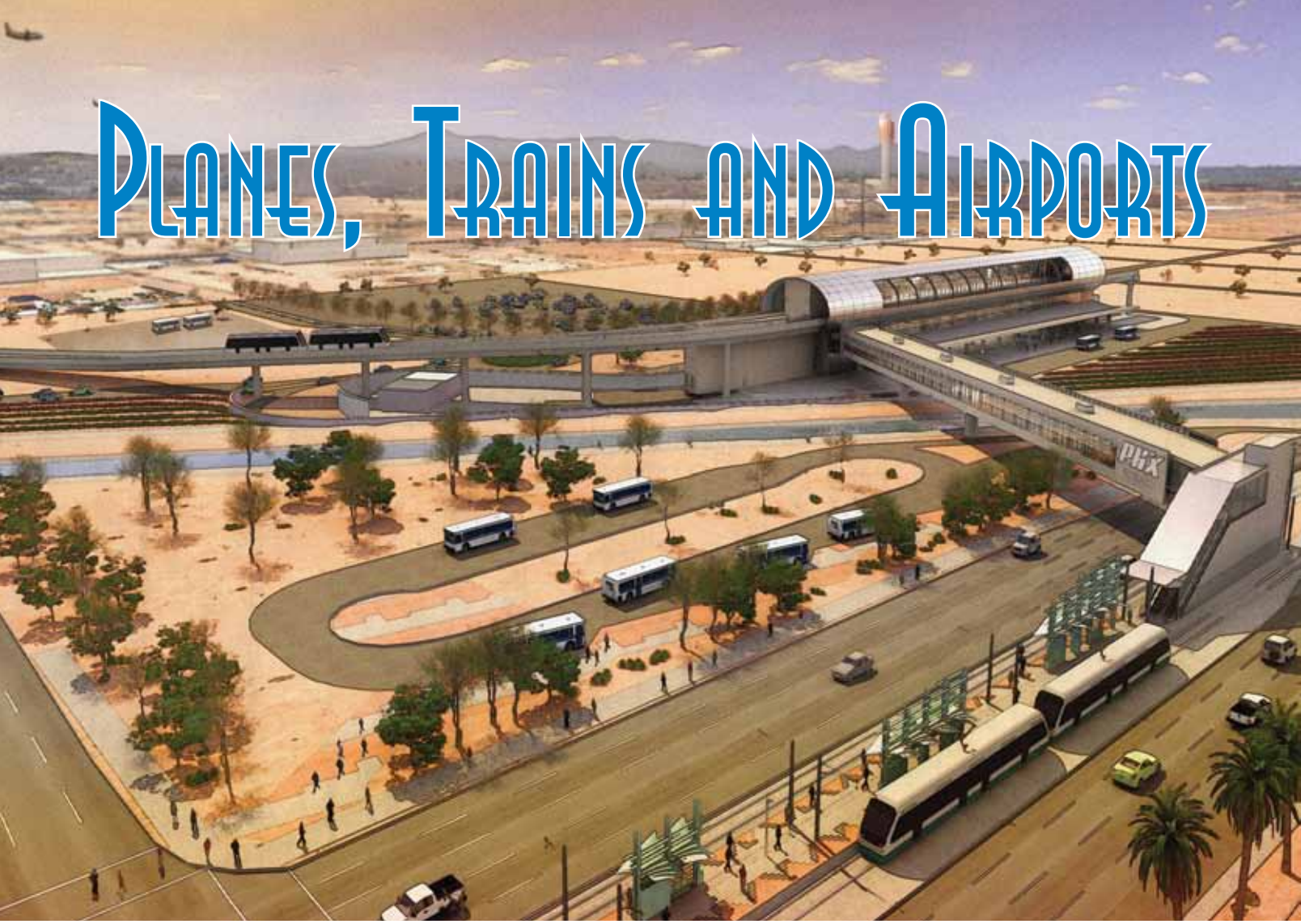
Planes, Trains and Airports



Airports are increasingly becoming key locations of multimodal travel activity, as this illustration of the airport rail system now under construction at Phoenix International Airport demonstrates.

By Rich Sampson

The familiar, but sudden jolt that accompanies the meeting of wheels with runway, closely followed by the quickly enveloping rush of the reverse thrusters are a signal to many travelers that their air travel experience has concluded. Cell phones and email devices are reactivated in a flurry, seatbelts are loosened and many air passengers begin contemplating how they navigate their way to their ultimate destination. Increasingly, that connection from air to destination involves a train.

For much of the second half of the 20th Century, passenger rail and air travel were seen as contrasting means of conveyance that had little business interacting with each one another. Trains were antiquated and slow, while aircraft could cover vast distances in a fraction of the time. And yet as more people began flying across the continent and around the world, it became increasingly obvious that air travel could not exist independent of a vibrant and connected transportation network. Today, whether travelers are en-route to or from the airport, or rushing to make a connection within the airport, they often will take a train to the plane.

Prepare for Takeoff: Atlanta

Atlanta's Hartsfield-Jackson International Airport is the world's busiest passenger airport, measured not only by its 90 million annual passengers, but also its rank as fielding the greatest number of takeoffs and landings. Comprised of two terminals for check-in, baggage, security and departure, and six concourses hosting nearly 180 aircraft gates, travelers at Hartsfield are faced with a daunting network of passages, food and shopping pavilions and thousands of weary or confused passengers. Linking it all together is the airport's automated people mover system, and connecting it to the Atlanta Metropolitan region is the Metropolitan Atlanta Regional Transportation Authority (MARTA) rapid transit network.

