Memorandum

To: Sean Scanlon, Tweed Airport **Date:** November 10, 2020

From: Shawn Callaghan, FHI

Subject: **Tweed Airport Master Plan Update Technical Advisory Committee Meeting #2 Summary of 10/15/2020 Meeting**

The second Technical Advisory Committee (TAC) meeting for the Tweed-New Haven Airport (HVN) Master Plan Update was conducted from 5pm to 6pm virtually using the Microsoft Teams platform. Sean Scanlon welcomed TAC members and the consultant team conducted a presentation, which was followed-up by questions and discussion with TAC members. The presentation is attached below.

The TAC Meeting was attended by 12 TAC committee members along with several members of the project team and Tweed Airport staff.

Sean Scanlon, the Executive Director of Tweed Airport, provided an introduction and thanked the committee members for their participation. Jeff Wood of McFarland Johnson (MJ), the project manager for the Master Plan Update, introduced the project team, outlined the master plan process, and explained the agenda. Mr. Wood updated the committee on the project schedule and gave a summary of COVID-19 updates and impacts. He then reviewed and summarized the forecasts approved by the Federal Aviation Administration (FAA) and explained that initial assessments have been completed on various elements of the master pan, and more in-depth analysis will continue in the next phase.

Laura Canham of MJ presented on the airport facility requirements, including runway lengths, widths, orientation, geometry, and strengths; runway design surfaces; markings, lighting, and signage; taxiways; and apron/ramp areas. She also reviewed critical/design aircraft, both current and proposed. There are no changes to the grouping of aircraft anticipated to use the airport in the future. The existing runway is 5,600 feet long and the recommendation is to increase this to 6,000 - 7,600 feet. Smaller aircraft do not necessarily need smaller runways, so runway length does not directly correlate to aircraft size. The alternatives will review a balance of runway length and associated operational reliability with physical limitations.

A review of the design surface analysis was conducted. The FAA prefers that the runway protection zones are free of incompatible uses, but many airports in the country are like Tweed, where homes are located in these areas.

The results of automobile parking, passenger terminal requirements, curb front and overall parking, airport access, and hangar requirements were presented and will be used in the alternatives analysis. Public health accommodations that the airport has undertaken in response to the pandemic were listed. The results of the facility requirements to general aviation assessments for ramp requirements, parking, and fueling were presented. The support facility assessment included a look at utilities, airfield

maintenance/snow removal, firefighting, deicing practices, back-up power, and fence/wildlife management. Some additional considerations recommended included electric vehicle charging stations, a drainage study, and resiliency planning.

Next steps in the Master Plan process include development of alternatives, followed by preparation of the Airport Layout Plan (ALP) for FAA review and approval. Additional TAC meetings will be held at each of these key milestones. After the Airport Master Plan Update is completed, the National Environmental Policy Act (NEPA) process would be completed next, followed by final design, and permitting.

After the presentation was completed, the attendees were asked if there were questions or comments. The following is a summary of the questions by TAC members and key discussion points.

- The PowerPoint presentation will be distributed to all attendees.
- The current runway length is 5,600 feet long.
- Transportation Network Carrier (TNC) alternatives review will be investigated in the next stage of the project and reported back in future meetings/documents. The City will be included in those conversations and their input will be part of the assessment.
- The tower does not have a full power backup, but rather a back-up generator for emergency services and evacuation of the tower. They also have some batteries for back-up that last about four hours. The terminal and airport operations each have a back-up generator as well.

Following the questions and discussion, Jeff Wood asked if anything could be improved with this virtual meeting format. None of the participants added any input to this question.

Ms. Lesperance said that the presentation was great, and the consultant team did a good job of presenting technical information in an easy to digest format.

The project team thanked TAC members and ended the meeting.

Attendees:

- Sean Scanlon, HVN
- Jeremy Nielson, HVN/Avports
- Johnson Chang-Fong, HVN/Avports
- Felipe Suriel, HVN/Avports
- Eliot Jameson, HVN
- Lisa Lesperance, FAA
- Charles Skelton, Yale Aviation
- John Olson, Midwest ATCT
- Jim Yeske, HVN Board of Directors
- Bob Bruno, CAA
- Evan Warren, Robinson Aviation
- Rick Wies, Gregg Wies & Gardner Architects, LLC
- Diane Proto, Piedmont /dba American Airlines
- Megan Mitchell, Technical Representative
- Doug Hausladen, City of New Haven
- Shawn Callaghan, FHI
- Jeff Wood, McFarland Johnson
- Rick Lucas, McFarland Johnson
- Laura Canham, McFarland Johnson
- Steve Bourque, McFarland Johnson

MASTER PLAN UPDATE

Tweed-New Haven Airport Authority

Advisory Committee Meetings Oct. 15, 2020

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Logistics

- Meeting Recording
- Please Mute Your Microphone
- Sign-In Sheet - Please Send a Chat with:
  - Name
  - Affiliation
  - Email Address
- Questions Will be Addressed at the End
  - Send a Chat any Time During the Presentation
  - Open Mic Q&A at the Conclusion

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Introductions

- Sean Scanlon, Executive Director
- Jeremy Nielson, Airport Manager
- Consulting Team:
  - McFarland Johnson
  - Fitzgerald Halliday, Inc.
  - ASM Americas
  - Harris Miller Miller & Hanson, Inc.
  - Woolpert
- Attendees

