

Container Terminal Planning and Operations

Moving Today's Cargo Volumes

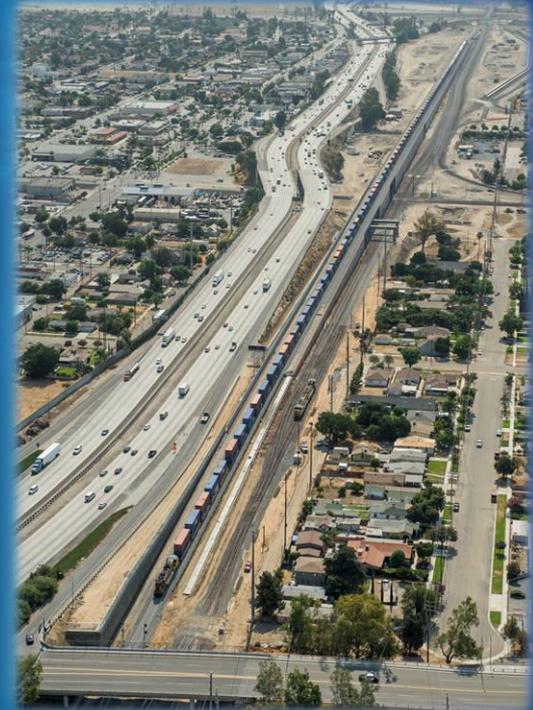
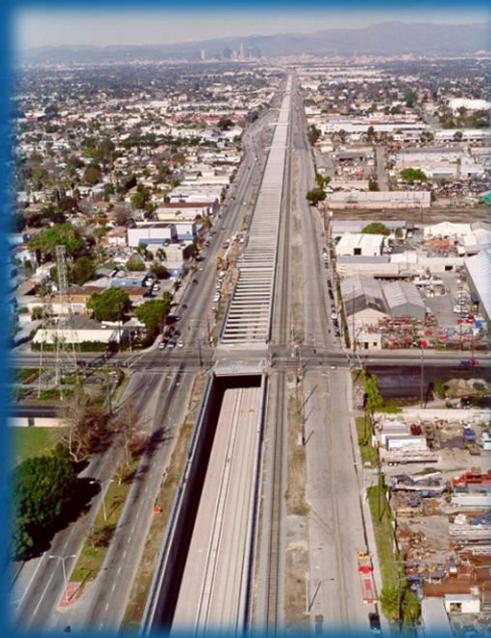
Michael Leue

PARSONS

Cargo Demand



Landside Transport



Railroad Connection

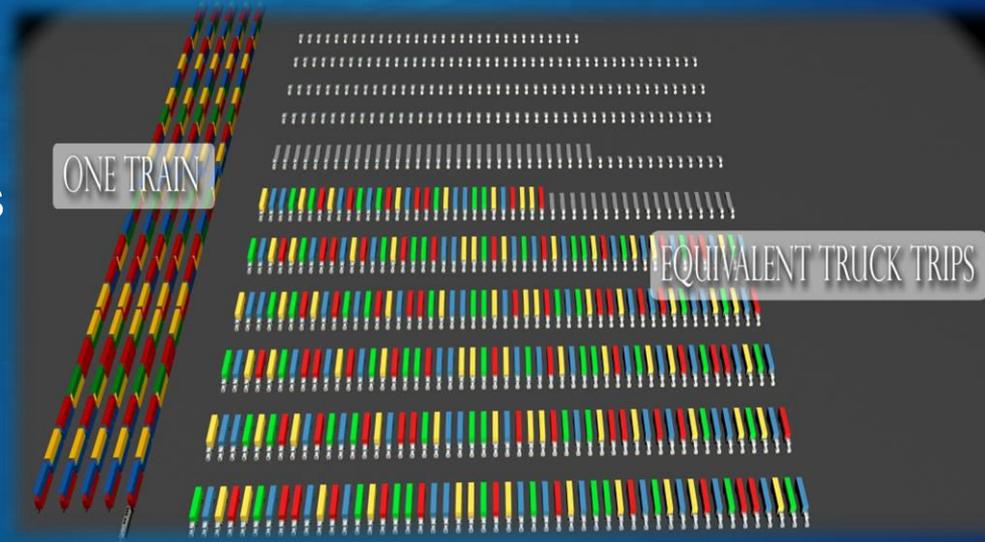


Rail is Key to Port of the Future

- Green Port Policy
- Clean Air Action Plan
- Emission Reduction Program
- Tier 3+ Switching Locomotives
- CARB/EPA Compliant Class I



