

Staff Study:

Evaluate the need for Class C Airspace at Westchester County Airport (HPN)

June 2022

Prepared by:

Jane Littlecloud FAA, Front Line Manager

Dr. Wycliffe L. Walcott NATCA, Air Traffic Control Specialist

Concurred by:

Demisha Nesbitt FAA, Air Traffic Manager

Devon Browne NATCA Facility Representative, Air Traffic Control Specialist

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Acronyms

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Definitions¹

AIR TRAFFIC CONTROL: A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

AIRPORT SURVEILLANCE RADAR: Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

Air Traffic Control Tower: A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area.

AREA NAVIGATION (RNAV): A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

CLASS B: Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive

separation services within the airspace. The cloud clearance requirement for VFR operations is “clear of clouds.”

CHARTED VISUAL FLIGHT PROCEDURE APPROACH: An approach conducted while operating on an instrument flight rules (IFR) flight plan which authorizes the pilot of an aircraft to proceed visually and clear of clouds to the airport via visual landmarks and other information depicted on a charted visual flight procedure. This approach must be authorized and under the control of the appropriate air traffic control facility. Weather minimums required are depicted on the chart.

CLASS C: Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area with a 5 NM radius, a circle with a 10 NM radius that extends no lower than 1,200 feet up to 4,000 feet above the airport elevation, and an outer area that is not charted. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.

CLASS D : Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.

CLASS E: Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the

48 contiguous States and Alaska, up to, but not including 18,000 feet MSL, and the airspace above FL 600.

GLOBAL POSITIONING SYSTEM (GPS): GPS refers to the worldwide positioning, navigation and timing determination capability available from the U.S. satellite constellation. The service provided by GPS for civil use is defined in the GPS Standard Positioning System Performance Standard. GPS is composed of space, control, and user elements.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

INSTRUMENT FLIGHT RULES: A set of rules governing the conduct of flight under instrument meteorological conditions.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids: Localizer, Glideslope, Outer Marker, Middle Marker, and Approach Lights.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

MODE: The letter or number assigned to a specific pulse spacing of radio signals transmitted or received by ground interrogator or airborne transponder components of the Air Traffic Control Radar Beacon System (ATCRBS).

Mode A (military Mode 3) and Mode C (altitude reporting) are used in air traffic control.

RADIO DETECTION AND RANGING: A device that provides information on range, azimuth, and/or elevation of objects by measuring the time interval between transmission and reception of directional radio pulses and correlating the angular orientation of the radiated antenna beam or beams in azimuth and/or elevation.

REQUIRED NAVIGATION PERFORMANCE (RNP): A statement of the navigational performance necessary for operation within a defined airspace.

RESOLUTION ADVISORY– A display indication given to the pilot by the Traffic alert and Collision Avoidance System (TCAS II) recommending a maneuver to increase vertical separation relative to an intruding aircraft. Positive, negative, and vertical speed limit (VSL) advisories constitute the resolution advisories. A resolution advisory is also classified as corrective or preventive.

RUNWAY: A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned instrument flight rule (IFR) air traffic control (ATC) departure procedure printed for pilot/controller use in graphic form to provide obstacle clearance and a transition from the terminal area to the appropriate en route structure.

STANDARD TERMINAL ARRIVAL (STAR): A preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

Terminal RADAR Service Area: Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft.

Visual Flight Rules: Rules that govern the procedures for conducting flight under visual conditions.

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¹ Federal Aviation Administration. (2021). *PILOT/CONTROLLER GLOSSARY*.

https://www.faa.gov/air_traffic/publications/media/pcg_basic_6_17_21.pdf

Executive Summary

Westchester County Airport (HPN) is a small-hub airport² located approximately 19 nautical miles northeast of LGA. HPN ATCT is a level 7 VFR tower that provides limited ATC RADAR approach control services 17 hours a day between the hours of 0600L and 2300L. The airspace surrounding HPN is Class D. LGA's Class B airspace overlaps HPN and more than 50% of HPN's Class D airspace. The LGA Class B Mode C Veil extends north of HPN's Class D airspace, and the N90 TRACON TRSA overlies both LGA's Class B airspace and HPN's Class D airspace. HPN ATCT provides limited RADAR approach control services to IFR and VFR aircraft in and around HPN ATCT's Class D airspace.

In 2018, a collaborative work group comprised of FAA management and NATCA met to discuss IFR/VFR conflict resolutions for aircraft arriving and departing HPN as well as flying through HPN's Class D airspace. In 95 safety conflict events during the months of April, May, and June of 2021, VFR aircraft receiving and not receiving RADAR services were in direct conflict with airliners (part 91), air taxi (part 135), high performing turbojet, turboprop, and other high performing

² Federal Aviation Administration. (2021). *Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports*.

http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

general aviation aircraft landing and departing HPN. The current limitations of HPN's Class D led to the current staff study for a Class C airspace.

HPN's enplanement count for the years 2016 through 2020³ were 766,170; 759,334; 789,283; 872,023; 232,325³ respectively. The average enplanement of passengers in the past five years is 683,827⁴, which exceeds the Class C Standard of 250,000 IAW JO 7400.2L CHG 1 by approximately 174 percentage points. These numbers do not account for the enplanement of passengers at FBOs – Citigroup, IBM, JP Morgan CHASE, Million Air, NetJets, FlexJet, PepsiCo, Ross Aviation, Signature Flight Group, and others. Additionally, the airspace surrounding HPN is complex and congested. HPN is a multi-use small-hub airport that services airlines – ASQ, AWI, DAL, JBU, JIA, JSX, MNU, RPA, SKW; fractional ownership private jet companies – CNS, EJA, EJM, FTH, GAJ,

³ COVID-19 restrictions resulted in a negative impact on travel in 2020
U.S. Government Accountability Office. (2021). *COVID-19 Pandemic: Observations on the Ongoing Recovery of the Aviation Industry*.

<https://www.gao.gov/products/gao-22-104429>

⁴ Federal Aviation Administration. (2021). *Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports*.

http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

GPD, HPK, JKR, KAP, LXJ, NEA, PGN, RLI, SXL, TFF, VTE, XLS, XOJ, and others; MNC fleet aircraft – JP Morgan CHASE, Citigroup, PepsiCo, and others; flying clubs and flight training schools – Academy of Aviation, Performance Flight, Westchester Flying Club, and Wings Air; and flights for special events – Freedom Flight, NBAA, NYC Fashion Week, UNGA, Wings of Freedom tour(WWII Bombers), and VIPs – heads of state, military flights, and professional sports teams (e.g. NYK, NYR, and NYY). Aircraft sizes varying from large (e.g. B757), to small (e.g. R44) weight classes are common at HPN. Due to the unique combination of aircraft types and operations departing, arriving, and transitioning through HPN’s departure and arrival corridors and Class D airspace, there is a need to ensure a safe operating environment for all.

Aircraft flying VFR navigate above and around the HPN Class D airspace to popular routes and destinations in the vicinity of the airspace and the New York-New Jersey-Connecticut tri-state area; Alpine Tower; Connecticut shoreline; Croton Point practice area; Downtown Manhattan/Wall Street Heliport (JRB); East 34th St. Heliport (6N5); Governor Mario M. Cuomo Bridge; Hudson River; Martha’s Vineyard, Nantucket, and Hyannis destinations; New York Class B Airspace HUDSON RIVER EXCLUSION; West 30th St. Heliport (JRA); and Westchester Medical Center Heliport (7NK8). HPN IFR departures climb out directly over the Hudson River after takeoff climbing to an altitude of 3,000 feet MSL. HPN IFR arrivals are vectored towards the right downwind five miles east of HPN. Additionally, HPN IFR arrivals are vectored towards the left downwind

over the Hudson River for visual approaches. HPN VFR aircraft are unrestricted clear of the New York Class Bravo airspace. Direct communication between HPN ATCT and VFR aircraft operating in the vicinity of HPN's Class D airspace is critical to maintaining an appropriate margin of safety. Establishing a Class C airspace for HPN ensures direct communication between HPN ATCT and VFR aircraft operating within 10 nautical miles of HPN. A Class C airspace would provide HPN ATCT the ability to utilize applicable separation standards between VFR aircraft and HPN IFR departures and arrivals thus reducing safety conflict events for every pilot and all types of operations.

Background

This section contains the traffic volume and makeup that currently exists. Prior to the COVID-19 pandemic in 2020, HPN ATCT had an approximate 1.4 percent increase in traffic annually between CY2018 and CY2019. This includes itinerant, local, and overflight traffic.

Adjacent Airspace Considerations

Other Considerations

Breeze Airways, a new low-fare airline, is expected to launch new service out of HPN during the summer of 2022 to several destinations including Los Angeles, California; San Francisco, California; Las Vegas, Nevada; Charleston, South Carolina; Norfolk, Virginia; Jacksonville, Florida; and Savannah, Georgia.

Approximately 14 additional flights, per day, will be created by these operations utilizing the Airbus 220-300 aircraft – A223*. With 126 seats on board, Breeze Airways can possibly account for an additional 500,000 enplanements and 5,000 itinerant operations or more per calendar year⁵.

⁵ Vora, S. (2022, April 29). New discount airline makes it a breeze to fly from Westchester. *New York Post*. <https://nypost.com/2022/04/29/new-discount-airline-makes-it-a-breeze-to-fly-from-westchester/>

* More commonly known as the Bombardier C series – BCS3

Current Operations and Aviation Activity

Primary Airport – Westchester County Airport (HPN)

Passenger Enplanement Count

Airport ID	Airport Name	CY17	CY18	CY19	CY20	CY21
HPN	Westchester County Airport	759,334	789,283	872,023	232,325*	547,011**

Figure 1-1⁶

⁶ Federal Aviation Administration. (2021). *Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports.*

http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

* COVID-19 restrictions resulted in a negative impact on travel in 2020

** Preliminary data only

Historical Trends 2000-2040 and HPN APO Forecast

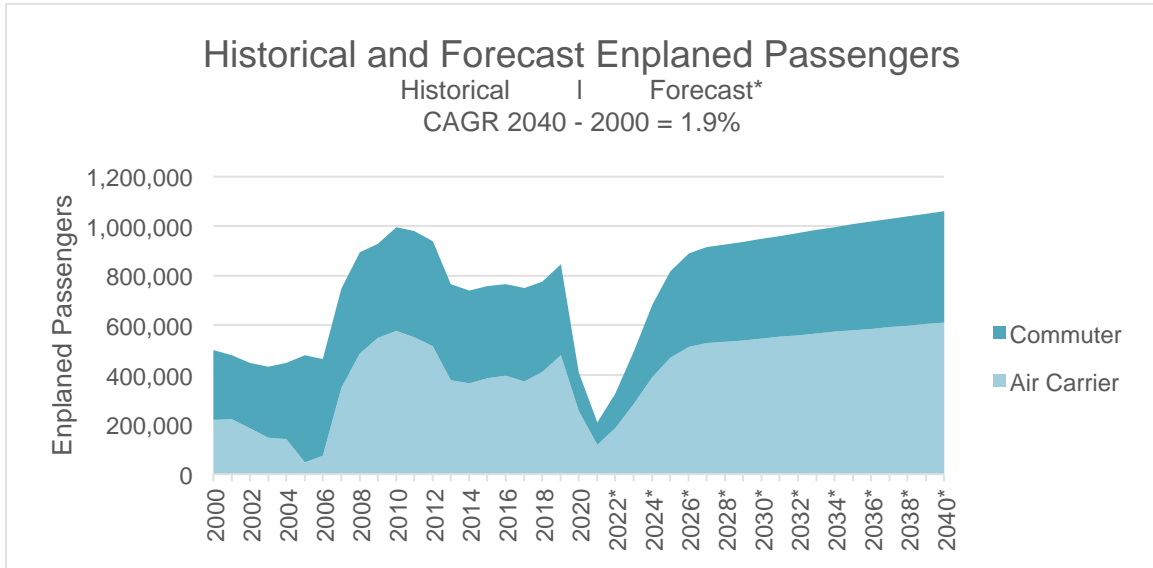


Figure 1-2⁷

⁷ Federal Aviation Administration. (2021). *APO TERMINAL AREA FORECAST SUMMARY REPORT*. <https://taf.faa.gov/>

Total Annual Operations Count

Airport ID	Airport Name	CY18	CY19	CY20
HPN	Westchester County Airport	160,001	162,243	105,181*

Figure 1-3⁸

Total Annual IFR/Itinerant Operations Count

Airport ID	Airport Name	CY18	CY19	CY20	CY21
HPN	Westchester County Airport	100,339	99,902	59,808*	97,400

Figure 1-4⁹

⁸ Federal Aviation Administration. (2021). *CountOps*.

