

The Part 150 Assessment

Purpose

The purpose of this report is to analyze the results of the Part 150 *Airport Noise Compatibility Study* done for Piedmont Triad International Airport (PTIA), which has been completed and accepted by the Federal Aviation Administration (FAA), and determine if any changes to the city's Airport Overlay District are warranted. This report presents the Part 150 Study's conclusions and staff's resulting recommendations for changes to the overlay zone district regulations. In addition, as noise impacts change over time, new studies will need to be conducted and the overlay district and the Land Use Plan will have to be analyzed and adjusted as needed. For example, as a result of the Part 150 Study's noise mitigation measures, the *Northwest Area Plan* recommended amendments to the city's Land Use Plan to reflect altered flight tracks and changing noise impacts from PTIA.

Background

In 1998, a citizens committee was formed to create a plan for the Johnson Street/Sandy Ridge Road area. The study area included approximately 6,000 acres on both sides of Sandy Ridge Road and Johnson Street between Interstate 40 and Skeet Club Road. The announcement that PTIA was chosen as the intended location of a FedEx regional package sorting hub, which would require the construction of a third runway parallel to the primary runway, was one impetus to doing the plan at that time.

The committee understood that noise from the proposed third runway presented the potential for severe impacts on noise sensitive uses such as residential development, schools and churches. However, the committee was faced with the difficulty of recommending a land use plan that responded to this potential impact without knowing exactly where it would be most strongly felt. This was because the Environmental Impact Statement (EIS) on the project, which would have contained this information, was delayed several times. As a result, the *Johnson Street/Sandy Ridge Road Area Plan* was adopted in April 2000 with a set of interim land use recommendations, including a large increase in the amount of land designated for industrial use in the northern High Point Planning Area, which resulted in a reduction in the amount of land designated for residential use.

After the final EIS was made available in December, 2001, city staff researched solutions; and in August, 2002, staff released the *Aircraft Noise and Land Use Planning* report, which reviewed the issues and presented some possible options. However, the information released in the EIS and researched by staff was not sufficient to develop adequate land use solutions. The report recommended hiring an acoustical consultant to analyze the situation and to make recommendations to address anticipated nighttime noise impacts.

In the fall of 2002, the city hired Wyle Laboratories, Inc. The acoustical consulting firm presented its findings and recommendations in a report in February 2003. The Wyle

Report notes that DNL, which is the metric most commonly used in calculating potential noise impacts from airports (especially when determining which residents may be entitled to compensation for those impacts), is based on a day-night, 24-hour average noise level. As such, it may under-represent the effects of nighttime flight operations. Flights generated by the cargo hub will take place at night over north High Point, when most residents will be asleep. The report concludes that estimating and mitigating the effects of aircraft noise would be more effective and accurate if the program were based on the number of individual nighttime noise occurrences above certain benchmark noise levels. This noise measurement method is termed, "Number of Events Above," or NA. Based on the NA method, the study defined a noise impact area where the proposed nighttime aircraft noise events on a typical night can affect sleep. In this noise impact area under existing conditions, 2 percent or more of the population will experience various levels of sleep disturbance (i.e. delaying the onset of sleep, changes in stages of sleep, or waking up). It is impossible to eliminate sleep disturbance (i.e. personal needs, indoor noise sources, etc.). However, there are steps that can be taken to reduce the number of people experiencing sleep disturbance due to aircraft noise.

City Council directed staff to pursue the implementation of the recommendations, which included amending the *Land Use Plan*. In August 2003, City Council adopted the current Airport Overlay District boundaries (shown on Map 1) and regulations, which are based on the 2003 Wyle Report, in order to protect existing and proposed land uses.

The Airport Overlay District boundaries are based on noise contours that radiate outward from the airport's runways and which indicate specific decibel levels – an average reading in the case of DNL contours and NA Contour lines at which a number of individual aircraft flights generate noise at a specific decibel level. However, the district boundaries do not exactly coincide with the noise contours. Instead, they are tied to features on the ground that can be easily identified, often streets or streams. This accomplishes two things: first, determining a particular location or development proposal in relation to one or more of the zones is made simple; second, drawing the boundaries loosely allows changes in flight patterns over time to be accommodated without frequently being forced to alter planned land use patterns within the Airport Overlay District.

The four zones have the following requirements:

- Zone 1: The intent of Zone 1 is to prevent the development of land uses sensitive to objectionable noise resulting from daytime and nighttime aircraft flights and those land uses that could pose safety hazards to aircraft and to large groupings of people on the ground such as schools and hospitals. No new residential uses are allowed. Zone 1 boundaries are based on a contour representing average daily sound levels of 65 decibels. This is referred to as the 65 DNL contour and is shown on Map 6.
- Zone 2: The intent of Zone 2 is to prevent the development of land uses sensitive to objectionable noise resulting from nighttime aircraft flights. No new residential uses are allowed. The boundaries of Zone 2 are based on the NA (number above) metric, or the number of individual flights that exceed the NA 90(1)

decibel level. Maps 4 and 5 show NA noise contours from the 2003 Wyle Report and the Part 150 Study, respectively, on which Zones 2, 3 and 4 of the current and proposed Airport Overlay District are based.

- Zone 3: The intent of Zone 3 is to protect new residential uses and their residents by reducing the interior level of objectionable noise resulting from nighttime aircraft flights. This goal is accomplished through the construction design standards. The boundaries of Zone 3 are based on the same metric as those of Zone 2. The area included in Zone 3 would have been part of Zone 2, except for the fact that the pattern of development was already established as residential in nature. There were also environmental considerations (i.e. watershed critical area).
- Zone 4: The intent of Zone 4 is to protect new residential uses and their residents by reducing the interior level of objectionable noise resulting from nighttime aircraft flights through the requirement for central heating and air conditioning. Residents are thus able to keep their windows closed during hot summer nights. The boundaries of Zone 4 are based on the NA 85(2) metric.

