

CHAPTER ONE EXECUTIVE SUMMARY

The Part 150 Noise Compatibility Study Update for T.F. Green Airport has two components: Noise Exposure Maps and a Noise Compatibility Program. The Noise Exposure Maps (NEMs) provide to all interested parties, information on the existing (1998) and future (five-year) expected boundaries of significant levels of annual average noise exposure surrounding the airport. The Noise Compatibility Program (NCP) sets forth measures intended to mitigate the impacts of significant noise exposure on residential areas near the airport and to restrict the introduction of new incompatible uses into locations exposed to significant noise levels. The Noise Compatibility Study Update was conducted under guidance provided in Part 150 of the Federal Aviation Regulations.

This document reflects the third iteration in noise compatibility planning for T.F. Green Airport. The airport's first Part 150 Noise Compatibility Program (NCP) was prepared by the Rhode Island Department of Transportation and approved by the FAA in 1986. The 1986 plan included:

- fourteen measures to reduce noise impacts by reducing or redirecting noise through construction, air traffic, or aircraft operations actions
- three measures to prevent or limit new incompatible land uses
- three measures to abate or mitigate impacts on noise-sensitive uses in areas exposed to significant noise levels

One of the recommendations of the previously approved plans is the periodic update of the NEMs and NCP to maintain currency with local conditions. The Noise Exposure Maps were updated by the Rhode Island Airport Corporation (RIAC) and approved by the FAA in 1995.

This 1999 update of the airport's Noise Compatibility Program provides noise exposure maps for 1998 and 2003 and provides a program of 38 recommended measures that continue or expand the approved 1986 NCP. Five originally approved measures have been completed and therefore are not included in the 1999 NCP. Five measures from the 1986 NCP are withdrawn from this NCP Update and in some cases are being replaced by new measures. Detailed supporting documentation, including the steps taken to reach the recommended program measures, is provided in subsequent chapters of this document. The record of public comment is provided in Appendix E, *Public Review and Comment Opportunities* and Appendix F, *Public Hearing*.

FAA approval of Part 150 measures and the follow-on environmental impact statement, environmentally clears the agency to participate in actions over which the agency has primary implementing responsibility (e.g., air traffic modifications), and certifies the eligibility for Federal funding participation in those measures, such as sound insulation, for which the airport is the responsible party. Approval by the FAA does not, however, commit the agency or the Rhode Island Airport Corporation to either a specific schedule of implementation or guarantee for the allocation of Federal funds for implementation of any measure.

1.0 EXISTING NOISE CONDITIONS

The noise exposure pattern at T.F. Green Airport is presented in terms of the average annual Day-Night Sound Level (DNL) for existing (1998) and forecast future (2003) conditions. The annual DNL measure is the annual average of the total noise energy that occurs at a location. With DNL, nighttime (10:00 p.m. to 6:59 a.m.) noise events are weighted (or penalized) by 10 decibels to reflect the greater perceived impact of noise at night. DNL is used in Part 150 Studies and in documents prepared to demonstrate compliance with the National Environmental Policy Act (NEPA). The NEMs display contour lines that connect points of equal DNL exposure at 65, 70, and 75 decibels.

The noise levels were computed during this study using Version 5.2a of the Integrated Noise Model (INM). The INM was developed under the auspices of the FAA for use in Part 150 and other environmental studies. The distribution of the noise pattern calculated by the INM is a function of the number of aircraft operations during the period evaluated, the types of aircraft flown, the time of day when they are flown, the way they are flown, how frequently each runway is used for landing and takeoff, and the routes of flight used to and from the runways. Substantial variations in any one of these factors may, when extended over a long period of time, cause marked changes to the annual noise pattern. Detailed information on each of these elements may be found in Appendix A, *Methodology*.

The distribution and number of dwellings, persons, and noise-sensitive public uses located within each indicated contour range (65-70 DNL, 70-75 DNL, 75+ DNL) were determined through application of Geographic Information System (GIS) technology, coupled with the use of recent aerial photogrammetry and field validation surveys. The underlying base map on which each noise exposure pattern is displayed was current as of September 30, 1998. All noise impacts associated with existing and future noise scenarios were automatically calculated by combination of the contour set with the GIS base map.

1.1 Existing (1998) Noise Exposure Map

The official Noise Exposure Map for 1998 is presented as [Exhibit 1-1](#). The noise contours displayed on the Existing NEM do not assume the inclusion of any NCP recommendation that was not approved as part of the 1986 Part 150 program. They represent the noise pattern as it existed in 1998. The data on which the existing baseline contours are based was derived from the airport's records of aircraft operations that occurred between January, 1997, and December, 1997. Since there was a difference of only six percent between base period and 1998 operations levels, the contours based on the baseline period are considered to be representative of 1998 conditions.

During the baseline period, an average of 403 landings and takeoffs occurred at the airport every day. **Table 1-1** presents the activity in separate user groups. The number of operations and their distribution between the day and night hours was derived from air traffic records maintained by the airport and/or from schedules of operations flown by commercial operators.

