

# Big Ships and Port Multi- Service Congestion

# Definition of Port Congestion

- Port Congestion occurs when users of port services interfere with one another to the extent that their times incurred in using these services increase.
- “Congestion is the single biggest competitive issue for (container) ports today”.
- A major contributor of this congestion is the sheer volume of containers that is unloaded from and loaded to mega container ships while in port.

# Port Congestion

- At the ports of Los Angeles/Long Beach 14,000-TEU ships are generating as many as 10,000 container moves per vessel call.
- 18,000-TEU ships are generating as many as 17,000 moves per vessel call.
- Such cargo surges over a period of several days are overwhelming to the port's yard and gate operations, resulting in significant increases in port congestion.
- Container port congestion attributed to large numbers of container moves per vessel call is a new type of congestion for the world's major container ports, i.e., port multi-service congestion.

# Port Multi-Service vs Single-Service Congestion

- Port multi-service congestion occurs when port users of “two or more different port services” provided at a given port location or over a given port pathway interfere with one another to the extent that they experience port congestion (Talley and Ng, 2016).
- Port single-service congestion occurs when port users of a “single port service” provided at a given port location interfere with one another to the extent that the users experience congestion at this location, e.g., the congestion that occurs at a container port’s truck entrance gate, where trucks hauling containers enter the gates during peak hours, thereby increasing their times to enter the port.
- A decrease in single port congestion at port truck entrance gates has been addressed by charging a higher fee for trucks passing through entrance gates during peak hours and a lower fee during off-peak hours (e.g., the Pier Pass Program utilized at the Ports of Los Angeles/Long Beach)

# Port Locations Shared by Port Multi-Services

1. Port Berth – water area alongside a quay, where a ship sits.

A port provides ship service (e.g., pilotage and tug) in placing a ship at the berth and cargo service (e.g., loading and unloading cargo) at the berth.

2. Port Yard – land area of the quay, where cargo is staged (or assembled) before loading on a ship or after unloading from a ship.

# Port Pathways Shared by Port Multi-Services

1. Berth-to-yard pathway and yard-to-berth pathway.
2. Yard-to-departure gate pathway and the entrance-gate-to-yard pathway.

# Innovation Methodology

- Where are the locations and pathways within a container port where, port multi-service congestion might occur?
- These locations and pathways can be determined by using the innovation methodology of “describing a container port as a spatial network”, i.e., describing the locations as nodes and the pathways as links within a container port that are shared by two or more different port services.

Thank You