<https://n90.countops.faa.gov>

⁹ Federal Aviation Administration. (2021). *OpsNet*.

<https://aspm.faa.gov/opsnet/sys/Main.asp>

* COVID-19 restrictions resulted in a negative impact on traffic in 2020

Types of Operations Conducted

Flight Schools

Airport ID	Airport Name	Group Name
HPN	Westchester County Airport	Academy of Aviation, Performance Flight, Westchester Flying Club, and Wings Air*

Figure 1-5¹⁰

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* Wings Air provides rotary-wing flight training utilizing Robinson R44 helicopters. WINGS AIR HELICOPTERS. (2021). *HELICOPTER FLIGHT TRAINING NEW YORK*. <https://wingsair.net/services/helicopter-flight-training-new-york/>

Helicopter Flights

Airport ID/ Heliport ID	Airport/Heliport Name	Group Name
HPN	Westchester County Airport	Westchester County Department of Public Safety – Aviation Unit*
ONK7**	IBM King St. Heliport	IBM

Figure 1-6¹¹

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* Westchester County Department of Public Safety – Aviation Unit assists and supports every public safety division and all local law enforcement in the county, conducts routine patrol flights including the Hudson River, Long Island Sound and their shorelines to identify environmental violations such as illegal dumping, pollution, or other problems, critical infrastructure, and utility/railroad rights-of-way, as part of ongoing counter-terrorism efforts, and any other locations, as part of police or public safety matters in and around HPN’s Class D airspace.

Westchester County Government. (2021). *Aviation Unit*.

<https://publicsafety.westchestergov.com/aviation-unit>

** ONK7 is a Private Use heliport located in Armonk, NY approximately 2.3 miles north of HPN.

Medical Flights

Airport ID/ Heliport ID	Airport/Heliport Name	Group Name
HPN	Westchester County Airport	Hatzolah Emergency Air Response Team*
7NK8	Westchester Medical Center Heliport	Westchester Medical Center

Figure 1-7¹²

Pipeline Patrol

Airport ID	Airport Name	Group Name
HPN	Westchester County Airport	Midwest Avtech**

Figure 1-8¹³

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* Hatzolah Emergency Air Response Team

Hatzolah Air. (2021). *Medical Transports*. <http://www.HatzolAir.org>

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** Midwest Avtech contracted by Kinder Morgan to perform routine pipeline inspections once or more per month pending weather.

MIDWEST AVTECH. (2021). *PIPELINE PATROL*.

<https://midwestavtech.com/services/>

Water Landings

Seaport ID	Seaport Name	Group Name
UNKN	UNKN	Belle Haven Club*

Figure 1-9¹⁴

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* The Belle Haven Club is a yacht club located in Greenwich, CT. underneath the THEEO waypoint (approximate 1 square mile surface area on the Long Island Sound). Tailwind Air operates between 2 to 5 flights per month under the telephony Peregrine (PGN).

Belle Haven Club. (2021). <https://www.bellehavenclub.com/>

Tailwind. (2021). <https://www.flytailwind.com/>

The Points Guy. (2021, August 4). *First look: The new seaplane service between New York and Boston on Tailwind Air.* <https://thepointsguy.com/news/boston-new-york-seaplane-review-tailwind-first-flight/>

Descriptions of the Terminal Area

Departure and Arrival Traffic Flows

The following are the existing standard IFR and VFR departure and arrival traffic flows.

HPN – BOUNO STAR North Flow (RWY 34 in use)

In Figure 1-10, IFR traffic cleared on the BOUNO FOUR ARRIVAL STAR via the COYLE TRANSITION or the SEA ISLE TRANSITION receive radar vectors to the final approach course pending weather upon reaching RYMES INT. In LIFR, IFR, and MVFR conditions, IFR arrivals are vectored several miles southeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 34 IAP. In VFR conditions, IFR arrivals are vectored several miles southeast of HPN for the SOUND VISUAL RWY 34 CVFP.

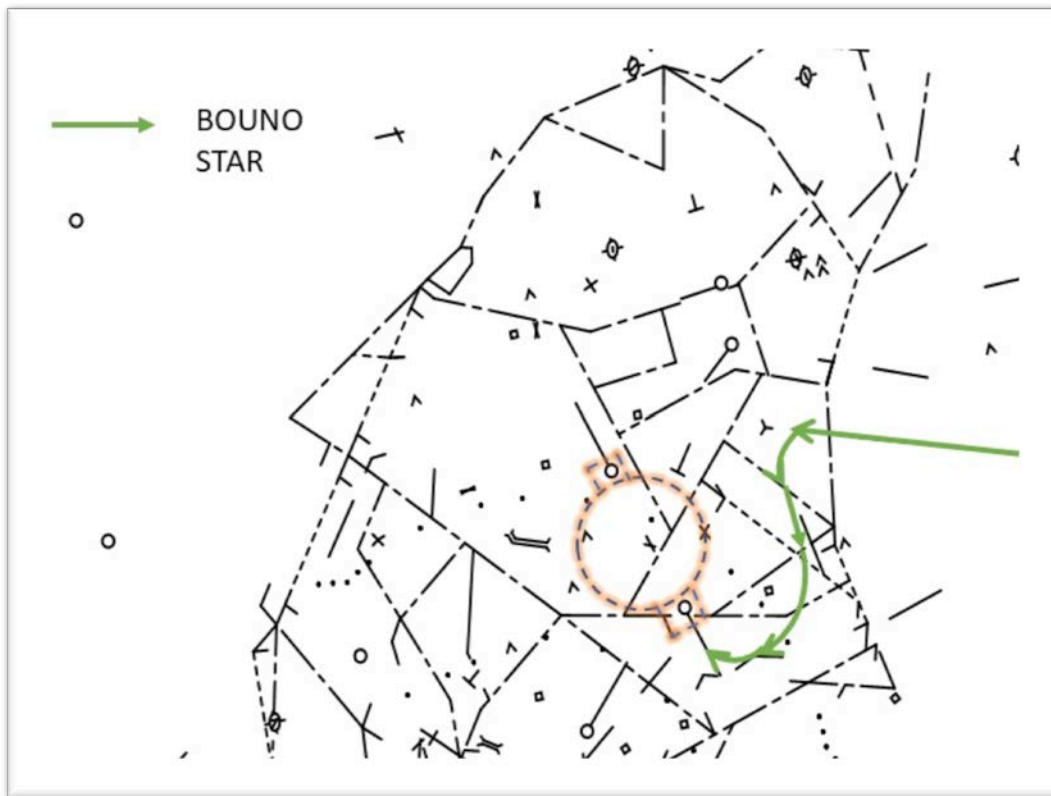


Figure 1-10

HPN – NOBBI STAR North Flow (RWY 34 in use)

In Figure 1-11, IFR traffic cleared on the NOBBI FIVE ARRIVAL STAR via the ALBANY TRANSITION, BARNES TRANSITION, CHESTER TRANSITION, DE LANCEY TRANSITION, or the ROCKDALE TRANSITION, receive radar vectors to the final approach course pending weather upon reaching CASSH INT. In LIFR, IFR, and MVFR conditions, IFR arrivals are vectored several miles southeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 34 IAP. In VFR conditions, IFR arrivals are vectored several miles southeast of HPN for the SOUND VISUAL RWY 34 CVFP.



Figure 1-11

HPN – RICED STAR North Flow (RWY 34 in use)

In Figure 1-12, IFR traffic cleared on the RICED FOUR ARRIVAL STAR via the DUNEE TRANSITION, receive radar vectors to the final approach course pending weather upon reaching RYMES INT. In LIFR, IFR, and MVFR conditions, IFR arrivals are vectored several miles southeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 34 IAP. In VFR conditions, IFR arrivals are vectored several miles southeast of HPN for the SOUND VISUAL RWY 34 CVFP.



Figure 1-12

HPN – VALRE STAR North Flow (RWY 34 in use)

In Figure 1-13, IFR traffic cleared on the VALRE FIVE ARRIVAL STAR via the ALBANY TRANSITION, DE LANCEY TRANSITION, or VEERS TRANSITION, receive radar vectors to the final approach course pending weather upon reaching HAARP INT. In LIFR, IFR, and MVFR conditions, IFR arrivals are vectored several miles southeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 34 IAP. In VFR conditions, IFR arrivals are vectored several miles southeast of HPN for the SOUND VISUAL RWY 34 CVFP.

