



# Technical Master Plan Update



# Agenda

- Technical Master Plan Team
- Plymouth Airport Highlights
- Purpose of a Master Plan
- Master Planning Process
- Forecast
- Typical Runway Lengths
- Runway Length Analysis
- Alternatives
- Timeline
- Questions

# Technical Master Plan Team



**Airport/ PAC**

The Airport, overseen by the Plymouth Airport Commission, has undertaken a Technical Master Plan Update.



**FAA/ MASSDOT**

The Plan is 90% funded by the Federal Aviation Administration. 5% funded by the MASSDOT Bureau of Aeronautics with the remainder, a local match.



**You**

Input from the Public is crucial to ensuring the Master Plan reflects the needs of the local community.



**D&K**

DuBois and King has over 30 years of experience serving Plymouth Municipal Airport and its community.

# Plymouth Airport Highlights....



## GOOD FOR THE ENVIRONMENT

- 150 preserved acres of Natural Habitat
- DEP standards
- Compatible Wildlife Program
- State wildlife approval for construction
- 800 acres of rural legacy



## HUB OF PUBLIC SERVICE

- State Police Air Wing
- Boston Medflight
- Cape Cod Community College
- Local Pilot Humanitarian Missions
- Civil Air Patrol



## GOOD NEIGHBOR

- Administration Building open to Public
- Public interaction with Airport activity- Patio and Play Area
- Public tours
- Precinct 11 voting location
- Noise Briefings



## GOOD FOR THE ECONOMY

- Municipal Enterprise Account
- \$450,000+ real estate tax revenue on ~60 Buildings
- \$62 million in Total Annual Economic Output



# Plymouth Airport Highlights Continued

## Plymouth Airport Non-Aeronautical Development Area



- Infrastructure mostly complete
- Opportunities for Plymouth Based Businesses
- Job Creation
- Lease Revenue for the Airport
- Tax Revenue for the Towns of Plymouth and Carver

