USC Marshall
Center for Global Supply Chain Management

"Port Solution" Research Project Overview

Port of Los Angeles, Port of Long Beach, University of Southern California

USC Marshall
Center for Global Supply Chain Management

Background:

Background

- The Ports of Los Angeles and Long Beach are not only integral components of Southern California's business landscape but one of the most critical asset of USA. Together they make up the nation's largest gateway for international trade, accounting for 40% of the nation's imports and over $400 billion in goods.
- However in recent years, the Ports of LA/LB have gradually lost market share to other U.S. ports and, more significantly, to Canadian and Mexican ports.
- Increased competition and ongoing operational inefficiencies are placing the Ports of LA/LB at risk of losing additional market share, which would have a serious effect on the regional and national economy.
- Unfortunately, these issues are not endemic to the Ports of LA/LB; ports around the country are faced with the challenge of competition and handling an increasing amount of cargo on an already strained infrastructure system.

USC Marshall
Center for Global Supply Chain Management

Project Objective:

Project Objectives

- There are many factors that impact the performance of a port, including infrastructure at the port and the surrounding intermodal facilities, operational processes, as well as labor and environmental policies. This project will carefully explore these factors from a supply chain perspective and provide action plans and sound policies that the Ports of LA/LB as well as decision makers in both the private and the public sector can use to improve operations.
- The USC Center for Global Supply Chain Management views this as an opportunity to serve the local community while effecting positive change in the global market. By drawing on the Center's wealth of talent and knowledge in the field of supply chain as well as lean operations and process improvement in order to address the issues impacting these ports, the Center will position itself with the Ports of LA/LB as models of innovative thought leadership in research and practice.

USC Marshall
Center for Global Supply Chain Management

Center of Excellence – Global Supply Chain Management's Role:

- The Center will incorporate key stakeholders from various industries for holistic engagement through elaborate measures: define, measure, analysis, design, validate (DMADV) projects. We will define, measure, and analyze the opportunity from end-to-end and create a future statistical blueprint that not only allows the Port of LA/LB to be leaders globally but will also create a best practice for the future rollout of the list of ports.

USC Marshall
Center for Global Supply Chain Management

Research Plan:

- The Center will undertake a two-year project involving research into the inefficiencies and wastes causing port congestion and into the use of evolving technologies in streamlining port operations. Following the research phase involving a global best practices scan in port management as well as issues specific to the Ports of LA/LB, the Center will take a leadership role in the port community and a defined group of stakeholders by facilitating systemic changes that address gaps in public policy, labor and management, and port infrastructure.

  - USC Center for GSCM will take a leadership role in the port community to cooperate with both public and private organizations.
  - The project would last for up to two years and have three stages (see slide 3).
  - The group would apply Lean Six Sigma techniques (Define, Measure, Analyze, Improve, and Control) to streamline the port operation.
  - Our vision is to establish a solution for the twin ports to increase the overall efficiency and to achieve the systematic optimization over the entire supply chain.