**Table 1-1
AVERAGE DAY OPERATIONS * - JANUARY 1997 TO DECEMBER 1997
T.F. Green Airport**

| User Group | Arrivals | | Departures | | Total | |
|-------------------|-----------------|--------------|-------------------|--------------|--------------|--------------|
| | Day | Night | Day | Night | Day | Night |
| Air Carrier | 46 | 10 | 46 | 11 | 92 | 21 |
| Cargo | 3 | 0 | 4 | 1 | 7 | 1 |
| Commuter | 36 | 5 | 33 | 2 | 69 | 7 |
| GA/Military | <u>98</u> | <u>5</u> | <u>99</u> | <u>4</u> | <u>197</u> | <u>9</u> |
| Total | 183 | 20 | 182 | 18 | 365 | 38 |

* Data rounded to the nearest whole operation.

Day = 7:00 a.m. to 9:59 p.m.

Night = 10:00 p.m. to 6:59 a.m.

Source: Landrum & Brown, 1998.

Currently, jet aircraft land from the southwest (on Runway 5R) and take off to the northeast (on Runway 5R) approximately 42 percent of the time. Runway 23L traffic arrives from the northeast and departs to the southwest approximately 38 percent of the time. The remainder of the jet aircraft arrivals and departures utilize Runway 34 (northwest flow) approximately 15 percent and Runway 16 (southeast flow) approximately five percent of the time. The prominent use of Runway 5R/23L is due to the longer length of this runway, as well as the prevailing wind direction on an annual basis. Because of its greater length, jet aircraft pilots frequently request Runway 5R/23L for departure even when Runway 16/34 is designated as the preferred runway based upon wind conditions. **Table 1-2** provides the current runway utilization. Additional detail may be found in Appendix A, *Methodology, Baseline Noise Exposure*.

Aircraft approaching or departing the airport follow the general flight corridors illustrated in Exhibits A-1, -2, -3, and -4 of Appendix A. Landing tracks generally follow a straight course to the airport within the area of study, while takeoffs disperse toward their destinations after reaching safe or prescribed altitudes.

The noise pattern presented on Exhibit 1-1 includes 3.89 square miles within the 65 DNL contour. The 65 DNL contour represents the outer boundary of the area considered, under FAA environmental guidelines, to be exposed to significant levels of noise, if the land use is noise-sensitive (residential, schools, churches, etc.). Less sensitive land uses, such as commercial or industrial property or vacant lands, are considered to be compatible with higher levels of aircraft noise exposure. (See the FAA compatibility information in Appendix A, *Methodology, Table A-22*).

The existing Noise Exposure Map indicates that the distribution of noise within the community follows the routes of flight and is larger to the southwest and northeast of the airport than to the southeast or northwest, owing to more frequent use of Runway 5R/23L by jet aircraft. The contour pattern extending from each runway end is symmetrically shaped, reflecting the wide dispersion of flight paths for departing aircraft.

**Table 1-2
RUNWAY UTILIZATION PERCENTAGES - BASELINE CONDITIONS
T.F. Green Airport**

| User Group | Operation | Percentage | | | | | |
|------------------------|------------------|-------------------|------------|-----------|-----------|------------|-------------|
| | | 5R | 23L | 16 | 34 | 5L* | 23R* |
| Commercial Jet | Arrival | 41.5 | 36.4 | 2.1 | 20.0 | n/a | n/a |
| | Departure | 43.8 | 40.8 | 4.4 | 11.1 | n/a | n/a |
| Cargo Jet | Arrival | 46.1 | 32.8 | 1.1 | 20.0 | n/a | n/a |
| | Departure | 36.7 | 40.0 | 2.2 | 21.1 | n/a | n/a |
| General Aviation/ Prop | Arrival | 32.0 | 26.7 | 4.2 | 37.1 | n/a | n/a |
| | Departure | 27.7 | 31.0 | 7.7 | 33.6 | n/a | n/a |
| 1998 | Touch-n-Go | 29.9 | 28.9 | 6.0 | 35.2 | n/a | n/a |
| 2003 | Touch-n-Go | 12.0 | 8.0 | 4.0 | 6.0 | 40.0 | 30.0 |

* Runway 5L/23R is used for propeller Touch-n-Go operations in the future baseline (2003) condition. It was not operational during the current baseline period.

Source: Landrum & Brown and ATCT records, 1998.

To the northwest and the southeast of the airport, the noise pattern falls largely over land uses which are inherently compatible or have been made compatible through noise mitigation programs established by the 1986 Part 150 Noise Compatibility Program. To the southwest and the northeast, the area located within the 65 - 70 DNL contours is mostly incompatible residential land uses. These areas are identified for investigation in this Part 150 Update.

Table 1-3 indicates the number of homes, estimated population, and noise-sensitive facilities that fall within the various levels of noise indicated by the 1998 NEM.

