

# LONG ISLAND MACARTHUR AIRPORT

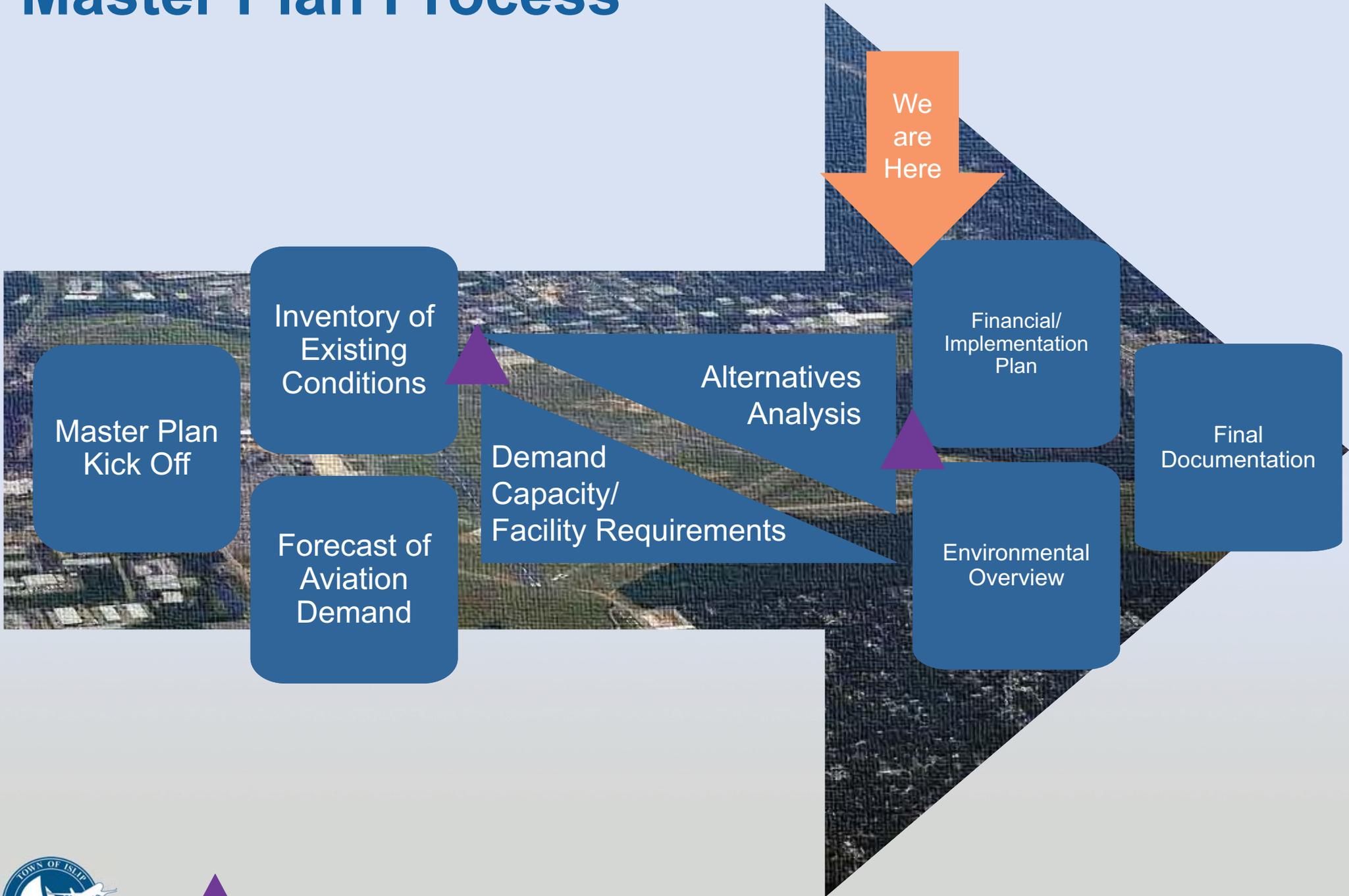
## Master Plan Update



# Airport Master Plan Open House

December 4, 2013

# Master Plan Process



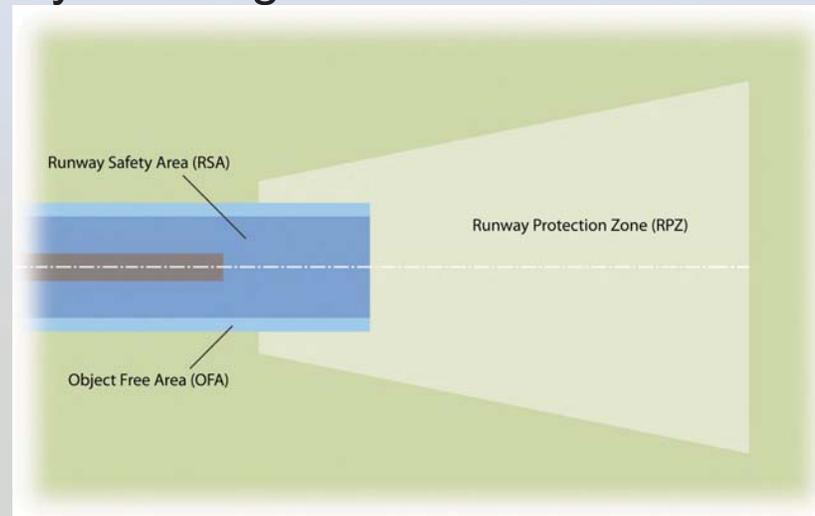
- Public Open House

For Discussion Purposes Only



## Definitions

- **Runway Safety Area (RSA)** – A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.
- **Object Free Area (OFA)** – An area centered on the ground on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.
- **Runway Protection Zone (RPZ)** – An area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground.



## Definitions

- **Clean Runway** – Full length of runway pavement is available for arrival and departure operations in both directions (absence of Declared Distances).
- **Critical Aircraft (Design Aircraft)** – An aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility (such as EMAS).
- **Engineered Materials Arresting System (EMAS)** – A standard EMAS provides a level of safety that is equivalent to an RSA built to dimensional standards. Engineered materials are defined as, high energy absorbing materials of selected strength, which will reliably and predictably crush under the weight of an aircraft.
- **Maximum Takeoff Weight (MTOW)** – The maximum design weight for any aircraft for takeoff.
- **Maximum Landing Weight (MLW)** – The maximum authorized weight of the aircraft for landing.
- **Payload** – The part of the useful load of an aircraft that is over and above the load necessary for the operation of the vehicle. The term used for passengers, baggage, and cargo.



## ■ Airfield

- Meeting Standards
  - Runway Safety Areas
  - Object Free Areas
  - Runway Protection Zones
- Capacity
  - Runway Extension
  - Maintaining 4<sup>th</sup> runway

## ■ Terminal

- Additional Contact Gates
- Better level of service
- Greater Concession Opportunities
- Intermodal Connectivity

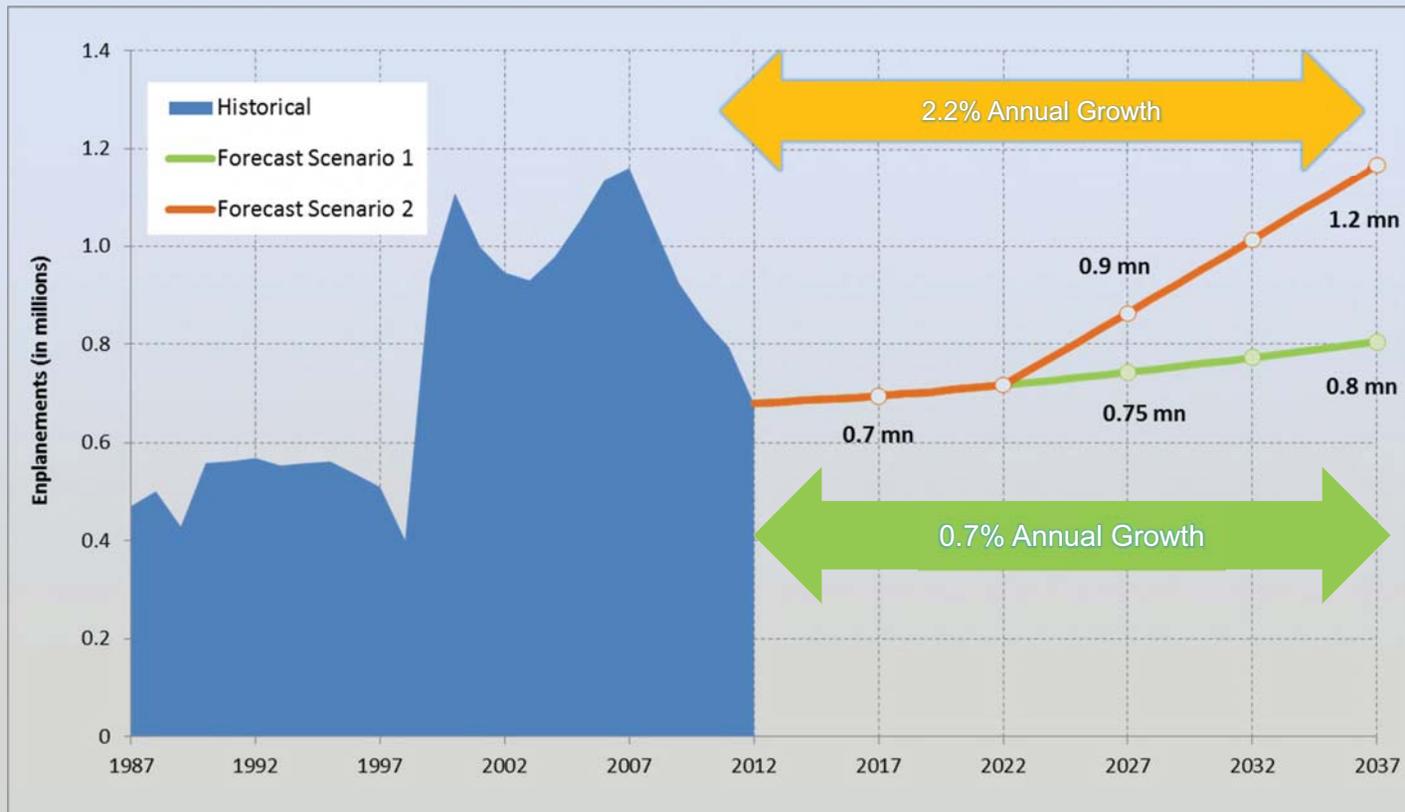
## ■ Land Side

- Relocated Rental Cars
- Ensure Sufficient Auto Parking
- Intermodal Connectivity