In all zones, potential buyers of property must be notified of possible noise from aircraft overflights. A waiver of claim is required for all subdivisions of land within the Airport Overlay District. The waiver is executed by the owner of the property for the benefit of the city, and it waives all existing and future owners' right to any claim or cause of action against the city in connection with adverse aircraft noise impacts or other consequences of the district's noise mitigation requirements.

The Part 150 Study

The Land Use Plan amendments, zoning regulations and, especially, the overlay district boundaries were adopted prior to the Part 150 Study, also known as an *Airport Noise Compatibility Study*. This study, which was funded by a grant from the FAA, sought to reduce the impact of airport operations on neighborhoods surrounding the airport. It was anticipated that further regulatory changes and amendments to the Land Use Plan might be required based on the results of the study.

The study looked at four basic components:

- Airport Plan - the layout of the airport and its physical facilities;
- Airport and Airspace Use - airport operational activities;
- Land Use - the impacts of airport operations on its surroundings; and
- Noise Program Management - ways in which noise impacts are managed over time.

A number of scenarios were created under the methodology of the study using a variety of configurations of flight arrival and departure patterns, runway assignments, flight paths, aircraft mix and other aspects of the proposed operation. In this case, the planned peak operational year of 2014, with 126 departures/landings, was used to

analyze the potential impacts on the airport's surroundings and develop mitigation measures.

The study began in 2004. Three committees were appointed to review the airport layout, flight procedures and land use around the airport. The committees (which included residents living near the airport, elected and appointed government officials and airport tenants) were led by a consultant and met regularly for more than two years to determine how best to reduce airport noise in the neighborhoods surrounding the airport.

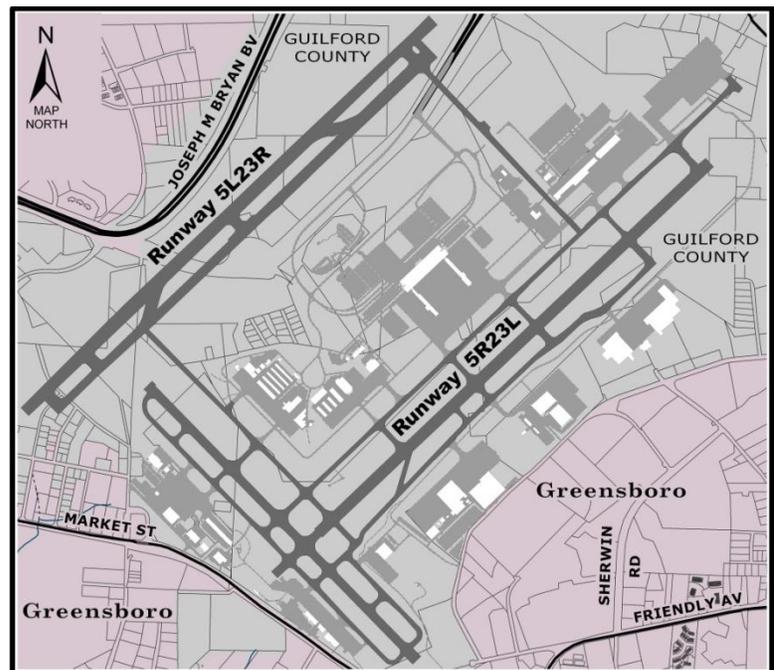
The Part 150 Study had two products:

- A set of Noise Exposure Maps (NEMs); and
- A number of mitigation measures collectively known as the Noise Compatibility Program (NCP).

The committees, with the aid of the consultant, developed the NEMs and the NCP. The NCP includes 21 measures: one under the Airport Plan component; 12 under the Airport and Airspace Use component; five under the Land Use component; and three under the Noise Program Management component. One of the important assumptions used in developing the NCP was that Boeing 727s would continue to be a part of FedEx's fleet in 2014. These aircraft are the noisiest of all aircraft serving the air cargo hub. They will eventually be replaced by quieter planes.

The NEMs and NCP were accepted by the FAA in June and November, 2008, respectively. For the purposes of this report and the proposed new Airport Overlay District boundaries, the following four measures, all from the Airport and Airspace Use component of the NCP, are the most important. They are summarized as follows:

- Preferred Night Runway Use – When weather and other conditions permit, all FedEx flights, which are primarily nighttime flights, will arrive on runways 5L and 5R and depart from runways 23L and 23R (see Figure 1 for a diagram of the airport). That is, flights will



generally land from the south and depart to the south, over north High Point. Where feasible, arrivals should be split between left and right runways. Departures are assigned under the next measure.

- Night Runway Use Assignment – All departing 727s (Retrofitted Stage 3 aircraft) should use the new runway, 23R. That is, departing 727s should take off from the new runway toward the southwest. Departing aircraft other than 727s (New Stage 3 aircraft) should be assigned to runways according to their destinations.
- Night Southbound Departure Corridor from Runway 23L – Aircraft departing from runway 23L for southern destinations should use a new nighttime flight path east of and parallel to NC 68. A left turn onto this flight path should be made as soon as practicable.
- Night Departure Procedures from Runway 23R - Aircraft departing runway 23R at night and turning right toward western destinations shall initiate the right departure turn as soon as practicable.

There are two other measures that involve the Piedmont Triad Airport Authority (PTAA) requesting that the FAA Air Traffic Control Tower personnel direct all jet aircraft arriving at the airport to maintain optimal altitudes while landing to minimize noise impacts on the ground.

