

Section 2

Evaluation of the RWY 20 Departure RPZ and Potential Effects of Reducing the Useable Length of RWY 2/20 at New Smyrna Beach Municipal Airport

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International Aviation Management Group, Inc.**

July 14, 2008



Presented by Friends Of New Smyrna Beach Airport, Inc.

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I. Introduction

Friends Of New Smyrna Beach Airport Inc. (FONSBA) is aware of the New Smyrna Beach City Commission's consideration of reducing the useable length of Runway 2/20 at the New Smyrna Beach Municipal Airport. With the interest of opposing any shortening RWY 2/20, FONSBA has retained the services of Seth Young, Ph.D., to perform an independent objective analysis on the potential impacts of this decision on both the users of the airport and the surrounding community.

This brief paper reports on this analysis. The results of which refute any allegations that shortening RWY 2/20 is a necessity to be in compliance with FAA regulations, or that any runway length reduction would have no impact on the airport and its surrounding community.

Rationalization of reducing the useable length of Runway 2/20 is based on three premises:

1. The RWY 20 Departure Runway Protection Zone (RWY 20 Departure RPZ) is not depicted on some Airport Layout Plan (ALP) drawings, and requires relocation to the current RWY 2 threshold to be within FAA standards of safety.
2. Reducing the useable length of RWY 20 will have minimal impacts on safe airport operations.
3. Reducing the useable length of RWY 20 will have minimal environmental impacts on the surrounding community.

This document provides analysis and issues determinations that refute the above assumptions, and presents recommendations supporting the current full length of RWY 2/20. The analysis is supported by official documentation from the Federal Aviation Administration and figures extracted from the New Smyrna Beach Municipal Airport Master Plan.

II. Analysis

Initial analysis was performed to investigate any errors in the ALP that may imply an improper location of the RWY 20 departure RPZ. As part of this analysis, the 2005 ALP set and the FAA Airport Design Advisory Circular 150/5300-13 change 13 were referenced and representatives from the FAA Orlando Airports District Office were consulted. Based on these references it has been determined that the current useable length of RWY 2/20 at 4,001 feet is within full compliance of FAA standards. Further, there is evidence that any reduction in the useable length of this runway may have significantly increased noise impacts and risks to safety.

A. Runway 2/20 RPZ Analysis

Specifically, the RWY 20 Departure RPZ is currently and properly located 200 feet beyond the southern end of the Runway 2/20 pavement at New Smyrna Beach Municipal Airport.

One of the most recent motivations by the city to reduce the runway length of RWY 2/20 is due to recent assumptions that there are errors in the most recent (2005) update to the airport's FAA approved Airport Layout Plan (ALP). Specifically, it has been noted that the RWY 20 Departure RPZ that should be located 200 feet off the southern end of the full length of pavement of RWY 2/20 is missing from the ALP.

This omission has led to the theory that the proper location of the RWY 20 Departure RPZ should not be at the end of the full length pavement, but rather at the landing threshold of Runway 2. This relocation is urged not only to correct the omission, but also to remedy other assumed issues regarding the location of railroad tracks, as well as any requirements for the airport to own all property within the RPZ.

It has been suggested that to correct this issue "declared distances" could be assigned to RWY 20. Specifically, consideration has been given to reducing the published available distance for takeoffs and landings southbound on RWY 20 from its current length of 4,001 feet (the full length of runway pavement), to 3,216 feet. This would effectively prohibit the use of an otherwise usable 785 foot portion of the southern end of RWY 2/20 for all aircraft operations with the exception of northbound departures from RWY 2.

Figure 1 provides an illustration of the runway layout at the New Smyrna Beach Municipal Airport, as found in the Executive Summary the airport's 2005 master plan update. This figure illustrates the proper dimensions and locations of the outer most RPZs for each runway, including the RWY 20 Departure RPZ.

