



Chapter Five

RECOMMENDED PLAN

Grand Canyon

NATIONAL PARK AIRPORT

TERMINAL AREA PLAN

CHAPTER FIVE

RECOMMENDED PLAN

The previous chapter outlined the alternatives process undertaken that has evolved into a recommended concept for future terminal area development. This chapter further refines and defines the recommended development that is designed to meet projected air tour and destination demands up to as much as one million annual enplanements.

The recommended plan includes a new terminal building, with adjacent access and parking, and the ability to accommodate both monorail and rail access should others decide to develop these transportation modes to access the Grand Canyon National Park (GCN) in the future. Space is also planned for additional general aviation development as well as an aircraft maintenance facility, should the need arise. The

sections below further discuss the recommended plan beginning with the focal point, the passenger terminal building.

TERMINAL BUILDING

The recommended terminal building plan combines aspects of all three alternatives for flexibility to respond to actual demand. This will allow phasing of the project and implementation of security screening as needs may change in the future. The following describes the plan:

SITE DESIGN

As depicted on **Exhibit 5A**, the new Grand Canyon National Park Airport



terminal site layout locates the new terminal building along the flight line and in close proximity to midfield of the active runway. It is directly north of the existing elevated air traffic control tower (ATCT) and northeast along the flight line from the recently constructed Operations/ARFF facility. This location serves to provide greater separation between general aviation and commercial service uses for security and functional purposes. It also makes better use of the expansive parking apron that is available. As shown, the destination airline aircraft are grouped around the main building while air tour aircraft can be parked northeast along the ramp, with an electric vehicle access route taking passengers from the terminal to standalone “kiva pod” departure lounges to await their small fixed wing tour flights.

The new terminal building expansion axis is developed parallel with the active runway and is designed to expand in linear fashion as future out-year expansion needs arise. The new terminal building would be located further to the south of tour helicopter flight operations and further south of the existing outdated terminal building.

Exhibit 5B depicts a larger scale version of the terminal building site plan, while **Exhibit 5C** presents a cross section of the site. The natural slope of the existing topography facilitates a two-level terminal design solution with outgoing and incoming baggage handling in the lower level of the new terminal building. Future monorail

passenger operations, and even a future railroad spur expansion, are accommodated in the terminal site design for passenger/tourist convenience. It is understood that these two elements will be dependent upon development by other entities, but the site plan demonstrates the ability of the terminal to adapt to these potential multi-modal opportunities.

The parking needs of the planning period can be accommodated first with surface parking, and ultimately with a future vertical structure that would serve to minimize the parking footprint. Three major transportation elements of air, rail, and monorail have the potential to come together in dramatic fashion at the new Grand Canyon National Park Airport terminal building. Although the master plan incorporates numerous transportation elements, the design allows for the development of the terminal and primary vehicular circulation as a standalone component that would not be adversely affected if the monorail and rail stations never come to fruition.

ARCHITECTURE

The overall design intent for the new terminal is to create a modern, flexible, and efficient terminal building that provides a dramatic and unique passenger experience, while being sensitive to the architectural character of the newly built existing Operations/ARFF facility and the surrounding natural environment of the Kaibab National Forest and Grand Canyon

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LEGEND

- Ultimate Building
- Ultimate Road/Parking
- Park Monorail
- Pavement To Be Removed

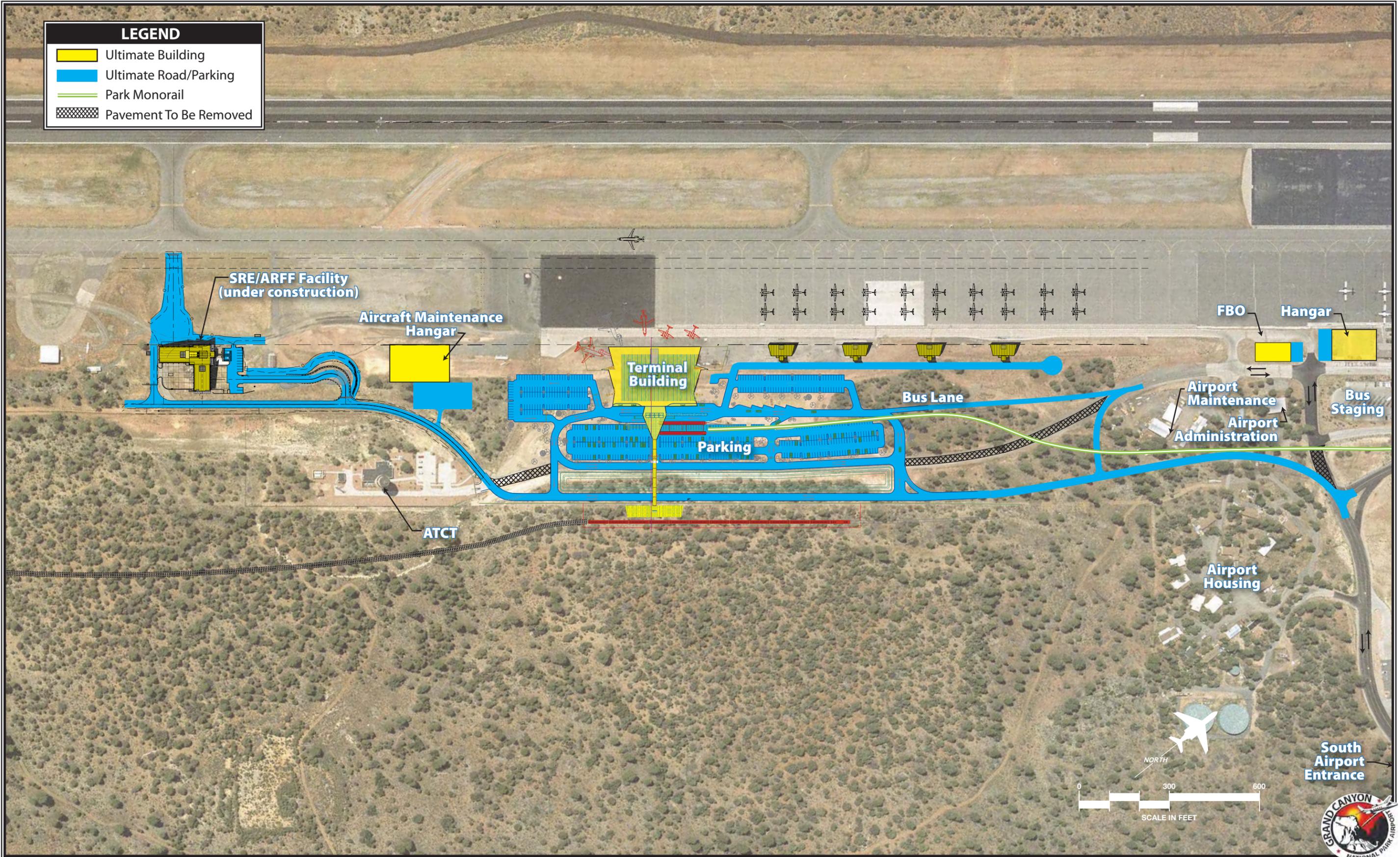
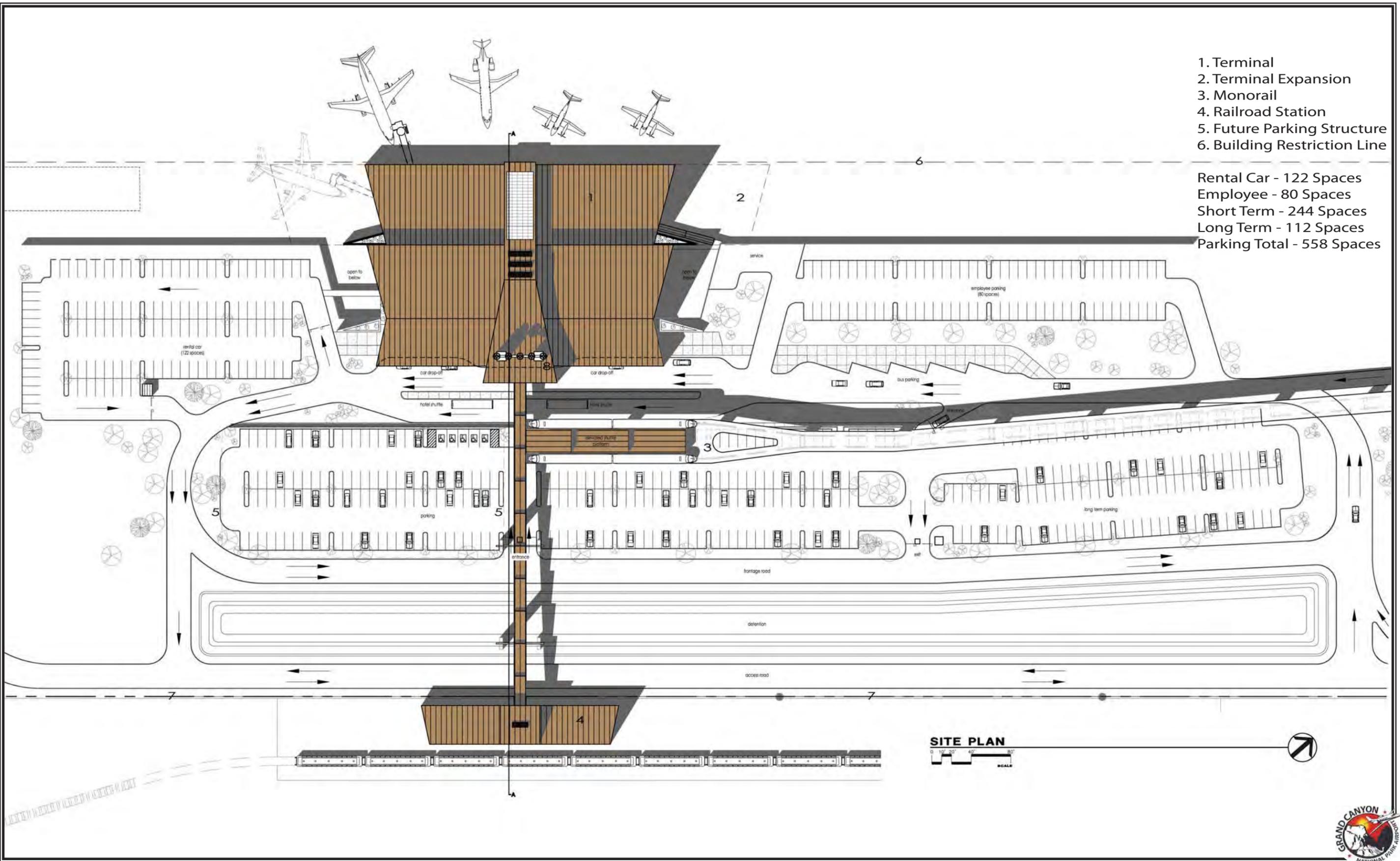