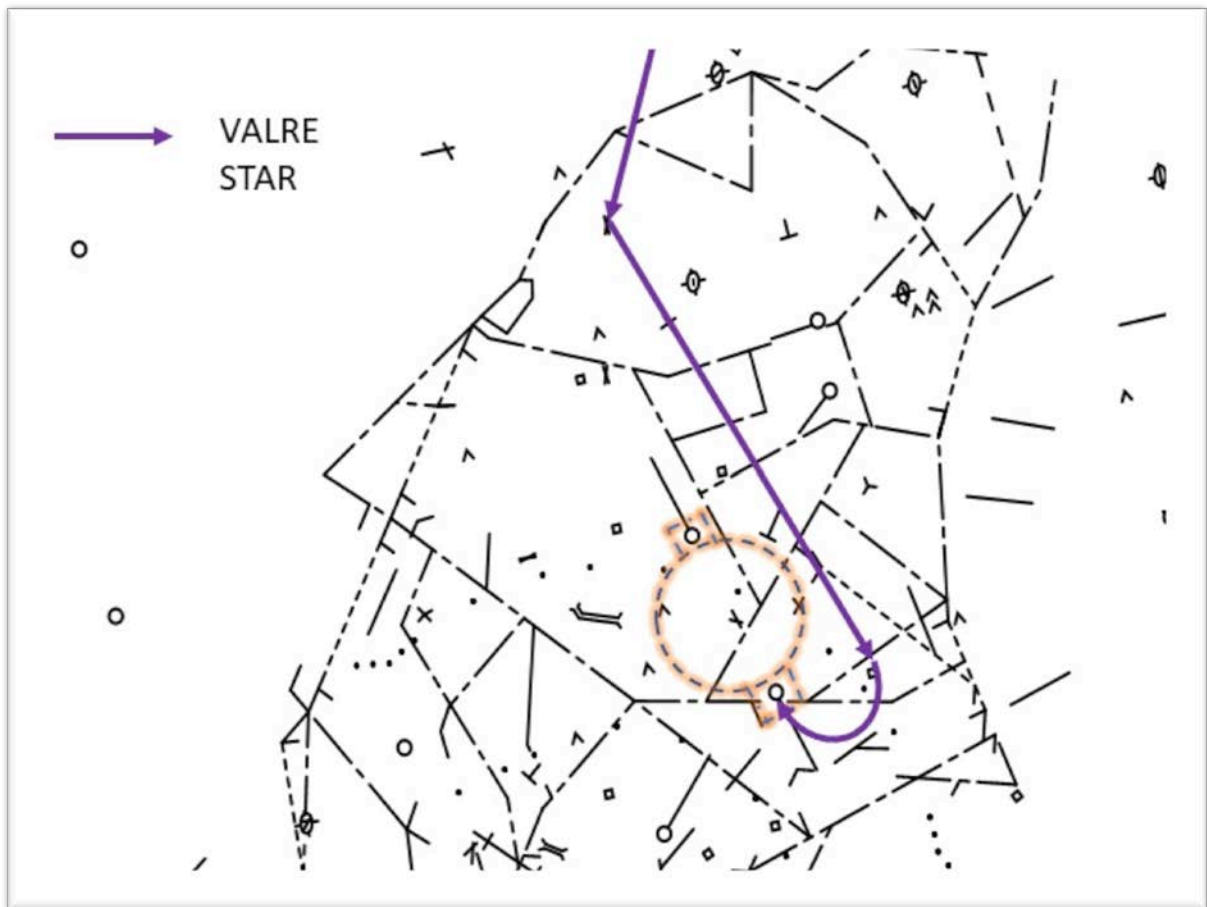


Figure 1-13

HPN – BOUNO STAR South Flow (RWY 16 in use)

In Figure 1-14, IFR traffic cleared on the BOUNO FOUR ARRIVAL STAR via the COYLE TRANSITION or the SEA ISLE TRANSITION receive radar vectors to the final approach course pending weather upon reaching RYMES INT. In LIFR, IFR, MVFR, and VFR conditions, IFR arrivals are vectored several miles northeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 16 IAP.

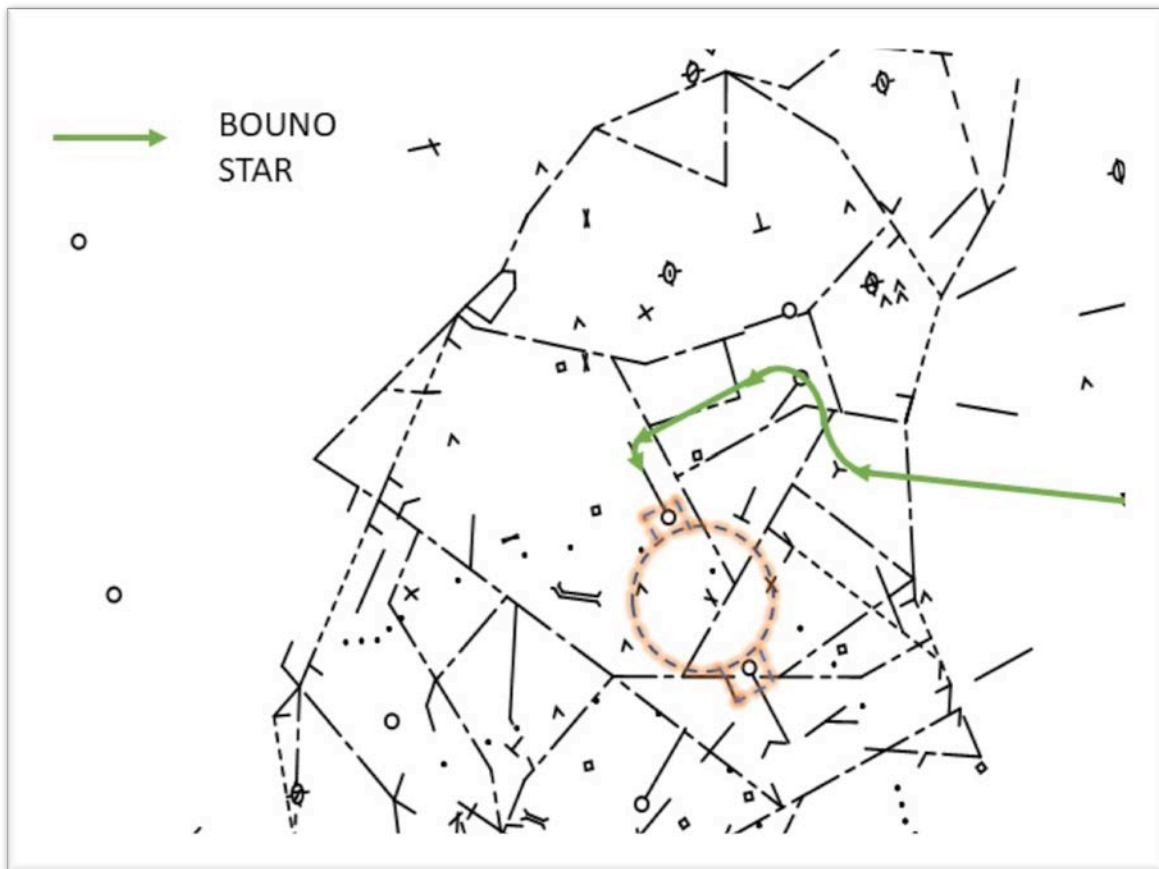


Figure 1-14

HPN – NOBBI STAR South Flow (RWY 16 in use)

In Figure 1-15, IFR traffic cleared on the NOBBI FIVE ARRIVAL STAR via the ALBANY TRANSITION, BARNES TRANSITION, CHESTER TRANSITION, DE LANCEY TRANSITION, or the ROCKDALE TRANSITION, receive radar vectors to the final approach course pending weather upon reaching CASSH INT. In LIFR, IFR, MVFR, and VFR conditions, IFR arrivals are vectored several miles northeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 16 IAP.

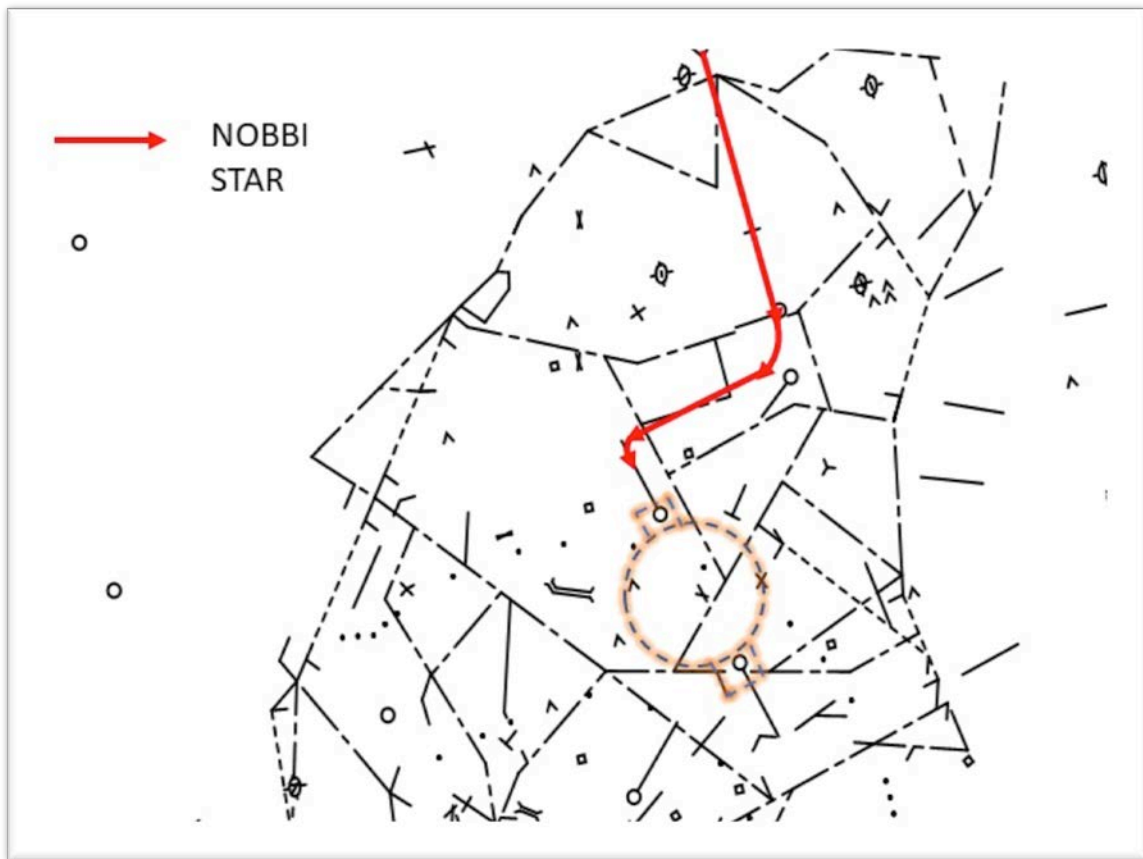


Figure 1-15

HPN – RICED STAR South Flow (RWY 16 in use)

In Figure 1-16, IFR traffic cleared on the RICED FOUR ARRIVAL STAR via the DUNEE TRANSITION, receive radar vectors to the final approach course pending weather upon reaching RYMES INT. In LIFR, IFR, MVFR, and VFR conditions, IFR arrivals are vectored several miles northeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 16 IAP.

