# LONG BEACH CONTAINER TERMINAL - OVERHEAD LOAD PROTECTION SYSTEM

this system creates a safer work environment for personnel in the rail yard by restricting cranes from passing over head

## *the challenge*

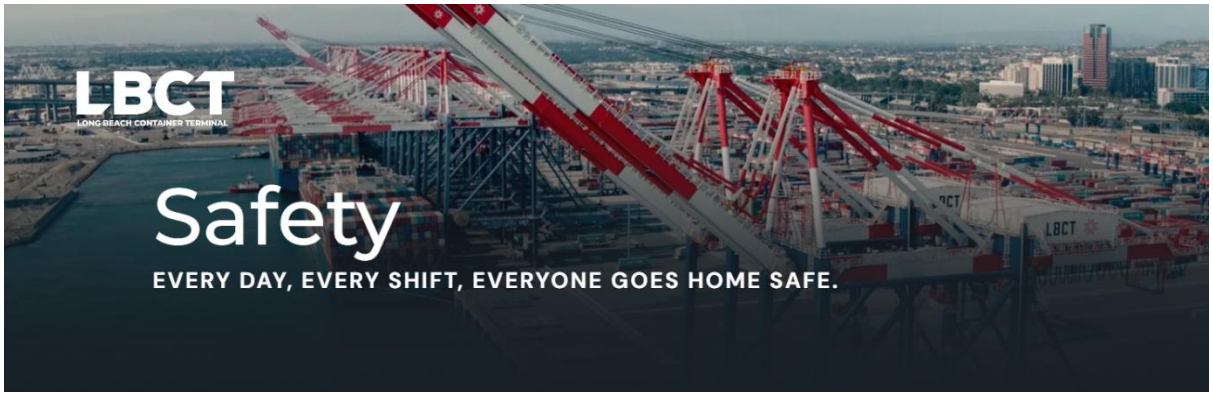
Long Beach Container Terminal (LBCT) has over 48,000 feet of rail tracks, making it one of the largest on-dock rail yards in North America. The rail yard is active around the clock, with many of these activities occurring at the same time: BNSF/UPRR delivering and departing trains, PHL switching railcars, TTX inspecting and repairing railcars, and operations discharging and loading containers. Containers are moved via 6 Intermodal Yard Cranes (IYCs) spanning 8 working tracks each covering a length of ~4,300 feet. Personnel on the ground operate Inter-Box Connectors (IBC) Carts, pickup trucks, forklifts, Kubotas, switching carts, and locomotives.

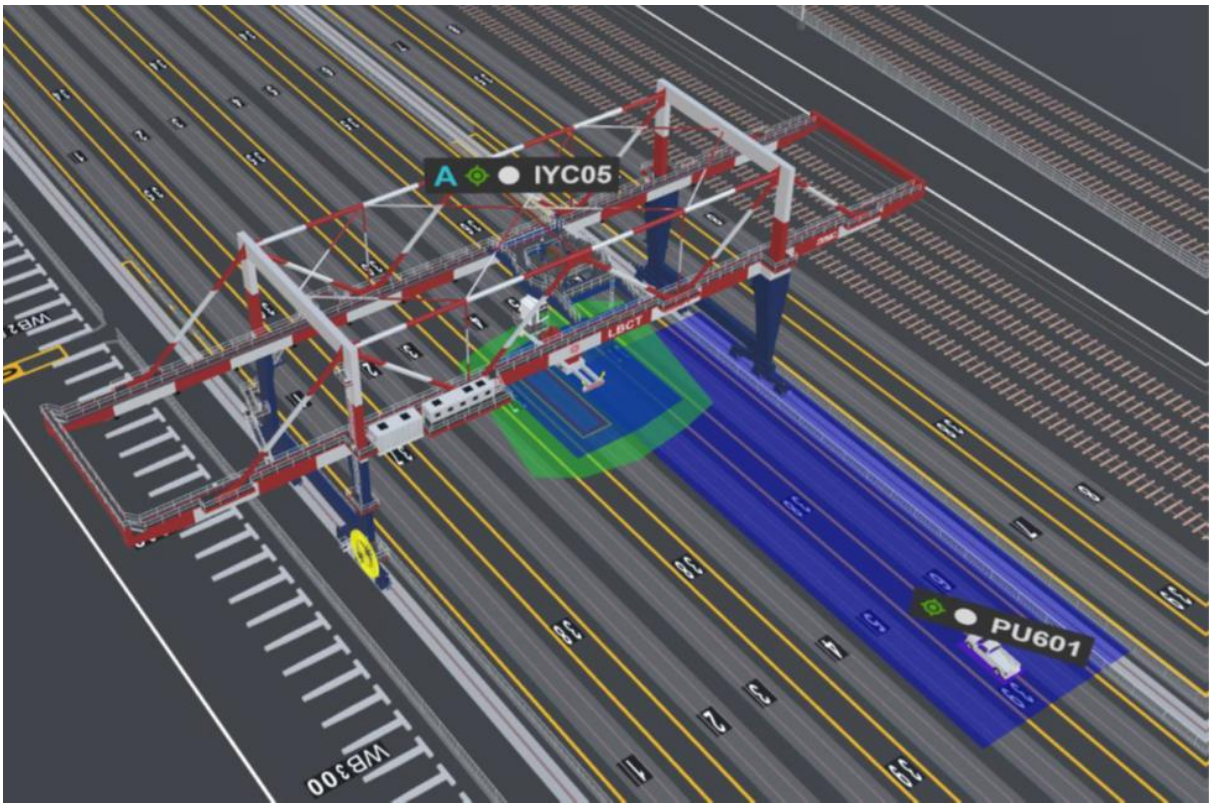
There is significant risk to ground personnel when cranes are operating and passing over head. These overhead risks include objects falling from containers, such as twist locks and debris, as well as the container itself. Cranes have thousands of assembly pieces also creating falling hazards should they come loose, such as nuts and bolts, cables, electronic and containers, instruments, and general tools used to conduct repairs. Vendors, maintenance and service providers, and locomotive crews had standing policies to not enter the working railyard while cranes were moving to ensure all personnel safety. This provided difficulties in operational planning and limited overall production.