Exhibit 5A
SOUTH TERMINAL
AREA CONCEPT



- 1. Terminal
- 2. Terminal Expansion
- 3. Monorail
- 4. Railroad Station
- 5. Future Parking Structure
- 6. Building Restriction Line

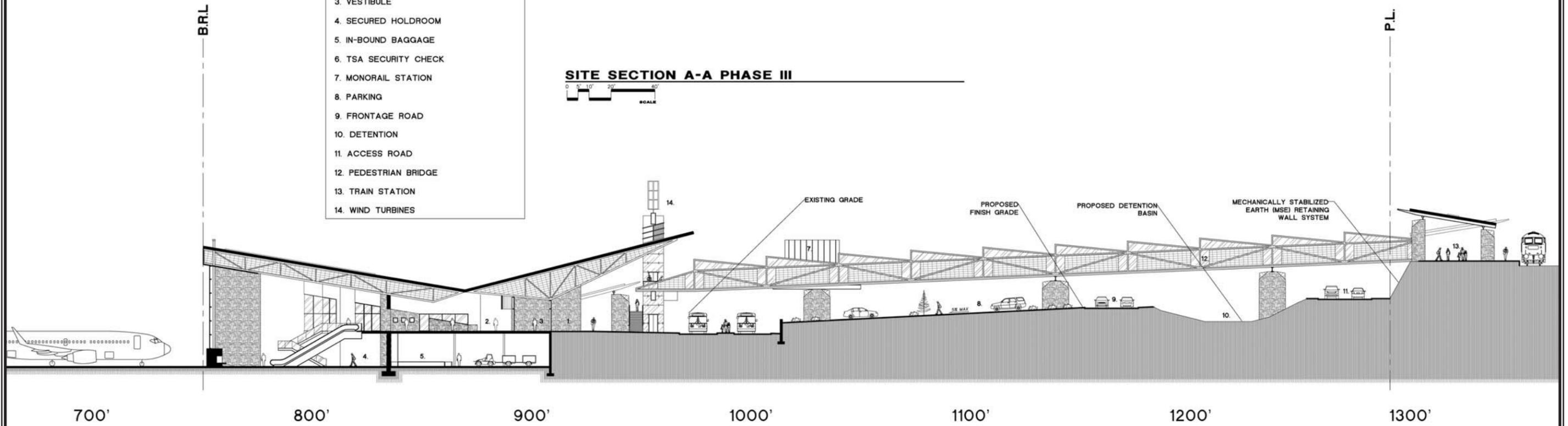
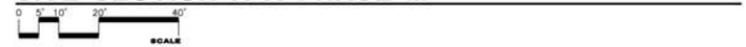
Rental Car - 122 Spaces
 Employee - 80 Spaces
 Short Term - 244 Spaces
 Long Term - 112 Spaces
 Parking Total - 558 Spaces

SITE PLAN
 0 10' 20' 40' 80'
 SCALE



SPACE KEY	
1.	ENTRANCE
2.	UNSECURED LOBBY
3.	VESTIBULE
4.	SECURED HOLDROOM
5.	IN-BOUND BAGGAGE
6.	TSA SECURITY CHECK
7.	MONORAIL STATION
8.	PARKING
9.	FRONTAGE ROAD
10.	DETENTION
11.	ACCESS ROAD
12.	PEDESTRIAN BRIDGE
13.	TRAIN STATION
14.	WIND TURBINES

SITE SECTION A-A PHASE III



National Park area. Airport campus architecture with common materials and design concept is the focus of the sustainable architecture proposed for the new GCN terminal. With the goal of achieving LEED certification, the “green terminal building” will incorporate numerous sustainable building strategies including: solar photo voltaics, solar hot water, natural daylight harvesting, water harvesting, sustainable site strategies, low flow plumbing fixtures, low emitting and recycled materials, and wind energy opportunities.

