Award of Distinction

Project Title: **38 N 82 W Regional Airport**

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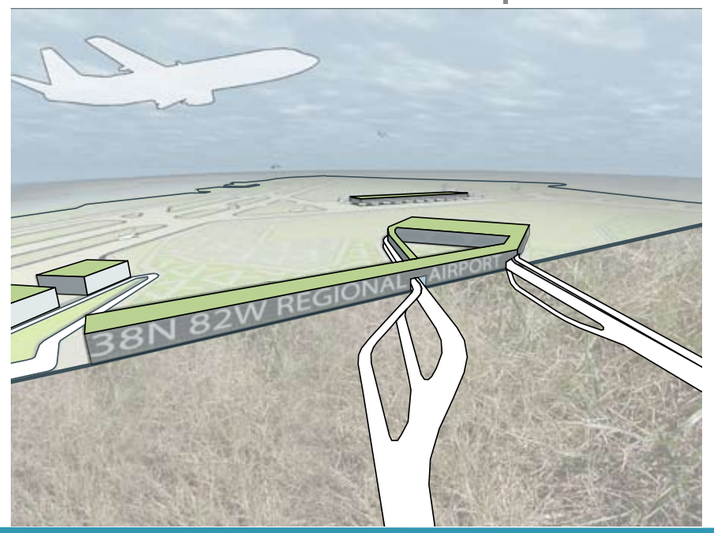
38N 82W
REGIONAL AIRPORT
travel / adventure / experience



Summary description of project:

Post 9-11 security concerns, among other issues, have produced an atmosphere for air travel that is neither enjoyable, nor adequately secure. '38N 82W Regional Airport' identifies critical problems associated with conventional airports and attempts to resolve them through the introduction of a number of emergent technologies as well as innovative planning themes centered on the experience of travel.

Ecologically speaking, airports present major problems in terms of their impacts on surrounding areas. Out of a concern for local populations, runways and landscaping attempt to minimize the negative audio-visual presence of the new airport. Furthermore, interior gardens, green roofs, biotope waste processing, intelligent landscaping, and passive solar HVAC initiatives reduce the environmental loads of the complex.

Convenience and accessibility are addressed through several features. '38N 82W Regional Airport' utilizes a fully automated parking system in which parking spots literally become the front door of the airport, drastically reducing walking and transport times. By replacing paper tickets with RFID tags that interface with other systems, information can be custom tailored to each passenger. For example, a passenger with children could be directed to the children's play areas in the concourse and later notified of impending boarding times; eliminating the necessity of waiting in designated areas. Lastly, the layout of the airport allows for simple and efficient navigation through each of the program spaces and reduces the average walking distance from the curb side to the aircraft to under 800 feet.

To maintain the highest possible level of security while minimizing invasive procedures, a Modular transporter concept is adopted that integrates security protocol with transit to the concourse, affording many benefits. Passengers and personnel board 6-person transport units, which reduce lines, provide

a greater period of time to scan individual passengers without interfering with travel times, minimize the effects of complications during scanning procedures, and diminish damages in the event of foul play. The layout of the system allows for a physical separation of functional elements, isolating valuable assets and allowing for efficient management of emergency situations. Finally, RFIDs, biometric systems, and other emergent technologies are employed in a manner that provide the highest possible levels of security while minimizing negative effects on passengers.

Above all else, the airport is established as a definitive place through a number of qualitative measures. A simple, consistent material pallet and dramatic forms produce a unique identity for the airport and the community. The side-by-side configuration of the ticketing and baggage halls, as opposed to the conventional staked format, provide equally dramatic entry and exit sequences for the airport. A number of new program elements such as an art gallery, interior gardens, public lounges, children's play areas, and a among others broaden the services offered by the concourse, transforming waiting times into recreation periods. The main circulation corridor of the concourse undulates in response to program elements, producing a meandering path punctuated by a series of larger gathering spaces and serviced by an even distribution of program that comes to resemble the urban character of a main street. Lastly, the spaces defined by the interior surface produce a variety of rooms; allowing for the existence of both highly public and more intimate areas that come to resemble residential living rooms, ultimately improving the comfort of passengers in the airport.