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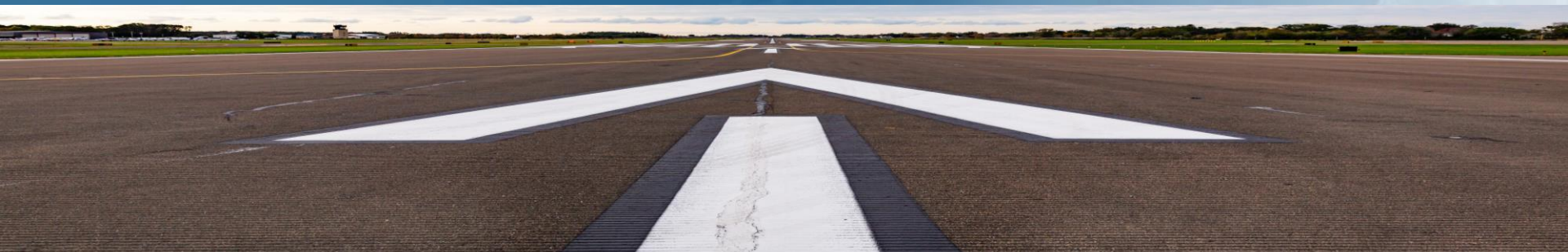
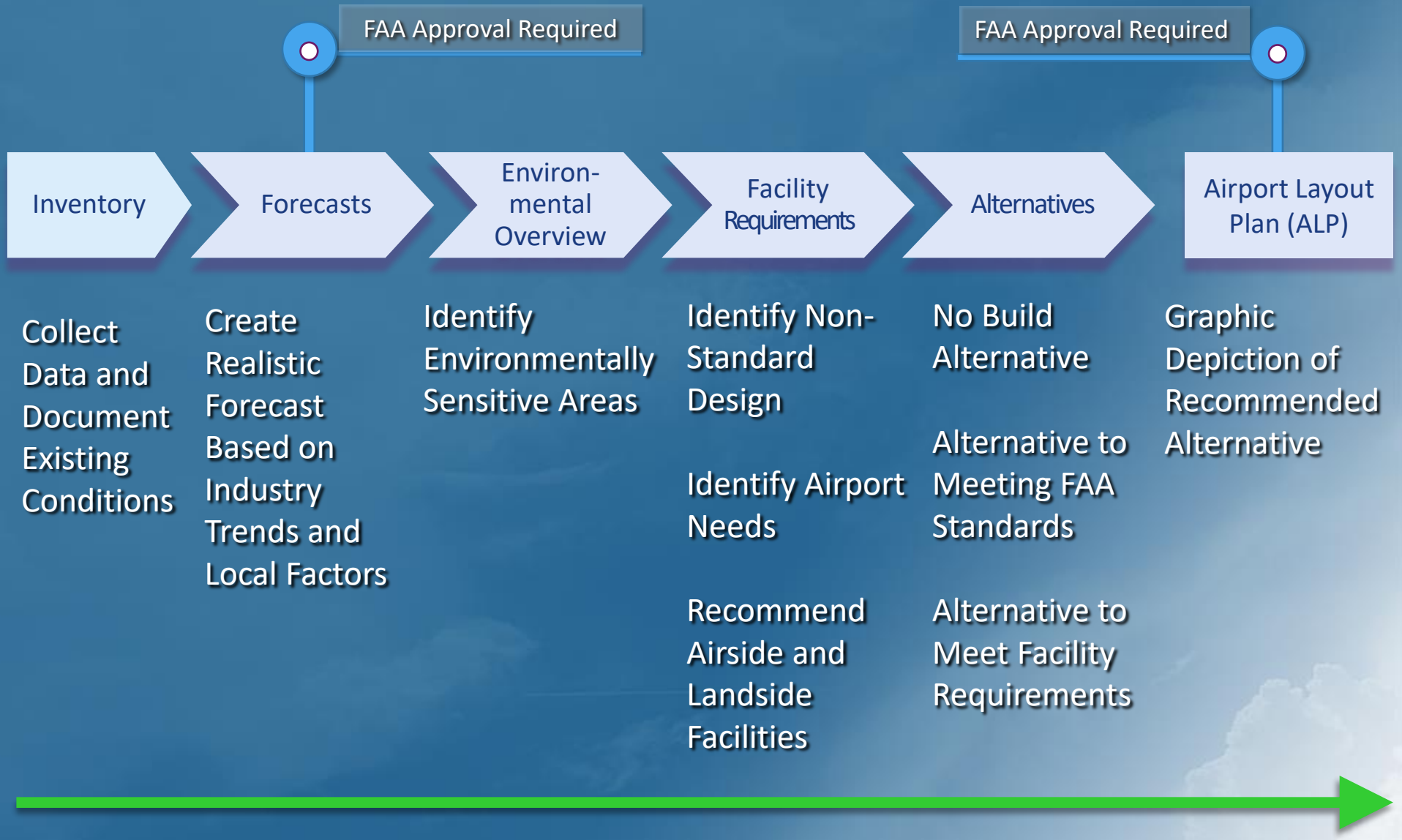
Agenda

- Introductions
- Master Plan Process
- Schedule
- Key Issues and Goals
- COVID-19 Update
- Forecasts/Design Aircraft
- Facility Requirements
- Next Steps
- Conclusion/Questions



Master Plan Process



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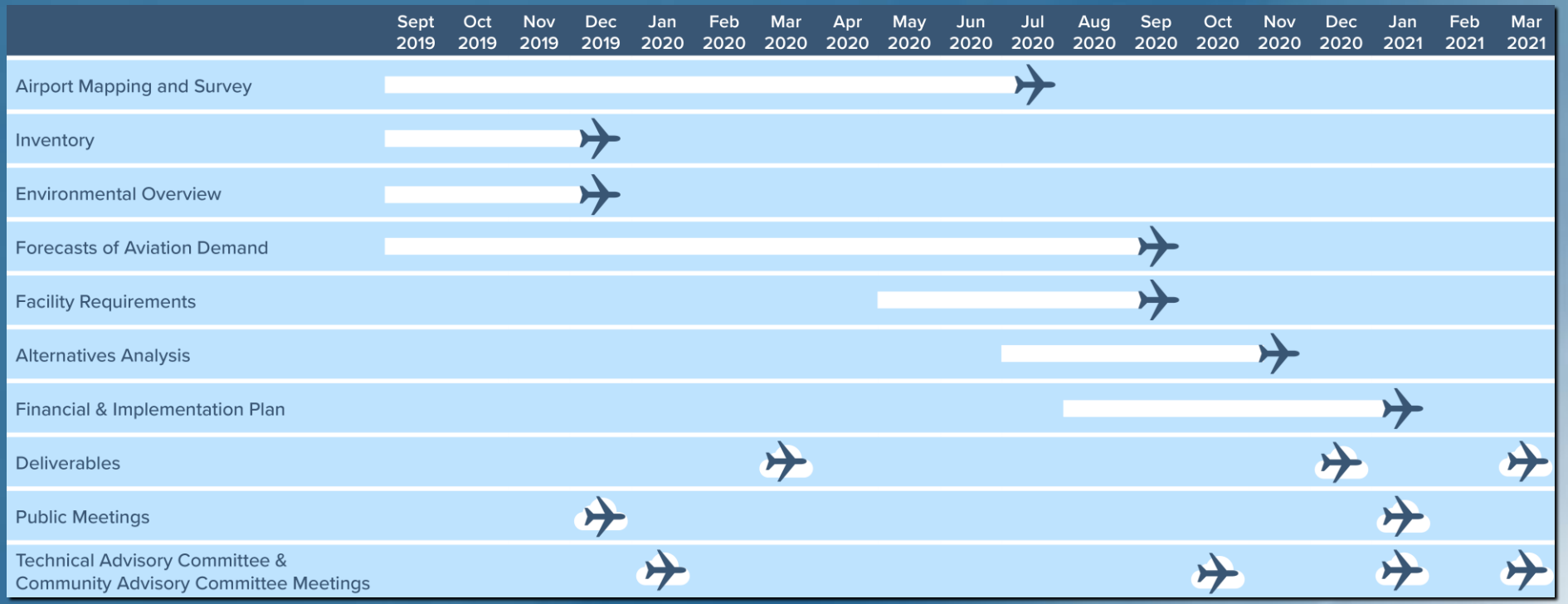
Schedule



