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Newark Int'l Builds New Terminal A

Kansas City Int'l Opens New \$1.5 Billion Terminal



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FACTS&FIGURES

Project: Terminal Redevelopment

Location: Newark (NJ) Liberty Int'l Airport

Terminal: A

Scope: 1 million sq. ft.

Cost: \$2.7 billion

Airport Owner: Port Authority of New York & New Jersey

Terminal Operator: Munich Airport NJ

Airline Tenants: Air Canada; American; Delta; JetBlue; United

Open to Public: Jan. 2023 (21 of 33 gates currently operational; remaining 12 slated to open later this year)

Design/Build Joint Venture: Parsons/Tutor Perini

Architects: Grimshaw; Parsons; PGAL; STV

**Construction Management
& Inspection services:** WSP

Owner's Representative: Burns

Wireless Network: Boingo

Canopy Photovoltaic Glass Panels: Onyx Solar

Electrical: Five Star Electric

Seating: Arconas; Green Furniture

Checkpoint Queue Management: Visiontron

Sensor Technology: Xovis

**Special Systems & Fire Protection Engineering
Lead:** Arora Engineering

Enterprise Management Software: Maximo,
implemented by Arora

Passenger Boarding Bridges: TK Airport Solutions Inc.

Ramp Operations Technology: ADB SAFEGATE

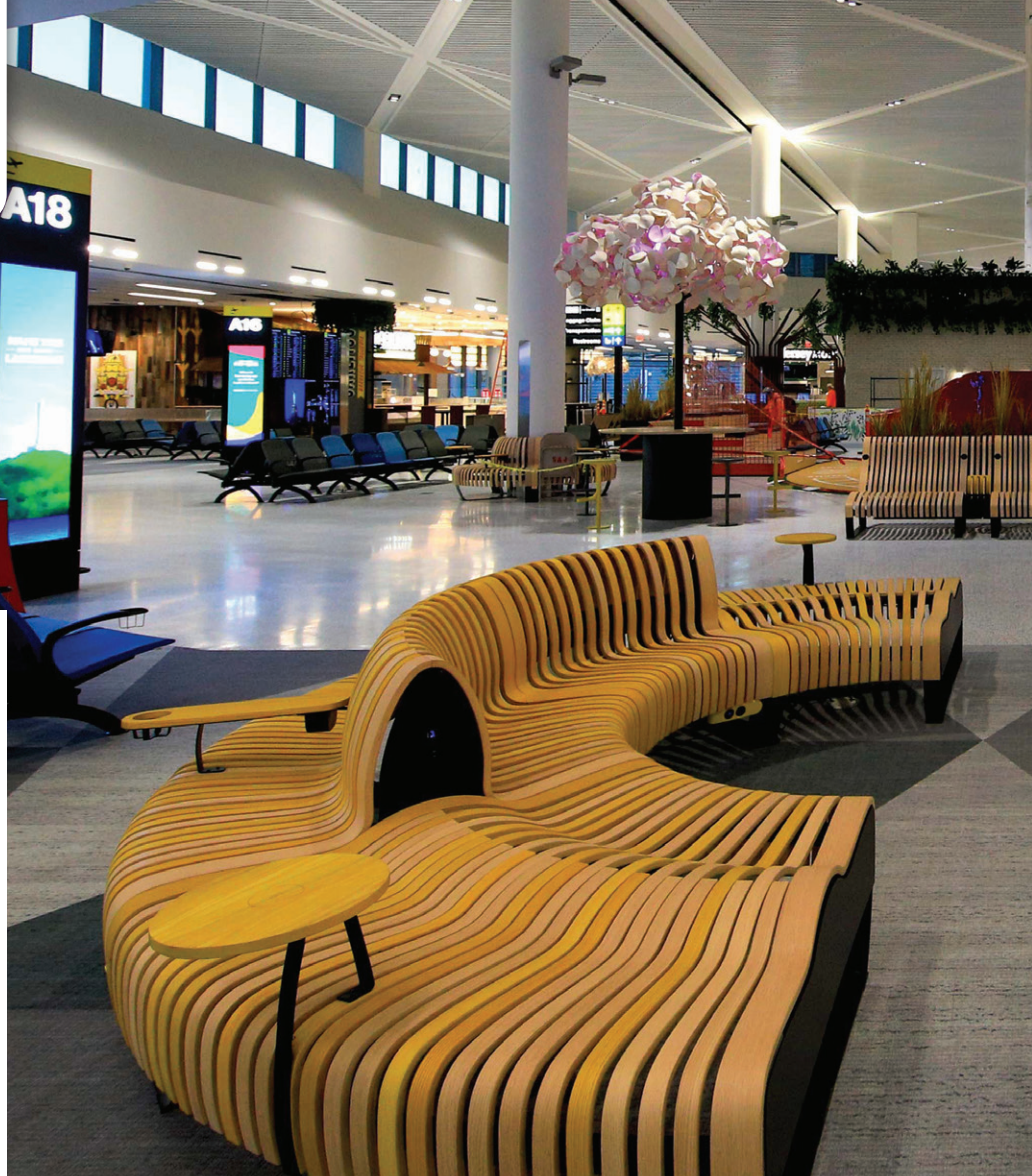
**Design Lead for Digital Wayfinding, Lighting,
Mechanical & Stormwater Systems:** Burns