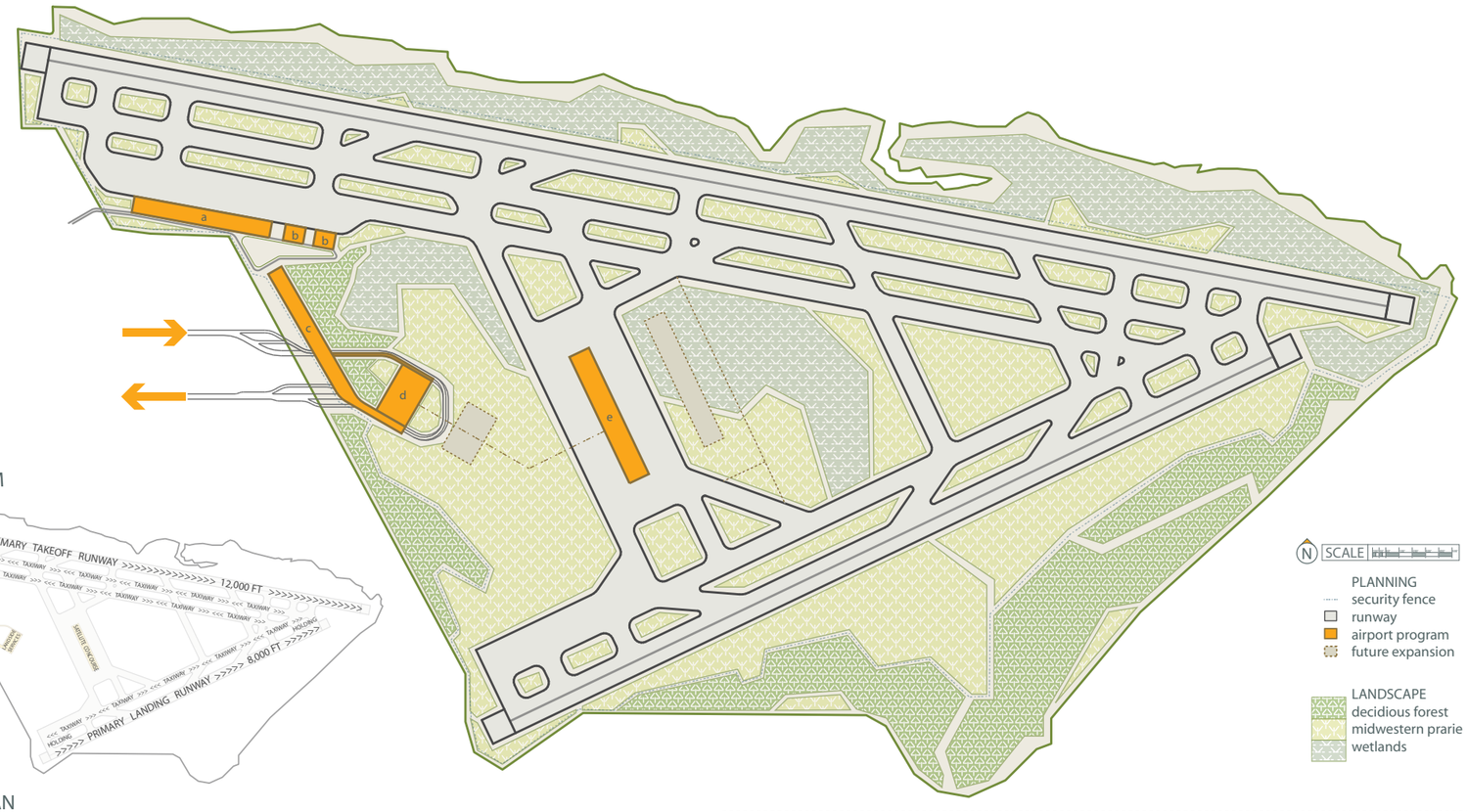
Collectively, these elements bring a sense of pleasure and adventure back to air travel; the burdens commonly associated with this transitional space evolving into an engaging, experiential place.

MASTER PLAN

1. Orients program elements in a manner that is deliberately considerate of the concerns of local communities.
2. Maximizes the expansion and evolution of program elements through the separation of discrete functions.
3. Carefully considers environmental systems, incorporating such elements as green roofs on all program elements.