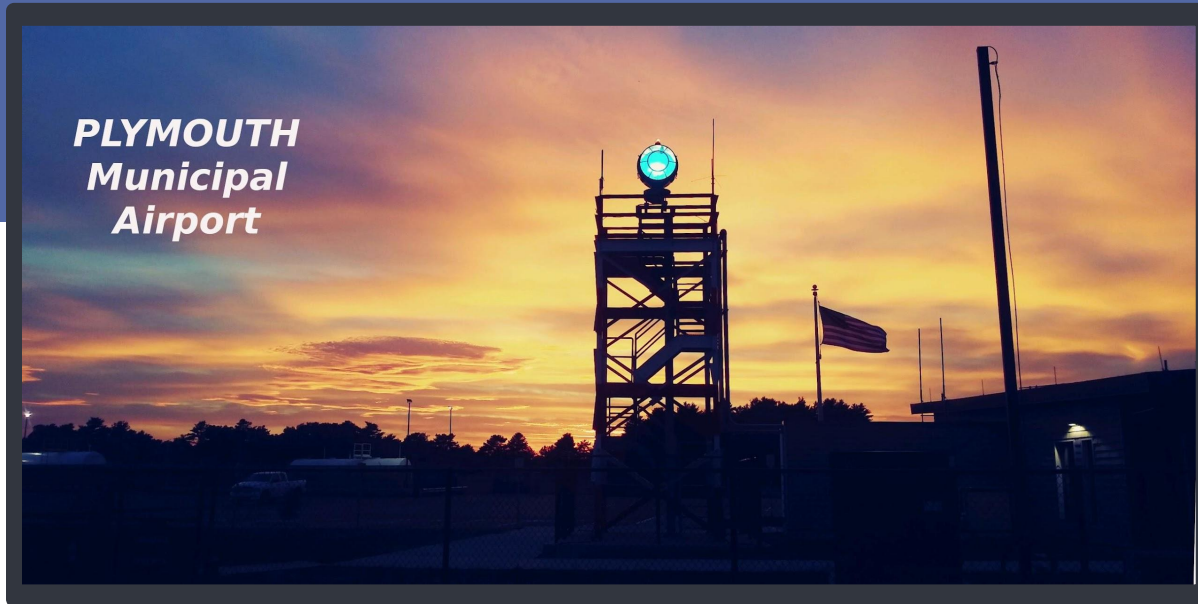


# Purpose of a Technical Master Plan Update

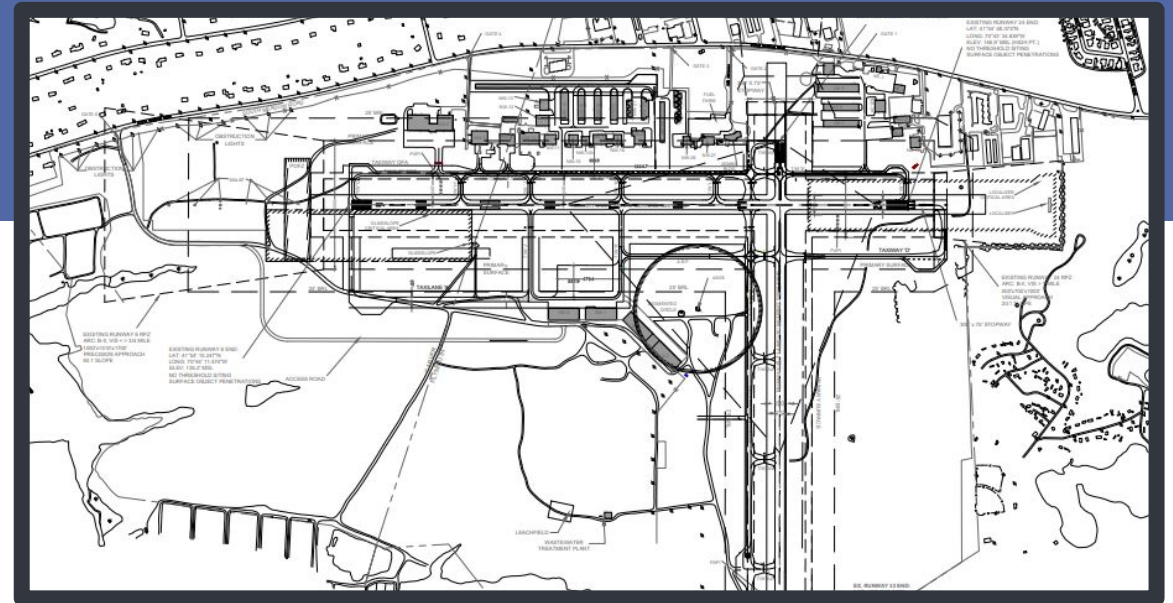


- Incorporate Public Involvement
- Aligning Airport future with the Town / Community
- Evaluate Safety Needs to include a Runway Length Analysis
- Determine Sustainable Infrastructure Needs
- Identify Economic Development Opportunities
- Develop an Efficient Timeline for the Airport's future

# Master Planning Process



- Meet with PAC
- First Public Meeting - Overview
  - Introduction, Existing Conditions, and Forecast
  - Submit Forecast to Plymouth Airport Commission, FAA and MASSDOT for approval
- Second Public Meeting (Draft Alternatives review)
  - Facility Needs and refine Draft Alternatives (based on public comment)



## Next steps

- Develop
  - Environmental Overview
  - Recommended Preferred Alternative
- Third Public Meeting
- Airport Layout Plan Update, Financial and Implementation Considerations
- FAA Review and Approval of the ALP
- Distribution of the Final Document



# Forecast

Table 3-9 - Summary of Baseline Data			
Based Aircraft (Table 3-3)	105		
Local Itinerant Split (Table 3-4)	Local	Itinerant	Total
	33,103	27,918	61,021
Operations by Aircraft Type (Table 3-6)	Operations	% Total Operations	
Single-Engine	41,494	68.00%	
Multi-Engine	5,492	9.00%	
Turbo-Prop	7,323	12.00%	
Turbo-Jet	4,271	7.00%	
Rotorcraft	2,441	4.00%	
Glider	0	0.00%	
Light Sport	0	0.00%	
Military	0	0.00%	
Operations by FAA Grouping (Table 3-7)			
AAC/ADG	Operations	% Total Operations	
A-I	58,595	96.00%	
A-II	697	1.10%	
A-III	3	0.00%	
B-I	384	0.60%	
B-II	1,122	1.80%	
B-III	3	0.00%	
C-I	90	0.10%	
C-II	96	0.20%	
C-III	2	0.00%	
Source: DuBois & King			

## Findings

- 8% Increase in Total Operations
- 8% Decrease in Based Aircraft

## Summary

- Modest changes. On track with National Average.

Table 3-16 - Summary of Forecast Data for 2041			
Based Aircraft (Table 3-11)	96		
Local Itinerant Split (Table 3-14)	Local	Itinerant	Total
	36,078	30,411	66,489
Operations by Aircraft Type (Table 3-14)	Operations	% Total Operations	
Single-Engine	44,932	67.6%	
Multi-Engine	5,835	8.8%	
Turbo-Prop	8,041	12.1%	
Turbo-Jet	4,847	7.3%	
Rotorcraft	2,834	4.3%	
Glider	0	0.0%	
Light Sport	0	0.0%	
Military	0	0.0%	
Forecasted Operations by FAA Grouping (Table 3-15)			
AAC/ADG	Operations	Operations	
A-I	63,845	96.0%	
A-II	759	1.1%	
A-III	3	0.0%	
B-I	419	0.6%	
B-II	1,222	1.8%	
B-III	3	0.0%	
C-I	98	0.1%	
C-II	105	0.2%	
C-III	3	0.0%	
Source: DuBois & King			

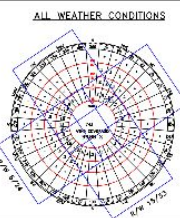


# Plymouth Municipal Airport 2016 Ultimate Airport Layout Plan



APPROVED BY: [Signature]  
CREATED BY: [Signature]  
DATE: [Signature]  
SCALE: [Signature]  
SHEET: [Signature]

## WIND ROSE



COMBINED RUNWAY WIND COVERAGE  
10% Run  
15 Run  
15 Run

## RUNWAY DATA TABLE

APPROACH VIS. MINIMUMS FAIR PAVT 77 CAT.	EXISTING	FUTURE
	RW 6: ≥ 3/4 MI RW 15: 3/3: VISUAL RW 6 PRECISION	RW 6: ≥ 3/4 MI RW 24: 3/4 MI RW 15: 1 MI RW 6 PRECISION RW 33: 15, 24 NONPRECISION
APPROACH SLOPE	RW 6: 50.1 RW 24: 16.33 RW 15: 33: 20.1	RW 6: 50.1 RW 24: 34.1 RW 15: 34.1
RUNWAY LENGTH / WIDTH	RW 6: 24: 4,349' x 75' RW 15: 33: 4,350' x 75'	RW 6: 24: 4,349' x 75' RW 15: 33: 4,350' x 75'
PAVEMENT TYPE	BITUMINOUS CONCRETE	SAME
PAVEMENT DESIGN STRENGTH	12,500 LBS (SW)	12,500 LBS (SW)
LIGHTING	MIRL	RW 6-24: MIRL RW 15-33: MIRL
EST. AIRPORT ELEVATION	146.9' MSL	146.9' MSL
RUNWAY HIGH/LW POINTS	RW 6: PRECISION RW 15: 33: 0.44%	RW 33: 15, 24: NONPRECISION RW 6: PRECISION
PERCENT GRADIENT	RW 6-24: 0.3% RW 15-33: 0.44%	RW 6-24: 0.3% RW 15-33: 0.2%
MAXIMUM RUNWAY GRADE	1.5%	1.5%
CRIT. AIRCRAFT	HAWKER 850	HAWKER 850
RUNWAY SAFETY AREA DIMENSIONS	RW 6-24: 4,949' x 150' RW 15-33: 5,250' x 150'	RW 6-24: 5,249' x 150' RW 15-33: 5,250' x 150'
OBJECT FREE AREA DIMENSIONS	RW 6-24: 4,849' x 500' RW 15-33: 5,250' x 100'	RW 6-24: 5,249' x 500' RW 15-33: 5,250' x 500'
OBSTACLE FREE ZONE DIMENSIONS	RW 6-24: 4,749' x 400' RW 15-33: 4,750' x 250'	RW 6-24: 4,749' x 400' RW 15-33: 4,750' x 400'
OBSTACLE FREE ZONE PENETRATIONS	NONE	NONE
EFFECTIVE RUNWAY LENGTH	RW 15-33: 4,650' RW 6-24: 4,350'	RW 15-33: 4,650' RW 6-24: 4,350'