**Engineer of Record for Art & Multimedia
Infrastructure Installations:** Burns

Design/Build Engineer of Record: STV

Infrastructure Engineer of Record: Burns

Project Benefits: Increased capacity & enhanced operational efficiencies; improved customer amenities; updated technology systems



Newark Int'l Builds New Terminal A

BY JODI RICHARDS



"A journey of surprises" —that's what the New Terminal A at Newark Liberty International Airport (EWR) is designed to be. The surprises run the gamut from more holdroom seating, new concessions and upgraded restrooms to dazzling artwork and digital displays. Technology also plays a crucial role, with an upgraded Wi-Fi network, e-gates and radio frequency identification for baggage tracking.

The \$2.7 billion facility, which debuted to the public in January, is being widely hailed as a striking contrast to its outdated, cramped predecessor. The Port Authority of New York and New Jersey, which owns EWR, reports that the new 1 million-square-foot Terminal A is wowing passengers and tenants alike. Floor-to-

ceiling windows in the ticketing lobby are a particularly welcomed change.

Authority officials describe the facility as a "state-of-the-art gateway to the world with an elevated passenger experience and a modern, 21st century facility that delivers superior amenities."

James Heitmann, director of Aviation Redevelopment for the Port Authority, notes that the larger 33-gate terminal increases capacity by 20% and is designed to accommodate 13.6 million annual passengers. In contrast, the original Terminal A was designed for 9 million annual passengers when built in 1973.



JAMES HEITMANN



Munich Airport NJ LLC, a subsidiary of Munich Airport International, manages the new terminal under a Port Authority contract that began in 2018. As such, it is responsible for airport operations, maintenance and concession management. The terminal operator was also a key partner in the recently completed redevelopment program.

Elisabeth Sailer, vice president of Commercial Development and Management for the organization, says that Munich Airport NJ provides “a fresh set of eyes” for the Port Authority. “We can bring the knowledge and experience that we have collected at our home airport and projects around the world and match them with the Port Authority experiences,” she explains. “It’s a different market—and, of course, the Port Authority is the local expert—but we can add value by bringing additional information to the team.”



ELISABETH SAILER

Munich Airport International also manages terminals at Sofia Airport in Bulgaria and Palmerola Airport in Honduras.

Multi-Year Initiative

Construction of EWR’s new Terminal A began in 2018, but planning dates back to 2004. Heitmann notes that the project was executed in three calculated phases. Phase 1 began in 2004

when the Port Authority Board of Commissioners authorized three planning studies to modernize and expand Terminal A.