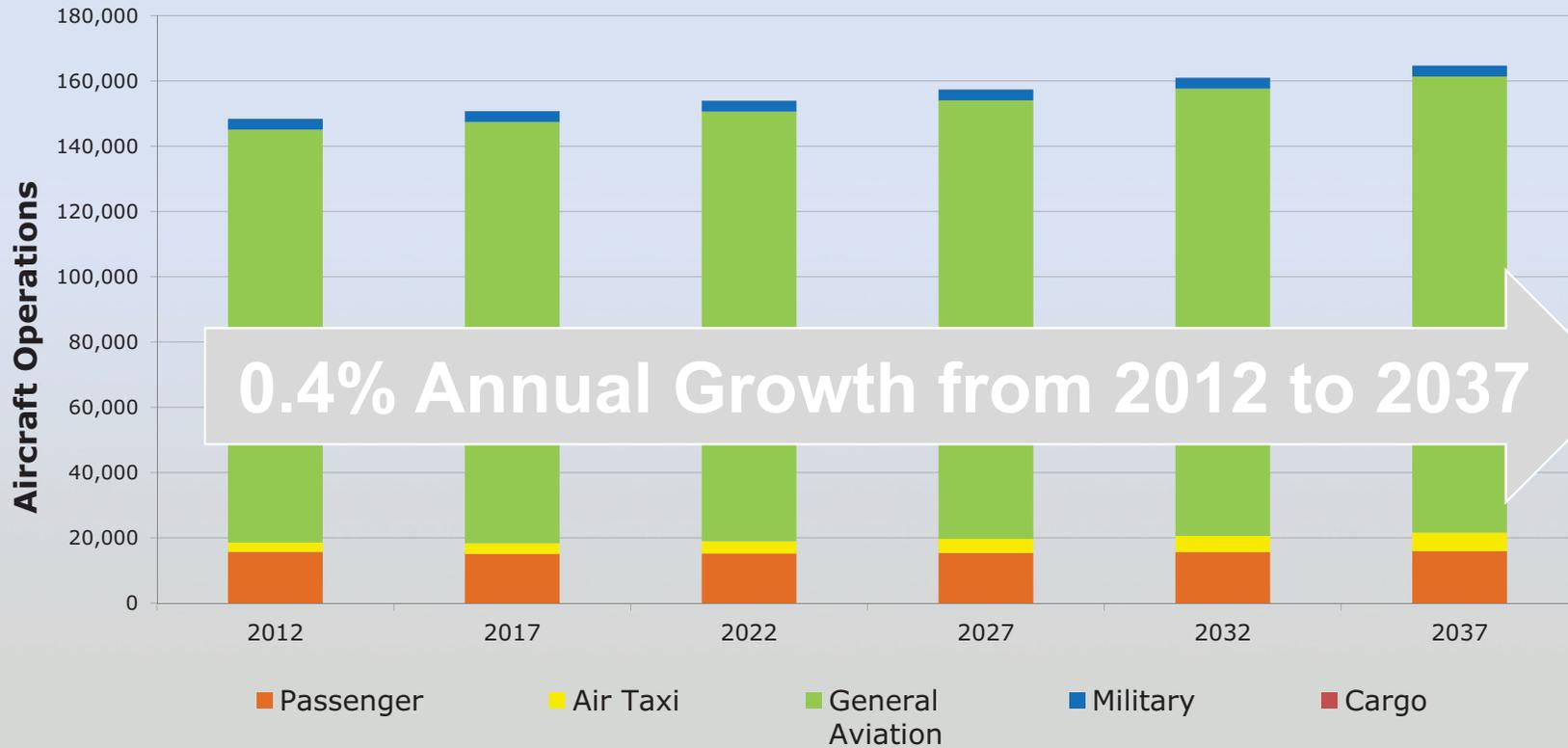
# How Many Passengers Are We Planning For?

- Projected growth in population, employment, and income levels in Nassau & Suffolk County will support growth in air travel at LIMA
- A modest reversal in catchment area “Leakage” from JFK, LGA, EWR to LIMA is assumed over the forecast period
- Passenger forecast scenarios provide a long-term range of 0.8 to 1.2 million annual passenger enplanements



# How Many Aircraft Operations Can We Expect?

- LIMA has a diverse user base comprising passenger, cargo, air taxi, general aviation, and military flights
- Aircraft operations are projected to grow on average of 0.4% per annum
- About 165,000 aircraft operations forecast by 2037



# Runway Length Analysis – Fleet Mix

Manufacturer	Model	% of Existing Fleet	% of Future Fleet	ARC	MTOW (lbs)	MLW (lbs)	Max Payload (lbs)
Boeing	737-300	9.1%	0%	C-III	135,000	114,000	33,960
Boeing	737-500	1.6%	0%	C-III	136,000	110,000	33,470
Boeing	737-700W <sup>1</sup>	66.1%	83.7%	C-III	154,500	129,200	38,700
Boeing	737-800W <sup>2</sup>	0%	0%	C-III	174,200	146,300	47,000
Airbus	A320-200	0%	0%	C-III	171,961	142,198	43,555
Airbus	A321-200	0%	0%	C-III	205,030	171,520	59,401
Bombardier	CRJ-200	10.2%	0%	C-III	51,000	47,000	13,500
Bombardier	CRJ-900			C-III	84,500	75,100	23,050
Bombardier	DHC-8-400	13.1% <sup>3</sup>	16.3% <sup>3</sup>	C-III	61,750	61,750	17,716
Embraer	EMB190	0%	0%	C-III	105,359	94,799	28,440