1.2 Future (2003) Baseline Noise Exposure Contour

The baseline noise exposure contours projected for 2003 are presented in **Exhibit 1-2**. These projected contours assume growth as forecasted by the Rhode Island Airport Corporation, supplemented by specific information provided to this study by the airline operators, with no change from the current method of operation. The forecasted growth is presented in **Table 1-4**. The projected 2003 contour retains the same shape of the 1998 baseline, but is smaller despite a 32 percent increase in the number of flights. Its size is moderated by the completion of a transition from mixed FAR Part 36, Stage 2, (older louder) and Stage 3 (newer, quieter) jet aircraft to a fleet composed entirely of Stage 3 jet aircraft. **Table 1-5** indicates the number of homes, estimated population, and noise-sensitive facilities that fall within the various levels of noise indicated by the 2003 Future Baseline.

**Table 1-3
NOISE INCOMPATIBILITY – 1998 EXISTING NEM
T.F. Green Airport**

| | 65-70 DNL | 70-75 DNL | 75 + DNL | TOTAL |
|--------------------------------|------------------|------------------|-----------------|--------------|
| <u>Housing units</u> | | | | |
| Currently In Program | 405 | 490 | 6 | 901 |
| *Not In Program | <u>2,330</u> | <u>111</u> | <u>0</u> | <u>2,441</u> |
| Total | 2,735 | 601 | 6 | 3,342 |
| <u>Population</u> | | | | |
| Currently In Program | 1,050 | 1,332 | 16 | 2,398 |
| *Not In Program | <u>6,041</u> | <u>236</u> | <u>0</u> | <u>6,277</u> |
| Total | 7,091 | 1,568 | 16 | 8,675 |
| <u>Churches</u> | | | | |
| Currently In Program | 0 | 0 | 0 | 0 |
| *Not In Program | <u>2</u> | <u>0</u> | <u>0</u> | <u>2</u> |
| Total | 2 | 0 | 0 | 2 |
| <u>Schools</u> | | | | |
| Currently In Program | 2 | 0 | 0 | 2 |
| *Not In Program | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| Total | 2 | 0 | 0 | 2 |
| <u>Area (Sq. Miles)</u> | 2.29 | 0.92 | 0.68 | 3.89 |

* Not in program - includes all structures and residences outside of the on-going mitigation program from the 1986 NCP.

Source: Landrum & Brown, 1998
Reference: 97bs01

**Table 1-4
AVERAGE DAY OPERATIONS * - 2003
T.F. Green Airport**

| User Group | Arrivals | | Departures | | Total | |
|-------------------|-----------------|--------------|-------------------|--------------|--------------|--------------|
| | Day | Night | Day | Night | Day | Night |
| Air Carrier | 74 | 13 | 76 | 11 | 150 | 24 |
| Cargo | 5 | 2 | 7 | 0 | 12 | 2 |
| Commuter | 61 | 3 | 58 | 6 | 119 | 9 |
| GA/Military | 103 | 5 | 104 | 4 | 207 | 9 |
| Total | 243 | 23 | 245 | 21 | 488 | 44 |

* Data rounded to the nearest whole operation.
Day = 7:00 a.m. to 9:59 p.m.
Night = 10:00 p.m. to 6:59 a.m.
Source: Landrum & Brown assessment of forecasts, 1998.

**Table 1-5
NOISE INCOMPATIBILITY - 2003 FUTURE BASELINE
T.F. Green Airport**

| | 65-70 DNL | 70-75 DNL | 75 + DNL | TOTAL |
|-------------------------|------------------|------------------|-----------------|--------------|
| Housing units | | | | |
| Currently In Program | 747 | 88 | 0 | 835 |
| *Not In Program | 1,151 | 0 | 0 | 1,151 |
| Total | 1,898 | 88 | 0 | 1,986 |
| Population | | | | |
| Currently In Program | 2,018 | 216 | 0 | 2,234 |
| *Not In Program | 2,914 | 0 | 0 | 2,914 |
| Total | 4,932 | 216 | 0 | 5,148 |
| Churches | | | | |
| Currently In Program | 0 | 0 | 0 | 0 |
| *Not In Program | 1 | 0 | 0 | 1 |
| Total | 1 | 0 | 0 | 1 |
| Schools | | | | |
| Currently In Program | 0 | 0 | 0 | 0 |
| *Not In Program | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 |
| Area (Sq. Miles) | 1.59 | 0.58 | 0.53 | 2.70 |

* - Not in Program - includes all structures and residences outside of the on-going mitigation program from the 1986 NCP.
Source: Landrum & Brown, 1998
Reference: 03bs01

2.0 NOISE COMPATIBILITY PROGRAM

The most recent Noise Compatibility Program (NCP) was approved in 1986 and is based upon operating conditions and land use patterns that were present at that time. Measures were set in place that provided for a voluntary curfew for all scheduled takeoffs and landings between Midnight and 6:30 a.m. Additionally, restrictions were imposed on maintenance and pre-flight run-ups, the use of auxiliary power units, and on aircraft repositioning under power or making 180 degree turns on runways. The 1986 NCP also recommended the construction of a fillet at the intersection of Runway 5R with former runway 10/28 and a noise barrier parallel to Runway 5R. These measures were implemented. The philosophy guiding the program was to place restrictions on aircraft operations during the most sensitive period of the night and to provide airfield procedures that reduce the noise exposure to the surrounding community. Land use measures included sound insulation and voluntary acquisition for residential land uses and selected schools. Recommendations also were made regarding zoning and building code amendments to enhance the compatibility of the land uses within the noise contours.