The effect of the mitigation measures described above is to minimize somewhat the noise impacts from night aircraft departures from the two runways. The new runway, 5L/ 23R will accommodate all departing 727s, placing the noisiest aircraft over the currently least-inhabited part of north High Point. Departing flights from the existing runway 5R/ 23L shift to the east, impacting less on residential areas and more on industrial areas. The emphasis on departing aircraft is due to the fact that landing jet aircraft from the FedEx fleet, no matter the type, generate similar noise profiles.

The nighttime departure flight tracks recommended in the Part 150 Study that are most pertinent to High Point are shown on Map 7.

Implementation of the recommendations of the Part 150 Study is underway. The standard arrivals and departures flight tracks are in use. For example, all southbound departures from runway 5R/23L immediately turn due south along the Highway 68 corridor and remain on that heading until an altitude of 4,000 feet is attained. In addition, in January 2011, a Request for Proposals for a Noise and Operations Monitoring (NOM) system will be sent to vendors. An NOM system is a high-tech, computerized system used to accurately gauge the actual noise impacts of individual flights. It is hoped that the system will be in place in April or May of 2011. A Part 150 Study must be performed every five years, so the next one should begin in 2012.

As this report was being written, PTIA officials announced that an updated airport master plan had been developed. Map 8 depicts the 2010 PTIA Master Plan update, illustrating potential airport growth both in physical size, from 4,000 acres to 6,300 acres, and in operations. Growth is shown in three phases:

- Phase 1(0 to 10 years) – acquisition of 317 acres, new control tower, various equipment and facility upgrades, expansion of original runway, site preparation for FedEx next phase. Phase 1 anticipates construction of I-73 and a major new aviation tenant requiring a new taxiway crossing Bryan Boulevard.
- Phase 2 (beyond 10 years) – acquisition of 742 acres, additional tenants, need to abandon Bryan Boulevard as a public right-of-way.
- Phase 3 (beyond 30 years) – acquisition of 1,247 acres, potential for a third parallel runway, relocate NC 68 to the west with a new interchange with I-73

Land use designations shown on Map 8 are from the recommendations in the *Northwest Area Plan*. Staff has reviewed future airport expansion plans, particularly for a third parallel runway. The potential new runway alignment validates the need to maintain a solid industrial and commercial land use pattern that prevents the establishment of noise sensitive land uses in Sandy Ridge Rd./I-40 area.

The potential third runway is anticipated to be 30+ years in the future. If the runaway moves closer to reality, then the noise impacts will need to be studied based on the current technology of aircraft and the potential flight mix at that time. At this time it appears the best course of action for the city is to continue following and adjusting as needed its land use policy and airport overlay district to aid in mitigating existing and future noise impacts.

The Airport Overlay District

The purpose of the city's Airport Overlay District is to minimize the impact on future land use of aircraft noise associated with the FedEx air cargo sorting hub at PTIA. Now that the recommendations of the Part 150 Study are approved and can be analyzed, the boundaries can be fine-tuned accordingly. The boundaries of the existing Airport Overlay District are generally NC 68 and Pegg Road on the east, Interstate 40 on the north, the Guilford County/Forsyth County line and Sandy Ridge Road on the west, and Skeet Club Road on the south (see Map 1).

Based on the results of the Part 150 Study, staff recommends revisions to the overall boundaries of the district and adjustments to individual zones. The proposed new district boundaries are generally Tarrant Road and Pegg Road on the east, Chimney Rock Road and Interstate 40 on the north, Bunker Hill Road and the Guilford County/Forsyth County line on the west, and Skeet Club Road on the south (see Map 2).

The boundaries of Zones 2, 3 and 4 are proposed to change solely due to the increase in nighttime aircraft noise (see Map 5) and the nighttime noise mitigation measures in the NCP. The boundaries of Zone 1 are proposed to remain the same because they are based on daytime noise impacts and the daytime impacts will not change. The recommended boundary changes are shown on Map 2. They result in significant regulatory changes in three areas, labeled A, B and C, which are shown on Map 3.

- Area A: Area A, as shown on Map 3, is adjacent to I-40. In this area, Zone 2 is considerably reduced in size with most of its former area being replaced by Zone 4. The current boundary of Zone 2 is the result of a proposal made during the 2003 ordinance adoption process that departing flights from the new runway to the south and west be directed to use the I-40 corridor until well away from High Point. The desire was to quickly shift noise away from the city. This proposal was not accepted in the Part 150 Study; therefore, the highly restrictive Zone 2 can be reduced in size. Zone 4 is recommended to replace Zone 2 in most of Area A, as noise impacts from nighttime flights are still anticipated. The area west of Bunker Hill Rd. is recommended to be removed from the Airport Overlay Zone.
- Area B: Area B is generally located in the northwest quadrant of the intersection of Kendale and Skeet Club Rds. Zone 4 is recommended for expansion south to Skeet Club Rd. due to the mitigation measure in the NCP restricting the noisiest component of the jet fleet to the new runway for departures. Also in Area B, Zone 3 is recommended to expand from Sandy Ridge Rd. west to the Deep River. As in the existing Zone 3, only new construction will be affected by the interior noise reduction design measures.
- Area C: Area C is generally located between NC 68 and Tarrant Rd north of Wendover Ave. In area C, Zone 2 is recommend to extend east along Federal Dr. to Chimney Rock Rd. and Zone 4 is recommended to extend east to Tarrant Rd. and south to Wendover Ave. These recommendations are due to the mitigation measure in the NCP directing departing southbound flights from Runway 23L toward the southeast to follow the NC 68 Corridor until an altitude of 4,000 feet is reached.

Table 1, indicates the acreages of each zone in the existing and proposed Airport Overlay District.

