

SOUTHWEST FLORIDA INTERNATIONAL AIRPORT

Noise Compatibility Program Post Study Update and Status of FAA Initiatives

Prepared for
Lee County Port Authority

October 2014



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Post Study Update and Status of FAA Initiatives

**Prepared for
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November 2014



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SOUTHWEST FLORIDA INTERNATIONAL AIRPORT

Noise Compatibility Program - Post Study Update and Status of FAA Initiatives

1.0 Introduction

In 2011, the Lee County Port Authority (LCPA) began an update to the 2006 14 Code of Federal Regulations (CFR) Part 150 Noise and Land Use Compatibility study for Southwest Florida International Airport (RSW). The 14 CFR Part 150 study process is the only formal process available to an airport sponsor to address noise and land use compatibility concerns between an airport and the surrounding community. The process is voluntary in nature, but codified in federal regulations (CFR Title 14, Part 150). Changes that occurred since the completion of the previous study include:

- FAA implementation of the Florida West Coast Airspace Redesign or FLOWCAR.
- Opening of the midfield terminal complex and introduction of air carrier service by Southwest Airlines.
- Changes in aircraft operational levels, forecast activity and fleet mix.
- Modification and adjustments to arrival and departure procedures.
- Implementation of new technology and resulting operational procedures.
- Implementation of PASSUR™ based financial management system which provides improved aircraft fleet tracking/accuracy.
- New concerns raised by communities including those along the Estero corridor, Fort Myers Beach and the Forest.
- Lee County Comprehensive Plan policy that requires update of the noise exposure conditions around the airport every five years.

Throughout the course of the study, numerous workshops and meetings were held with key stakeholders including concerned citizens and the FAA. The two phase study first evaluated aircraft noise exposure through development of Noise Exposure Maps (NEMs) then evaluated measures to improve land use compatibility through development of a Noise Compatibility Program (NCP). The FAA officially accepted the updated NEMs in November 2012. A public hearing on the NCP was held in January 2013 and the FAA issued its formal Record of Approval (ROA) in April 2014. The goal of this technical memorandum is to summarize each measure recommended in the NCP, the resulting FAA determination, the current status of implementing

NCP and other mitigating measures by the FAA independently outside (but as a result of) the formal Part 150 process, and documenting the next steps and time lines for possible implementation. For those measures already implemented, attempts are made to either quantitatively or qualitatively identify the net benefit provided.

2.0 Part 150 Noise Exposure Maps Overview

In 14 CFR Part 150, the FAA required primary metric for assessing aircraft noise exposure is the Day-Night Average Sound Level (DNL). The DNL combines the noise energy from all aircraft operations occurring from the events in one day into an average, while applying a penalty to nighttime events, between the hours of 10:00 pm and 6:59 am, when people are more sensitive to sound. The standard methodology for analyzing the noise conditions at airports involves the use of an aircraft noise model to determine noise exposure. The FAA has approved the Integrated Noise Model (INM) for use in 14 CFR Part 150 Studies. In order to develop DNL noise contours, the INM uses a series of input factors. Some of these factors are included in the database for the model (such as engine noise levels, thrust settings, aircraft profiles and aircraft speeds) and others are airport-specific and need to be determined for each condition analyzed. These airport-specific data include the airport elevation, average annual temperature, runway layout, the mathematical description of ground tracks above which aircraft fly, and the assignment of specific aircraft with specific engine types at specific takeoff weights to individual flight tracks. Other INM input factors specific to RSW include:

- Runway orientation and use
- Existing 2011/2012 aircraft operations and fleet mix
- Future 2017 aircraft operations and fleet mix
- Time of day/night operations
- Stage lengths of aircraft (flight distance)

DNL levels are indicated by a series of contour lines superimposed on a map of the airport and off-airport environs. These levels are calculated for designated grid points on the ground from the weighted summation of the effects of all aircraft operations occurring on the average 24-hour day. Some operations are far enough away from a grid point location that their effect is minimal, while other operations may dominate noise exposure at that location. The RSW 2012 and 2017 NEMs were formally accepted by the FAA on November 27th, 2012.

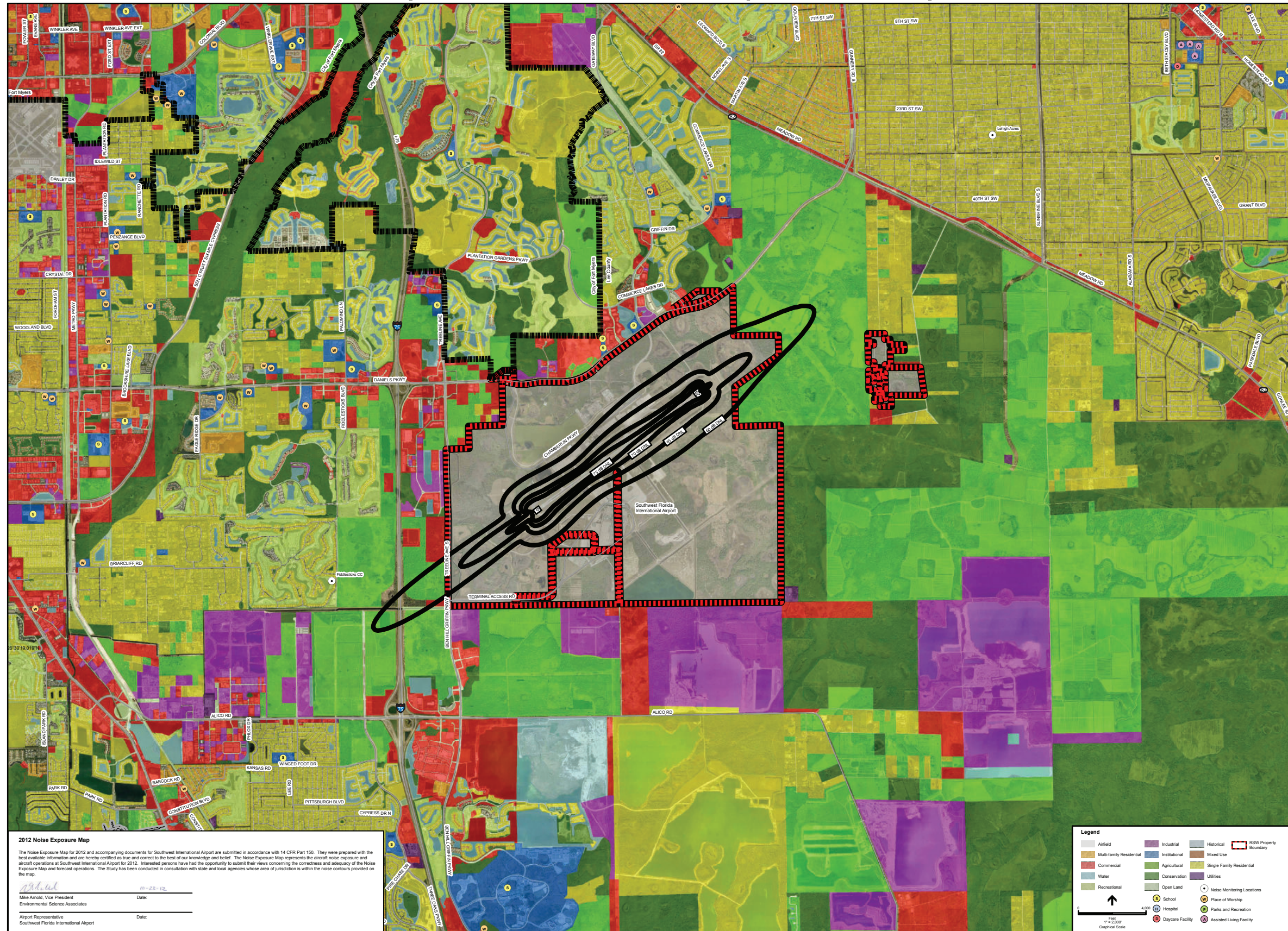
The FAA defines noise sensitive sites as uses within the 65 DNL that would be incompatible with aircraft noise without the proper Noise Level Reduction (NLR). Such sites would include residences, schools, places of worship, hospitals, passive parks, historic properties and other uses that could be adversely affected by aircraft noise. Outside the 65 DNL contour, all land uses are considered compatible with aircraft activities. Since the 65 DNL limits remain on Airport property for both the 2012 and 2017 conditions, no population or noise sensitive sites are located within the 65 DNL or higher for 2012 or 2017 (see **Figures 1 and 2**).

For the purposes of long term land use planning, Lee County has adopted overlay zoning that extends to the 60 and 55 DNL contour limits. Specifically, no noise sensitive uses are allowed in the 60 DNL contour and a notification area is identified for noise sensitive uses within the 55 DNL contour. As with the 65 DNL contour, no population or noise sensitive sites are located within the 60 and greater DNL contours for 2012 or 2017.

While there are no impacts to noise sensitive uses within the highest noise areas, the LCPA Board/Board of County Commissioners (BCC) recognizes that there are still community concerns and annoyance associated with the operation of the Airport. As a result the LCPA committed to using the 14 CFR Part 150 process to explore potential operational modifications, update its existing long term land use compatibility measures, and explore management measures to enhance its near term and long term relationship with the surrounding communities.

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Map A - 2012 Noise Exposure Map



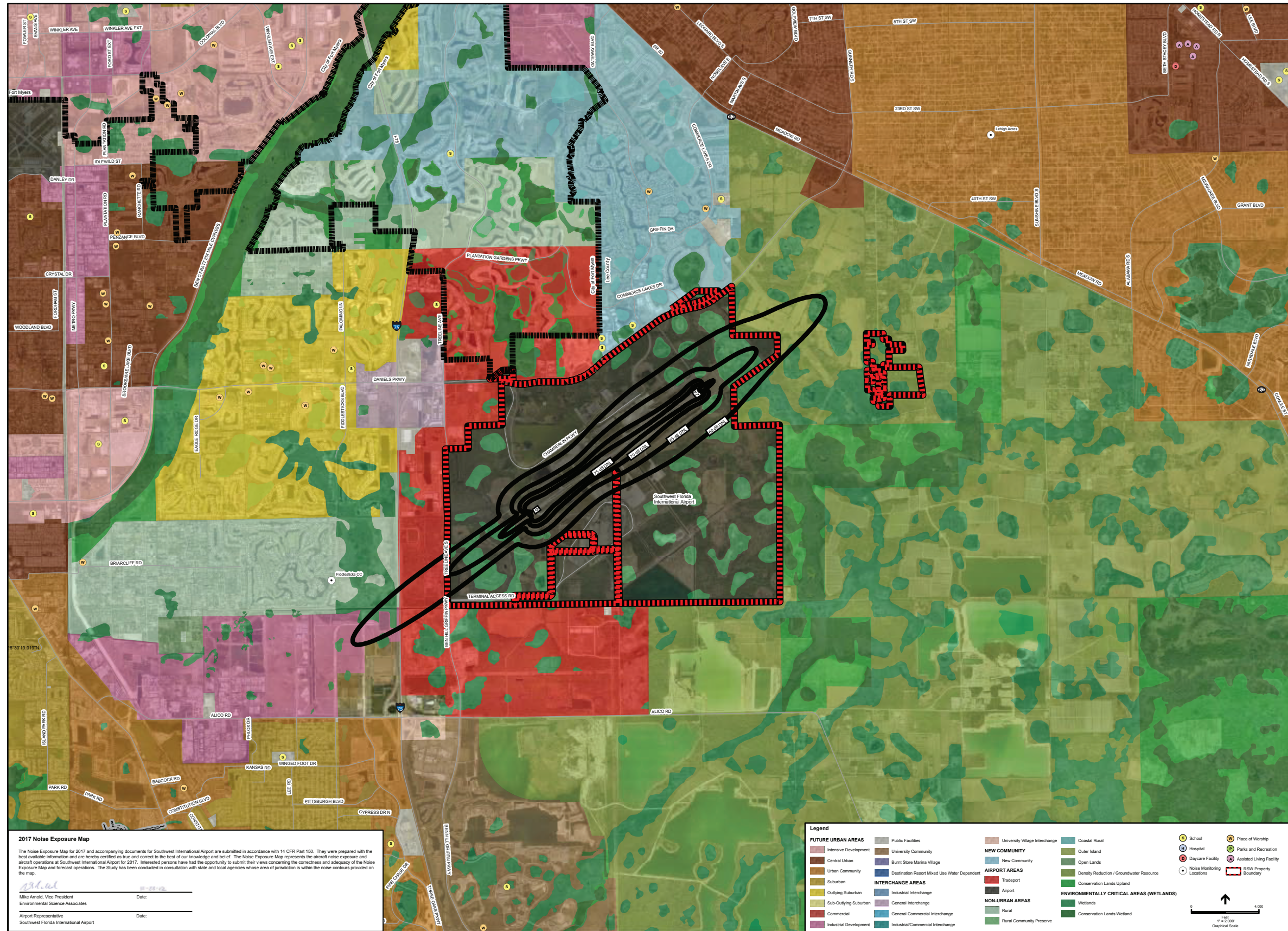
SOURCE: ESA Airports, 2012; INM 7.0c; Lee County GIS Department