## *the innovation*

LBCT drastically reduced the risk of injury by implementing an Overhead Load Protection System. This system creates a safer work environment for personnel in the rail yard by restricting cranes from passing over head.

This Overhead Load Protection System physically prevents cranes from going over ground crews, thereby significantly reducing the risk of falling objects to those ground crews. This solution also increased the level of safety for all jobs and personnel in the rail yard by providing operations live monitoring of all personnel and vehicle locations. Before, somebody's location would only be known if operations had eyes on the person or vehicle.

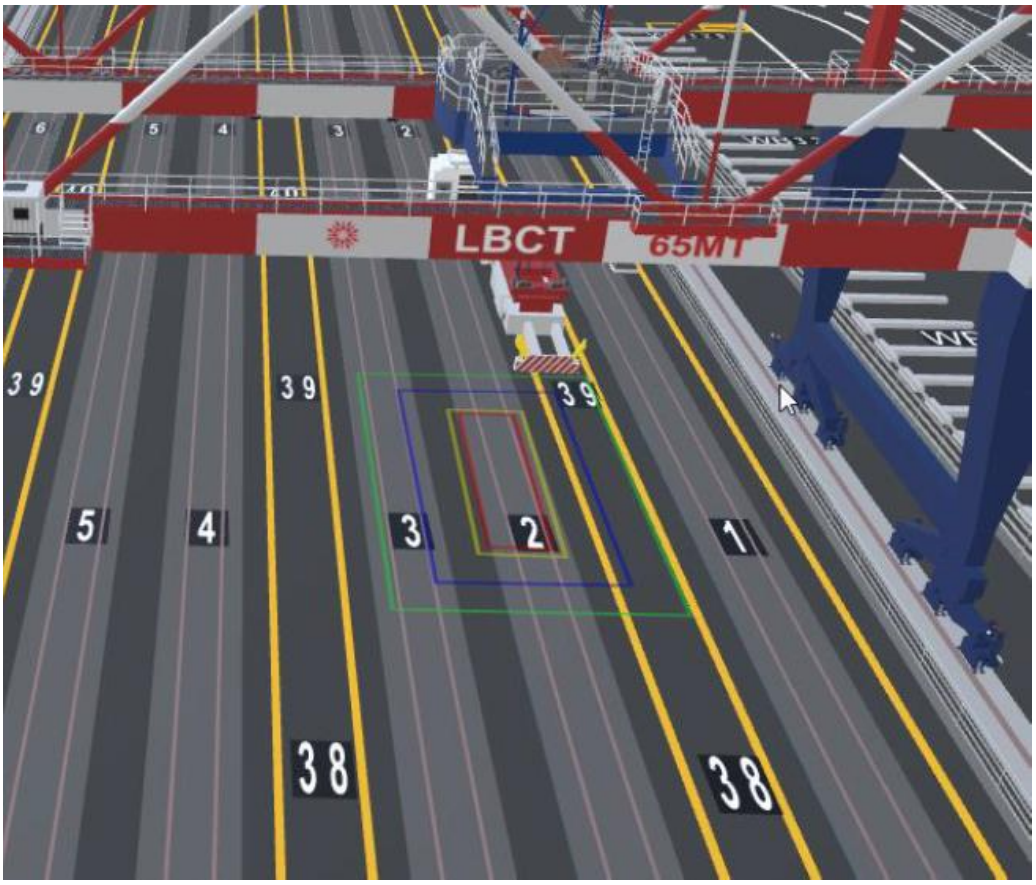





*Exclusion Zones Vehicles equipped with a Mi-Jack system are contained within a vehicle exclusion zone that follows the vehicle around the working rail yard. Manual exclusion zones can be drawn anywhere within the working rail yard to permit vehicles and personnel without Mi-Jack systems to safely work. Finally, train motion exclusion zones allow tracks and adjacent tracks and wide aisles to be blocked off from overhead crane movement when trains are inside the working rail yard.*