## AIRPORT DATA TABLE

AIRPORT REFERENCE POINT (NAD 83)	EXISTING	FUTURE
	41°54'32.50"N 70°43'38.60"W	41°54'31.24"N 70°43'38.60"W
MEAN DAILY MAX TEMP	82.4°F	
WIND COVERAGE (VFR/IFR %)	99.4%	
AIRPORT MAG. VARIATION	10.2°W - July 28, 2008	
AIRPORT REFERENCE CODE	B-II	B-II
NPAS SERVICE LEVEL	GENERAL AVIATION	
TAXIWAY LIGHTING	MITS	
RUNWAY 06 LONGITUDE	41°54'15.24"N NAD 83	41°54'15.24"N NAD 83
RUNWAY 06 LATITUDE	70°44'11.474"W NAD 83	70°44'11.474"W NAD 83
RUNWAY 24 LONGITUDE	41°54' 50.673"N NAD 83	41°54' 50.673"N NAD 83
RUNWAY 24 LATITUDE	70°43' 32.315"W NAD 83	70°43' 32.315"W NAD 83
RUNWAY 15 LONGITUDE	41°54'43.928"N NAD 83	41°54'43.928"N NAD 83
RUNWAY 15 LATITUDE	70°43'48.352"W NAD 83	70°43'48.352"W NAD 83
RUNWAY 33 LONGITUDE	41°54'16.588"N NAD 83	41°54'16.588"N NAD 83
RUNWAY 33 LATITUDE	70°43'40.000"W NAD 83	70°43'40.000"W NAD 83
VISUAL APPROACH AIDS	RW 06: PAPI-4; RW 24: PAPI-4; RW 15: 1; RW 33: PAPI-4; ALL: WINDCONES; ROTATING BEACON	RW 24: SAME; RW 15: SAME; RW 33: PAPI-4
OTHER NAVAIDS	RW 6: GLIDESLOPE & LOCALIZER, ASOS	RW 6: GLIDESLOPE & LOCALIZER, ASOS
RUNWAY 06 ELEVATION	135.2' MSL	135.2' MSL
RUNWAY 24 ELEVATION	146.9' MSL	146.9' MSL
RUNWAY 15 ELEVATION	145.0' MSL	145.0' MSL
RUNWAY 33 ELEVATION	133.4' MSL	133.4' MSL

## DECLARED DISTANCES

	EXISTING				FUTURE			
	RW 6	RW 24	RW 15	RW 33	RW 6	RW 24	RW 15	RW 33
TODA	4,650'	4,650'	4,350'	4,350'	4,650'	4,650'	4,350'	4,350'
LODA	4,850'	4,850'	4,350'	4,350'	4,850'	4,850'	4,350'	4,350'
ASDA	4,850'	4,850'	4,350'	4,350'	4,850'	4,850'	4,350'	4,350'
LDA	4,650'	4,650'	4,350'	4,350'	4,650'	4,650'	4,350'	4,350'

## APPROVAL

PLYMOUTH MUNICIPAL AIRPORT  
MASSACHUSETTS DOT  
FEDERAL AVIATION ADMINISTRATION

## BUILDING TABLE\*

NO.	DESCRIPTION	NO.	DESCRIPTION
NW-1	ROCKING HORSE LIGHT	NW-24	COMMERCIAL AVIATION
NW-2	PROFESSIONAL PILOTS	NW-25	PORT-A-PORT HANGARS
NW-3	ISS CORP	NW-26	ROCKING HORSE LIGHT
NW-4	ISS CORP	NW-27	PORT-A-PORT HANGARS
NW-5	STATE POLICE	NW-28	PORT-A-PORT HANGARS
NW-6	HYPERMARTINS	NW-29	PORT-A-PORT HANGARS
NW-7	AMERICAN VENDOR	NW-30	NALLY PARKING (BASKET)
NW-8	BENEFIT CORP	NW-31	PAC TRUST
NW-9	PAC TRUST	NW-32	TOWN HANGAR
NW-10	HUNTS ELECTRIC	NW-33	POWER HANGAR
NW-11	W. HAN CRAFTWORK	NW-34	CIVILIAN ELECTRIC
NW-12	PAC TRUST	NW-35	PAC TRUST
NW-13	ALPHA CORP	NW-36	FOSSICK
NW-14	PAC TRUST	NW-37	PRATT & WHITNEY (COMMERCIAL)
NW-15	ALPHA CORP	NW-38	EAST COAST HELICOPTERS
NW-16	PAC TRUST	NW-39	CS AERODYNAMICS
NW-17	PORT-A-PORTS	NW-40	PI AVIATION
NW-18	YANKEE SERVICE CORP	NW-41	BENDIX CORP
NW-19	PORT-A-PORTS	NW-42	BENDIX CORP

## PHASING

PHASE	SYMBOL	PHASE	SYMBOL
TO BE REMOVED	[Red Box]	TO BE REMOVED	[Red Box]
COMPLETED BY 2011	[Green Box]	COMPLETED BY 2011	[Green Box]
I 2008-2013	[Blue Box]	I 2008-2013	[Blue Box]
II 2013-2018	[Yellow Box]	II 2013-2018	[Yellow Box]
III 2018-2028	[Orange Box]	III 2018-2028	[Orange Box]
IV BEYOND 2028	[Pink Box]	IV BEYOND 2028	[Pink Box]