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Key Issues and Goals

- Identify Runway 2-20 ultimate length (1)
- Determine terminal area improvements to meet demand (2)
- Future of Runway 14-32 (3)
- Identify opportunities for economic sustainability
- Determine phasing and implementation plan for recommended improvements
- Engage the public throughout the process
- Maintain planning flexibility for future aviation industry changes

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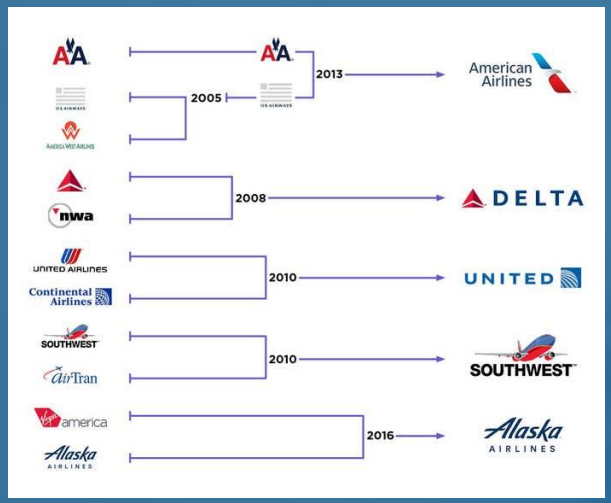
National Aviation Impacts



- Nationwide 95% Drop in Demand for April
- September Demand Down 83% at HVN
- Sustained Lack of Demand Resulting in Unprecedented Times for Airlines
- ~1,000 Aircraft Expected to Prematurely Retire
- Additional Consolidation or Bankruptcies
- Airline Crew Layoffs and Furloughs
- Recovery Uncertain

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COVID Changes at HVN

- Public Outreach – Online versus in Person
- HVN Terminal Changes
  - Floor Placards
  - Hand Sanitizing Stations
  - Digital Signage for Public Announcements
  - Pursuing ACI Airport Health Accreditation Program
- Fleet Changes due to Premature Retirement and Network Changes
- Network and Regional Airline Model
  - Weakened Appetite for New Opportunities
  - Increased Appeal of Smaller Airports like HVN
- Overall General Aviation Impact
- Long-Term Impact on Demand for Flight Training

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Forecasts

- Goal: Devise a Realistic Forecast
  - General Aviation (GA)
    - Service Area
    - Trends
    - Historic and Forecast Operations
    - Historic and Forecast Based Aircraft
  - Commercial Aviation
    - Catchment Area
    - Trends
    - Historic and Forecast Enplanements
    - Historic and Forecast Operations
  - Existing and Future Design Aircraft

Summary of FAA Approved Forecasts

Enplanements			
Year	Constrained Low (Selected MP)	Covid-19 Impact	Revised Master Plan Forecast
2020	65,659	-80%	13,132
2021	74,377	-50%	37,188
2022	76,379	-25%	57,269
2023	78,436	-10%	70,592
2024	80,776	-5%	76,737

	Baseline	Forecasts			
	2019	2025	2030	2040	CAGR
FAA TAF (2019)					
Enplanements	46,953	49,836	52,380	57,861	1.05%
Total Operations	26,255	26,162	26,394	26,895	0.12%
Based Aircraft	59	65	70	80	1.53%
Master Plan Forecast					
Enplanements	50,355	82,723	94,531	123,999	3.40%
Total Operations	25,219	25,923	26,476	27,631	0.46%
Based Aircraft	50	51	53	56	0.57%
Percent Difference From TAF					
Enplanements	7.2%	66.0%	80.5%	114.3%	
Total Operations	-3.95%	-0.91%	0.31%	2.74%	
Based Aircraft	-15.25%	-21.54%	-24.29%	-30.00%	

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Existing/Future Design Aircraft

Existing - Embraer 175

Existing - Gulfstream V/550

Future - Airbus 319/320

Future - Gulfstream 650

No Change in Design Criteria (C/D-III)

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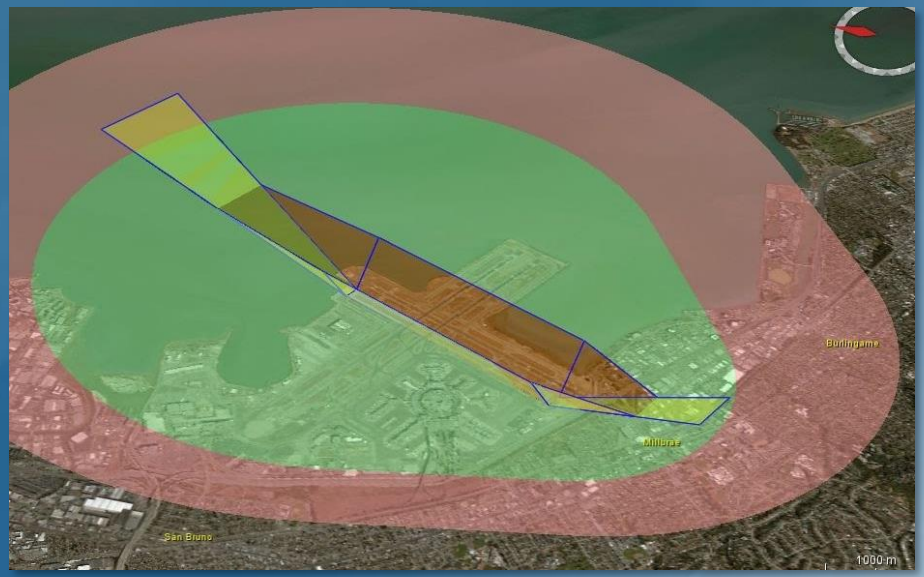
Facility Requirements

Inventory | Forecasts | Environ-mental Overview | **Facility Requirements** | Alternatives | Airport Layout Plan (ALP)

- Goal: Identify Needs for Alternatives
  - Compare Existing Conditions To:
    - FAA Safety Standards
    - FAA Design and Geometry Standards
    - Code of Federal Regulations Airspace Surfaces
    - Forecasts