Billions Served

Atlanta has always functioned as a key transportation nexus in the southeast United States – first as a booming railroad crossroads, then as one of the nation's first true hubs of air travel, home to eventual airline behemoths Eastern and Delta air lines. After the first flight landed at then Candler Field in 1926, air traffic at the facility grew rapidly, and although a series of expansions allowed the airport to accommodate over six million annual passengers by the early 1960s, Atlanta officials determined a

massive facility would be required by the end of the next decade. Following a decade of planning, Atlanta Maynard Jackson initiated construction of a new airport to be named for his predecessor, William Berry Hartsfield. Due to the massive scope envisioned for the airport, even an elaborate system of hallways and tunnels wouldn't do. Instead, Atlanta's Department of Aviation planners turned to rail.

As planners and engineers were designing the new airport in the late 60s and early 70s, a novel concept had just been introduced by Walt Disney's Imagineers at Disneyland with the development of the PeopleMover attraction. The new technology featured automated vehicles operating over a fixed guideway – an ideal method for transporting people across relatively short distances within a confined location.

Officials at airports quickly took notice, and in 1971, Tampa International Airport deployed the world's first airport people mover, constructed by the Westinghouse Corporation. Although their neighbors to the south had bested Atlanta on timeframe, the rail operation at Hartsfield would be larger in scope. While Tampa's initial operation served only two lines and three stations with eight vehicles, Atlanta's airport rail network would connect six stations through nearly three miles of track and a fleet of over 50 C-100 automated vehicles manufactured by Adtranz.

"Having the people mover was critical to the success of Hartsfield from the outset," explains Steven Poerschmann, Aviation Transportation Systems Manager at Hartsfield-Jackson Atlanta International Airport. "It was a very new concept for airports, but it needed to work well from the very start."

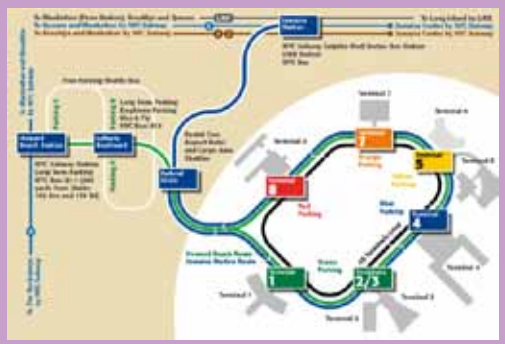
The Hartsfield-Jackson Atlanta International Airport and its corresponding rail system opened on Sept. 12, 1980. Designed to host more than 55 million passengers each year, the massive number of passengers flying to and through Atlanta quickly grew into the new facility and made full use of the innovative new people-moving technology. Soon after its opening, airport trains were moving more than a 100,000 daily riders –

The JFK AirTrain

More than a quick connection among airport terminals and concourses, the AirTrain network at New York's John F. Kennedy International Airport (JFK) more closely resembles a full-fledged rail transit system. Whereas most airport rail systems utilize vehicles with rubber tires operating over concrete guideways, the JFK AirTrain employs the more traditional steel wheels on steel rails framework of railroading. Comprised of three lines serving 10 stations over more than 8 miles of track, the service not only links JFK's eight terminals to each other, but also to the larger New York metropolitan rail network with routes to the Howard Beach subway station and the busy Jamaica terminal, linking with Long Island Railroad commuter trains and two subway lines.

Although JFK has long been one of the nation's busiest airports, it never offered a convenient connection to the region's substantial subway and commuter rail network. That changed on Dec. 17, 2003 – the centennial anniversary of the Wright brothers' first flight – when the JFK AirTrain opened for service, complementing a similar service at Newark International Airport, which offers connections to Amtrak and New Jersey Transit's Northeast Corridor trains. The Port Authority of New York and New Jersey operates both airports, their corresponding AirTrain systems and the Port Authority Trans Hudson (PATH) rapid transit service.

Comprised of equipment and technology manufactured by Bombardier Transportation – which also is contracted to oversee its automated operations along with maintenance activities – 32 vehicles provide service on the system's three routes: one a circular loop serving only the airport terminals; one branch reaching the New York City Subway's A Train line between Far Rockaway and 207th Street via the Howard Beach station, where local bus connections are available, and Lefferts Boulevard, again providing connections to local bus service, along with long-term parking lots; and the line serving Jamaica – the nation's busiest suburban rail station – via Long Island's Van Wyck Expressway, where passengers can transfer to every one of the Long Island Railroad's nine commuter rail lines. The New York City Subway's E, J and Z lines also call at the Jamaica station, offering direct trips to the World Trade Center and Broad Street stations in downtown Manhattan.



More than 11 percent of JFK air passengers utilize the AirTrain's Howard Beach and Jamaica lines, delivering more than 12,000 riders per day to the system, which requires a fare to ride. Meanwhile, nearly 50,000 passengers each day access the intra-airport terminals loop at no cost.

Milwaukee's Mitchell Airport Rail Station

Corresponding with the steady growth of both train frequency and passenger traffic on Amtrak's *Hiawatha* corridor between Chicago and Milwaukee is the rail station serving Milwaukee's General Mitchell International Airport. Opened on Jan. 18, 2005, seven daily roundtrip trains stop at the facility and nearly 150,000 passengers traveled through the station in 2008.

The 1,600-square foot station does not host station support staff, but rather offers Amtrak's Quik-Trak ticket vending machines and real-time train status boards. Close-circuit cameras are monitored by Milwaukee Police Department officials to ensure safety. The station's annual operating costs are supported by parking fees at the station's parking lots, although passengers may be picked-up or dropped off by awaiting vehicles at no cost. Free shuttle bus service is provided by the airport to reach air terminal buildings.