## LEGEND

DESCRIPTION	EXISTING SYMBOL	FUTURE SYMBOL
RUNWAY SAFETY AREA	[Line]	[Line]
RUNWAY OBJECT FREE AREA	[Line]	[Line]
RUNWAY PROTECTION ZONE	[Line]	[Line]
BUILDING RESTRICTION LINE	[Line]	[Line]
TAXIWAY - TAXILANE OFA	[Line]	[Line]
TAXIWAY - TAXILANE CENTERLINE	[Line]	[Line]
SLOT ELEVATIONS	[Line]	[Line]
AIRPORT REFERENCE POINT	[Point]	[Point]
AIRPORT PROPERTY LINE	[Line]	[Line]
RUNWAY VISIBILITY ZONE	[Line]	[Line]
TREE LINE	[Line]	[Line]
ROADWAYS TO CONTOURS	[Line]	[Line]
ENCLOSURE	[Line]	[Line]
NON-AERONAUTICAL AREAS	[Line]	[Line]
TOLD LINES	[Line]	[Line]
ON AIRPORT BUILDINGS	[Line]	[Line]
OFF AIRPORT BUILDINGS	[Line]	[Line]
ROADS WITHIN RPZ	[Line]	[Line]
FUTURE PROPERTY (FEE)	[Line]	[Line]
FUTURE PROPERTY EASEMENT	[Line]	[Line]
TREES TO BE REMOVED	[Line]	[Line]
MALSF	[Line]	[Line]
OBSTRUCTION LIGHT TOWERS	[Line]	[Line]
TOWN BOUNDARY	[Line]	[Line]

PLYMOUTH MUNICIPAL AIRPORT  
ULTIMATE AIRPORT  
LAYOUT PLAN

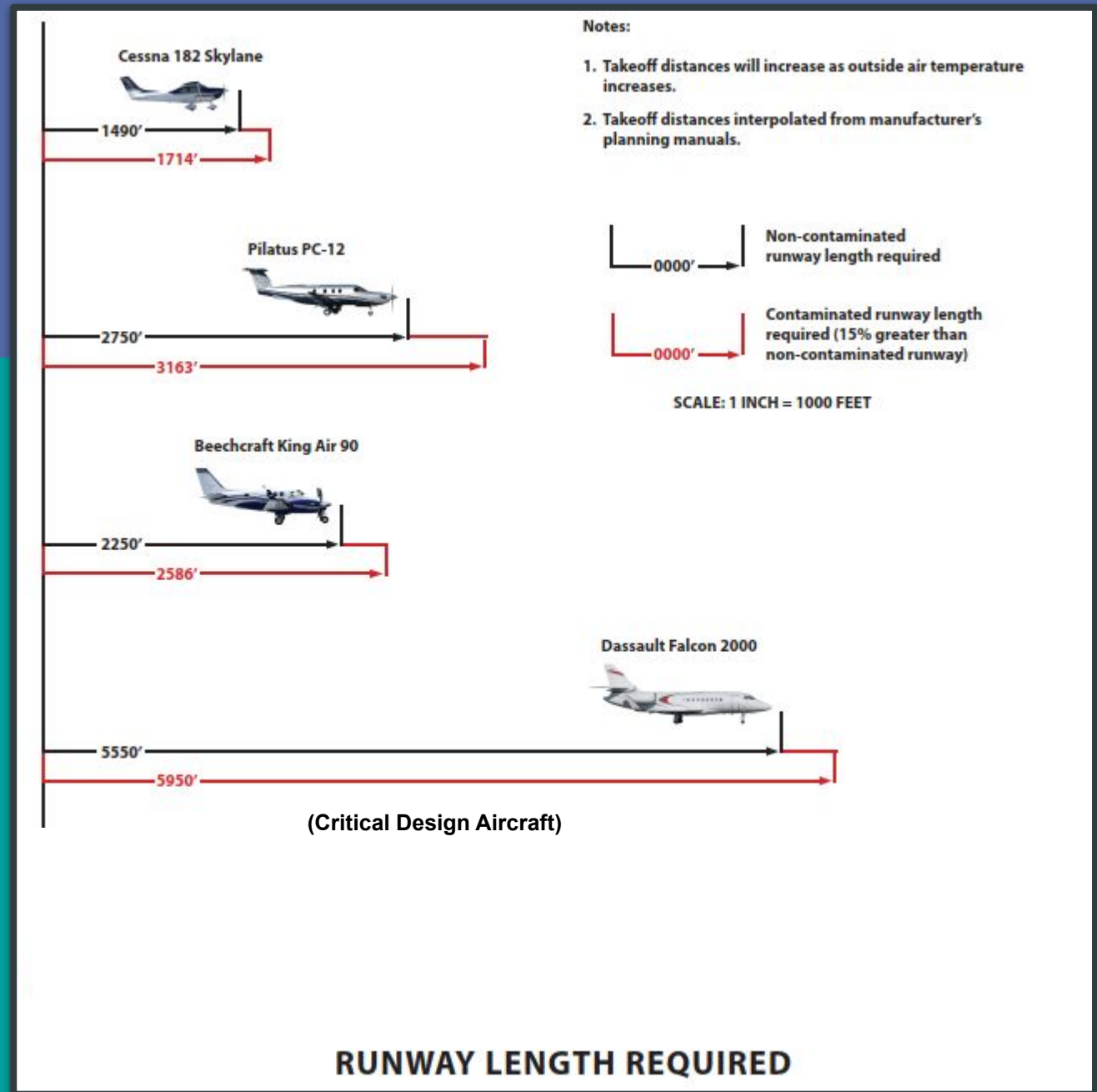
ULTIMATE AIRPORT  
LAYOUT PLAN

ALC. PROJECT NO.  
3  
OF  
12

# Typical Runway Length Requirements

Temperature = 30°C - Average Temperature Hottest Month  
Flaps = 0  
Max Gross Takeoff Weight  
Zero Wind  
Zero R/W Gradient  
Pressure Altitude = Sea Level