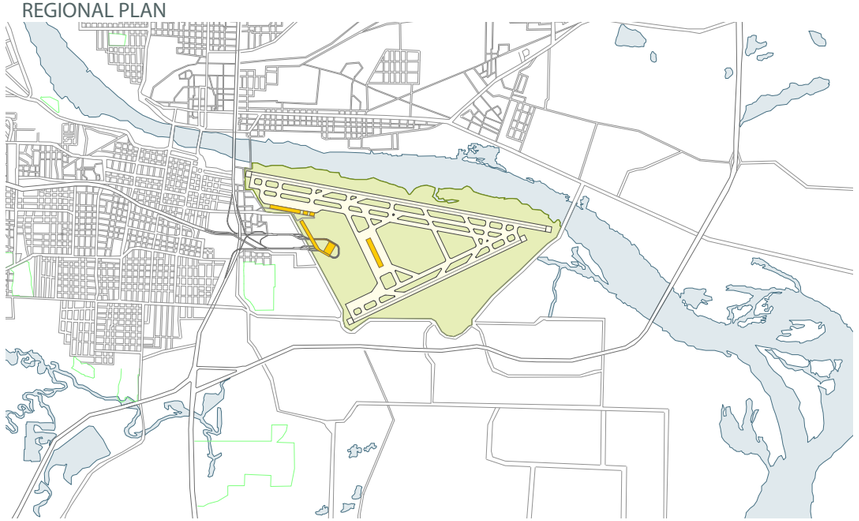
SITE PLAN

a. cargo
b. hangar
c. parking
d. ticketing hall
e. concourse



SITE PROGRAM

REGIONAL PLAN



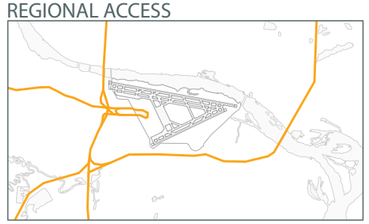
LANDSCAPE

Native deciduous forests produce an audiovisual barrier between the airport and the surrounding community in an attempt to minimize the negative effects of the new airport while contributing to local air quality. The area of forest on the south-eastern corner of the site may also become a public park beyond the secure boundary.

Prairie not only offers extremely low maintenance costs, but also becomes a beautiful display of native species. Furthermore, the resilience of prairie plant varieties makes them ideally suited to absorbing water runoff from runways during storms, naturally filtering water and slowly redepositing it back into the local ecosystem.

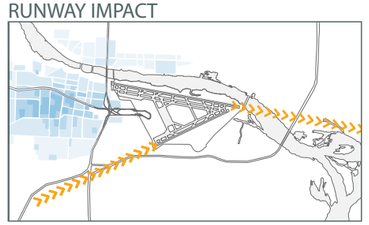
Wetlands contribute to a general green aesthetic while offering the unique ability to naturally process waste water from the concourse and landside buildings. By minimizing waste exports, the airport may begin to offset its exceptionally high emissions.

REGIONAL ACCESS



All major regional roads have direct access to the airport.

RUNWAY IMPACT



The runway layout deliberately avoids flight patterns over the urban core out of a consideration for local residents.

Aircraft Load

Annual	82,125
Peak	124,830
Daily	225

Passenger Load

Annual	10,000,000
Peak	15,000,000
Daily	27,397
Per Flight	120

Passenger Time

Average	17 min
Peak	24 min
With Parking	
Average	22 min
Peak	31 min

Parking Load

Annual	2,500,000
Peak	3,750,000
Daily	6849
Per Flight	30

Ticketing Load

Average	5 min
Peak	8 min
Station Count	
Average	63
Peak	96

Baggage Load

Annual	21,010,475
Peak	30,859,573
Daily	57,563
Per Flight	251

Security Load

Queuing Time	
Average	0 min
Peak	2 min
Idle Time	1 min

SYSTEMS CAPACITY ANALYSIS

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SECURITY TRANS-PORTER SYSTEM EFFICIENCY

Occupied Seats	■ □ □ ■ □ □
Load/UnLoad Time	1m : 43s / 2m : 14s
Scanning Time	1m : 24s

Occupied Seats	■ □ ■ ■ □ ■
Load/UnLoad Time	4m : 02s / 2m : 46s
Scanning Time	2m : 09s

Reasons for the Nomination:

The digital tools here are used as a means of defining the morphology of his project. Tools are used as an abstract means of development and representation, working with flows and particles to define movement and stationary elements within the project.