In October 2009, Phase 2 began with the formation of the Terminal A Redevelopment Program. In January 2012, a preliminary project definition report was released that outlined the planning parameters for a new domestic terminal, including airside and landside infrastructure.

Planning involved intensive stakeholder engagement meetings with Port Authority departments, airlines and TSA. The agenda centered on a classic airport question: Modernize the old terminal or construct an entirely new facility? Analysis and stakeholder input indicated that a new terminal would be the more cost-effective option. Moreover, building new would cause minimal impact to operations in the existing terminal throughout construction—a critical consideration for the busy airport.

Project planners determined that a 33-gate terminal with common-use technology and preliminary infrastructure for a future 12-gate expansion would provide the greatest flexibility. Heitmann notes that the new Terminal A attempts to address the delicate balance between accommodating future passenger levels and evolving aircraft fleets with providing efficient current operations and ensuring the ability to adapt to unforeseen changes.

Visiontron stanchions without visible bases maximize pre-checkpoint space.



From the terminal operator's perspective, Sailer says that the inherent flexibility provided by common-use systems will help her organization maximize space and resources. Heitmann also foresees tremendous benefits for tenants and passengers stemming from the common-use operational model. "The focus of the program was to build a terminal that provided the flexibility to accommodate changes in demand, while providing a world-class experience," he summarizes.

In 2015, Phase 3 authorized early construction of a singular bridge. That project was later bundled into a contract with two other bridge projects and awarded in 2017. Main terminal construction began in 2018. In addition to a LEED-Silver certified terminal, construction work included site clearing, a stormwater collection system, an underground hydrant fueling system, plant utilities, the abatement and demolition of multiple buildings, additional structures, pavement and utilities.

Planning and Design | Program & Construction Management Facilities Management | IT | Asset Management

Arora was proud to lead the following services for EWR's \$2.7B, 1M SF Terminal A Redevelopment Program:

- Fire Protection & Special Systems Engineering and CA services with the Design Build Team
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Complete Redevelopment

Several terminal layouts were sketched and evaluated after the project team determined that building new would be more economical and less impactful to operations than renovating the existing Terminal A. "The modernization of the old terminal was considered in the early stages, but determined to not be viable or preferred for a long-term solution," Heitmann explains. "The current design was selected based on the Port Authority's vision to deliver world-class amenities that improved the passenger experience, increased efficiency of aircraft operations and the baggage system design, as well as the impact on existing airport operations, constructability and cost."

As noted, the old Terminal A was designed for 9 million annual passengers but exceeded that number decades ago. Pre-pandemic, the busy facility served 11 million per year. The increased passenger volume caused congestion throughout the facility, beginning with congestion on the frontage road and in the check-in lobby. In addition, the previous terminal had three separate TSA checkpoints, with inadequate space to accommodate updated screening equipment. Throughout

the years, basic passenger facilities such as holdrooms and restrooms became conspicuously undersized. Most concessions were located before the TSA checkpoints, and the limited airside options were spread among three separate concourses.

Terminal tenants were also eager for improvements, including back-of-house service access to their leaseholds, better storage areas and separate security screening for employees.

Working with input from many stakeholders, officials committed to the goal of “creating a world-class passenger experience with a design that was open, filled with natural light and suggested an intuitive flow for passengers from curb to gate.”

Aesthetic and operational priorities developed early in the process included:

- a concessions program with diverse, local offerings to create a sense of place;
- improved passenger amenities, such as enhanced restroom designs with mother's care, adult changing areas and all-gender facilities; pet relief areas; and sensory rooms;
- space for airlines to offer premium passenger check in and post-security lounges;
- common-use operational systems;
- a centralized terminal operations center; and
- transitioning to virtual apron control.