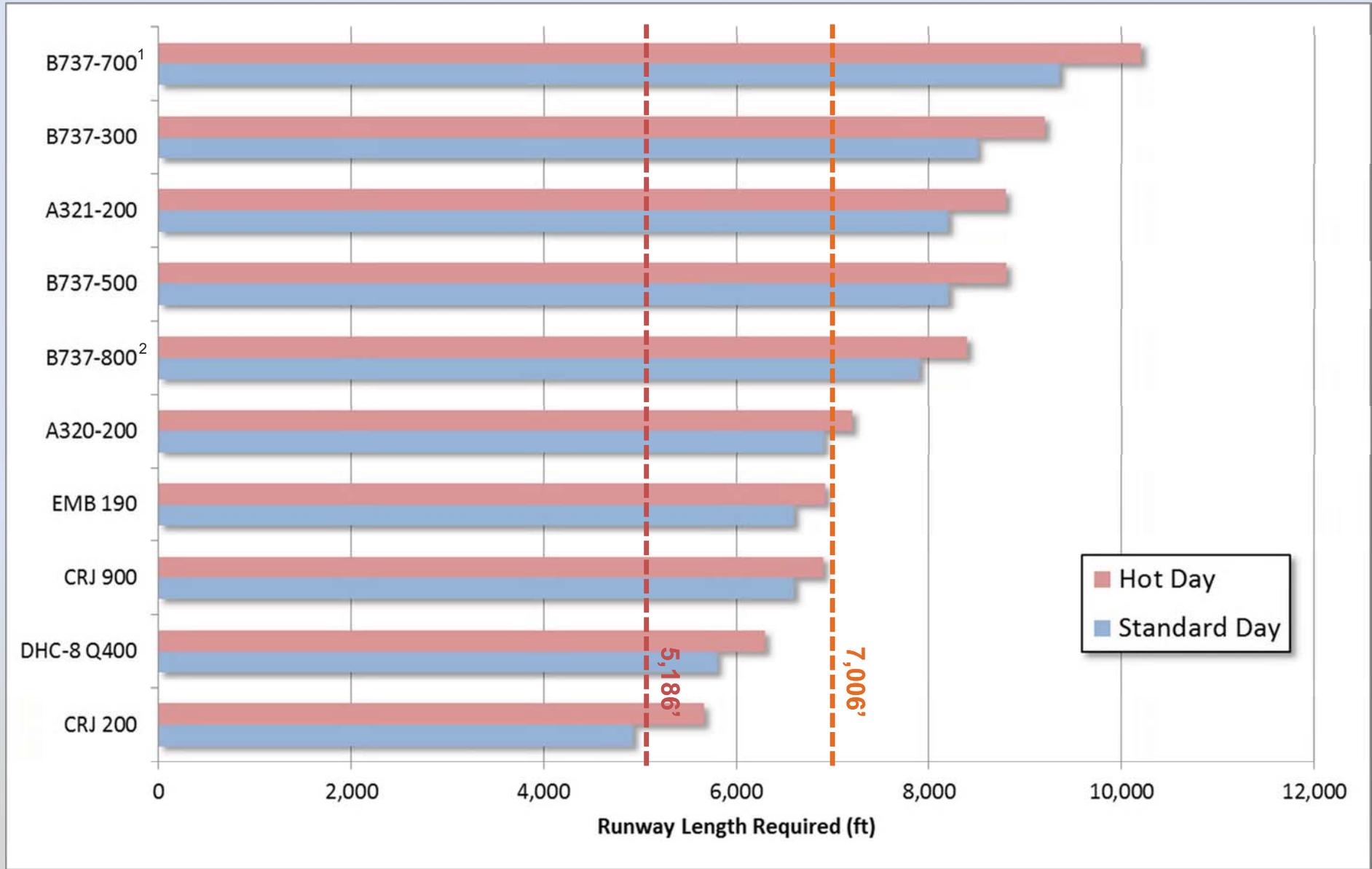
1 – Current critical design aircraft

2 – Future critical design aircraft

3 – All DHC-8 variants combined



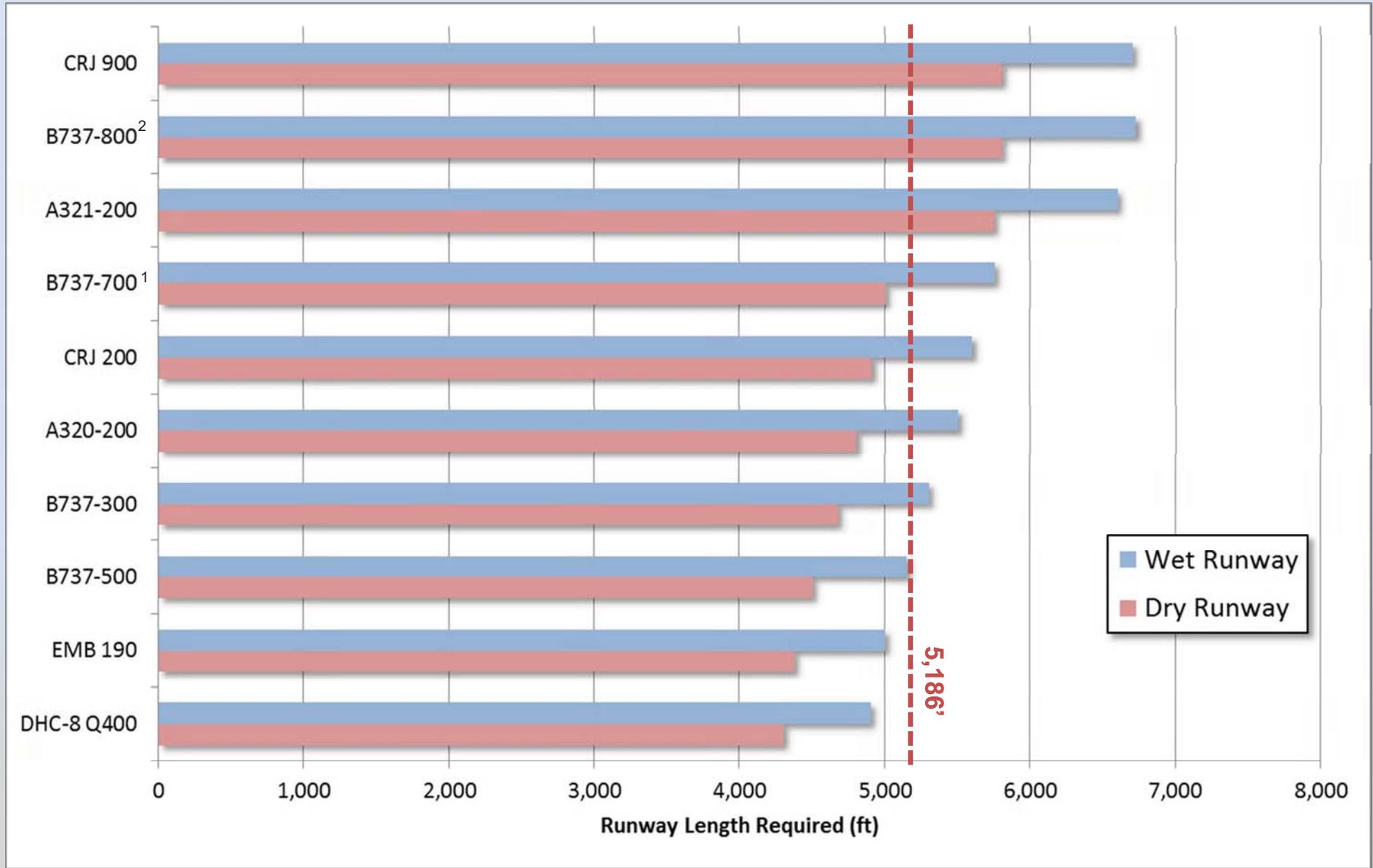
## MTOW Takeoff Requirements



- 1 – Current critical design aircraft
- 2 – Future critical design aircraft



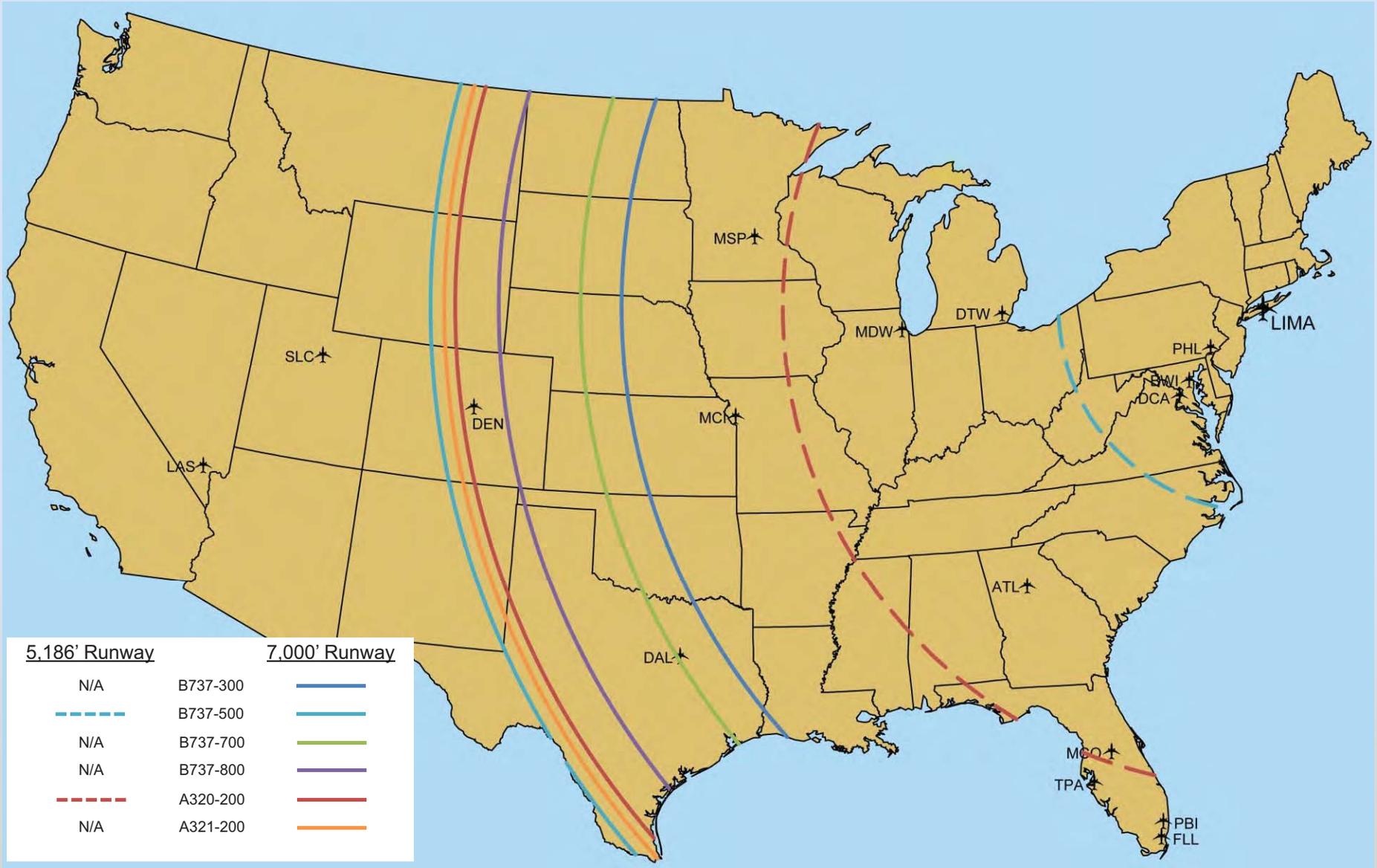
## MLW Landing Requirements



- 1 – Current critical design aircraft
- 2 – Future critical design aircraft



## Range at Maximum Payload

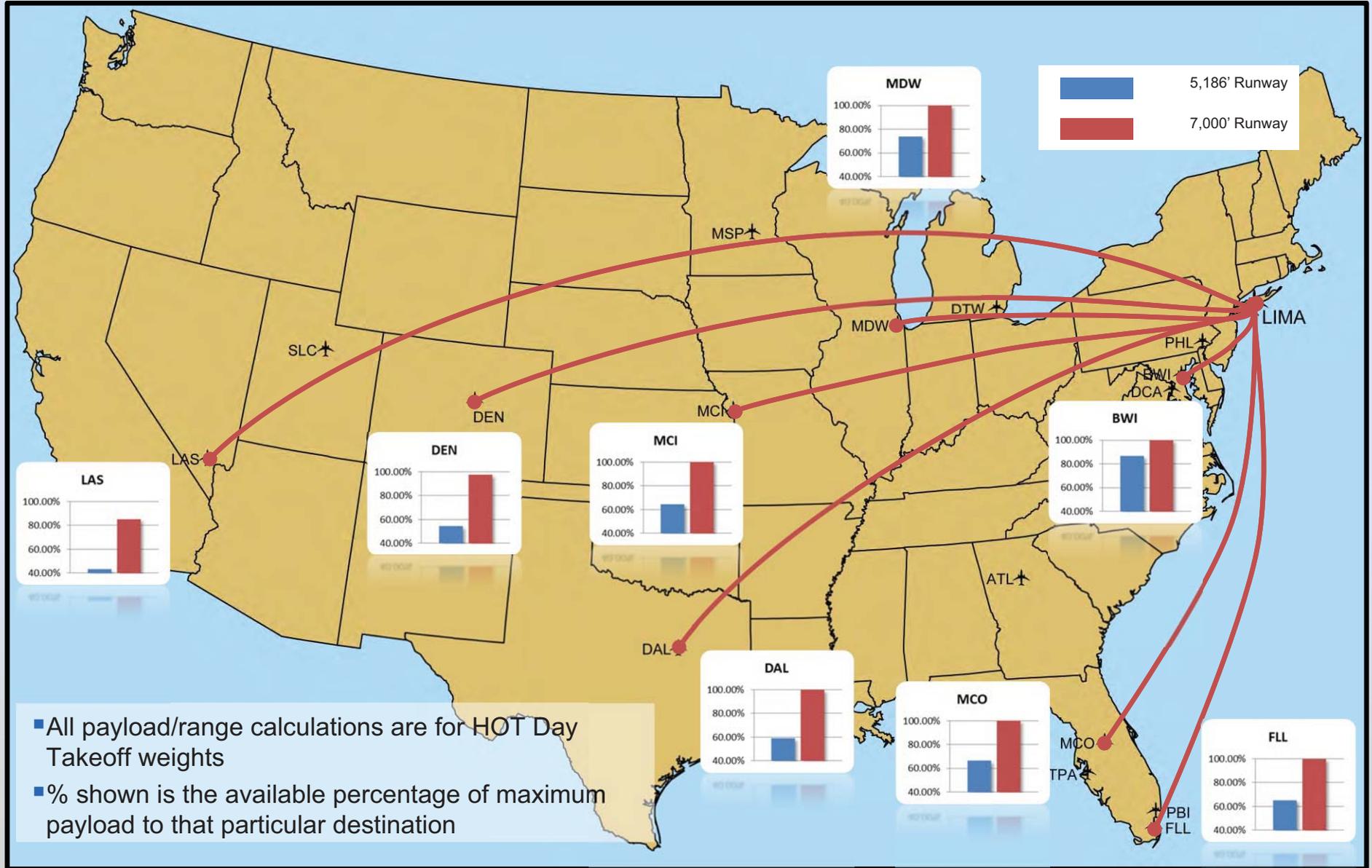


- The following aircraft are unable to depart with max payload from 5,186' of runway:  
B737-300, B737-700, B737-800, and A321-200

For Discussion Purposes Only



## Boeing 737-800<sup>1</sup> Example



- All payload/range calculations are for HOT Day Takeoff weights
- % shown is the available percentage of maximum payload to that particular destination

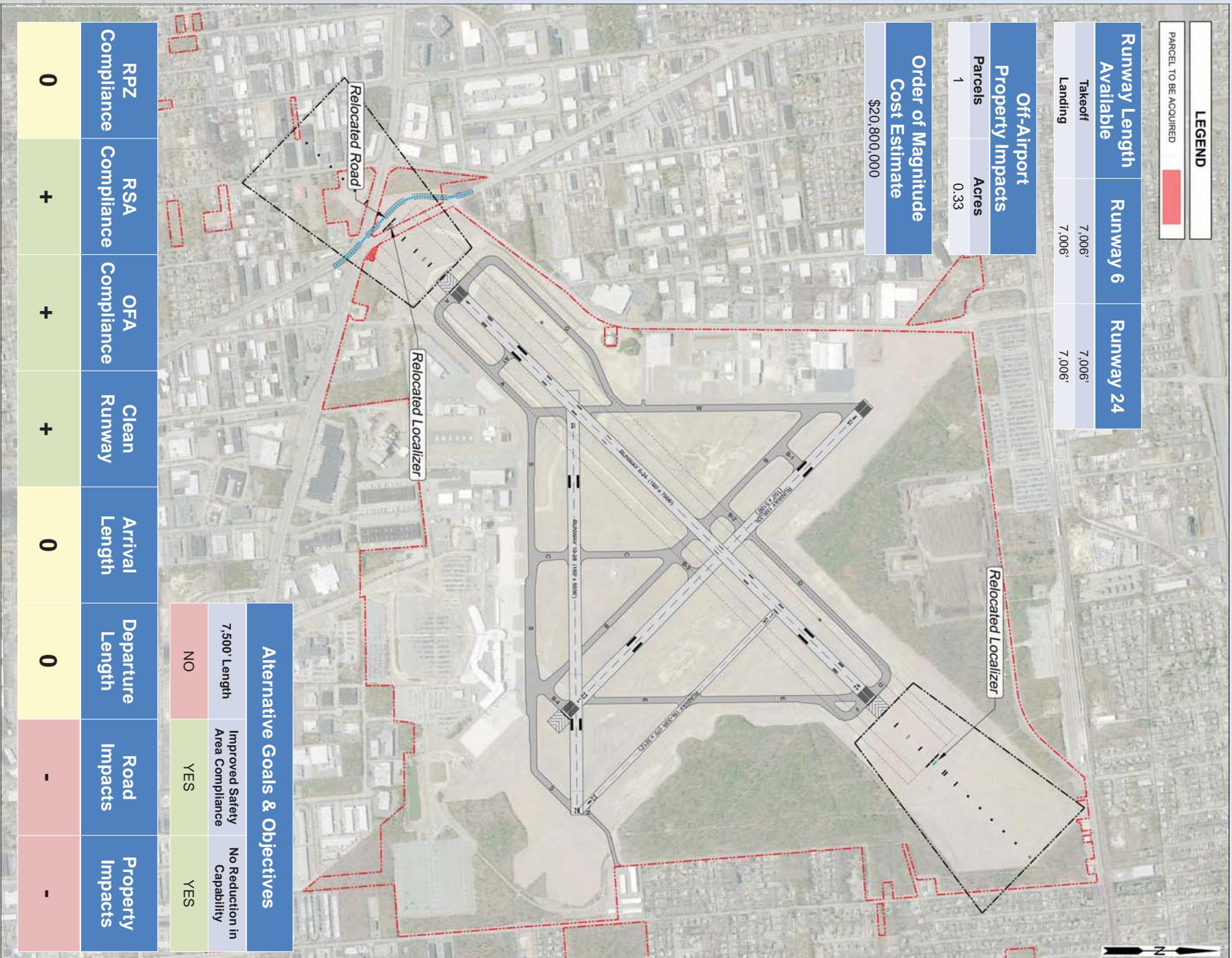
1 – Future critical design aircraft





# Runway 6/24 Alternative 01

## Existing Runway Length Standard RSA & OFA



**LEGEND**  
PARCEL TO BE ACQUIRED

Runway Length Available	Runway 6	Runway 24
Takeoff	7,006'	7,006'
Landing	7,006'	7,006'