On-dock Rail

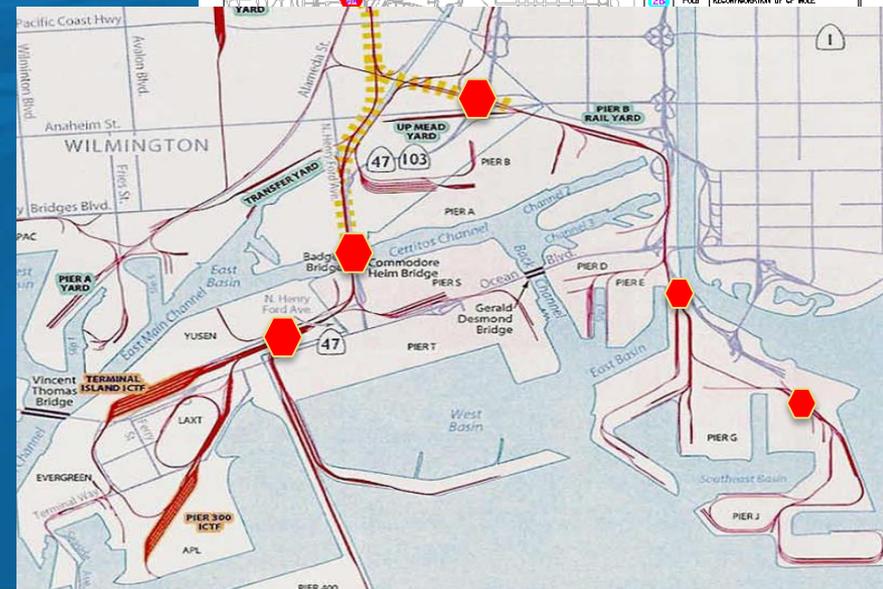


Industry Leading On-dock

\$2B Rail Enhancement Program

- On-dock Rail Yards
- Support Rail Yards
- Rail Network Infrastructure

ON-DOCK MARINE TERMINAL PROJECTS			RAIL ENHANCEMENT PROJECT LIST	
PROJ. ID	PIER / BERTH	PROJECT DESCRIPTION	PROJ. ID	PROJECT DESCRIPTION
01	PIER G	ITS RAIL YARD REDEVELOPMENT	025	PIER F SUPPORT YARD
02	PIER E,F	MIDDLE HARBOR RAIL YARD	026	TRACK REALIGNMENT AT OCEAN BLVD / HARRIS SCENE DRIVE
03	PIER A	MISC./SAT RAIL YARD REDEVELOPMENT	027	PIER B RAIL YARD (PHASE I) TIER 2
04	PIER S	PIER S RAIL YARD DEVELOPMENT	028	PIER B RAIL YARD (PHASE II) TIER 2
05	PIER G	PIER G UETRO TRACK IMPROVEMENTS	029	PIER B STREET REALIGNMENT
			030	TERMINAL ISLAND NYC TRACK REALIGNMENT
			031	PIER B RECONFIGURATION OF CP MILE