Partnership Throughout

Munich Airport NJ LLC was named terminal operator in early 2018 and immediately assumed an advisory role in the design and planning of

the terminal redevelopment. Sailer describes the process as very collaborative, with joint meetings to ensure that the building would meet the operational requirements of all users.

She notes that it was crucial for the new facility to meet the high standards both the Port Authority and Munich Airport NJ have for providing a quality passenger experience, particularly regarding capacity, security and airfield operations. The terminal operator also placed a premium on appropriate space allocation for the commercial program and the passenger holdrooms.

In 2018, the Port Authority awarded the project's design-build contract to a joint venture of Tutor Perini/Parsons, together with STV as lead engineer and Grimshaw as the base building architect. The Port Authority also selected several key partners, including WSP USA for construction management and inspection services and PGAL as one of the key architects.

“The partnership developed [among] the owner, design-builder and stakeholders early in the project contributed greatly to the success of the new Terminal A,” says Chris Kovary, program director at Parsons.

The Port Authority emphasized its desire for a world-class terminal with every stakeholder, adds Alex Bosco, project manager with Burns



CHRIS KOVARY



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Engineering. Burns supported PGAL during the planning stages of the project, and later served as the owner's representative for the Port Authority, guiding the terminal's development through the concept stage and design to construction and commissioning. "We were impressed with the entire team," Bosco observes. "The Port Authority knew what they wanted and put the best people in a position to make it happen, and it shows when you look at the terminal."

Design Inspiration

Sailer says that the new Terminal A takes travelers on a "journey of surprises," from the ticket counter and commercial program, to gate areas and everywhere in between—even the restrooms. Multimedia displays, art and architecture provide a unique experience that fully encompasses the surprises of New Jersey landmarks, people, innovations and history, she adds.

The Journey of Surprises concept rose out of research that Munich Airport NJ conducted about New Jersey. "It was very important for the Port Authority to make sure this is a New Jersey terminal, not another New York terminal," Sailer explains, noting that the team discovered a lot about New Jersey that even some locals didn't know. As terminal operator, Munich Airport NJ wanted to bring that same feeling of surprise to passengers.

Four main principles were identified to drive the terminal's Journey of Surprises: firsts, variety, community and "your way."

Firsts: New Jersey is the birthplace of many inventions, including the shipping container and light bulb. "These inventions and entrepreneurship make New Jersey New Jersey," Sailer remarks. One region called the Forest of Firsts celebrates the state's pioneering accomplishments in science, literature, energy and film. The terminal operator also posed a related question to tenants: What "firsts" are you bringing to EWR?

Variety: The project team worked to represent the full spectrum of New Jersey's landscape in the new terminal—coastlines, agricultural regions, diverse metropolitan areas, etc.

Community: New Jersey hosts many community events, and Sailer emphasizes the importance of creating a sense of community throughout the terminal. "We want to create a terminal community and make sure everybody feels responsible for the terminal and part of the bigger game," she explains.

Your Way: Inspired by the famous Frank Sinatra lyric, Munich Airport NJ wants the new terminal to address the specific needs of each travel group "so everyone can experience the journey in their own way, travel their own way," Sailer says.

Upgrades Abound

In addition to more overall square footage, Terminal A now has 60% more seating capacity. Designers also developed new layouts for check-in, TSA checkpoints and concessions to offer a more intuitive experience for travelers, notes Kovary. Curbside pick-up/drop-off areas meet the latest requirements from the Department of Homeland Security, and special gate entry deterrent systems were added for the Airport Operations Area. Advanced boarding bridge technology from TK Airport Solutions Inc. offers versatility in aircraft mix and supports common-use gate operations.

Heitmann notes that the terminal's T configuration optimizes the airfield for aircraft gating and boosts operational efficiency. After clearing the TSA checkpoint, passengers pass through the same central commercial plaza whether they're headed for the double-loaded concourse to the east or the single-loaded concourses to the north and south. This provides passengers with easy and immediate access to concessions and amenities.

