Redesigning the Airline Passenger Experience

When addressing the topic of travel, a series of mixed emotions can rise within us. Stemming from our experience from previous trips, we may choose to see the entire trip as a positive or negative based upon a single element: air travel. I aim to improve the overall perception of air travel by redesigning the passenger experience in the context of commercial aviation: door to door. What this means is that I plan to investigate and improve the expedience and convenience for the passenger when navigating to, through and from the realm of travel via means of passenger aircraft. Rather than just focusing on improving the airport, I want to encapsulate the entire experience; from the second you leave your home to the moment you arrive at your destination. This stretches across a broad array of factors to consider, such as luggage transportation, accommodation/reservation management, as well as the atmosphere for the passenger in flight, just to name a few. As a result, I aim to create a network of systems that is integrated cohesively to one another to focus not on the amount of money to be made, but rather on the betterment of the entire air travel passenger experience.

The results of this thesis research were eye-opening and crucial to the success of this project. Airlines are dealing with a new type of traveler: educated, increasing aware of their needs and rights, and able to choose between a broad range of air carriers. The keys to delivering on passenger expectations are listening and innovating. The 2018 IATA Global Passenger Survey identified passengers' desire for technology that gives them heightened control over their travel experience through

1. The automation of a growing number of airport processes;
2. A single identity token for all travel processes, using biometric identification;
3. Real-time flight information sent directly to personal devices;
4. Increasingly efficient airport security that does not require having to remove or unpack personal items; and
5. Seamless border control.

Passengers are becoming more tech savvy and want the airline industry to provide new services that match this growing trend. Monitoring the location of their bags, getting updates on flight status, and getting notifications about wait times at security/immigration were leading concerns as well. Passengers are also bringing more luggage along with their personal devices, putting a higher demand on the airlines to provide the space desired within the passenger cabin.

The airline industry is an ever-growing entity that has a presence in nearly every corner of the world. With improvements in technology and engineering, it is becoming easier for people to purchase an airline ticket to take them to their desired destination. Each journey is different, with thousands of options that a passenger can choose, stitching together the pieces of their personalized travel experience.

By redesigning the passenger experience in the context of commercial aviation, designers, airport planners, airline providers and passengers alike will all be able to create a new standard of passenger travel. This thesis will act as a template for how the newly designed passenger experience could improve the physical atmosphere of the day to day operations of airline travel, as well as boost the social reputation of how airlines treat their customers. Happier customers make for more likely repeat passengers, repeat passengers means more business for the airlines. This incentive pays dividends to both the passenger and the airline and all its affiliates; the airport, air traffic control, support and facilites workers, travel planners, hotel and rental companies, etc.

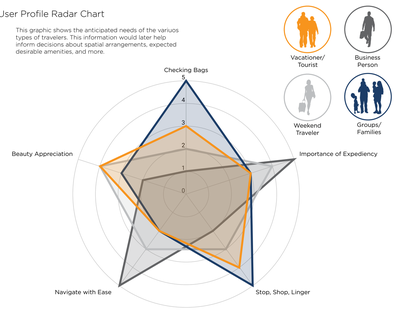
The race to create the ideal user experience from door to door, that is, from home to destination in the context of commercial aviation, could give organizations the edge they need to not only excel in terms of customer approval, but also create the new standard to which other airlines try to achieve. As a result, I aim to create a new network of systems that are integrated cohesively to one another to focus not on the amount of money to be made, but rather on the betterment of the entire air travel passenger experience.

Mind Mapping

Tracking the various elements, actions, and needs of the passenger experience from start to finish.