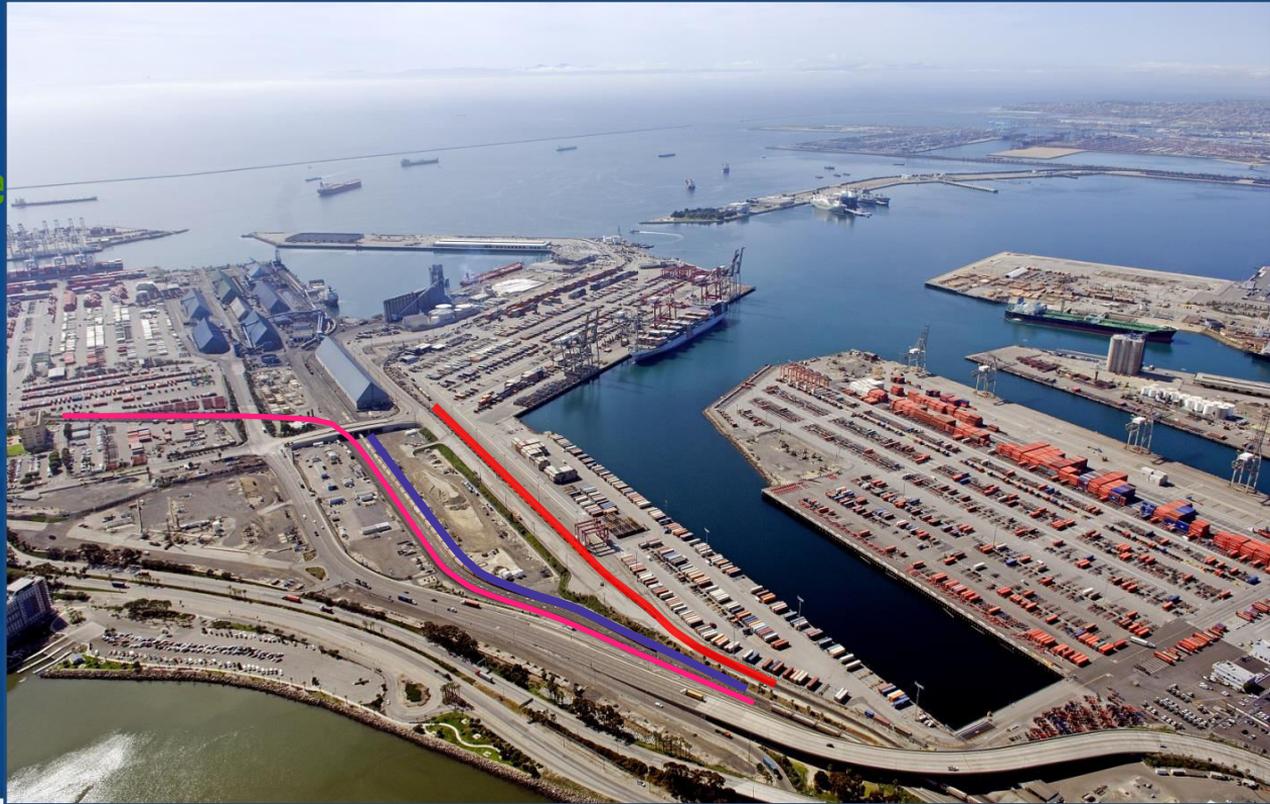
Rail Modeling

- Intermodal Yard
 - MPC Model
 - Simulation
- Network Performance
 - Track Utilization
 - RTC