Off-Airport Property Impacts	
Parcels	Acres
1	0.33

**Order of Magnitude Cost Estimate**  
\$20,800,000

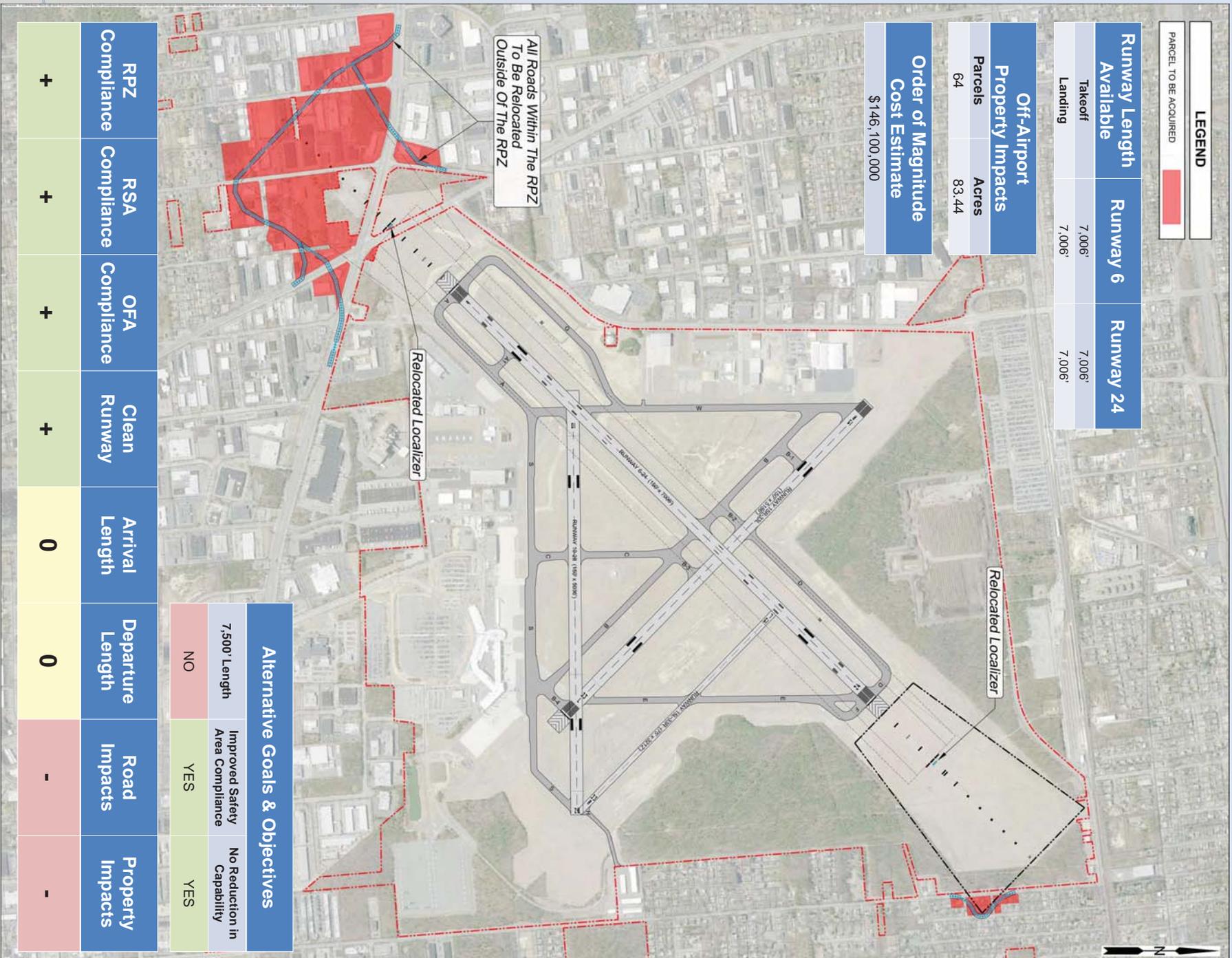
RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
0	+	+	+	0	0	-	-

Alternative Goals & Objectives		
7,500' Length	Improved Safety Area Compliance	No Reduction in Capability
NO	YES	YES



# Runway 6/24 Alternative 02

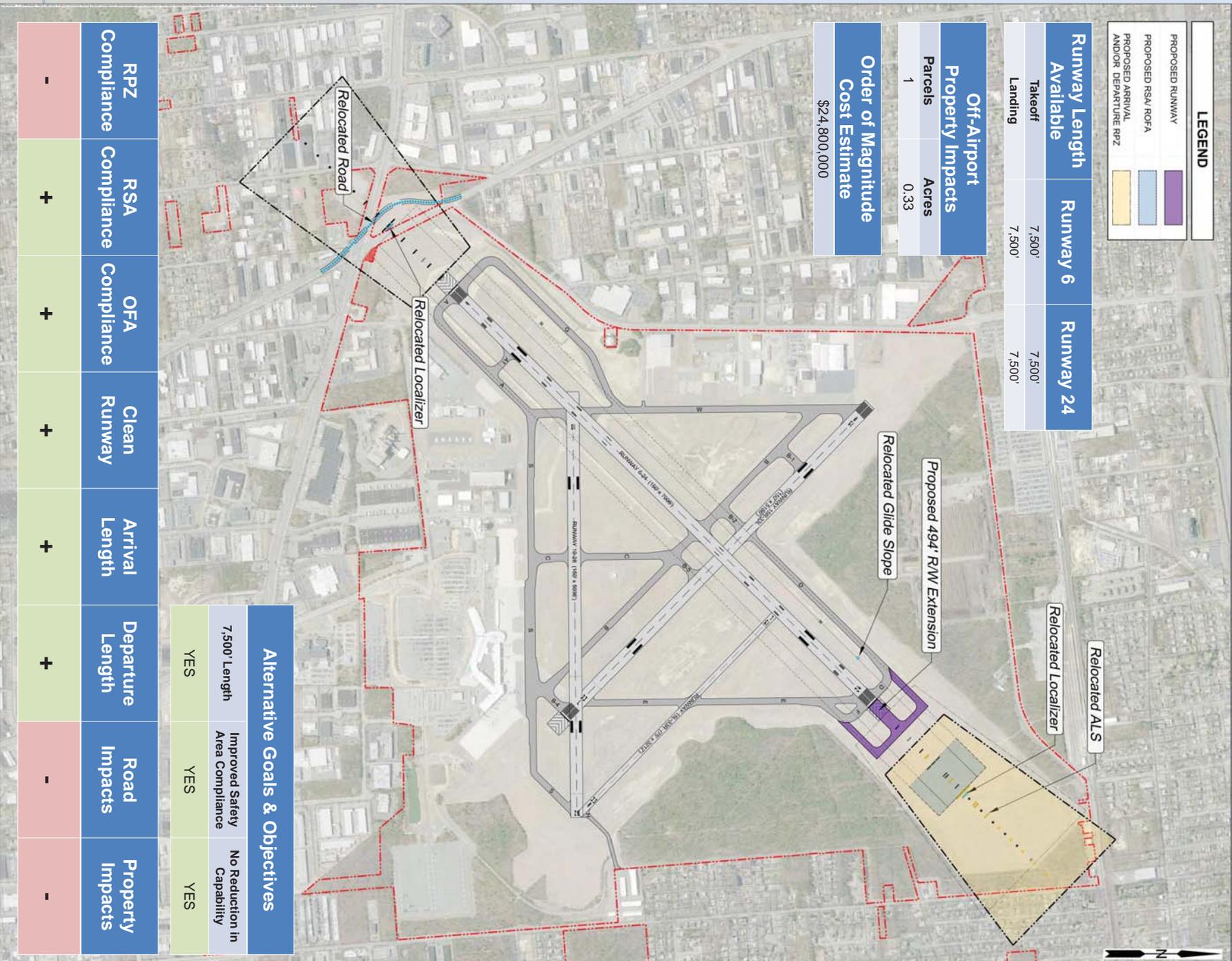
## Existing Runway Length Standard RSA, OFA, & RPZ





# Runway 6/24 Alternative 03

## Extend to 7,500' Standard RSA & OFA



LEGEND	
<span style="display:inline-block; width:15px; height:10px; background-color:purple; border:1px solid black;"></span>	PROPOSED RUNWAY
<span style="display:inline-block; width:15px; height:10px; background-color:lightblue; border:1px solid black;"></span>	PROPOSED RSA /OFA
<span style="display:inline-block; width:15px; height:10px; background-color:yellow; border:1px solid black;"></span>	PROPOSED ARRIVAL AND/OR DEPARTURE RPZ

Runway Length Available	Runway 6	Runway 24
Takeoff	7,500'	7,500'
Landing	7,500'	7,500'

Off-Airport Property Impacts	
Parcels	Acres
1	0.33

Order of Magnitude Cost Estimate
\$24,800,000

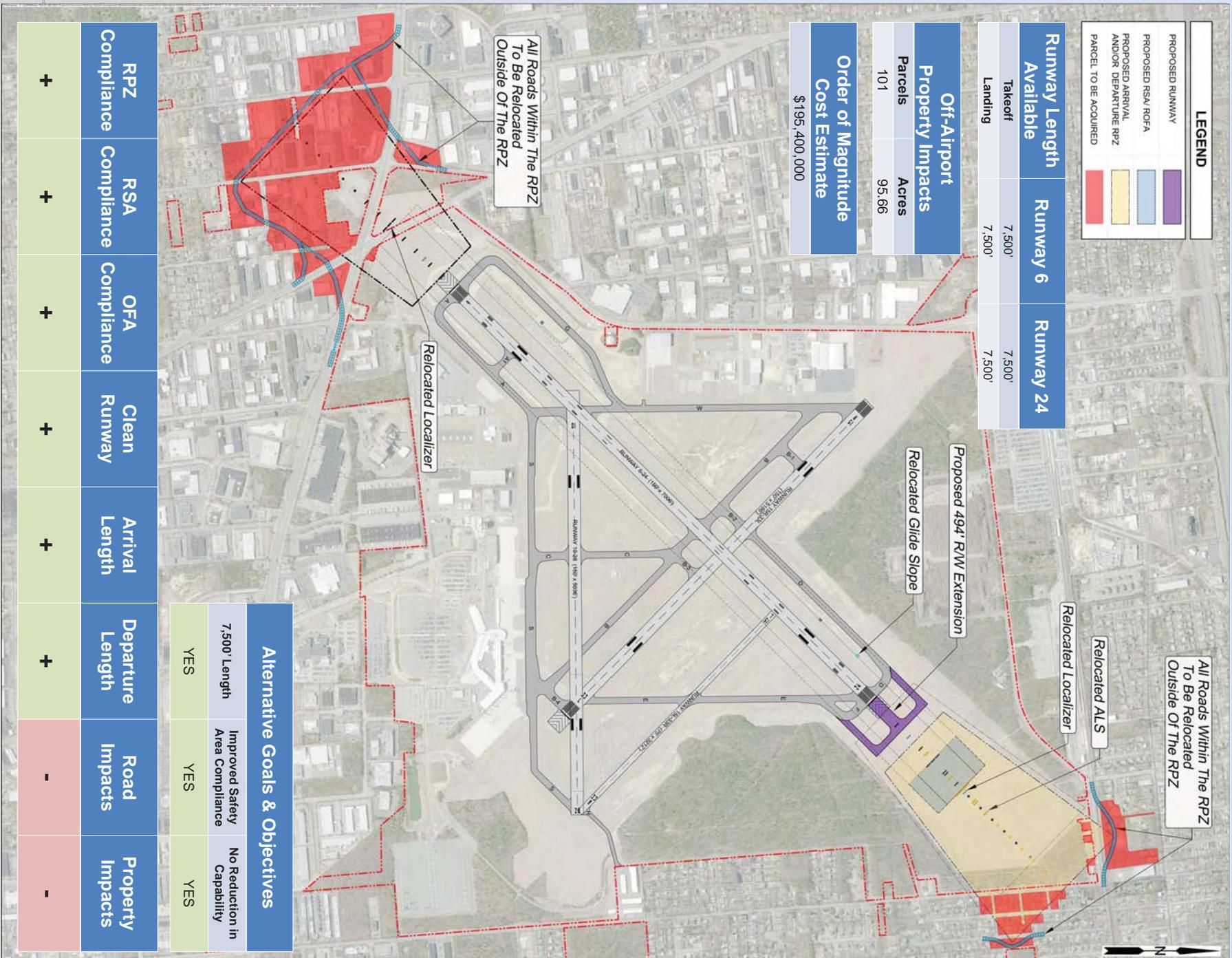
Alternative Goals & Objectives		
7,500' Length	Improved Safety Area Compliance	No Reduction in Capability
YES	YES	YES

RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
-	+	+	+	+	+	-	-



# Runway 6/24 Alternative 04

## Extend to 7,500' Standard RSA, OFA, & RPZ



### LEGEND

- PROPOSED RUNWAY
- PROPOSED RSA /RFA
- PROPOSED ARRIVAL AND/OR DEPARTURE RPZ
- PARCEL TO BE ACQUIRED

Runway Length Available	Runway 6	Runway 24
Takeoff	7,500'	7,500'
Landing	7,500'	7,500'

Off-Airport Property Impacts	Acres
Parcels	95.66
101	

**Order of Magnitude Cost Estimate**  
\$195,400,000

All Roads Within The RPZ To Be Relocated Outside Of The RPZ

All Roads Within The RPZ To Be Relocated Outside Of The RPZ

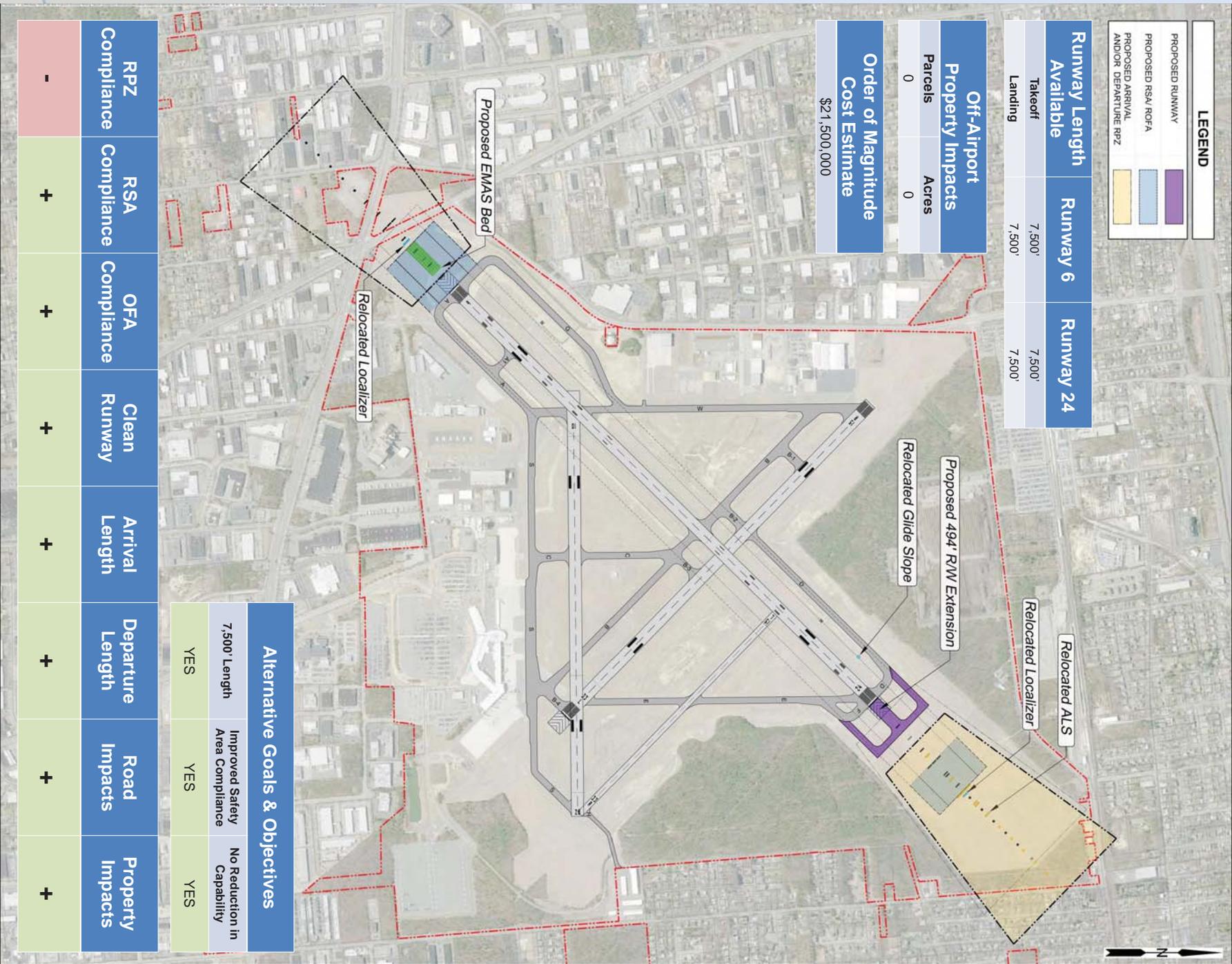
Alternative Goals & Objectives		
7,500' Length	Improved Safety Area Compliance	No Reduction in Capability
YES	YES	YES

RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
+	+	+	+	+	+	-	-



# Runway 6/24 Alternative 05

## Extend to 7,500' with EMAS Standard RSA & OFA



LEGEND	
<span style="display:inline-block; width:15px; height:10px; background-color:purple; border:1px solid black;"></span>	PROPOSED RUNWAY
<span style="display:inline-block; width:15px; height:10px; background-color:lightblue; border:1px solid black;"></span>	PROPOSED RSA ROFA AND/OR DEPARTURE RPZ
<span style="display:inline-block; width:15px; height:10px; background-color:yellow; border:1px solid black;"></span>	PROPOSED ARRIVAL AND/OR DEPARTURE RPZ

Runway Length Available	Runway 6	Runway 24
Takeoff	7,500'	7,500'
Landing	7,500'	7,500'

Off-Airport Property Impacts	
Parcels	0
Acres	0

<b>Order of Magnitude Cost Estimate</b>	\$21,500,000
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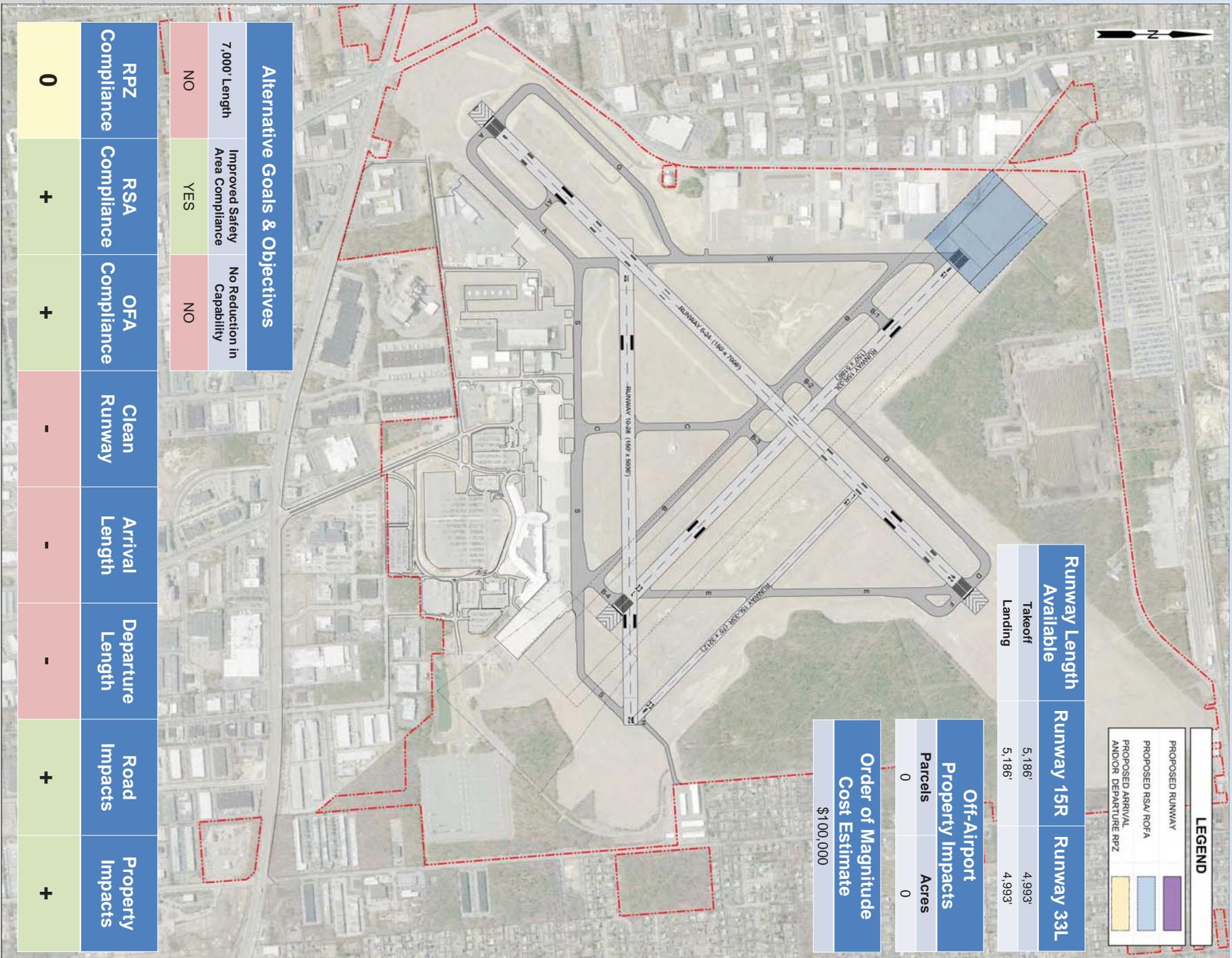
RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
-	+	+	+	+	+	+	+

Alternative Goals & Objectives		
7,500' Length	Improved Safety Area Compliance	No Reduction in Capability
YES	YES	YES



# Runway 15R/33L Alternative 01

## Reduce Runway Length Standard RSA & OFA



LEGEND	
<span style="color: purple;">█</span>	PROPOSED RUNWAY
<span style="color: blue;">█</span>	PROPOSED RSA ROFA
<span style="color: lightblue;">█</span>	PROPOSED ARRIVAL AND/OR DEPARTURE RPZ

Runway Length Available	Runway 15R	Runway 33L
Takeoff	5,186'	4,993'
Landing	5,186'	4,993'