Table 1

EXISTING OVERLAY DISTRICT		PROPOSED OVERLAY DISTRICT	
Zone 1	1,463acres	Zone 1	1,463 acres
Zone 2	2,415 acres	Zone 2	1,810 acres
Zone 3	1,013 acres	Zone 3	1,985 acres
Zone 4	3,900 acres	Zone 4	6,046 acres

Appendix 1 provides a brief summary of the Airport Overlay District requirements. More information can be found at http://www.highpointnc.gov/plan/airport_noise.cfm

Appendix 1

Summary of Airport Overlay District Requirements

The Airport Overlay District was designed to apply as an overlay zoning district on top of existing zoning districts. The underlying zoning district determines the general use and development standards. The Airport Overlay District is intended to: facilitate orderly development within the vicinity of the Piedmont Triad International Airport, ensure land use compatibility by protecting noise sensitive land uses from objectionable aircraft noise impacts, mitigate noise impacts from aircraft over-flights, and contribute to the safe operation of the airport. Therefore, the overlay district prohibits certain uses and establishes specific standards to ensure potential aircraft noise is lessened.

Requirements by Zone

The district is divided into 4 different zones that have different noise mitigation standards. A description of each zone follows:

Zone	Notification	Waiver of Claim	Prohibited Uses	NLR Design Standards ¹ 30dB NLR
1	X	X	X	
2	X	X	X	
3	X	X	X	X
4	X	X		

1. NLR is Noise Level Reduction.

Zone 1: The intent of Zone 1 is to prevent the development of land uses sensitive to objectionable noise resulting from daytime and nighttime aircraft flights. It is based on the 65Dnl contour. No new residences are allowed, new daytime noise sensitive uses like schools are prohibited, and certain uses presenting safety concerns are barred. Owners of residential properties are required to provide notification of potential aircraft overflight noise to prospective purchasers and a notification statement is required on all final subdivision plats of property.

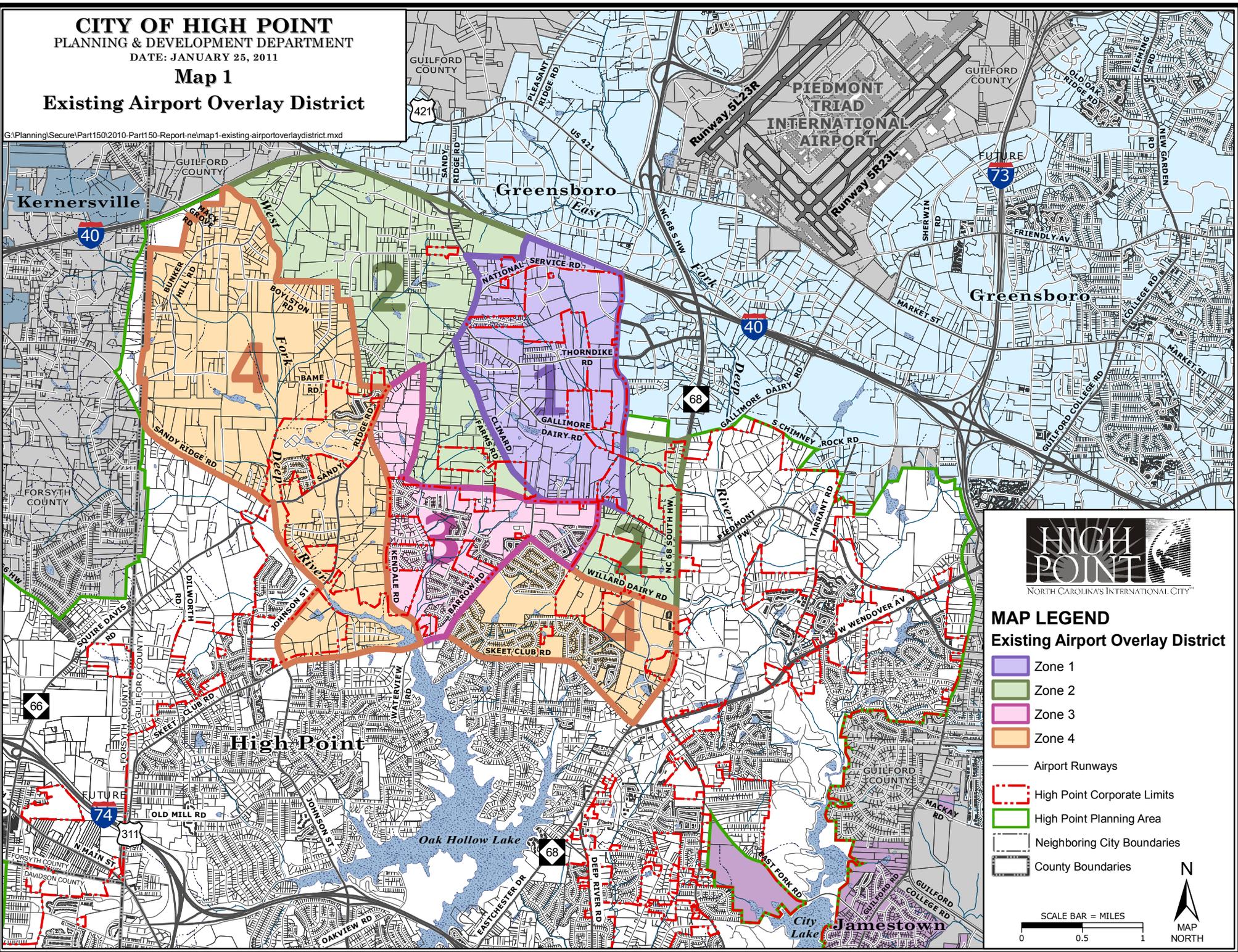
Zone 2: The intent of Zone 2, which is based on the NA90(1) contour, is to prevent the development of land uses sensitive to objectionable noise resulting from nighttime aircraft flights. No new residences are allowed. Owners of residential properties are required to provide notification of potential aircraft overflight noise to prospective purchasers and a notification statement is required on all final subdivision plats of property.