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Airside Facility Requirements

- Determines What, if any, Additional Facilities Will be Required
- Based on Most Demanding Aircraft Characteristics (Multiple Aircraft)
- Is Based on Existing and Forecast Activity
- Considers Peak Hour and Annual Demand
- Reviews the Following:
  - Runway Length
  - Runway Widths
  - Runway Strengths
  - Runway Orientation
  - Runway Design Surfaces (RSA, ROFA, OFZ, RPZ, etc.)
  - Markings, Lighting, and Signage
  - Taxiways
  - Apron/Ramp Areas (GA and Terminal)
  - Runway Geometry Standards
  - Visual Approach Aids

Runway Length

- HVN to Charlotte on ERJ-175 at maximum payload: 5,400 to 7,200 feet take-off length
- During strong crosswinds, runway contamination, and other factors, passenger/baggage/cargo load may be limited

Aircraft	Takeoff Length (MTOW)	Landing Length (MLW and Wet)
Existing		
E175 STD	6,061' – 7,261'	4,945' – 5,405'
E175 LR	7,361' – 7,861'	4,945' – 5,405'
E175 AR	8,061' – 9,061'	4,945' – 5,405'
CRJ7	5,861'	5,865'
GLF5	5,971'	3,186'
Future		
A319	7,561'	5,175' – 5,290'
A320	7,661'	5,520' – 5,750'
GLF6	6,360'	4,034'

Find Balance between Airport Limitations and Operational Reliability

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Runway Length – Route Comparison

		Takeoff (feet)	Landing – Wet Runway (feet)
Commercial	CRJ-700 – ex. Philadelphia (136 NM)	4,661	5,865
	CRJ-700 – ex. Charlotte (525 NM)	5,861	5,865
	ERJ-175 AR – ex. Philadelphia (136 NM)	4,861	5,290
	ERJ-175 AR – ex. Charlotte (525 NM)	7,100	5,290
	ERJ-175 AR – ex. Chicago (674 NM)	8,161	5,290
	Airbus A319 – ex. Sanford, FL (1,479 NM)	7,561	5,290
	Airbus A320 – ex. Punta Gorda (971 NM)	7,561	5,635
Gen. Aviation	Gulfstream IV	5,341	3,865
	Gulfstream G550	5,971	3,186
	Global 5000	5,601	2,538
	Global Express	5,881	2,519
	Dassault Falcon 900EX	5,274	2,772
	Gulfstream G650	6,360	4,034

Smaller Aircraft Does Not Mean Shorter Runway

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Runway Length

- Airlines are Retiring Fleets Earlier
- Operators Generally Require a Minimum of 6,000 Feet of Runway Length
- Aircraft Serving HVN are a Function of the Larger Network
- Some Smaller Aircraft May Need Longer Runways
- The More Minimal a Schedule, the More Reliable Service Needs to be
- Current Runway Only Accommodates 24% of Class C Aircraft in Wet Conditions
- **Recommendation:** 6,000' - 7,600' (48-93% wet, 92-100% dry)

Find Balance between Physical Limitations and Operational Reliability

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Wind Coverage

- Runway 2-20 Meets 95% => No Eligible Crosswind

- Planning Estimate of Reconstructing Runway 14-32 (Excluding Obstruction Removal): $7.1 million

All-Weather				
	10.5	13	16	20
Runway 2-20	96.28%	98.10%	99.53%	99.88%

IFR				
	10.5	13	16	20
Runway 2-20	95.37%	97.08%	98.83%	99.66%

VFR				
	10.5	13	16	20
Runway 2-20	96.52%	98.36%	99.71%	99.93%

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Capacity

- Maximum Annual Service Volume (ASV) Expected is 21%
- No Capacity Constraints

Year	Demand		Capacity			Percent Peak Hour		Percent ASV
	Annual	Peak Hour	ASV	Hourly VFR	Hourly IFR	VFR	IFR	
2019	25,219	10	134,658	77	53	13%	19%	**19%**
2025	25,923	10	134,658	77	53	13%	19%	**19%**
2030	26,476	11	134,658	77	53	14%	21%	**20%**
2040	**27,631**	**11**	**134,658**	**77**	**53**	**14%**	**21%**	**21%**

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Runway Width and Strength

- Runway 2-20: 150 Feet Wide
- Meets C-III Standards
- Pavement Strength Meets Demand

	ACN	Runway 2-20 PCN	Deficiency
Embraer 175	10-19	57 /F/C/X/T	None
Airbus 319	17-50	57 /F/C/X/T	None
Airbus 320	19-42	57 /F/C/X/T	None
Gulfstream 650	13-32	57 /F/C/X/T	None