More impressive than its operating arrangements is the station's Prairie-style architecture, made famous by Wisconsin native Frank Lloyd Wright. Marked by clean horizontal lines with hipped roofs, the Mitchell Airport rail station is a true reflection of the form, with long, open porticos and stunning stained glass windows that illuminate the indoor waiting area. In 2006, Milwaukee Mayor Tom Barrett awarded the station an Urban Design Award for its architectural achievement.

In 2009, the Wisconsin Department of Transportation lengthened the station's platform by an additional 400 feet to accommodate up to seven-car train consists. At the same time, the route now served by Amtrak's *Hiawatha* trains could receive additional investment to upgrade the service to high-speed standards.

MARTA's Hartsfield Airport station (above) provides a convenient connection to the metropolitan Atlanta region, while the new ATL SkyTrain (below) has introduced a second airport rail system at Hartsfield.

trailing only a handful of large rail transit networks. The addition of the E Concourse in 1994 and subsequent rail expansion – in advance of 1996 Summer Olympic Games – only introduced more riders to the system. By 2002, the airport rail system was moving more than 175,000 riders each day and more than 64 million passengers per year.

"Transporting passengers from one location to the other is no easy task, everything must operate like clockwork starting where the rubber meets the road," says Melvin Redd, Bombardier's Transportation Director at Hartsfield. "By working safely, and being the best at what we do, we keep the airport moving without missing a beat and tremendous amount of pride training our team to constantly perform at a high level."

More Rail at Hartsfield

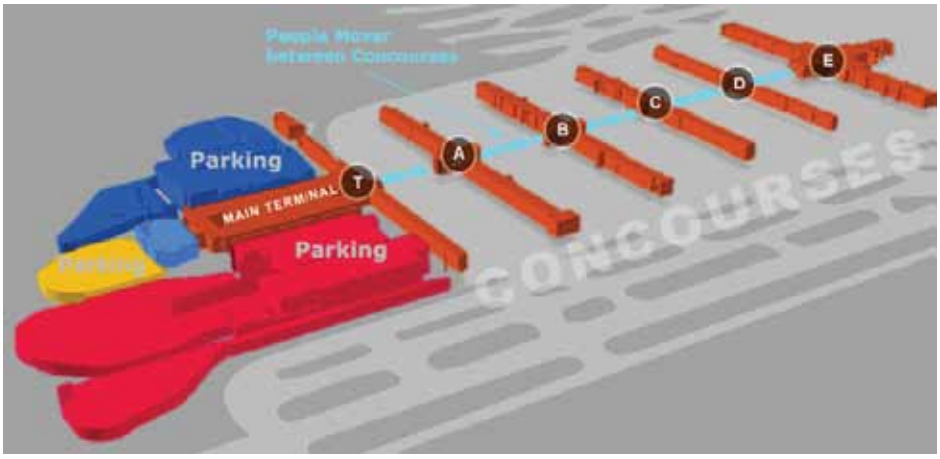
Having established the world's busiest airport rail service, Atlanta's Department of Aviation has sought new ways for rail to enhance options available to travelers. Due to growth

in demand for international flights, the airport is in the process of adding a second terminal devoted to overseas travel. Concourse F – to be formally known as the Maynard Holbrook Jackson, Jr. International Terminal – is scheduled to be completed next year and will include a corresponding expansion of the people mover network. The addition will push the system's track length to over three miles and is expected to attract more than 10,000 additional daily trips on airport trains.

"We're excited about our involvement in the upcoming expansion to the Jackson International Terminal," says Redd. "We have a good structure to operate one of the world's busiest rail systems and we're looking forward to taking the next step."

Beyond the coming expansion to the new international terminal, Hartsfield has introduced an additional airport rail service connecting travelers to airport facilities outside of the secured terminals and concourses. The ATL Skytrain opened on Dec. 8, 2009 and links the airport's main terminal with the Consolidated Rental Car Facility and the Gateway Center of the Georgia International Convention Center. While both the rental car location and convention center are a short distance away from the airport, a bustling network of access roads and highway interchanges makes travel between the sites dangerous, especially for pedestrians. The ATL Sktrain – which operates entirely independent of the intra-airport rail system – deploys six automated two-car trains manufactured by Mitsubishi. Like the original service, trips on Skytrain are free, and both networks are owned and operated by the Atlanta Department of Aviation.

Hartsfield's airport rail system is the busiest such system in the world, connecting the main terminal with five outlying concourses, and expansion to another underway.



Accessing Atlanta

In as much as travel among the various locations in and around Hartsfield has been made convenient by the airport's people mover systems, the massive facility is still located about seven miles south of Atlanta's central business district. Fortunately, travelers whose ultimate destination is the Atlanta region, rail service also offers easy and reliable connections to downtown and its surrounding neighborhoods and communities.

The Metropolitan Atlanta Rapid Transit Authority (MARTA) is the 9th-largest transit system in the United States, and opened its heavy metro rail network beginning in 1979. Since then, the system has grown to a regional operation serving Clayton, Fulton and DeKalb counties on four routes and 38 stations. By 1988, MARTA's north-south rail line had reached Hartsfield, with a station constructed along with the airport's new facility in 1980, allowing for an easy connection at the airport's main terminal.