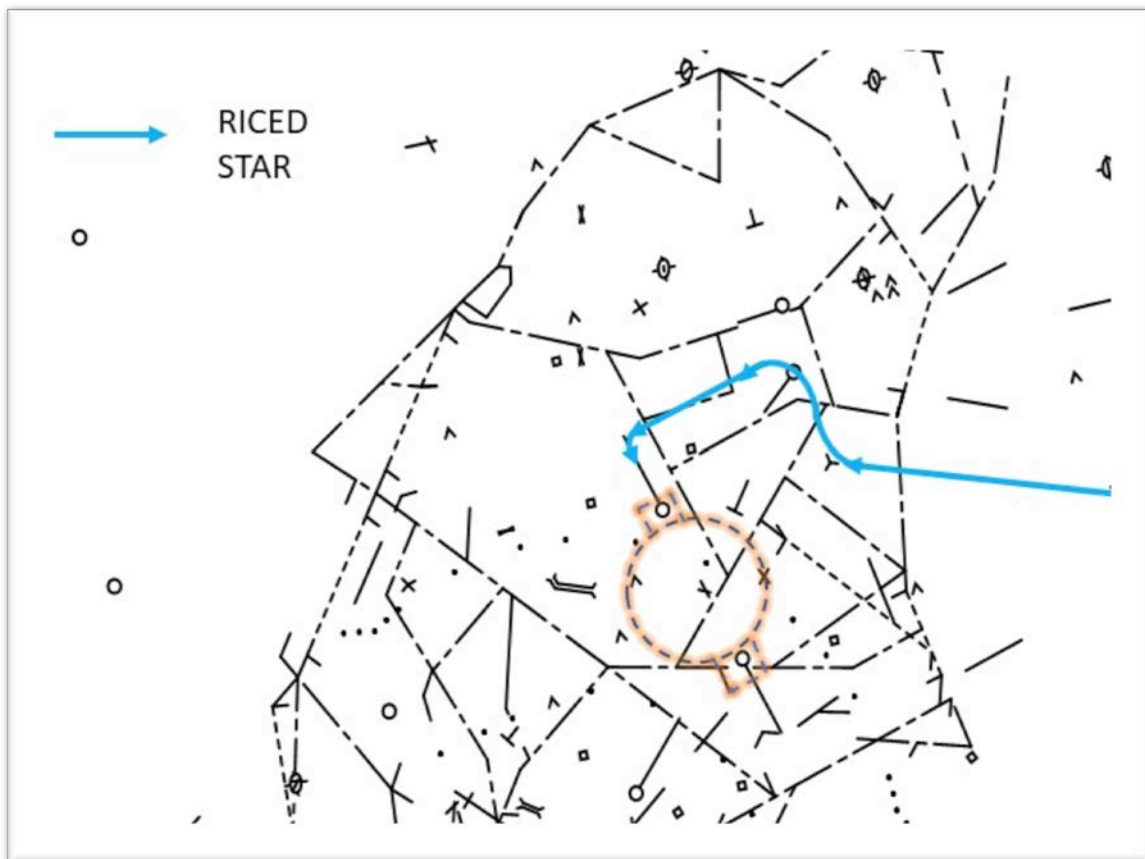


Figure 1-16

HPN – VALRE STAR South Flow (RWY 16 in use)

In Figure 1-17, IFR traffic cleared on the VALRE FIVE ARRIVAL STAR via the ALBANY TRANSITION, DE LANCEY TRANSITION, or VEERS TRANSITION, receive radar vectors to the final approach course pending weather upon reaching HAARP INT. In LIFR, IFR, MVFR, and VFR conditions, IFR arrivals are vectored several miles northeast of HPN to intercept the ILS, LOC, RNAV (RNP) Z, or RNAV (GPS) Y RWY 16 IAP.

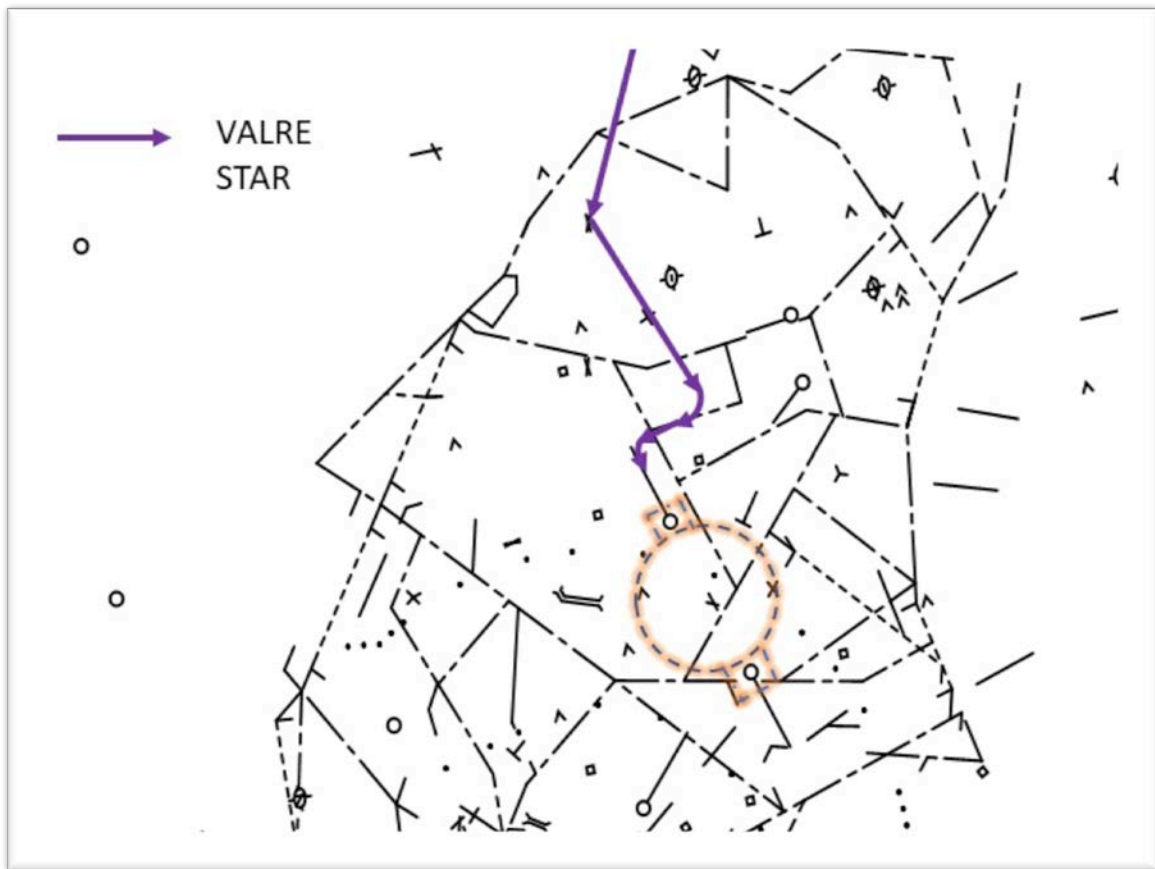


Figure 1-17

Enroute and Transitional Traffic Flows

The following are existing standard routes and altitudes that IFR and VFR traffic use while operating enroute through the area or transitioning to/from all popular routes and destinations in the vicinity of the airspace and the New York-New Jersey-Connecticut tri-state area.

LGA Arrival IFR Overflights

In Figure 1-18, IFR traffic arriving LGA on RWY 22 overfly HPN's Class D airspace at 3,000 and 4,000 feet. IFR traffic arriving LGA on any runway other than RWY22 overfly HPN's Class D airspace at 4,000 feet.



Figure 1-18

VFR Transitions

In Figure 1-19, numerous VFR cross-country routes pass within five miles of HPN's Class D airspace, and portions of V3, V123 and V157 airways are within 10 miles of HPN's Class D airspace. VFR traffic transits HPN's Class D airspace and/or circumnavigates the edges of HPN's Class D airspace at all altitudes and directions. The diagram below depicts popular routes.

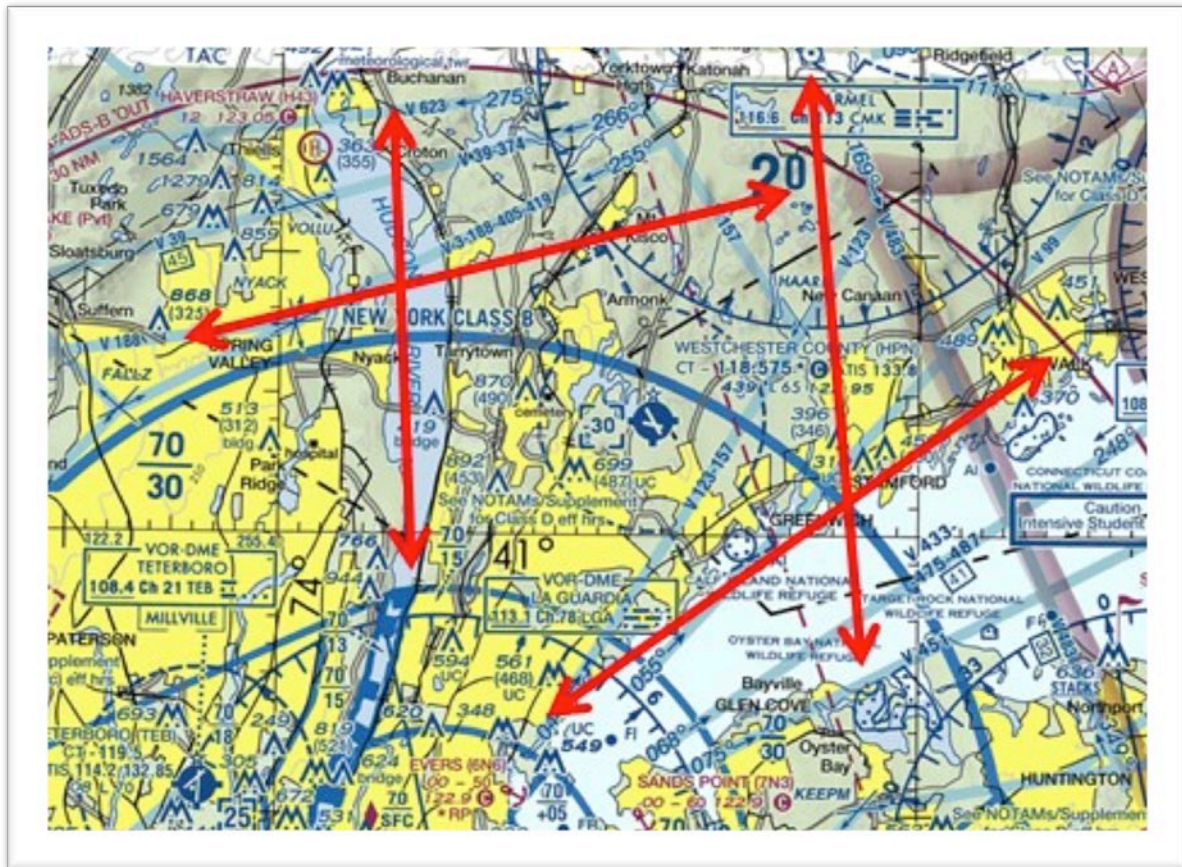


Figure 1-19

Operational Issue

Runway configuration, geography, proximity to other airports, navigational aids, flight training, and the mix of jet and propeller aircraft make the airspace above HPN a web of intersecting flight paths. Repeatedly, this results in an undesirable state with aircraft in an unsafe proximity to each other including IFR/VFR conflicts due to traffic density and complexity. This staff study explains the operational issue revolving around the safety of every person flying in and around HPN airspace regardless of pilots receiving ATC services or not.

Statement of the Problem

HPN's five-year average enplanement count is 683,827 and exceeds the Class C Standards of 250,000 IAW FAA JO 7400.2L CHG1 by over two and a half times. Minimally, 1,800 people fly in and out HPN daily. Considering flights in and around HPN annually, the number of people flying near HPN's airspace may reasonably exceed 2,000 per day. Additionally, the enplanement count at HPN is only passengers traversing the airport through its main terminal. The enplanement count does not include passengers passing through FBOs and private hangars. Operations at HPN include a full range of aircraft types and performances from the smallest light sport to large airliner aircraft. HPN routinely accommodates these aircrafts:

- Air Carriers (A320, CRJ9, E190, etc.)
- Charter (A319, B757, B737, MD88, etc.)
- Corporate (C750, E550L, F900, GLF6, HA4T, LJ60, etc...)
- General Aviation (BE58, C172, C414, M20P, PC12, SR22, TBM9, etc...)
- Military (A10, AH1, C130, CH47, E2, F18, UH1, UH60, V22 and the Presidential fleet including B757)
- Regional Carriers (CRJ2, CRJ7, E145, E170, etc.)