Southwest Florida International Airport NCP Implementation Technical Memorandum .210140

Figure 1
 Map A - 2012 Noise Exposure Map

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Map B - 2017 Noise Exposure Map



SOURCE: ESA Airports, 2012; INM 7.0c; Lee County GIS Department

Southwest Florida International Airport NCP Implementation Technical Memorandum .210140

Figure 2
Map B - 2017 Noise Exposure Map

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3.0 Noise Compatibility Program Overview

The purpose of 14 CFR Part 150 Study is to reduce or eliminate noise-sensitive land uses within the 65 dB DNL contour. Traditionally, 14 CFR Part 150 Studies use the DNL metric for evaluating measures in the Noise Compatibility Program (NCP) portion of the Study. Since noise-sensitive land uses do not exist within the existing (2012) or future (2017) 65 dB DNL contours, the NCP portion of the Study focuses on measures that will reduce noise levels to local communities whom receive the bulk of aircraft overflights and have the greatest potential for annoyance. Measures evaluated include those that are not approvable for the purposes of Part 150 (reduction in impacts within the 65 dB DNL contour cannot be demonstrated), but can be implemented voluntarily at the local level subject to the discretion of the FAA ATC.

Evaluation of NCP measures for RSW adhered to the following criteria:

- Develop a balanced and cost effective program for reducing noise without limiting airport utility, aviation efficiency, or adversely affecting safety.
- Improve the overall noise environment, while not shifting noise from one community to another.
- NCP measures must be technically and legally feasible, and approved by the FAA (flight procedures) and local governments (land use measures).
- Measures subject to FAR Part 161 evaluation will not be part of the Study recommendations.

On April 7, 2014 the FAA issued its ROA, as shown in **Appendix A**, which formally approved 5 of the 16 proposed action measures as follows:

- All 10 of the operational measures were disapproved for the purposes of Part 150. Since there are no incompatible land uses within the 65 dB DNL contour, noise benefits related to the 65 dB DNL contour cannot be demonstrated. These measures can be pursued on a voluntary basis subject to the discretion of local air traffic control (ATC).
- The single land use measure was disapproved for the purposes of Part 150. The land use measure uses a long term composite contour representing the existing single runway operating at 85 percent capacity combined with a future two runway configuration operating at 2030 activity levels. While composite contours are useful in land use planning, their use is no longer being approved for the purposes of Part 150.
- All 5 of the program management measures were approved

As of August 2014, 11 of the 16 measures recommended in the NCP have already been either partially or fully implemented by the FAA and/or the LCPA. The disposition of each measure is summarized in **Table 1**.

For each of the operational, land use and program management measures included in the NCP, a more detailed description highlighting the intent of the measure, the current disposition, benefits already achieved and next steps is provided in the following sections.

TABLE 1
NCP DISPOSITION SUMMARY
SOUTHWEST FLORIDA INTERNATIONAL AIRPORT

NCP Measure	FAA Determination	Implementation Status
<u>Operational</u>		
OP-1 Promote Use of RNAV Visual Optimized Profile Descent to Runway 06	Disapproved for purposes of Part 150	Implemented
OP-2 Explore Feasibility of Initiating RNAV Optimized Profile Descent Further From the Airport	Disapproved for purposes of Part 150	Not Yet Implemented Feasibility Pending National Testing
OP-3 Explore Feasibility of Raising the Downwind Altitude to Runway 06	Disapproved for purposes of Part 150	Feasibility Coordination Implemented Not Feasible based on review with FAA
OP-4 Shift Downwind Flight Track to the South	Disapproved for purposes of Part 150	To be Implemented Concurrent with Future Parallel Runway
OP-5 Publish Charted Visual Approach to Runway 6 from the North and South	Disapproved for purposes of Part 150	Implemented – Updated Procedure published October 16, 2014
OP-6 Keep Aircraft at 3,000 Ft. Over Ft. Myers Beach	Disapproved for purposes of Part 150	Implemented – New procedure published May 2, 2013, verbal directives issued mid 2013
OP-7 Delay Point at which Aircraft Lower their Landing Gear	Disapproved for purposes of Part 150	Not Yet Implemented
OP-8 Increase Altitude for Early Morning Arrivals	Disapproved for purposes of Part 150	Partially Implemented – RSW ATC coordinated with Miami Center in early 2014
OP-9 Change Runway 24 to Preferred Runway From 10:00 PM – 6:00 AM	Disapproved for purposes of Part 150	Partially Implemented – Tower began promoting with controllers on August 1, 2013
OP-10 Modify CSHEL FOUR Departure Procedure	Disapproved for purposes of Part 150	Partially Implemented
<u>Land Use Measures</u>		
LU-1 Update Noise Overlay Zones	Disapproved for purposes of Part 150	In Process - Overlay Implementation Study Conducted
<u>Program Management</u>		
PM-1 Noise Compatibility Program Management	Approved	Implemented
PM-2 Update Noise Program as Mandated by Lee Plan	Approved	Implemented
PM-3 Noise Forums with RSW Air Traffic Controllers	Approved	Implemented
PM-4 Develop a Jeppesen Insert on Noise Abatement Program at RSW	Approved	Not Yet Implemented
PM-5 Install Runway End Reminder Signs	Approved	Not Yet Implemented

3.1 Operational Measures

OP-1. Promote Use of RNAV Visual Optimized Profile Descent (OPD) to Runway 06

Description: Recent advancements in technology and flight procedures that combine the precision of instrument navigation with visual references allow aircraft to approach the airport in a constant descent while also flying a precise path over more compatible land uses. During completion of this Study, an RNAV Visual Optimized Profile Descent (OPD) to Runway 06 was introduced by the FAA and Southwest Airlines. RSW's RNAV Visual OPD to Runway 06 routes aircraft off of the SHFTY TWO RNAV Arrival and the TYNEE ONE RNAV Arrival over the back bay waters to the east of Fort Myers Beach as shown in **Figure 3**.

Benefits: This procedure reduces overflights of populated areas including Fort Myers Beach and reduces thrust setting when overflying communities such as Estero. It also shortens aircraft flight paths and increases the fuel efficiency by maintaining a continuous descent (idle) approach.

FAA's Record of Approval Decision: "Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure's noise benefits on the DNL 65 dB contour." This measure can be pursued at the local level on a voluntary basis subject to the discretion of local air traffic control.

Current Disposition: Implemented with limited success. This procedure was published November 11, 2011 and actively promoted with airlines by the FAA on August 20, 2012. Currently, four airlines have been certified to fly the approach including Southwest Airlines/AirTran Airways, Delta Air Lines, JetBlue Airways, and US Airways. There have been a number of challenges in implementing this procedure. This special procedure was originally only available if requested by a pilot. In efforts to increase its use, the availability of the procedure was advertised by ATC on the Automatic Terminal Information Service (ATIS). This resulted in approximately 4-5 aircraft using this approach per day. The ATC staff was then allowed to assign this procedure but required the controllers to know if the aircraft and the pilot were certified to fly the approach. This also had limited success. Pilots will now be required to request the procedure and it will again be advertised on the ATIS as available.

Effectiveness: **Figure 4** identifies the track locations and aircraft altitudes for the published procedure based on FAA tests. This special procedure requires airline certification, pilot and controller training and properly equipped aircraft and must be requested by the pilot. While there has been considerable interest from both the ATC and airlines in using this approach, it is not yet widely used. Aircraft that are not capable of flying the approach typically fly the entire SHFTY TWO or TYNEE ONE arrival procedures out over Fort Myers Beach. This in turn creates spacing issues with aircraft that can fly the approach which reduces the amount of time it can be used.

As more airlines actively use the approach, ATC becomes more experienced and other procedures (see OP-5) are implemented that allow all pilots and aircraft to fly the same routing, use of this procedure is expected to increase. Utilization of this procedure will be limited during busy periods, when the sequencing of aircraft from both the north and south arrival streams requires aircraft to fly extended final approach paths to ensure adequate separation. This measure should

become more prevalent over the next 12-36 months and is contingent on controller training, airline certification, and pilot proficiency.

