

Passenger Terminal World Expo 2011
Copenhagen, Denmark

Airports of the Future

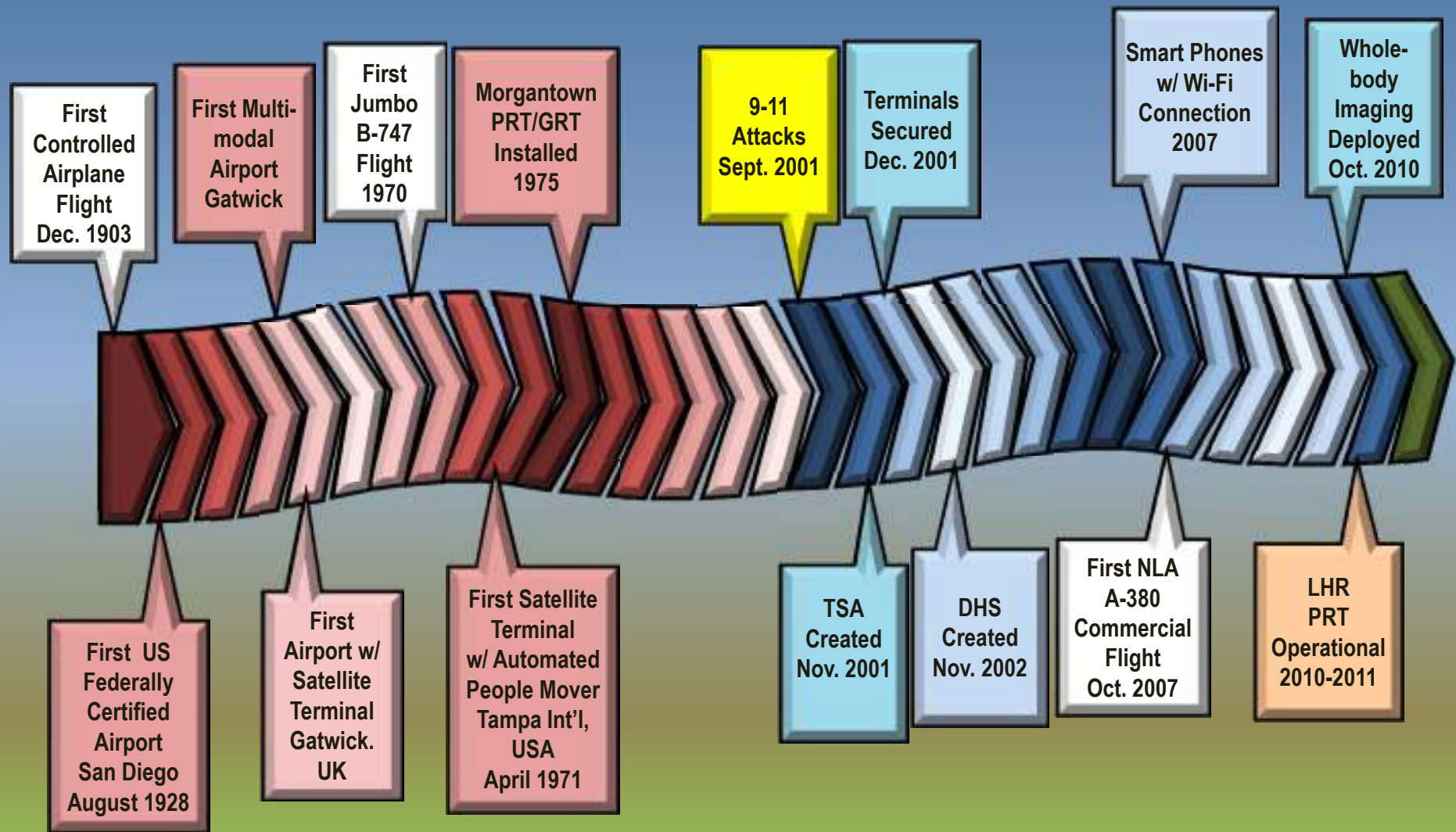
Taking the Terminal to the Traveler

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TYLININTERNATIONAL

Summary Aviation Timeline



Airport Perspective

➤ Pre 9-11 Airport

- Customer Satisfaction was High
- Development Costs were Moderate
- Security was Generally Viewed as Non-intrusive
- Technologies were in Development

➤ Post 9-11 Airport

- Airport Customer Satisfaction is Low
- Development Costs are High and Continue to Escalate
- Security Screening is Viewed as Highly Intrusive
- Technologies are Highly Developed
- Integration of Technologies is Readily Feasible