### *how it was implemented*

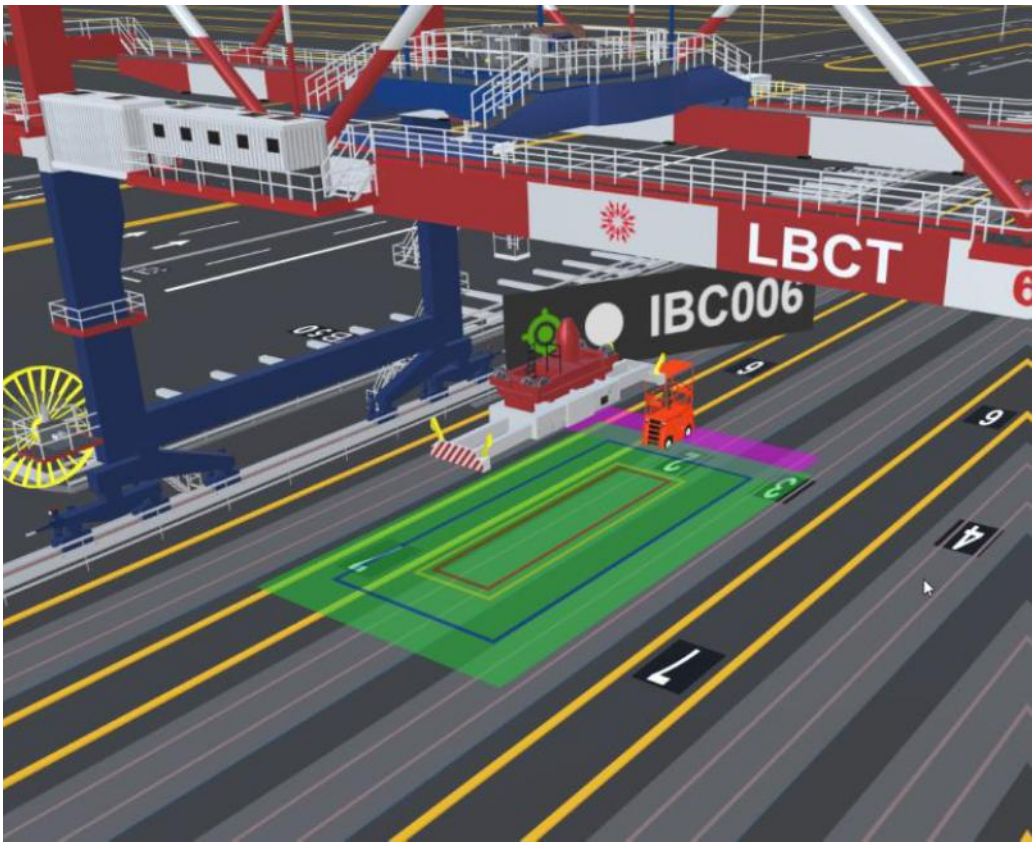
Considering the overhead risk in a large scale on-dock rail yard, LBCT began research for a solution close to 10 years ago. Yardeye was selected in 2022 to achieve this eventual safety milestone. Yardeye is based in Germany and developed the initial tracking technology, and was later acquired by Mi-Jack. The project kicked off with identifying locations on the cranes and vehicles to mount the tracking equipment, as well as mapping out geographic boundaries of the working railyard and designing the operational process flows. Next was the installation of various computers, wireless clients, custom fabricated mounts, including GPS, RFID, wireless antennas and ancillary devices. Each crane includes over 20 antennas, sensors and readers, while vehicles belonging to both LBCT and vendors were outfitted with the tracking technology. Once the equipment was installed, and testing of both the hardware and software finished, training was conducted to ensure all personnel were familiar with the system to ensure a successful launch. The Overhead Load Prevention System went live in April 2025.




*IY Collision Zone - IY Cranes have concentrically smaller square collision zones around their spreaders that determine the crane's speed when overlapping with vehicle exclusion zones*

## *what was the* result

Since going live in April 2025, the system has operated successfully, and LBCT hasn't experienced a single overhead incident as a result (nor any safety incidents related to the system). LBCT has also reduced down time and improved planning strategies since vendors, maintenance and service providers now work in the railyard safely while the cranes continue moving. Instead of limited time between operational periods, all ground personnel have the flexibility to conduct critical fixes and maintenance in a single visit, rather than stopping the service midway and waiting for the next window. The system automatically monitors and provides LBCT full visibility of all equipment in the railyard, while protecting all ground crews and vehicles.




*An IY's green collision zone overlapping with any exclusion zone will slow the IY down to 20% of its top speed (gantry, trolley, slew, and hoist) , while the IY's blue collision zone will slow the crane down to 5% its top speed. The crane will stop moving in the direction of a vehicle once a yellow collision zone touches a vehicle's exclusion zone.*

LINK: https://www.lbct.com/

LONG BEACH CONTAINER TERMINAL

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