A deliberate 30-foot column grid “square” facilitates optimum repetitive construction techniques and allows future expansion in an orderly way. Expansive vistas are maximized by the tall vertical glass curtain wall along the hold areas/flight line which provide dramatic views mainly to the north–northwest and out to the airfield for a great aviation experience of arriving and departing aircraft. Corten rusting steel, natural masonry, insulated glass, insulated energy conserving semi-transparent Kalwal, and natural regional stone make up the main palette of materials for the new terminal building. The form and spatial qualities of retail and food and beverage spaces metaphorically relate to the organic form of the Grand Canyon and Colorado River. A destination feature restaurant space open to both air travel passengers and the general public will provide a truly inspiring experience for both passengers and the general public. The restaurant overlooks the dramatic passenger hold areas and has expansive views to the

airfield. The lower level hold rooms incorporate a central axis fireplace at the focus of stairs and escalators contributing to the unique airport experience. **Exhibits 5D** and **5E** display a variety of schematic views of the terminal building and the site architecture.

TERMINAL FLOOR PLAN

The terminal building is designed so that it can be built in phases. The main and lower levels for Phase I are presented on **Exhibits 5F** and **5G**, respectively. The initial building would encompass 41,005 square feet with 19,180 square feet on the main level and 21,825 square feet on the lower level. This would be adequate to accommodate the short term planning horizon of at least 500,000 annual enplanements (450,000 air tour and 50,000 destination passengers).

As travelers enter the building on the main level, ticketing is to the right and baggage claim is to the left. Restrooms are also located next to the ticketing area. Straight ahead is an open view through the building to airside glass and the fireplace. Along the front wall of the building are waiting areas, rental car counters, and a baggage service office.

On the left side of the grand entryway is the security checkpoint leading to the secure departure gates. First and second level departure areas are available as well as an elevator and stairs to traverse the two levels. A small vending area is included on the

second level as well as restrooms on both levels.

Passengers and visitors alike can walk through the hallway to the escalators to enjoy the view. They will find a restaurant and bar to the right overlooking the lower level. The non-secure lower level can be accessed by escalator, elevator, or stairs. A non-secure departure lounge is located on the lower level primarily for air tour airlines. Air tour passengers may be led to the ramp to their aircraft or to an electric vehicle that will transfer them down the flight line to a weatherized “kiva pod” prior to their flight.

The lower level also includes TSA (Transportation Security Administration) offices and checked baggage inspection facilities, as well as bag make-up and an inbound baggage drop. The building mechanical and airline operations space is also located on the lower floor.

The Phase II plan is depicted on **Exhibits 5H** and **5J**. Under Phase II, the terminal would be increased to 72,741 square feet with the building extended to the north and south. This would accommodate at least the intermediate planning horizon level of approximately 665,000 annual enplanements, including 550,000 air tour enplanements and 115,000 destination enplanements.

The extensions essentially allow for increased space for all the basic functions. It also increases the space available for retail and other conces-

sions. Should traffic increase beyond the intermediate planning horizon, the building can be further expanded as depicted by the dashed lines on **Exhibit 5B** to accommodate the long range planning horizon of at least 1.0 million annual enplanements. Should the monorail or train station be developed, a skywalk feature for pedestrian access over the parking lot and all terminal roadways can be built in. The following section further discusses the terminal access and parking.

TERMINAL BUILDING ACCESS AND PARKING

The terminal building site plan on **Exhibit 5B** depicts a large scale view of the parking plan and terminal access road system. As presented, the parking plan provides 558 total parking spaces as surface parking. The main lot across the terminal road from the terminal would provide up to 356 vehicle spaces. A rental car ready/return lot is located on the south side of the terminal which is designed for up to 122 spaces. The employee lot on the north side has 80 spaces.

This would be adequate to serve the combination terminal through the intermediate planning horizon. Should activity exceed that level, a parking structure is planned for the main lot in front of the terminal that would meet the long range planning horizon of 1.0 million annual enplanements. At the same time, the footprint of the parking lot would not be increased.