This update of the NCP seeks to further reduce noise exposure to the community by focusing the aircraft noise into predictable corridors that fall over mostly compatible land uses. This is accomplished by identifying departure and arrival routes, by recommending the extension and construction of additional noise barriers, and by recommending the delineation of sound insulation and voluntary acquisition program boundaries to mitigate residences which will fall within areas that will continue to be exposed to significant levels of noise.

The recommended 1999 NCP consists, in part, of measures that were implemented under the 1986 NCP. These measures are recommended either to be continued "as is" or with modification. Some of the new recommended measures may be initiated immediately after approval of the NCP by the FAA, while other new measures must be delayed until the measures are approved in accordance with the National Environmental Policy Act or until Federal funding is available for implementation. All measures may be divided into noise abatement (air traffic and aircraft-specific), land use (both preventive and corrective), and program management (administrative) actions.

NOISE ABATEMENT RECOMMENDATIONS

Noise abatement measures are those which deal with the operation of aircraft either on the airfield or in the air. The recommended update to the approved Noise Compatibility Program includes 33 such measures. These measures are listed below. Eight measures have been carried forward from the approved 1986 Noise Compatibility Program, with one measure being modified. Six measures are recommended for withdrawal from the NCP or have been completed. Nineteen measures are entirely new to this program update. Greater detail on each measure is provided in Chapter 3, *Recommended Noise Compatibility Program Measures*.

Noise Abatement Measures

- **NA-1** Construct fillet at intersection of Runways 5R/23L and 10/28. *Completed.*
- **NA-2** Construct parallel taxiway serving Runway 5R/23L. *Continue Approved Measure.*
- **NA-3** Construct noise barrier parallel to Runway 5R. *Completed.*
- **NA-4** Incorporate noise barrier in the design of air cargo building. *Withdraw Measure.*
- **NA-5** Displace landing threshold on Runway 5L. *Completed.*
- **NA-6** Physical isolation of maintenance run-ups. *Continue Approved Measure.*
- **NA-7** *Voluntary* nighttime restrictions for scheduled air carrier operations (Midnight - 6:00 a.m.). *Continuation with Modification of Approved Measure.*
- **NA-8** Auxiliary power unit restrictions. *Continue Approved Measure.*
- **NA-9** Restrictions on aircraft repositioning under power. *Continue Approved Measure.*
- **NA-10** Pre-takeoff run-up restrictions. *Continue Approved Measure.*
- **NA-11** Informational program on reverse thrust. *Continue Approved Measure.*
- **NA-12** Rotational runway use program. *Withdraw Measure.*
- **NA-13** Helicopter operational procedures. *Withdraw Measure.*
- **NA-14** *Restrictions* on 180 degree turns on runway, unless operationally necessary. *Continue Approved Measure.*
- **NA-15** Discourage engine maintenance run-ups during the period of the voluntary nighttime flight operations curfew of NA-7. *New Measure.*
- **NA-16** Discourage, when safe and practicable, engine start-ups and auxiliary power unit starts prior to the end of the voluntary nighttime curfew of NA-7. *New Measure.*
- **NA-17** Designate FAR 91-53A Close-In Noise Abatement Departure Procedures (NADP's) as developed and applied by each carrier for its own system-wide needs, as the airport's preferred procedure for takeoffs on Runway 5R by Stage 2 jet aircraft and Stage 2 jet aircraft modified to meet Stage 3 noise criteria. *New Measure.*
- **NA-18** Designate FAR 91-53A Close-In Noise Abatement Departure Procedures (NADP's), as developed and applied by each carrier for its own system-wide needs, as the airport's preferred procedure for takeoffs on Runway 23L by Stage 2 jet aircraft and Stage 2 jet aircraft modified to meet Stage 3 noise criteria. *New Measure.*