Off-Airport Property Impacts	
Parcels	0
Acres	0

Order of Magnitude Cost Estimate
\$100,000

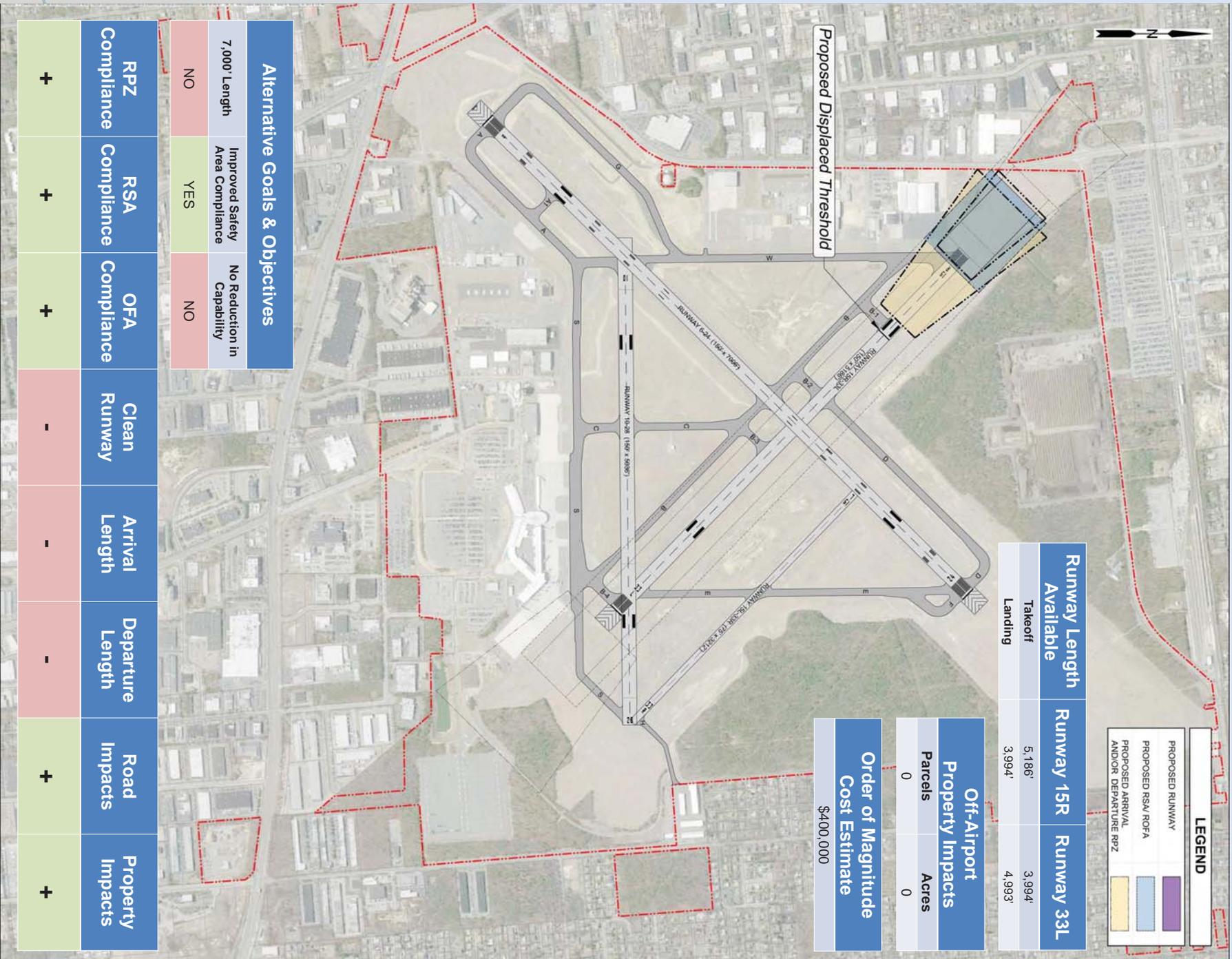
Alternative Goals & Objectives		
7,000' Length	Improved Safety Area Compliance	No Reduction in Capability
NO	YES	NO

RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
0	+	+	-	-	-	+	+



# Runway 15R/33L Alternative 02

## Reduce Runway Length Standard RSA, OFA, & RPZ



Runway Length Available		
Takeoff	5,186'	Runway 15R
Landing	3,994'	Runway 33L

Off-Airport Property Impacts	
Parcels	0
Acres	0

**Order of Magnitude Cost Estimate**  
\$400,000

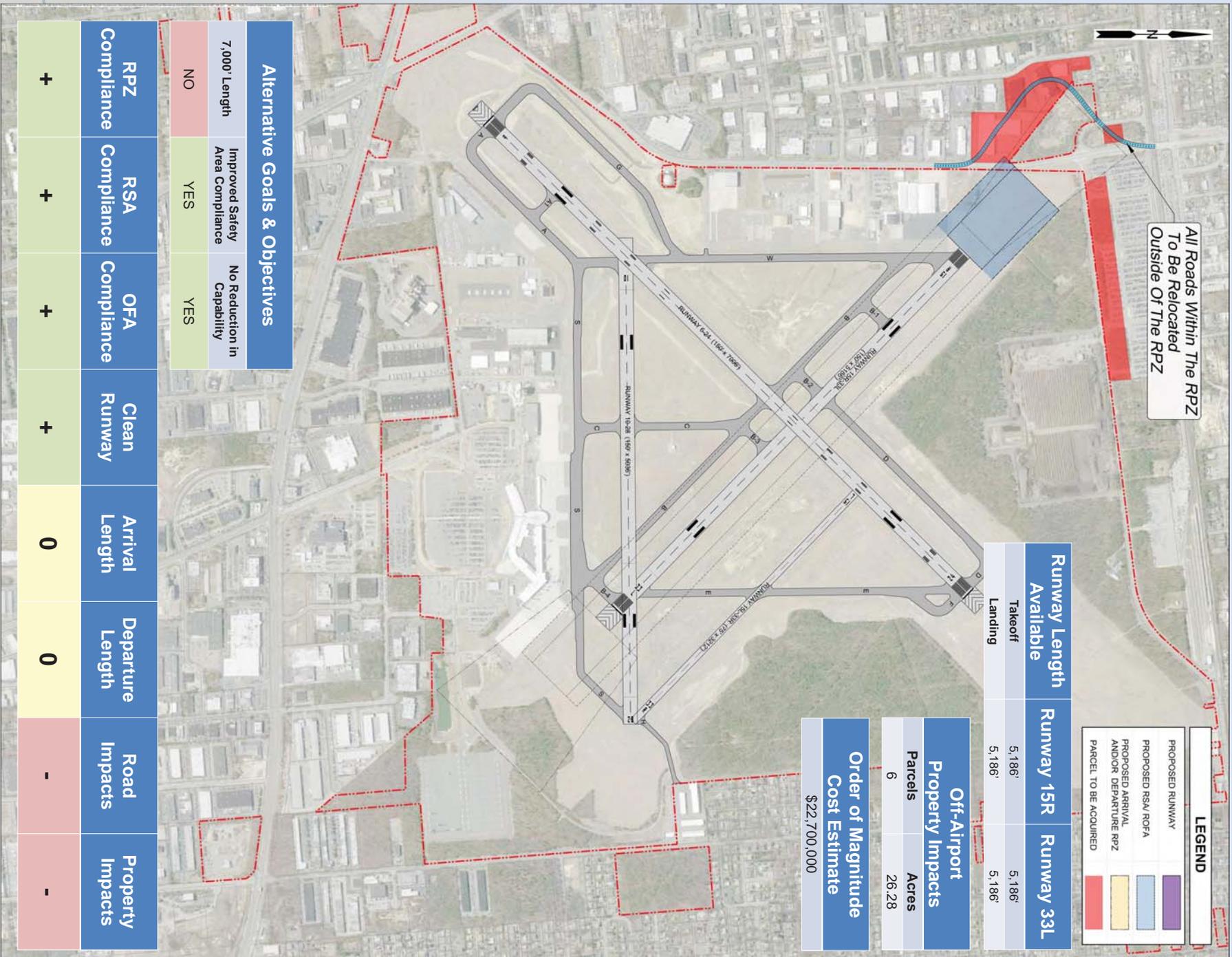
Alternative Goals & Objectives		
7,000' Length	Improved Safety Area Compliance	No Reduction in Capability
NO	YES	NO

RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
+	+	+	-	-	-	+	+



# Runway 15R/33L Alternative 03

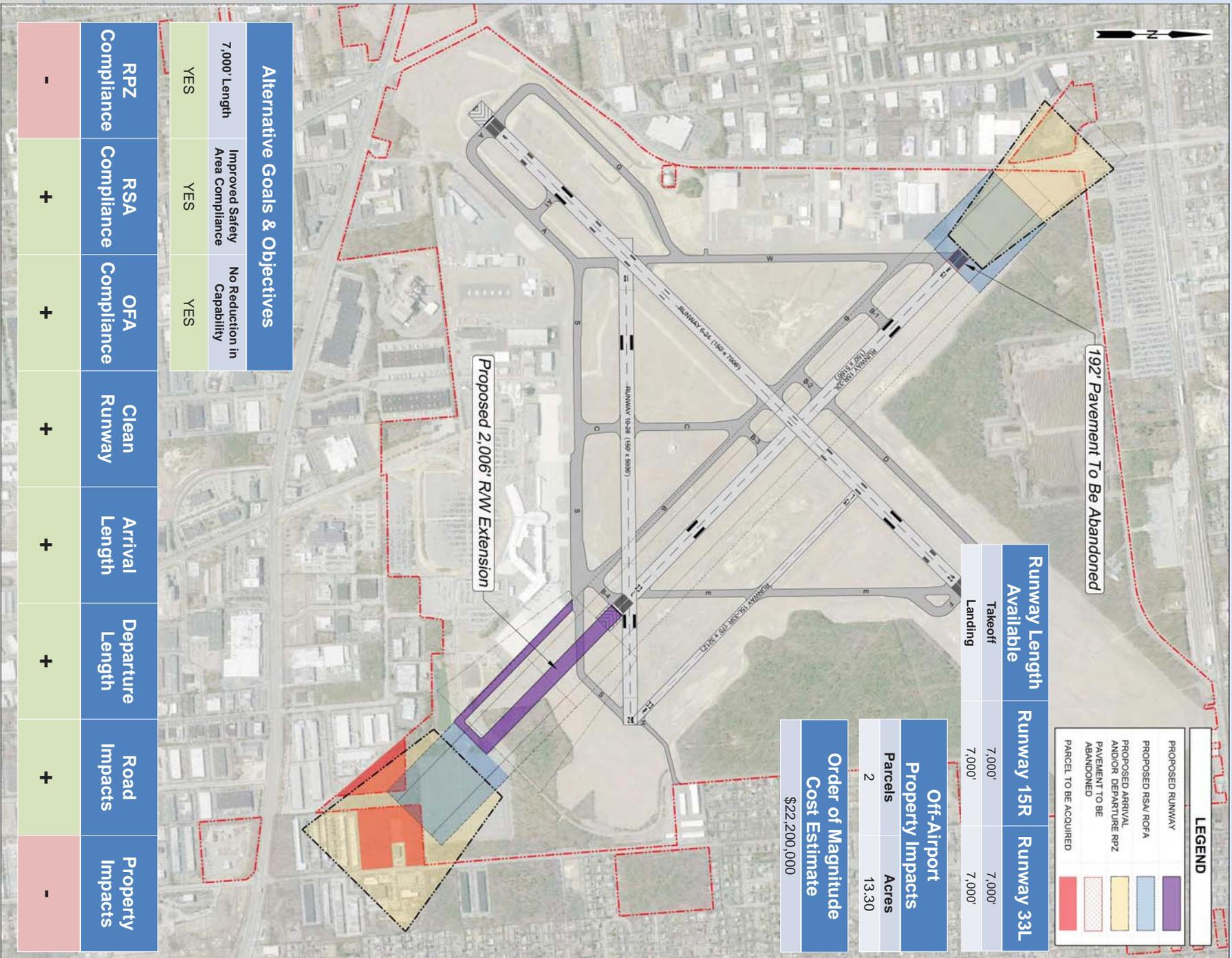
## Existing Runway Length Standard RSA, OFA, & RPZ