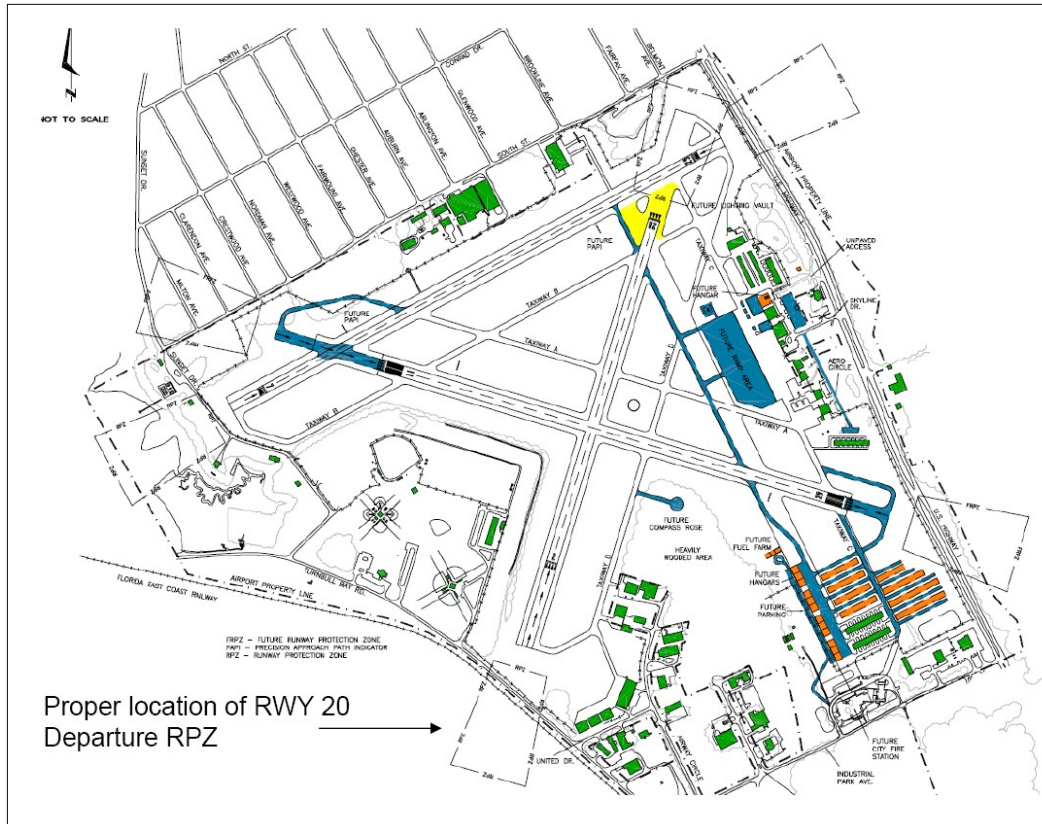


Figure 1: Location of the RWY 20 Departure RPZ as depicted in the Master Plan Executive Summary (Source: New Smyrna Beach Municipal Airport Master Plan Executive Summary, 2005)

Despite the fact that the RWY 20 Departure RPZ is erroneously omitted from other pages in the ALP, the FAA recognizes the proper location as it is illustrated in Figure 1. An e-mail from the FAA Airport District Office in Orlando, Florida, to this effect is attached in the Supporting Materials section. The key determination in this e-mail explains:

“In a recent review of the 2005 EVB Airport Layout Plan (ALP), the FAA discovered the Runway 2 departure RPZ was omitted from the plan. However, the RPZ is an imaginary surface, and although it is not shown on the ALP, it still exists based on the current use of the runway”

This determination is consistent with a variety of published sources that depict the useable length of RWY 2/20 as 4,001 feet. These sources, which include: the FAA's Airport Master Record, NOAA and Jeppesen Airport Charts, the State of Florida official Airport Directory, the AOPA Airport Directory, and the official FAA Airport Facilities Directory, are widely used by aviators for flight planning purposes. Some of these sources are included in the Supporting Materials section.

The above FAA e-mail also provides a determination that, despite any allegations to the contrary, the location of railroad tracks within the RPZ is *not* prohibited. Uses which *are* prohibited include residences and places of public assembly, including churches, schools, hospitals, office buildings, and shopping centers, because the RPZ function is to “enhance the protection of people and property on the ground” (ref: FAA Advisory Circular on Airport Design, AC 150/5300-13 §212). Relevant Excerpts from this advisory circular are provided in the Supporting Materials section.

As the RPZ is currently in its proper location, there is no need to reduce the useable area of the runway by assigning any declared distances. Furthermore, any intent to assign such distances may only be considered with a formal update of the ALP, and is subject to full scrutiny and review by the Federal Aviation Administration and the Florida Department of Transportation / Aviation Division. It should be noted that assigning of declared distances significantly affects all areas of aviation operations, including airport facilities, aircraft flight planning, and airspace management, and as such any thought of adding or modifying such distances is subject to an intense and often expensive FAA review process. Furthermore, assigning of declared distances is a highly uncommon practice for runways with a pavement length of less than 5,000 feet in length. This is due to the fact that such distances are generally inapplicable to small aircraft, such as those in use at New Smyrna Beach Municipal airport.