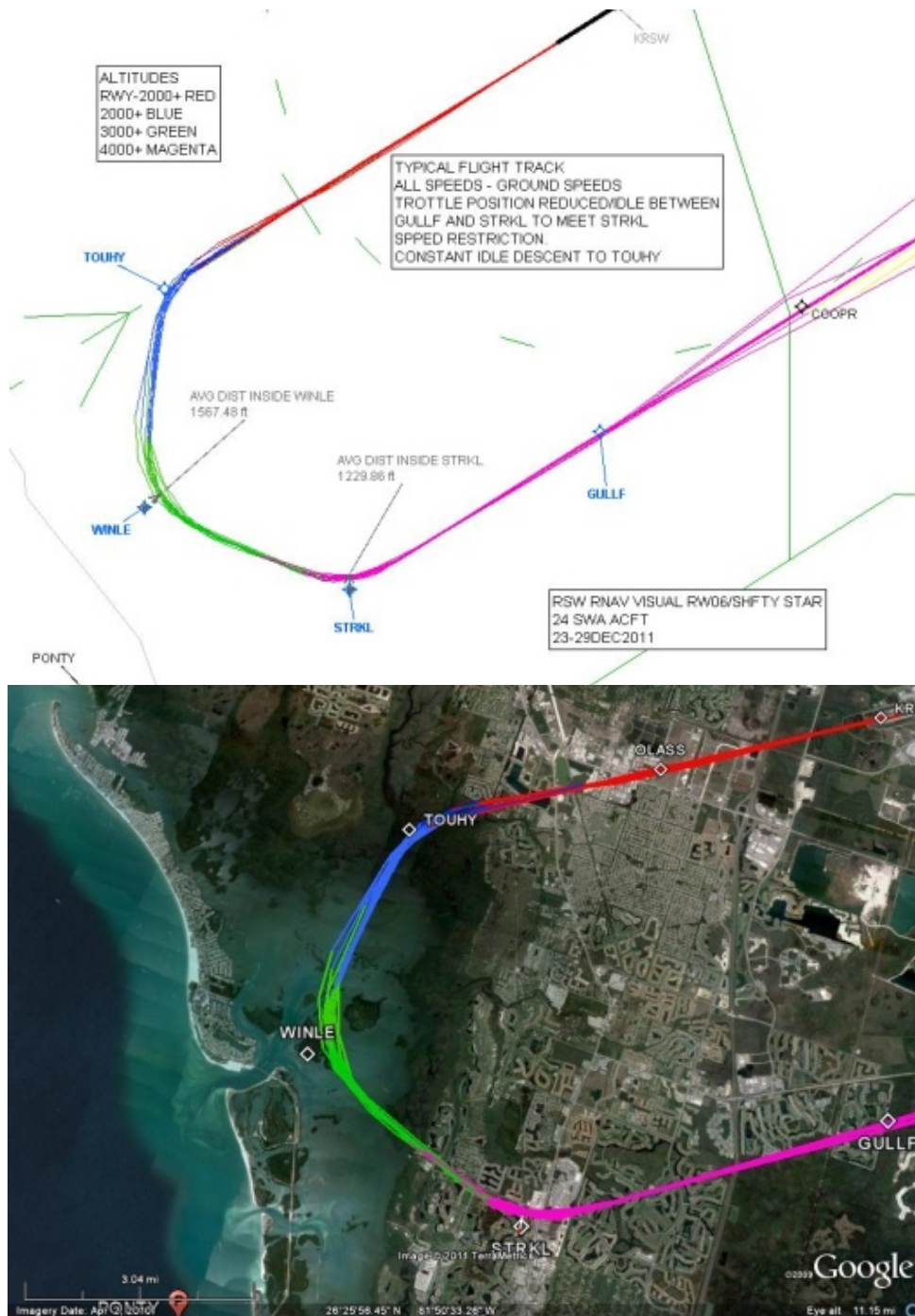
Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC, the pilot in command and the airlines.

Next Steps and Timeline: The LCPA should continue to work with ATCT to promote to airlines and pilots.

FIGURE 3
RNAV VISUAL OPTIMIZED PROFILE DESCENT



**FIGURE 4
AIRCRAFT TRACKS AND ALTITUDES RNAV VISUAL OPD**



Source: FAA

OP-2. Initiate RNAV Optimized Profile Descent Further From the Airport

Description: This measure builds on measure OP-1 related to the use of RNAV Visual OPD approaches. The FAA is currently testing procedures that result in operational and noise benefits further from the airport and begin at higher altitudes. Currently aircraft level-off over communities on the south downwind approach over Estero. This leveling off requires the pilots to add thrust which generates more noise. By initiating RNAV OPD and/or constant descent approaches at RSW at a greater distance from the airport, greater benefits can be achieved from the new technology. This measure recommends monitoring the progress of FAA testing and evaluating the feasibility of implementing the initiation of RNAV OPD procedures further from the airport.

Benefits: This procedure reduces thrust setting when overflying communities such as Estero. It also increases the fuel efficiency by maintaining a continuous descent (idle) approach from a much higher altitude much further from the airport. This increased fuel efficiency provides even more of an incentive of airlines to use and promote the use of these procedures.

FAA's Record of Approval Decision: "Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure's noise benefits on the DNL 65 dB contour." This measure can be pursued at the local level on a voluntary basis subject to the discretion of local air traffic control.

Current Disposition: Not yet implemented. As part of the FAA's NextGen program, a major goal is to sequence the enroute phase of flight with the arrival and landing phase so that aircraft perform arrivals and approaches in a continuous descent to the airport. Implementation of OPD arrivals connecting the enroute phase of flight to the arrival phase is still being evaluated by the FAA.

Effectiveness: To be determined. Progress and feasibility will depend on FAA, but it is estimated that OPD arrivals will be common throughout the country in the 2020 – 2025 timeframe when NextGen is fully implemented.

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Timeline: The LCPA should review progress with the FAA annually.

OP-3. Raise the Downwind to Runway 06

Description: A new RNAV arrival procedure to Runway 06 that was implemented as part of FLOWCAR resulted in a considerable increase in the volume of overflights experienced by residential areas south of the airport. The new routing concentrates flights to a very narrow path over communities in the Estero area, known as the Estero Corridor, that previously (prior to FLOWCAR) only occasionally experienced overflights. Concurrent with the initiation of the study, the altitude of the downwind approach was raised from 3,000 ft. to 4,000 ft. The purpose of this measure is to evaluate the feasibility of increasing the altitude from 4,000 ft. to 5,000 ft. and if determined feasible, proceed with implementation.

Benefits: An increase in the altitude of the south downwind approach to 5,000 ft. over the Estero Corridor results in an estimated reduction in noise ranging between 1.9 and 2.5 decibels according to the INM. Generally, a 3-5 decibel change is required to be noticeable in the community so the noise benefit of this change would be limited.

FAA's Record of Approval: "Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure's noise benefits on the DNL 65 dB contour." This measure can be pursued at the local level on a voluntary basis subject to the discretion of local ATC.

Current Disposition: Feasibility evaluation implemented. Based on discussions with the FAA, this measure is not currently feasible. Specifically, FAA concerns were raised related to the sequencing of aircraft, the 4,000 ft. MSL Class C airspace ceiling and jet departures from Naples airport (APF) that overfly the downwind at 5,000 ft. MSL.

Effectiveness: N/A

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Timeline: No further action by the LCPA is anticipated at this time.

OP-4. Shift Downwind Flight Track to the South

Description: This measure involves a shift of the downwind flight corridor to the south concurrent with construction of the new parallel runway. Citizens that live along the Estero Corridor noted that there are more compatible land uses to the south of the corridor that could be utilized by aircraft flying the south downwind approach. However, a shift in the location of the downwind flightpath would result in exposure of new communities to aircraft overflights and increase the flight distance without a specific operational need. A second parallel runway is planned for construction approximately 5,000 ft south of the current Runway 06-24. This will likely create an operational need to shift the current arrival flight paths approximately one mile south.

Benefit: In moving the downwind approach one mile further south, there is an average decrease of 7.2 decibels for the communities located along the Estero Corridor. While there is a similar increase in noise for the new communities that did not previously experience direct overflights, the number of people exposed to the shifted flight path is estimated to be roughly half those currently overflown.

FAA's Record of Approval Decision: "Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure's noise benefits on the DNL 65 dB contour." This measure can be pursued at the local level on a voluntary basis subject to the discretion of local air traffic control.

Current Disposition: To be implemented by the FAA concurrent with construction of the future parallel runway. The FAA has noted that changes in procedure design may result in a shift in the downwind further south in advance of construction of the new runway. Specifically, the downwind flight path may shift from 5 miles south of the airport to 5.8 miles south to address RNAV procedure design changes. The earliest this shift would likely occur is 2016.. Completion of the new runway is expected sometime after 2020.

Effectiveness: To be determined.

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Estimated Timeline: No further action by the LCPA is anticipated at this time.

OP-5. Publish Charted Visual Approach to Runway 06 from the North and the South

Description: This measure involves the FAA publishing a procedure that identifies visual landmarks to assist pilots flying under visual flight rules to avoid flying over non-compatible land uses. By publishing charted visual approaches that all aircraft can fly when certain weather conditions permit, more compatible land uses can be taken advantage of. Using this procedure to mirror or overlay the new RNAV Visual OPD approach will improve sequencing and allow the ATCT to use the RNAV Visual OPD procedure more consistently.

Benefit: This procedure will help to reduce overflights of Fort Myers Beach during visual flight conditions.

FAA's Record of Approval Decision: "Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure's noise benefits on the DNL 65 dB contour." This measure can be pursued at the local level on a voluntary basis subject to the discretion of local ATC.

Current Disposition: Implemented. The Bay Visual Approach to Runway 06 was published by the FAA on May 9, 2014 as shown in **Figure 5** and was updated May 29, 2014 as shown in **Figure 6** and again on October 16th 2014 (**Figure 7**).

Effectiveness: This type of procedure is new for RSW. Between its initial and most recent publication, the procedure was made unavailable to pilots as the FAA made refinements to address concerns about confusion related to its use. As a result, its effectiveness is still being evaluated by the FAA. Since pilots fly this procedure based on visual cues, this procedure is not authorized at night. However, FAA believes this measure could result in a meaningful reduction in overflights of Fort Myers Beach during daytime VFR conditions. RSW ATCT staff indicated training simulation issues as a factor possibly delaying full implementation. Utilization of this procedure will be limited during busy periods, when the sequencing of aircraft from both the north and south arrival streams requires aircraft to fly extended final approach paths to ensure adequate separation. Full procedure benefits are anticipated in the 6 -18 month timeframe and are contingent on final flight procedure publication, procedure refinement, controller proficiency and training.

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Estimated Timeline: Work with ATCT to promote to airlines and pilots.