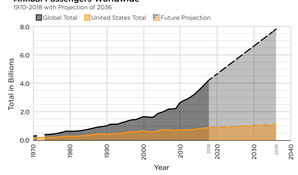
User Profile Radar Chart

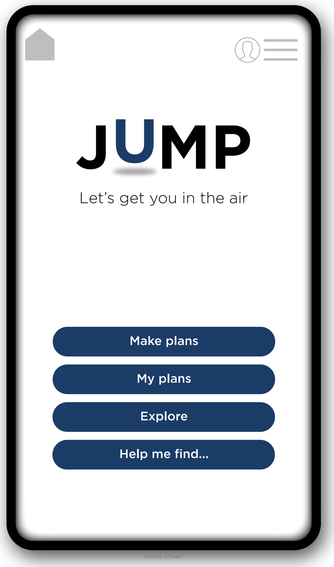
This graphic shows the anticipated needs of the various types of travelers. This information would later help inform decisions about spatial arrangements, expected desirable amenities, and more.



Annual Passengers Worldwide

1970-2018 with Projection of 2036



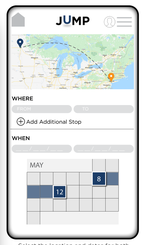


When approaching travel, it is easy for the inexperienced traveler to get lost in more ways than one. The Jump app is designed to be used help guide passengers of all experience levels to their destination in a way that feels intuitive rather than complicated. The fewer hoops you feel you have to jump through without paying an arm and a leg, the more positive the travelers experience.

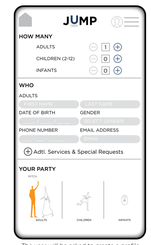
JUMP: Let's get you in the air!

This app would seek to combine a series of digital tools in a way that makes the user be able to follow their path of travel from start to finish, or in this case, door to door. Shown here are some sample screenshots of how I picture the UI of the app to appear. Designed to take all the jargon, hidden fees and unexpected detours out of air travel, JUMP would deconstruct the journey into bite-size pieces that even the most in experienced passenger would understand.

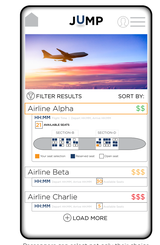
Most elements of JUMP will seem familiar to anyone who has used a phone based travel aid. The difference with JUMP is that it combines the best of the planning, booking, wayfinding and packaging details all into one application on your personal device. This eliminates the need to jump between multiple host apps or services, busying precious time during travel. Rather than treat the travel experience as something to be endured, JUMP would make travel into something to be enjoyed.



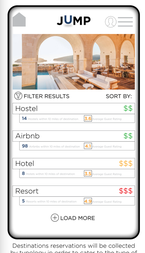
Select the location and dates for both deaparture and arrival. Suggested changes to dates could be made to help the user save money.



The user will be asked to create a profile with the basic information of each member in their party. This information can be used to save time later in the trip.

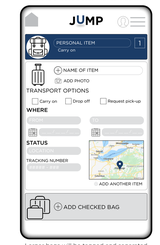


Passengers can select not only their choice airline, but also be able to access basic information about those in the reserved seats to choose a seat with confidence.

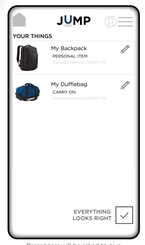


Destinations reservations will be collected by typology in order to cater to the type of stay that the passenger desires.

Passengers will be asked to register any personal bags they intend on bringing along. Photo ID will help with tracking of all personal belongings.

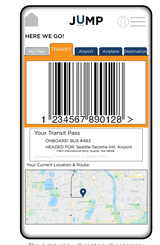


Larger bags will be tagged and separated from the passenger. These bag can either be collected or dropped at set locations to be delivered directly to their destination.

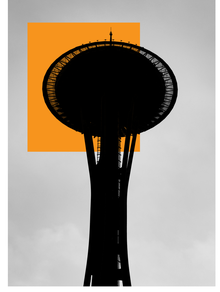


Passengers will be asked to give confirmation of the information provided for the photo of their corresponding belonging.

Depending upong type of transit, users will have access to the necessary information that applies to their specific travel needs.



The Jump app will contain all necessary passes, maps, schedules and important information needed for the user to navigate to their destination quickly and easily.