IFR/IFR Conflicts Due to Traffic Density and Complexity

LGA is located approximately 19 nautical miles southwest of HPN. Aircraft landing LGA routinely penetrate HPN's Class D airspace when LGA arrivals are landing on RWY22. Routinely, HPN ATCS must amend SID instructions to aircraft departing HPN RWY16 to stop their climb on the PROP ONE and WESTCHESTER SEVEN SIDs at 2,000 feet for LGA arrivals landing RWY22 at 3,000 feet.

IFR/VFR Conflicts Due to Traffic Density and Complexity

The Hudson River is approximately seven nautical miles west of HPN. VFR aircraft frequently transition from the river to upstate New York and New England areas. These VFR aircraft routinely conflict with HPN arrivals and departures. The Long Island Sound is approximately six nautical miles south of HPN. VFR aircraft, mostly helicopters, frequently transition east and westbound over the sound, and these aircraft also routinely conflict with HPN arrivals and departures.

Non-participating Above Class D

The airspace above HPN's Class D airspace falls into two classes. Directly above the airfield extending south is LGA Class B airspace with a floor of 3,000FT. North of the airfield above the Class D is Class E airspace. Aircraft do not have a requirement to establish 2-way radio communication with ATC in Class E airspace. Aircraft often circumvent both Class B and Class D airspace just outside the boundary as depicted in figures 1-20, and 1-21.

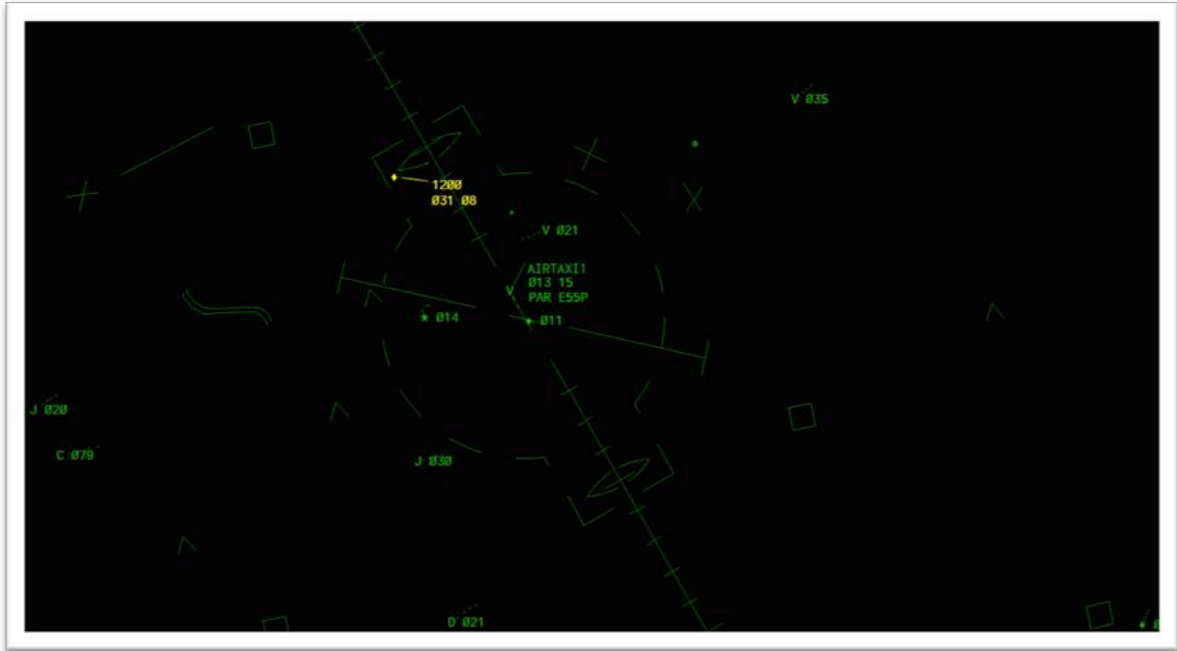


Figure 1-20

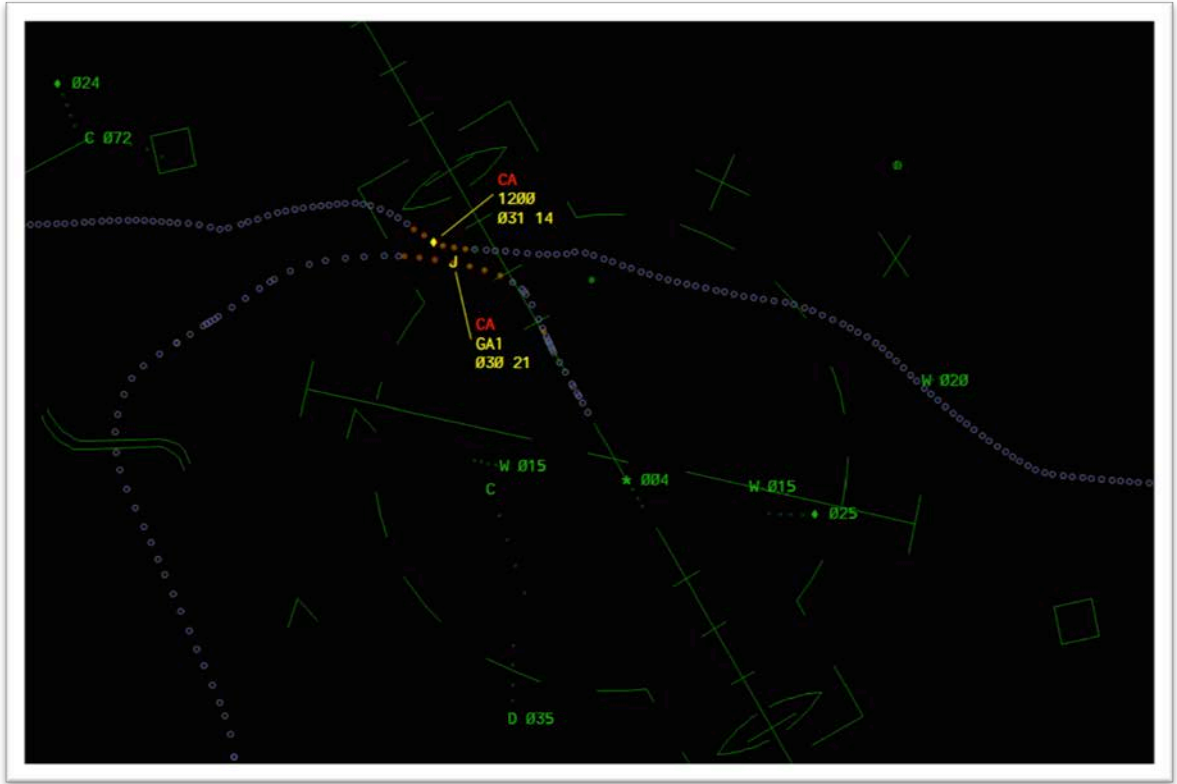


Figure 1-21

Non Participator Transition

In Figure 1-22, AIRTAXI1 is being vectored for the ILS approach to runway 16 at HPN. The aircraft squawking 1200 (yellow) is transitioning east to west outside of the HPN Class D airspace. New York TRACON (N90) is forced to take the pilot off the approach to avoid the transient traffic. AIRTAXI1 was then able to continue the approach to Runway 16 via a Visual approach and landed without incident.

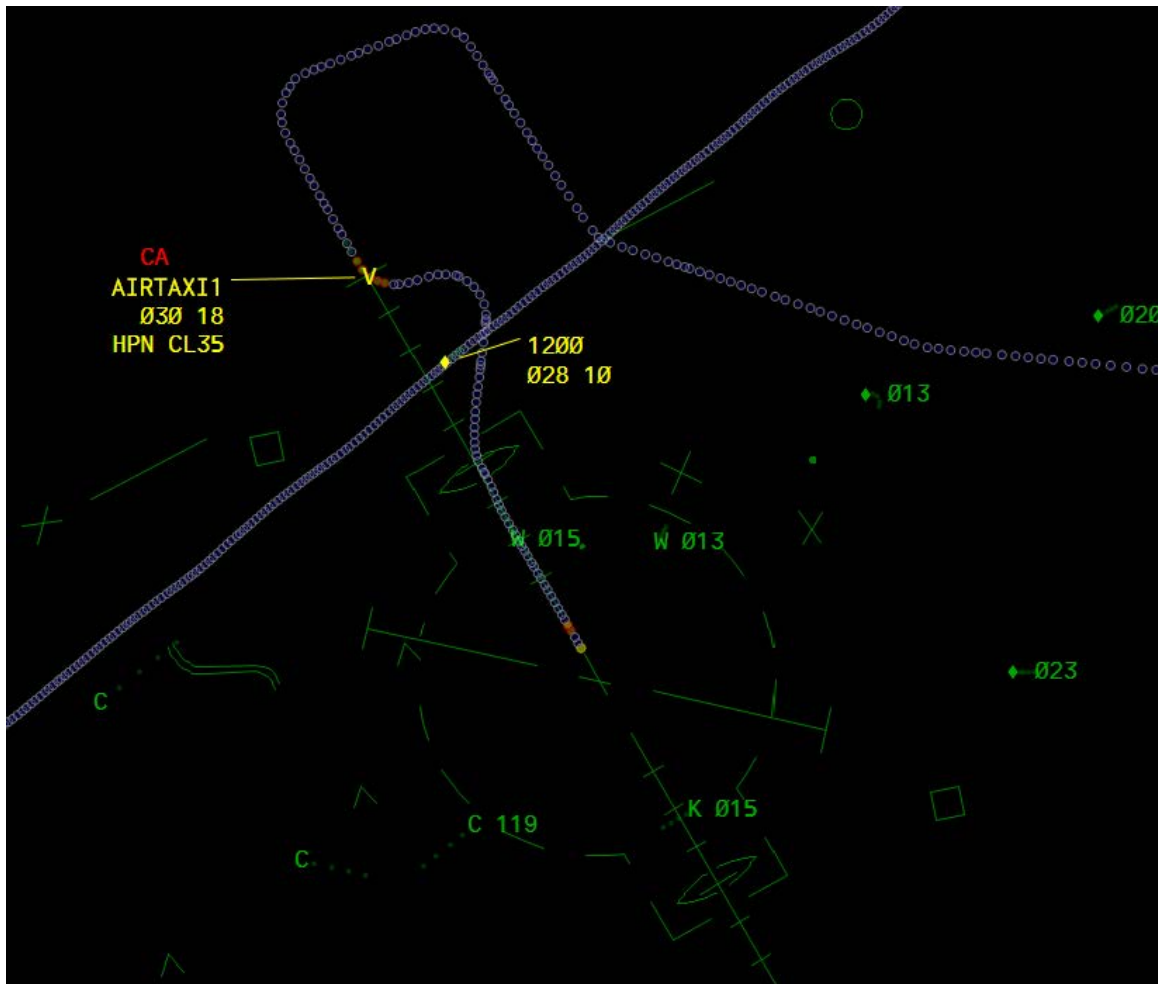


Figure 1-22

In Figure 1-23, GA1 is on the base leg of the SOUND VISUAL APPROACH to Runway 34, which is normally flown at 2000' according to the approach plate. As GA1 makes the approach on the base leg, two aircraft squawking 1200(yellow) are transitioning from East to West along the New York/Connecticut shoreline. The altitudes of these two aircraft is a hinderance to ATC operations as GA1 is forced to maneuver to avoid the conflict with the VFR aircraft.