Current Passenger Movement

On-line Check-In and Print Boarding Passes

Transit

Drive to
Airport

Park in
Surface Lot or
Garage

Board Shuttle
To Terminal

Check-In

Walk to Ticket
Counter

Check-In
Passengers
and Bags

Receive
Boarding
Passes

Boarding

Walk to
Security
Checkpoint

Walk to Gate
and/or
Concessions

Board Aircraft

Future Passenger Movement

On-line Check-In and **Download Boarding Passes**

Transit

Drive to
Airport

Park in
Surface Lot or
Garage

Board Transit
Pod To
Terminal

**Security
Screening**

Scan
Electronic
Passes

Tag/Drop Bags
& Enter
Security Tunnel

Board
Terminal
Transit Pod

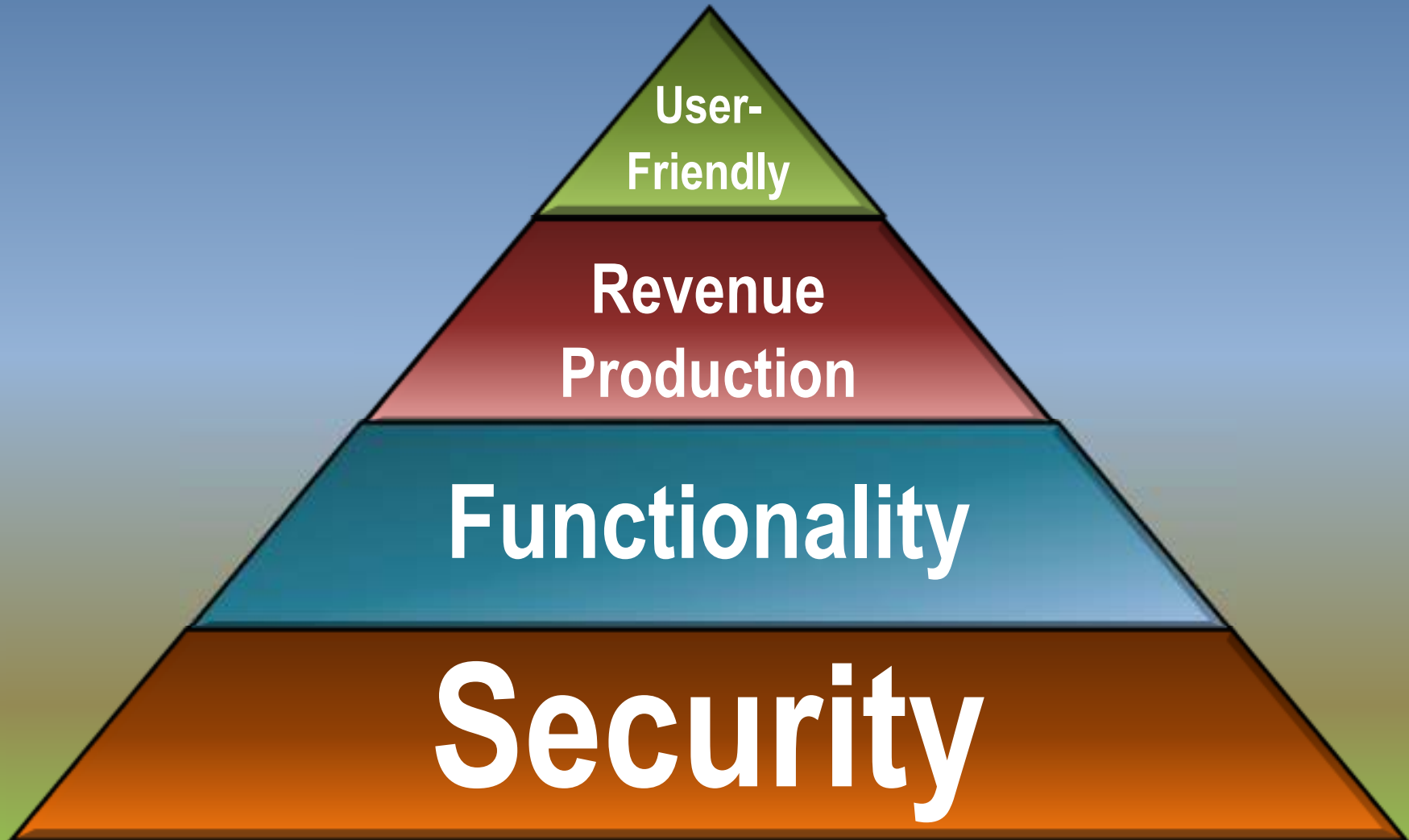
Boarding

Exit at Sec.
Bldg. or
Concourse

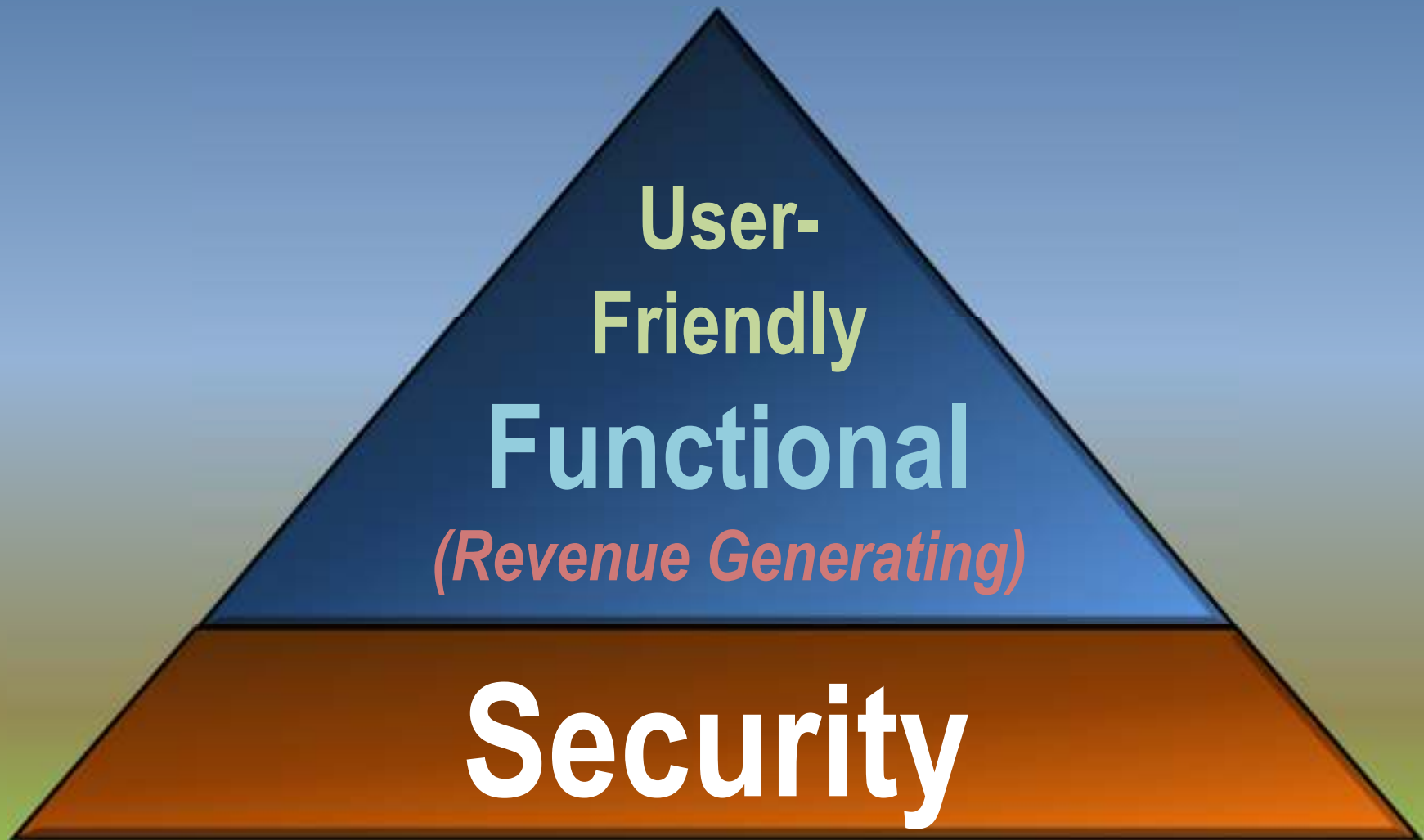
Enter Gate &
Concession
Lounge Area

Board Transit
Pod to
Aircraft

Typical Development Hierarchy



Optimum Development Hierarchy



System Automation



SMART PHONES



**SELF-SERVICE PARKING, SHOE SCANNERS, EDS,
CUSS KIOSKS, BAG-DROP, WHOLE BODY IMAGING**



System Automation

SMART THINKING

THE SMART PHONE GENERATION ENABLES AIRPORT OPERATORS
TO TAKE THE TERMINAL TO THE TRAVELLER



SELF-SERVICE

IF THE IMPLEMENTATION OF NEW INFORMATION AND
COMMUNICATION TECHNOLOGIES IS TO BE SUCCESSFUL,
AIRPORT DESIGN MUST BE CONSIDERED

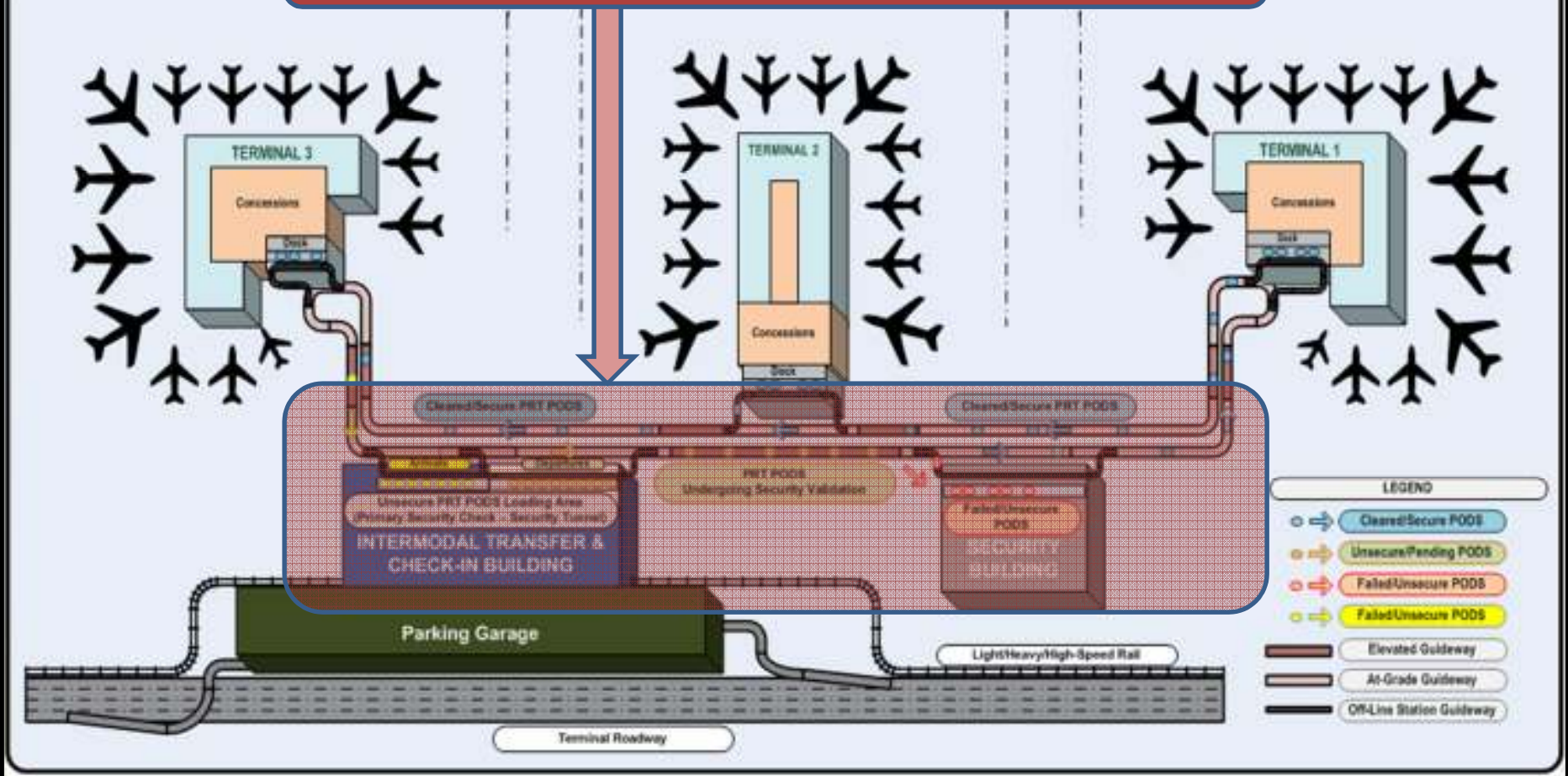


- Self Check-In
- Self Bag Tagging (RFID)
- Automated Screening
- Automated Bag Tracking
- Automated Passport Control
- Augmented Reality (Ancillary Revenue)
- Automated Boarding

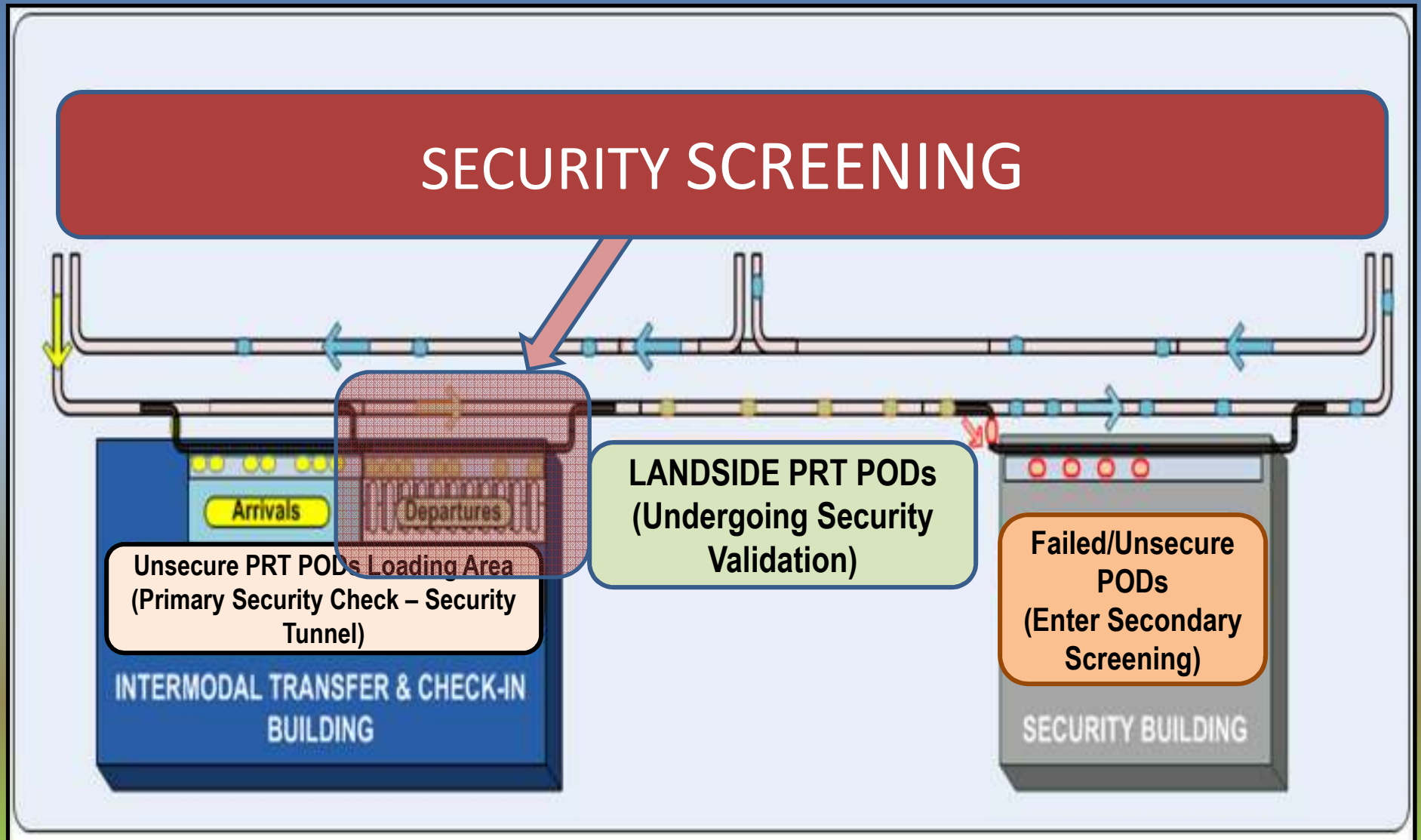
**Passenger Terminal
World
SHOWCASE 2011**

