

# PASSENGER TERMINAL WORLD



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**SALT LAKE CITY**  
 Utah's US\$1.8bn terminal is one of the largest construction projects taking place in the USA

**INTERMODAL TRANSPORT**  
 Improving airport connectivity can help drive growth and increase revenues

# clean slate

Salt Lake City International's multibillion-dollar project to centralize its terminal operations will streamline the passenger journey and create a sense of place for the millions of people who travel through Utah's gateway each year



■ What do you do when your airport no longer meets building regulations and your traffic has grown by more than 100% since the facility was built? Knock it down and start again. Or at least that’s what the decision makers at Salt Lake City International Airport (SLC) have decided to do.

Originally constructed in 1961 with a capacity of 10 million passengers per annum, SLC now handles 22 million travelers each year, which means that the airport is too small to provide the great passenger experience it strives for and the aging airport buildings no longer meet earthquake safety standards.

“In addition the airport is made up of 29 buildings connected together to form three terminals, which is not conducive to a smooth passenger experience,” explains Maureen Riley, executive director of the Salt Lake City Department of Airports. “We have experienced great growth in the past few years and are now handling 22 million passengers annually, so everything is undersized. We took all that into consideration in designing a new facility that can accommodate these additional passengers and is easily expandable for future demand.”

At a cost of US\$1.8bn and with a phased construction program scheduled for completion in 2023 (the three-story terminal will open in 2020), the Salt Lake City International Airport Terminal Redevelopment Program (TRP) is one of the largest construction projects currently taking place in the USA, according to Gordon Huether, the artist working on the project (see Welcome to Utah on page 16).

**Project elements**

- Single, three-level terminal built to the west of the existing terminal complex with a centralized security checkpoint
- One linear concourse connected to the terminal with 38 gates featuring jet bridges. Portions of the existing B, C and D concourses will be upgraded to bring the total number of gates to 72
- Gateway center between the terminal building and parking garage housing rental car counters, airline ticket counters and light rail services
- New parking garage with 3,600 spaces – twice as many as currently available
- Modern central utilities plant
- Service and maintenance facilities for car rental companies



HOK

MAIN IMAGE: The canyon artwork guides passengers through the terminal  
ABOVE : The Plaza is a centralized concession area

Gordon Huether Studio 2015

## 16 CASE STUDY: SALT LAKE CITY

For Robert Chicas, director of aviation and transportation at HOK, the principal architect in charge of the project, the biggest transformation of SLC is the centralization of operations. "The current 29 buildings that make up the airport will be demolished or refurbished and replaced with a modern, expansive central terminal with dual level access, new parking and rental car facilities [see Project element on page 15]. The airport will have one centralized security screening checkpoint and one meeter/greeter area so that the main activities are concentrated in one location, which will make for a much better passenger experience."

The airport will reduce the number of gates from 85 to 72, but they will all be fitted with jet bridges (currently only 55 have this feature, the rest being boarded from the ramp), enabling the airport to better use its preferential gate system whereby any airline can use any gate. "New, larger gates will support Delta's transition from 50-seat regional jets to larger two-cabin aircraft," says Shane Jones, vice president of corporate real estate at Delta Air Lines, the airport's largest user.

Not only will the new terminal and its accompanying facilities improve the passenger experience, but it will also benefit the local



community. In fact the airport's latest economic impact study predicts that the redevelopment will create nearly 24,000 jobs, generate US\$1bn in wages/income, add US\$1.5bn to the state's GDP and create US\$3.3bn in total economic output.

### Catering to the local community

Utah is well known for its large Church of Jesus Christ of Latter Day Saints (LDS) community (62% of the state's population are members of the church) and this was a consideration for the airport and architect when designing the facility. "We call it the Salt Lake Phenomenon, whereby we have a very large meeter/greeter contingent who arrive at the airport to meet their returning loved ones who have been off on LDS missions for two years, and we've tried to accommodate that in the design of the new terminal," says Riley.

The airport has created a dedicated family room adjacent to the security exit that will allow family and friends to reconnect with their returning LDS missionaries. "This was a key part of the design," explains Matthew Needham, senior aviation and transport planner at HOK, "and we have actually included a



LEFT: The airport's current facilities are not conducive to a smooth passenger experience

## Welcome to Utah

One aspect of this project that makes it so unique is the artwork by Gordon Huether Studio that has been integrated into the design from a very early stage. Taking its inspiration from the surroundings of the Utah valley, visitors to the terminal will be able to experience an indoor canyon.