From the airport, the rail line heads north, paralleling Main and Lee streets to reach downtown Atlanta and the system's central transfer station at Five Points. The line is now identified as both the system's Red and Yellow lines, as two branches split at the Lindberg Center station north of the city to reach North Springs and Doraville, respectively. More than simply the southern terminus of these rail lines, MARTA's Airport station is the system's second-busiest after Five Points, accounting for 13,500 of the network's more than a quarter million daily passengers.

For both elected officials and airport leaders, having an efficient and accessible connection to the larger metropolitan region isn't a convenience, it's a necessity.

"MARTA's Airport station – conveniently located inside Hartsfield-Jackson Atlanta International Airport – is a major catalyst for attracting businesses, events and conventions to our city and is one of Atlanta's biggest recruiting tools," says Debra Cannon,

DFW's original Airtrans rail network (above and below) was extensive, including over 15 miles of track, 33 stations and 68 vehicles.

SkyLink (below), which replaced the Airtrans system, offers a modern, simplified approach that's better suited for post-September 11th airport travel needs.

Director of Georgia State University Hospitality School.

Cruising Altitude: Dallas-Fort Worth, Texas

Situated equidistant from the ever-growing urban hubs of Dallas and Fort Worth, the International Airport that bears the joint name of the two cities could be considered the heart of the region known locally as the Metroplex. Beyond its geographic station, it is the conduit of billions of dollars of annual economic activity and has shaped land-use decisions and demographic trends since its opening in 1969. The joint airport – commonly referred to as DFW – also has marked an evolving vision for how passenger rail interacts with a large regional airport.

The First TrAAin

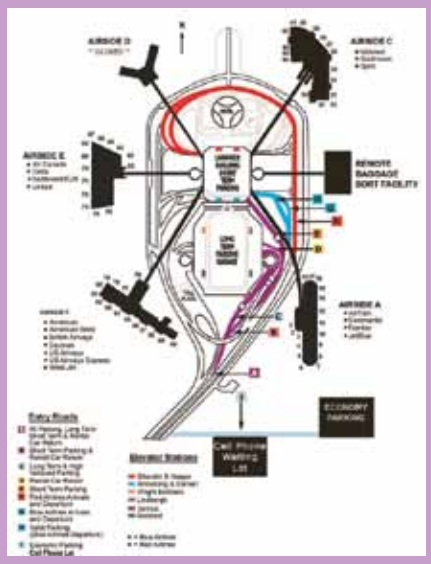
The competition between rival airports in both Dallas and Fort Worth through the first half of the Twentieth Century led to the Federal Aviation Administration (FAA) to encourage a combined facility in the 1960s. An agreement was reached in 1966 for both cities to purchase land between the two communities and DWF's 1969 opening was commemorated by the first U.S. landing of the Concorde. The new airport facility was massive – the largest in Texas, second biggest in the nation after Denver International Airport and third largest in the world. DFW includes seven runways along with five terminals. In 2007, 60 million passengers traveled to, through and from DFW.

The airport's largess lured the nation's busiest airlines with its plethora of gates and facilities, and in 1981, American Airlines positioned the airport as one of its hub locations, corresponding with its citing of its headquarters in Fort Worth. Since then, DFW has emerged as American's largest concentration of traffic and passengers, with 85 percent of the

Tampa: The Original Airport Rail Service

In 1971, Tampa, Fla., opened a new airport facility to accommodate growing air traffic to the region. The new airport also included an automated people mover system, the first such operation at an airport anywhere in the world. Similar to airports in northern Virginia and Atlanta, the new Tampa International Airport was configured with a main terminal building to house check-in, baggage handling and security checkpoints, along with a series of concourse building to host gate locations. An automated train network became the solution to link the various airport components.

From its initial three-line operation connecting the terminal to the B, D and E concourses, a total of seven different routes now comprise the Airport People Mover system. The vehicles – originally manufactured by Westinghouse and operated and maintained by Bombardier – are operated as two-car trains and offer service headways of no less than five minutes on each route. Two trains are assigned to each line – one servicing each depot and then returning at the same time as its counterpart.