FIGURE 5
RUNWAY 6 CHARTED VISUAL APPROACH – Published May 9, 2014

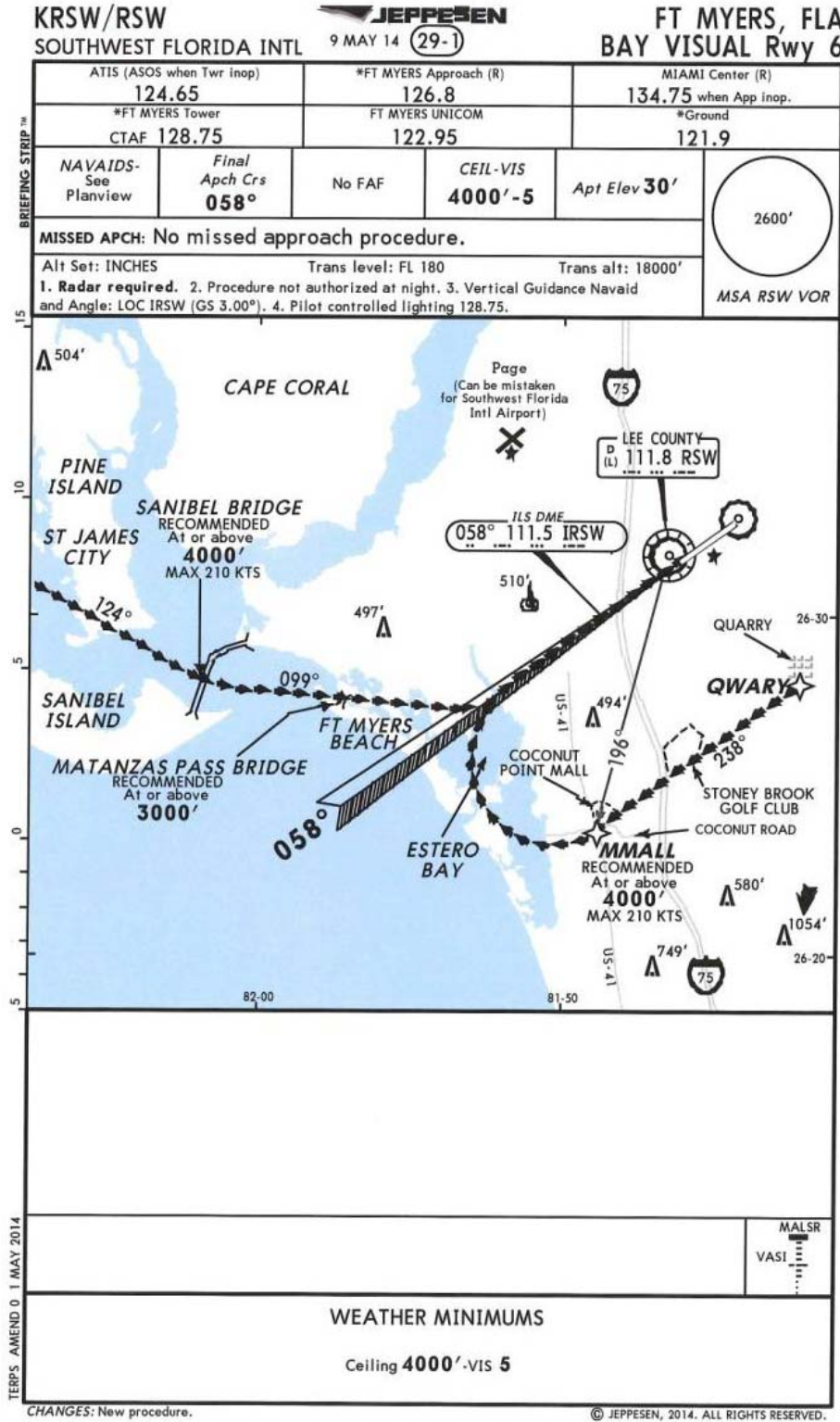


FIGURE 6
RUNWAY 6 CHARTED VISUAL APPROACH – Published May 29, 2014

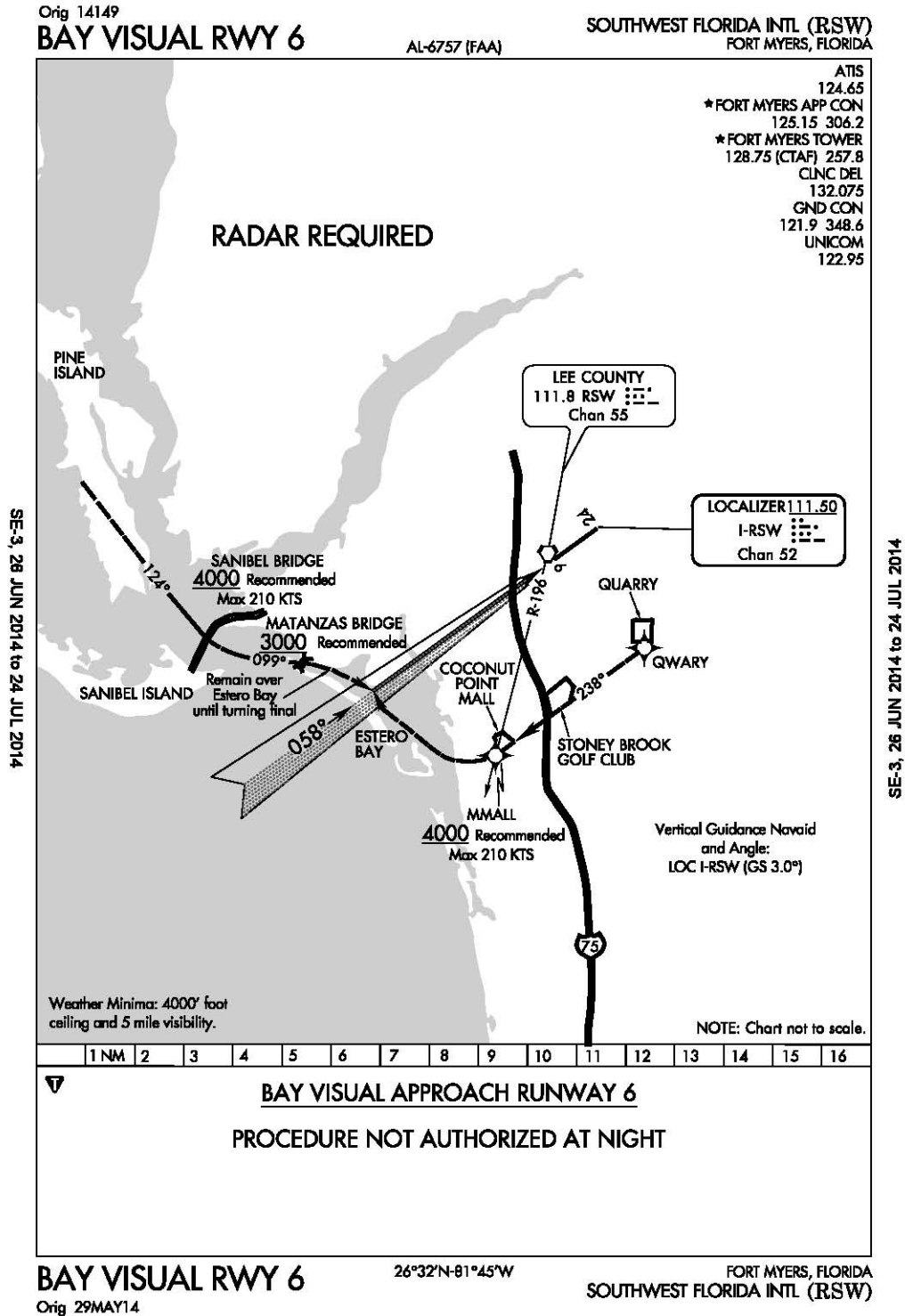
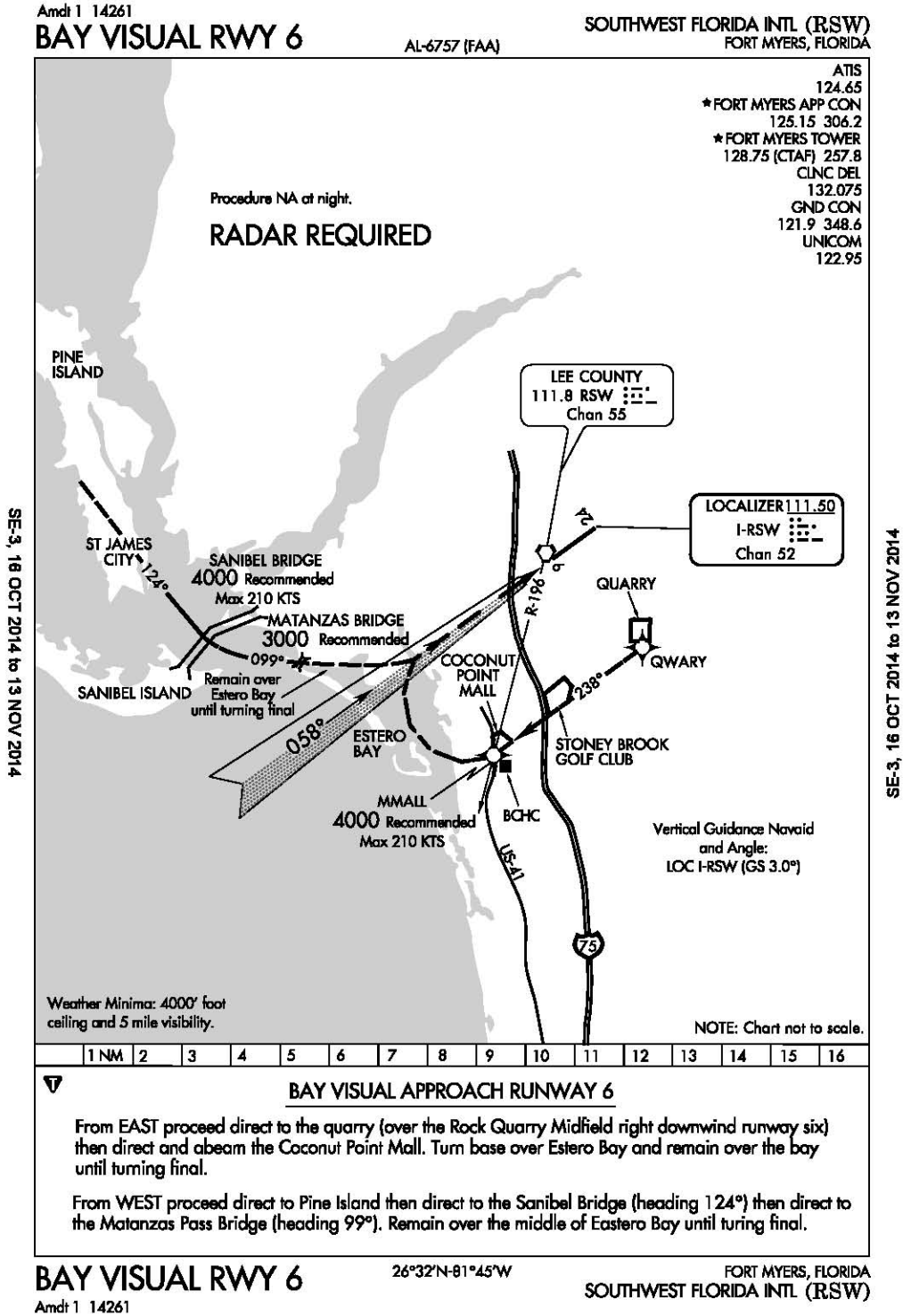


FIGURE 7
RUNWAY 6 CHARTED VISUAL APPROACH – Published October 16, 2014



OP-6. Keep Aircraft at 3,000 Ft. Over Ft. Myers Beach

Description: This measure is consistent with a previously approved voluntary measure from the 2006 14 CFR Part 150 Study to “Keep ‘em High”. The previous measure was revisited to explore mechanisms to improve its effectiveness. At the beginning of this 14 CFR Part 150 Study Update, the Instrument Landing System (ILS) arrival procedure had a minimum glide slope intercept altitude of 1,600 ft. MSL as shown in **Figure 8**. The designation resulted in aircraft descending to that altitude well in advance of intercepting the glide slope. A significant number of comments were received during the public workshops from citizens of the Fort Myers Beach (also referred to as Estero Island) community concerning aircraft arrival overflights that are low and noisy at a distance of approximately 10 nautical miles from the approach end of Runway 06. It is the intent of this measure to implement mechanisms to delay the descent of arriving aircraft and maintain an altitude of up to 3,000 feet until after they overfly Fort Myers Beach.

In an effort to keep aircraft at 3,000 ft. MSL over Estero Island, the Town of Fort Myers Beach passed a resolution that was submitted during the public hearing. The request included increasing the altitude aircraft passed over TROPIC (just west of Fort Myers Beach) to 3,300 ft. with the goal of ensuring that aircraft would remain at or above 3,000 ft. over Fort Myers Beach while descending on the glide slope. That resolution was approved for transmittal to the FAA ATO by the Lee County Port Authority Commission.

Benefit: An increase in the altitude of aircraft from 1,600 ft. to 3,000 ft. over Fort Myers Beach results in a reduction in noise of approximately 5.2 dB. The magnitude of this change exceeds the 3-5 dB change that is typically required to be noticeable.