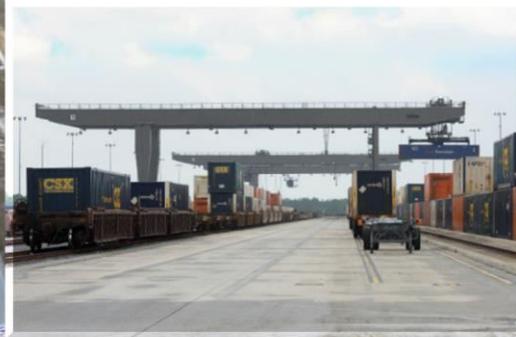


Rail Yard Access

- Lead Length
 - arrival/departure
- Yard Protection
- Mainline Protection



Wide-Span Gantry Cranes

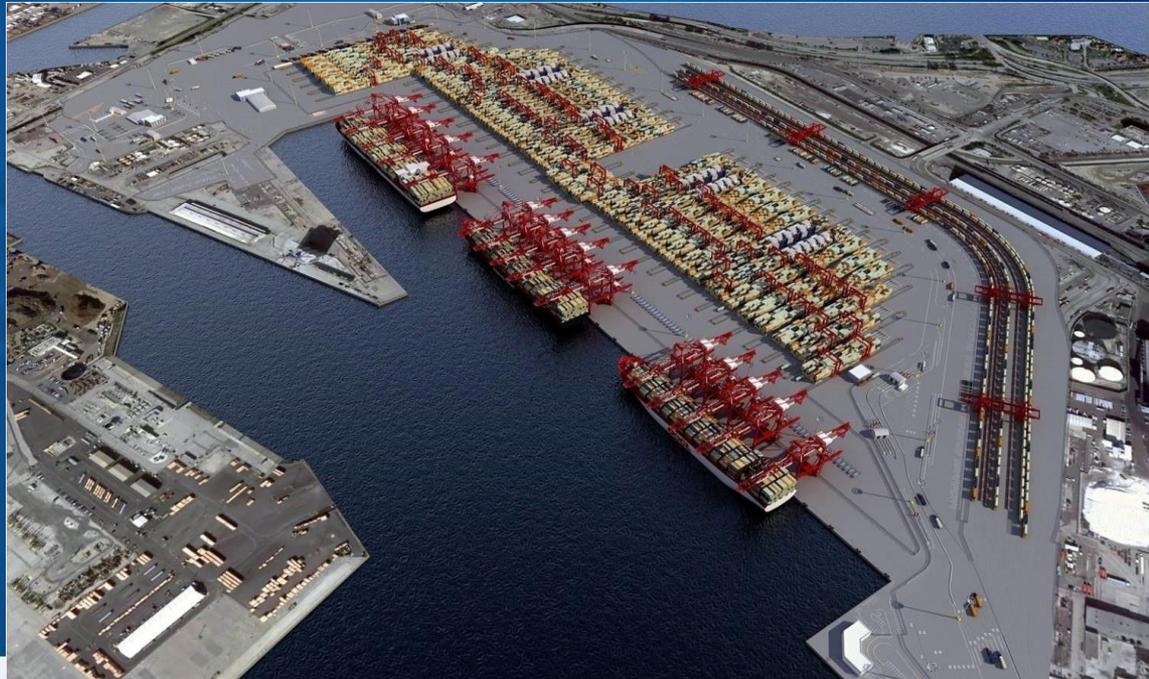


On-dock Projects



Middle Harbor Terminal

- Long Beach Container Terminal
- \$1.2B Construction over 10 years
- 304-Acres
- 3.3M TEU Capacity
- 1.1M On-dock Rail



On-dock Environment

- High-Value Property
- Constrained Space
- Longshore Labor
- Railcar Repairs
- Marine Terminal Interface
- Engineering Challenges