Aircraft Planning Manual Vs FAA Runway Length Analysis





# Runway Length Analysis

B-II Jet Composite		
Aircraft Type	Operations	% of Composite
Cessna CJ3/4	4	0.8%
Cessna Citation Bravo	4	0.8%
Cessna Citation Encore	7	1.4%
Cessna Citation Excel	68	13.3%
Cessna Citation Sovereign	13	2.5%
Cessna Citation Latitude	69	13.5%
Cessna Citation X	2	0.4%
Embrear Legacy 450	15	2.9%
Embrear Phenom 300	45	8.8%
Dassault Falcon 2000	149	29.0%
Dassault Falcon 900	75	14.6%
Dassault Falcon 50	7	1.4%
Hawker 4000	55	10.7%
Total Operations	513	



**Falcon 2000**

The Falcon 2000 is the most demanding aircraft (critical design) in the composite of aircraft with more than 500 annual operations.

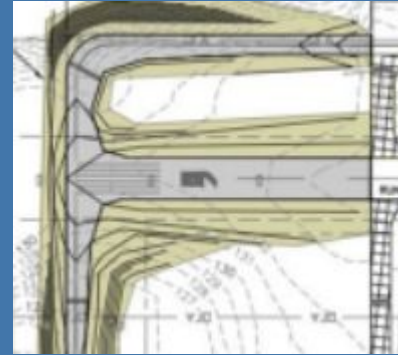
FAA Runway Length Analysis - Unconstrained Runway Length - 5,500-ft.

# Alternatives - Overview



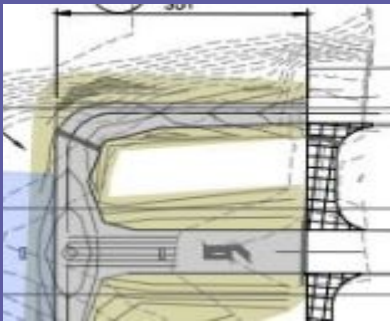
## Alternative #1: No Build

- Everything remains the same, no changes are applied
- No Penetrations



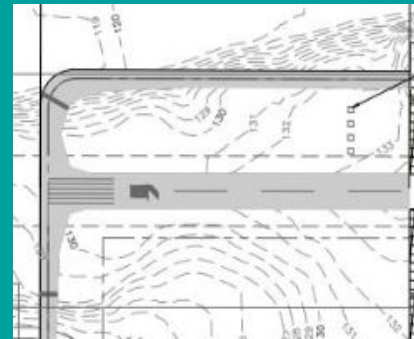
## Alternative #3: 550-ft ext

- 5200 Feet
- Taxiway A and E extensions
- Relocation of Glideslope and MALS
- One penetration area



## Alternative #2: 351-ft ext

- 5001 Feet
- Taxiway A and E extensions
- Relocation of Glideslope and MALS
- No penetrations