USC Marshall
Center for Global Supply Chain Management

Project Stages

Track 1
Front Process

Source → Port/Quayside

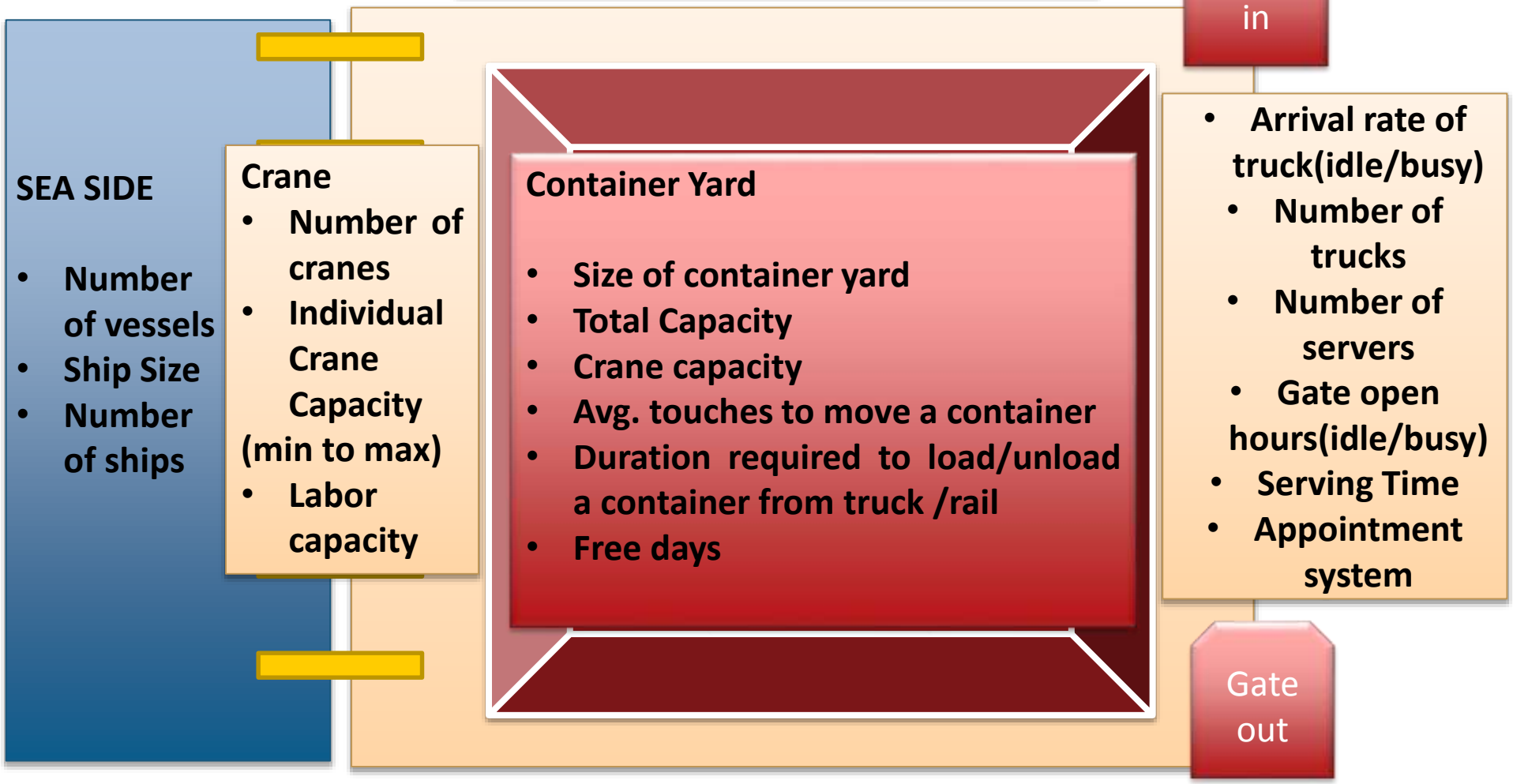
Track 2
Terminal Operations

Vessel Unloading → Container Storage

Track 3
Gate Management

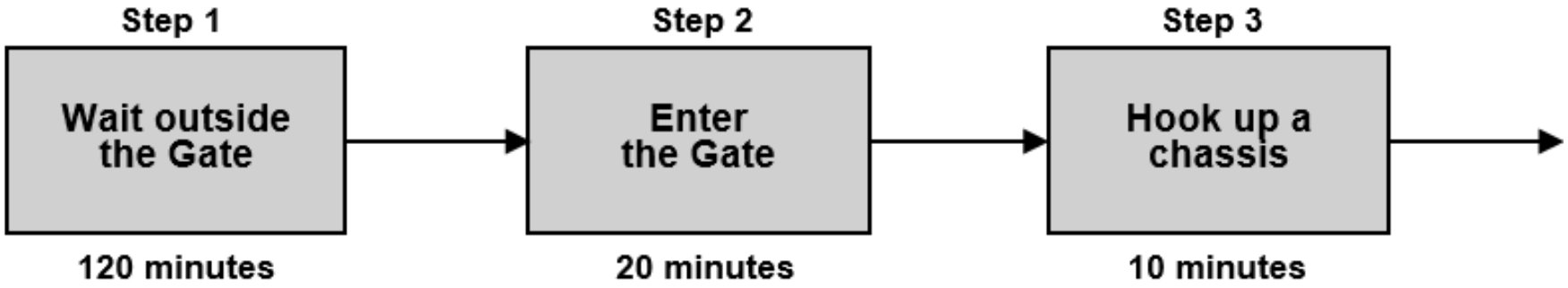
Dispatch → Disposition

- Y1 = System Throughput
- Y2 = Loss Function(Y2)

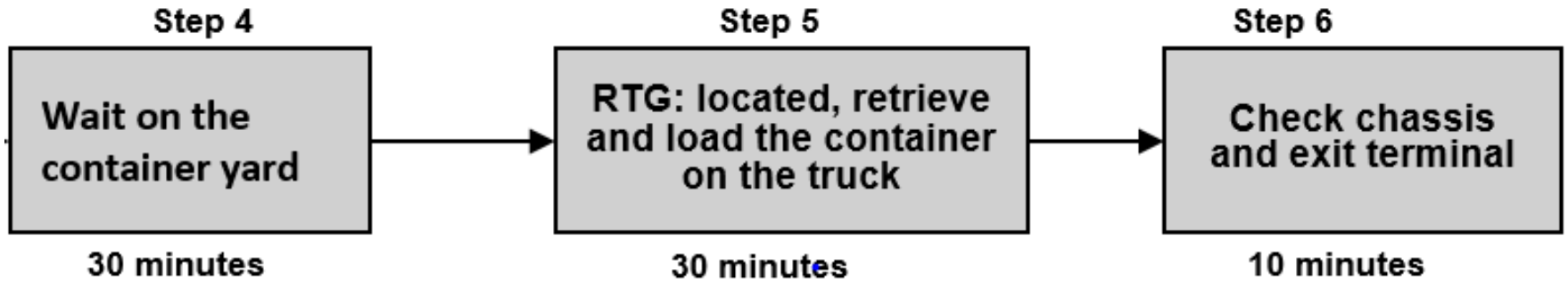


Incorporate Lean Six Sigma Practice to Port operation, build an interactive model for general port.