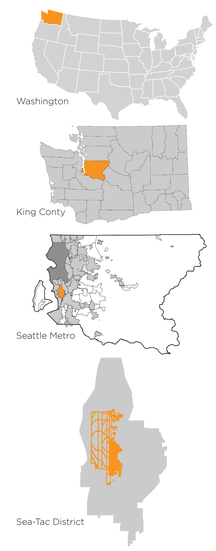
SEATTLE METRO AREA CONNECTION

The site chosen for this thesis project located in the state of Washington is the Seattle-Tacoma International Airport, or Sea-Tac for short. This airport was chosen based upon its rank and growth as one of the top 30 international airports in the United States. Sea-Tac ranked #18 in the US based upon total enplanement of passengers; over 24 million in 2018. This number has steadily grown at a constant rate, seeing a 3.4% increase from 2016 to 2017 and a jump of 9.9% going into 2018. This rate of increased passenger traffic was only exceeded by one airport in rate of successful growth per year – FLL, or Fort Lauderdale-Hollywood International Airport in Fort Lauderdale, Florida. This high rate of growth generated interest in how this airport handled such high capacity of passengers on its relatively small footprint.

Sea-Tac rests between Seattle and Tacoma, some of the largest cities in the Pacific Northwest. This large hub of shipping, trade goods, tourism, and major industry centers for engineering and technology companies has drawn crowds from both the domestic and international audience. Seattle, the larger of the two neighboring cities, claims most business that comes through Sea-Tac. With a population of 3.94 million and growing in its metro area, it ranks as the 15th largest city in the US. As a major gateway for trade with Asia as one of its main suppliers, it holds the 4th largest port in North America. The community has developed into a very diverse composition as well; Scandinavian, Native American, Asian-American, and African-American are a few of major demographics that create the rich cultural diversity that this city provides.

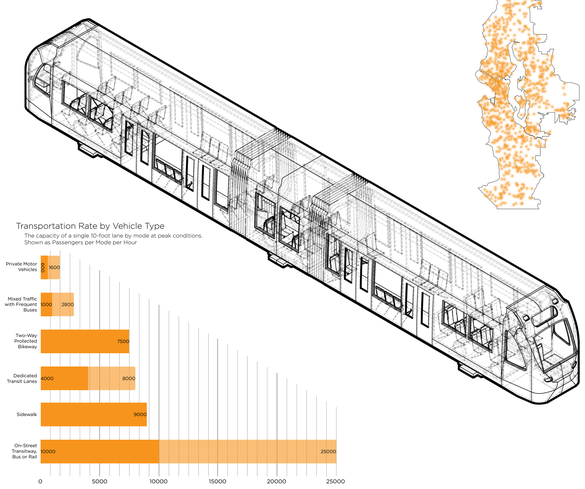
Sea-Tac is located in the industrial district between Seattle and Tacoma, providing the space to handle such high air traffic without having to navigate flight paths directly over the city centers, as well as isolating excess noise pollution by pulling the airport to the edges of each city. Domestic flights account for 89% of all passengers that pass through Sea-Tac, while supporting 11% of international flights from its ideal location on the Pacific coastline. With 29 documented international destinations and 91 non-stop domestic destinations, air traffic controllers stay busy to make the most efficient use of its 3 runways. There are 80 gates throughout Sea-Tac and has recently announced that it will be expanding from 85 to 135 airport dining and retail establishments. This growth will provide national brands as well as local favorites a chance to capitalize on the customer base of passengers, staff and air crew that populate its concourses. The airport has one central terminal with 4 attached concourses and 2 satellite concourses that are accessible via bus service or underground light rail.