Expanded frontage added 250% more curbside loading space than the previous terminal design, and an 880-foot canopy extends over the arrivals level. Dynamic digital signage with real-time wait information was added to the curbside as well.

The departures hall is an open, expansive space designed to help passengers easily identify their respective airline check-in areas and proceed to the centralized security checkpoint. Beyond screening, there is an extensive recomposure area that overlooks the commercial plaza below and helps orient passengers with clear sight lines to the concourses and amenities. Airline lounges are above the commercial plaza on a mezzanine level. Terminal A is home to Air Canada, American Airlines, JetBlue, United Airlines and Delta Air Lines.

The new terminal features a variety of seating options from Arconas and Green Furniture, all equipped with charging stations. Restrooms decorated with images of New Jersey landscapes and interactive children's play areas are other new amenities. Digital displays at gates provide boarding information and feature rotating images of specific flight destinations.

Dining and retail options represent more than 50 regional, national and global brands, including six local shops based in Newark, Elizabeth and Jersey City. Concessions are now balanced before and after the passenger screening checkpoint. The main centralized post-security area features local favorites such as Jersey Mike's, Smokehouse BBQ, Office Tavern & Grill, Kitchen Step Neighborhood Bistro, Playa Bowls and Bang Cookies.

Public art installations throughout Terminal A showcase the work of 29 local artists and highlight the vitality, unique history, architecture, people and character of the Garden State. Immersive digital content features New Jersey's landmarks, art and innovations through a series of permanent, large-scale multimedia displays. As engineer of record for these programs, Burns provided electrical, technology, structural and mechanical design support for the massive artwork and multimedia installations.

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Grand Lobby
at Nashville
International Airport

*Photo courtesy of Maxime Roux/
Gentilhomme Studio*



New Terminal A
at Newark Liberty
International Airport

Technology upgrades include facial comparison for document checks, e-gates and baggage tracking via radio frequency identification—all with the overriding goal of creating a seamless experience for passenger from curb to aircraft. The new technology, along with a larger, modernized common-use check-in area will help reduce wait times throughout the terminal, Heitmann advises.

Dynamic signage at TSA checkpoints displays wait times and allows queue zones to be adjusted based on traffic. Passenger and baggage screening includes state-of-the-art technology to expedite screening while prioritizing safety.

On the arrivals level, Burns incorporated information technology systems designed to facilitate passenger flow and accommodate the eventual adoption of autonomous vehicles.

Sailer notes that using Maximo enterprise management software will allow Munich Airport NJ to better manage assets, operations, management and processes throughout the new facility.

All of the terminal's added technology requires a robust network. Boingo Wireless deployed a converged network featuring Wi-Fi 6, DAS and private LTE to support connectivity for passengers and critical airport operations.

Navigating Challenges to Opening Day

Although the majority of terminal construction occurred on a grayfield site, there was still some impact to ongoing operations. Beginning in 2016, EWR's growth in domestic travel was increasing at an annual rate of 10%, which increased pressure on its already-constrained facilities. This growth, plus the need to support daily operations, impacted how projects were phased and scheduled.

"Program restaging and acceleration of airfield and landside construction was implemented not to impede upon operations," Heitmann explains. "The site projects were independent of the Terminal A Redevelopment Program but were executed by the Terminal A Program to best leverage a cohesive design and minimize conflicts of contractors in the field."

The new terminal is located on the south side of the former Terminal A, a site that provided the least impact to ongoing operations. Where possible, affected tenants were located to other areas of the airport or off airport property. Contractors had to relocate and/or upgrade existing utilities; road improvements to support construction and the ultimate build-out were also needed.



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


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An electronic control system helps limit access to ticketed passengers.

