Terminal Productivity and its impact on supply chains

Captain Chaim Shacham
Master Mariner

www.ccs-maritimeservices.com

March 4th, 2014
Agenda

- The Marine Terminal
- Definition of Terminal Productivity
- Ship in Port – Time Chart
- Terminal Productivity Vocabulary
- Benefits of Higher Productivity
- Higher Productivity = $$$
- Factors Affecting Productivity
- Carriers Contribution to Higher Productivity
- Optimization of Terminal Productivity
The Marine Terminal

The Marine Terminal consists of at least three or (sometime) four components:

- The Berth aka The Apron
- The Container Yard
- The Gate(s)
- The Rail Facility
Definition of Terminal Productivity

Terminal Productivity definitions by different pertinent stake holders in the Marine Terminal:

- **Ocean Carriers** – Container moves per Crane OR Vessel OR Berth per hour
- **Terminal Operators** – Container Throughput per acre
- **Stevedores** – Container moves per Crane hour
- **BCOs/Shippers/Receivers/Truckers** – Turn Around Time of trucks
Ship in Port – Time Chart (I)
Ship in Port – Time Chart (II)

1. End of sea passage / Arrival pilot station
2. Finish With Engines / Vessel safely moored
3. Commence of cargo operations
4. Completion of cargo operations
5. Stand by engines / Vessel cast off
6. Full Away / Commence of sea passage

- Pilotage In
- Minimize this time span
- Optimize Productivity
- Minimize this time span
- Pilotage Out

Total Time in Port

Gross Berth Time

Net Berth Time

Maritime Services
Terminal Productivity Vocabulary

- Gross Crane hourly Productivity = Total moves / [ Gross hours worked * Crane density ]
- Net Crane hourly Productivity = Total moves / [ Net hours worked * Crane density ]
- Net hours = Gross hours – unproductive hours
- Vessel Gross or Net Productivity = Total moves / Gross or Net Berth Time
- Berth Productivity = Measures the productivity of the whole berth when working ships simultaneously
Benefits of Higher Productivity

For the Ocean Carrier: Shorter time in port, hence:

- Lower expenditure in Overtime Differential costs
- More time at sea → Lower speed to next port → Cost savings due to lower fuel consumption

For the Stevedore: Higher Profitability

- Same revenue but lower expenses

For the Terminal Operator: Higher utilization of the facility

- Higher throughput leading to higher revenues
Higher Productivity = $$$ (I)

Scenario #1 – 2000 moves; 4 gangs; 25 moves per crane hour
2000 / (4 * 25) = 20 hours  8 straight time + 12 over time

Scenario #2 – 2000 moves; 4 gangs; 29.4 moves per crane hour
2000 / (4 * 29.4) = 17 hours  8 straight time + 9 over time

(12 – 9) * 4 * $1000 = $12,000 per ship per call

Net Savings = 8 (ships) * 5 (ports) * 4 (sailings) * $12,000 = $1,440,000
Higher Productivity = $$$ (II)

Distance to next port 400 miles; Cruising speed 20 Knots; Fuel consumption at this speed 120 tons per day; Cruising speed 18 Knots; Fuel consumption 100 tons per day

\[
\frac{400 \text{ miles}}{20 \text{ Knots}} = 20 \text{ hours} \rightarrow \text{Fuel consumption 100 tons}
\]

\[
\frac{400 \text{ miles}}{18 \text{ Knots}} = 22 \text{ hours} \rightarrow \text{Fuel consumption 92.5 tons}
\]

7.5 tons * $650 per ton = $4,875

Net Savings = 8 (ships) * 5 (ports) * 4 (sailings) * $4,875 = $780,000
Factors Affecting Productivity

Vessel Operations:
- Stowage on board the ship
- Size of the vessel
- Total number of moves

Cranes and Drivers:
- Multiple containers in one lift
- Cycling during Load/Discharge process
- Expertise of crane drivers

Container Yard Operations:
- Type and Efficiency
- Yard Congestion and/or Density
Carriers Contribution to Higher Productivity

The Utopia is a ship discharged and loaded in one port

- **Itinerary** – Keep the number of ports of call to the minimum necessary (→ Optimize revenue)

- **Stowage** – (1) Full bays across / top to bottom (2) enable tandem load of empty containers (special certified twist locks)

- **Cargo** – Minimize the carriage of non-containerized cargo such as OOG units and break bulk

- **Schedule** – On time arrival at agreed upon “windows”
Optimization of Terminal Productivity

- The Cargo Owners are indifferent. They rate the importance of Berth / Vessel / Crane productivity very low.

- The Terminal Operators are interested in keeping the terminal fluid and all assigned machinery working, thus looking for a Productivity Optimization between the yard and the berth.

- The Ocean Carriers are interested in minimizing their expenses, and the optimal Productivity means avoiding UGT.
Questions

THANK YOU

You have been a wonderful audience