site section
0 8 16 32

grand canyon national park airport terminal



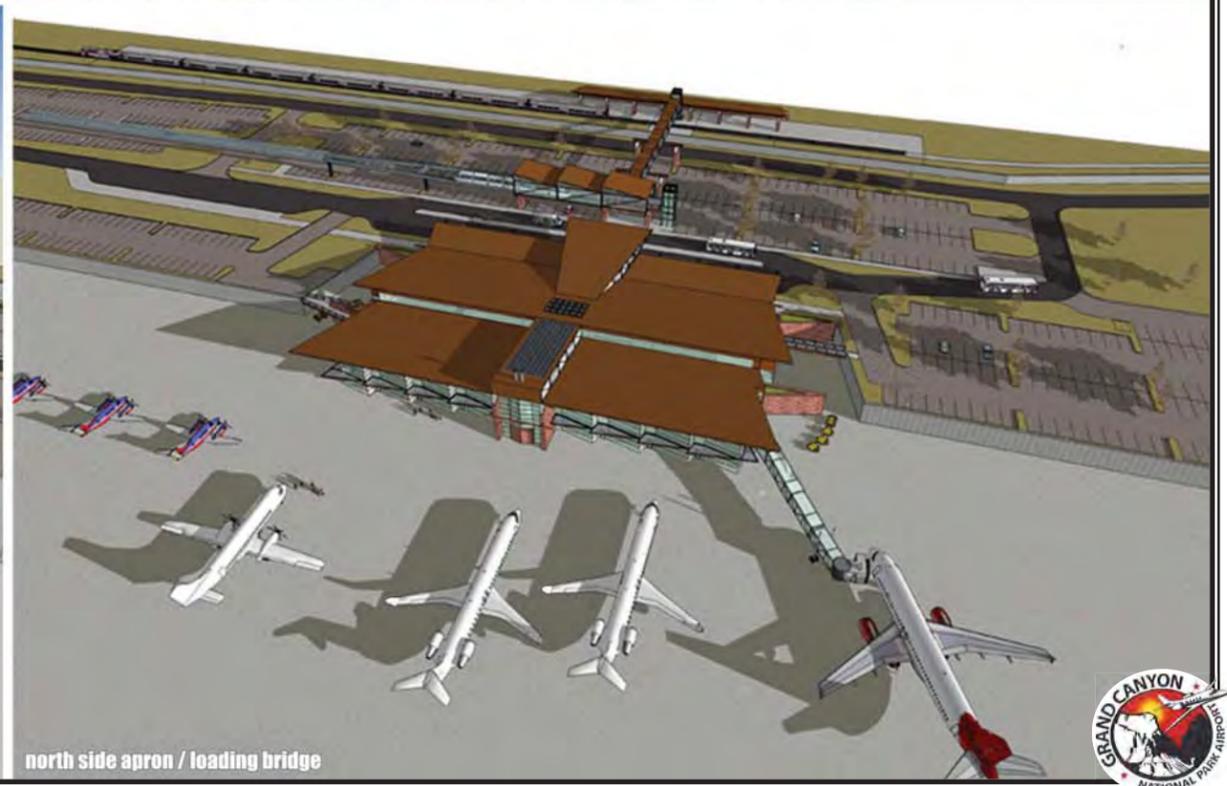
view towards north



terminal / elevated shuttle



north side terminal



north side apron / loading bridge

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north elevation

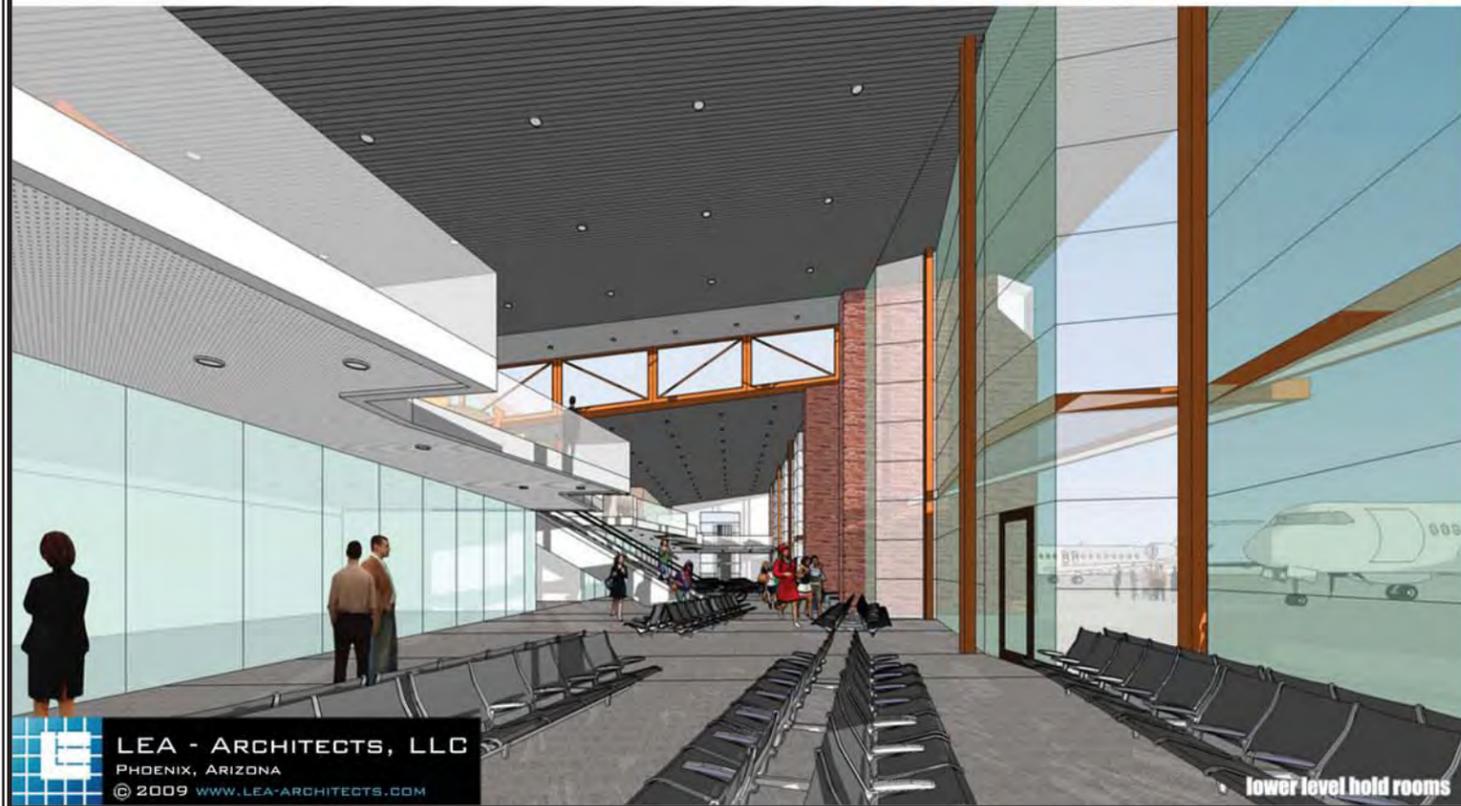


view to holding rooms + flight line



terminal + rail + monorail

grand canyon national park airport terminal



lower level hold rooms

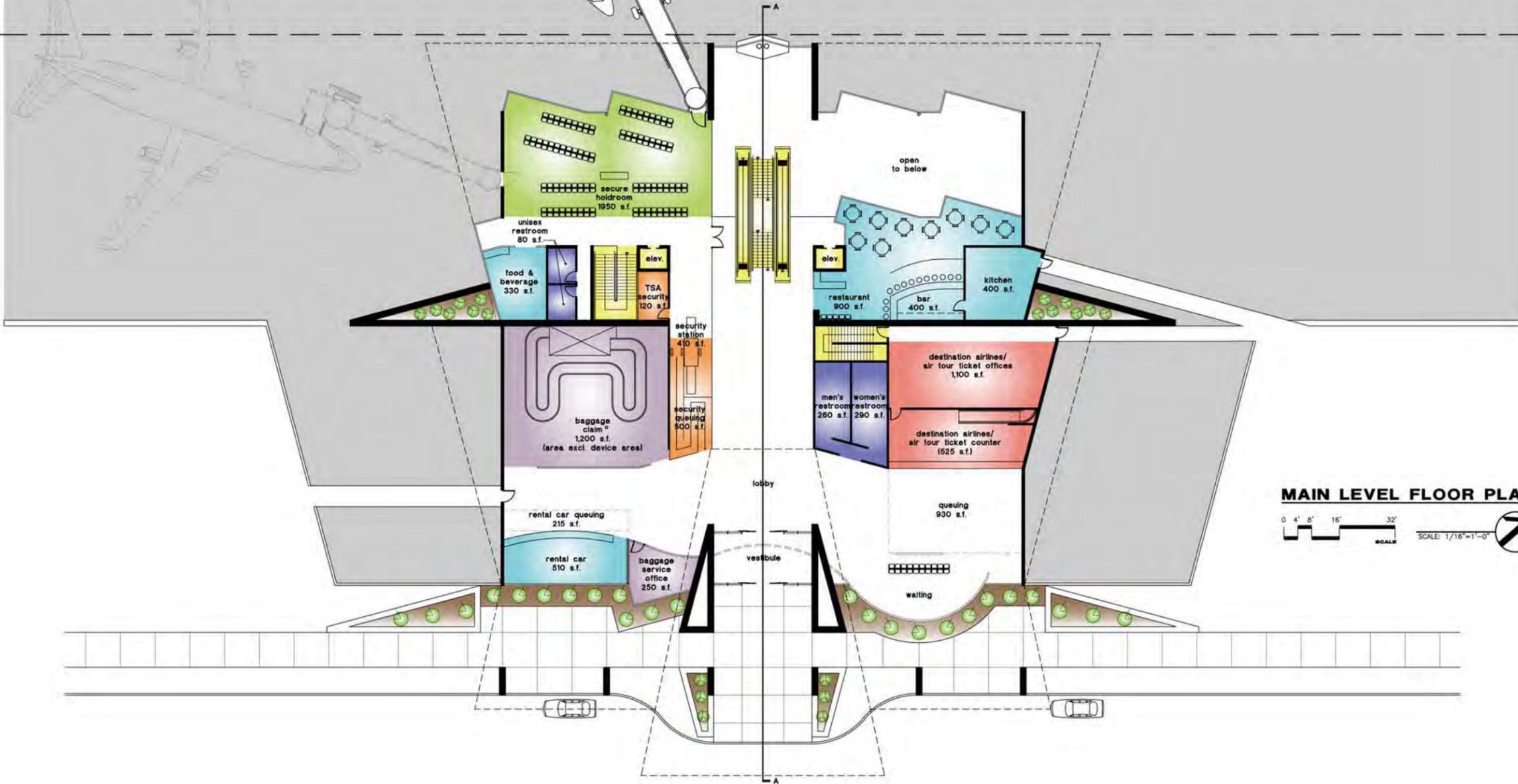
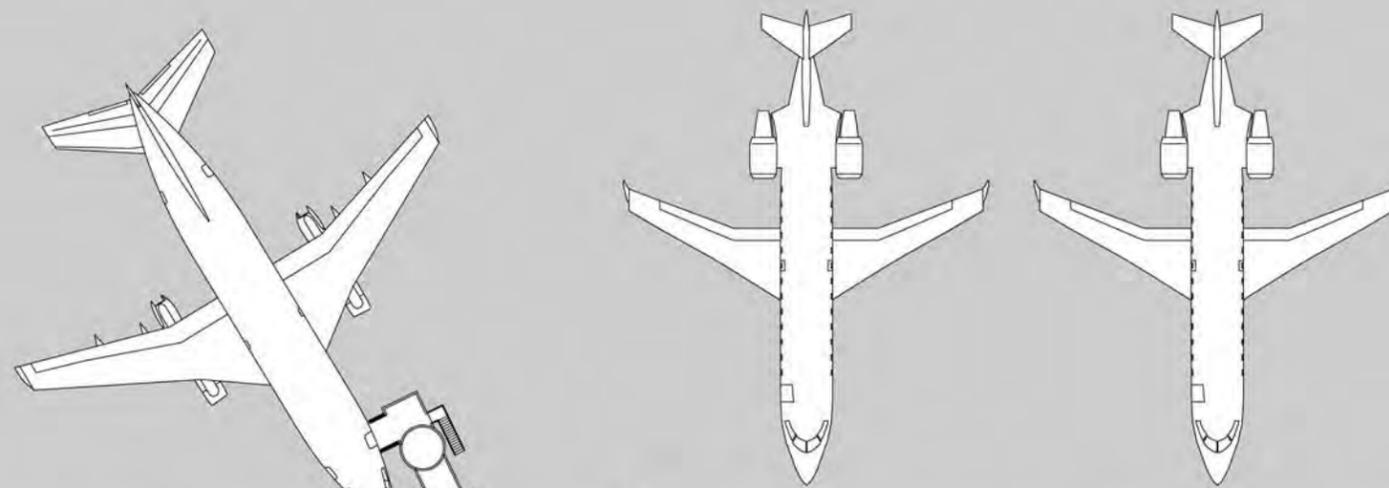