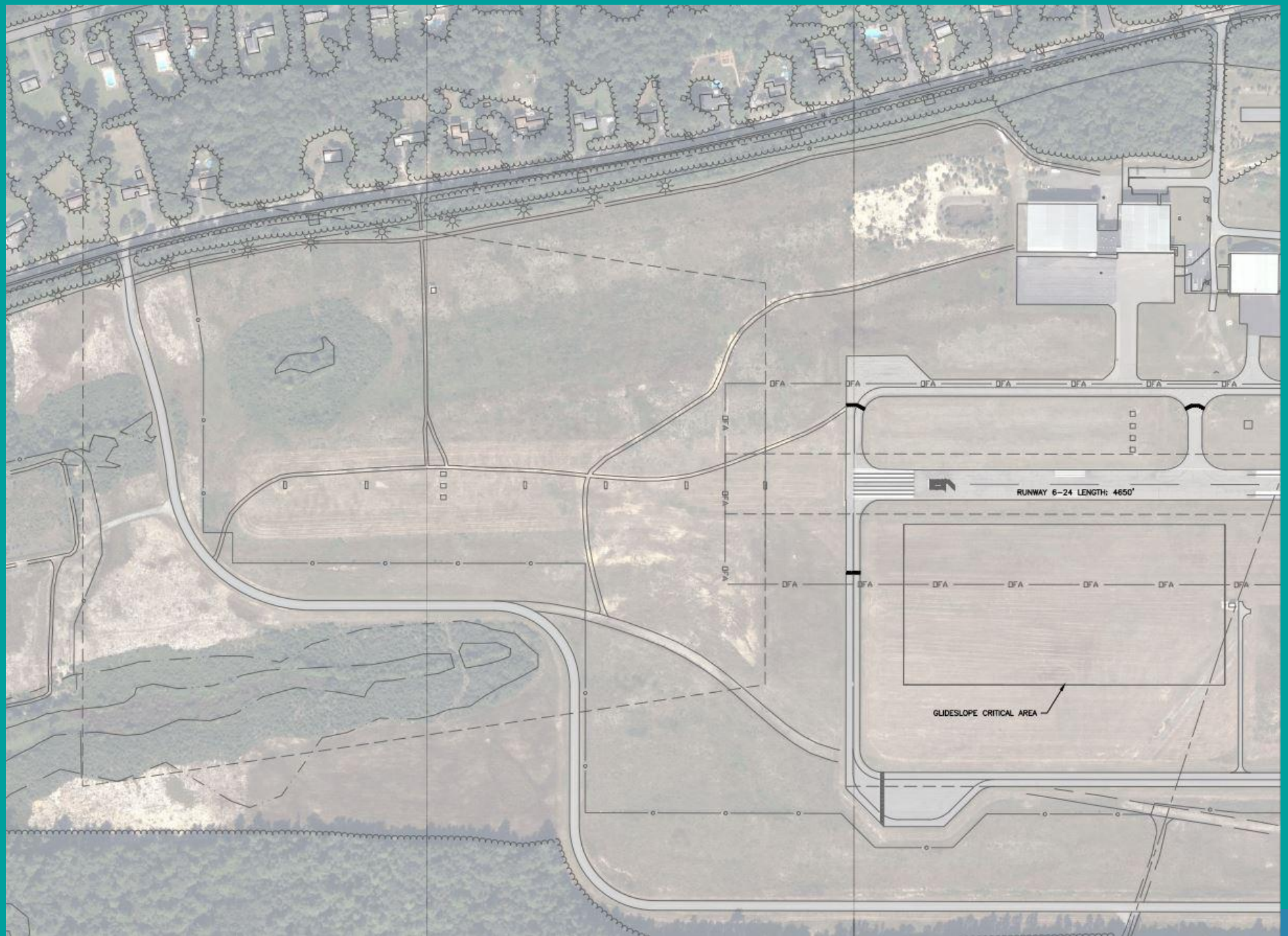
## Alternative #4: 850-ft ext

- 5500 Feet
- Taxiway A and E extensions
- Relocation of Glideslope and MALS
- Multiple penetrations



# Alternative #1 : No Build

LEGEND	
	AIRPORT PROPERTY LINE
	OBJECT FREE AREA
	MARKING - TAXIWAY AND RUNWAY
	HOLDING POSITION MARKING
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE ZONE AND RUNWAY PROTECTION ZONE
	GLIDESLOPE CRITICAL AREA
	EXISTING CHAIN-LINK FENCE
	WETLAND
	EXISTING ROADWAY





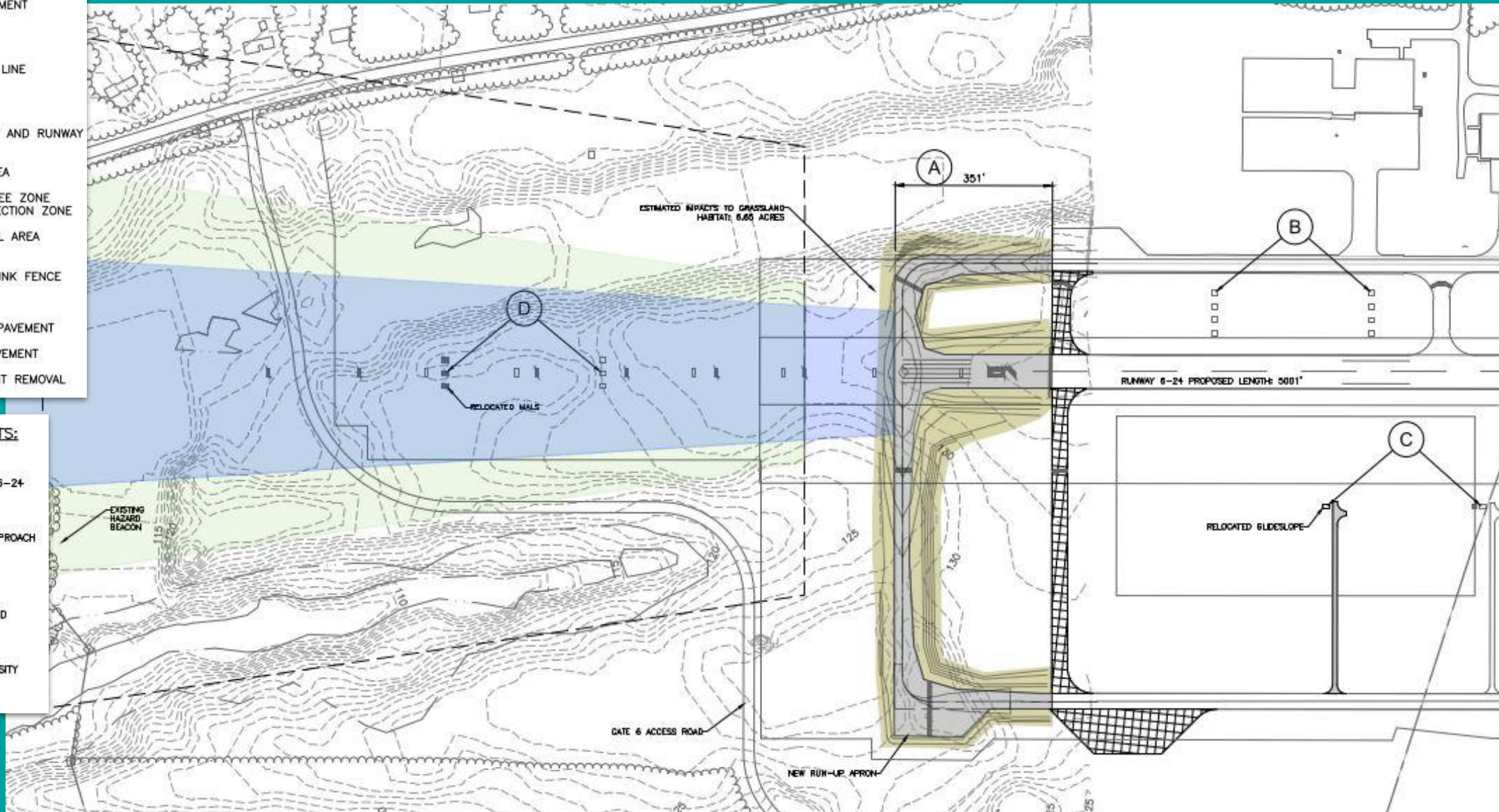
# Alternative #2: 351-ft Extension

## LEGEND

- (A) PROJECT WORK ELEMENT
- AIRPORT PROPERTY LINE
  - OFA --- OBJECT FREE AREA
  - ||||| MARKING - TAXIWAY AND RUNWAY
  - RUNWAY SAFETY AREA
  - RUNWAY OBJECT FREE ZONE AND RUNWAY PROTECTION ZONE
  - GLIDESLOPE CRITICAL AREA (RELOCATED)
  - ○ --- PROPOSED CHAIN-LINK FENCE
  - WETLAND
  - EXISTING EDGE OF PAVEMENT
  - PROPOSED NEW PAVEMENT
  - XXXXX PROPOSED PAVEMENT REMOVAL

## PROJECT WORK ELEMENTS:




- (A) 351' EXTENSION OF RUNWAY 6-24
- (B) RELOCATION OF PRECISION APPROACH PATH INDICATOR.
- (C) RELOCATION OF GLIDESLOPE, GLIDESLOPE ACCESS ROAD, AND CRITICAL AREA.
- (D) RELOCATION OF MEDIUM INTENSITY APPROACH LIGHTING SYSTEM.