Near-Term Future Airport 1

LANDSIDE FACILITIES

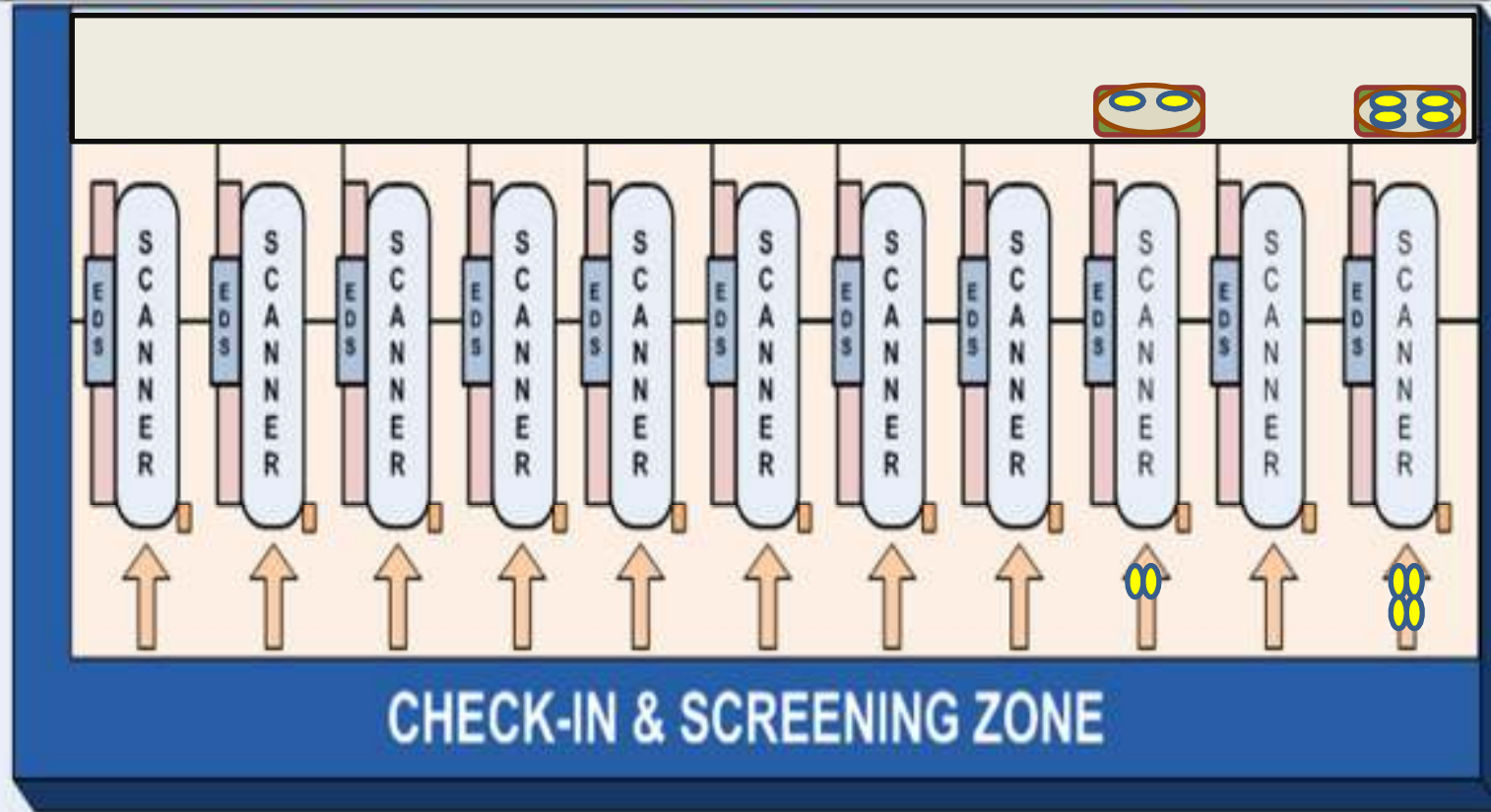


Conceptual Terminal Processor

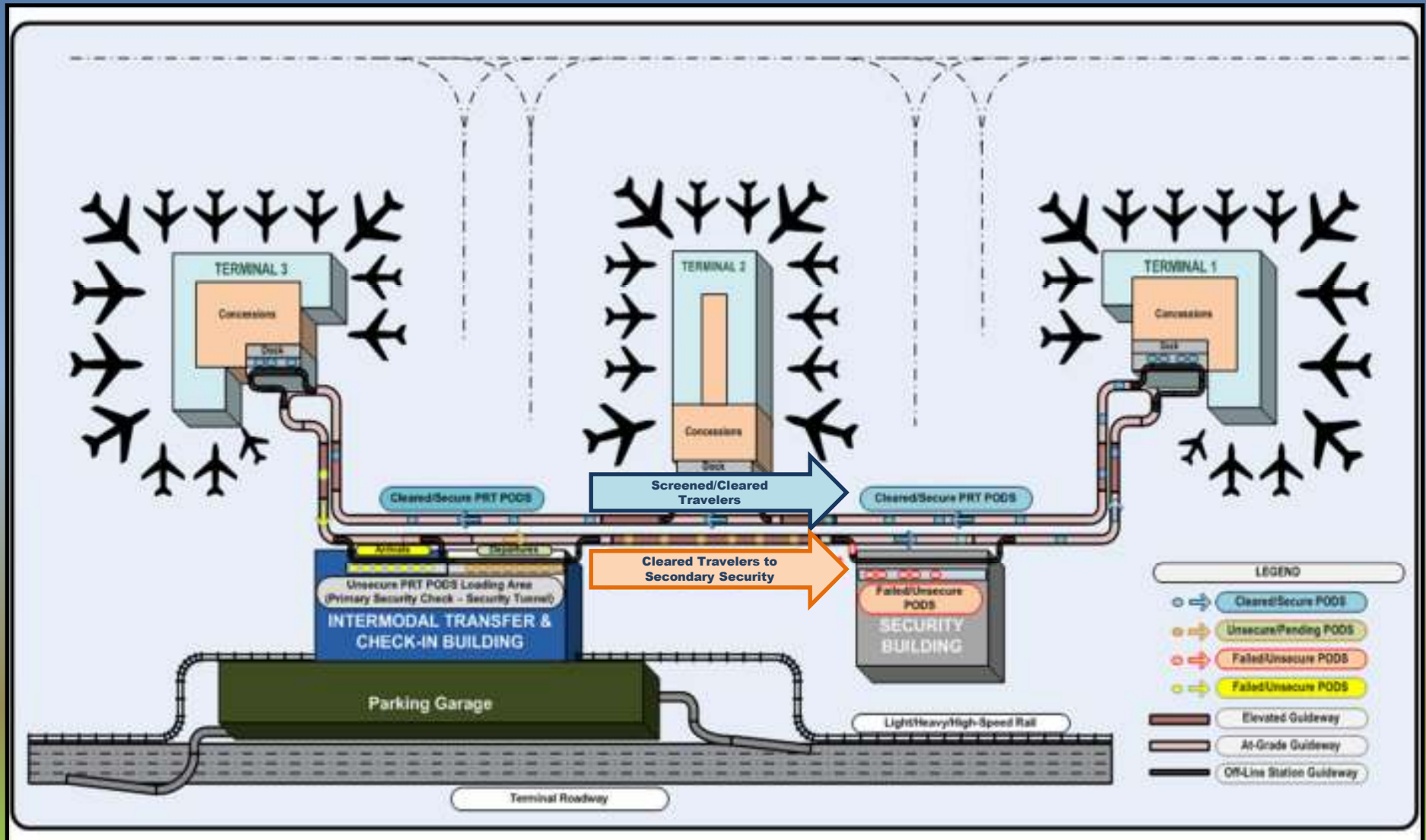


Conceptual Security & Departures

Departures Platform

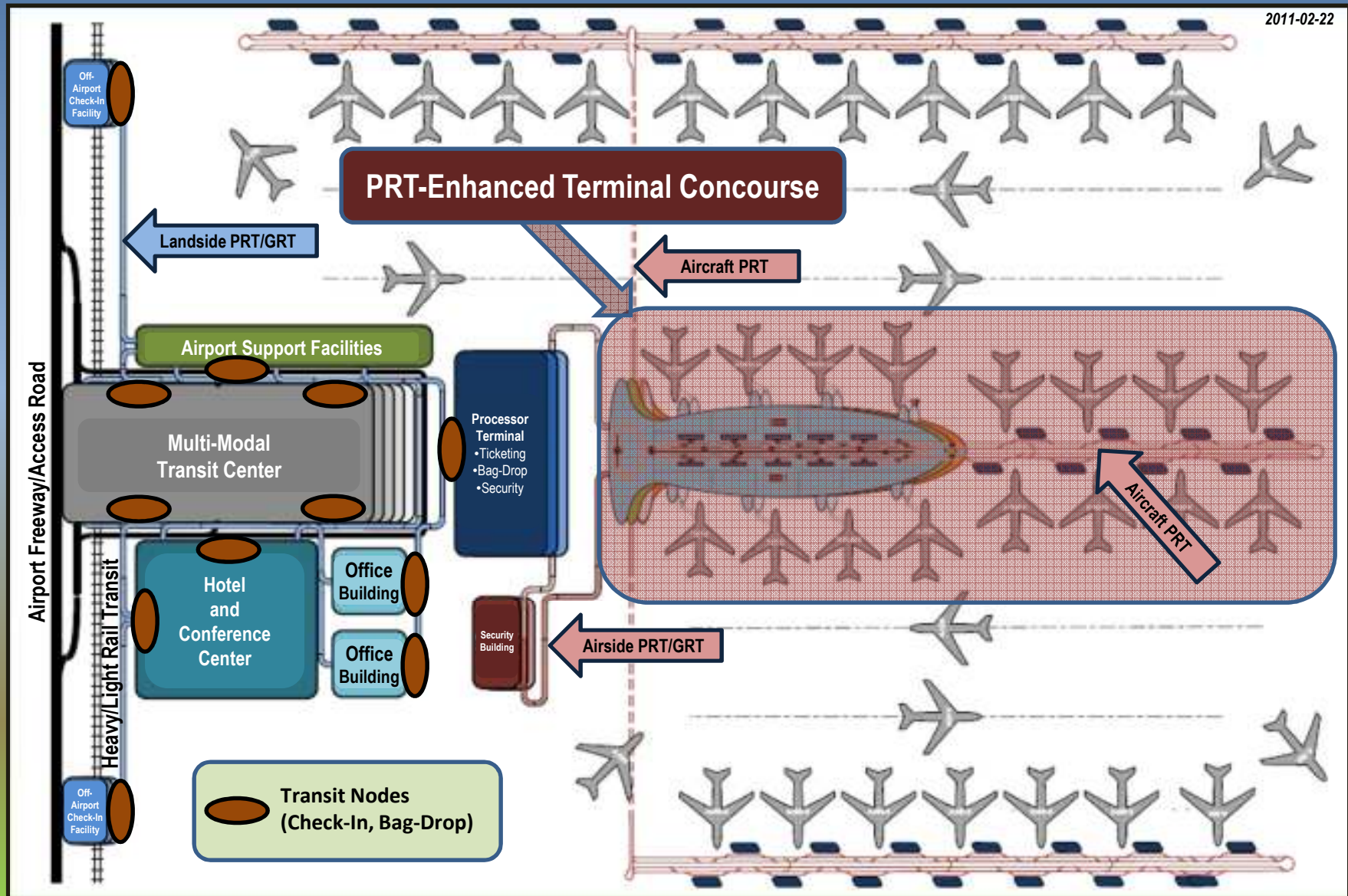


Near-Term Future Airport 1



Conceptual Future Airport 2

2011-02-22



Conventional Terminal (with Single Linear Concourse)

