

CASE STUDY

# First-Class Arrival: New Delta Air Lines Terminal C

LaGuardia Airport (LGA) has undertaken an \$8 billion transformation and redevelopment. The project includes a new \$4 billion Delta Air Lines terminal, a world-class facility spanning 1.3 million square feet. As the airport's largest airline, Delta embraced the development but only if project impacts were minimized to customers, employees and the community. The stipulation presented planning and construction challenges and opportunities for efficiency and innovation.



## Challenge

The new Delta Terminal C would be built by merging the existing — and operating — Terminals C and D and would also take place alongside the redevelopment of Terminal B. Designing and constructing the new terminal complex while working with a large number of interested parties and without impacting ongoing operations would be a challenge.

In addition, the site of the Delta Terminal C project spanned multiple flood zones and the existing footprint could not expand due to Flushing Bay to the north and east, and the Grand Central Parkway to the south. The project would require meticulous space utilization planning, design and construction within this tight footprint. Flood protection and barriers would be needed for personnel, electrical and mechanical equipment, infrastructure protection, and climate resiliency.

## Project Stats

### Client

Delta Air Lines

### Location

LaGuardia Airport Flushing,  
New York

**\$4B**  
PROJECT COST

**1.3M**  
SQUARE FEET

**1**  
NEW TERMINAL

**37**  
NEW AIRCRAFT  
GATES

**4**  
CONCOURSES

The planned state-of-the-art facility at LGA also set goals to incorporate world-class features and services while addressing sustainability and resiliency.

## Solution

Due to the sheer size of the Delta Terminal C project, addressing the challenges would require several solutions, given the diversity of tasks and goals to achieve.

### Plan Early and Communicate Often

Because of the redevelopment of the nearby Terminal B, the project team prioritized upfront planning and ongoing communications. Increased collaboration among the project team and between the team and contractors, terminal operators and the Port Authority of New York and New Jersey (PANYNJ) was essential from the start.

Construction planning, material procurement, and design and construction phasing and scheduling were coordinated among the team and interested parties to avoid delays. Budgets were also established and approved early and funding was broken down by project, funding source and division and managed throughout the life cycle of the program. Before beginning work, change management procedures for potential cost, schedule and change order events were defined in order to streamline approvals.

Construction began in 2017 during record LGA operations and, while the COVID-19 pandemic created an unexpected lull in travel, the team was ready to safely accelerate the project during this period because of upfront planning and regular collaboration.



### Develop Processes to Avoid Disruption

To minimize traffic disruptions to the passengers, the team developed several solutions at the outset. An innovative roadway and airside phasing approach was used to maintain continuous operations and airline traffic movement. Using a temporary structure, the team created a plan to connect two departure level roadways, which freed up valuable construction space and alleviated traffic congestion throughout the construction areas.

New roadway foundations and the headhouse required 4,000 piles. As pile completion was critical to the schedule, the team developed a real-time progress data and status tracking of pile production. An inspection methodology was utilized to log daily reports, progress, inspections and corrections. This real-time data and progress tracking was sent to the team to plan subsequent tasks and stay on schedule.

The project would require hardstands where aircraft could be regularly relocated during construction. Detailed phasing, grading, paving and access plans were developed to avoid operational interruptions. The hardstand requirements were met through the established communication and collaboration practices among team members and interested parties.

### Elevate Operations on Flood Plains

Two flood plains constrained the Delta Terminal C project site. As a result, the team constructed the new terminal vertically to optimize airfield functionality and maximize limited space. By designing across two flood zones, the departures level was designed to be elevated, which would protect critical equipment while allowing floodwaters to flow under the building.

All major electrical and mechanical equipment for the new terminal is located on the upper levels. In addition, a 12-megawatt substation is located within the first concourse to mitigate site constraint issues and provide additional electric capacity to the airport. This 21,000-square-foot substation is integrated alongside other critical equipment and designed to connect to future terminal components.

At ground level, the terminal and concourses are protected through the use of flood barriers of flexible roll-up membranes and deployable plank systems to seal the building and baggage claim hall. These portable plank systems are stored on-site and installed before an expected flood event.

## Results

With upfront planning and regular communication among project team members and interested parties, the Delta Terminal C project was designed and constructed to the highest quality, within a constrained site footprint and phased to maintain Delta Air Lines and LGA operations. However, the project achieved more.

The new Terminal C features 37 aircraft gates connected by a centralized terminal headhouse for streamlined efficiency. The headhouse includes a check-in lobby, security checkpoint and baggage claim. Airfield efficiency was improved with dual taxi lanes added between concourses to minimize time between the gate and takeoff or landing.

Additionally, passenger experience was prioritized with improvements to drop-off and pickup areas, curbside check-in and direct garage access. Customers with special considerations were also factored into the design with the headhouse featuring a multisensory room to provide a calming space for passengers on the autism spectrum. A hearing loop system broadcasts announcements at each gate to assist passengers with hearing aids and cochlear implants. Additionally, the facility offers a new Delta Sky Club with a gourmet kitchen and a variety of food and hydration options.

Improved vehicular traffic flow and roadways around the new terminal were designed to mitigate challenges posed by limited linear distance. Delta can now separate vehicles picking up passengers from taxis and for-hire vehicles on separate roadways along with a parking garage for these vehicles to park while waiting for passengers to be picked up at the curb. As a result, congestion is eased and service quality is enhanced.

The project was designed and executed to maximize operational efficiency and to see that sustainability was achieved in a range of ways:

- The team included energy-efficient HVAC, plumbing and lighting systems, along with an energy-efficient ice storage system that utilizes off-peak power to produce 110,000 gallons of ice for cooling mechanical systems during the summer months.
- Sensors analyze sunlight to determine electric lighting use and automatic window tints and adjustments based on the weather and time of day.



- The project team designed ways to capture and treat 90% of the average annual rainfall and remove 80% of the average yearly post-developmental suspended solids.
- The project has no permanent irrigation, and uses 40% less interior water through efficient fixtures and fittings.
- The project diverted 90% of waste from landfills. It also used 30% recycled content and 20% regional content (by cost). The project also included 75% FSC-certified wood.
- Charging for electric ground support equipment was also included.

The project team expects the project to achieve a minimum of LEED v3 Silver certification. With upfront planning and ongoing communications as development touchstones, the project avoided disruptions to Delta Air Lines and LGA operations and improved design and execution within a tight footprint and among flood plains. The project also achieved a number of sustainable and environmentally resilient approaches.

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