Zone 3: The intent of Zone 3, which is based on the NA 90(1) contour, is to protect residents by reducing the interior level of objectionable noise resulting from nighttime aircraft flights. New residences in new subdivisions are required to meet design standards that reduce interior sound levels by 30 decibels (dB). Owners of residential properties are required to provide notification of potential aircraft overflight noise to prospective purchasers and a notification statement is required on all final subdivision plats of property.

Zone 4: The intent of Zone 4 is to provide public notification of potential night time aircraft noise impacts. Owners of residential properties are required to provide notification of potential aircraft overflight noise to prospective purchasers and a notification statement is required on all final subdivision plats of property.

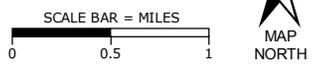
CITY OF HIGH POINT
 PLANNING & DEVELOPMENT DEPARTMENT
 DATE: JANUARY 25, 2011
Map 1
Existing Airport Overlay District

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MAP LEGEND
Existing Airport Overlay District

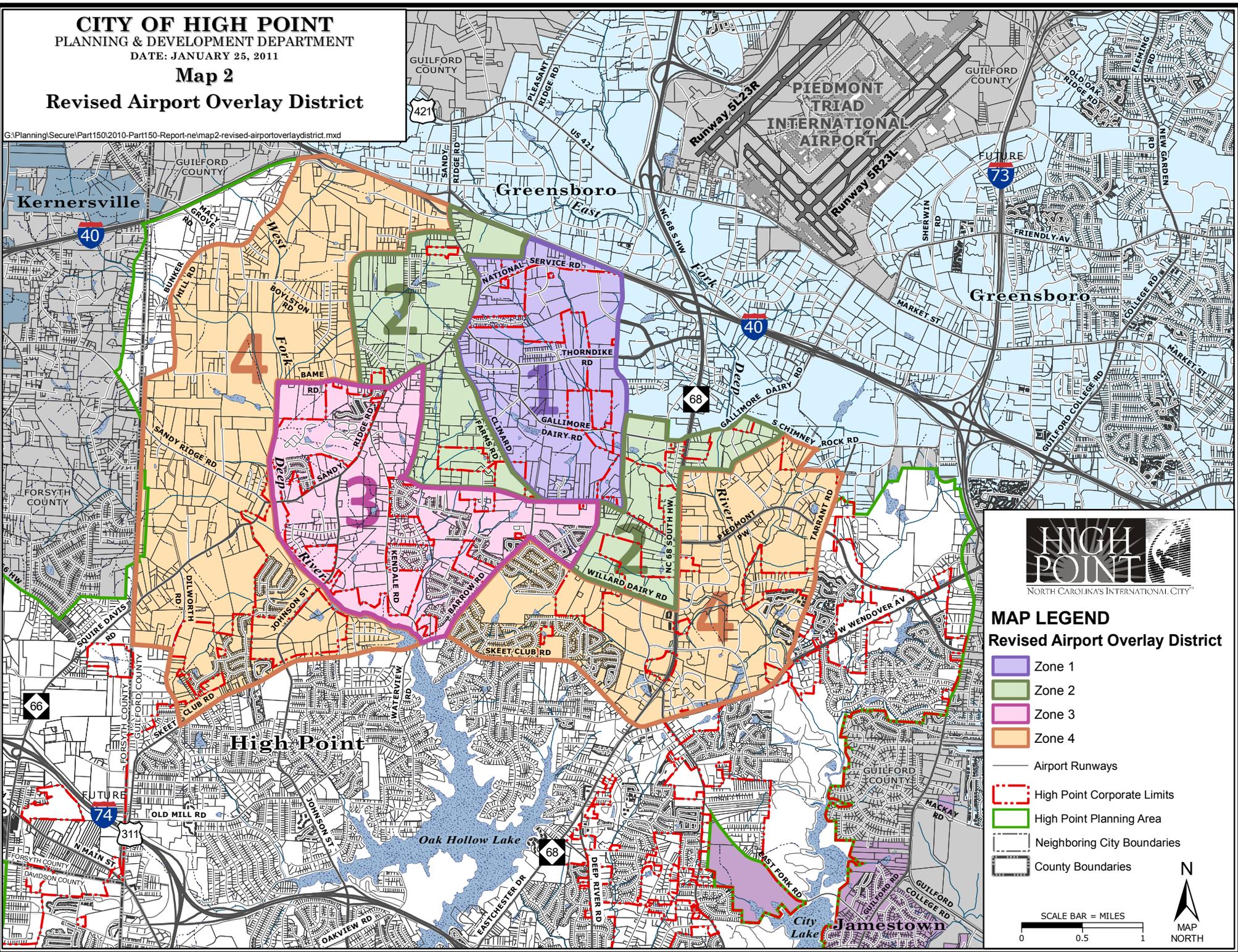
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Airport Runways
- High Point Corporate Limits
- High Point Planning Area
- Neighboring City Boundaries
- County Boundaries