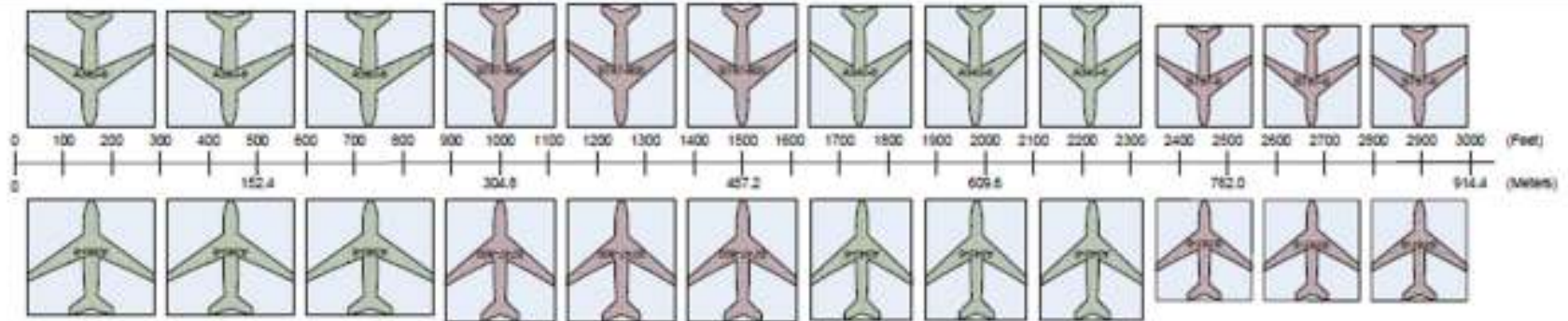


Figure 1

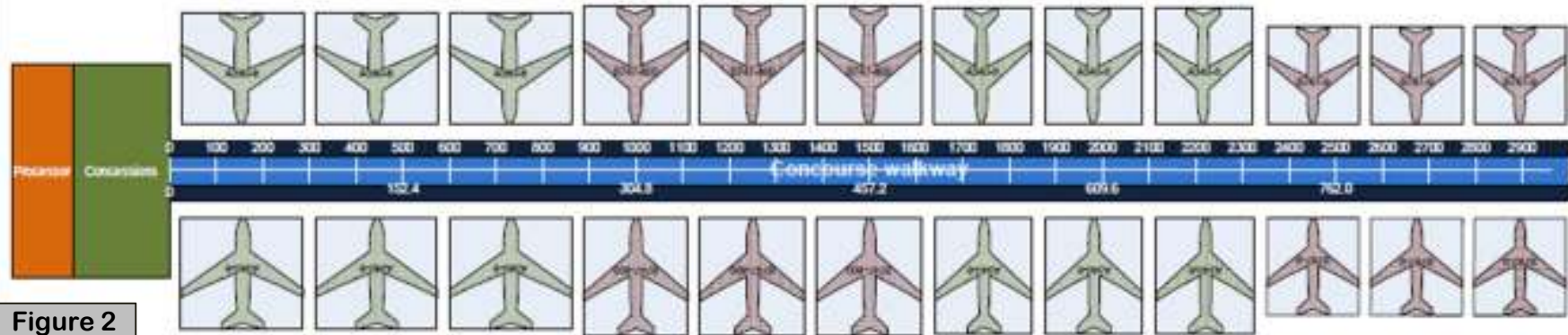


Figure 2

- Figure 1: Standard Double-Stacked Flight Line (24 Aircraft Parking Positions/Gates)
- Figure 2: Conventional Linear Terminal with Connected Processor and Concessions (Terminal Concourse – Driven by Flight Line plus Boarding Areas and Transit Corridor)

Reconfigured Terminal Concourse (w/o Processor or Concessions)

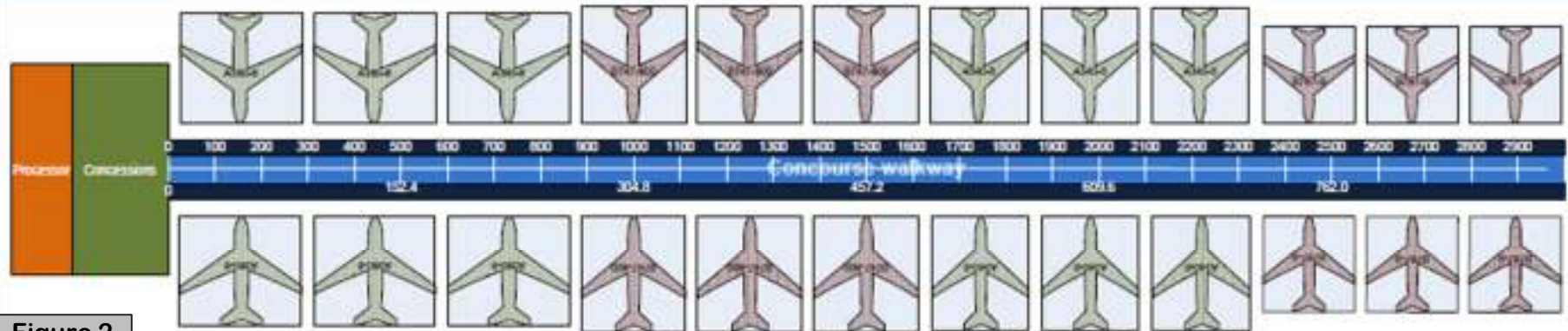


Figure 2

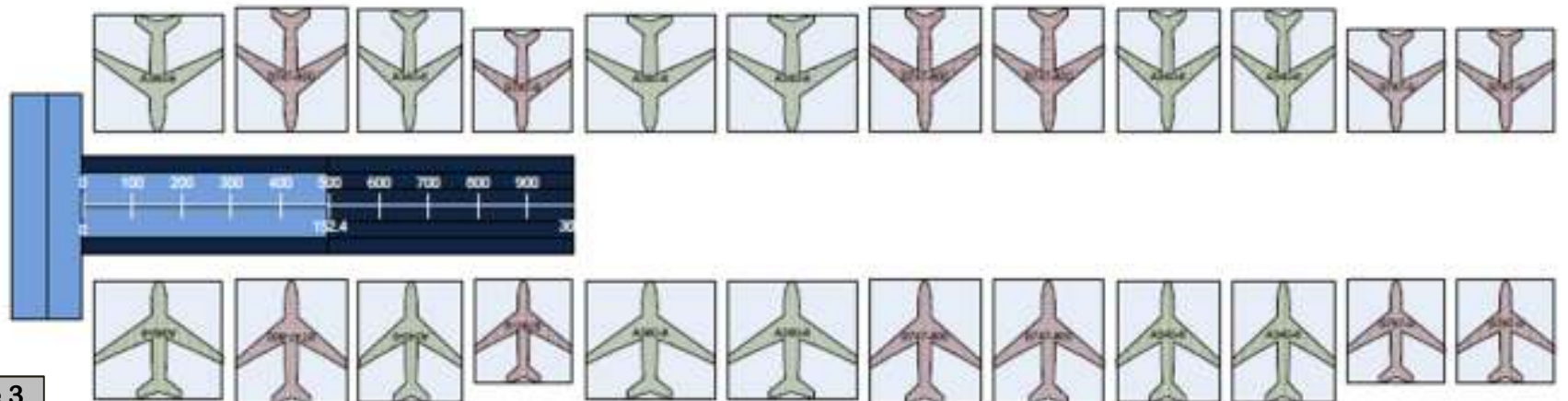


Figure 3

- Figure 2: Conventional Linear Terminal (2,974 ft / 906 m)
- Figure 3: Consolidated Boarding Areas and Corridor (991 ft / 302 m)

Conceptual Future Airport (with PRT Aircraft Stations)