- **NA-19** Designate FAR 91-53A Close-In Noise Abatement Departure Procedures (NADP's), as developed and applied by each carrier for its own system-wide needs, as the airport's preferred procedure for takeoffs on Runway 16 by Stage 2 jet aircraft and Stage 2 jet aircraft modified to meet Stage 3 noise criteria. *New Measure.*
- **NA-20** Designate FAR 91-53A Close-In Noise Abatement Departure Procedures (NADP's), as developed and applied by each carrier for its own system-wide needs, as the airport's preferred procedure for takeoffs on Runway 34 by Stage 2 jet aircraft and Stage 2 jet aircraft modified to meet Stage 3 noise criteria. *New Measure.*
- **NA-21** Weather and traffic permitting, all southbound jet aircraft departing Runway 5R, turn right to a 080 degree heading until reaching 3 DME (from the PVD VORTAC), before being vectored to assigned heading. Prop and turboprop may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*
- **NA-22** Weather and traffic permitting, all northbound jet aircraft departing Runway 5R turn left as soon as practicable after passing runway end to fly a 360 degree heading until reaching 3 DME (from the PVD VORTAC); before being vectored to assigned heading. Prop and turboprop may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*
- **NA-23** Weather and traffic permitting, all southbound jet aircraft departing Runway 23L, turn left as soon as practicable after passing runway end to a 160 degree heading until reaching 5 DME (from the PVD VORTAC) or intercepting 180 degree radial (whichever occurs first); before being vectored to an assigned heading (if necessary). Prop and turboprop may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*
- **NA-24** Weather and traffic permitting, all northbound jet aircraft departing Runway 23L, turn right as soon as practicable after passing runway end to a 280 degree heading until reaching 3 DME (from the PVD VORTAC); before being vectored to assigned heading. Prop and turboprop may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*
- **NA-25** Weather and traffic permitting, all southbound jet aircraft departing Runway 34, turn right to a 360 degree heading until reaching a position 3 DME north of the PVD VORTAC, before being vectored to assigned heading. Prop and turboprop departures may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*
- **NA-26** Weather and traffic permitting, all northbound jet aircraft departing Runway 34, turn left as soon as practicable after passing runway end to a 330 degree heading until reaching 4 DME (from the PVD VORTAC); before being vectored to assigned heading. Prop and turboprop departures may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*

- **NA-27** Weather and traffic permitting, all southbound jet aircraft departing Runway 16, turn right to a 180 degree heading until reaching 3 DME from the PVD VORTAC, or intercepting the PVD VORTAC 180 degree radial (whichever occurs first), before being vectored to an assigned heading (if necessary). Prop and turboprop departures may be assigned divergent headings at the discretion of Air Traffic Control. *New Measure.*
- **NA-28** Approaching Runway 34, all jet aircraft intercept the final approach course before crossing the shoreline at Rocky Point beach on Warwick Neck (4 DME from the PVD VORTAC). *New Measure.*
- **NA-29** Extend existing noise barrier 500 feet south to the Runway 5R safety area boundary. *New Measure.*
- **NA-30** Construct a 6,500-foot noise barrier (24 foot high wall or earthen berm) along the east side of the airport between Airport Road on the north and the lower Buckeye Brook to the south. *New Measure.*
- **NA-31** Construct a 1,500-foot noise barrier (24 foot high wall or earthen berm) on the east side of Warwick Industrial Drive north of SR-113 from Strawberry Field Road south to the Runway 5R safety area boundary. *New Measure.*
- **NA-32** Construct a 1,600 foot long, 12-foot high noise wall parallel to and on the north side of Strawberry Field Road West along the Airport property line. *New Measure.*
- **NA-33** Designate a run-up position and orientation for maintenance run-up activity. *New Measure.*

LAND USE MANAGEMENT RECOMMENDATIONS

Land use management measures are those that deal with the mitigation of aircraft noise either through the use of preventive or corrective land use management techniques. The recommended update to the approved Noise Compatibility Program includes nine such measures. These measures are listed below. Three measures have been carried forward with modifications from the approved 1986 Noise Compatibility Program while three measures were withdrawn or have been completed. Three measures are entirely new to this program update. Greater detail on each measure is provided in Chapter 3, *Recommended Noise Compatibility Program Measures.*

Land Use Measures

- **LU-1 (Corrective)** Rezone selected residential properties within the 70-75 DNL noise contour. *Withdraw Measure.*
- **LU-2 (Preventive)** Amend the subdivision regulations within the City of Warwick. *Withdraw Measure.*

- **LU-3 (Preventive)** Amend the State of Rhode Island building code to require that new construction and major additions within or immediately adjacent to the 2003 Noise Exposure Map, based on the 65 DNL noise contour of the 2003 NCP, meet an interior noise standard through the use of sound insulation techniques. *Continuation and Modification of Approved Measure.*
- **LU-4 (Corrective)** Modify Measure LU-4 to provide for the voluntary acquisition of approximately 210 residential structures located within or adjacent to the 70 DNL noise contour of the 2003 Noise Compatibility Program. *Continuation and Modification of Approved Measure.*
- **LU-5 (Corrective)** Sound insulate all schools within the 65 DNL of the 1986 NCP. *Completed.*
- **LU-6 (Corrective)** Provide sound insulation for approximately 830 single-family homes, on a voluntary basis, within the 2003 Noise Exposure Map, based on the 65 DNL contour of the 2003 NCP. *Continuation and Modification of Approved Measure.*
- **LU-7 (Preventive)** Implement a formal Fair Disclosure Policy whereby the State of Rhode Island amends the Fair Disclosure Policy legislation to require formal disclosure of noise levels on residential property located within a 65 DNL noise contour and is supplemented by information on aircraft noise levels distributed by airport staff within the community and among the citizens, neighborhood associations, developers, real estate agencies, and lenders. *New Measure.*
- **LU-8 (Preventive)** The City of Warwick's Comprehensive Plan should be updated to address airport influence on the surrounding community; and where appropriate to encourage compatible land uses within the 2003 Noise Exposure Map boundary, based on the 65 DNL noise contour of the 2003 NCP. *New Measure.*
- **LU-9 (Corrective)** Initiate a formal study to evaluate the noise levels at various schools located under heavily used aircraft flight paths for eligibility for sound insulation. *New Measure.*