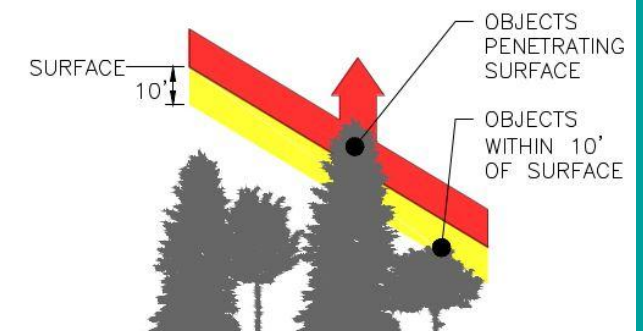


# Alternative # 2 Obstruction Map: 351-ft Extension



	AC 150/5300-13A TABLE 3-2 ROW 4 OBSTACLE CLEARANCE SURFACE
	AC 150/5300-13A TABLE 3-2 ROW 6 OBSTACLE CLEARANCE SURFACE
	VEGETATIVE OBSTRUCTION (REFER TO PENETRATION KEY)

## VEGETATIVE PENETRATION KEY





# Alternative #3: 550-ft Extension

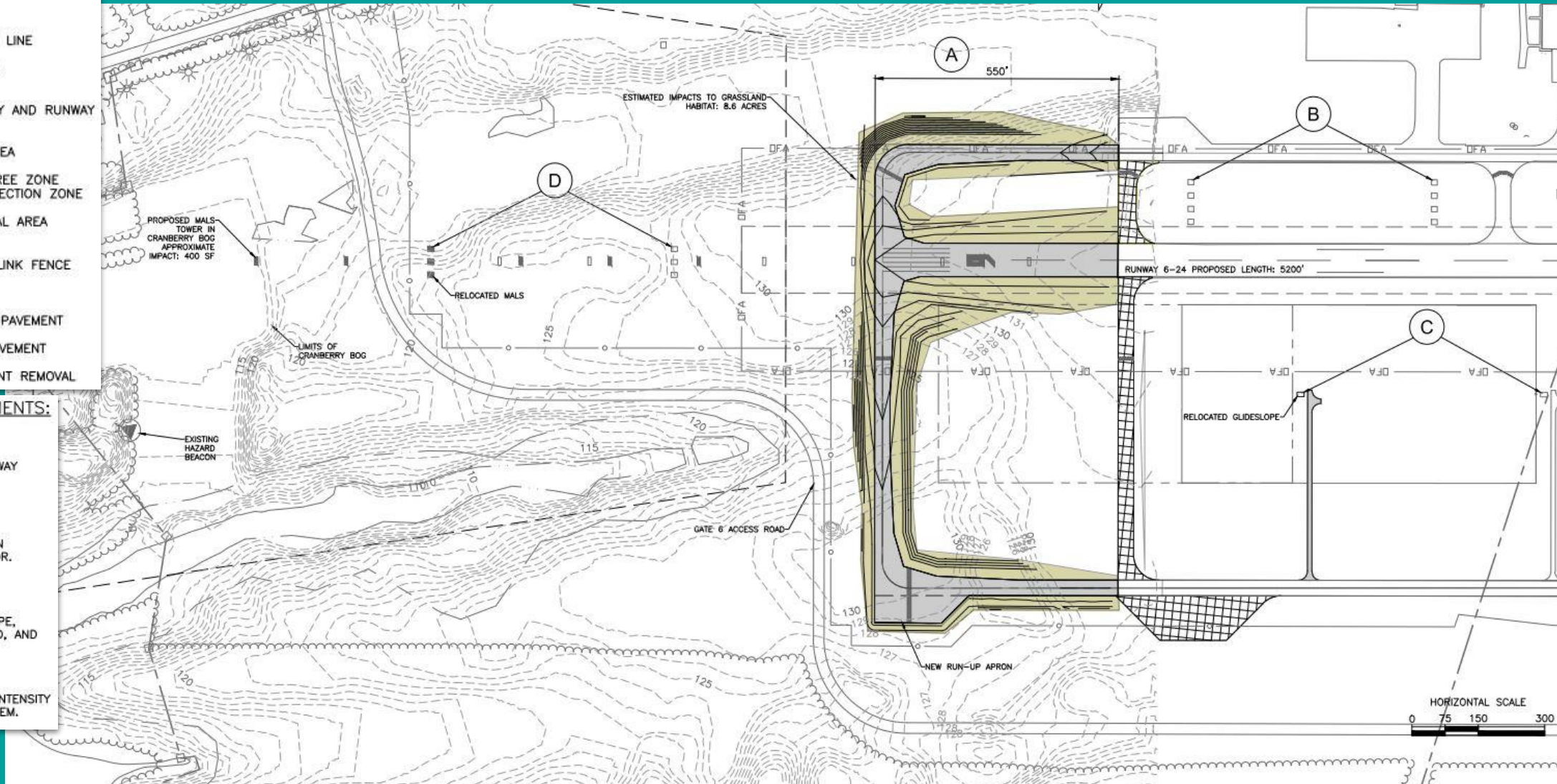
## LEGEND

(A) PROJECT WORK ELEMENT

- AIRPORT PROPERTY LINE
- OFA --- OBJECT FREE AREA
- ==== MARKING - TAXIWAY AND RUNWAY
- RUNWAY SAFETY AREA
- RUNWAY OBJECT FREE ZONE AND RUNWAY PROTECTION ZONE
- GLIDESLOPE CRITICAL AREA (RELOCATED)
- PROPOSED CHAIN-LINK FENCE
- WETLAND
- EXISTING EDGE OF PAVEMENT
- PROPOSED NEW PAVEMENT
- XXXX PROPOSED PAVEMENT REMOVAL

## PROJECT WORK ELEMENTS:

- (A) 550' EXTENSION OF RUNWAY 6-24
- (B) RELOCATION OF PRECISION APPROACH PATH INDICATOR.
- (C) RELOCATION OF GLIDESLOPE, GLIDESLOPE ACCESS ROAD, AND CRITICAL AREA.
- (D) RELOCATION OF MEDIUM INTENSITY APPROACH LIGHTING SYSTEM.