FAA’s Record of Approval Decision: “Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure’s noise benefits on the DNL 65 dB contour.” This measure can be pursued at the local level on a voluntary basis subject to the discretion of local ATC.

Current Disposition: Implemented. A new ILS procedure was published on May 2, 2013 that increases the glide slope intercept altitude from 1,600 ft. to 3,000 ft. MSL just west of Fort Myers Beach (**Figure 9**). This places aircraft descending on the ILS glide slope to Runway 6 at between 2,700 and 2,800 ft. MSL as they cross Fort Myers Beach. The FAA has indicated that an increase in the intercept altitude from 3,000 ft. to 3,300 ft. is not feasible and/or would create potential safety concerns. It was noted that the average intercept altitude for ILS approaches at all commercial service airports in Florida is 2,100 ft. In addition to publication of the new procedure, in August 2013 the FAA began including verbal directives to aircraft operating under VFR to remain at 3,000 ft until over Fort Myers Beach. The FAA believes that this action has been the most effective at providing relief to the Fort Myers Beach community. During discussion with the FAA, it was noted the Runway 6 RNAV procedure currently uses an altitude of 2000 feet at a fix located west of Fort Myers Beach. The potential to increase this altitude is still being reviewed.

Effectiveness: FAA analyzed sample days in January 2011, 2012, 2013 and 2014 to compare the altitudes of aircraft over Fort Myers Beach (**Figure 10**). The FAA analysis indicates that shortly

after the start of the RSW 14 CFR Part 150 Study Update in 2012, nearly 69 percent of aircraft were overflying Fort Myers Beach below 3,000 ft. MSL, and 12 percent were below 2,000 ft. MSL. As of January 2014, the percentage of aircraft flying over Fort Myers Beach below 3,000 ft. MSL has been reduced to 27 percent, with approximately 1 percent below 2,000 ft. MSL. **Figures 11 and 12** depict the associated flight tracks. During busy periods aircraft sequencing and spacing requirements will reduce the effectiveness of this measure. The FAA has indicated that due to altitude separation requirements associated with sequencing of the two arrival streams and the need for one stream to be below the glidepath (with the other on the glidepath), there will likely never be a time that all aircraft will be at or near 3,000 when transiting Fort Myers Beach.

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Timeline: Promote awareness with airlines. Explore feasibility of increasing the altitudes associated with the Runway 6 RNAV procedure with the FAA.

FIGURE 9
REVISED ILS APPROACH TO RUNWAY 6

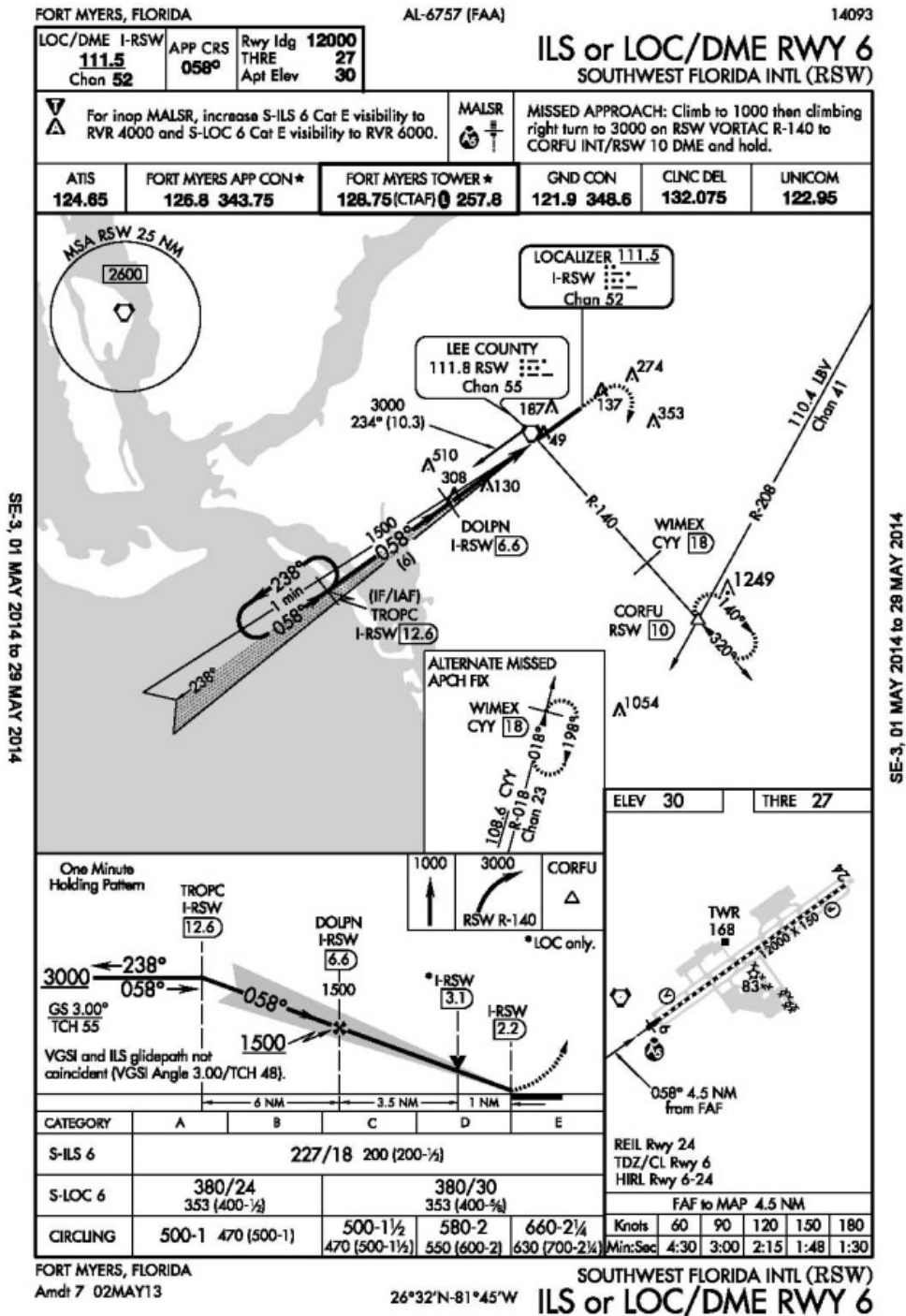
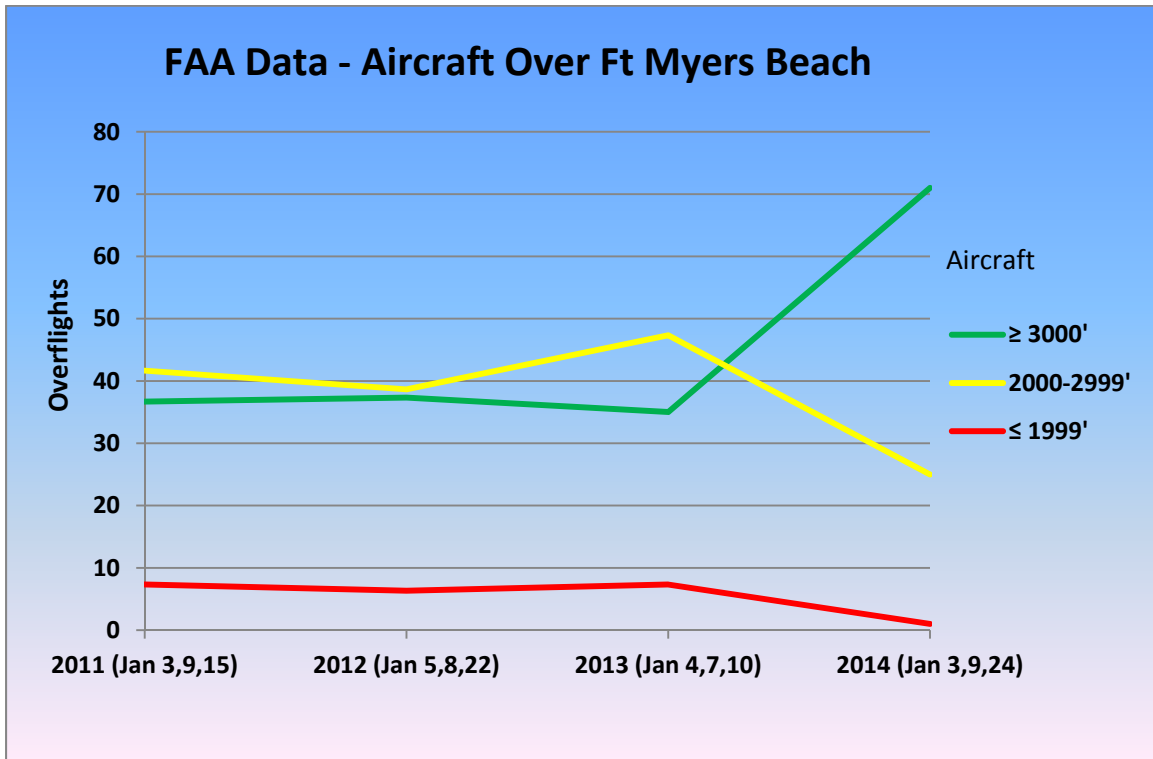
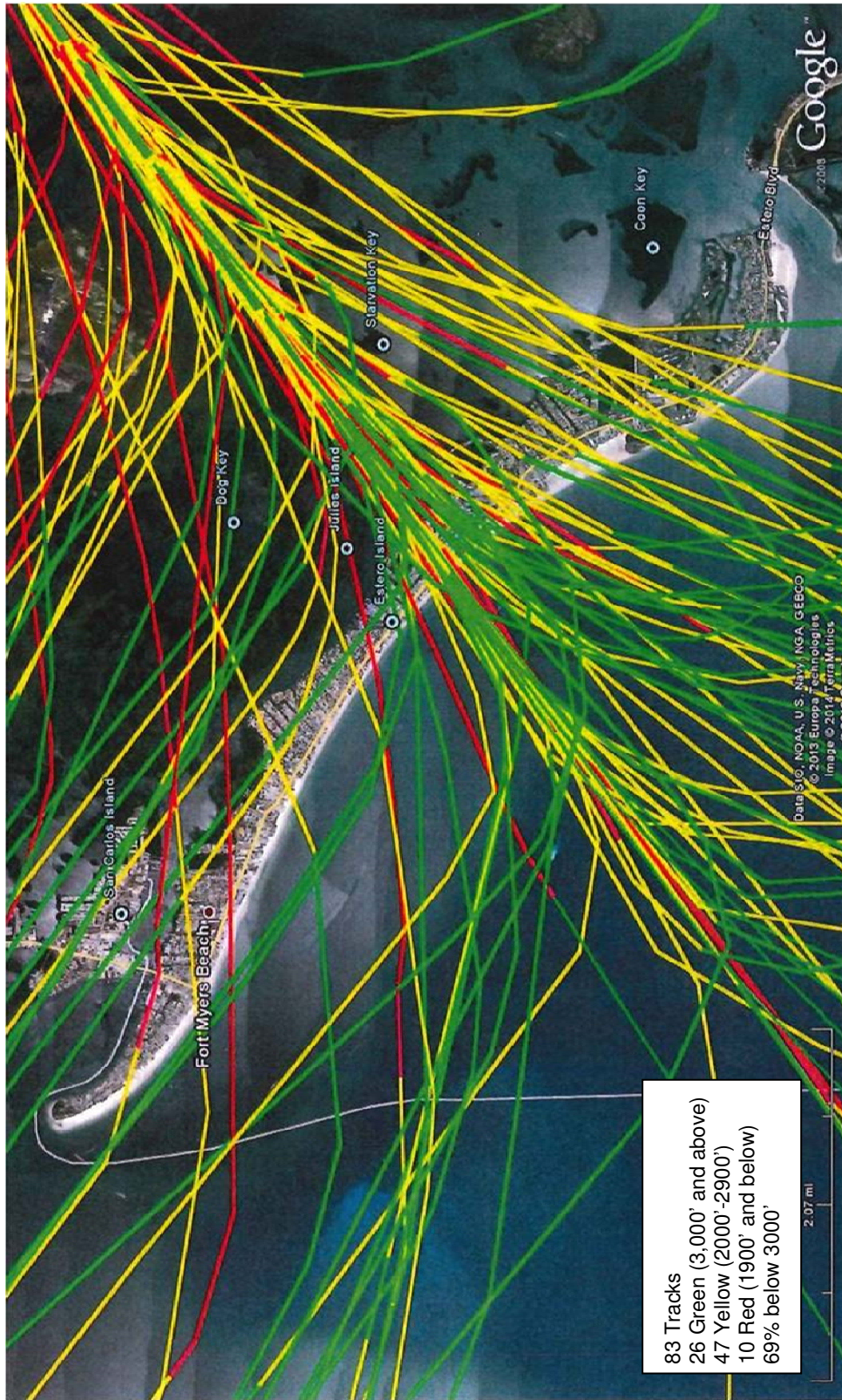