Figure 1-23

Loitering in the Arrival Corridor

Arrivals approaching HPN from the east are handed off from the ISP area at N90 to the LGA area at 4000'.

In Figure 1-24, controllers at N90's LGA area and ISP area must amend their traditional handoff point and heading due to two VFR aircraft squawking 1200(yellow) performing what appears to be flight training just east of HPN. CARRIER1 was given a turn to the northwest and an early descent to avoid the flight training pair. As the airspace east of HPN is designated as Class E airspace, aircraft under Visual Flight Rules(VFR) are not required to establish 2-way radio communication with ATC.

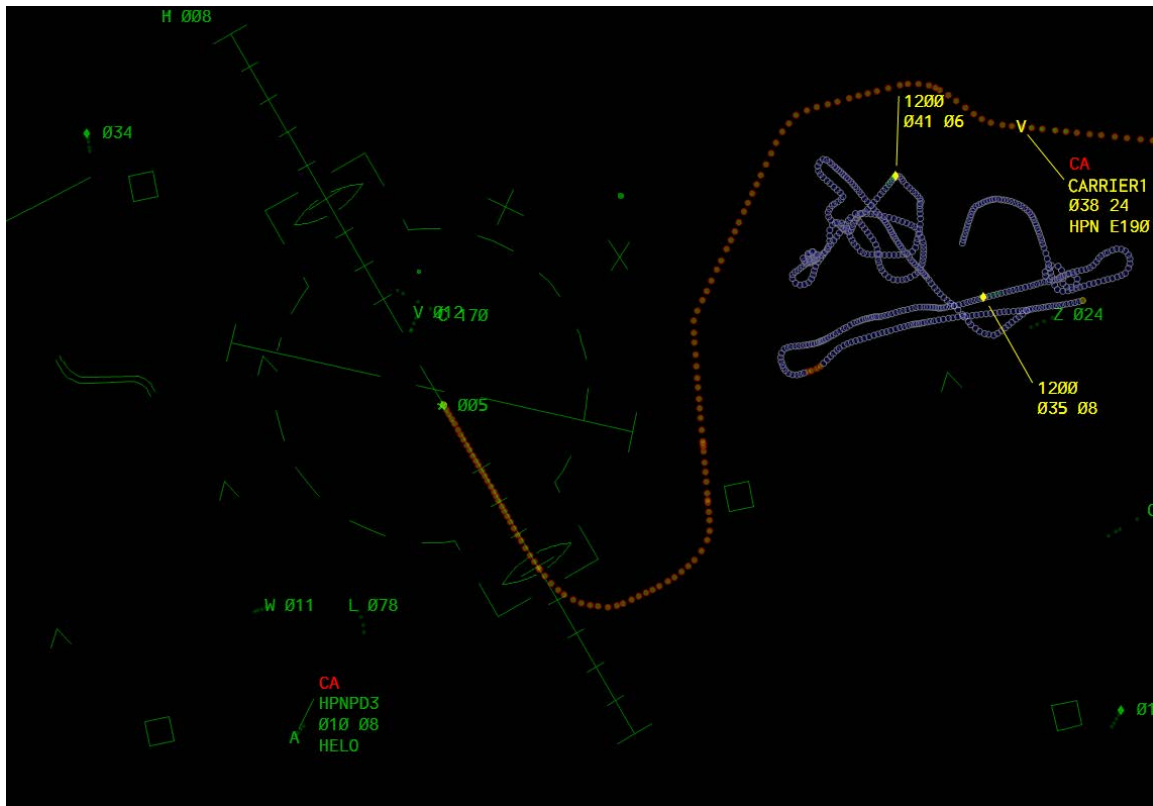


Figure 1-24

In Figure 1-25, AIRTAXI1 and AIRCARRIER1 had their arrival paths impacted by two VFR aircraft squawking 1200. Those two aircraft, level at 2000' and 3500', appear to have been flight training in the arrival's corridor. Their presence in the arrival's corridor at their current altitude causes the controller to keep the inbound traffic to HPN at 4000' for a longer duration than a normal operation, potentially putting that aircraft in conflict with an arrival into LGA from the northeast or an unstable approach as the aircraft will not be able to descend in time.



Figure 1-25

Arrival Conflicts

Transient traffic avoiding LGA Class B airspace is the number one cause of conflicts to aircraft inbound to HPN.

In Figure 1-26, AIRCARRIER1 comes into conflict with an aircraft squawking 1200 transitioning from East to West and not in contact with ATC. AIRCARRIER1 is only 200' below that aircraft, creating an uncomfortable scenario for the pilot of AIRCARRIER1 and the controllers at HPN. The controller at HPN was able to issue a traffic alert to AIRCARRIER1 which resulted in that aircraft establishing visual contact and separation with the transitioning aircraft.

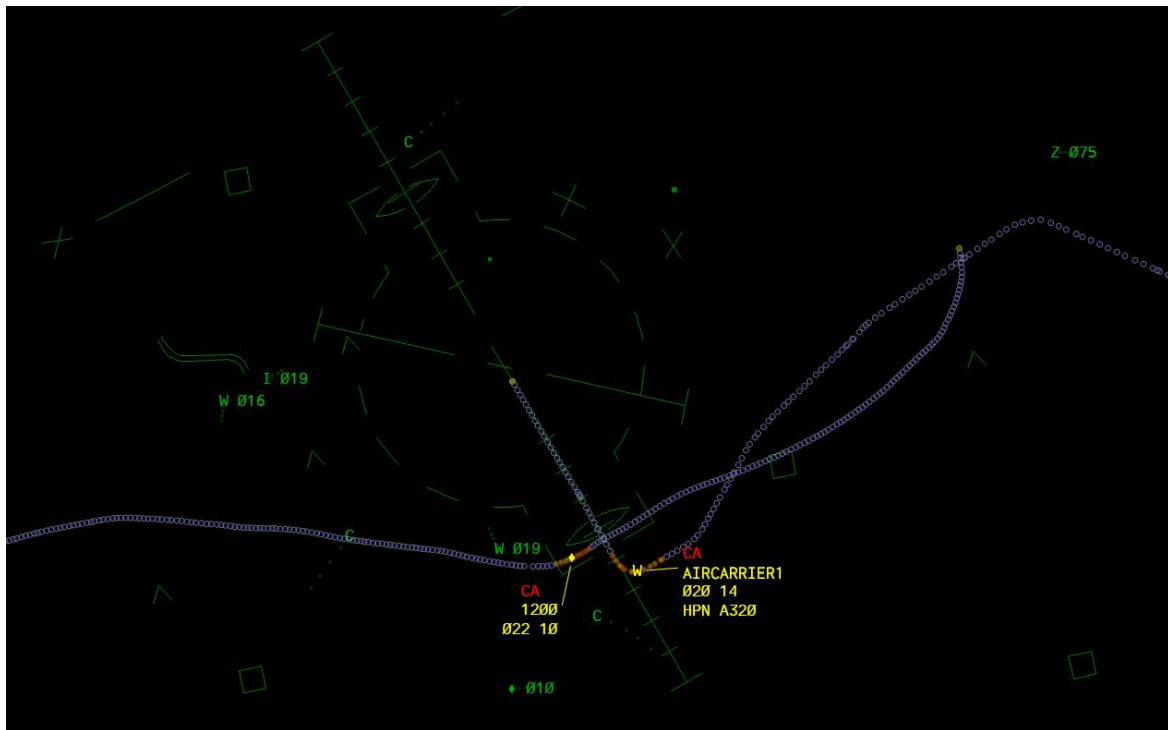


Figure 1-26

In figure 1-27, AIRTAXI1 is being vectored to a base leg by N90 at 3,000'. The Local controller at HPN has observed both AIRTAXI1 and a VFR aircraft departing their airspace on converging paths. Traffic was issued to the VFR aircraft by the HPN local controller to which they advised they had the traffic in sight and they were maintaining visual separation. Once clear of the lateral limits of HPN's Class D airspace, the VFR aircraft proceeded to climb through the altitude of AIRTAXI1, forcing the approach controller to turn AIRTAXI1 to avoid a potential collision. HPN tower attempted to reach the VFR aircraft to suggest they stop their climb but they were no longer on HPN tower's frequency.

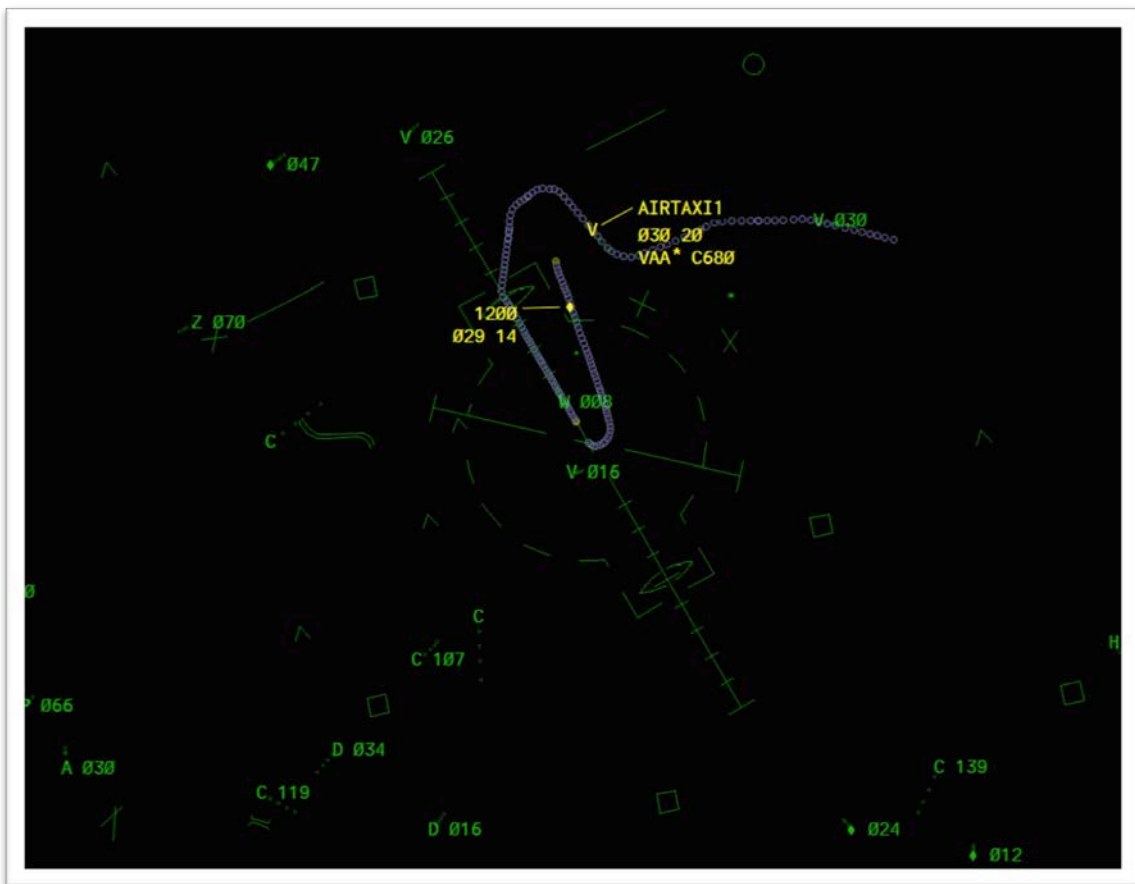


Figure 1-27

Supporting Data that Illustrates the Operational Issue

IFR/VFR Conflicts are a Top 5 ATO Concern

The FAA's Air Traffic Organization (ATO) is the operational arm of the FAA. It is responsible for providing safe and efficient air navigation services to 29.4 million square miles of airspace¹⁵. The ATO is committed to a permanent measurable risk reduction in the NAS. Annually, the ATO outputs its TOP 5 list of quantifiable hazards that contribute to the highest risks identified each year. In 2017, the number one item was close encounters between IFR and VFR aircraft. Since 2018, the number one item was lack of issuance of traffic advisories and/or safety alerts where required including incidents where a conflict between aircraft became imminent because a traffic advisory and/or safety alert was not issued¹⁶.