view from

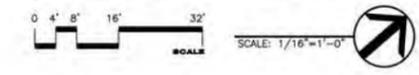
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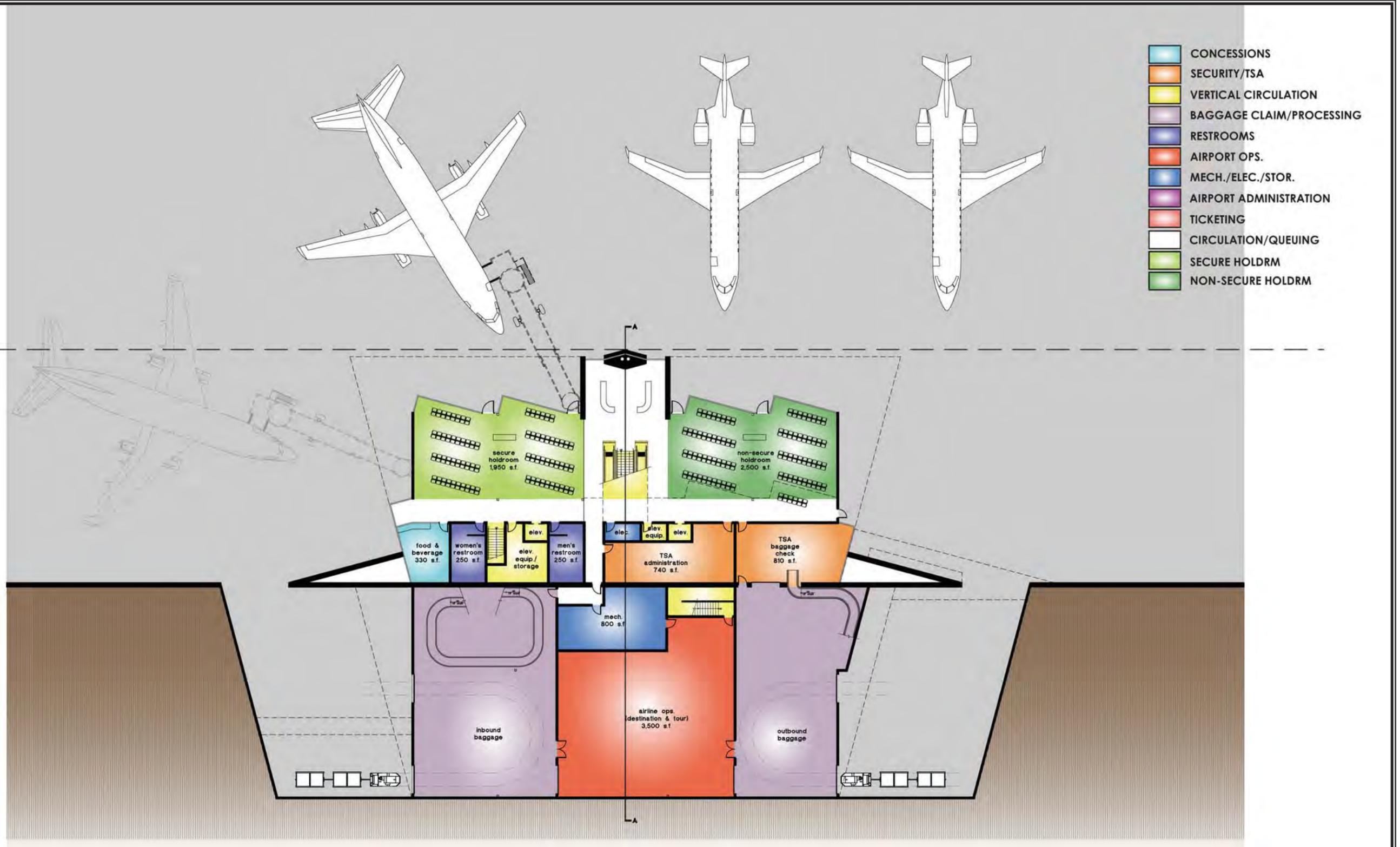


- CONCESSIONS
- SECURITY/TSA
- VERTICAL CIRCULATION
- BAGGAGE CLAIM/PROCESSING
- RESTROOMS
- AIRPORT OPS.
- MECH./ELEC./STOR.
- AIRPORT ADMINISTRATION
- TICKETING
- CIRCULATION/QUEUING
- SECURE HOLDRM
- NON-SECURE HOLDRM