"The genesis of The Canyon artwork came from the airport and HOK – when they started designing the terminal they had a long spine down the center of the building that was always referred to as the canyon, so it was obvious which direction I was going to take," comments Gordon Huether, the artist for the project. "The artwork is very much inspired by nature and the natural wonders of Salt Lake City and the Utah area. The striations and lines in the natural canyons took millions of years to form through air and water erosion, which is fascinating and changes

your whole idea of time and space. I did half a dozen different prototypes based on the canyon idea and it morphed and got refined into what it is today."

The result is a massive art installation integrated on the east and west walls of the terminal and running 362ft in length. The Canyon begins at the arrivals lobby and continues uninterrupted to the grand plaza, enabling passengers to make a connection from one end of the airport to the other. "The artwork helps to create a strong sense of place for passengers; we're using nature because the natural wonders of Utah are unique."

The Canyon uses computer-driven LED lighting to enable the airport to choose color ranges for each season. "For example, in the winter the lighting might be very white or ice

blue to reference a winter landscape, while in the summer the lighting might be more amber and gold to reflect the sunlight on the canyons. The Canyon will be something that continually changes, so even though it has no moving parts it will be a passively kinetic installation that reflects how the canyons will continue to evolve," continues Huether.

In addition to The Canyon, Huether has also designed the Column Plates and an 80ft-tall escalator well sculpture. The sculptural Column Plates, located in a gathering area for both arriving and departing passengers, will separate baggage claim from the main lobby area. "There are these massive columns that support the building, and rather than looking at the columns as a constraint, we looked at them as an opportunity, so they are being clad with



HOK



ABOVE: Airside view of The Plaza with views of the city's mountain range  
LEFT: The single, three-level terminal building, gateway center and parking garage

our orientation and our fundamental design, and then we're adding all the elements of technology we can such as daylight harvesting, LED fixtures, a very efficient central plant mechanical system, and an efficient baggage system whereby the motors are stop/start and don't run continuously. We've taken a very considered approach to every project component in terms of energy saving and it has helped us to be on track with LEED Gold."

The centralization of operations has also helped reduce energy use while improving the passenger journey, as there are fewer level changes and a reduced number of elevators and escalators.

"We wanted to make this facility easier for the passengers, and the airport really drove this – they wanted to make SLC an easy transport hub," Needham says. The terminal will have three levels. Level 1 will feature passenger pick-up and drop-off, international baggage claim, employee security screening and baggage handling areas; Level 2 will feature pedestrian bridges connecting to the parking terrace and the roadway system, and access to the concourses and retail areas; and Level 3 will provide space for airport administration offices, airline ticketing and check-in counters.

"Level 2 houses almost everything – a huge percentage of passengers are transfer and they all transfer on this level," Needham continues. "For the O&D passengers we looked at how we can make passenger movement simpler. For example, if you're arriving at Salt Lake City and want a rental car to get to your ski resort, you can come

real fireplace using stone from the local quarry to make this room as comfortable and welcoming as possible for those who haven't seen their loved ones in years."

But it's not just the meeters and greeters that had to be accommodated; there were considerations in the concessions area to meet LDS rules. Chicas comments, "SLC historically had very strict rules about where alcohol could be sold and, while it's not quite as rigorous as it used to be, there are some policies that we need to respect, so we have designed zones where alcohol can be consumed at the concession where it is bought."

Reducing the footprint

In line with modern building standards, SLC's new terminal pays great attention to reducing its carbon footprint and is being built to LEED Gold standard.

"LEED Silver is a Salt Lake City mandate, but we hope to achieve Gold standard through a number of things," explains Needham. "The floor-to-ceiling glazing occurs mainly on the north side, as we're being very site sensitive to

We've taken a very considered approach to every project component in terms of energy saving and it has helped us to be on track with LEED Gold

enormous fiber glass plates that allude to the idea of water and air erosion of rock. There are four of these large pieces and there are 'cousin' pieces – smaller benches – that go down the spine of the canyon and are related to the plates," says Huether.

The escalator well sculpture has stainless-steel cables running from the ceiling to the floor, and uses dichroic glass and hand-drawn glass rods that are mechanically fastened to the cables to create a cascade of light and color down the escalators. "Dichroic glass is very colorful and light sensitive, changing color depending on one's angle of vision, so as you're going up and down the escalators or walking across the floor and looking at the sculpture it will change color," Huether adds.