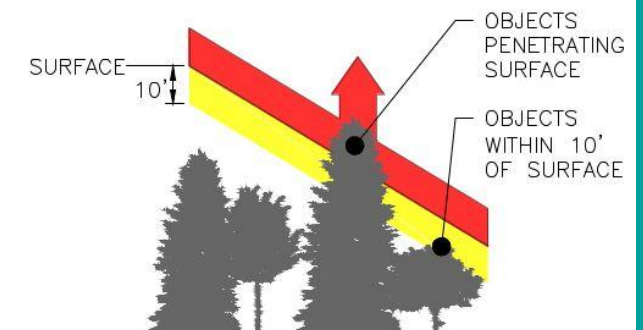
# Alternative # 3 Obstruction Map: 550-ft Extension



## SURFACE LEGEND

	AC 150/5300-13A TABLE 3-2 ROW 4 OBSTACLE CLEARANCE SURFACE
	AC 150/5300-13A TABLE 3-2 ROW 6 OBSTACLE CLEARANCE SURFACE
	VEGETATIVE OBSTRUCTION (REFER TO PENETRATION KEY)

## VEGETATIVE PENETRATION KEY

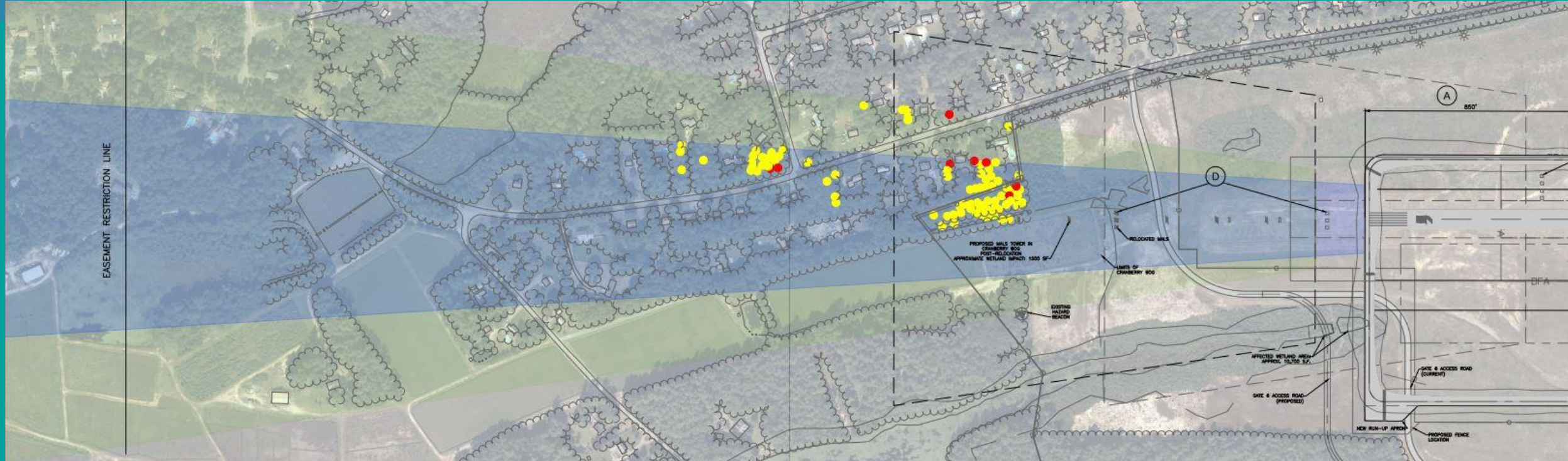











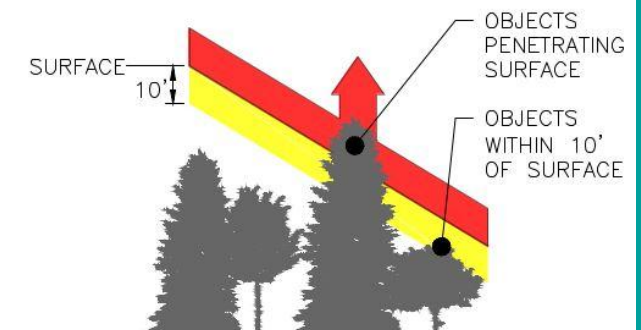
# Alternative #4 Obstruction Map: 850-ft Extension



## SURFACE LEGEND

	AC 150/5300-13A TABLE 3-2 ROW 4 OBSTACLE CLEARANCE SURFACE
	AC 150/5300-13A TABLE 3-2 ROW 6 OBSTACLE CLEARANCE SURFACE
	VEGETATIVE OBSTRUCTION (REFER TO PENETRATION KEY)

## VEGETATIVE PENETRATION KEY





# Additional Initiatives

- Solar
- Water
  - Water collection gutters and cisterns for equipment cleaning
- Non Aeronautical Businesses
- Electric Aircraft/ Automobile Charging





# Timeline

JAN  
2022

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Background and First  
Public Meeting

Development of  
Facility Needs,  
Alternatives and  
Second Public Meeting

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APR  
2022

June  
2022

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Third Public Meeting

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Implement Plan

TBD



**Questions**

**Comments**

[PlymouthAirportMasterPlan@gmail.com](mailto:PlymouthAirportMasterPlan@gmail.com)



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