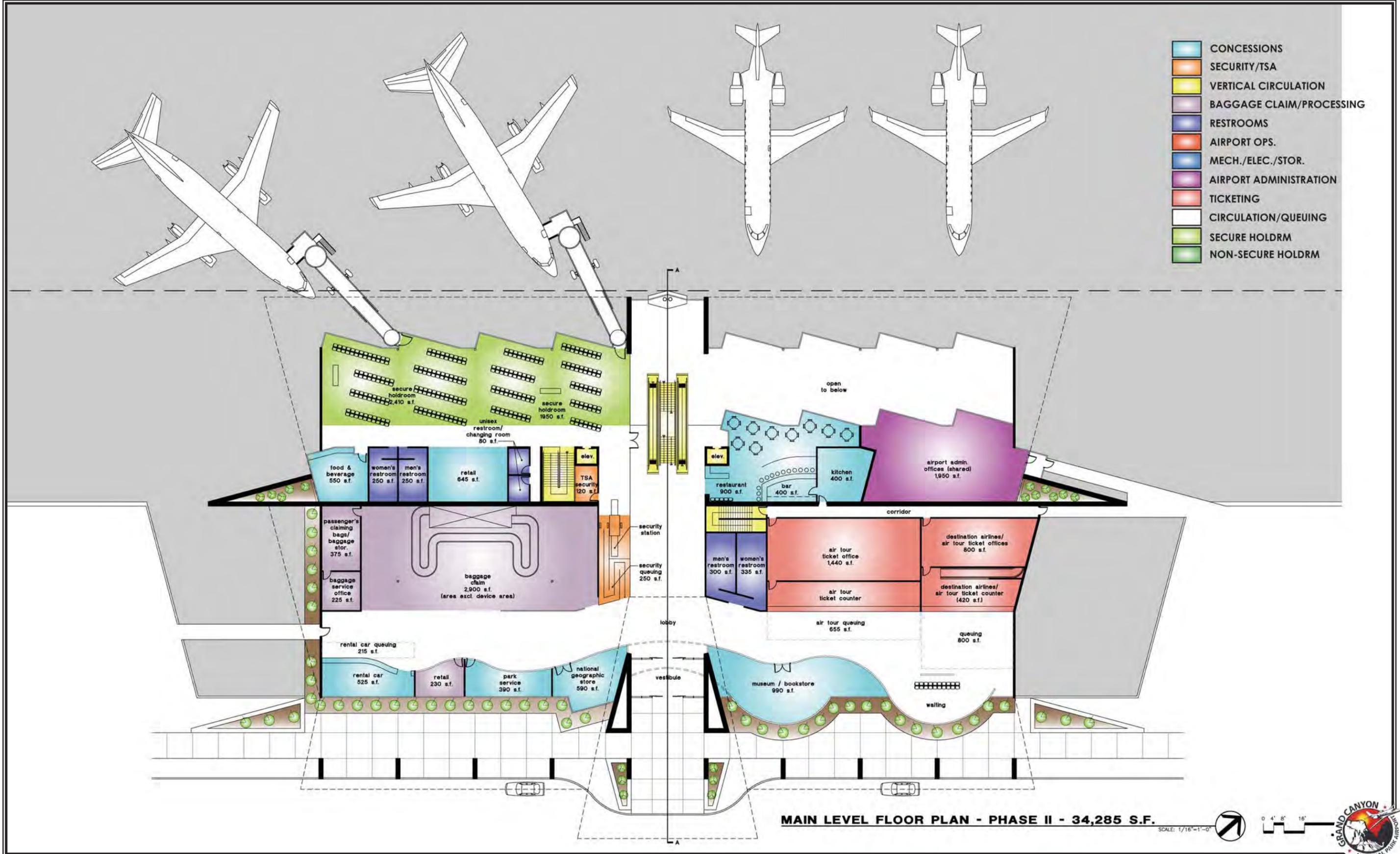
MAIN LEVEL FLOOR PLAN - PHASE I - 19,180 S.F.

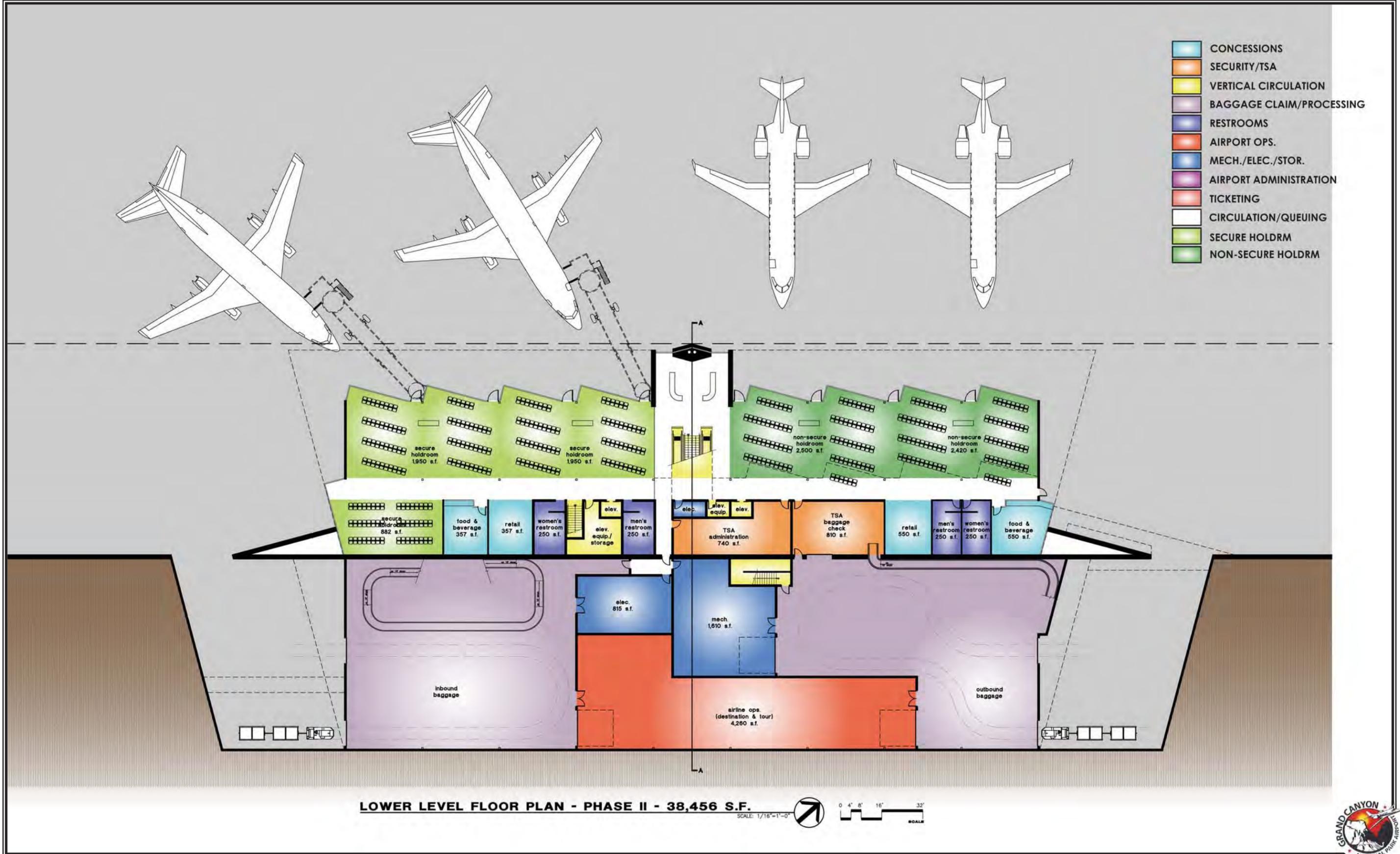




LOWER LEVEL FLOOR PLAN - PHASE I - 21,825 S.F.
 SCALE: 1/16"=1'-0"
 0 4' 8' 16' 32'
 SCALE







LOWER LEVEL FLOOR PLAN - PHASE II - 38,456 S.F.