B. Environmental / Safety Analysis

Regardless of necessity, one premise associated with the arbitrary decision to reduce the effective length of RWY 2/20 is that such a decision would have minimal impacts on either airport operations or the surrounding community. To the contrary, based on an analysis of operational activity at the airport and FAA published procedures and guidelines, **any reduction in the useable length of RWY 20 may have significant negative impacts on all operations as well as the local community from an environmental and safety perspective.**

C. Air Traffic Control Inefficiencies

According to air traffic control estimates, the airport accommodates approximately 170,000 operations by a variety of fixed wing aircraft on an annual basis. Depending on prevailing wind conditions, the runways at the airport are operated in an “east-flow” or “west-flow” operation.

As illustrated on Figure 2, during east-flow operations, RWY 7 is used primarily for training aircraft flying a left-hand pattern, runway 11 is used for itinerant departures, and runway 2 is used for itinerant arrivals.

Preferred East Flow Operations: New Smyrna Beach Municipal Airport

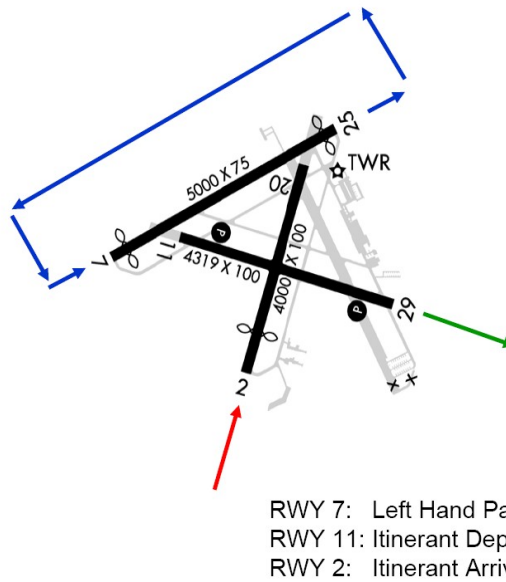


Figure 2: East Flow Operations, New Smyrna Beach Municipal Airport.

As illustrated on Figure 3, during west-flow operations, runway 25 is used for training aircraft flying a right-hand pattern, runway 29 is used for itinerant arrivals and runway 20 is used for itinerant arrivals. East-flow and west-flow operations each occur 50% of an annual operating year, depending on wind conditions.

Preferred West Flow Operations: New Smyrna Beach Municipal Airport

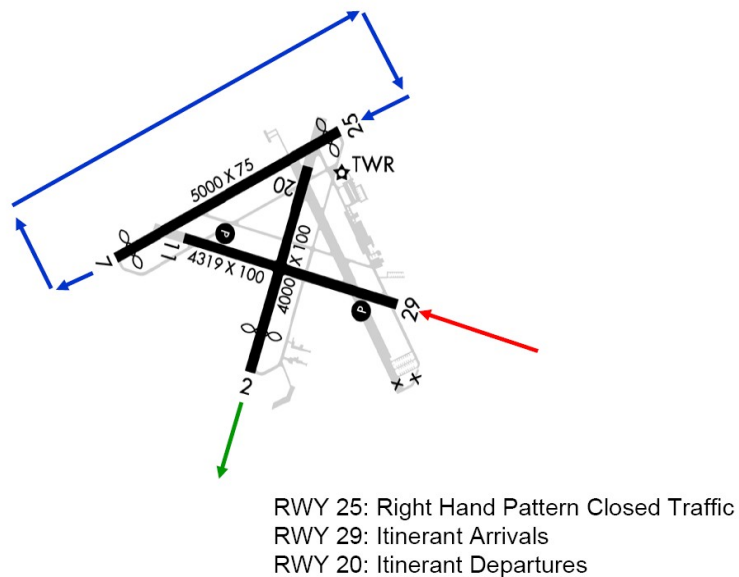


Figure 3: West Flow Operations, New Smyrna Beach Municipal Airport

For both east-flow and west flow operations, RWY 2-20 is used for approximately 30% of these operations. About 15%, or approximately 25,000 annual operations, operate over the southern end of RWY 2/20 and an additional 5% or 5,000 annual operations require clear areas beyond the southern end of the runway in case of emergencies. Each of these operations requires a sufficient runway length and safety area off the southern end of the runway.