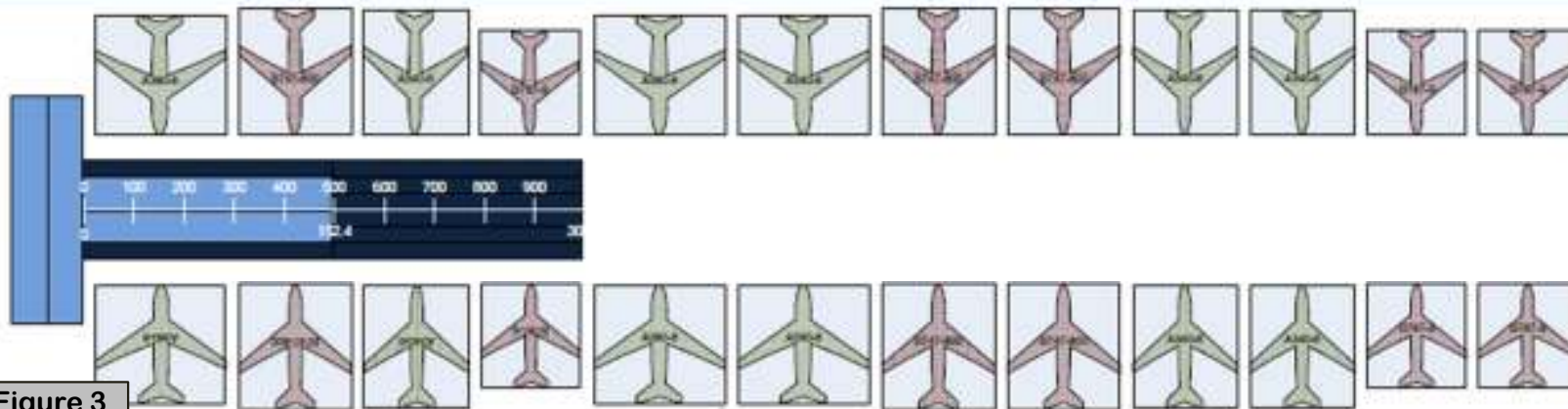


Figure 3

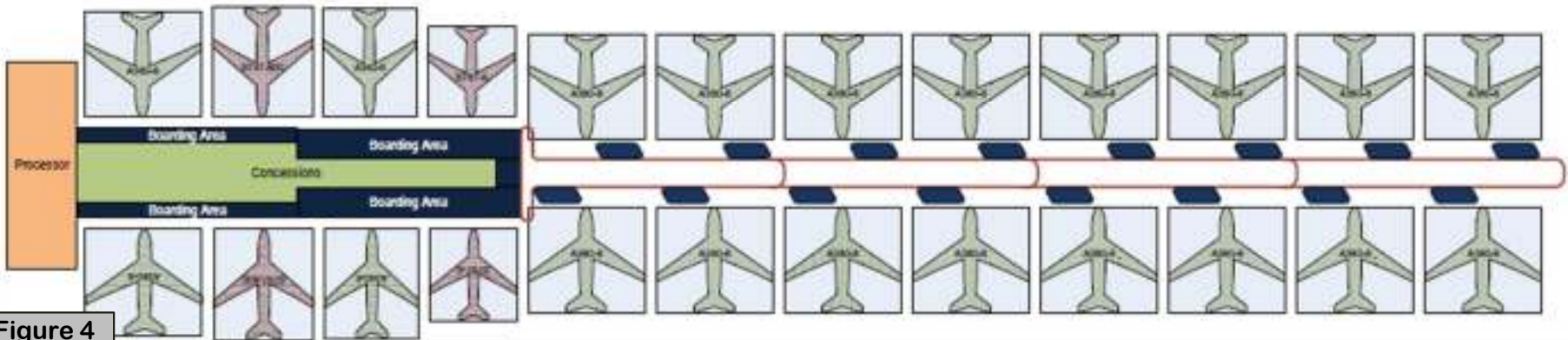
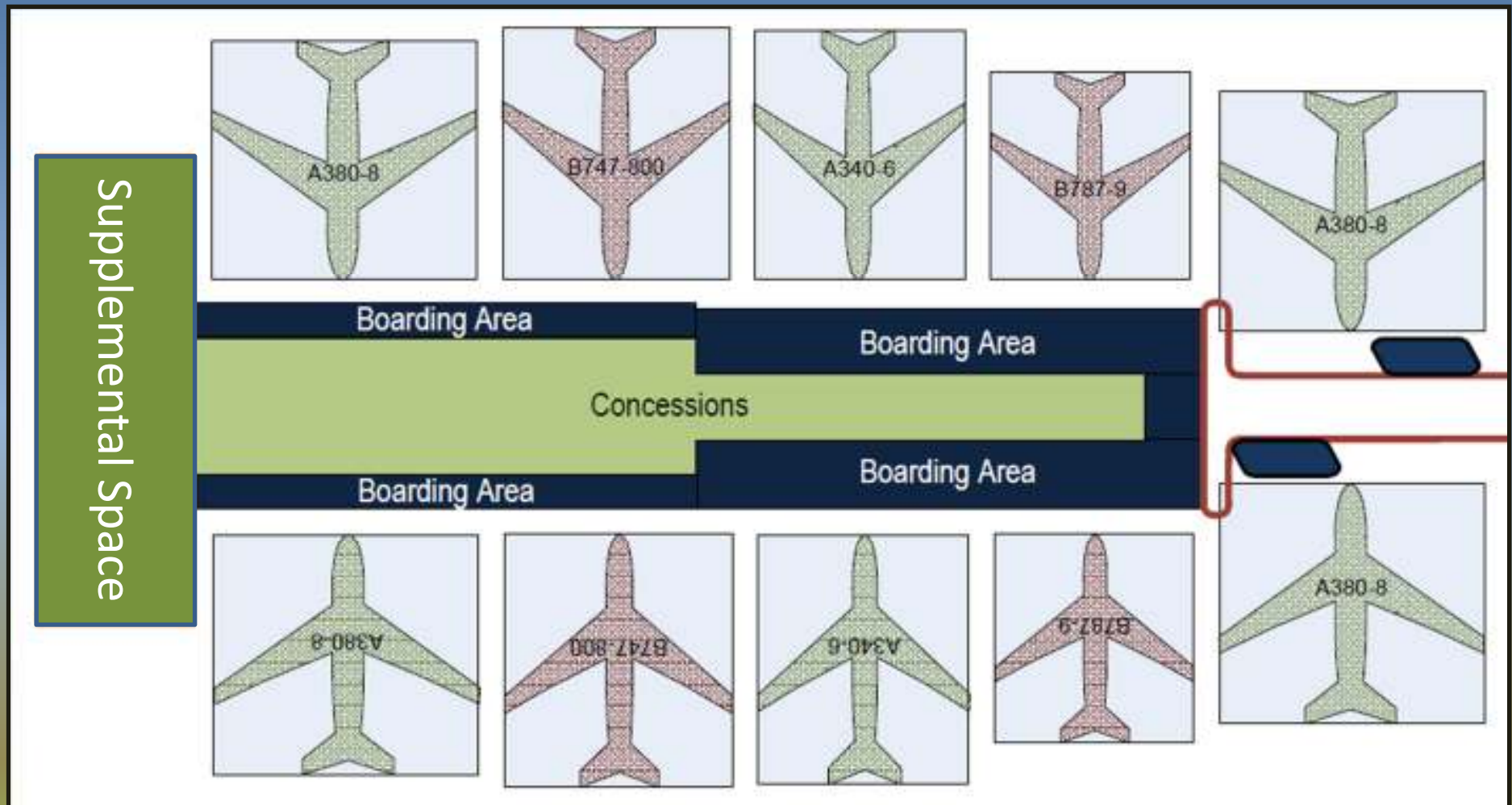


Figure 4

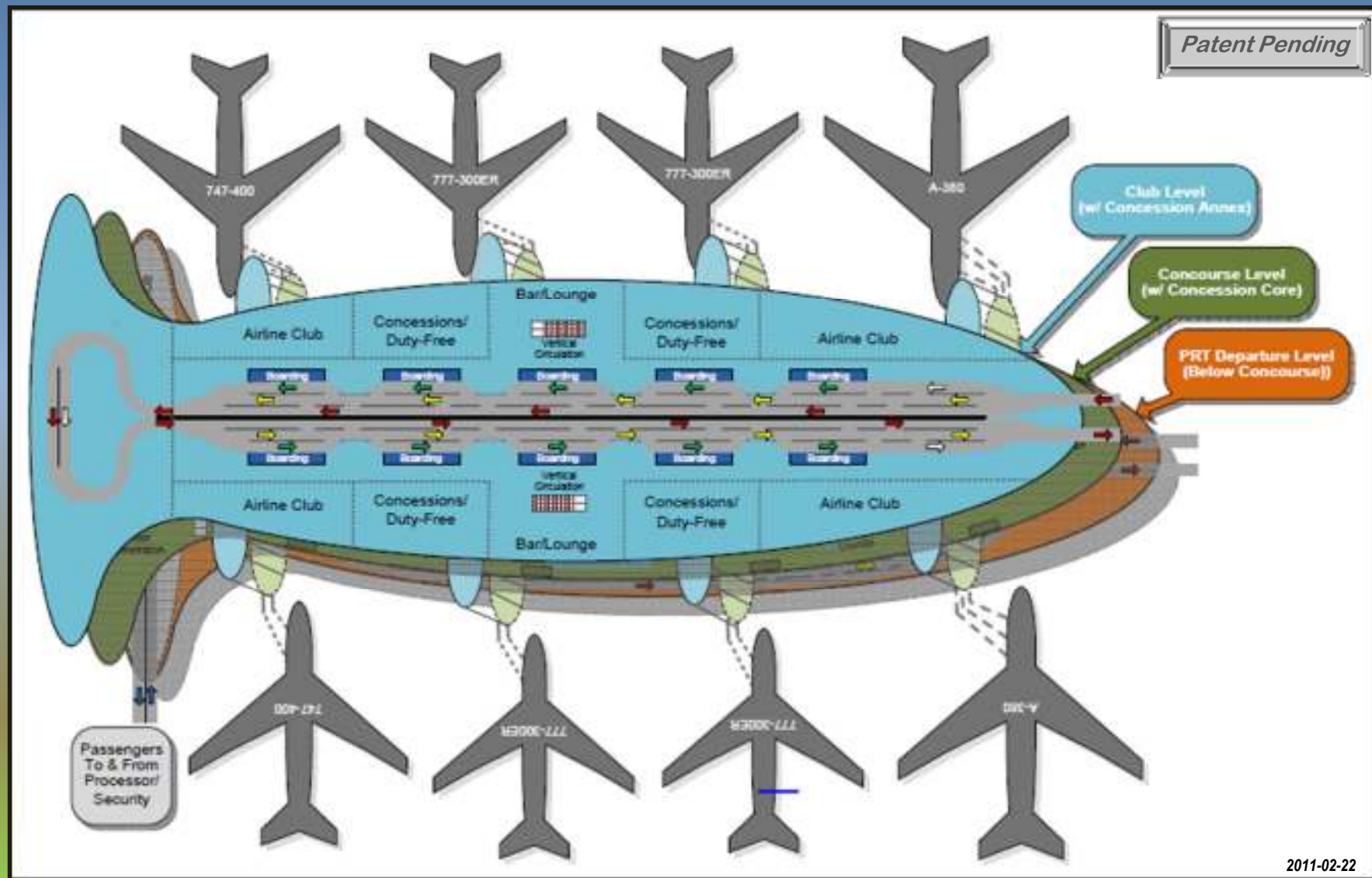
- Figure 3: Consolidated Terminal Concourse - 8 Contact Gates (991 ft / 302 m)
- Figure 4: PRT-Enhanced Gates - 16 Gates Served by PRT Transit Vehicles (PODs)

Compressed Terminal Layout

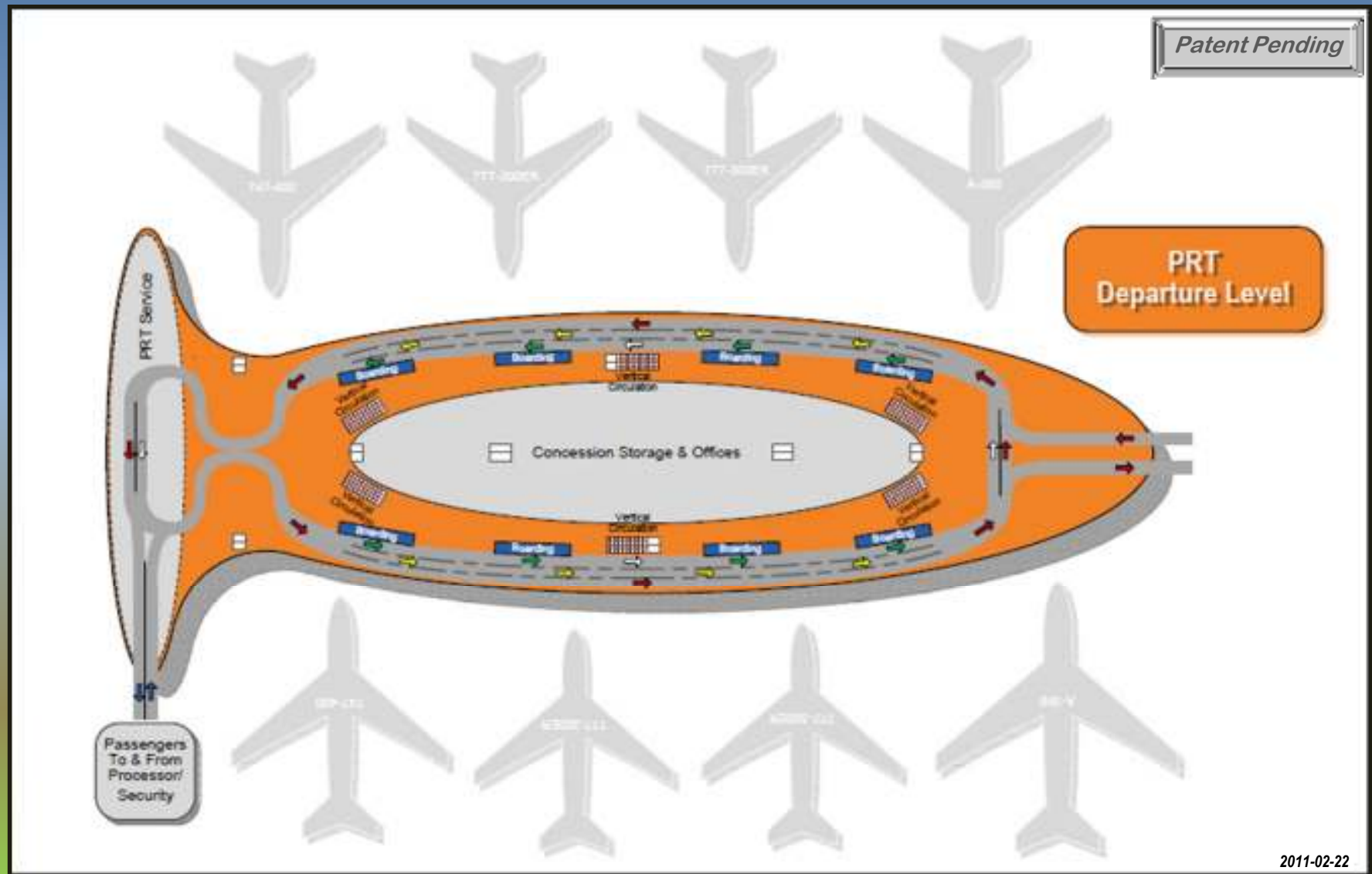


- Conventional Connected Processor and Concourse
- Satellite Concourse (Creates Supplemental Space on Concourse)