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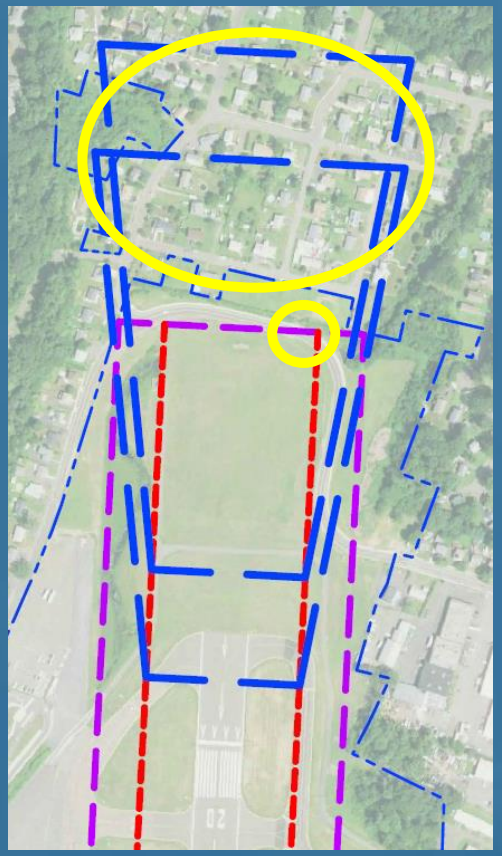
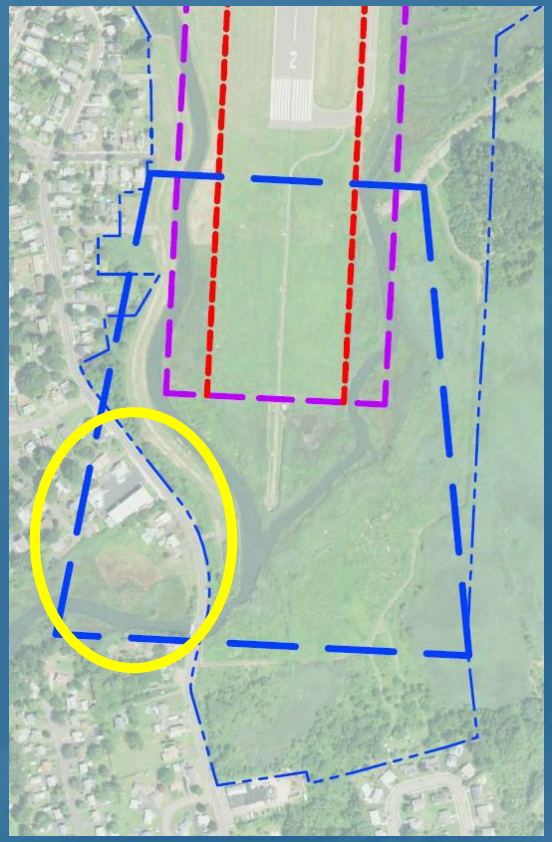
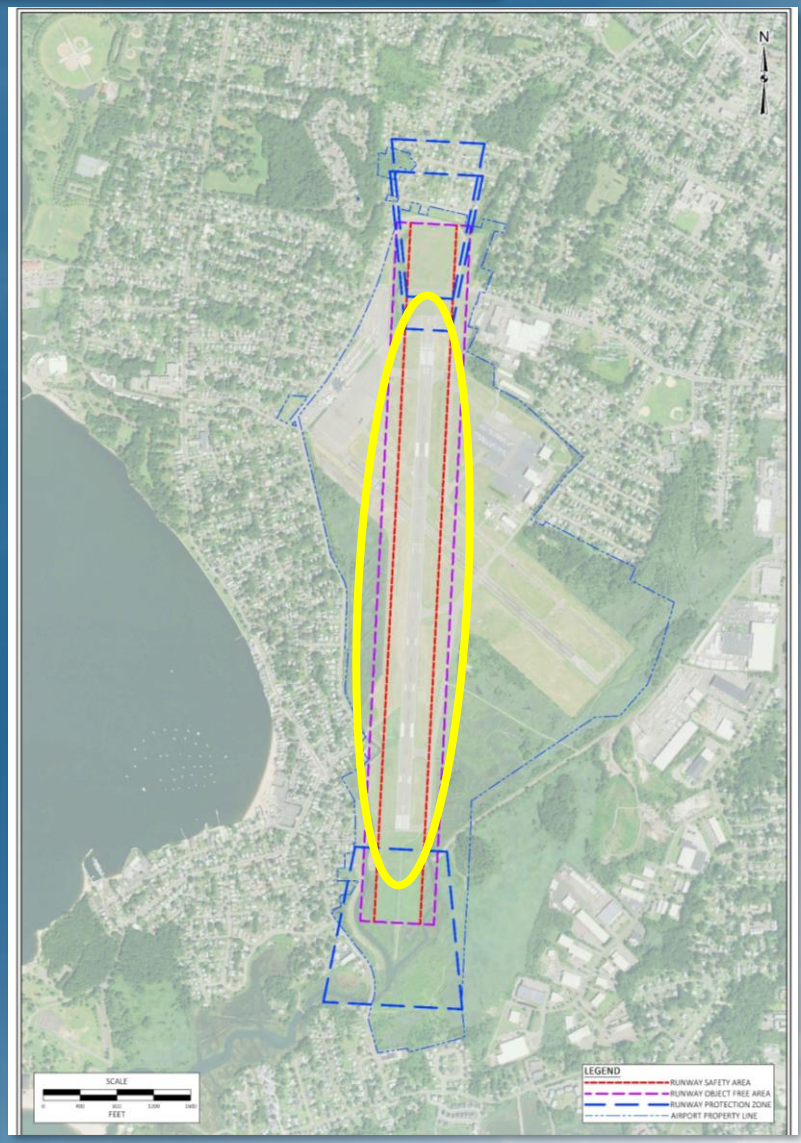
Runway Design Surfaces







Review RSA for Incremental Improvements
Acquire Land in RPZs in Fee or Easement

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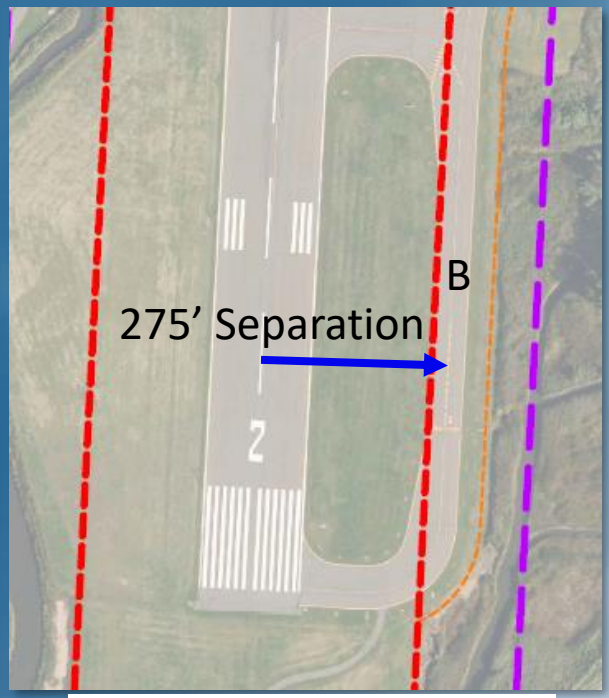
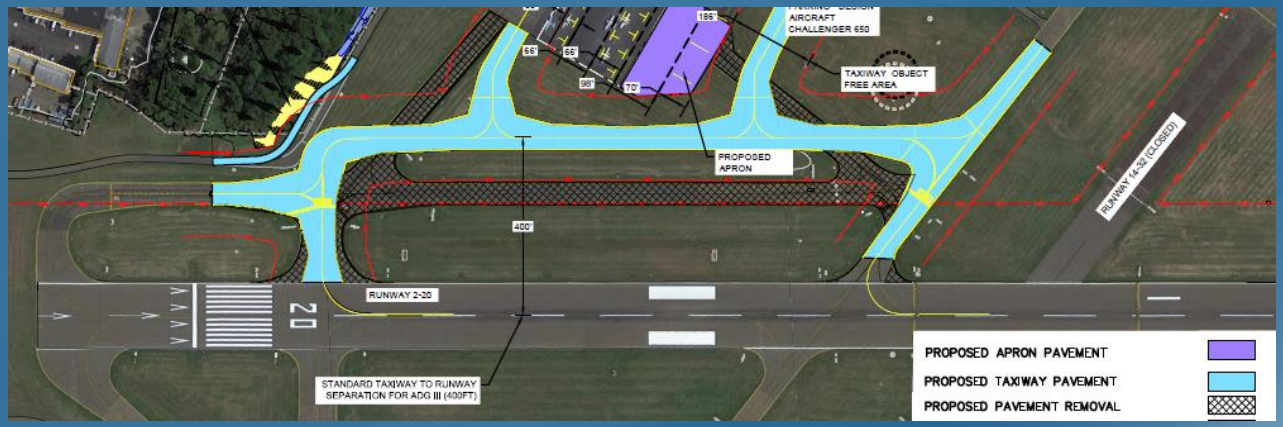
Runway Design Surfaces