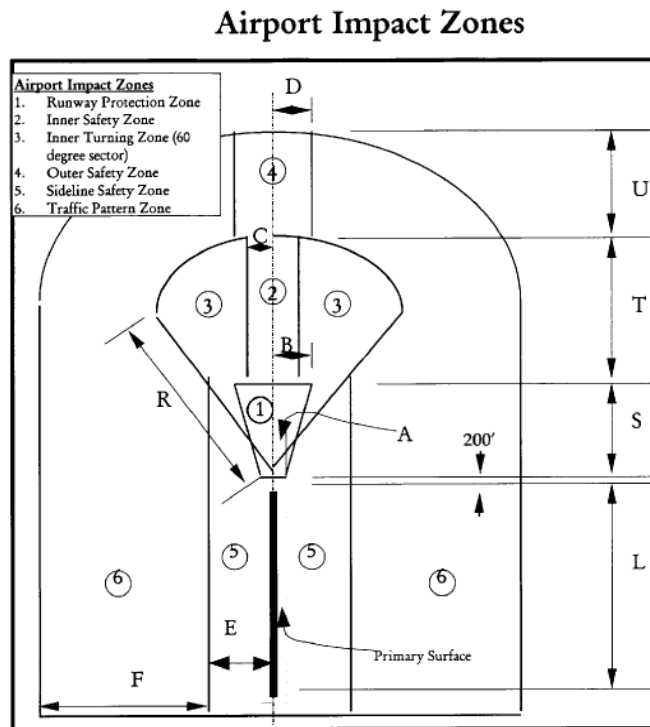
There are a number of situations where the full length of pavement and associated clear areas within the vicinity of the southern end of the airfield are critical, particularly when operating on Runway 20, including:

1. Normal Departures
2. Departures with engine failure
3. Aborted departures due to engine failure
4. Missed Approaches
5. Long Landings
6. Brake Failures upon landing

While a reduction in the effective length of Runway 20 from 4,001 to 3,216 feet will not physically preclude these operations for the majority of aircraft operating at New Smyrna Beach Municipal Airport, aircraft discouraged from using RWY 2/20 will lead to inefficiencies in operations from an air traffic control perspective. In addition, reducing the runway's effective length may have serious safety consequences associated with these operations, particularly if areas off the end of the reduced runway are developed.

D. Safety and Noise Impacts

As described in its publication, Land Use Compatibility and Airports, The FAA Southern Region identifies a series of “Airport Impact Zones”. As illustrated in Figure 4, these Zones provide guidance to communities with recommendations for compatible land uses around the immediate vicinity of an airport runway. Development of medium to high residential or commercial development is discouraged within these zones, and is recommended to be prohibited in Zones 1, 2, and 5. Reducing the published length of RWY 20 could encourage development close to the runway end, and could subject any proposed development to additional safety risks, and to aircraft as well as the development itself. Also, any development located south of RWY 20, in such a close proximity will most certainly be subject to noise impacts of aircraft that will continue to operate on the runway.



Airport Impact Zone Dimension (in Feet)

| Dimension | Runway Length Category (L) | | |
|----------------|----------------------------|-----------------------|----------------------|
| | Runway less than 4,000 | Runway 4,000 to 5,999 | Runway 6,000 or more |
| A | 125 | 250 | 500 |
| B | 225 | 505 | 875 |
| C | 225 | 500 | 500 |
| D | 225 | 500 | 500 |
| E | 500 | 1,000 | 1,000 |
| F | 4,000 | 5,000 | 5,000 |
| R (60° Sector) | 2,500 | 4,500 | 5,000 |
| S | 1,000 | 1,700 | 2,500 |
| T | 1,500 | 2,800 | 2,500 |
| U | 2,500 | 3,000 | 5,000 |

Figure 4: Airport Impact Zones

E. Effect of RWY 2 Instrument Approaches

The FAA has recently approved a GPS-based instrument approach to RWY 2, which allows aircraft to descend to less than 350 feet above the ground prior to achieving visual contact with the runway environment. A copy of this published procedure is illustrated in Figure 5. While this approach has been determined to be both safe and have minimal impacts over the current land use south of the runway, any development encouraged immediately south of the runway would carry increased safety risks and environmental impacts of low flying aircraft, particularly during inclement weather (IFR) conditions.