¹⁵ Federal Aviation Administration. (2021). *Air Traffic Organization*.

[https://www.faa.gov/about/office_org/headquarters_offices/ato#:~:text=The%20Air%20Traffic%20Organization%20\(%20ATO,million%20square%20miles%20of%20airspace.](https://www.faa.gov/about/office_org/headquarters_offices/ato#:~:text=The%20Air%20Traffic%20Organization%20(%20ATO,million%20square%20miles%20of%20airspace.)

¹⁶ Federal Aviation Administration. (2021). *ATO 2017 Top 5*. MyFAA.

https://my.faa.gov/org/linebusiness/ato/safety/aps/programs/top_five/archive/2017-top-5.html

By nature of HPN's Class D airspace, no separation services are provided to VFR aircraft¹⁷.

¹⁷ Federal Aviation Administration. (2021). *Controlled Airspace*. ATPUBS.

https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

TCAS RAs

TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) is an airborne collision avoidance system. TCAS has two systems including one that issues traffic information and provides resolution (collision avoidance) advisories instructing pilots of appropriate corrective actions¹⁸. In 2019, TCAS RA/Evasive Action was a top three Traffic/Airspace Proximity or Separation Event listed in an ATO Voluntary Safety Reporting Programs Quarterly Report¹⁹.

¹⁸ Federal Aviation Administration. (2021). *PILOT/CONTROLLER GLOSSARY*.

https://www.faa.gov/air_traffic/publications/media/pcg_basic_6_17_21.pdf

¹⁹ Federal Aviation Administration. (2021). *VSRP Q4 FY2019*. MyFAA.

<https://my.faa.gov/content/dam/myfaa/org/linebusiness/ato/safety/sp/vsrp/reports/VSRP-2019-Q4-Report.pdf>

In order for TCAS to work, aircraft must utilize an operating transponder capable of providing collision avoidance protection²⁰. Despite Class B airspace Mode C Veil requirements that necessitate an operable radar beacon transponder with automatic altitude reporting capability within 30 NM from LGA, Class D airspace requirements are limited to operable two-way radio only²¹.

²⁰ Federal Aviation Administration. (2021). *Introduction to TCAS II Version 7.1*.
https://www.faa.gov/documentlibrary/media/advisory_circular/tcas%20ii%20v7.1%20intro%20booklet.pdf

²¹ Federal Aviation Administration. (2021). *Controlled Airspace*. ATPUBS.
https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

The design of HPN's Class D airspace inadvertently increases the risk factors of a mid-air collision due to no VFR aircraft separation requirements²². Numerous pilots have lodged complaints of TCAS/RA events at local HPN user group meetings. However, TCAS/RA events affecting HPN arrivals are filed with N90 due to traffic conflicts occurring while being vectored by N90 controllers outside of HPN's Class D airspace where often times there are no VFR aircraft separation requirements. Data tracking TCAS/RA events for traffic landing HPN were inaccessible at the time of this staff study.

²² Federal Aviation Administration. (2021). *Controlled Airspace*. ATPUBS.

https://www.faa.gov/air_traffic/publications/atpubs/aim_html/chap3_section_2.html

ATSAP

Air Traffic Safety Action Program (ATSAP), is an integral part of a collaborative FAA and NATCA safety goal. ATSAP provides a system for ATCS and other FAA employees to voluntarily identify and report safety and operational concerns²³.

The data recorded is analyzed by safety work groups for the detection and improvement of operational deficiencies and adverse trends. ATSAP promotes a safety culture dedicated to early intervention of aviation safety hazards.

HPN ATCT reviewed numerous ATSAP reports highlighting IFR/VFR conflicts. The reports identify unsafe scenarios of IFR/VFR conflicts. Below are several statements from ATCS about the IFR/VFR conflicts in and around HPN's Class D airspace:

“The facility has done a great deal of outreach to the numerous flight schools on the field. Educating instructors and students alike on the traffic patterns inbound to HPN and the suggested/recommended routes and altitudes into the field. But with the turnover rate being so high, the problem reoccurs within no time.”

“VFR aircraft routinely fly directly at IFR traffic reported to them by ATC causing IFR/VFR conflicts. On occasion, the IFR aircraft will respond to a TCAS/RA alert.”

²³ PARTNERSHIP FOR SAFETY. (2022). <http://www.facilitysafety.org/>

“Aircraft transitioning along the shoreline has been an issue since the day I showed up to the facility. Half the time you’re talking to the transitioning aircraft and can help them navigate away from traffic inbound to the field. The other half of the time, you are issuing traffic alerts to the inbound IFR traffic. Seems simple enough until the workload on the airport prevents you from making a timely traffic alert. Something needs to be done to better control the transients around the airspace.”

“HPN does not have an overlapping TRSA to assist protecting IFR arrival and departures from VFR aircraft. However, we provide RADAR services anyway. Numerous times daily, VFR aircraft interrupt the flow of IFR air carrier and air taxi aircraft into and out of HPN.”

“The number of close calls traffic inbound to the field have been alarming. A systemic change is needed to ensure the safety of the thousands of flights in and out of the airport. The flying public deserves that at a minimum.”

Alternatives Considered

Internal Operational Measures

HPN's Class C staff study considers internal operational measures that can be modified to address the operational issue described. Modifications to internal operations will not affect the number of enplanements at HPN and the risk posed to those passengers by VFR aircraft loitering in and around HPN's Class D airspace.

Conclusion

Conclusion will be reached as a result of this process

Modification of Instrument Procedures

Current instrument procedures for RWY 16 and RWY 34 cannot be modified without conflicting with aircraft receiving vectors to and from EWR, JFK, LGA, and TEB. Modifications to current instrument procedures will not affect the number of enplanements at HPN and the risk posed to those passengers by VFR aircraft loitering in and around HPN's Class D airspace.

Conclusion

Conclusion will be reached as a result of this process

Pilot/Controller Education Programs and Aviation

Education

Pilot/Controller education programs and aviation education have no bearing on the dynamic scenarios created by the full range of aircraft types and performances from the smallest light sport to large airliner aircraft operating in and around HPN's Class D airspace. Numerous local user group meetings have engaged educational discussions between pilots and controllers for decades. Many local pilots fly in a safe manner avoiding areas of conflict between IFR and VFR aircraft. Still, the non-mandatory participation requirements of HPN's Class D provides extensive opportunities for pilots to operate unsafely in and around HPN's Class D airspace.

Conclusion

Conclusion will be reached as a result of this process

Analysis of Staffing Options and Issues

Anticipated Staffing Requirements

A Class C airspace at HPN will have no impact to staffing requirements.

Impact on Air Traffic and Air Navigation Facilities

This HPN Class C airspace staff study considered air traffic and air navigation facilities including new or modified control positions required. In addition, this HPN Class C airspace staff study considered new or relocation of existing navigational aids and/or communication equipment. There is no impact on air traffic and/or navigation facilities.

Preliminary Airspace Design

Written Descriptions

Existing Class D

HPN Class D airspace is 5 statute miles (4.34 nautical miles) in diameter, centered around HPN's ASR9. The airspace features two permanent 2 nautical mile extensions that encapsulates the final approach fix (FAF) for RWY 16 and RWY 34 instrument approaches. The airspaces vertical limits extend from the surface up to but not including 3,000' MSL.

Proposed Class C

A proposed Class C airspace will be reached as a result of this process. The preliminary starting point for Class C discussion is depicted on the following pages. Accepted Class C design standards, areas of known and/or observed IFR/VFR conflicts, and pre-existing flight paths/instrument procedures determined the boundaries and altitudes of the preliminary presentation of a possible Class C.

Airspace Depiction

Top Altitudes (see Figure 1-28)

- – Airport elevation of HPN is 439FT MSL. IFR departures climb to an altitude of 3,000FT MSL on both north and south configurations. IFR arrivals are vectored to the downwind leg descending from 4,000FT MSL. To provide 500FT of separation with these arrivals, we recommended a top altitude of 4,500FT MSL.

Bottom Altitude of outer shelf (see Figure 1-28)

- – The bottom altitude of 1,200FT MSL was calculated to provide 500FT of separation between IFR aircraft being vectored at 2,000FT MSL and all other aircraft. This altitude also allows non-participating aircraft to transition along the Hudson River and New York/Connecticut shoreline unencumbered and without being in communication with ATC.



Figure 1-28

Impacts on the Operation

The preliminary design of the Class C airspace ensures all aircraft traversing the airspace centered around HPN receive positive control from ATC. The design ensures aircraft receiving radar services are not in conflict with non-participating aircraft. It also prevents non-participating aircraft from impacting operations while safely proceeding through the area. This design decreases risk and improves safety for passengers and aviation professionals.

IFR/VFR Conflicts Due to Traffic Density and Complexity

The preliminary airspace design addresses the operational issue of safety between IFR/VFR aircraft. The airspace design segregates participating aircraft departing and/or arriving HPN and aircraft arriving LGA from non-participating aircraft. This ensures all groups within the airspace can operate safely.

Participating aircraft will be able to transition the proposed Class C airspace safely with 2-way radio communications with ATC.

The following are the existing standard IFR departure and arrival flows at HPN as described earlier in this staff study with the preliminary Class C airspace design (See Figure 1-29 and Figure 1-30).