FIGURE 10
AIRCRAFT ALTITUDES OVER FORT MYERS BEACH



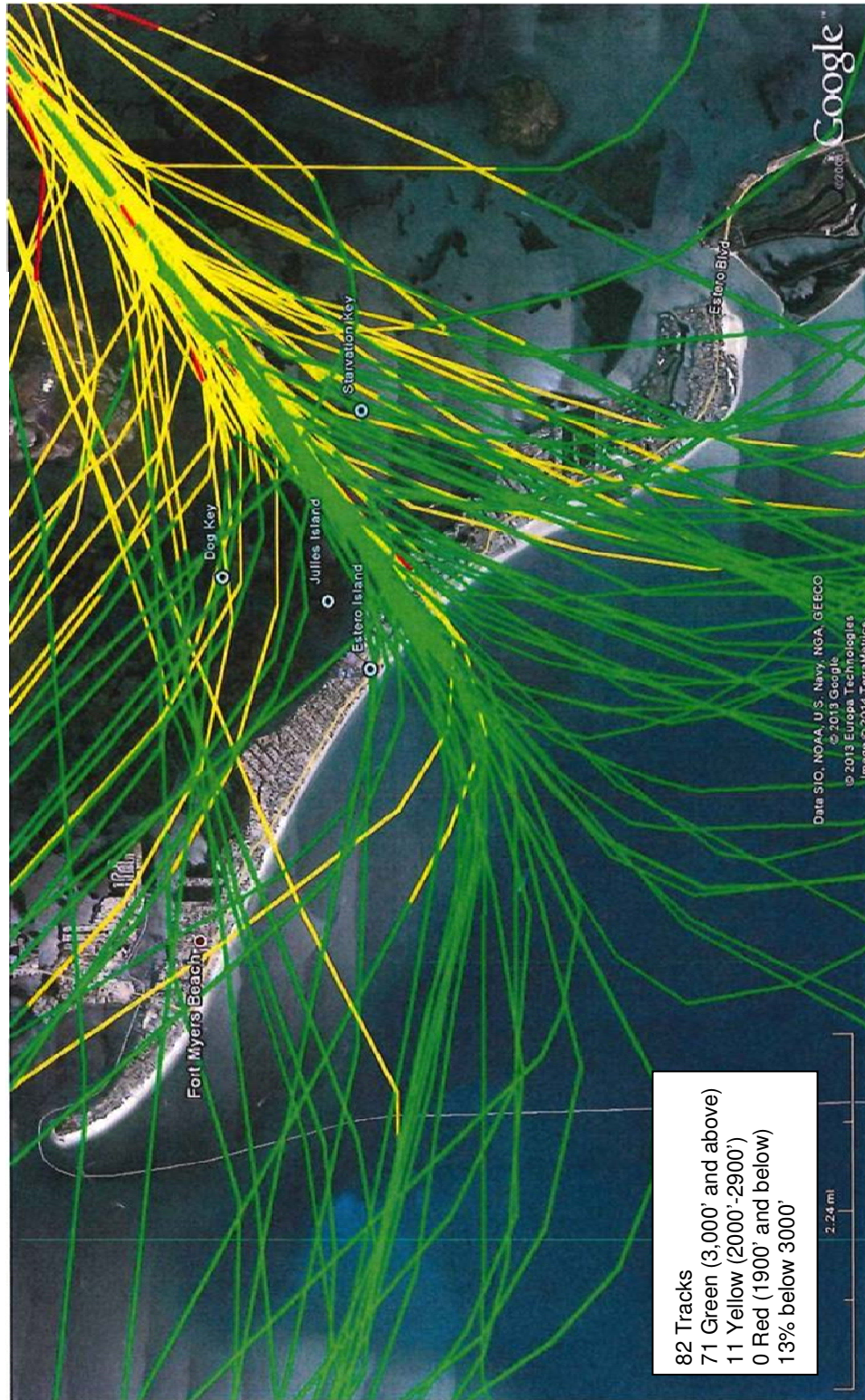
Source: RSW FAA ATC

FIGURE 11
AIRCRAFT ALTITUDES OVER FORT MYERS BEACH – January 22, 2012



Source: RSW FAA ATC

FIGURE 12
AIRCRAFT ALTITUDES OVER FORT MYERS BEACH – January 3, 2014



Source: RSW FAA ATC

OP-7. Delay Point at which Aircraft Lower their Landing Gear

Description: The drag that results when the landing gear is dropped requires an increase in the engine thrust setting to maintain altitude and airspeed. Concerns were raised by members of the community about the distance from the airport that pilots are configuring the aircraft for landing and the associated increased noise. In particular, it was noted that the current procedure of routing all aircraft on the SHIFTY TWO downwind approach well west of the airport to PONTY without an early visual release is likely increasing the number of pilots that are configuring their aircraft for landing much further from the airport than they would otherwise. New recommended measures such as the RNAV OPD and the charted visual would likely reduce this practice. However, working with the operators to increase awareness may also help to reduce potential annoyance.

This measure involves working with air carriers and operators to highlight the benefits of delaying the point at which the landing gear is lowered.

Benefit: Delaying the lowering of the landing gear will allow aircraft to operate at reduced thrust settings until closer to the airport. This will help reduce annoyance associated with individual overflights.

FAA Record of Approval Decision: “Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure’s noise benefits on the DNL 65 dB contour.” This measure can be pursued at the local level on a voluntary basis subject to the discretion of local air traffic control.

Current Disposition: Not yet implemented.

Effectiveness: To be determined. The effectiveness of this measure will depend on airline procedures certified by the FAA, and the point at which the landing gear is put down would remain the pilot’s discretion. The new arrival procedures implemented at RSW (RNAV OPD and Bay Visual), will help pilots to better gauge the appropriate time to lower their landing gear. It is recommended this measure be promoted once the pilots have had a chance to become familiar with the new procedures that have been published by the FAA.

Enforcement Action: None. This measure can only be pursued on a voluntary basis and is subject to the discretion of ATC and the pilot in command.

Next Steps and Estimated Timeline: Promote use with airlines in the 12-15 month timeframe.

OP-8. Increase Altitude of Early Morning Arrivals

Description: Concerns were raised during the public workshops about low and noisy aircraft arrival overflights during the early morning hours. In particular, cargo carrier flights occurring before 6:00 am were cited as a concern. Since the RSW tower is not yet in operation when these flights arrive, these aircraft receive clearances from Miami Air Route Traffic Control Center (ARTCC). As a result it is common for these aircraft to fly over Fort Myers Beach well below 3,000 ft. MSL.

Benefit: Keeping early morning arrival overflights higher until closer to the airport will reduce the annoyance of these aircraft.

FAA Record of Approval Decision: “Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure’s noise benefits on the DNL 65 dB contour.” This measure can be pursued at the local level on a voluntary basis subject to the discretion of local ATC.

Current Disposition: Partially implemented. The FAA implementation of the new ILS procedure, the RNAV OPD, and the Bay Visual may help to reduce some of the overflights and annoyance caused by early morning arrivals to Runway 06. In early 2014, RSW ATCT coordinated with Miami ARTCC to have the ARTCC keep these aircraft higher as they transition Fort Myers Beach. Full benefits are anticipated in the 6-12 month timeframe.

Effectiveness: Not yet determined.

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Estimated Timeline: The LCPA will promote early aircraft arrivals remain at as high as altitude as possible with RSW ATCT and Miami ARTCC.

OP-9. Change Runway 24 to Preferred Runway From 10:00 PM – 6:00 AM

Description: In exploring opportunities to address late night and early morning aircraft operations occurring at RSW, it was determined that a potential change in the voluntary preferential runway after 10:00 PM (shown in **Figure 13**) could reduce nighttime annoyance. It was determined that this would be beneficial to the local communities because it would greatly reduce the number of overflights that would be routed over the noise sensitive communities in the Estero Corridor and Fort Myers Beach area during periods when potential annoyance from aircraft activities is the highest.

Benefit: With Runway 24 as the preferred nighttime runway, aircraft arriving down the west coast of Florida would be flying over the Estero Corridor at a higher altitude on the TYNEE ONE Arrival, and aircraft arriving down the middle of the state flying the SHFTY TWO Arrival would fly straight-in to Runway 24, avoiding the Estero corridor and Ft. Myers Beach altogether. Nearly all operations being conducted at the airport after 10:00 PM are arrivals. As a result, the Runway 24 departure noise concerns for the communities of Fiddlesticks and The Forest would be minimal.

FAA Record of Approval Decision: “Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure’s noise benefits on the DNL 65 dB contour.” This measure can be pursued at the local level on a voluntary basis subject to the discretion of local ATC.

Current Disposition: Partially implemented by the RSW ATCT August 1, 2013 on a voluntary basis from 10:00 PM to 12:00 AM when weather and conditions permit.

Effectiveness: Pilots traveling down the coast on the TYNEE ONE procedure often request Runway 6 during nighttime hours to avoid the 15 plus miles of added flight distance that this measure would require. Additionally, the RSW tower is closed from 12:00 AM until 6:00 AM and aircraft are handled by the Miami ARTCC. Coordination has occurred between RSW ATC and Miami ARTCC, but the effectiveness of this measure is still being determined. Pilots can still request Runway 6 and the FAA is obligated to accommodate the request if traffic and conditions allow.

Enforcement Action: None. This measure can only be pursued as a voluntary measure and is subject to the discretion of ATC and the pilot in command.

Next Steps and Estimated Timeline: The LCPA will continue to promote utilizing Runway 24 with the airlines and the FAA as the preferential runway after 10:00 PM.