# Runway 15R/33L Alternative 04

## Extend to 7,000' Standard RSA & OFA



LEGEND	
	PROPOSED RUNWAY
	PROPOSED RSA ROFA
	PROPOSED ARRIVAL AND/OR DEPARTURE RPZ
	PAVEMENT TO BE ABANDONED
	PARCEL TO BE ACQUIRED

Runway Length Available	Runway 15R	Runway 33L
Takeoff	7,000'	7,000'
Landing	7,000'	7,000'

Off-Airport Property Impacts	
Parcels	2
Acres	13.30
<b>Order of Magnitude Cost Estimate</b>	
\$22,200,000	

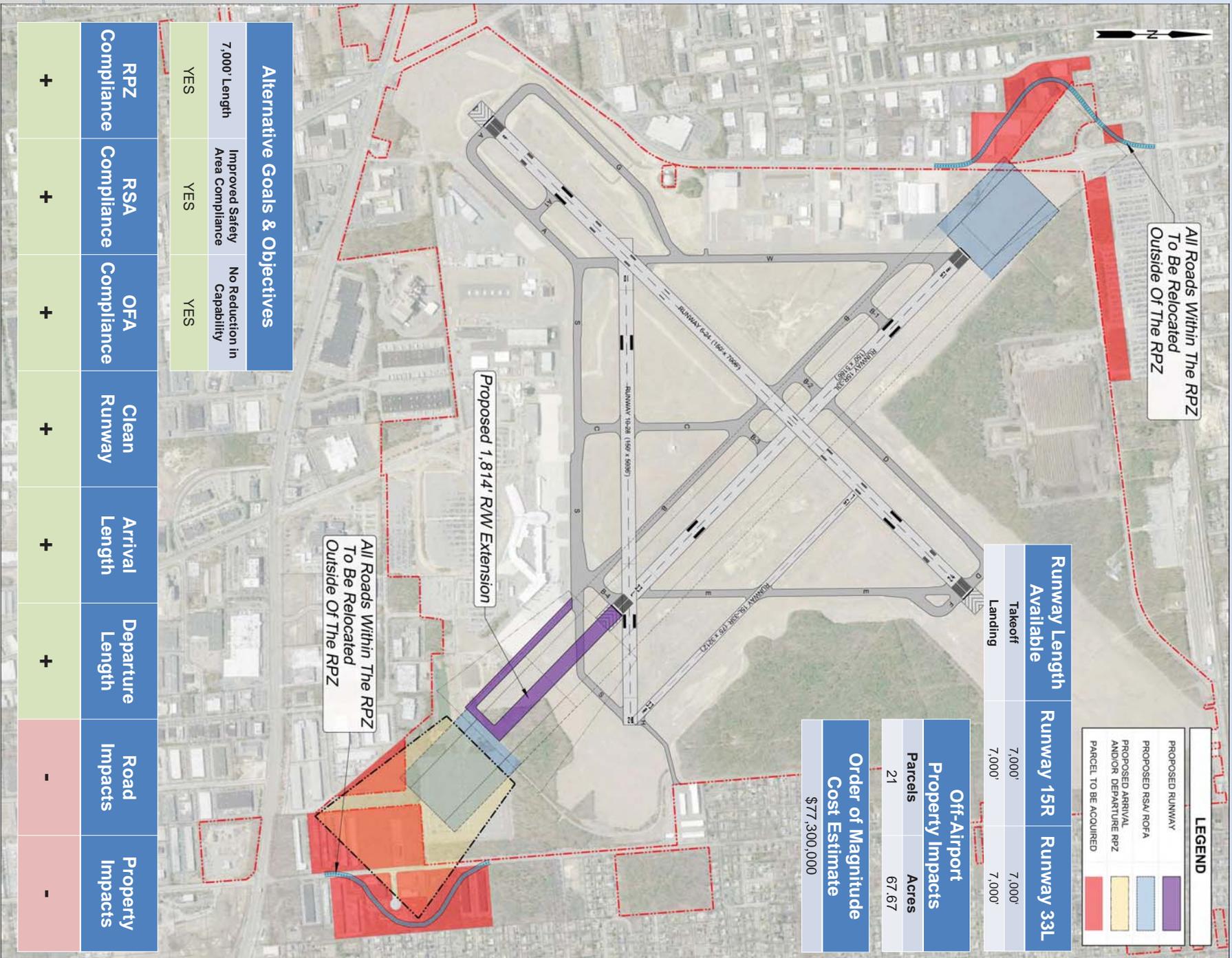
Alternative Goals & Objectives		
7,000' Length	Improved Safety Area Compliance	No Reduction in Capability
YES	YES	YES

RPZ Compliance	RSA Compliance	OFA Compliance	Clean Runway	Arrival Length	Departure Length	Road Impacts	Property Impacts
-	+	+	+	+	+	+	-



# Runway 15R/33L Alternative 05

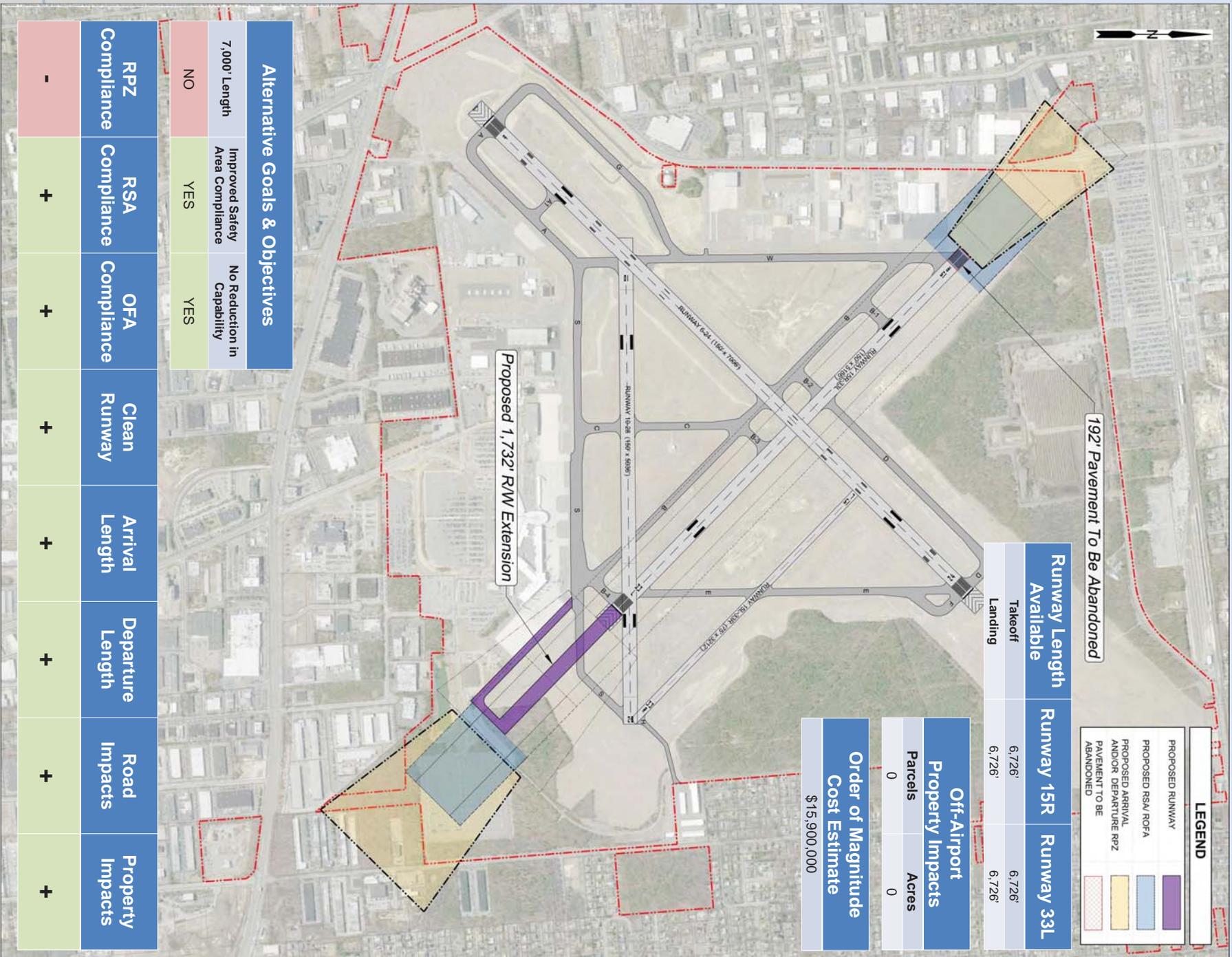
## Extend to 7,000' Standard RSA, OFA, & RPZ





# Runway 15R/33L Alternative 06

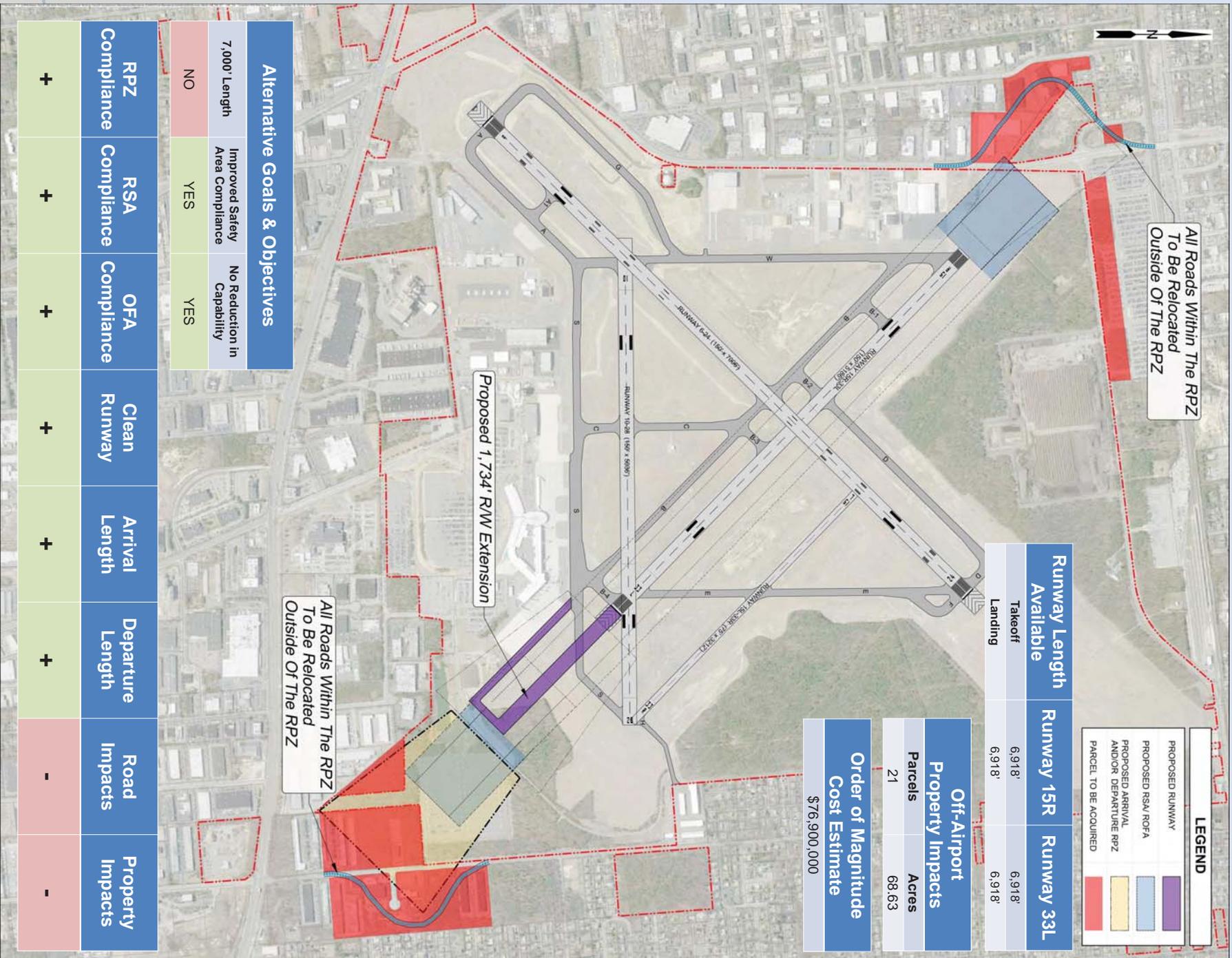
## Maximum Extension Possible 6,726' Standard RSA & OFA