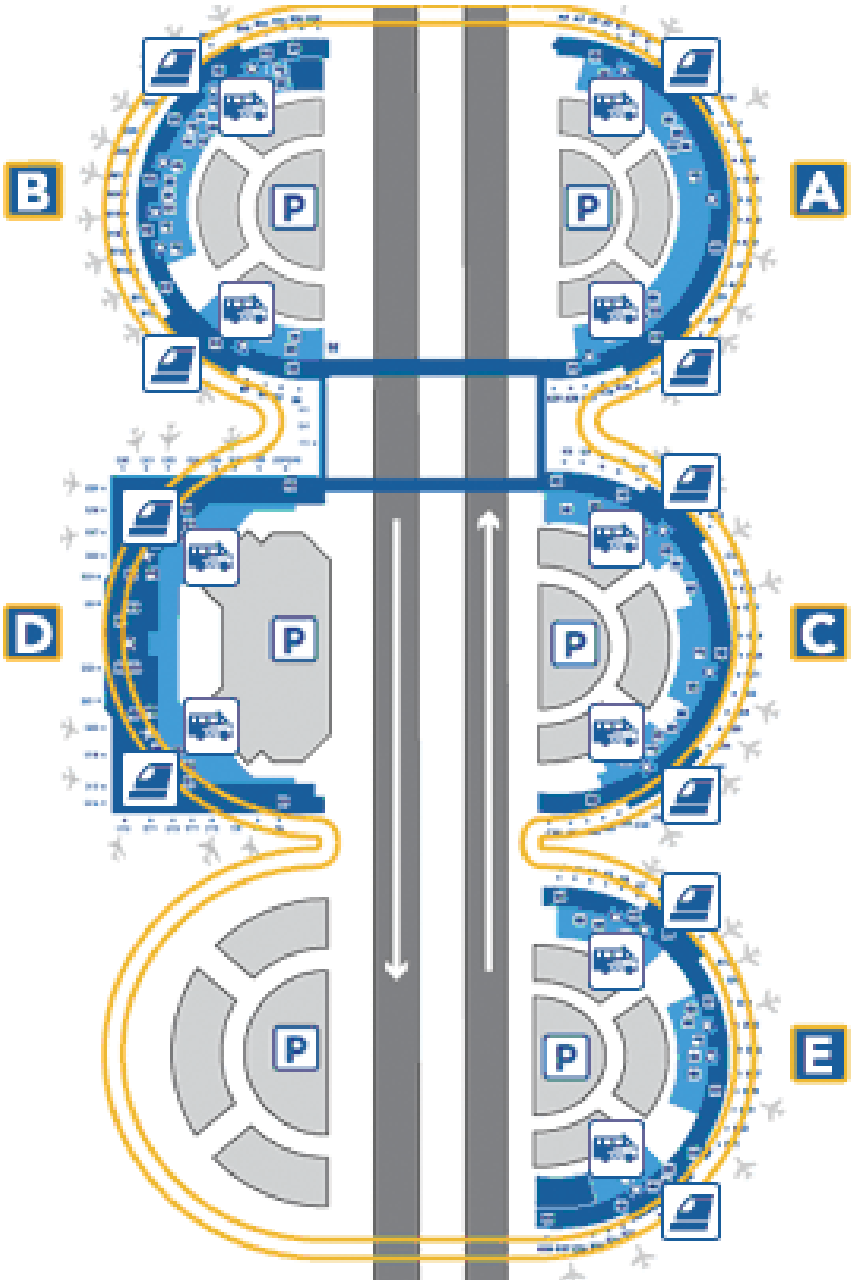
airlines flights operating through the facility. Among the key attractions for the airline was the airport's automated people mover system, which was installed along with its construction. The system provided a key connection between the airport's three original terminals, which collectively stretched out for several miles.

Spanning the entire sprawling facility, the rail system – known as Airtrans – offered more than 15 miles of track serving 33 stations and operating 68 vehicles. However, the initial configuration of the operation focused on linking the independent terminal buildings, which functioned outside of security apparatus, requiring travelers, employees and support staff to navigate the security check process to reach the other terminals. Owing to its expanding presence and influence at DFW, American Airlines worked with airport officials to arrange a specific routing of a group of rail vehicles to serve its terminal locations beyond security check points. The airline dubbed the focused service as the American Airlines TrAAin.

Despite DFW's extensive rail grid, by the mid 1990s, the Airtrans system and its underlying technology was showing its age, and its routing was not ideally suited to cope with aviation security enhancements that had proliferated in the meantime. Although the people mover operation had an unblemished safety record and recorded a 99.8 percent reliability level even after it had instituted 24-hour operation in 1989, its speeds topped out at 17 miles per hour and most of its mechanical and computer components were outdated and difficult to maintain or replace.

"Our original people mover system was appropriate for its time, but became less useful in the post-September 11th world," says Clay Paslay, DFW's Executive Vice President of Airport Development. "We worked to identify a new system that could serve our high volumes of passenger traffic even better.

In 2005, after more than 30 years of service and transporting over



SkyLink serves DFW's five existing terminals with two stations apiece, while the southeast-to-northwest commuter rail project (below) will connect downtown Fort Worth with DFW.

250 million passengers, Airtrans and the TrAAin were removed from service, with vehicles numbered 25 and 30 donated to the Frontiers of Flight Museum in Dallas and North Texas Historic Transportation in Fort Worth, respectively.

The Sky's the Link

The phase-out of the Airtrans system did not spell the end of intra-airport rail service at DFW. In fact, it only improved it. DFW officials sought a new system to transport passengers through the substantial complex, which had expanded to five separate terminals. From 1996 through 1998, officials and outside consultants conducted the *Airport Train Critical Needs Analysis and Implementation Study* to determine how best to replace the aging system. The study determined that although Airtrans was comprised of an extensive network of platforms, tunnels and alignments – roughly at or below ground level – new automated people mover technologies and vehicles could not be accommodated by the existing infrastructure.

The project ultimately selected Bombardier Transportation to design, construct and install a new entirely elevated system that would serve all existing terminals beyond security checkpoints and include new terminals as they were constructed. Construction began in 2002 and was concluded in 2005, weaving concrete columns and track beams above the tarmac while airport operations continued undisturbed. The resulting project – ultimately termed SkyLink – included nearly five miles of track and 10 stations, producing the largest airport rail system in the world. Unlike its predecessor, SkyLink would feature two tracks for bi-directional operation, allowing trains to operate both clockwise and counter-clockwise along the circuit. The Airtrans network ceased operations on May 20, 2005 – although much of its infrastructure still remains to this day – and SkyLink commenced

service the following day.

"SkyLink represents the very latest in an airport rail operation," says Eduard Popa, Bombardier's Director of Transportation at DFW. "It's an incredibly reliable, efficient and rider-focused system that helps the airport serve its customers in a very convenient manner."