CITY OF HIGH POINT
 PLANNING & DEVELOPMENT DEPARTMENT
 DATE: JANUARY 25, 2011

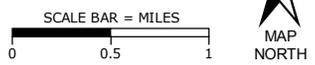
Map 2
Revised Airport Overlay District

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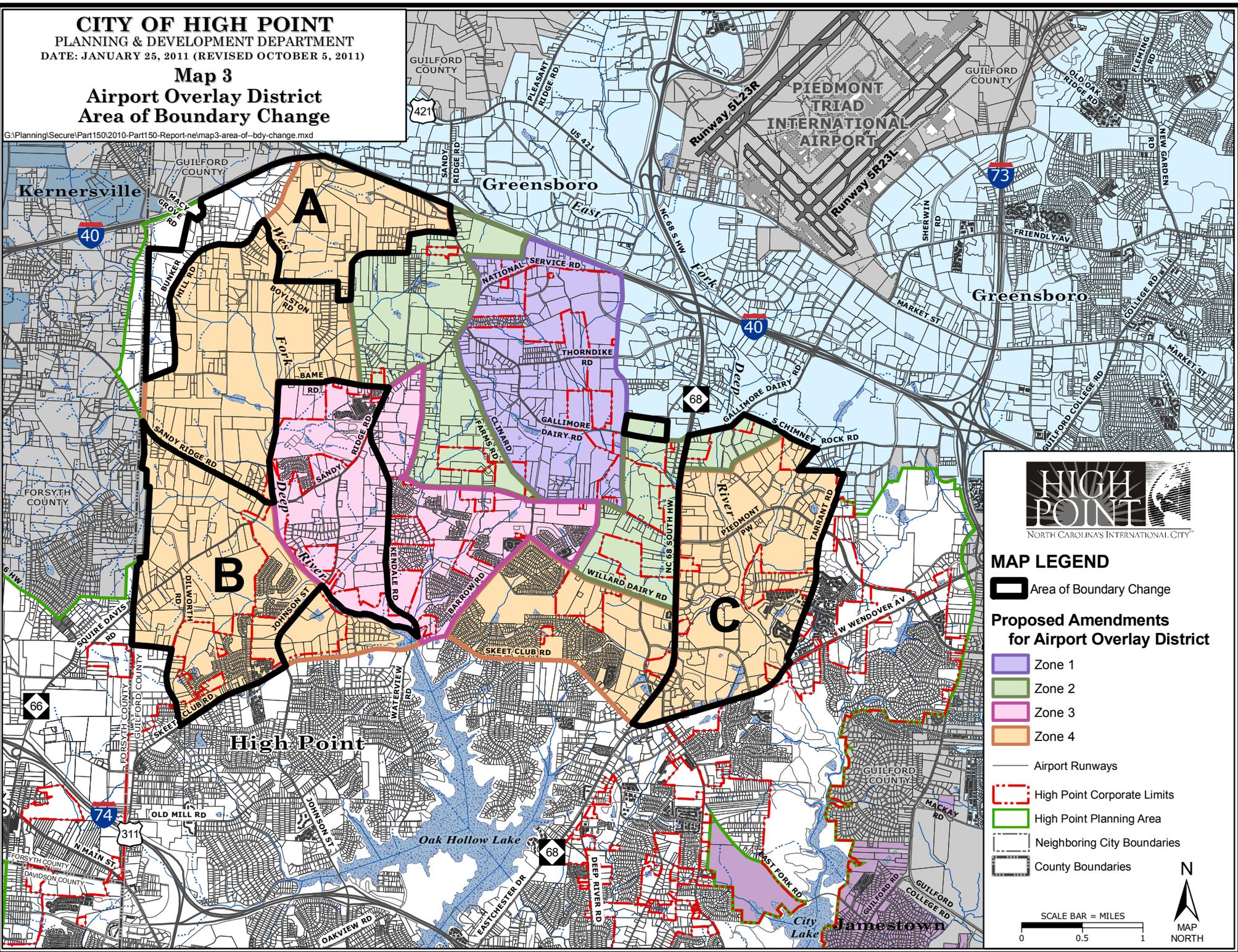
MAP LEGEND
 Revised Airport Overlay District

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Airport Runways
- High Point Corporate Limits
- High Point Planning Area
- Neighboring City Boundaries
- County Boundaries