By working with contours, displacements, and folded sheets, new geometries are created, allowing a smoother interaction between landscape and programme.

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Jury Comments

Great use of the digital tools to both communicate through diagram and rendering as well as produce intricate form with a sensitivity to understanding form's material character. - **Bart Overly**

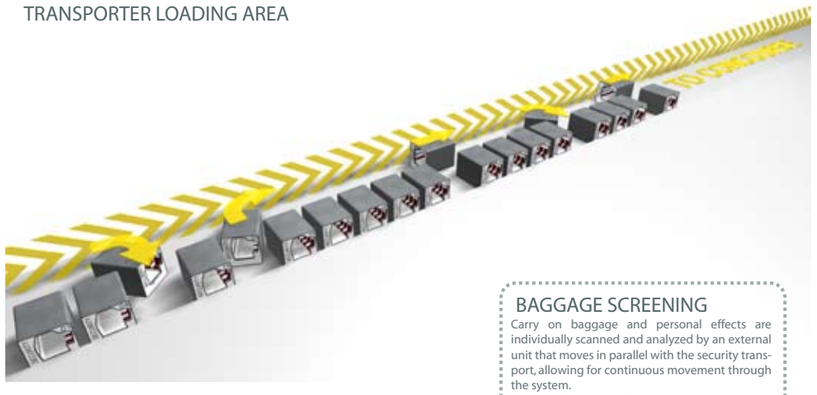
This project is impressive in its scale and the ability of the author(s) to convey design intention. The systematic investigation of security and flow through an airport is rigorous. The forest-like bamboo-clad interior effectively softens what would otherwise be a large sterile non-space. – **Wassim Jabi**

This project displayed a high degree of development and execution that culminated in a well-organized and cohesive presentation. This student used different modes of drawing, modeling and rendering to effectively convey the ideas of the project. Thus, the student displays a command of the media that allows them to formulate and defend their ideas both through execution and presentation – **Victor Martinez**

SECURITY SOLUTION

1. Conceives of security as a series of integrated systems centered on a transporter concept that allow for minimal disruptions and the highest levels of security.
   a. Physically isolates program elements in a manner allowing for the containment and swift suppression of security risks.
   b. Combines security screening with the movement to the satellite concourse, transforming screening into an event.

TRANSPORTER LOADING AREA



INTELLIGENT PROFILING

The paper ticket is replaced with an RFID tag, allowing for the intelligent management of passenger information. The airport effectively becomes a learning system capable of assembling available data to assess the relative risk category of individuals. Risk may be identified through frequent access to the system, building an expandable profile that may be supplemented with data such as who the passenger is traveling with, destination, or other publicly available information. Furthermore, the future integration with other airports and government agency watch lists offers an additional layer of protection over current systems.

VIDEO CONTENT ANALYSIS

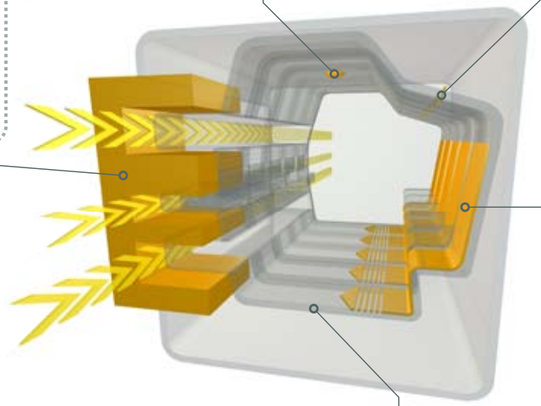
Provides security personnel with the ability to respond more quickly to threats by automating security maintenance procedures using a variety of hardware and software solutions. Applications include camera displacement detection, left or removed object alert, people and crowd counting, motion detection, perimeter intrusion detection, and smoke detection. In the security transports, VCA is utilized to provide a reliable means of identifying potential risks and abnormalities.