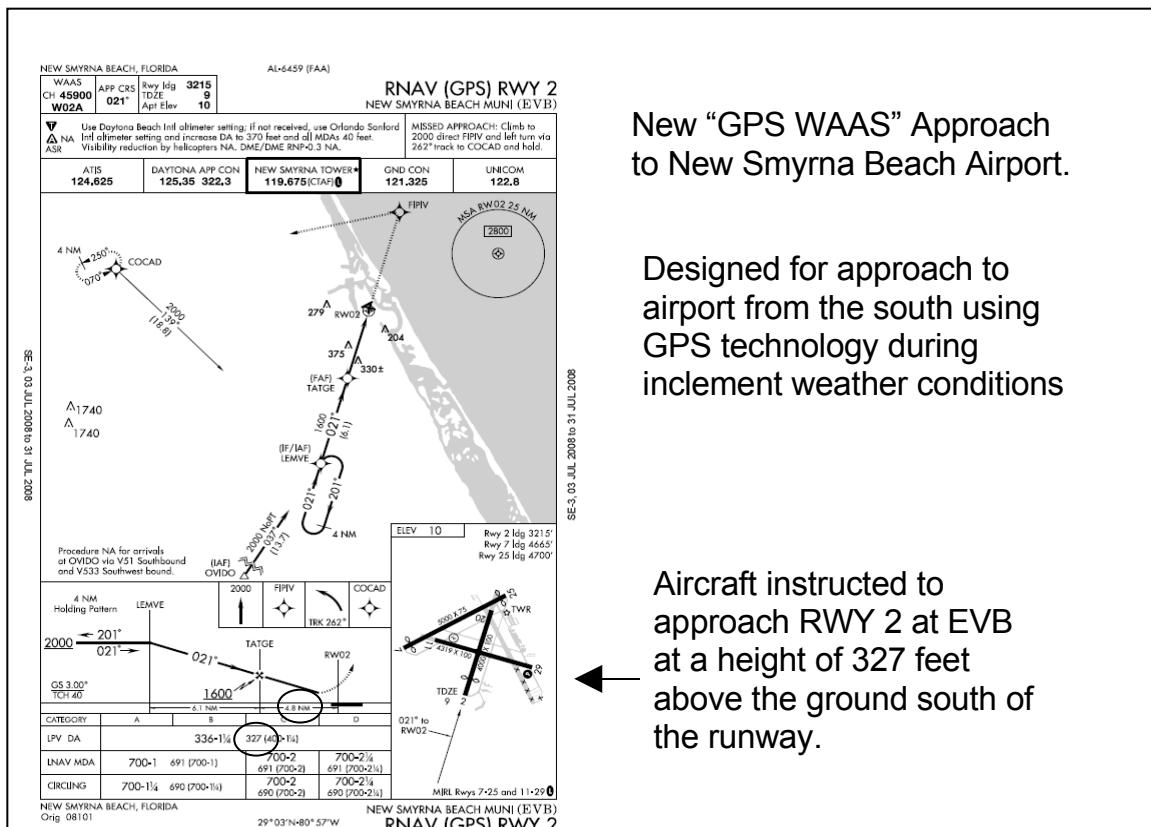


Figure 5: RNAV GPS RWY2 Approach to New Smyrna Beach Municipal Airport

F. Cross-Wind Runway Considerations

Under IFR Conditions, when weather is inclement, often combined with relatively strong wind conditions, RWY 2/20 in fact becomes a critical runway for nearly 10% of all operations, as illustrated on the IFR Weather Wind Rose, published on the 2005 New Smyrna Beach ALP and illustrated in Figure 6.