- Runway/Taxiway Standard Separation for C-III Airports is 400’
- Existing Taxiways A and B – 275’
- Projects Ongoing for Taxiway A Separation





Meet FAA Standard Separation Between Runways and Taxiways

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Airfield Lighting

- Runway 2-20 HIRL (Standard)
- Runway 2:
  - Existing: MALSF
  - Review Lower Minimums Feasibility Potential MALSR
- Runway 20:
  - Existing: No Approach Lights (GPS)
  - PAPI Being Installed (2020)
  - Recommend:
    - Runway End Identifier Lights (REILs)
    - Evaluate Feasibility of Vertically Guided Approach
- Taxiway Lighting MITL (Standard)
  - Two Areas of Reflectors:
    - Taxiway B/C Closure
    - Run-up Pad on Former Runway 14-32

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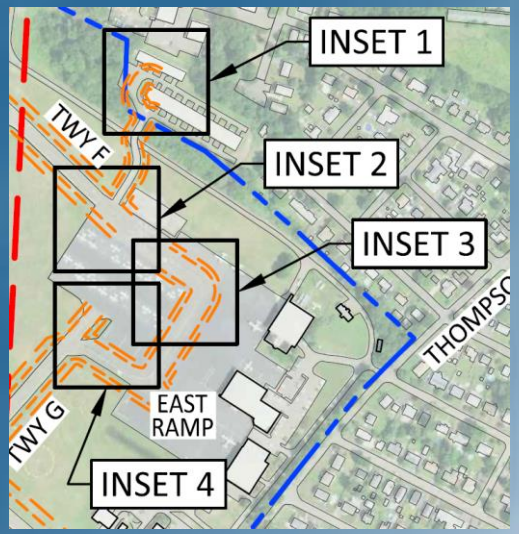
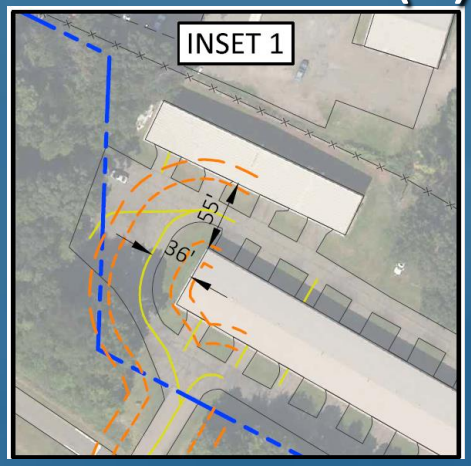
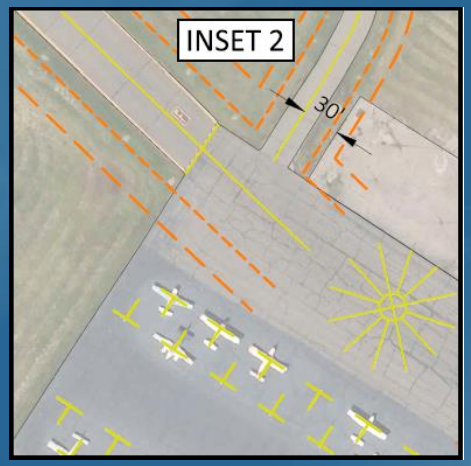
Taxiway Design Surfaces

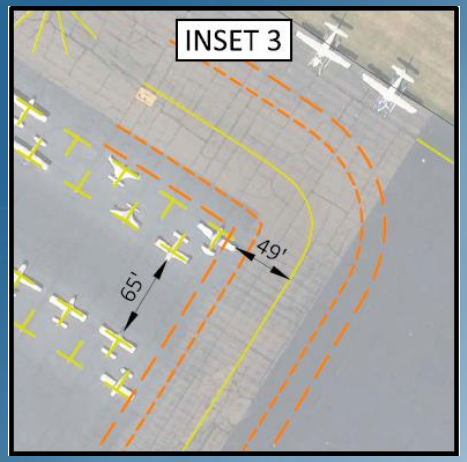
- Taxilane ADG I OFA: 79’
  - T-Hangars – 55’ (1)
  - Taxilane between Tiedowns – 65’ (2)
- Taxilane ADG II OFA: 115’
  - East Ramp Taxilane – 49’ to Wingtip (2)
- Taxiway G North of Taxilane – Existing Wingspan Restriction for Aircraft Greater Than 36’ (4)

Key Map









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Airfield Geometry Standards

- High Energy Intersection
- Direct Access
- Taxiway Intersecting Runway at Other Than a Right Angle
- Unexpected Hold Lines

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Airside Facility Requirements Summary

Item/Facility	Demand
Runway Length	Existing: 6,000’; Future: 7,600’
Runway Safety Area	Review Fence and Road in Runway 20 RSA Address RSA Transverse Grading
Runway Object Free Area	Review Fence, Road, and NAVAIDs in Runway 20 ROFA
Runway Protection Zone	Control of All RPZs Through Ownership or Avigation Easements
Runway Lighting	Update to Cable in Conduit Remove Runway 14-32 Lights
Runway Visual Aids	Upgrade to MALSR Runway 2 Install REIL on Runway 20
Instrument Approaches	Lower Runway 2 Minimums, if Possible Provide Vertical Guidance to Runway 20, if Possible
Taxiways	Runway 2-20 and Taxiway A Separation Runway 2-20 and Taxiway B Separation Address Taxilane/Taxiway Object Free Area Address Airfield Geometry Concerns and Meet FAA Standards

Passenger Terminal Apron Parking

- Existing Provision
  - 1 Jet bridge Parking Position
    - Sized Approximately for Boeing 737
  - 1 Ground Level Boarding Position
    - Intended for Commuter Operations
- Recommended Provision
  - 2 Jet bridge Parking Positions
    - Both Sized for Group III (737/A220/A320)
  - Flexibility for a 3rd Position, Ground Boarding-OK
- Utilities
  - Terminal Electrical Capacity
  - Improve Internet Connection