Integrated Terminal Layout



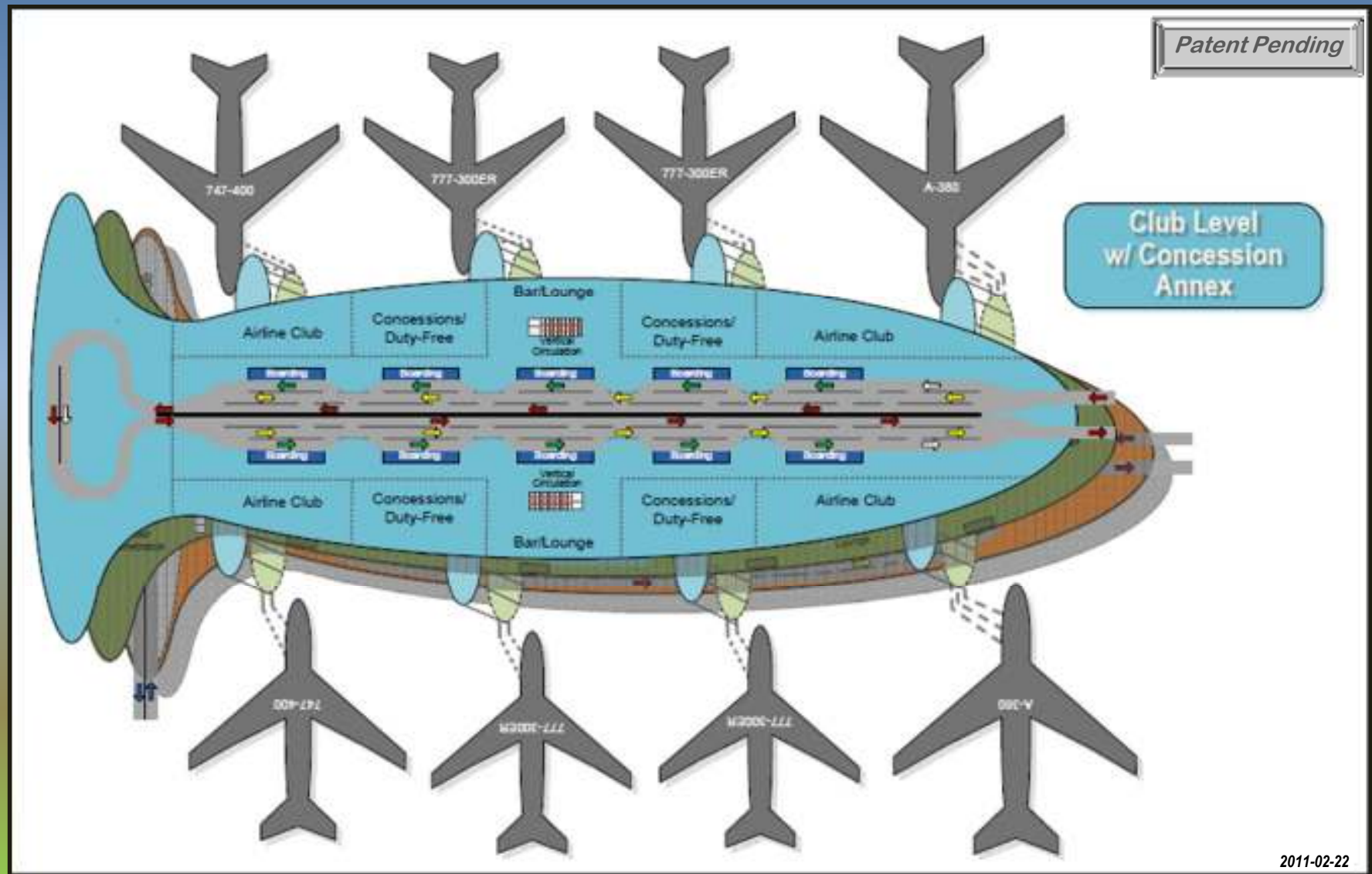
Integrated Terminal Layout - Level 1



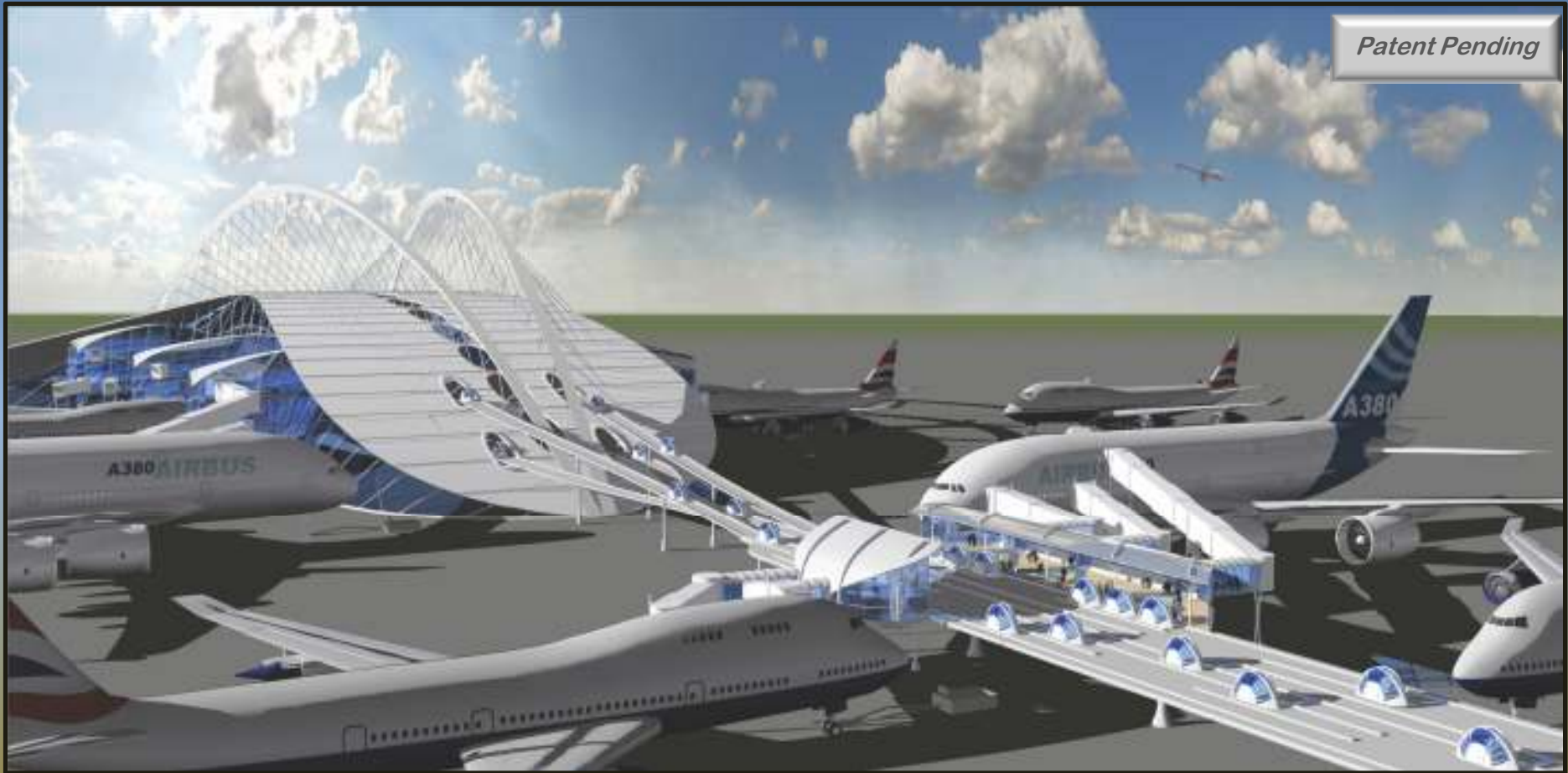
Integrated Terminal Layout - Level 2



Integrated Terminal Layout - Level 3



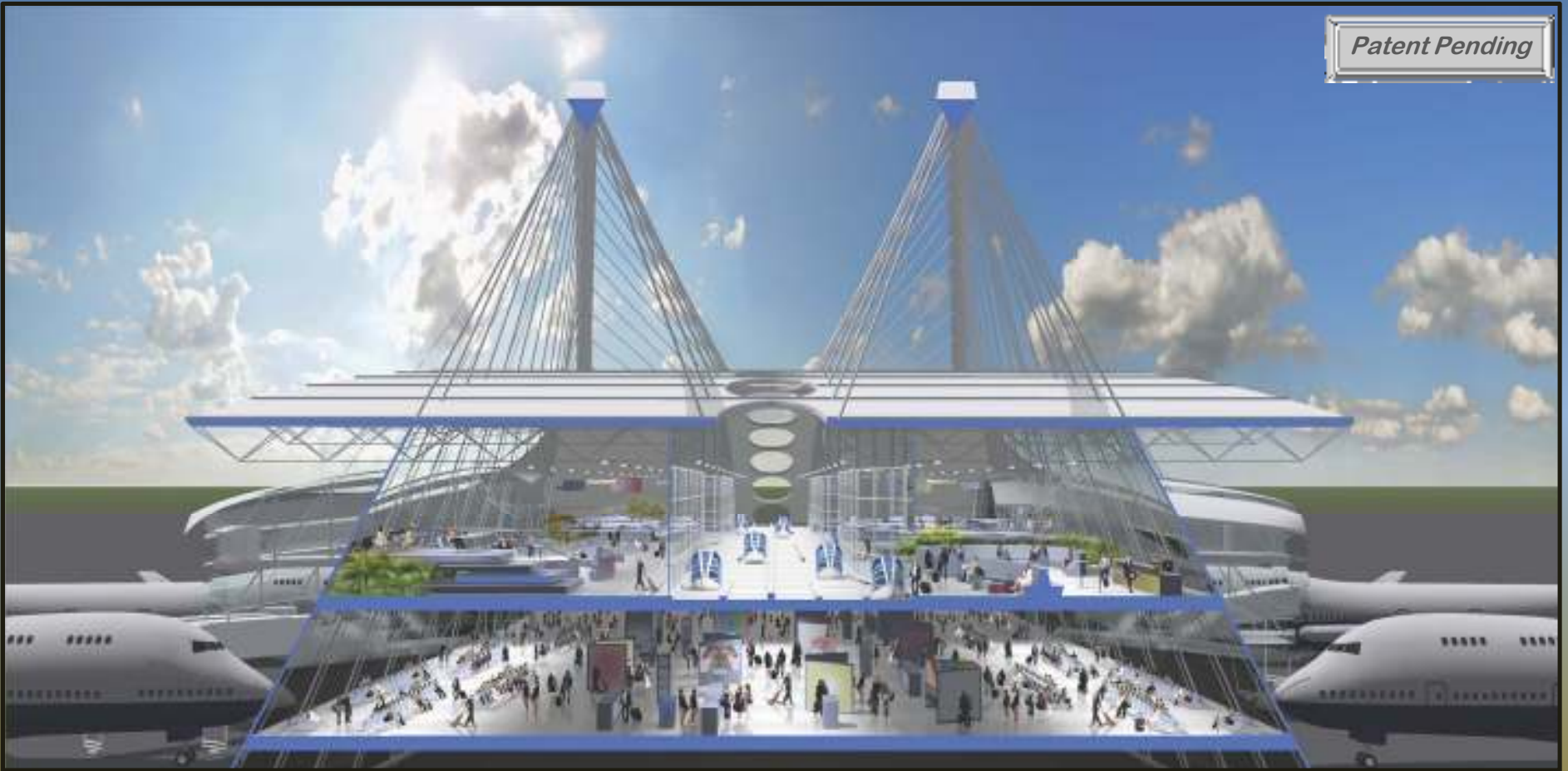
Integrated Terminal Layout



- Three (3) Level Concourse w/ Integrated PRT Enhancement
- PRT Guideway w/ Aircraft Boarding Stations