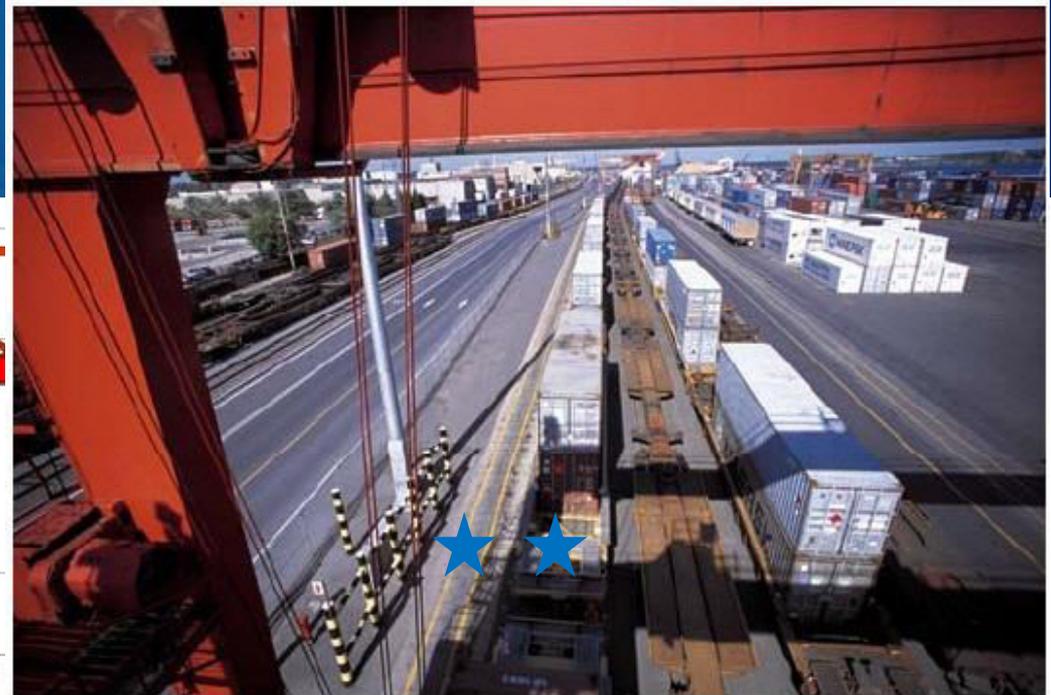
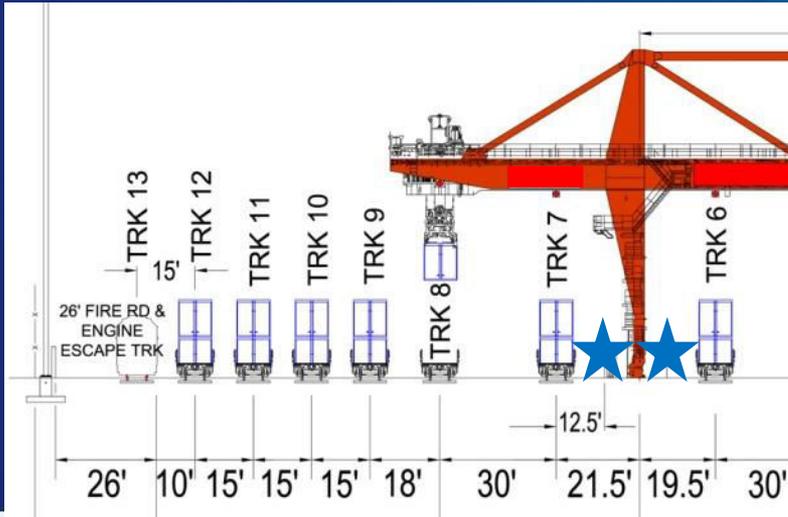


Yard Operations

- Train Arrival
- Secure Train/Yard
- Unload Containers
- Inspect Railcars
- Repair Railcars
- Load Containers
- Build Train
- Train Departure

Facility Layout

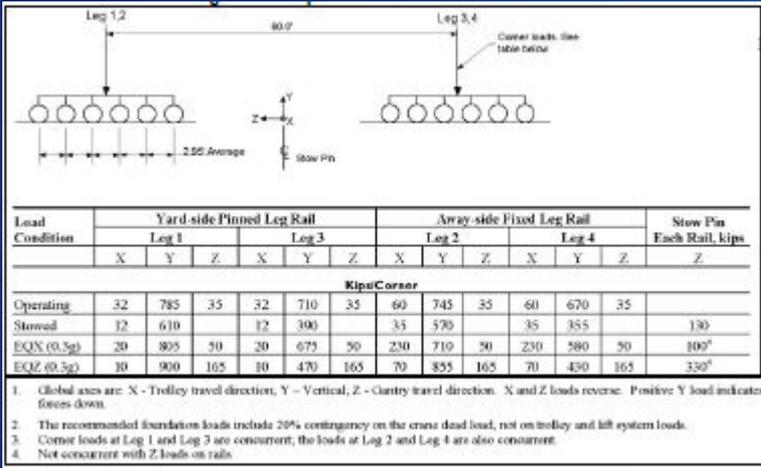
- Yard Track Lengths
- Track Spacing
- Work Areas