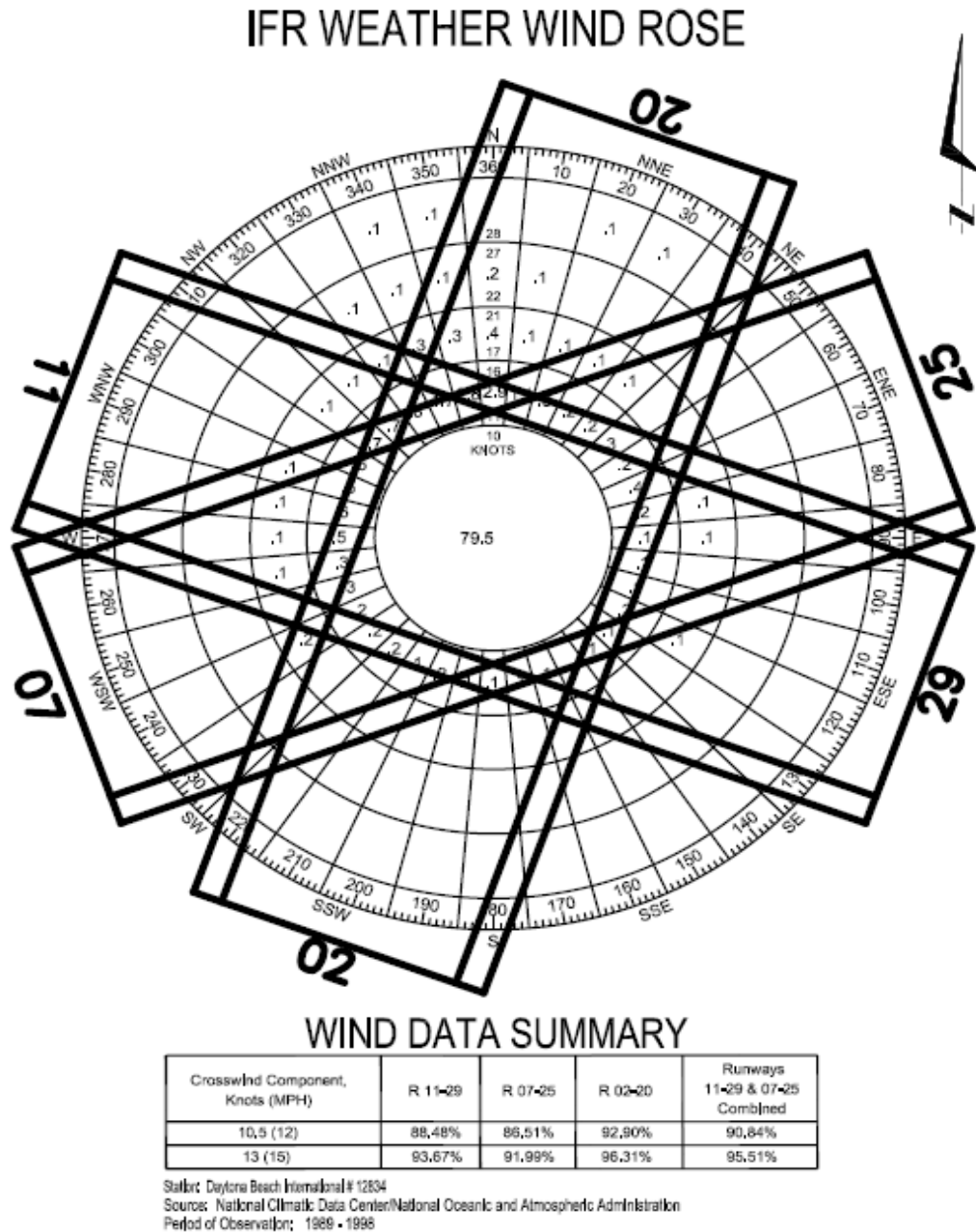


Figure 6: IFR Wind Rose, New Smyrna Beach Municipal Airport: Shaded areas indicate wind-critical runway use of RWY 2/20.

G. Loss of Runway for Larger Aircraft; Increased East-West Noise

Finally, a small percentage of the operations that currently use Runway 20 will be precluded from operating on this runway if the useable length of RWY 20 is reduced. This small percentage are those aircraft that require at least 3,500 – 4,000 feet of pavement for safe operations, operated by multiple tenants at the New Smyrna Beach Airport, Vintage Props & Jets, American Aero and Higginbotham Management Company.

Vintage Props & Jets has a history of operating a fleet of Beechcraft King-Air and 1900 series turboprop aircraft, and Higginbotham operates a Cessna Citation XLS jet. Several times a year historic aircraft such as the tailwheel B-17 Flying Fortress, and B-24 and B-25 bombers, fly in to American Aero for maintenance. Under certain wind conditions, shortening RWY 2/20 would prevent these aircraft from landing at New Smyrna Beach airport at all.