PROGRAM MANAGEMENT RECOMMENDATIONS

Program management measures are those actions that deal with the implementation and management of either noise abatement or land use management measures. The recommended update to the approved Noise Compatibility Program includes five such measures. These measures are listed below. Greater detail on each measure is provided in Chapter 3, *Recommended Noise Compatibility Program Measures.*

Program Management Measures

- **PM-1** Install an aircraft operations monitoring system to evaluate the efficiency of the implementation of track corridor or runway use programs of the ultimate adopted NCP. *New Measure.*

- **PM-2** Implement a "Fly Quiet" public relations publication and communication program to deliver the message of the NCP to airport users and the public. *New Measure.*
- **PM-3** Establish a Permanent Implementation Committee to monitor/assist in the implementation and success of the air traffic and land use measures approved as a part of the NCP. *New Measure.*
- **PM-4** Continue five-year updates of the NCP and two-year reviews of the NEMs. *New Measure.*
- **PM-5** Conduct further study analyzing the possible extension of Runway 16/34 for noise abatement purposes. *New Measure.*

2.1 Noise Compatibility Program Noise Exposure Map - Future Activity Levels

Upon its approval and implementation, future noise exposure patterns at T.F. Green Airport will be guided by the recommendations of the Noise Compatibility Program. Because the future (2003) NCP map represents the expected future condition of noise exposure, with all newly proposed measures in place, it represents the Noise Exposure Map contours for the future (five-year) condition. Additionally, the 2003 NCP map is representative of the forecasted conditions for 2004.

The implementation of the recommended measures of the NCP would alter the operating conditions at T.F. Green Airport in two ways. First, new flight corridors for noise abatement have been defined for departures off of each runway end and for arrivals to one runway end. These corridors will consolidate aircraft over more predictable and mostly compatible land uses. Greater detail on flight corridor measures is provided in Chapter 3, *Recommended Noise Compatibility Program Measures*, and Appendix A, *Methodology*.

Second, operators of jet aircraft weighing over 75,000 pounds that are classified as FAR Part 36 Stage 2, or are Stage 2 retrofitted to meet Stage 3, will be encouraged to utilize their FAR Part 91-53A designated "Close-In" Noise Abatement Departure Procedure for departures off each runway end. This measure will be effective in the near-term since NADP's have been found to reduce the noise exposure from Stage 2 and retrofit Stage 3 jet aircraft the most. Greater detail on Noise Abatement Departure Procedures is provided in Chapter 3, *Recommended Noise Compatibility Program Measures*, and Appendix A, *Methodology*.

The number of aircraft operations at T.F. Green Airport are not projected to increase over the 2003 future baseline condition as a result of any of the measures recommended in the NCP. Likewise, the types of aircraft operating at the airport are not forecast to change as a result of implementing the NCP measures. Table 1-4 provides the forecasted increase in operations at the airport for the 2003 condition.

Exhibit 1-3 shows the five-year future (2003) NCP/NEM noise contours over the airport environs base map. With the recommended NCP measures in place, a small bulge in the north part of the contour is evident due to the consolidation of the northbound and westbound departures from Runway 5R into the corridor overflying Elmwood Avenue (Route 1). Likewise, the 2003 NCP/NEM contour is smaller than the 2003 baseline along the extended centerline of Runway 5R because the departure traffic has been consolidated over the more compatible corridor. Along the extended centerline of Runway 34, the 2003 NCP/NEM contour is shifted slightly to the south due to the consolidation of the flight corridor. The final difference in the shape of the contours is found to the southwest along the extended centerline of Runway 23L. The 2003 NCP/NEM contour is reduced in length, stopping short of Apponaug Cove and thinner on the east side of the extended centerline. This reduction in size is primarily the result of consolidating the departing aircraft into two corridors going either northwest or southeast. The general decrease of the size of the contour pattern will result in decreases in the number of dwellings, population, and noise-sensitive uses within the contours. **Table 1-6** indicates the projected impacts of the abated 2003 case, assuming the implementation of all measures as recommended in the NCP.

The NCP recommends the inclusion of all units (approximately 830) located within the 65 to 70 DNL contour that are not already eligible for mitigation into the airport's on-going sound insulation program. Additionally, the NCP recommends that approximately 210 single-family residential units located within or adjacent to the 70 DNL contour to be eligible for voluntary acquisition. **Exhibit 1-4** identifies the boundaries of the proposed sound insulation and voluntary acquisition program, as well as the area subject to the State Building Code revision, City of Warwick comprehensive plan amendments, and the requirements of the fair disclosure policy.