# Runway 15R/33L Alternative 07

## Maximum Extension Possible 6,918' Standard RSA, OFA, & RPZ



## Runway Alternatives Evaluation Matrix

RUNWAY ALTERNATIVES		RUNWAY 06/24					RUNWAY						
		NO EXTENSION		EXTEND TO 7,500'			NO EXTENSION			EXTEND TO 7,000'	EXTEND TO ????		
		R-01	R-02	R-03	R-04	R-05	R-01	R-02	R-03	R-04	R-05	R-06	R-07
<b>Airfield Goals and Objectives</b>													
Fatal Flaws	15R/33L 7,000'						(1)	(1)	(1)			(1)	(1)
	6/24 7,500'	(1)	(1)										
	Improved Safety Area Standards Compliance												
	No Reduction in Capability						(1)	(1)					
<b>Improve Safety Area Standards Compliance</b>													
	Runway Protection Zone (RPZ)	0		(1)		(1)	0			(1)		(1)	
	Runway Safety Area (RSA)												
	Object Free Area (OFA)												
	Clean Runway (no declared distances)						(1)	(1)					
<b>Runway Length Impacts</b>													
	Arrivals	0	0				(1)	(1)	0				
	Departures	0	0				(1)	(1)	0				
<b>Off Airport Impacts</b>													
	Roads	(1)	(1)	(1)	(1)				(1)		(1)		(1)
	Property	(1)	(1)	(1)	(1)				(1)	(1)	(1)		(1)
<b>Total Score</b>		2	3	5	7	9	-	1	3	7	7	7	5
<b>RANK</b>		7	5	3	2	1	11	10	8	1	1	1	5

### Master Plan Recommended Runway Alternatives

- Runway 6/24 – Alternative R-08 EMAS
  - Ranked highest
- Runway 15R/33L – Alternative R-12
  - Of highest ranked - no fatal flaws, and least off airport impacts

Matrix Rating System		
Impact	Rating	Color
Negative	(1)	
Neutral	0	
Positive	1	



# Runway to Taxiway Conversion

## Convert Runway 10/28 to Taxiway "S"



## Summary of Requirements

Terminal Facility/ Processor	Existing	2012 Req.	2017	2022	2027	2032	2037
Gates (contact)	10	7	7	7	8	8	8
Curb Front (lf)							
Departures Curb	430	243	267	269	269	273	274
Arrivals Curb	340	243	267	269	269	273	274
Ticketing (units)							
Counters	50	13	13	13	12	11	10
Kiosks	10	4	6	7	12	14	16
Baggage Screening (EDS units)	3	3	4	4	4	4	4
Security (lanes)	4	3	3	3	3	3	3
Baggage Claim (lf)	557	117	129	129	130	131	132

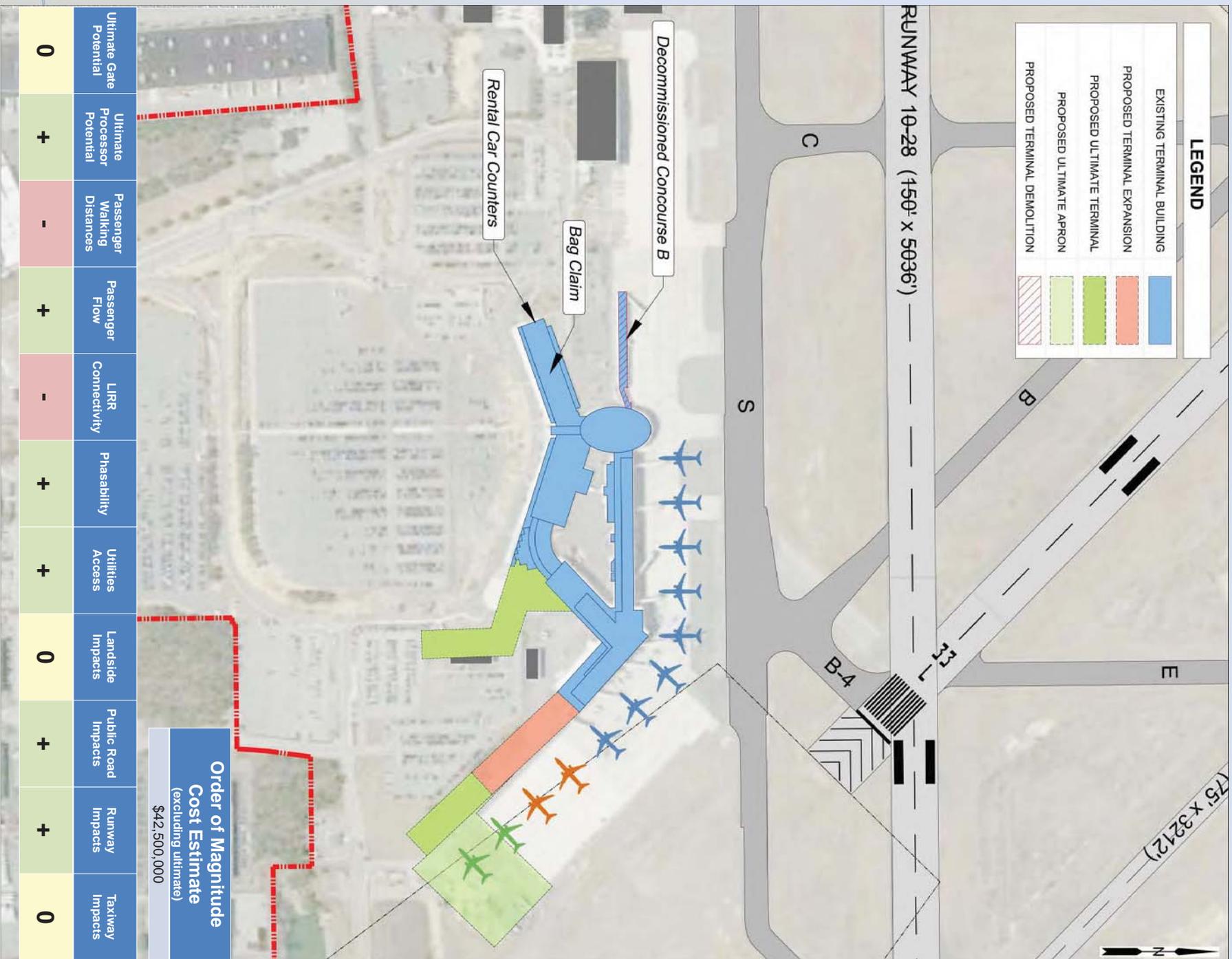
- Additional ticketing kiosks & baggage screening (EDS units) will be needed by the end of the planning period





# Terminal Alternative 1

## “Re-center” Existing Terminal

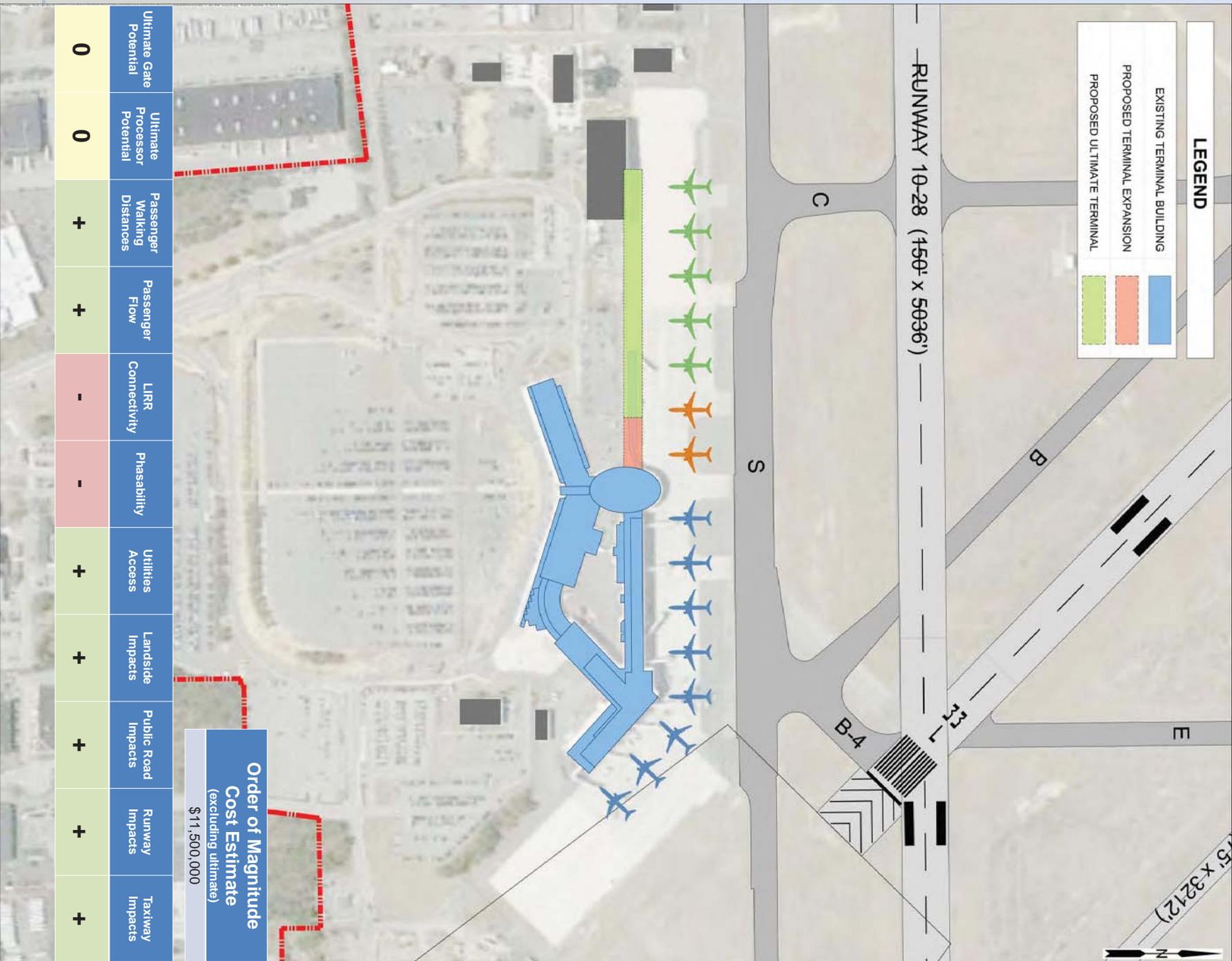


**Order of Magnitude  
Cost Estimate  
(excluding ultimate)**  
\$42,500,000

Ultimate Gate Potential	Ultimate Processor Potential	Passenger Walking Distances	Passenger Flow	LIRR Connectivity	Passability	Utilities Access	Landside Impacts	Public Road Impacts	Runway Impacts	Taxiway Impacts
0	+	-	+	-	+	+	0	+	+	0

# Terminal Alternative 2

## Existing Terminal Rebuild/Extend West Concourse



# Terminal Alternative 3

## Existing Terminal – Relocate Processor & Expand Landside