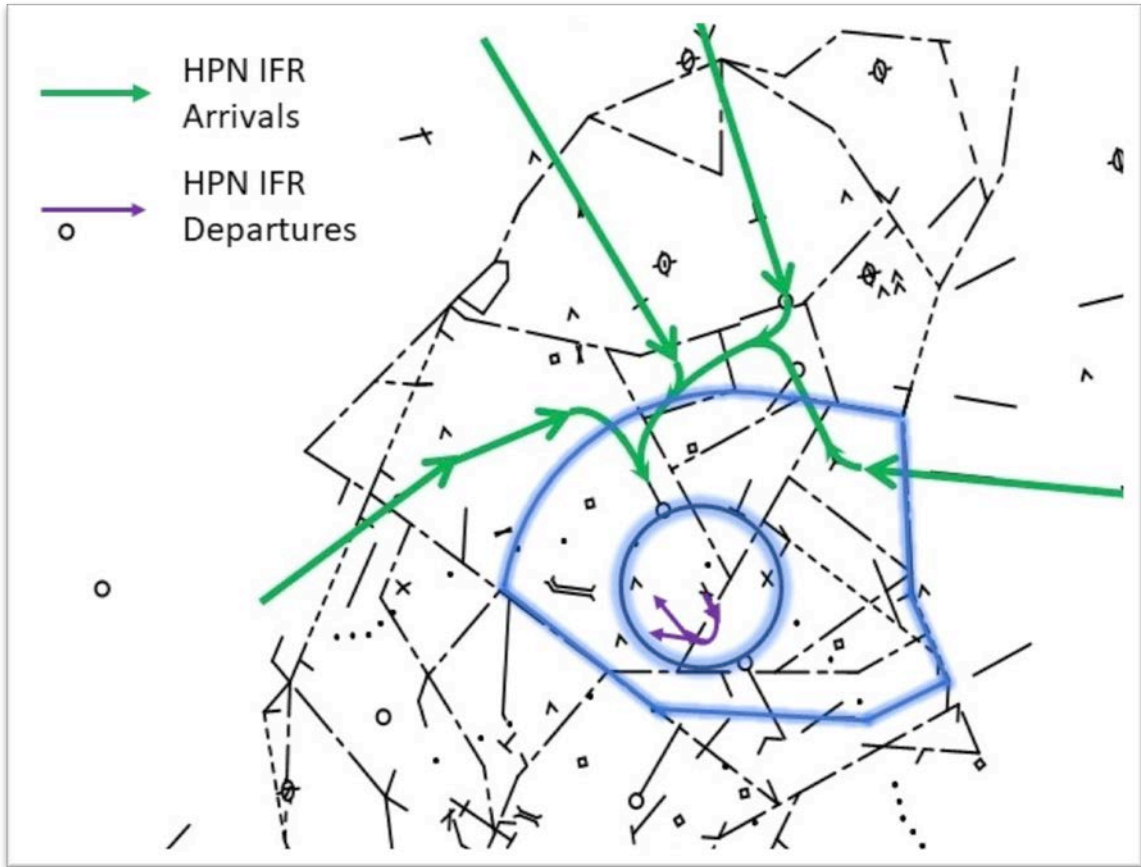


Figure 1-29

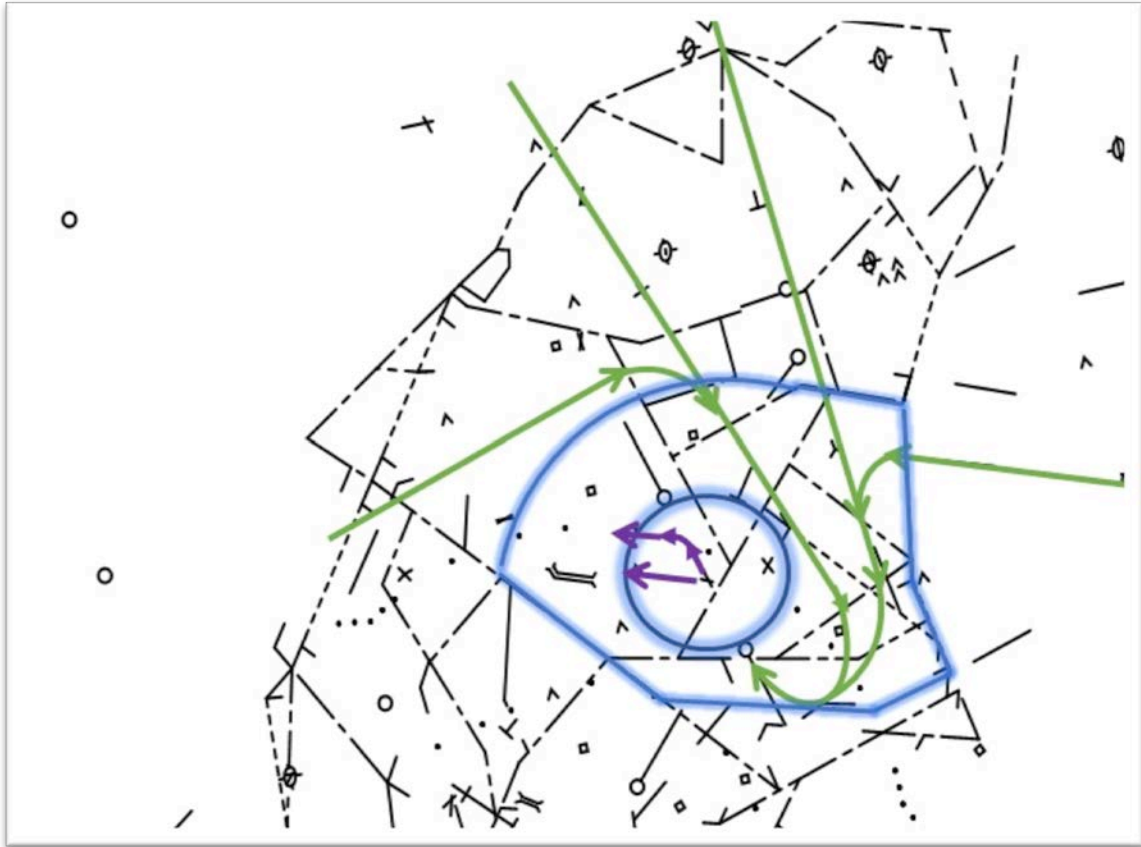


Figure 1-30

TRSA and Class D Airspace

HPN ATCT is a limited RADAR service VFR tower operating under Class D airspace. Operations at HPN are conducted in a Terminal RADAR Services AREA (TRSA) manner notwithstanding no TRSA exists above HPN's Class D airspace. Separation services for pilots operating in Class D airspace is optional.

Class C airspace functions similarly to a TRSA with the exception that Class C airspace participation is mandatory. Therefore, the proposed Class C airspace insulates participating aircraft arriving and departing HPN from non-participating aircraft operating within the vicinity around the proposed Class C airspace ensuring that both groups of aircraft can operate safely. Participating aircraft can transition the proposed Class C airspace safely in communication with ATC.

The proposed Class C airspace has no affect on the current arrival and departure procedures at HPN. The proposed design addresses the need for additional safety in the current Class D.

Impacts on Nonparticipating Aircraft

Aircraft Equipment

Non-participating aircraft must have a transponder to transition within and above Class C airspace IAW 14 CFR 91.215(b)4. This transponder requirement also applies to aircraft operating within 30nm of LGA's Class B. Aircraft without transponders would be required to fly below the outer shelf, go around the Class C, or coordinate operating within the Class C airspace with ATC.

VFR Transitions

Minor changes to routing would be required for nonparticipating aircraft.

Proposed VFR Transition Routes for Nonparticipating Aircraft below 1,200

Feet MSL. Nonparticipating aircraft may transition underneath the outer shelf of the preliminary Class C by flying below 1,200 feet MSL. Minor adjustments to their route are required to transition around the inner Class C area (See Figure 1-31). Departures from HPN can remain in Class C airspace and will climb above aircraft that remain below 1,200 feet MSL. Arrivals to HPN can remain in Class C airspace above aircraft that remain below 1,200 feet MSL.

Proposed VFR Transition Routes for Nonparticipating Aircraft between

1,200 Feet MSL and 4,500 Feet MSL. Nonparticipating aircraft may transition around the outer shelf of the preliminary Class C between 1,200 feet MSL and 4,500 feet MSL. Minor adjustments to their route are required to transition around the Class C area (See Figure 1-31). Nonparticipating aircraft transitioning the boundary of the Class C have room to accomplish their transition while remaining clear of the New York Class B airspace.

Minimal adjustments in the flight path of nonparticipating aircraft provides separation between them and participating IFR and VFR aircraft. The depiction of this proposed Class C airspace on VFR Sectional Charts should illustrate the dense concentration of air traffic in this area including high performance turbo prop and jet aircraft arriving and departing HPN and LGA.

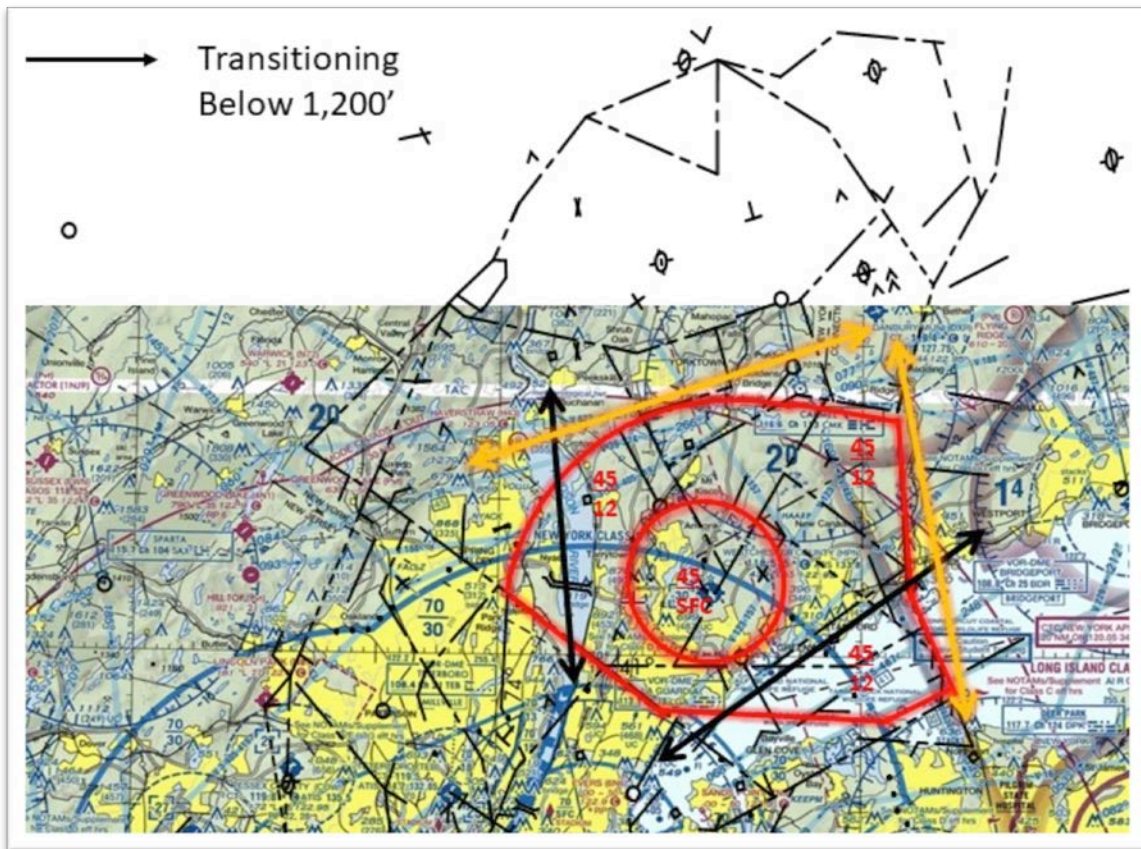


Figure 1-31

Environmental Considerations

A conclusion on environmental impacts will be reached as a result of this study.

Conclusion

The goal of this staff study is to gather comprehensive facts regarding the safety of air traffic in and around HPN and its Class D airspace. These facts, including but not limited to traffic volume, complexity, and a review of recent safety concerns, are the foundation by which we may evaluate the options available to reduce the potential risk of a midair collision, enhance safety, and maximize efficiency. Creating a Class C airspace around HPN is a very viable solution to these concerns.