ITEMISER TRACE DETECTION

From a small air sample the Itemiser analyzes positive and negative ions, enabling the detection of a broad range of explosives and narcotics. Detection of both positive and negative ions allows for the most effective identification from a single sample. The system is small, efficient and adds a valuable additional layer of narcotics detection to the Millimeter Wave Scan.

BAGGAGE SCREENING

Carry on baggage and personal effects are individually scanned and analyzed by an external unit that moves in parallel with the security transport, allowing for continuous movement through the system.
Utilizing X-ray diffraction technology in conjunction with in line imaging systems, all baggage is thoroughly analyzed for all standard contraband and explosives.

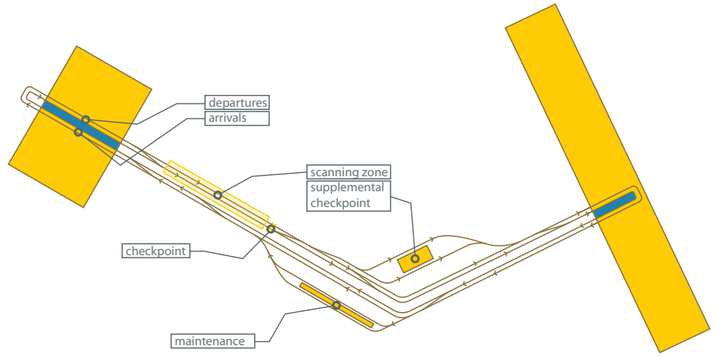


MILLIMETER WAVE SCAN.

Utilizes a passive detection medium produced through analysis of electromagnetic wave energy that ranges from 1 mm to 10 mm wavelength and 30 to 300 GHz in frequency.
Unlike traditional X-rays Millimeter Wave Scanning is radiation free thereby posing no risk to humans. Additionally, dielectric materials such as plastics, ceramics, and organic materials that are not visible to traditional X-ray technologies will cause some reflection , and transmission of the waves, so they will be seen as partially transparent.
In conjunction with software solutions related to VCA, any object contrasting the human body may be identified and flagged through analysis of density, temperature and reflectivity readings, thus passively identifying any unforeseen objects. Identification and risk assessment is subsequently performed to determine if additional screening is necessary.

SECURITY SYSTEM FUNCTION

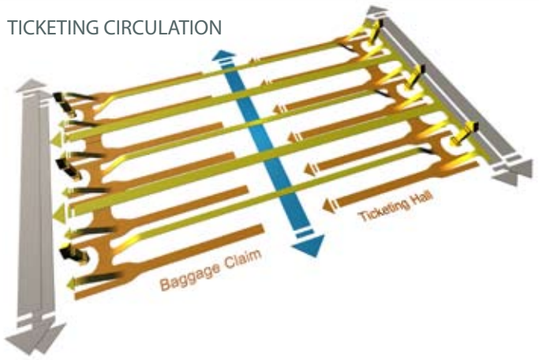
Security screening processes are conceived as an automated linear system. Upon departure from the transporter loading area in the ticketing hall, passengers and their baggage are scanned by a comprehensive array of existing and adapted technologies. If all passengers are cleared, than the transporter proceeds directly to the concourse. If additional precautions are required, the transporter will be redirected to the supplemental checkpoint, minimizing the impact of screening complications.



BLAST CONTAINMENT

In the event of an explosion in one of the security transports, a blast proofing layer is used to minimize injury and disruption of airport operations. This dual layered, blast mitigation assembly conforms to the interior envelope of the security transport. Volcanic glass beads, thermo-formed into pockets resembling bubble wrap, are contained in a protective layer of plastic. In the event of an explosion the bubbles collapse adsorbing the shock of the blast while the volcanic glass beads serve as an extinguishant, suppressing the fireball.