In addition, a reduction in the useable length of Runway 20 will encourage other aircraft to use the other runways, often in unfavorable wind conditions, particularly for training purposes.

As illustrated in Figure 7, these aircraft would operate on Runways 07-25 and 11-29 in a westerly direction. This would result in jet and turbo-prop departures over currently developed residential land-uses to the south and west of the airport, and an overall increase in single engine and light multi-engine training aircraft in the immediate vicinity of the airport, particularly those operating in the local runway patterns. As a result, those aircraft that would move their operations from RWY 20 to RWY 29 and 25, will also move their noise over the most noise sensitive areas of the community.

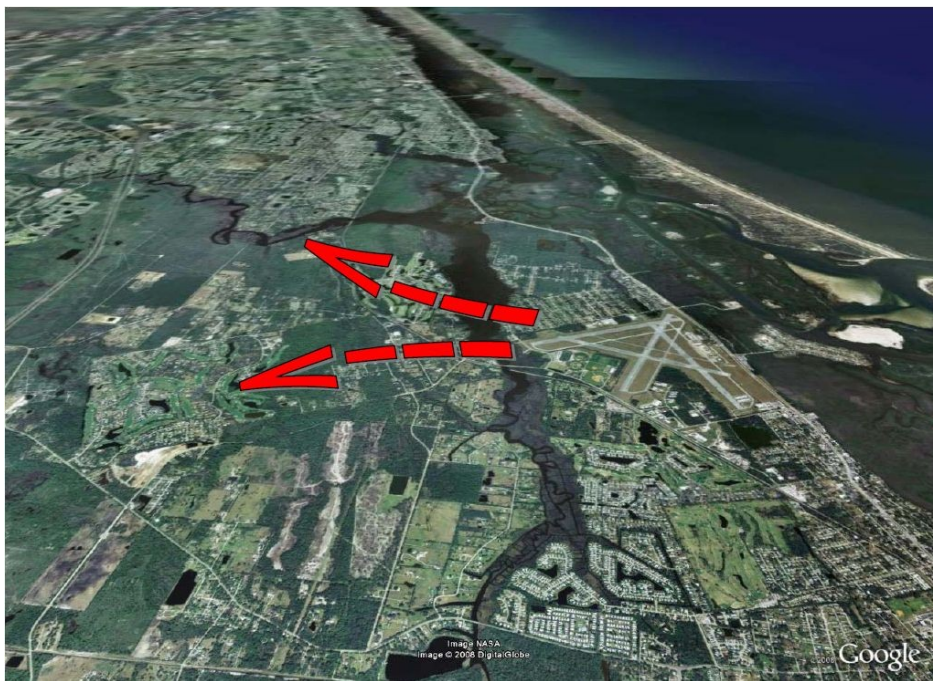


Figure 7: Visualization of increased turbo-prop and Jet traffic flight tracks as a result of a proposed reduction in useable length of Runway 20, New Smyrna Beach Municipal Airport.

Based on this analysis, it is evident that **the current full length of RWY 20 for departures is a critical factor in preserving a balance of noise impacts to the community.**

H. Part 150 Noise Study

The city of New Smyrna Beach has recently authorized and appropriated funds to perform a noise impact study in accordance with FAA Regulation Part 150 – “Airport Noise Compatibility Planning”. It is strongly recommended that any considerations with respect to the current and proposed future runway infrastructure be included for complete analysis as part of the FAA Part 150 study before any changes to runway utilizations be further discussed, and that **and no modifications to its useable length of RWY 2/20 should be considered prior to a complete FAR Part 150 noise study.**

III. Conclusion

In summary, based on the above analysis of regulatory and operational conditions at the New Smyrna Beach Municipal Airport, it may be determined that:

1. **The current length of RWY 2/20 at 4,001 feet and its associated RWY 20 Departure RPZ is in full compliance with FAA design standards and no modifications to the runway, including the consideration of declared distances, is either necessary or recommended.**
2. **Any reductions in the useable length of RWY 2/20 may have significant safety and environmental noise impacts on both the users of the airport and the surrounding community.**
3. **Consideration of any runway length modification to the airfield at the New Smyrna Beach airport should only be made upon conclusion of the currently authorized FAR Part 150 Noise Impact Study.**

It is hoped that this analysis assists the city of New Smyrna Beach in determining the best alternatives for their airport and the citizens of their community.