Apron Parking Positions Should be Commensurate with Terminal Holdroom Sizes and Locations

Passenger Terminal Requirements

Terminal Functional Area	Existing Provision	100 Peak-Hour Passengers	150 Peak-Hour Passengers	200 Peak-Hour Passengers	250 Peak-Hour Passengers
Check-In /Ticketing	1,648	949	1,446	1,897	2,394
Baggage Screening & Makeup	751	3,115	3,240	3,240	3,240
Security Screening Checkpoint	1,356	4,883	4,981	6,366	8,854
Secure Holdrooms	1,865/1,511	5,780	6,878	9,072	12,364
Baggage Claim and Inbound Baggage	769	5,566	4,292	8,820	12,265
Concessions	1,090	2,078	3,117	4,156	5,194
Other Functions/Tenants	5,810	12,286	15,644	17,871	23,689
Total	14,800	34,657	39,598	51,422	68,000
Passenger Terminal Requirement Range		30,000-35,000	35,000-40,000	50,000-55,000	65,000-70,000

Recommendation Priorities:

1) Expand Baggage Claim Area
2) Expand Secure Holdroom
3) Expand Security Checkpoint
4) Expand Circulation and Support Facilities
5) Expand Outbound Baggage Screening Area (In-line System)

Total Additional Space - 20,000-55,000 SF

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Accommodations for Public Health

- Terminal Social Distancing
- Ventilation and Filtration
- UV Light Sanitation

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Curbfront and Parking

- Existing Curb – Approx. 100 Linear feet (useful)
- Required Curb
  - 200 LF Required @ 150 Peak Hr. Pax; 340 LF Required @ 250 PHP
- Auto Parking Demand will Increase with LCC Service
- Dedicated/Off Curb TNC Area Recommended
- No Changes Anticipated for Rental Cars
  - Improved Servicing Facility May be Required

Auto Parking Demand	Existing Demand	100,000 Enpl.	125,000 Enpl.	150,000 Enpl.	175,000 Enpl.
Average Demand	130-150	260-300	300-450	450-600	600-750
Peak Demand	150-220	300-400	450-550	600-700	750-850
Existing Provision	585				

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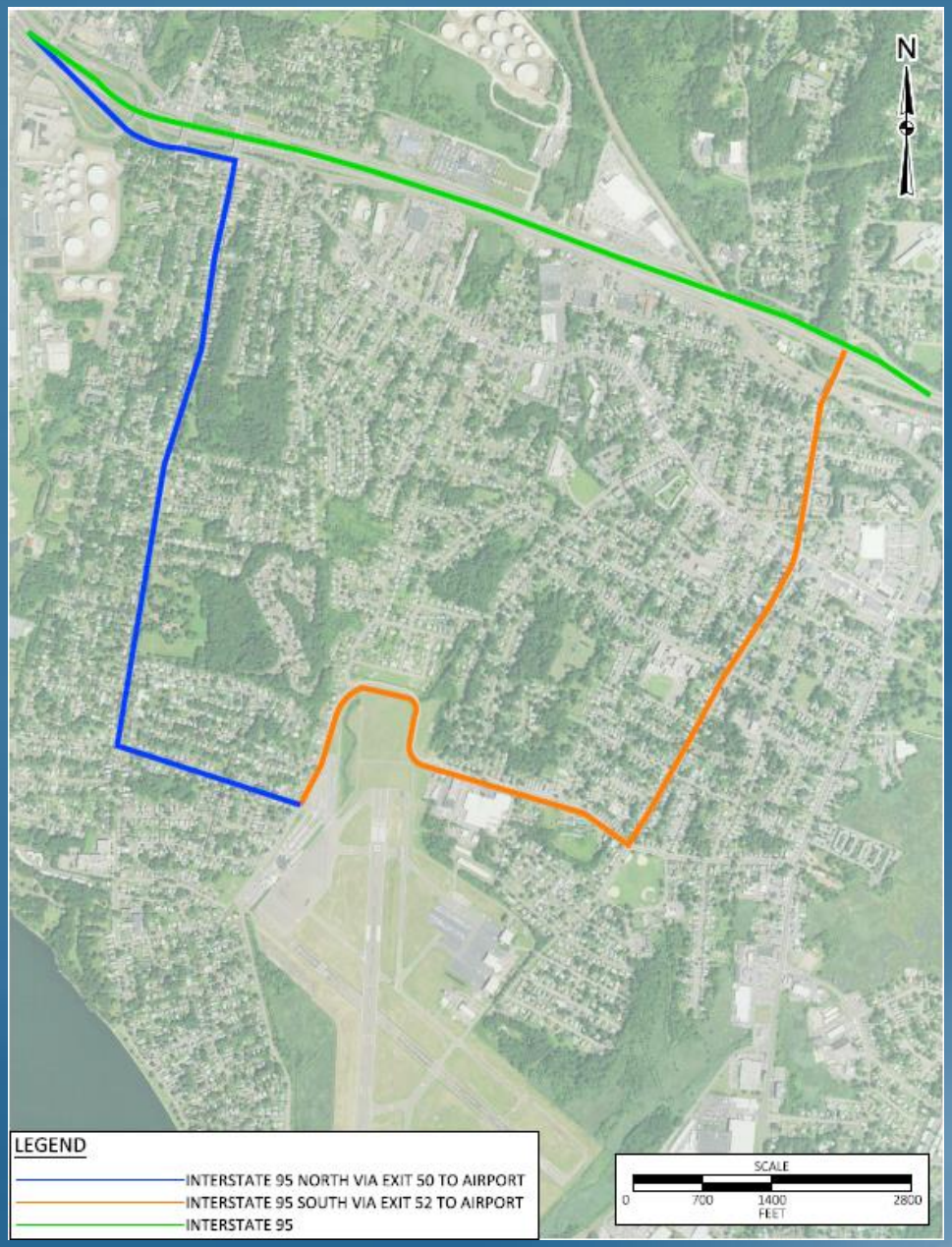
Airport Access



Access Route	
Route 95 North via Exit 50 to Airport	
Route 95 South via Exit 52 to Airport	

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Airport Access

Deficiencies:

- Access to the Airport is Through Residential Areas
- No place for TNCs (wait in residential areas)

Overall Recommendations:

- Improve Airport Signage
- Create Cellphone/TNCs Lot

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Hangar Requirements

- Currently 50 Based Aircraft
- Forecast to Grow to 56 Based Aircraft

Based Aircraft	Existing	2040 Demand	Shortage
Individual Hangars	20 units	22 units	2 units
Conventional Hangars[1]	28,500 SF	70,700 SF	42,200 SF