An emphasis was given on the integration, even celebration, of the Sound Transit light rail system that connects directly to Sea-Tac Airport. People who would have driven to the airport face the frustration of driving through traffic, finding a space to park, paying to park, finding a way to the main terminal, carrying your luggage to your gate - the list goes on. By using the light rail, passengers would be able to strip down the number of expected tasks between their arrival at the airport and the moment they get on the airplane. After studying the feasibility of asking passengers to utilize the light rail as their primary means of getting to Sea-Tac, I created a digram shown below that predicts that amidst the 900+ public transportation stops in the Seattle Metro area alone, 72% of entire area is within a quarter mile of the nearest stop. This means that the with proper planning, incoming passengers should be able to navigate to the airport via some branch of the public transportation system. Not only does this save them financially through money saved on parking, but it also reduces their carbon emissions by using mass transit systems and overall would save them time. In fact if you look to the chart below, you will see that the light rail option like that of Sound Transit is far greater at moving more people to their destination in higher efficiency in both time and space. This is why the Siemens S70, shown below, became the choice vehicle charged with connecting the greater Seattle Metro area to the Sea-Tac Airport.



Sea-Tac Metro Light Rail

Sound Transit | Siemens S70



Seattle Sound Transit

Public Transportation Stops

Scale in miles

Qaurter mile radius

Half mile radius

Transportation Rate by Vehicle Type

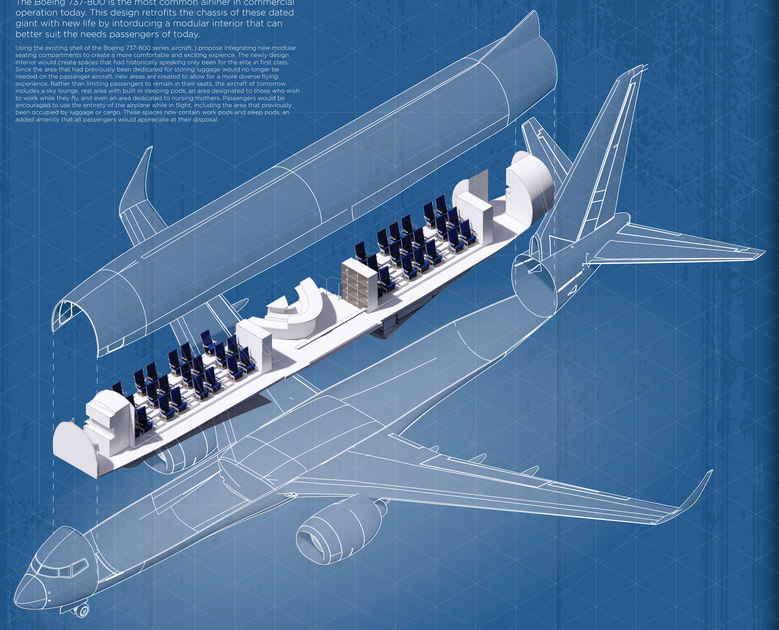
The capacity of a single 10-foot lane by mode at peak conditions.

Shown as Passengers per Mode per Hour

THE NEWLY REDESIGNED BOEING 737-800

The Boeing 737-800 is the most common airliner in commercial operation today. This design retrofits the chassis of these dated giant with new life by intorducing a modular interior that can better suit the needs passengers of today.

Using the existing shell of the Boeing 737-800 series aircraft, I propose integrating new modular seating compartments to create a more comfortable and exciting experice. The newly design interior would create spaces that had historically speaking only been for the elite in first class. Since the area that had previously been dedicated for storing luggage would no longer be needed on the passenger aircraft, new areas are created to allow for a more diverse flying experience. Rather than limiting passengers to remain in their seats, the aircraft of tomorrow includes a sky lounge, rest area with built in sleeping pods, an area designated to those who wish to work while they fly, and even an area dedicated to nursing mothers. Passengers would be encouraged to use the entirety of the airplane while in flight, including the area that previously been occupied by luggage or cargo. These spaces now contain work pods and sleep pods, an added amenity that all passengers would appreciate at their disposal.