SkyLink represents a new approach to airport rail systems. While Airtrans offered a milieu of different stations at each terminal, SkyLink includes two, substantial depots at each venue, simplifying arrangements for travelers already beset with confusing gate numbers and baggage claim locations. SkyLink stations are airy and well-lit, with a bank of windows at their parapets and artistic representations conveyed via the floor ties and wall décor, producing a serene escape for travelers in transit. Bombardier's 64 Innovia vehicles achieve a top speed of 37 mph – more than double the speed of the Airtrans – and operate every two minutes in both directions, ensuring passengers ample opportunity to reach their connecting flights. No trip between terminals is longer than nine minutes, which marks the duration needed to reach Terminal E from Terminal D, owing to the space allocated for the future construction of Terminal F. Moreover, all stations are equipped with options for additional train access doors, should growth in traffic require the use of four-car trains in the future rather than the current two-car consists.

"To build this massive of a system on the world's third busiest airfield and finish on time and on budget is certainly a tribute to the thousands of men and women who worked tirelessly to make it happen," says DFW's Paslay. "The result is a significantly improved passenger experience at our Airport, offering fast connections and dramatic aerial views of the Airport and our surrounding communities."

Detroit's ExpressTram

While some airport rail systems connect travelers between terminal and concourse buildings, and others link passengers with larger metropolitan regions, ExpressTram – at Detroit's Metropolitan Wayne County Airport – operates entirely inside an airport building. Given that the airport's McNamara Concourse is the second-largest airport building in the world, terminal designers needed an efficient way to move air travelers through the more than 4,000-foot long structure. Enter the ExpressTram, which opened for service on Feb. 24, 2002.

The involvement of the Otis Elevator Company – which manufactured the vehicles, constructed the system and oversees its maintenance – is fitting, given that the 3-station line is essentially a horizontal elevator. Operating 24 feet above the building's floor, two trains consisting of two tram vehicles each navigate along the guideway, propelled by a cable-driven mechanism and floating on an air cushion, similar to a hovercraft. The two trains – each with a capacity of more than 200 – meet at the two-track Center station.

Capable of speeds of more than 30 miles per hour, ExpressTram connects nearly 80 gates served primarily by Northwest Airlines, which has since been acquired by Delta Air Lines. Automation technology orchestrates the system so if one of the trams is delayed at either terminal station, its counterpart is held at the Central platform to prevent the vehicles from meeting. Up to 4,000 passengers per hour – or 200,000 riders each day – can be transported by ExpressTram, which required $68 million in investment from the Airport and then Northwest Airlines. ExpressTram marks the world's only entirely indoor, above-ground rail operation.

In-Range to DFW

Given the airport's location between two of Texas' largest cities, accessing the entirety of the Metroplex could pose a tricky proposition, considering the region's fourth-worst traffic congestion. In recent years, however, there's been a marked effort to foster greater connections between DFW and its namesake cities. Increasingly this, too, is occurring by rail.

Much like the joint effort between Dallas and Fort Worth to create a signature airport for the region, leaders from both cities worked together in the 1990s to create a commuter rail service linking the area. The Trinity Railway Express (TRE) opened on Dec. 30, 1996, offering limited service from downtown Dallas to Irving, halfway to DFW. On Sept. 18, 2000, the service expanded further west to Richland Hills, and introduced a station near DFW. Although the connection required a transfer to a shuttle bus to reach the airport, the service represented the first time Dallas-area residents could reach DFW via rail. By the end of 2001, the TRE route was completed to reach downtown Fort Worth, achieving service to the airport from both cities. Today, TRE offers 18 weekday roundtrips along the route serving DFW, with an additional handful of trips between Dallas and the airport at mid-day.

"Service to DFW is a vital aspect of our ridership," says Wayne Friesner, Director of the TRE. "It's the center of our route between Dallas and Fort Worth and is one of the most important destinations in the region."

In as much as TRE service to DFW marked a significant step to connect the region with its largest airport, even greater rail options to reach DFW are underway. First to arrive will be the Orange Line light-rail route of Dallas Area Rapid Transit (DART) in 2013. Connecting downtown Dallas with the airport from the north and east, the Orange Line will also link with the Los Colinas Urban Center and its 1.5-mile Area Personal Transit (APT) system, along with Dallas' Love Field airport, home to Southwest Airlines.

"The Orange Line connection will be one of the few rail lines in the world that serves two busy airports on the same route," explains DART Spokesperson Morgan Lyons. "While the TRE provides excellent service to DFW already, the Orange Line marks another option for North Texas travelers."

Meanwhile, Fort Worth leaders hope to match Dallas' expansion towards DFW with southwest-to-northeast rail corridor. The route would be a commuter rail operation utilizing existing rail lines to connect communities to the southwest of downtown Fort Worth through the

Rail in the Airport: Baltimore and Portland

While many cities and regions offer extremely convenient links between their airports and rail systems, two of those position their airport rail stations directly at the facility itself.

At Thurgood Marshall Baltimore-Washington International Airport (BWI), the Maryland Transit Administration's (MTA) light-rail line serving downtown Baltimore and extending north to Hunt Valley serves BWI with a stop positioned at the facility's international terminal. From there, travelers are just steps away from the airport's five concourse wings and its rapidly growing number of flights, as BWI is a major East Coast hub for Southwest Airlines.

Additionally, the airport also offers a free and quick shuttle bus service to the nearby BWI Airport Rail Station, which is served by Amtrak's Northeast Corridor and *Acela* services, along with the MTA's MARC Penn Line commuter rail trains. That station became the nation's first connection between an airport and intercity passenger rail when it opened in 1980.