Safety Features



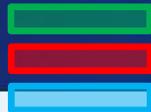
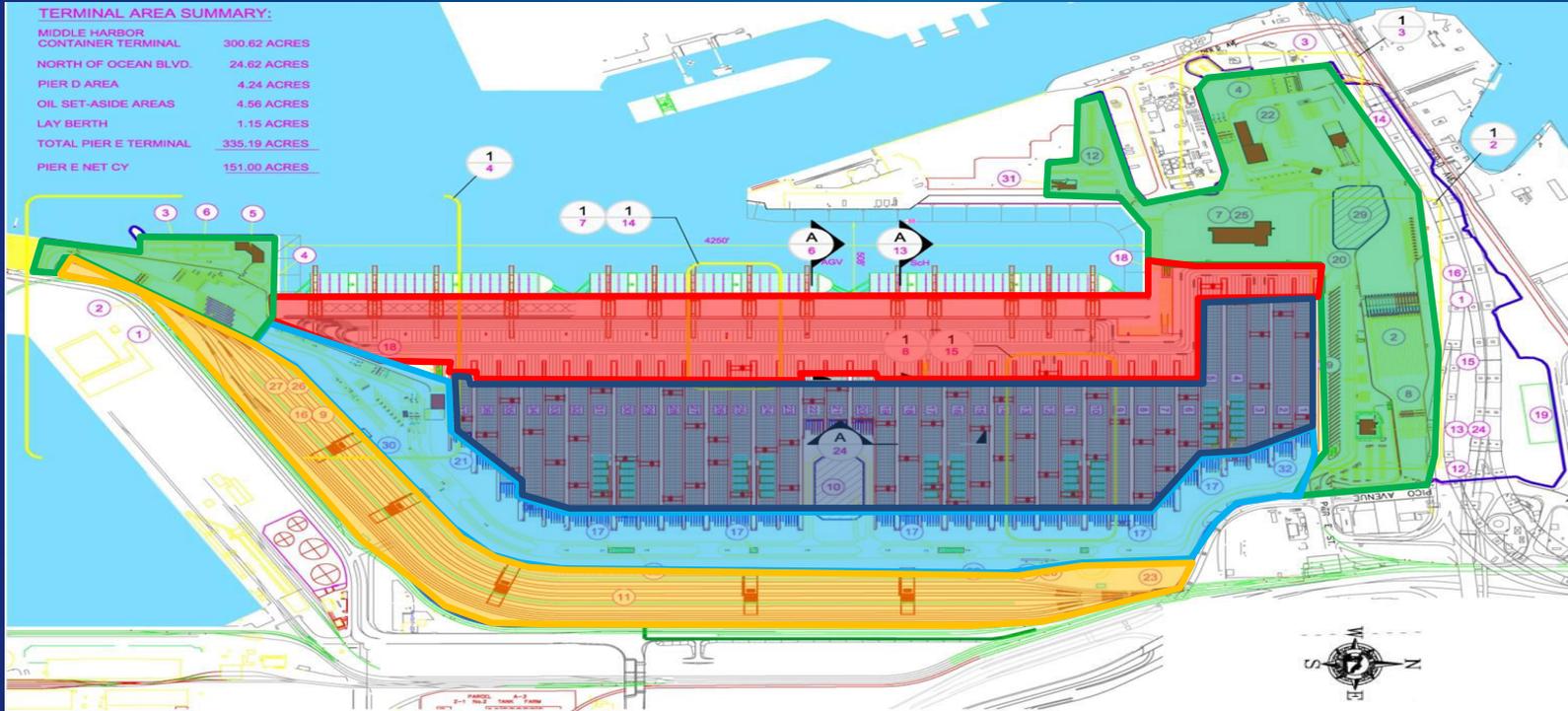
IY Design



Construction Phasing

TERMINAL AREA SUMMARY:

MIDDLE HARBOR CONTAINER TERMINAL	300.62 ACRES
NORTH OF OCEAN BLVD.	24.62 ACRES
PIER D AREA	4.24 ACRES
OIL SET-ASIDE AREAS	4.56 ACRES
LAY BERTH	1.15 ACRES
TOTAL PIER E TERMINAL	335.19 ACRES
PIER E NET CY	151.00 ACRES



Terminal Gate Area

Wharf & Automated Waterside Transport Area

Landside Transport Area



Intermodal Yard Area

Automated Stacking Area

Construction Phasing



Conclusions

WSC Intermodal Yards

- Efficient and Green
- Developing Technology
- Critical Design Issues
- Complex Operations will Benefit from Modeling



Conclusions

Bigger Ships

- Quay Cranes
- Container Yards
- Intermodal Yards
- Landside Transport