As demonstrated on **Exhibit 5K**, terminal access can be developed in stages in concert with the parking lot. The lots directly in front of the terminal would be developed first, along with the rental car lot and possibly a portion of the employee lot. The initial terminal access would utilize the current roadway that provides access to the ATCT and the Operations/ARFF facility. A one-way road would be developed from the roadway that would run past the terminal in a counter-clockwise direction before intersecting again with the through road.

As traffic increases, an internal loop road could be developed and the through road relocated further to the east near the property line. In addition, a bus lane could be developed that would provide a more direct route for buses coming from the staging area in the existing terminal parking lot.

TERMINAL AREA PLAN

Exhibits 5A and **5L** present the terminal building plans in concert with the rest of the terminal area south (**Exhibit 5A**) and north (**Exhibit 5L**). South of the terminal areas is the new Operations/ARFF facility, as well as a location recommended for an aircraft maintenance hangar. This hangar could serve as a single airline maintenance facility, or as a contract facility for both airlines and general aviation aircraft.

To the north of the new terminal building, the focus will become general aviation and ground transportation staging. The parking lot and the existing terminal could be converted to serve these uses. A second FBO and hangar are also planned immediately south of the old terminal.

The resulting flight line would become more evenly spaced along the apron beginning with general aviation services along the north portion, commercial service in the mid-portion, followed by aircraft maintenance, and airfield support. At the far south end would remain the National Park Service hangar.

Exhibit 5L also depicts the proposed revisions to the on-airport roadway system. The north entrance and access system remains the same through the existing terminal area. As commercial service traffic to the new terminal increases, the south entrance roadway would be realigned to provide more direct access to the new terminal. This design allows a terminal loop to be developed, but also allows two-way access to remain from the south entrance to all other areas within the terminal area. Subsequently, anyone entering the airport at the north entrance will still be able to access the entire terminal area as well.

Under the plan, the helicopter air tour lease areas remain fully intact with full access to the road system, including the new terminal.

TERMINAL DEVELOPMENT COSTS

Table 5A outlines the Phase I cost estimate for the terminal building, its access, and parking. **Table 5B** outlines the Phase II costs. The costs do not include the monorail, the railroad, or the other facilities. It is anticipated that these would be either developed privately, by other government agencies, and/or under leases with the airport.

Phase I development for the new terminal is estimated at \$18.77 million. Phase II expansion costs are estimated at \$15.47 million for a combined cost of \$34.24 million.

The cost estimates are in 2009 dollars and include all site improvements, the terminal building, and airport-owned equipment and furnishing for the buildings, as well as anticipated professional design and construction inspection fees.

LEGEND

- Short Term Development
- Long Term Development
- Park Monorail
- Pavement To Be Removed

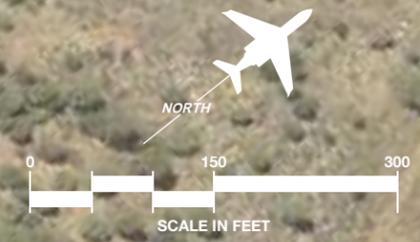
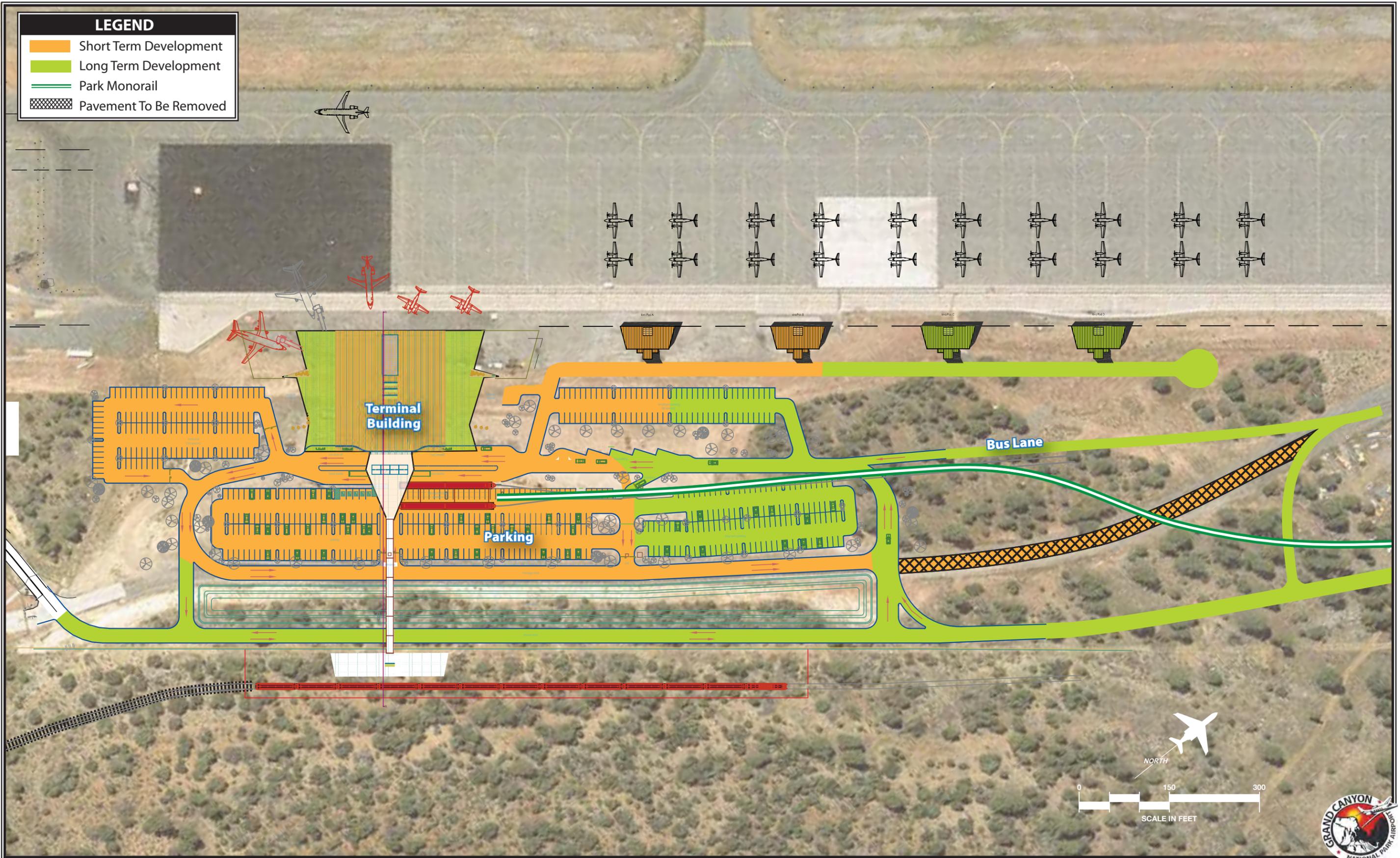