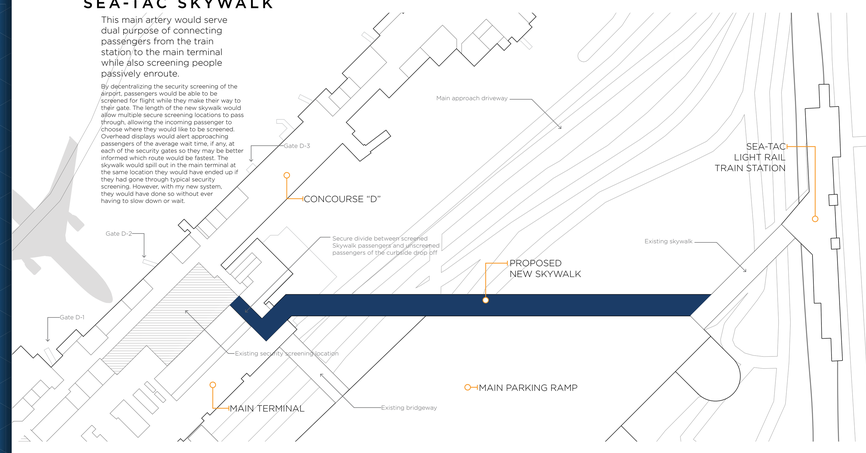


Although the overall passenger capacity has decreased from the previous model of the 737-800, this new design would prioritize comfort over capacity. Walkways are stretched to a minimum of 24" wide, making movement within the airplane easy rather than cramped. Restrooms have been doubled in size, allowing for easier use of facilities. Another new introduction is a private suite for new and nursing mothers at the back of the plane. This enclosed nook would allow for a secure space those who need a little privacy in flight without monopolizing the restrooms, equipped with a comfortable seat, small sink and counter space as needed. The needs of the modern passenger is ever-changing and this design would allow the airline industry to keep pace, but replacing modules or elements as needed without putting the entire plane out of comission.

SEA-TAC SKYWALK

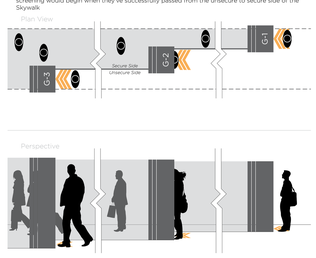
This main artery would serve dual purpose of connecting passengers from the train station to the main terminal while also screening people passively enroute.

By decentralizing the security screening of the *airport*, passengers would be able to be screened for flight while they make their way to their gate. The length of the new skywalk would allow multiple secure screening locations to pass through, allowing the incoming passenger to choose where they would like to be screened. Overhead displays would alert approaching passengers of the average wait time, if any, at each of the security gates so they may be better informed which route would be fastest. The skywalk would spill out in the main terminal at the same location they would have ended up if they had gone through typical security screening. However, with my new system, they would have done so without ever having to slow down or wait.



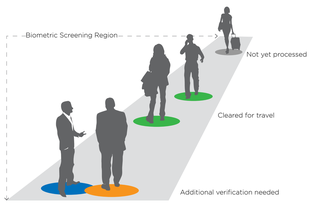
Skywalk Screening Gates Concept

By providing options of gates along the path of travel, passengers are no longer forced to pass through a single bottleneck. Overhead displays would give an estimated wait time, if any, at each of the progressive gates located further down the line of travel. Once through the screening gates, additional screening would begin when they've successfully passed from the unsecure to secure side of the Skywalk