- **Calculate Total Process Time**
- **Calculate Key Waste Elements**
- **Convert Friction to loss function**
- **Import/Export Operation**
- **Rail Side**



1	Arrival rate of Trucks at the Gate
	Service Rate at the Gate
	Number of Lanes available at the Gate
	Frequency distribution of Trucks at the Gate (Average, Seasonal, Impact of free days)
2	The Ratio of Imports and Exports (possible for the whole port operation)
	The General Reason for the delay in entering process (distribution of each reason?)
3	Proportion of Trucks come to chassis
	Availability of chassis
	Average rate of mounting chassis on the truck



4	Arrival rate of Trucks at the Container yard
	Service Rate at the Container Yard
	1. Average no. of touches to move container to the truck
	2. Average time taken for each touch to move the container
	Number of cranes available at the container yard
	Total capacity of Container Yard
	Daily volume of Container Yard
	The utilization rate of Container Yard
	Are the import and export sharing Container Yard
5	Time taken to move out of the port from the container yard

6	Average Time taken to move container from Ship to the container yard

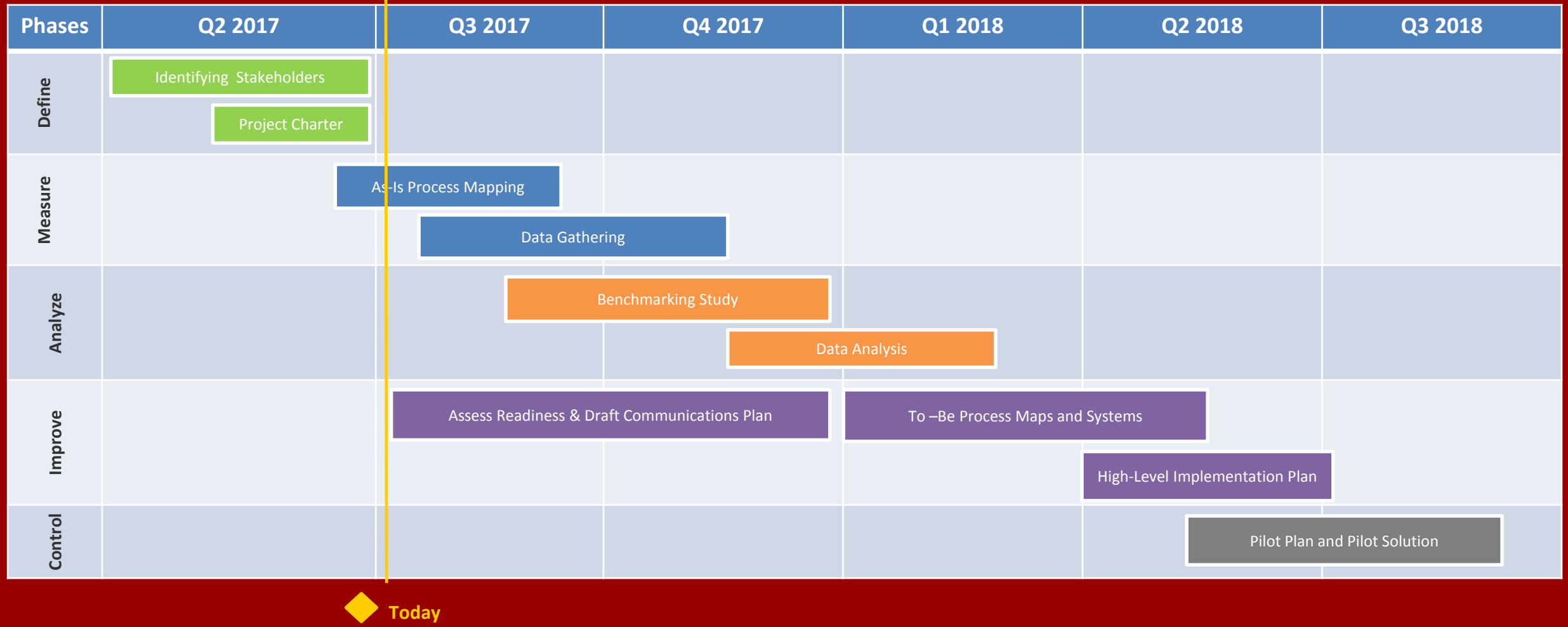
7	Time distribution of the containers stored on the container yard
8	The difference between truck and rail sides (enter, loading, unloading…)

USC Marshall
Center for Global Supply Chain Management

Stakeholders

USC Marshall
Center for Global Supply Chain Management

Project Timeline



USC Marshall
Center for Global Supply Chain Management

Project Timeline with Deliverables

Legend: =Completed =On track =Possibly delay =Significant delay =Not started