**Table 1-6
RESIDUAL NOISE INCOMPATIBILITY AND MITIGATION - 2003 NCP/NEM
T.F. Green Airport**

| | 65-70 DNL | 70-75 DNL | 75 + DNL | TOTAL |
|--------------------------------|------------------|------------------|-----------------|--------------|
| <u>Housing units</u> | | | | |
| Currently In Program | 736 | 92 | 0 | 828 |
| Proposed Mitigation | 947 | 0 | 0 | 947 |
| *Unmitigated Total | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| Total | 1,683 | 92 | 0 | 1,775 |
| <u>Population</u> | | | | |
| Currently In Program | 1,983 | 232 | 0 | 2,215 |
| Proposed Mitigation | 2,447 | 0 | 0 | 2,447 |
| *Unmitigated Total | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| Total | 4,430 | 232 | 0 | 4,662 |
| <u>Churches</u> | | | | |
| Currently In Program | 0 | 0 | 0 | 0 |
| *Not In Program | <u>1</u> | <u>0</u> | <u>0</u> | <u>1</u> |
| Total | 1 | 0 | 0 | 1 |
| <u>Schools</u> | | | | |
| Currently In Program | 0 | 0 | 0 | 0 |
| *Not In Program | <u>0</u> | <u>0</u> | <u>0</u> | <u>0</u> |
| Total | 0 | 0 | 0 | 0 |
| <u>Area (Sq. Miles)</u> | 1.52 | 0.59 | 0.53 | 2.64 |

* Not in Program - includes all structures and residences outside of the on-going mitigation program from the 1986 NCP and those not included in the 1999 NCP Update.

Source: Landrum & Brown, 1999
Reference: 03a115

2.3 Noise Compatibility Program Costs

The direct costs associated with the recommended Noise Compatibility Program measures will be incurred by the Rhode Island Airport Corporation, the City of Warwick, the State of Rhode Island, the FAA, and the airport's users. Costs for completion of the program have been estimated in 1999 dollars and are presented in **Table 1-7**.

The cost of implementation may be divided into recurrent or one-time expenditures, with RIAC and the FAA carrying the majority of responsibility for funding of program measures. Recurrent costs consist of the administrative expenses necessary to implement a continuing measure or operate aircraft in accordance with the recommended measures. One-time costs include the expenditures necessary to implement major mitigation programs such as residential sound insulation, as well as the acquisition of equipment required to implement continuing programs.

The total cost of all NCP recommendations is estimated at approximately \$70,000,000 to \$80,000,000 in one-time expenditures and recurrent administrative costs to RIAC, FAA, and the City of Warwick. However, most mitigation actions recommended for implementation are eligible for Federal matching funds assistance of up to approximately 80 percent of the total program cost. *The costs of each measure are detailed in Chapter 3.*

2.4 Implementation Schedule

Many of the recommended NCP measures may be implemented after the adoption of the program by the Rhode Island Airport Corporation, but others may be subject to approval by others. The FAA approved some measures under the 1986 Part 150 project and their implementation may continue under that approval. Other new measures will require approval of this Noise Compatibility Program by the FAA and their implementation must await that approval. Some of the new measures will result in a direct Federal action (such as air traffic revisions) and must be environmentally evaluated through the preparation of an Environmental Assessment or Environmental Impact Statement. Corrective land use measures that anticipate federal funding as a means of their implementation also require Federal approval.

Some measures do not require Federal participation nor are they eligible for Federal funding and consequently, may be implemented without delay after approval by the appropriate governing bodies (RIAC or the City of Warwick). Noise mitigation actions will typically require longer implementation periods, owing to the number of dwelling units included within the program boundaries and the construction efforts associated with sound insulation and voluntary acquisition measures, as well as the amount of time necessary to assure the proper response to each unit and the availability of funds from the FAA.

**Table 1-7
NCP IMPLEMENTATION COSTS
T.F. Green Airport**

| Type of Measure | Cost to Airport | Direct Cost to Local Government | Direct Cost or (Savings) to RIAC, FAA, and ATCT |
|-------------------------|---|--|--|
| Noise Abatement | \$10,000,000 -Parallel Taxiway for 5R/23L \$ 125,000 -Air Traffic EA/EIS \$ 5,380,000 -Construction of Berm/Walls \$ 100,000 -Construction of Runup Pad | \$0 | \$15,605,000 |
| Land Use and Mitigation | \$31,500,000 -Voluntary Acquisition \$24,900,000 -Sound Insulation \$ 635,000 - School Sound Insulation | \$0 | \$57,035,000 |
| Program Management | \$ 500,000 -Aircraft Operations Monitoring System \$ 50,000 -"Fly-Quiet" Brochure \$ 400,000 to \$500,000 -Periodic Update of NEM/NCP Documents \$ 50,000 - Runway 16/34 Extension Feasibility Study | \$0 | \$1,100,000 |
| Total | \$70,000,000 - \$80,000,000 | \$0 | \$73,740,000 |