Optimized Terminal Layout

Patent Pending



- Concourse Level 3: Airline Clubs and High-end Concessions
- Concourse Level 2: General Boarding (Contact Gates) and Concession Core
- Concourse Level 1: General Boarding PRT Access (not shown)

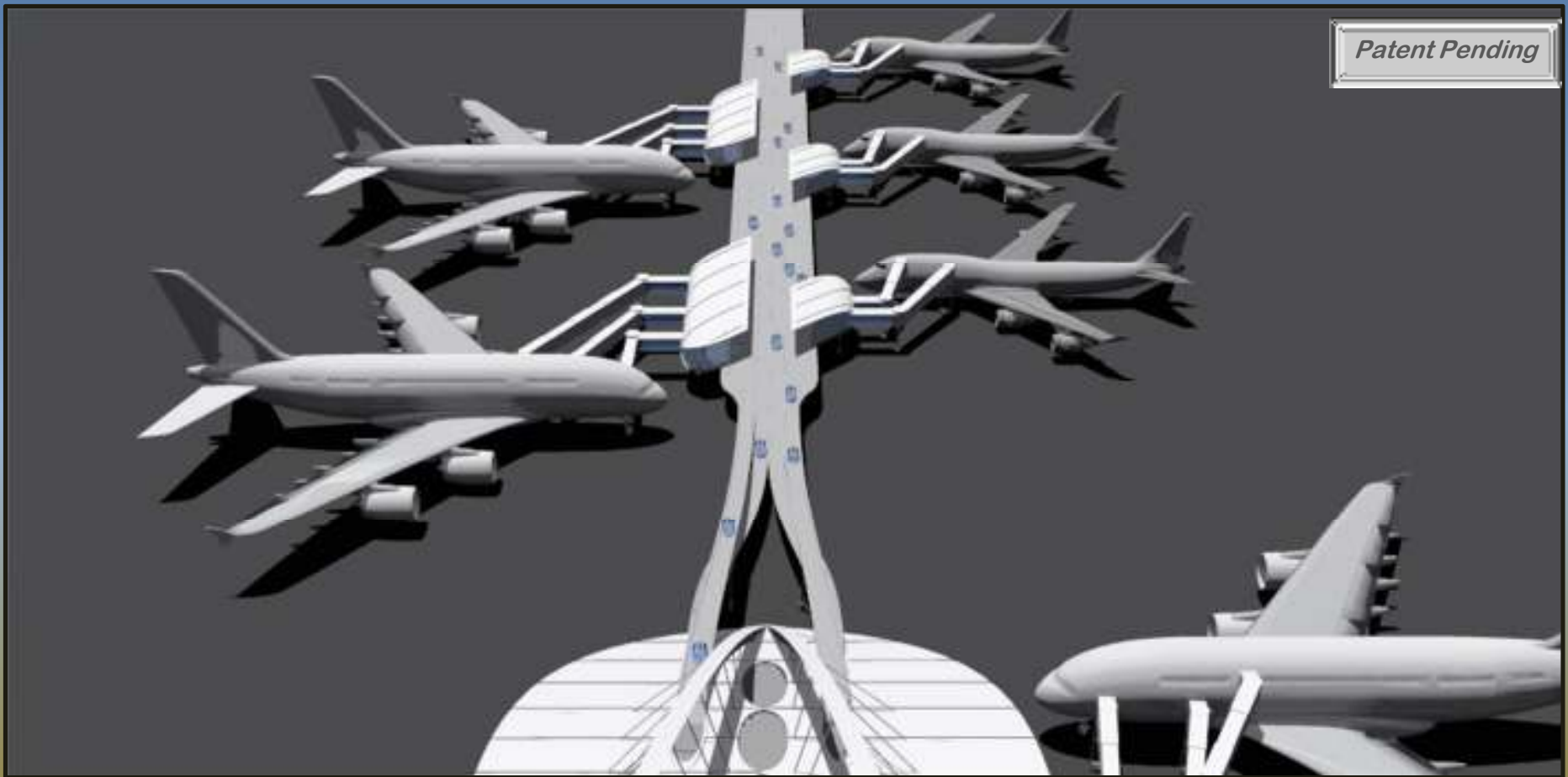
2011-02-22

Terminal w/PRT Guideway



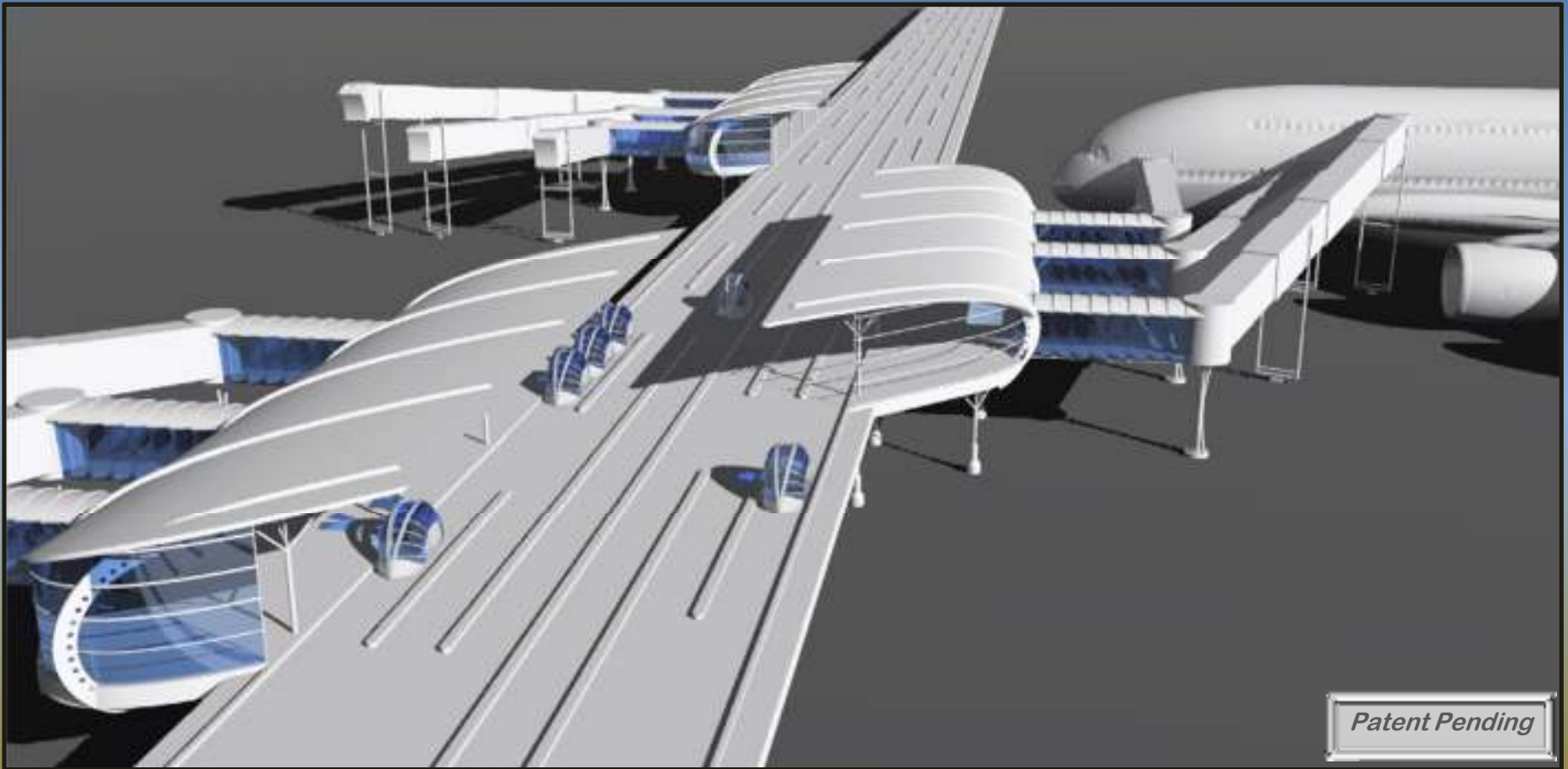
- Concourse w/ Integrated PRT Enhancement
- PRT Guideway w/ Aircraft Boarding Stations

Terminal w/PRT Guideway



- Concourse w/ Integrated PRT Enhancement
- Bi-directional PRT Guideway w/ Aircraft Boarding Stations