**FIGURE 13
PREFERENTIAL RUNWAY USE**



Current Preferential Runway – Runway 6



Recommended Nighttime Preferential Runway – Runway 24

OP-10. Modify CSHEL FOUR Departure Procedure

Description: The CSHEL FOUR Departure Procedure off of Runway 24 directs departing aircraft through the Alico industrial corridor. This measure would modify that procedure to reduce noise and annoyance for the communities located at the west end of this corridor.

Analysis of RSW airport operations from January 2008 to April 2011 determined that Runway 24 is used approximately 30 percent of the time. It was also noted that Runway 24 can be used as little as 10 percent in a given month or as much as 50 percent or more depending on the seasonal wind conditions. The Forest community is located at the west end of the Alico industrial corridor directly under the Runway 24 CSHEL FOUR Departure procedure. Through the noise monitoring conducted as part of this study, it was determined that this community receives the highest levels of aircraft noise of any local community. In discussions with ATCT, it was determined that the current CSHEL FOUR Departure procedure provides a safe separation between departing and arriving aircraft at RSW as well as an altitude cushion from aircraft that could be departing out of Page Field (FMY). It was also noted that slight modifications could be made in the CSHEL FOUR Departure procedure to reduce the number of direct overflights over The Forest community while providing a more direct routing to the north for some aircraft as shown in **Figure 14**.

Benefit: This measure will help reduce the number of overflights experienced by The Forest community by modifying the Runway 24 RNAV Departure procedure to lessen the concentration of aircraft departures over a narrow corridor (railroad effect). It would also reduce the flight distance for aircraft with greater climb out capabilities.

FAA's Record of Approval Decision: "Disapproved for purposes of Part 150. The analysis in the NCP does not demonstrate the measure's noise benefits on the DNL 65 dB contour." This measure can be pursued at the local level on a voluntary basis subject to the discretion of local ATC.

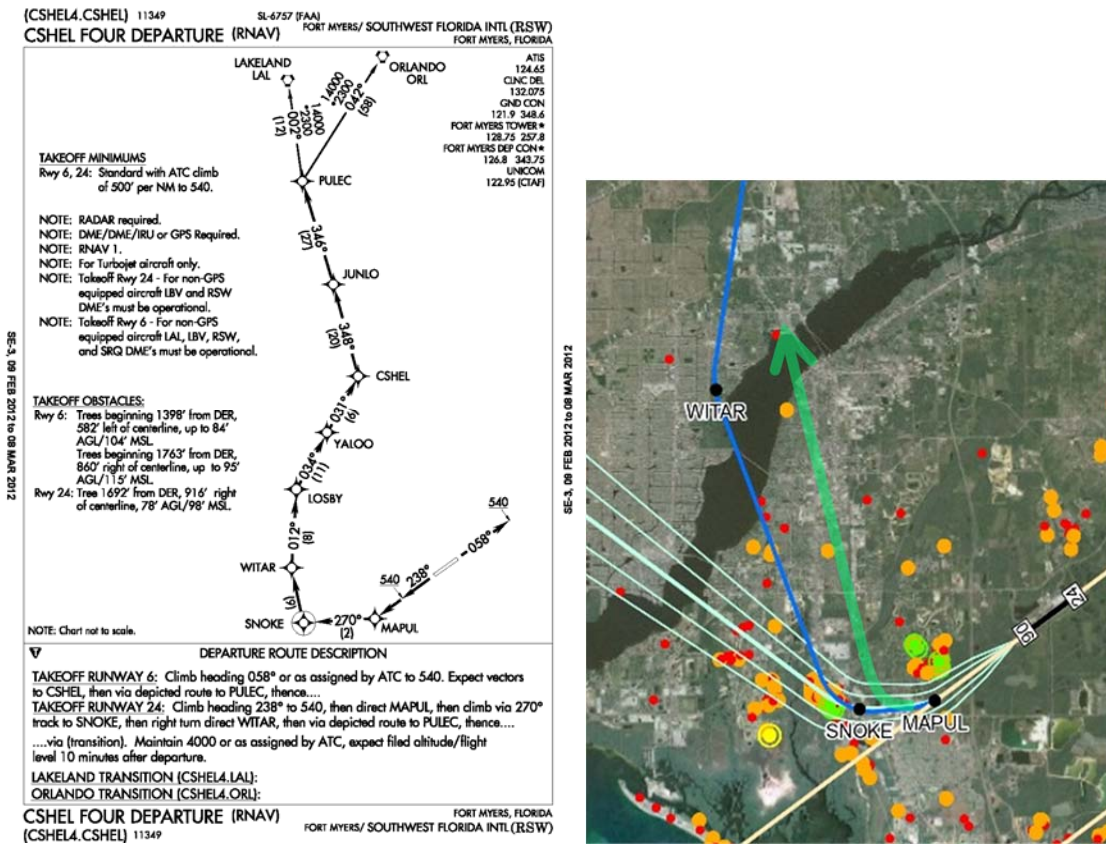
Current Disposition: Partially implemented. The tower has indicated that they may be able to manage implementation of this measure without formally modifying the published procedure. The FAA is currently providing verbal guidance directing aircraft reaching MAPUL and 3,000 ft MSL to turn direct to CSHEL, but a published procedure is not currently in development.

Effectiveness: Aircraft are being fanned as the turn to the north which has reduced the railroad effect over the Forest community.

Enforcement Action: None. This measure can only be pursued on a voluntary basis and is subject to the discretion of ATC and the pilot in command.

Next Steps and Estimated Timeline: The LCPA will continue to work with RSW ATCT to take advantage of more compatible land uses located east of The Forest community for departures from Runway 24.

FIGURE 14
CSHEL FOUR DEPARTURE – EXISTING AND PROPOSED ROUTING



3.2 Off-Airport Land Use Compatibility Planning Measures

LU-1. Update Noise Overlay Zones

Description: The 2006 Part 150 update modified previously established overlay zones around the airport to protect from future non-compatible land uses through 2020. With changes in activity and progression of time since the previous study, this measure involves updating these zones to reflect the land use and sound exposure conditions within the County expected in the year 2030. Composite 2030 DNL contours were generated that reflected the combination of the current single runway configuration operating at 85 percent of capacity with the future two runway configuration operating at 2030 activity levels. The updated noise overlay zones include four zones: A, B, C and D, as shown in **Figure 15**. Zone A is existing airport property and Zone B is the 60 DNL contour. Zone C reflects the 55 DNL contour or area that receives 10 percent of the noise exposure considered significant by the FAA. Finally, Zone D is a potential future flight pattern area that may be subject to aircraft overflights. Noise sensitive uses are not allowed in Zones A or B.

Benefit: Ensure long term compatible land uses in near proximity to the airport. Increase awareness of potential noise exposure to those that may be more sensitive to aircraft overflights.

FAA's Record of Approval Decision: "Disapproved for purposes of Part 150. The local jurisdiction has adopted a local standard lower than the Federal standard that defines incompatible land uses below DNL 65 dB. However, the recommended noise overlay zones are not based on either of the "official Noise Exposure Maps" accepted by the FAA in this study. The Federal government has no authority to control current or future local land use designations. The local jurisdictions have the authority to pursue their own proposed land use controls and enact the proposed Noise Overlay Zoning without FAA approval. Below the 65 DNL contour, FAA as a matter of policy encourages local efforts to prevent new non-compatible development immediately abutting the 65 DNL contour and to provide a buffer for possible growth in noise beyond the forecast period. Therefore, FAA's disapproval should not be interpreted as minimizing or negating the efforts of local jurisdictions to provide prudent planning."

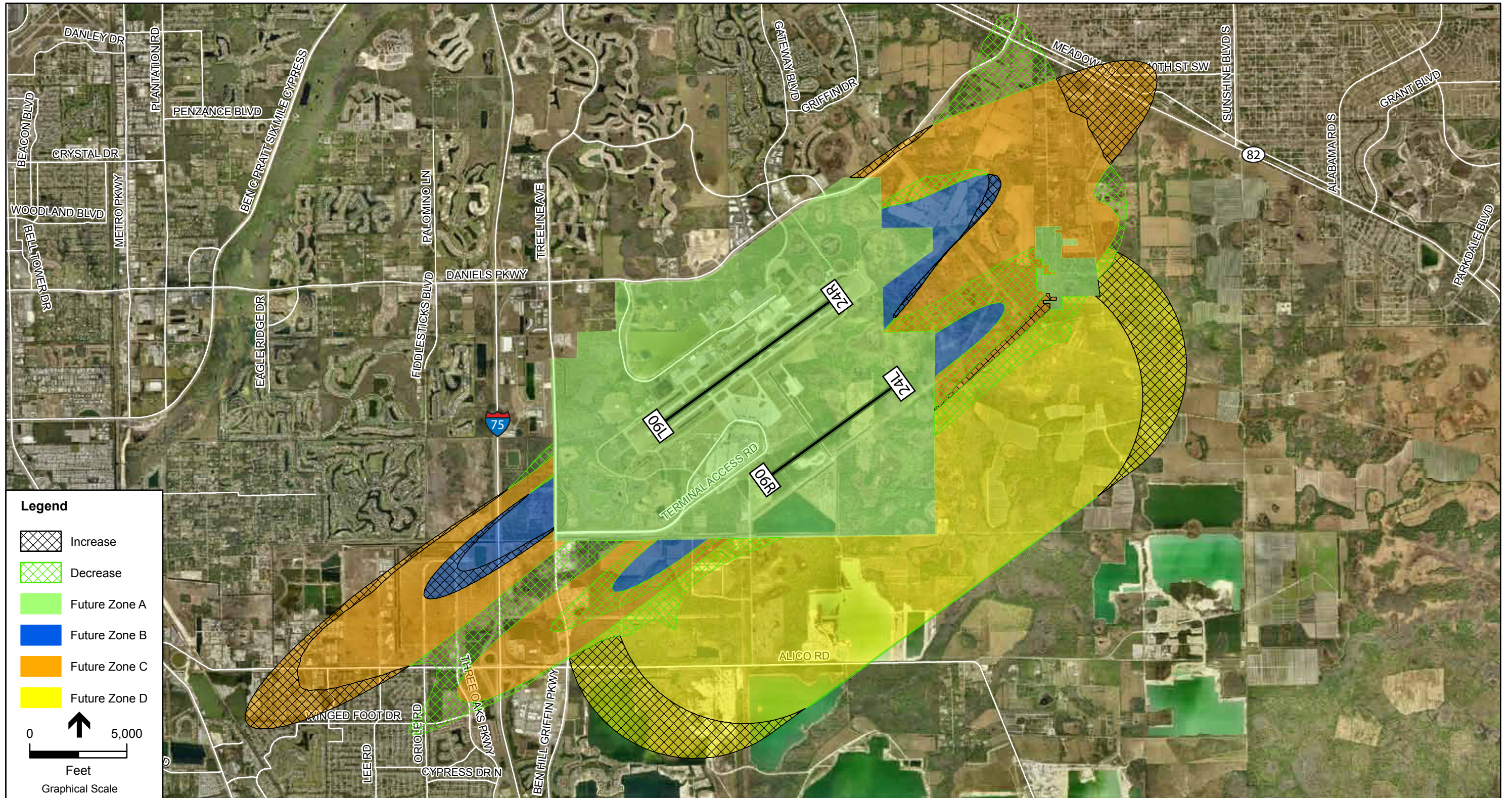
Current Disposition: In implementation process. The LCPA is currently evaluating alternative approaches to implementing that maximize the effectiveness of the overlay zones.