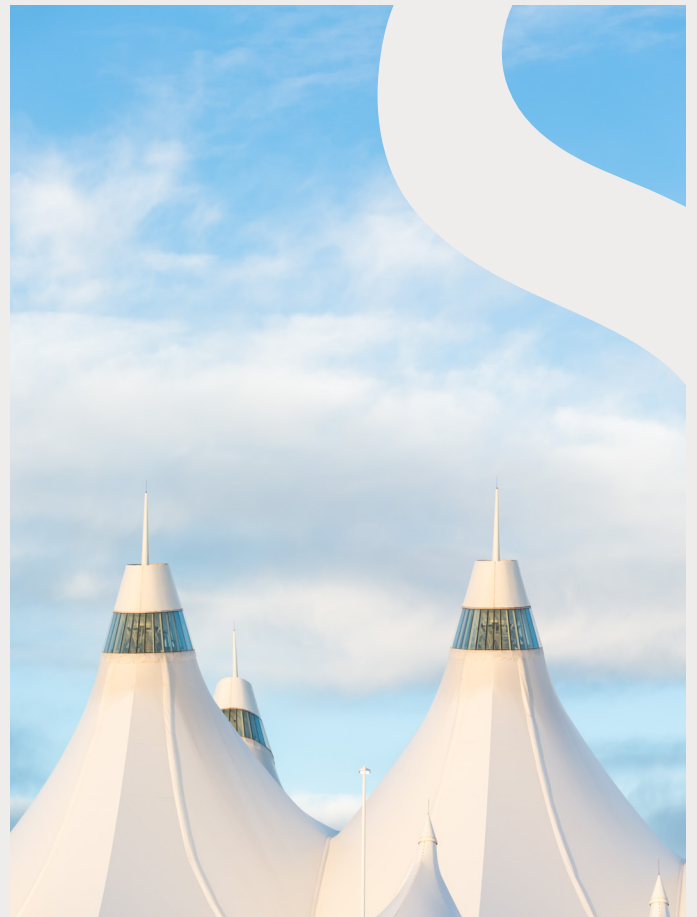


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The COVID pandemic posed additional challenges for the multi-year project, including common supply chain issues and difficulty maintaining construction schedules despite limited staff and funding.

With eight major contracts for the multibillion-dollar program, Heitmann worked to make all team members aware of each other's work. Coordinating project schedules and making necessary adjustments to create a unified design were other focus areas.

When the terminal was complete, a stand-alone team was assigned to ensure operational readiness for the public opening. Familiarization and technical training was conducted to prepare EWR employees and stakeholder personnel working with the new systems and assets. A set of intermediate and advanced trials stress-tested stakeholders and the facility by simulating real-life operations with volunteers acting as passengers departing, transferring through and arriving at the new terminal. "This rigorous process of preparing the terminal for Day One operations allowed for a successful opening," Heitmann reports.

"Among the various work groups, resources were great," adds Raul Ramirez, aviation project manager at WSP. "When it was time to open the terminal, everyone was available to work the hours needed to facilitate the process."

Just the Beginning


The \$2.7 billion Terminal A redevelopment program made a huge impact as the largest design-build project ever completed in New Jersey. Officials estimate that it generated more than \$4.6 billion in regional economic activity, created more than 2,500 jobs and provided more than \$1.9 billion in wages.

The new terminal is also the centerpiece of a \$3.3 billion airport-wide redevelopment program. EWR's transformation will continue with construction of a new AirTrain Newark system. The current system, which is reaching the end of its useful life, carries nearly 10 million riders each year, providing access to the Northeast Corridor Rail Link Station. It also provides airport customers and employees with crucial ground transportation to/from the terminals, parking lots and rental car facilities.

Other recently completed key projects at EWR include a \$400 million integrated public parking garage with new centralized rental car facilities and a \$175 million south airfield paving project. ✈️




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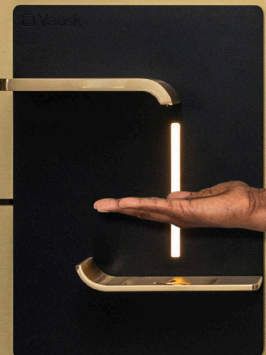
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