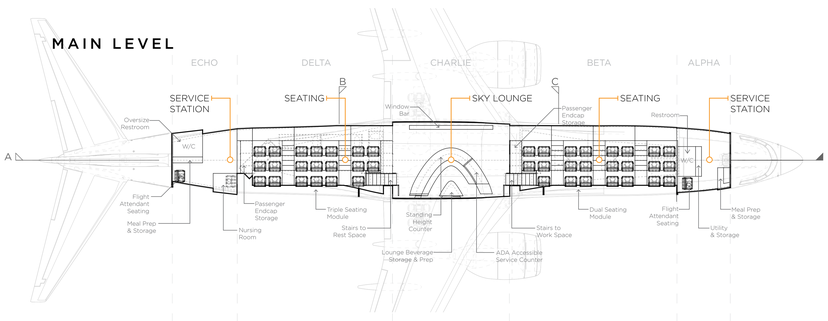


Passenger Halo Security Indicator

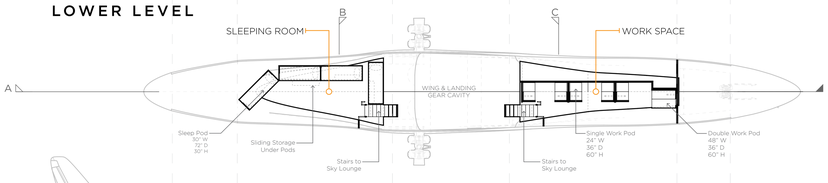
Utilizing a technology that already begun to make its presence known in the airline industry, biometric screening would be installed along the length of the secure side of the skywalk. Paired with motion tracking sensors and LED floor panels, a visible 'halo' would inform stationed officials on the status of all incoming passengers at all times. The halo beneath each passenger would change as the biometric screening system identifies the verdict of approval to fly or needs additional verification. This failsafe would ensure that in the case that the biometric system is not 100% certain of a passenger, airport officials will be alerted via the orange halo and step in for further verification.



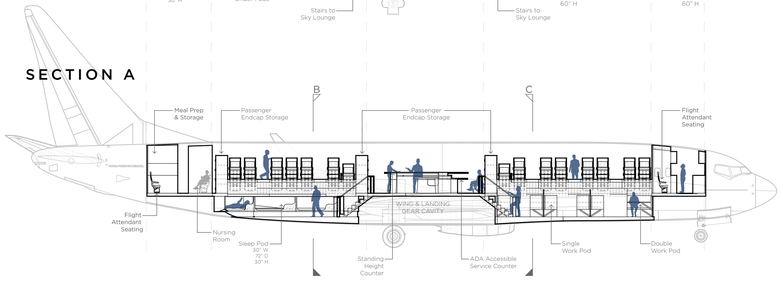
MAIN LEVEL



LOWER LEVEL



SECTION A



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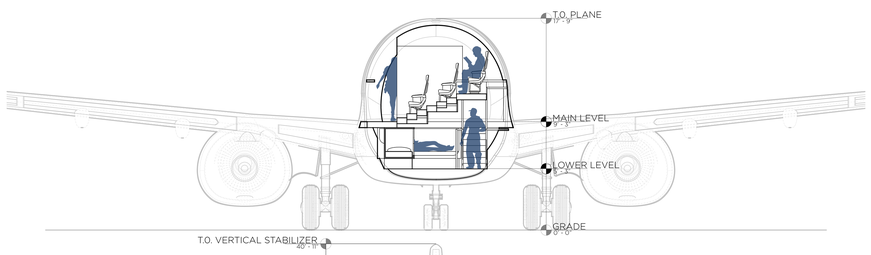

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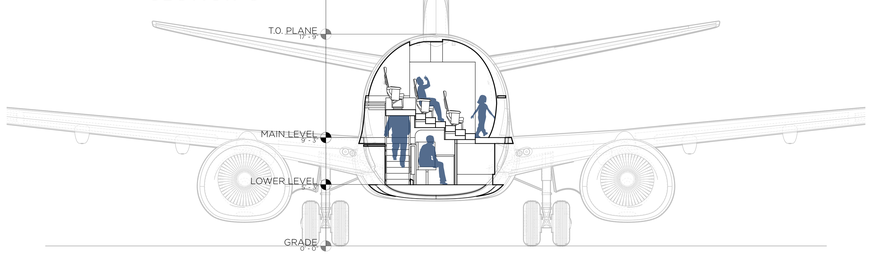

REDESIGNED PASSENGER SEATING

In order to make a more comfortable flying experience, the common aircraft passenger seating was due for some improvements.