TICKETING CIRCULATION



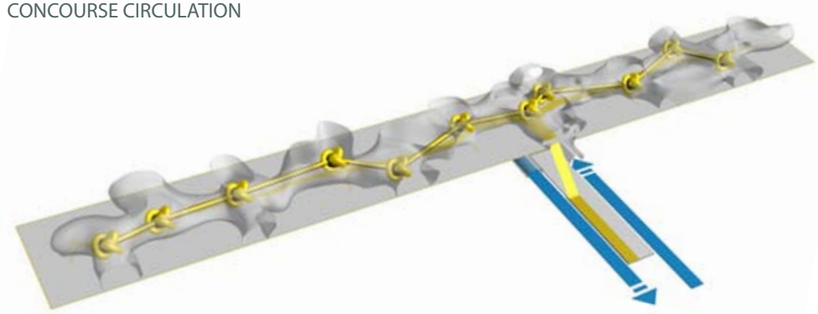
CIRCULATION

The flow of passengers, personnel, and baggage occurs in a legible, forward manner that facilitates efficient navigation and maximum capacities.

In the ticketing hall (left), passengers have a direct line of sight and movement to the security transports (blue arrow) and to the door from the transports upon arrival.

The concourse (right) becomes a series or urban nodes connected by a meandering path that facilitates a fluid movement of passengers through the airport.

CONCOURSE CIRCULATION



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MATERIALS + METHODS

A minimal set of sustainable finish materials helps to articulate a specific visual identity for the airport.

- Bamboo slats clad the interior surface of the concourse and the roof of the Landside architecture, aiding acoustic dampening and producing a legible direc tional flow throughout the airport.
- Resin coated concrete produces a resilient floorplate that may be imbedded with geothermal heating and cooling devices.

The structural system utilizes cast-in-place concrete for foundations and service levels to support a lightweight steel shell above.

SATELLITE CONCOURSE

1. Abandons the traditional structural bay in favor of an intersection between an organic interior skin, and an orthogonal structural envelope.
   a. Caters to the efficiencies, behaviors, and scale of people on the interior.
   b. Provides the highest levels of technical flexibility while streamlining operations for aircraft on the exterior.
   c. Produces a variety of spaces ranging in scale and intimacy that, with the introduction of a variety of new program elements such as an art gallery, interior gardens, children's play areas, public lounges, and a spa, restores a sense of adventure to travel.

CONCOURSE PLANS

SCALE

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a. airline lounge
b. art gallery
c. chapel
d. children's play area
e. green space
f. mechanical
g. offices
h. spa

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i. cafe
j. e-lounge
k. food services
l. gate lounge
m. retail