Map 3
Airport Overlay District
Area of Boundary Change

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MAP LEGEND

Area of Boundary Change

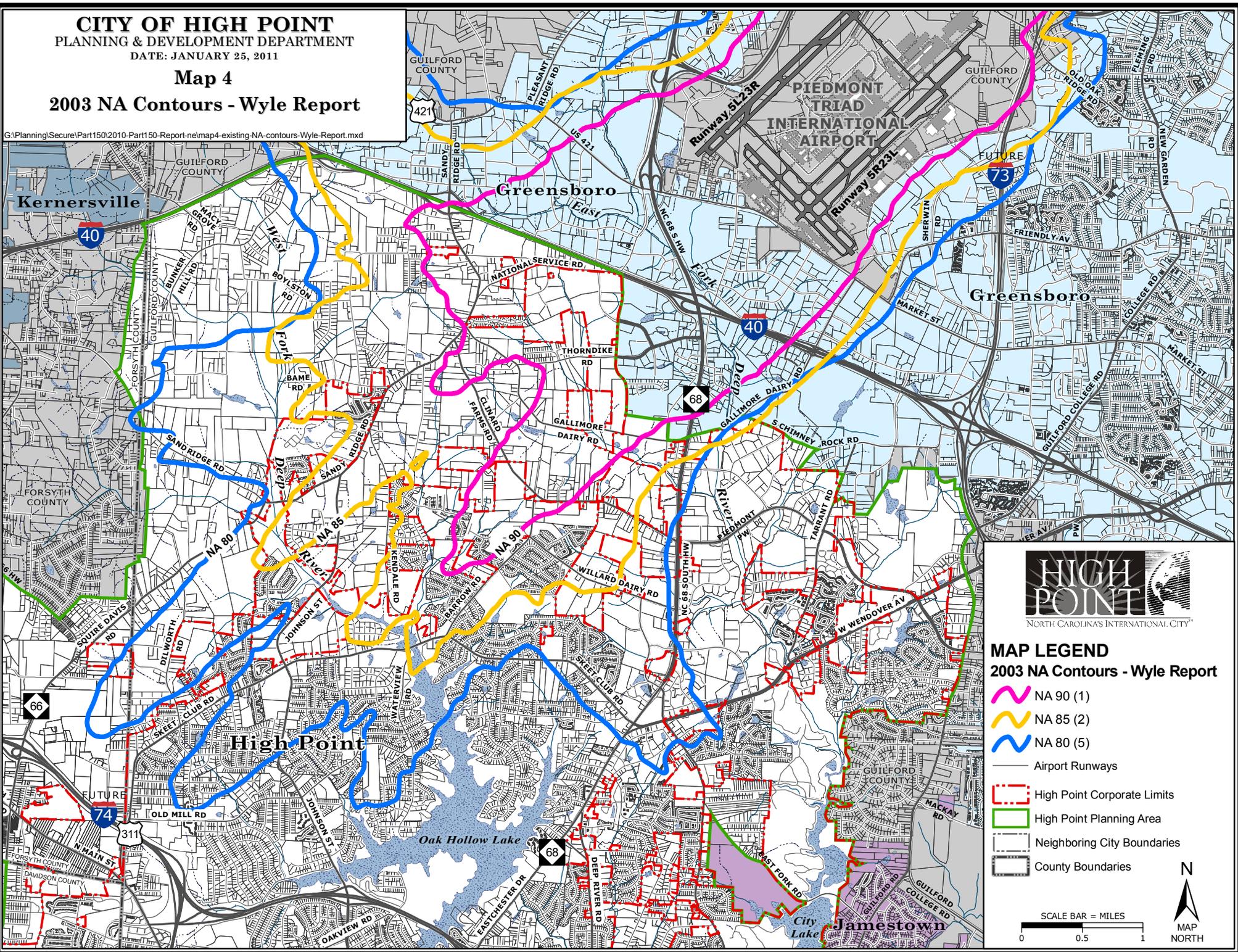
Proposed Amendments for Airport Overlay District

- Zone 1
 - Zone 2
 - Zone 3
 - Zone 4
 - Airport Runways
 - High Point Corporate Limits
 - High Point Planning Area
 - Neighboring City Boundaries
 - County Boundaries
- SCALE BAR = MILES
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- N
 MAP NORTH

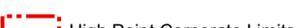
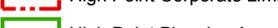
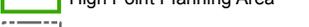
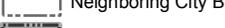
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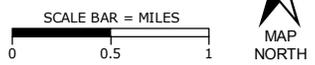
Map 4
2003 NA Contours - Wyle Report

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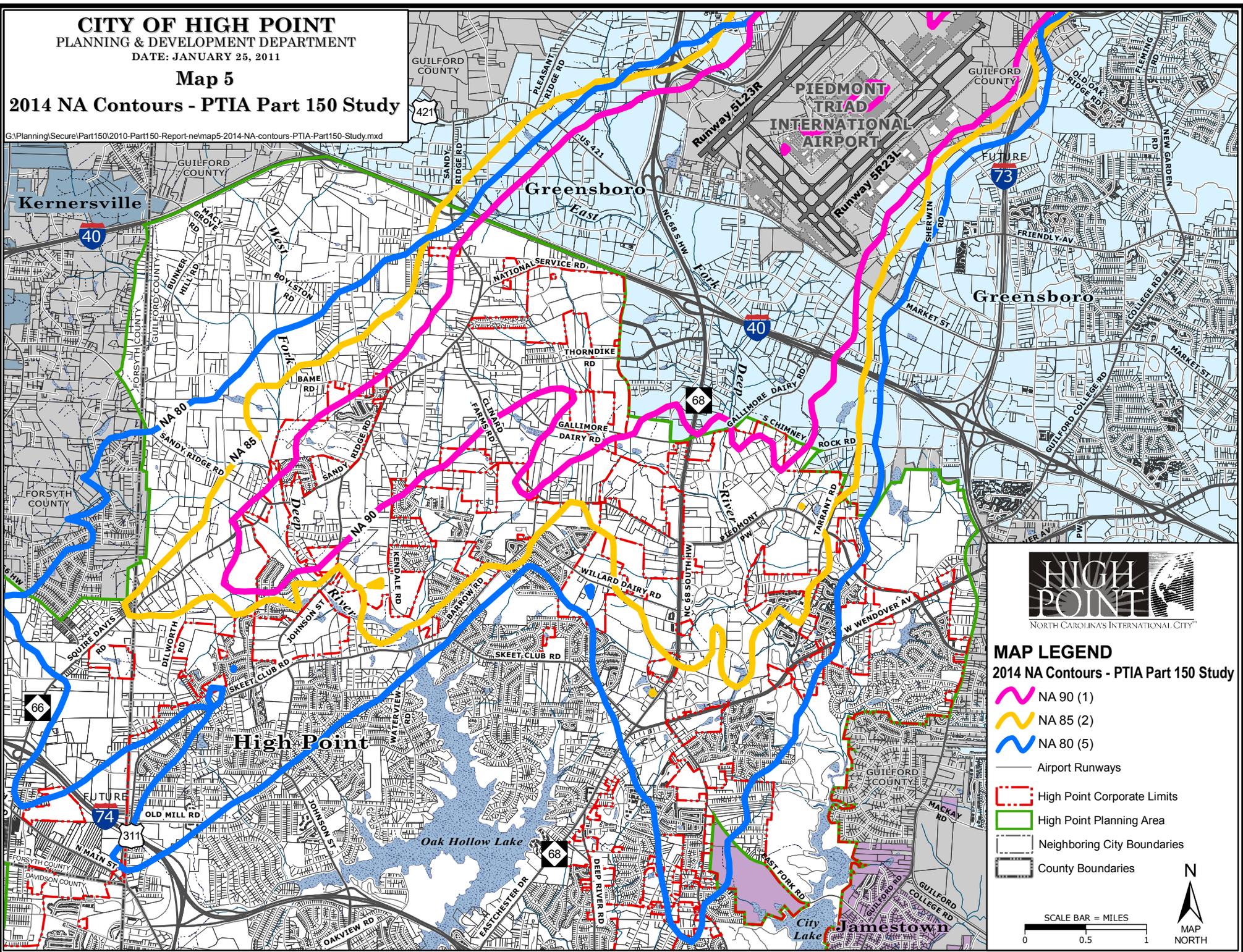
MAP LEGEND
2003 NA Contours - Wyle Report