There will be other areas of the terminal that will also incorporate art, with a competitive tender process beginning in 2017.

BELOW: The Canyon will use LED lighting to reflect the different seasons in Salt Lake City  
RIGHT: The 80ft escalator well sculpture uses dichroic glass



Gordon Huether Studio 2015



Gordon Huether Studio 2015



### on the web

Watch videos of the inspiration behind the Salt Lake City Terminal Redevelopment Project and take a walk through the departures and arrivals process at: [PassengerTerminalToday.com/video\\_home.php](http://PassengerTerminalToday.com/video_home.php)

ABOVE: Rendering of the landside area showing the split arrivals and departures levels

LEFT: The Canyon is 362ft long, connecting one end of the airport to the other

through the exit portal at security, go to baggage claim, walk across the bridge, and get to your car without going through a single level change.

“Light rail will also connect to that gateway center and there will be full check-in facilities so that departing passengers can arrive, check in and drop luggage, walk across the bridge and go through security all on the same level.

“The pedestrian bridges at Level 2 will take more than 50% of departing passengers to the terminal and over 60% of arriving passengers to the parking garage, rental cars or light rail. This enables us to reduce the number of escalators and elevators, simplifying the passenger journey while reducing the number of mechanical parts and reducing energy use.”

Over a period of years the airlines will also convert their ground equipment to electrically charged vehicles. “The new central utility plant will enable us to transition electric baggage tugs and associated ground service equipment to zero-emissions vehicles,” explains Delta’s Jones.

“We’ve provided ample room for expansion and have made the security area as flexible as possible, knowing that requirements will change

### Flexible future

Technology plays an important role in the passenger journey and this was a key consideration for HOK when designing the check-in and security areas. In the centralized security checkpoint, HOK worked closely with the TSA to develop a flexible design for the paired x-ray lanes. “We’ve not only provided 30ft bays for every lane pair, but we’ve also provided ample room for expansion and have made this area as flexible as possible, knowing that the security requirements will change over time,” says Needham.

Another benefit of the centralized checkpoint is that the airport will be able to provide early messaging to passengers to let them know how long it will take them to pass through security so that they can better plan their journey. Retail and food and beverage will also be centralized, although final decisions about the layout and concessionaires will be decided once the final designs are completed in mid-2016.

### Challenges and cooperation

Salt Lake City’s location proved to be one of the biggest architectural challenges for HOK, which had to make sure its design could withstand the earthquakes common in the region. Needham says, “The airport is located in an alluvial zone [lake bed sediments] with a high water table, so in addition to a lot of lateral bracing and piers [to enable the building to withstand seismic tremors], we had to do a lot of ground improvement throughout the facility. For the garage itself we had to install subsurface stone columns to assist the facility to withstand earthquake loads and still be usable even if damaged.”

Another challenge was building on an active airport site, ensuring that operations were not affected. The airport overcame this by phasing the construction process.

To ensure the success of the project, Riley encouraged full collaboration between the airport, architect, artist and airlines. “The TRP is one of the very few airport projects of this magnitude in the USA that did not receive a protest from the airlines,” she says. “We worked very closely with Delta and the other airlines at SLC over a couple of years to bring them to the table and discuss the right solution. During that time we discussed whether a renovation would be enough or if we had to demolish everything and start over. We all sat around the table and collaborated on those analyses to arrive at the right decision for everyone at SLC, and I hope this will create a better end result.” ■

### Fault lines

The state of Utah is situated on the Wasatch Fault, which runs for 240 miles, primarily along the western edge of the Wasatch Mountains, and passes through the Salt Lake area. It is made up of several segments, each measuring an average of 25 miles and capable of producing earthquakes up to 7.5 magnitude.

While the Wasatch Fault only produces a strong earthquake (those with a magnitude greater than 6.5) every 350 years or so, experts believe that a major quake is overdue in the region and a report published by the *Deseret News* in April 2015 predicted what the possible results of a 7.0 earthquake in Salt Lake County could be: up to 2,500 people killed, 36,000 injured and US\$32bn in economic losses.

In line with a law passed in 1975, the Salt Lake City Airport terminal redevelopment is being engineered to ensure it can withstand an earthquake with minimal damage and limited closures.

“The existing aging facility does not meet the seismic standards that have been established today so our number one priority in building this new facility is to make sure we in anything new that we build meets the modern standard for seismic protection,” explains airport executive director Maureen Riley.