On the nation's opposing coast, travelers flying through Portland International Airport (PDX) likewise find the region's MAX light-rail trains waiting just beyond the airport's baggage claim areas. The Red Line – operated by the region's transit provider, TriMet – connects PDX with downtown Portland before continuing west to Beaverton, where TriMet's Westside Express Service regional rail line terminates. Red Line trains, which began operating only a day before the events of Sept. 11, 2001, were made possible by a unique partnership between the Port of Portland – which owns and manages PDX – TriMet and the Bechtel Corporation that secured investment in the rail line in exchange for rail-oriented development opportunities at the line's Cascades and Mount Hood Avenue stations.

city's center before continuing on to approach DFW from the north and west, paralleling the Orange Line's route into the airport. If local and regional leaders are able to obtain investment to purchase equipment and construct station facilities, trains from Fort Worth could reach DFW by 2013.

"The southwest-to-northeast corridor project is building a good deal of excitement around here as not only an important commuter rail option for the region, but also a new way for travelers to reach DFW," says Richard Ruddell, Executive Director of The T, Fort Worth's public transit system.

Final Approach: Northern Virginia

Located in Loudon County, Va., Washington Dulles International Airport is one of the nation's most far-removed airports from the heart of the metropolitan area it serves. More than 25 miles to the west and north of the nation's capital, Dulles is a focal point for international flights from the East Coast and throughout the nation, hosting an average of 1,200 takeoffs and landings every day. It is also a facility that has long been considered isolated and challenging to navigate. Until now.

Moving On from Mobile Lounges

Established in the early 1960s to relieve congestion and satisfy air travel demand at Washington's Ronald Reagan National Airport in Arlington, Va. – an airport within sight of the White House and Washington Monument across the Potomac River – Dulles International Airport's location was determined by its wide swaths of open land. Since its 1962 opening matched the precipice of the forthcoming growth in air travel, it was designed to support large numbers of aircraft and passengers – a sharp contrast to Reagan National, shoehorned along

Ero Saarinen's iconic design of Dulles' main terminal is one of the few examples of distinctive airport architecture, while its mobile lounge transportation system (below) was equally unique.

The Dulles AeroTrain (below) opened in early 2010 and replaces the mobile lounges for most intra-airport trips.

Next in Line: Phoenix

While many airports have included rail systems for several decades, still others are planning new airport rail operations. The first such system likely to open will be the PHX Sky Train at Phoenix's Sky Harbor International Airport. Currently under construction, PHX Sky Train will link the airport's Terminals 3 and 4 with its rental car and parking facilities along with the region's METRO Light Rail line, which already serves a nearby station, requiring a shuttle bus connection to the airport.

Bombardier Transportation is overseeing the construction of the new system, which will employ its Innova vehicles and automated technology components. The project will incorporate right-of-way adjacent to Arizona State Route 153 and its tunnel will run beneath Union Pacific's freight rail line to reach the existing METRO station, which itself opened in late 2008 and provides connections to four Valley Metro bus routes.

The first phase of the project, linking the METRO Light Rail station to the East Economy Parking facility and Terminal 4 is expected to be completed in 2013, with the second phase connection to Terminal 3, a planned 5th terminal and the rental car center should be completed by 2010. At a projected $1 billion, PHX Sky Train's cost will nearly match that of the 20-mile METRO route.

the Potomac.

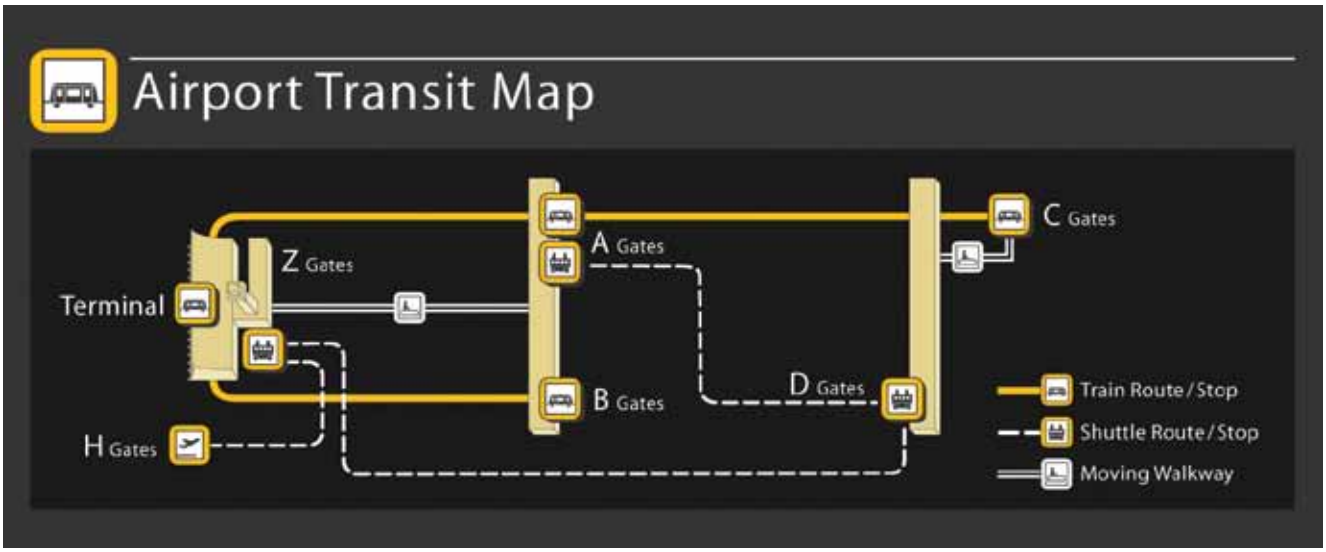
Moreover, Dulles was envisioned as a new model for airport construction. Its main concourse was one of the first air facilities to include a distinct architectural vision, provided by Finish architect Ero Saarinen, while most other airports at the time were uninspired utilitarian bunkers. Likewise, while Dulles replicated the use of multiple, independent terminals to stage scores of aircraft gates, it also introduced a series of large transport vehicles to shuffle passengers from the main concourse across the tarmac to their respective terminals. These mobile lounges, as they were dubbed by the Metropolitan Washington Airports Authority (MWAA), became as iconic to Dulles' image among the traveling public as its signature concourse.