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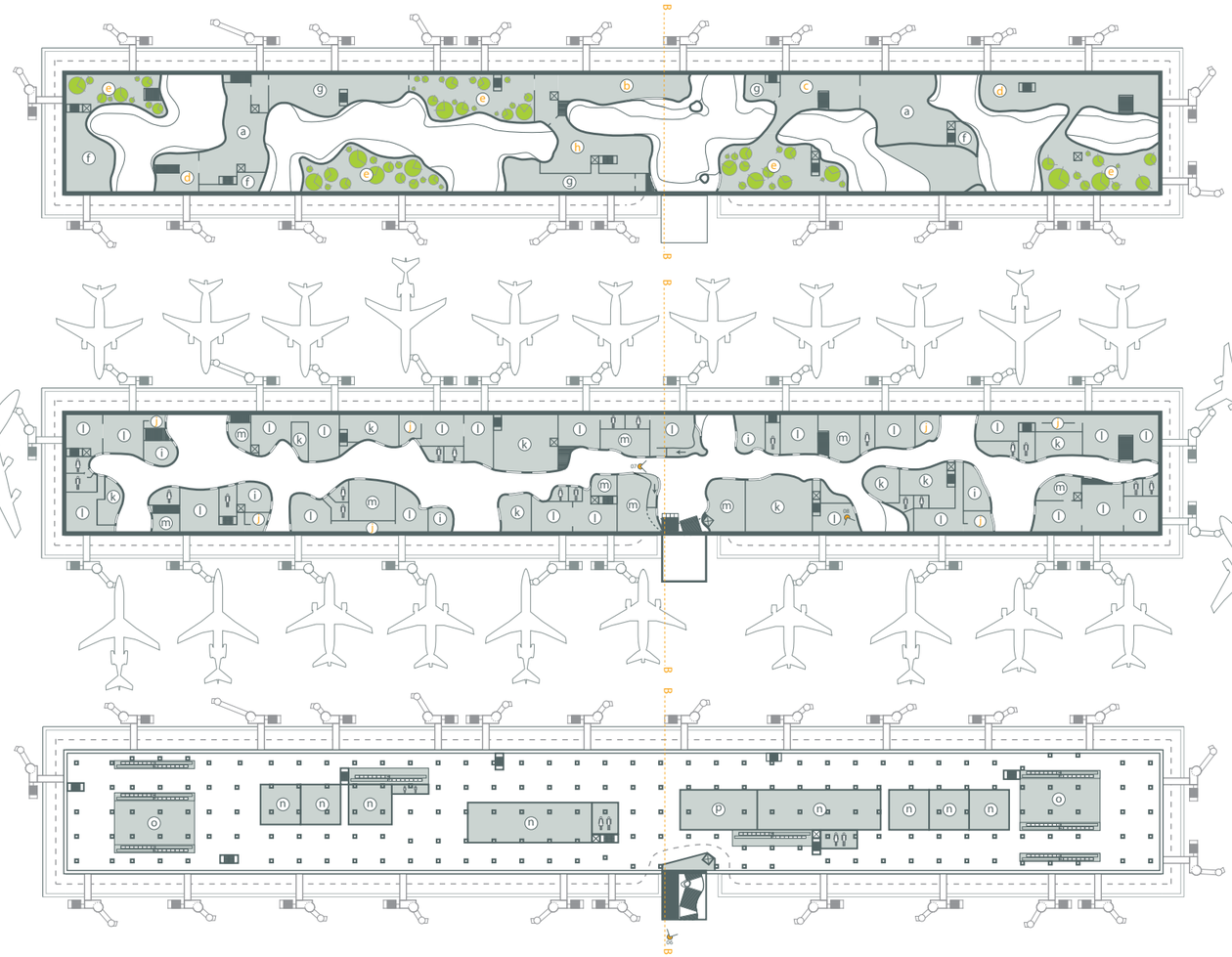
n. airline ramp offices
o. baggage make up
p. workshop

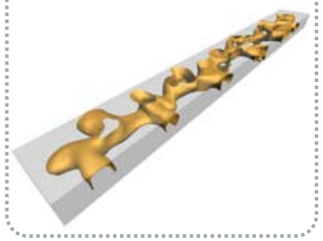
perspective

orange text identifies program not alotted in the brief

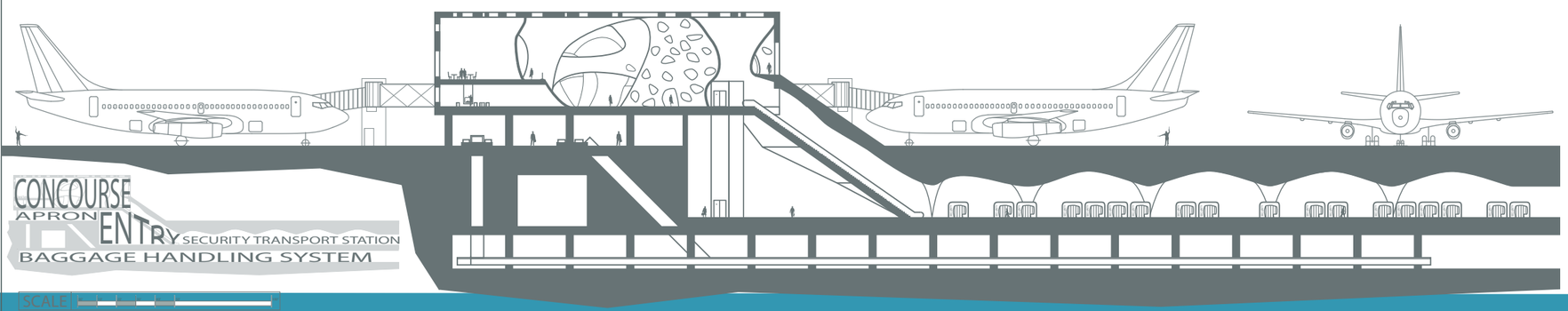


FORM.

The blob is manifested as an internal circulation void defined by program solids that occupy the interstitial spaces between blob and box.



SECTION B-B



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