[1] Based Aircraft Storage Only

- FBO Reports Conventional Hangars are Full
  - They Could Fill a 15,000 SF Hangar Today
  - 33,000 SF Minimum for Next Hangar

Recommendations:

- **2 Additional Individual Hangars**
- **42,200 SF Conventional Hangars**
- **Business Hangar(s) (private investment)**

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General Aviation Ramp Requirements

- Current Provision: 45 Tie-Downs
- Total Need: 35 Tie-Downs (Based Aircraft Plus Transient Demand in 2040)

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General Aviation and Admin Parking

- ACRP 103, *Guidebook on General Aviation Facility Planning*
- Based Aircraft Owners Could Park in Hangar/Tie-down
- Admin Building Could Park in Excess Rental Car Spots

	Existing Auto Parking Spaces	Existing Deficiency	Future Deficiency
Conventional Hangars	87	17	46
T-Hangars and Apron	0	58	51
Administration Building	8	24	24
Total	**95**	**99**	**121**

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General Aviation Fueling Requirements

- Jet A Fuel Storage
  - Two Tanks, 12,000 Gallons Each
  - Fuel Dispensed via Mobile Fuelers
- Avgas 100LL Fuel Storage
  - One Tank, 12,000 Gallons
  - Fuel Dispensed via Mobile Fuelers
- 2019 Dispensed:
  - 1.1 million gallons Jet A (22,000 gallons/week)
  - 98,000 gallons AvGas (1,890 gallons/week)

Plan Location/Parking for Electric Aircraft/Charging
Additional Fuel Tanks are Business Decision

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Support Facilities

- Utilities
  - Some lighting is cable in conduit, some direct burial
  - Terminal power load
- Airfield Maintenance/Snow Removal Equipment
  - Maintenance Facility is Aging
  - Less Than Half of Maintenance/Snow Removal Equipment can be Stored Indoors
  - Replace Vehicles as Eligible
- ARFF – Expand to House Equipment
- Deicing
  - Meets Standards
  - Review Permits with Increased Service
  - Monitor Regulatory Permit Changes

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Support Facilities

- ATCT
  - Full Power Restoration Back-up Generator
  - Will Exceed the Useful Life of the Building (1983)
- Fence/Wildlife Management – Follow 2019 Wildlife Hazard Management Plan

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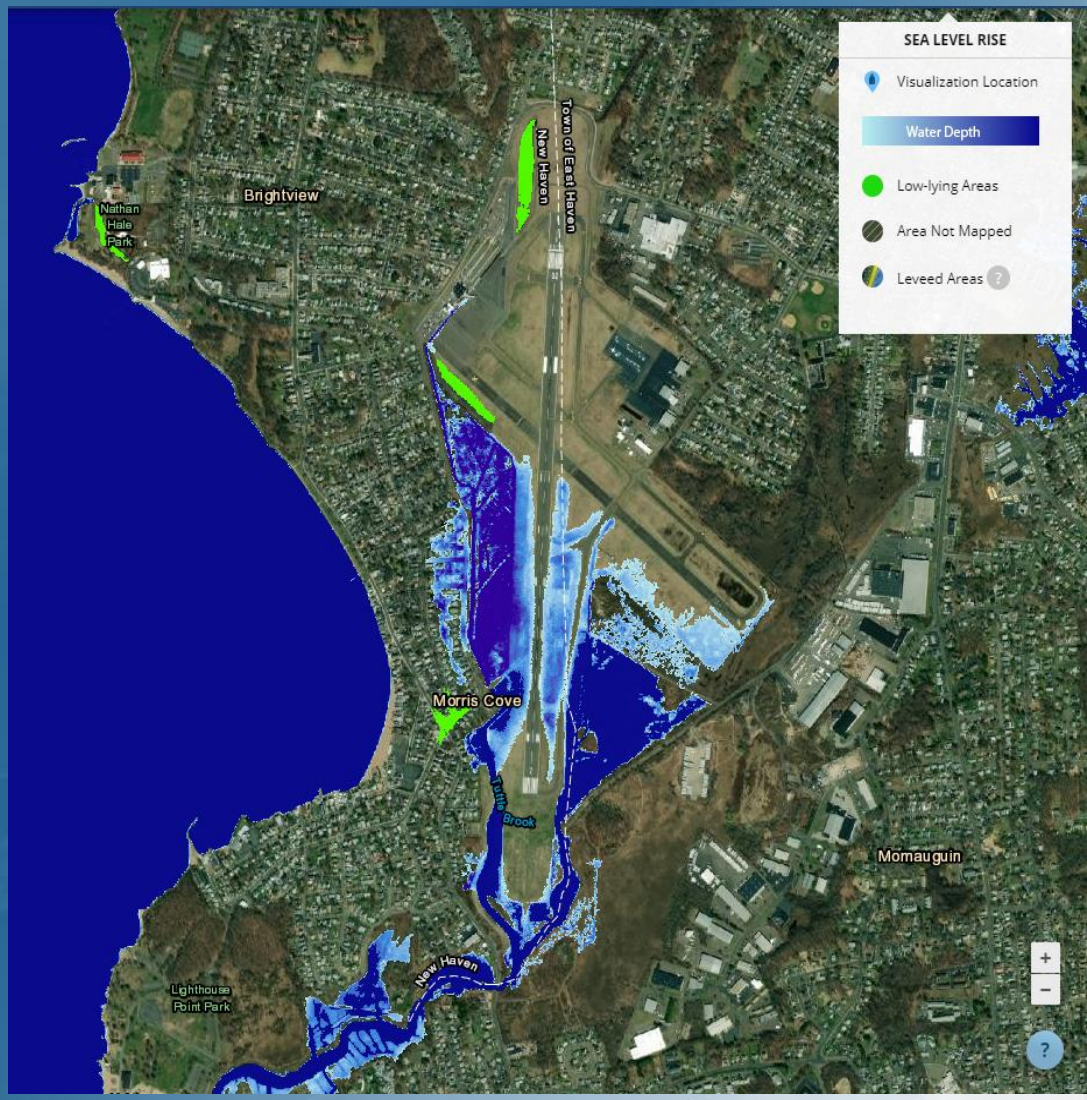
Other Considerations

- Electric Vehicle Charging Stations
- Drainage Study
- Resiliency Planning
  - Existing Tide Gate MOU
  - Additional Resiliency Measures



Next Steps

- Alternatives
- Airport Layout Plan – FAA Approval

After the Master Plan

- National Environmental Policy Act (NEPA) process
- Final Design and Permitting
- Begin Implementation

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Conclusion / Questions

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