PRT Guideway w/Boarding Stations

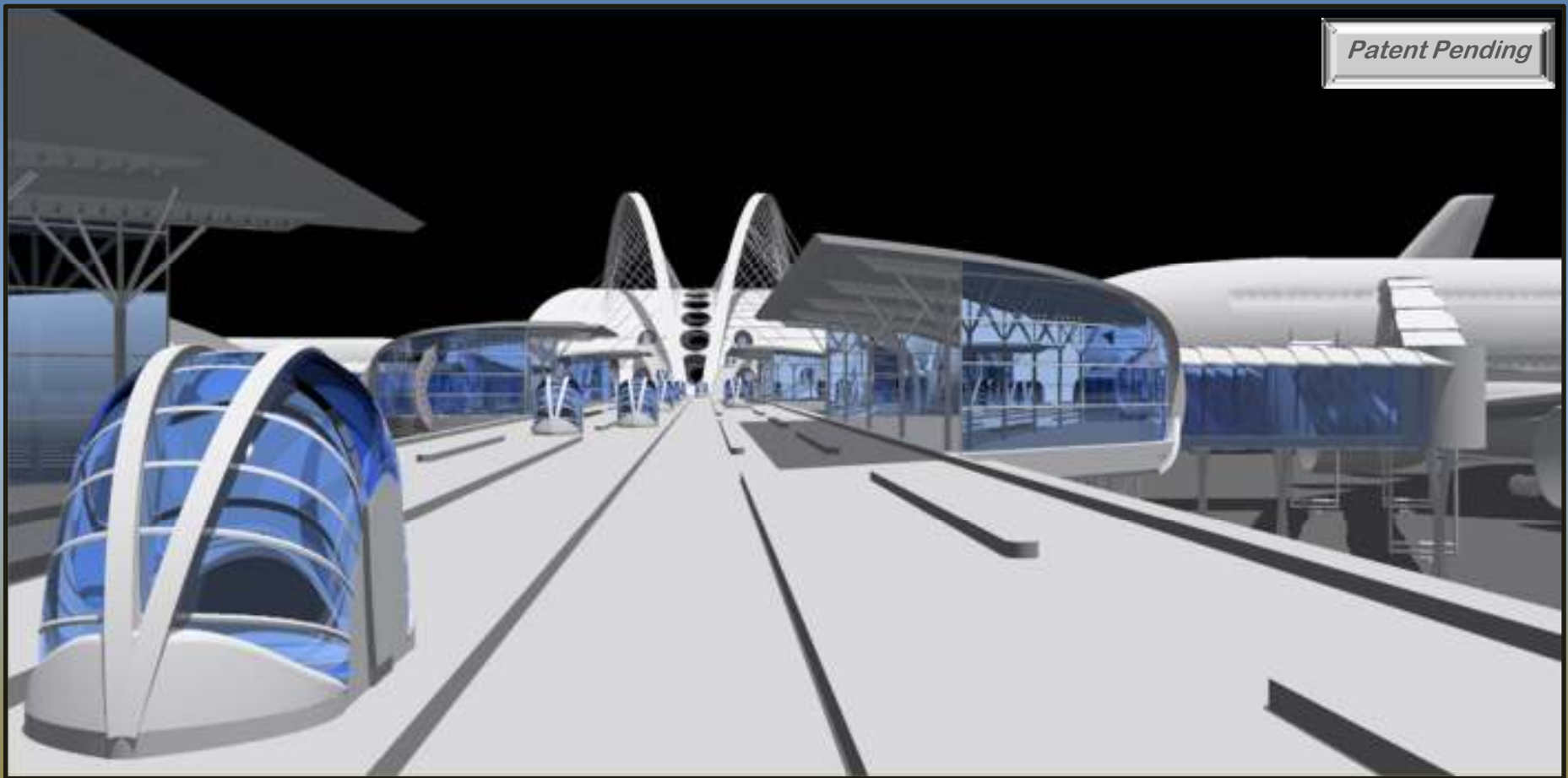


Patent Pending

- Six (6) Lane PRT Guideway w/ Aircraft Boarding Stations
- Multi-level Passenger Boarding Bridges

2011-02-22

Elevated Aircraft Boarding Station



- Elevated PRT Guideway w/ Aircraft Boarding Station
- Covered Boarding Station (Enclosed as Required)

Aircraft Boarding Station



Aircraft Boarding Station

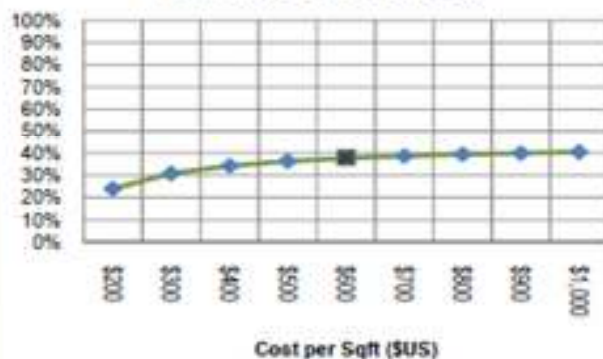


Initial Capital Investment Cost

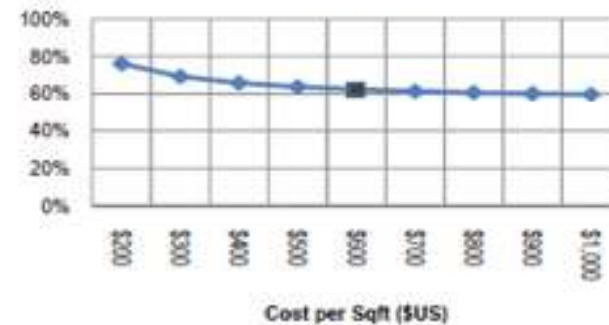
Imperial Units

Sqft Cost	Term. Only	PRT-Enhanced			Percent of Terminal Only Cost	Percent Cost Reduction
		Term.	PRT	Total		
\$ 200.00	\$ 267,699,600	\$ 148,722,000	\$ 55,000,000	\$ 203,722,000	76%	24%
\$ 300.00	\$ 401,549,400	\$ 223,083,000	\$ 55,000,000	\$ 278,083,000	69%	31%
\$ 400.00	\$ 535,399,200	\$ 297,444,000	\$ 55,000,000	\$ 352,444,000	66%	34%
\$ 500.00	\$ 669,249,000	\$ 371,805,000	\$ 55,000,000	\$ 426,805,000	64%	36%
\$ 600.00	\$ 803,098,800	\$ 446,166,000	\$ 55,000,000	\$ 501,166,000	62%	38%
\$ 700.00	\$ 936,948,600	\$ 520,527,000	\$ 55,000,000	\$ 575,527,000	61%	39%
\$ 800.00	\$ 1,070,798,400	\$ 594,888,000	\$ 55,000,000	\$ 649,888,000	61%	39%
\$ 900.00	\$ 1,204,648,200	\$ 669,249,000	\$ 55,000,000	\$ 724,249,000	60%	40%
\$ 1,000.00	\$ 1,338,498,000	\$ 743,610,000	\$ 55,000,000	\$ 798,610,000	60%	40%

Percent Cost Reduction



Percent of Conventional Terminal Cost



1. Cost presented in US Dollars
2. Unit prices for PRT System maintained at the midpoint for cost comparison purposes, but would vary based on the material availability and cost.

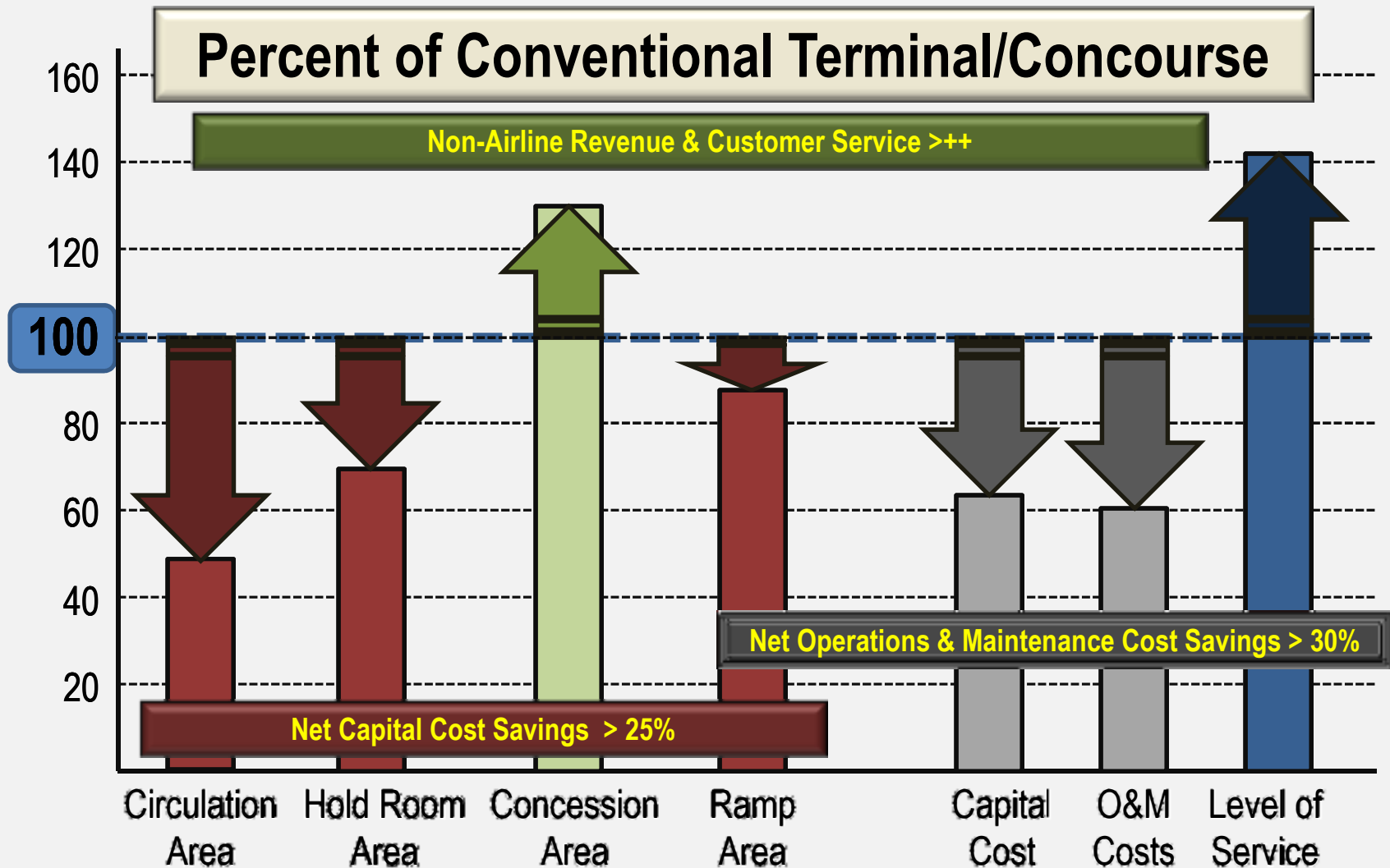
Initial Capital Investment Cost

Metric Units						
Sq M. Cost	Term. Only	PRT-Enhanced			Percent of Terminal Only Cost	Percent Cost Reduction
		Term.	PRT	Total		
\$ 2,150.00	\$ 266,925,368	\$ 148,291,871	\$ 55,375,000	\$ 203,666,871	76%	24%
\$ 3,230.00	\$ 401,008,809	\$ 222,782,672	\$ 55,375,000	\$ 278,157,672	69%	31%
\$ 4,310.00	\$ 535,092,250	\$ 297,273,472	\$ 55,375,000	\$ 352,648,472	66%	34%
\$ 5,380.00	\$ 667,934,178	\$ 371,074,543	\$ 55,375,000	\$ 426,449,543	64%	36%
\$ 6,460.00	\$ 802,017,618	\$ 445,565,344	\$ 55,375,000	\$ 500,940,344	62%	38%
\$ 7,530.00	\$ 934,859,546	\$ 519,366,414	\$ 55,375,000	\$ 574,741,414	61%	39%
\$ 8,610.00	\$ 1,068,942,987	\$ 594,888,000	\$ 55,375,000	\$ 650,263,000	61%	39%
\$ 9,690.00	\$ 1,203,026,428	\$ 669,249,000	\$ 55,375,000	\$ 724,624,000	60%	40%
\$ 10,760.00	\$ 1,335,868,355	\$ 743,610,000	\$ 55,375,000	\$ 798,985,000	60%	40%



1. Cost presented in US Dollars
2. Unit prices for PRT System maintained at the midpoint for cost comparison purposes, but would vary based on the material availability and cost.

Taking the Terminal to the Traveler



QUESTIONS

(Following Presentations)

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