Effectiveness: No non-compatible land uses are currently located within the long term overlay zones.

Enforcement Action: N/A

Next Steps and Timeline: Implement the new overlay zones into the Lee County Land Development code and continue to update when conditions dictate. Estimated timeframe for completion is 18 months.

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SOURCE: ESA Airports, 2012; INM 7.0b; Lee County GIS Department

Southwest Florida International Airport NCP Implementation Technical Memorandum .210140

Figure 15
Existing Airport Noise Overlay Zones Vs. Proposed (2030) Airport Noise Overlay Zones

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3.3 Noise Program Administration Measures

PM-1. Noise Compatibility Program Management

Description: The LCPA is the owner/operator of RSW and has the current responsibility for working with the operators at the Airport to establish and implement the NCP at RSW. This measure recommends that LCPA assign resources as may be required to assist in implementation and management the recommendations from this Study Update.

FAA's Record of Approval Decision: Approved.

Benefit: Maintaining program oversight allows the LCPA to effectively track implementation and maximize the effectiveness of the NCP recommendations brought forth by the RSW 14 CFR Part 150 Study Update.

Current Disposition: Currently Implementing. The LCPA is currently in the implementation process of the recently approved 14 CFR Part 150 Study Update. This NCP implementation technical memorandum is part of the LCPA's ongoing efforts to manage the implementation of the noise program.

Effectiveness: The LCPA has been working with the FAA throughout the Part 150 Update process to begin implementation of many of the recommended measures well in advance of the FAA's ROA. This has resulted in 11 of the 16 recommendation already being partially or completely implemented.

Enforcement Action: N/A

Next Steps and Estimated Timeline: The LCPA will continue to manage the implementation process as appropriate for each implementation measure.

PM-2. Update Noise Program as Mandated by Lee Plan

Description: The FAA, through 14 CFR Part 150 regulations, requires airport sponsors to prepare and submit revised NEMs if changes in operations of the Airport would result in a change in the amount of incompatible land uses. The FAA defines a substantial change as a noise sensitive area that would experience a 1.5 dB DNL or greater increase or decrease for noise sensitive land uses exposed to 65 dB DNL and above.

The LCPA staff should continue to routinely examine the number of operations as well as the operational characteristics, such as runway use and fleet mix, to determine if any major changes in operations at the Airport have resulted in increased aircraft noise exposure to noise sensitive land uses. A routine analysis of these characteristics should be performed on an annual basis by LCPA staff to determine if the NEMs and the associated NCP are still representative of, and responsive to, the noise environs around the Airport.

If no updates appear to be needed based on the annual review, the noise program should be updated as required by the Lee County Comprehensive Plan.

Benefit: Gives the LCPA the responsibility of updating its noise contours should conditions at the Airport change significantly, or if a specific period of time has passed since this RSW 14 CFR Part 150 Study Update completion.

FAA's Record of Approval Decision: Approved.

Current Disposition: Implemented. The LCPA will review operating conditions annually to determine if future updates are required.

Effectiveness: Implementation of this measure ensures that the airport noise contours remain representative of local conditions.

Enforcement Action: N/A

Next Steps and Estimated Timeline: The LCPA will review operational conditions annually.

PM-3. Noise Forums with FAA Air Traffic Controllers

Description: This measure establishes a regular noise forum with RSW ATC in an effort to highlight areas where opportunities might exist to address community concerns. Regular meetings should be held between the two parties so that the latest issues impacting ATC and the LCPA can be addressed and to determine if any mitigating efforts can be established. These meetings are a continuation of the meeting and strong working relationship fostered with ATC throughout the 14 CFR Part 150 Study Update.

Benefit: Opens the lines of communication between the LCPA and RSW ATCT to maximize the effectiveness of the NCP implementation and allow review of current issues and concerns.

FAA's Record of Approval Decision: Approved.

Current Disposition: Implemented. The LCPA met with the ATC on April 25, 2014 and again on August 21st to continue discussions relative to noise program implementation.

Effectiveness: Regular meetings are anticipated to maximize the effectiveness and refinement of the noise program.

Enforcement Action: N/A

Next Steps and Estimated Timeline: The LCPA will initially meet with RSW ATCT staff every four to six months to review the noise program implementation and then at least annually thereafter.

PM-4. Develop a Jeppesen Insert on Noise Abatement Program at RSW

Description: Pilot education is one of the strongest tools for addressing noise concerns at an airport. Since operations at RSW are mostly conducted by air carrier operations, educating pilots on the airport's specific procedures or noise concerns can be a challenge since the same pilots may not regularly fly in and out of RSW.

This measure involves development of a Jeppesen type insert that contains all noise abatement information, including graphics depicting noise sensitive areas. The half page specially formatted inserts allow integration into the pilot flight manuals. This allows pilots to be aware of noise sensitive areas and noise considerations at an airport that might not have yet been integrated into the specific operational notices (green sheets or dash 7 pages) for a specific carrier. It will also assist in communicating these measures to non-commercial pilots through distribution by RSW's fixed based operators (FBOs).

Benefit: Helps create pilot awareness of the noise sensitive communities around RSW and the recommended measures to reduce annoyance associated with aircraft overflights.

FAA's Record of Approval Decision: Approved.

Current Disposition: Not yet implemented. As the recommended measures are being implemented, the procedures are being refined. It is recommended that the pilot insert be developed once these measures have stabilized.

Effectiveness: TBD

Enforcement Action: N/A

Next Steps and Estimated Timeline: The LCPA will develop these inserts once the operational measures have been implemented and initial refinements have been completed. This is anticipated within 15 months of the ROA.

PM-5. Install Runway End and Noise Abatement Reminder Signs

Description: While locally based pilots may be familiar with the noise abatement or noise measures, RSW is predominantly an air carrier airport with very little locally based aircraft. To continue to educate and raise awareness of noise concerns for unfamiliar pilots, this measure involves adding runway end reminder signs that are visible to pilots just prior to takeoff.

Benefit: The signs can help reduce noise exposure by increasing pilot awareness. The signs can also identify locations of noise sensitive areas by directing pilots to avoid certain turns or fly certain instrument procedures aimed at avoiding noise sensitive sites.

FAA Record of Approval Decision: Approved. “Signage must not be construed as mandatory air traffic procedures. Prior to purchase and installation, signage must be reviewed and approved by the FAA outside of the Part 150 process.”

Current Disposition: Not Implemented. The LCPA will work with the FAA to ascertain funding for signage on the Airport to help spread awareness of the noise abatement policies and procedures at RSW.

Effectiveness: TBD. It should be noted that these signs are of most benefit to departing aircraft.

Enforcement Action: N/A

Next Steps and Estimated Timeline: The LCPA will review funding opportunities. Timing of this measure is subject to funding availability.

4.0 Observations

Aircraft arriving into RSW were observed using LCPA’s flight aware data beginning Sunday, June 29, 2014 at 12:00 am and ending Saturday, July 5, 2014 at 11:59 pm. During the seven day period, approximately 477 flights, including GA and commercial aircraft arrived at the airport.

Of the 477 aircraft: 185 used the Shifty Two Approach; 272 used the Tynee One Approach, and; 20 flights came in over land from the south and did not use either approach. Looking at the total number of aircraft arriving at RSW during the seven days:

- 118 aircraft used the Shifty Two Approach on Runway24, they do not fly over the beach
- 339 aircraft flew over the beach or the back bay using the Tynee One Approach or the Shifty Two Approach
- 7 aircraft were below 2,000ft
- 282 aircraft were at or above 2,800ft
- 50 aircraft were between 2,000ft and 2,700ft
- 53 aircraft flew over the back bay
- 259 aircraft flew over the beach

Tables 2 and 3 further detail the data based on the approach, runway, and altitude.

Table 2 summarizes the number of aircraft using the Shifty Two Approach. For the arrivals using Runway 6, the data is broken into aircraft coming in over the back bay and those flying in over the beach, as well as how many planes flew at an altitude below 2,000 ft, or at or above 2,800 ft.

**TABLE 2
SHIFTY TWO APPROACH
SOUTHWEST FLORIDA INTERNATIONAL AIRPORT**

Runway	Total Flights			Beach			Back Bay		
	Total	Below 2,000 ft	At least 2,800 ft	Total	Below 2,000 ft	At least 2,800ft	Total	Below 2,000 ft	At least 2,800 ft
Runway 6	67	2	58	55	0	51	12	2	7
Runway 24	118	NA	NA	NA	NA	NA	NA	NA	NA
Total	185	2	58	55	0	51	12	2	7

Table 3 summarizes the number of aircraft that used the Tynee One Approach. As in the previous table, it breaks the aircraft down into those approaching over the beach and the back bay, and highlights aircraft flying at an altitude below 2,000ft, or at or above 2,800ft.

TABLE 3
TYNEE ONE APPROACH
SOUTHWEST FLORIDA INTERNATIONAL AIRPORT

	Total Flights			Beach			Back Bay		
	Total	Below 2000ft	At least 2800ft	Total	Below 2000ft	At least 2800ft	Total	Below 2000ft	At least 2800ft
Runway 6	98	5	75	61	2	48	37	3	27
Runway 24	174	0	147	143	0	143	4	0	4
Total	272	5	222	204	2	191	41	3	31

Fifty aircraft arrived at RSW between the hours of 10pm and 6am during the seven day observation period:

- 22 aircraft used the Shifty Two Approach, landing on Runway 24;
- 28 aircraft used the Tynee One Approach;
- Of the 28, eight aircraft landed on Runway 6 ,and 20 aircraft utilized Runway 24; and
- Three of the aircraft using the Tynee One Approach to Runway 24 came in over land.

Table 4 summarizes the number of aircraft using the Tynee One Approach between 10pm and 6am. It breaks the aircraft down into those approaching over the beach and the back bay, and highlights aircraft flying at an altitude below 2,000ft, or at or above 2,800ft.

TABLE 4
TYNEE ONE APPROACH 12:00AM – 6:00AM
SOUTHWEST FLORIDA INTERNATIONAL AIRPORT

	Total Flights			Beach			Back Bay		
	Total	Below 2,000ft	At least 2,800ft	Total	Below 2,000ft	At least 2,800ft	Total	Below 2,000ft	At least 2,800ft
Runway 6	8	0	6	7	0	5	1	0	1
Runway 24	20	1	19	13	0	13	4	1	3
Total	28	1	25	20	0	18	5	1	4

5.0 Summary

A review of the status of NCP measures indicates significant progress both in advance and subsequent to the FAA's issuance of the ROA on April 7th, 2014. While the FAA disapproved all operational measures for the purposes of Part 150, the RSW ATCT has made significant progress in implementing measures that reduce annoyance caused with aircraft overflights for the communities surrounding RSW. This was apparent in a one week review and evaluation of aircraft operations at RSW between June 29th and July 5th 2014. While a variety of factors have limited the immediate effectiveness of certain measures, it is anticipated that these measures provide greater benefit over time. Maximum effectiveness of the overall program will likely not be realized for another 18 to 24 months and will continue to improve as some of the longer term measures are implemented. Future changes in FAA procedure design standards have the potential to impact any or all of the proposed operational measures and future modification may be required.