Source: Landrum & Brown, 1999

In general, the noise abatement (air traffic) actions may be initiated on approval of the NCP by the FAA, will be evaluated within the EA/EIS, and may be in place within a year of approval. The noise mitigation actions will be implemented over a period of several years, beginning on approval of the NCP by the FAA and the identification and commitment of funding by both RIAC and the FAA. Mitigation actions are continuing from the previous NCP (sound insulation programs) and will continue unimpeded by the approval process for the updated NCP. **Table 1-8** displays a general schedule of implementation for the recommended Noise Compatibility Program measures.

Implementation of new measures is expected to begin on approval of the revised NCP and expeditiously pursued to completion. A general rather than specific schedule of implementation is recommended owing to the continuing uncertainty of matching fund availability. The priorities for specific project implementation should be a topic of consideration by the Permanent Implementation Committee (PM-3).

A more detailed description of the implementation plan is suggested in Chapter 3, *Recommended Noise Compatibility Program Measures*.

**Table 1-8
NCP IMPLEMENTATION SCHEDULE
T.F. Green Airport**

| <u>Recommended Measure</u> | <u>Responsible Implementing Parties</u> | <u>Dates of Implementation</u> |
|--|---|--------------------------------|
| Currently approved and completed Noise Abatement Measures (NA-1, 3, 5, 6, 8, 9, 10, 11, and 14) | RIAC, aircraft operators | In place |
| Currently approved Noise Abatement Measures recommended for withdrawal (NA-4, 12, 13) | Not Applicable | Immediately |
| Continue approved Measure NA-2 for a parallel taxiway serving Runway 5R/23L | RIAC | 2003 |
| Modify approved Measure NA-7 placing voluntary restrictions on scheduled air carrier operations (Midnight - 6:00 a.m.) | RIAC, aircraft operators | In place |
| Discourage maintenance run-ups (NA-15) and engine start-ups (NA-16) during the voluntary curfew of NA-7 | RIAC, aircraft operators | 1999 |
| Designate "Close-In" NADP's from each runway end (NA-17, 18, 19, 20) | RIAC, aircraft operators | Continuing from 1998 |
| Establish noise abatement flight corridors from each runway end for departing aircraft (NA-21, 22, 23, 24, 25, 26, 27) | RIAC, FAA Air Traffic Control, aircraft operators | 2000 |
| Establish noise abatement flight corridors for aircraft landing on Runway 34 (NA-28) | RIAC, FAA Air Traffic Control, aircraft operators | 2000 |
| Construct or extend noise barriers along perimeter of airport (NA-29, 30, 31, 32) | RIAC | 2000-2003* |
| Design and construct run-up pad and establish run-up procedures (NA-33) | RIAC, aircraft operators | 2001 |
| Withdraw Land Use Measures (LU-1, -2, 5) | Not Applicable | Immediately |
| Continue with modifications LU-3 to amend the State Building Code to reflect airport's area of influence | State of Rhode Island, City of Warwick | 2000 |
| Continue with modifications LU-4 to provide voluntary acquisition for homes within or adjacent to the 70 DNL of the 2003 NEM | RIAC, FAA | 2000-2003* |
| Continue with modifications LU-6 to provide sound insulation for homes within the 2003 NEM | RIAC, FAA | 2000-2003* |
| Implement a formal and informal fair disclosure policy to notify residents of potential impacts by the airport (LU-7) | State of Rhode Island, RIAC | 2000 |
| Update City of Warwick Comprehensive Plan to encourage compatible development within the 2003 NEM (LU-8) | City of Warwick, RIAC | 2000-2001 |

**Table 1-8 (Continued)
NCP IMPLEMENTATION SCHEDULE
T.F. Green Airport**

| <u>Recommended Measure</u> | <u>Responsible Implementing Parties</u> | <u>Dates of Implementation</u> |
|---|---|--------------------------------|
| Study the impact of overflights on the schools within or near the 65 DNL of the 2003 NEM and offer sound insulation to those schools found to be severely impacted (LU-9) | RIAC | 2000 |
| Install Aircraft Operations Monitoring System to evaluate effectiveness of NCP (PM-1) | RIAC, State of Rhode Island | 1999 |
| Distribute "Fly-Quiet" document to pilots and public detailing noise abatement measures of the NCP (PM-2) | RIAC | 2000 |
| Establish committee to monitor/assist implementation of NCP (PM-3) | RIAC | 1999 |
| Five year updates of NCP and two year updates of NEMs (PM-4) | RIAC | 2001-2004 |
| Further study of extension to Runway 16/34 for noise abatement purposes (PX-5) | RIAC | 2000-2001 |

* The Permanent Implementation Committee (PM-3) will assist RIAC in determining the schedule and priority of implementing this measure.
Source: Landrum & Brown, 1999.