance vehicle that draws dust and another one that sprinkles water are deployed.




Vehicle to Draw Dust







Vehicle to Sprinkle Water




A) Green Pavement



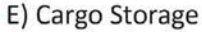
B) Desalination Device



C) Shed with Solar Panels on the Roof



D) Wind Generator



E) Cargo Storage

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## Improvements of Environment - Prevention of Dust during Cargo Handling

- In order to prevent the dust from cargo handling, the sites are surrounded by walls.



### Construction Cost

Items	Cost
Eco Zone with Access Road	8.6 M USD
Dust Prevention Base with Vehicles and Devices	9.1 M USD
Mobilization etc.	7.8 M USD
Sum	25.5 M USD

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## Shortening of Construction Period for the Redevelopment of AD West

- The Team proposes an execution method for shortening of construction works for the redevelopment of the AD west quays
- 10 days is sufficient for placing the steel plate shells of 100m in length.



Steel Plate Cellular Shell



Large Crane Ship



Installation

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## Challenges in Infrastructure Development

- 1) Construction schedules
- 2) Future demand
- 3) Collection of necessary data
- 4) Necessity of further study
- 5) Funding

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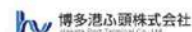
## Thank you for your Attention



Kattupalli Port



JICA Study Team



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