However, as both passenger counts and aircraft movements through Dulles grew from the 1970s through the turn of the century, the nature of the airport's isolated location, along with its cumbersome movement of internal traffic led airport officials to consider new ways by which its connections – to both the region and within its own facilities – could be improved. The answer to both challenges was rail.

Readying the AeroTrain

Due to the bulky, oversized frames of the mobile lounges, coupled with their use of the same tarmac space needed by taxiing aircraft, the process of operating the transport vehicles quickly grew cumbersome, averaging speeds no more than 15 miles per hour. MWAA officials sought a means to connect travelers between the main terminal and concourse buildings by circumventing the busy surface-level traffic entirely. Their solution ultimately became the AeroTrain.

Comprised of nearly four miles of underground track, the Dulles AeroTrain opened in early 2010 utilizing 29 Mitsubishi Heavy Industries Crystal Movers while



serving four stations – Concourses A, B and C, along with the main terminal. Like most other airport rail systems, AeroTrain operates beyond security checkpoints, transporting travelers who have already passed through the screening process. AeroTrain service operates every two minutes at speeds of up to 44 miles per hour, more than double the pace of its predecessor. Trips from the main terminal to Concourse C take no longer than two minutes, while the similar journey on a mobile lounge could run up to 10 minutes if aircraft movement was hectic on the tarmac.

More than simply a more efficient way to transport Dulles customers, the AeroTrain marks an airport ready to offer the latest amenities travelers have come to expect in modern air travel venues, an attribute that is increasingly significant as Dulles competes with not only Reagan National, but also the Thurgood Marshall Baltimore-Washington international Airport (BWI) in Maryland.

"Dulles is 44 years old and the AeroTrain is designed to rebuild the airport so we can serve the region for the next 40 years," says James Bennett, MWAA President and CEO. "We want our customers to know we appreciate their patience as we transform Dulles facilities and totally revamp our passenger transportation system."

The Dulles AeroTrain features 29 rail vehicles manufactured by Mitsubishi and serves four of the airport's gate concourses.

"This new system gives us the capacity to expand for years to come," adds Frank Holly, MWAA Vice President for Engineering. "If you're coming to the nation's capital, you should be able to walk through a world-class facility."

The Value of Silver

Just as the AeroTrain is offering a greater measure of mobility for Dulles patrons, a new means of linking the airport with the Washington metropolitan region is on the horizon. As the location for Dulles was selected and acquired during the 1950s, its planners also obtained a large swath of land to construct a highway to link into northern Virginia's roadway system. As part of that project – which ultimately became the Dulles Tollway, or Virginia State Route 267 – its engineers established a wide median that could someday accommodate a rapid transit line.

As the Washington region's heavy rail system – Metro – was planned,

The bright, airy and modern stations of DWF's SkyTrain offer a welcoming and comfortable environment for already-rushed airport travelers.

designed, constructed and opened, many Dulles travelers longed for the day when Metro trains would reach the region's busiest airport. Approval for the first phase of a line to Dulles first came in late 2008, when U.S. Secretary of Transportation Mary Peters approved nearly a billion dollars in federal investment to support additional billions of state and local funding. Connecting to the existing Metro network at the East Falls Church station in Arlington County, Va., the new route – to be dubbed the Silver Line – will reach Wiehle Avenue in the town of Reston, about 6 miles to the east and south of Dulles, in 2013.

After the first phase of the project opens in Reston, work will begin on the Silver Line's second phase to reach Dulles – and beyond, into Loudon County – and is expected to open for service in 2016. While most of the Silver Line route will be constructed at grade level – save for a few short tunnels in the busy Tysons Corner district – Silver Line trains will arrive underneath Dulles' main terminal at a new underground station. The Metro station at Dulles is expected to generate more than 10,000 daily trips and fuel even greater growth of passenger traffic at the airport.

"Enhanced transit service is an essential part of Northern Virginia's transportation future," said then-Virginia Governor Timothy M. Kaine, who added, "this extension is vital for the residents and businesses in the Dulles Corridor."

MWAA's Bennett agreed, saying the project "mark[s] a very large step toward the fulfillment of a longstanding vision — not just linking the airport to the region via Metrorail, but to make that same rail service available to all the residents and businesses in the corridor."

Leaving on a Train...and a Jet Plane

At one time, many transportation prognosticators would have never envisioned an environment where travel by air and rail seamlessly co-existed in the same mobility network. But that relationship is now so much more than even just complimentary options, as rail and transit connections to and from the air travel system are indispensable. Passengers, in fact, demand it.

Modern air travel allows for quick and easy journeys over massive distances, while local and regional rail connections allow travelers to engage not only the areas and regions they are traveling to, but, increasingly, the airports themselves. It marks a partnership that experts in biology might term symbiotic.

For, as legendary Canadian folk singer Gordon Lightfoot once intoned, "you can't jump a jet plane, like you can a train; so I'd best be on my way in the early morning rain."