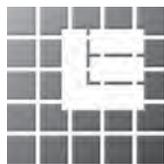
TABLE 5A**Phase I Terminal Cost Estimate**

No.	Item	Unit	Quantity	Unit Price	Total
A	Site Improvements				
1	Traffic Control and Barricading	LS	1.00	\$25,000.00	\$25,000.00
2	Stormwater Pollution Prevention	LS	1.00	30,000.00	30,000.00
3	Miscellaneous Removals and Other Work	LS	1.00	37,500.00	37,500.00
4	Miscellaneous Drainage	LS	1.00	37,500.00	37,500.00
5	Unclassified Excavation (Hard Dig)	CY	150,000.00	15.00	2,250,000.00
6	Clearing and Grubbing	AC	11.00	900.00	9,900.00
7	Subgrade Preparation	SY	39,000.00	4.00	156,000.00
8	6" Aggregate Base Course (MAG Spec)	SY	18,000.00	13.00	234,000.00
9	3" Asphaltic Concrete (MAG Mix)	SY	18,000.00	20.00	360,000.00
10	Bituminous Prime Coat	SY	18,000.00	1.00	18,000.00
11	Soil Sterilant	SY	18,000.00	2.00	36,000.00
12	Catch Basin	EA	14.00	5,000.00	70,000.00
13	24" Storm Drain Pipe	LF	1,675.00	100.00	167,500.00
14	36" Storm Drain Pipe	LF	800.00	150.00	120,000.00
15	Concrete Curb	LF	8,900.00	19.00	169,100.00
16	Pavement Marking	LS	1.00	12,500.00	12,500.00
17	Handicapped Marking	EA	10.00	1,000.00	10,000.00
18	Handicap Ramp	EA	4.00	4,000.00	16,000.00
19	New Waterline	LS	1.00	125,000.00	125,000.00
20	New Sewer Line	LS	1.00	200,000.00	200,000.00
21	New Electric Service	LS	1.00	150,000.00	150,000.00
	Subtotal				\$4,234,000.00
B	Terminal Improvements				
1	Terminal	SF	41,005.00	\$250.00	\$10,251,250.00
	Subtotal				\$10,251,250.00
C	Terminal Equipment and Furnishings				
1	Signage	LS	1.00	\$125,000.00	\$125,000.00
2	Baggage Make-up	LS	1.00	20,000.00	20,000.00
3	Baggage Claim	LS	1.00	300,000.00	300,000.00
4	Loading Bridge	EA	1.00	350,000.00	350,000.00
5	FIDS (Flight Information Display System)	LS	1.00	130,000.00	130,000.00
6	Security	LS	1.00	200,000.00	200,000.00
7	Furniture	LS	1.00	130,000.00	130,000.00
8	Contingency	10%			125,500.00
	Subtotal				\$1,380,500.00
D	Professional Fees				
1	A/E	12%			\$1,903,890.00
2	Geotechnical Investigation	LS	1.00	\$40,000.00	40,000.00
3	Testing & Inspections	LS	1.00	60,000.00	60,000.00
4	Construction Management (Terminal)	6%			697,905.00
5	Construction Management (Site Improvements)		1.00	200,000.00	200,000.00
	Subtotal				\$2,901,795.00
E	Totals				
A	Site Improvements				\$4,234,000.00
B	Terminal Improvements				10,251,250.00
C	Terminal Equipment and Furnishings				1,380,500.00
D	Fees				2,901,795.00
	Total Phase I				\$18,767,545.00

TABLE 5B					
Phase II Terminal Cost Estimate					
No.	Item	Unit	Quantity	Unit Price	Total
A	Site Improvements				
1	Traffic Control and Barricading	LS	1.00	\$25,000.00	\$25,000.00
2	Stormwater Pollution Prevention	LS	1.00	60,000.00	60,000.00
3	Miscellaneous Removals and Other Work	LS	1.00	37,500.00	37,500.00
4	Miscellaneous Drainage	LS	1.00	37,500.00	37,500.00
5	Unclassified Excavation (Hard Dig)	CY	50,000.00	15.00	750,000.00
6	Clearing and Grubbing	AC	9.00	900.00	8,100.00
7	Subgrade Preparation	SY	39,000.00	4.00	156,000.00
8	6" Aggregate Base Course (MAG Spec)	SY	22,000.00	13.00	286,000.00
9	3" Asphaltic Concrete (MAG Mix)	SY	22,000.00	20.00	440,000.00
10	Bituminous Prime Coat	SY	22,000.00	1.00	22,000.00
11	Soil Sterilant	SY	22,000.00	2.00	44,000.00
12	Catch Basin	EA	8.00	5,000.00	40,000.00
13	24" Storm Drain Pipe	LF	3,325.00	100.00	332,500.00
14	36" Storm Drain Pipe	LF	200.00	150.00	30,000.00
15	Concrete Curb	LF	20,000.00	19.00	380,000.00
16	Pavement Marking	LS	1.00	25,000.00	25,000.00
17	Handicapped Marking	EA	10.00	1,000.00	10,000.00
18	Handicapped Ramp	EA	4.00	4,000.00	16,000.00
19	New Waterline	LS	1.00	---	---
20	New Sewer Line	LS	1.00	---	---
21	New Electric Service	LS	1.00	150,000.00	150,000.00
22	Mechanically Stabilized Retaining Wall	LF	300.00	1,000.00	300,000.00
	Subtotal				\$3,149,600.00
B	Terminal Improvements				
1	Terminal	SF	31,736.00	\$275.00	\$8,727,400.00
	Subtotal				\$8,727,400.00
C	Terminal Equipment and Furnishings				
1	Signage	LS	1.00	\$75,000.00	\$75,000.00
2	Baggage Make-up	LS	1.00	20,000.00	20,000.00
3	Baggage Claim	LS	1.00	175,000.00	175,000.00
4	Loading Bridge	EA	1.00	350,000.00	350,000.00
5	FIDS (Flight Information Display System)	LS	1.00	60,000.00	60,000.00
6	Security	LS	1.00	200,000.00	200,000.00
7	Furniture	LS	1.00	100,000.00	100,000.00
8	Contingency	10%			98,000.00
	Subtotal				\$1,078,000.00
D	Professional Fees				
1	A/E	12%			\$1,554,600.00
2	Geotechnical Investigation	LS	1.00	\$40,000.00	15,000.00
3	Testing & Inspections	LS	1.00	60,000.00	60,000.00
4	Construction Management (Terminal)	6%			588,324.00
5	Construction Management (Site Improvements)	LS	1.00	300,000.00	300,000.00
	Subtotal				\$2,517,924.00
E	Totals				
A	Site Improvements				\$3,149,600.00
B	Terminal Improvements				8,727,400.00
C	Terminal Equipment and Furnishings				1,078,000.00
D	Fees				2,517,924.00
	Total Phase II				\$15,472,924.00
	Grand Total (Phase I and II)				\$34,240,469.00



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