-  NA 90 (1)
-  NA 85 (2)
-  NA 80 (5)
-  Airport Runways
-  High Point Corporate Limits
-  High Point Planning Area
-  Neighboring City Boundaries
-  County Boundaries

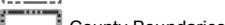


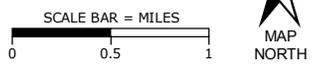
Map 5
2014 NA Contours - PTIA Part 150 Study

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MAP LEGEND
 2014 NA Contours - PTIA Part 150 Study

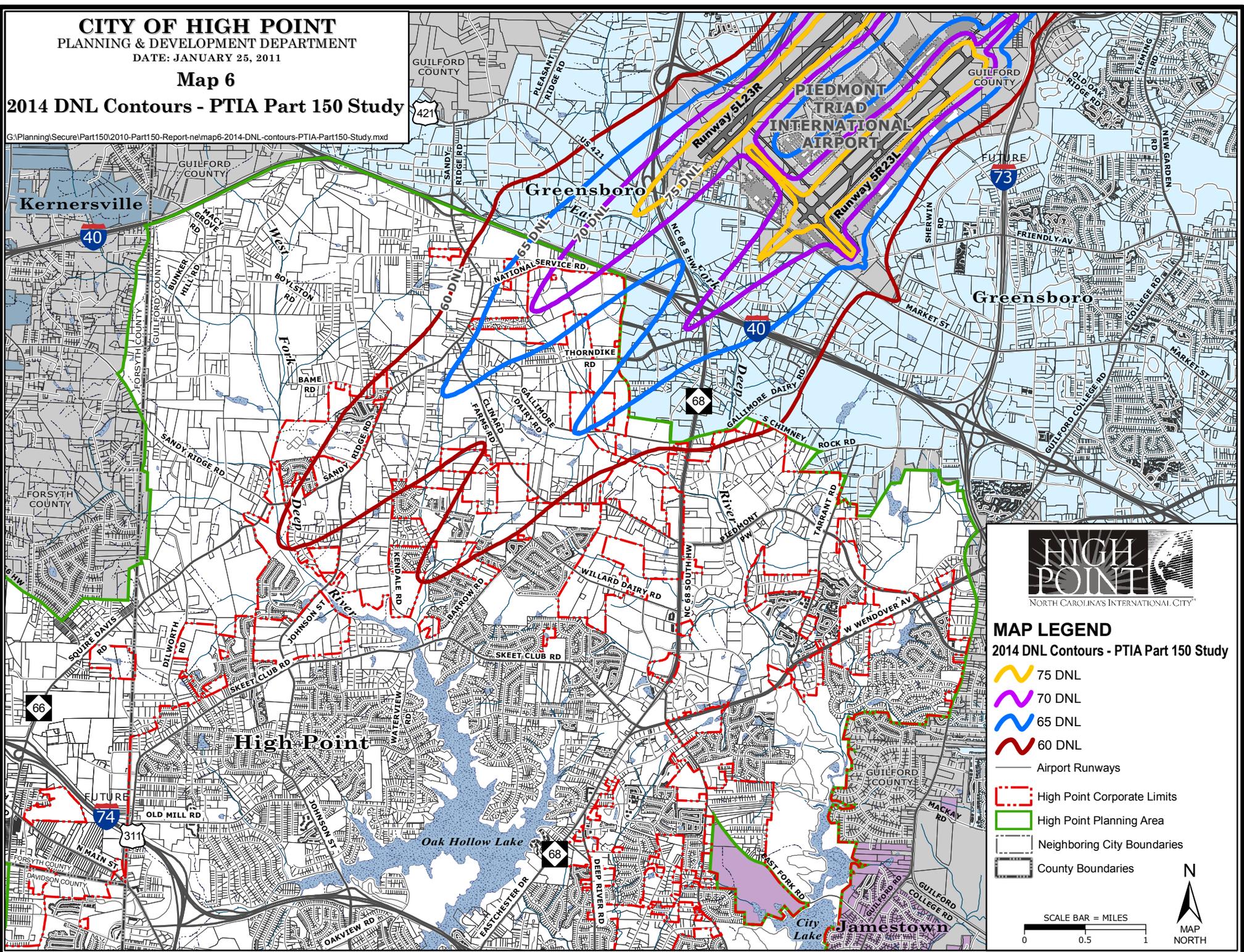
-  NA 90 (1)
-  NA 85 (2)
-  NA 80 (5)
-  Airport Runways
-  High Point Corporate Limits
-  High Point Planning Area
-  Neighboring City Boundaries
-  County Boundaries



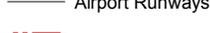
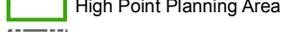
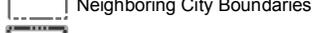
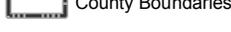
Map 6

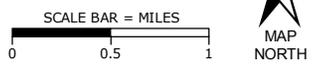
2014 DNL Contours - PTIA Part 150 Study

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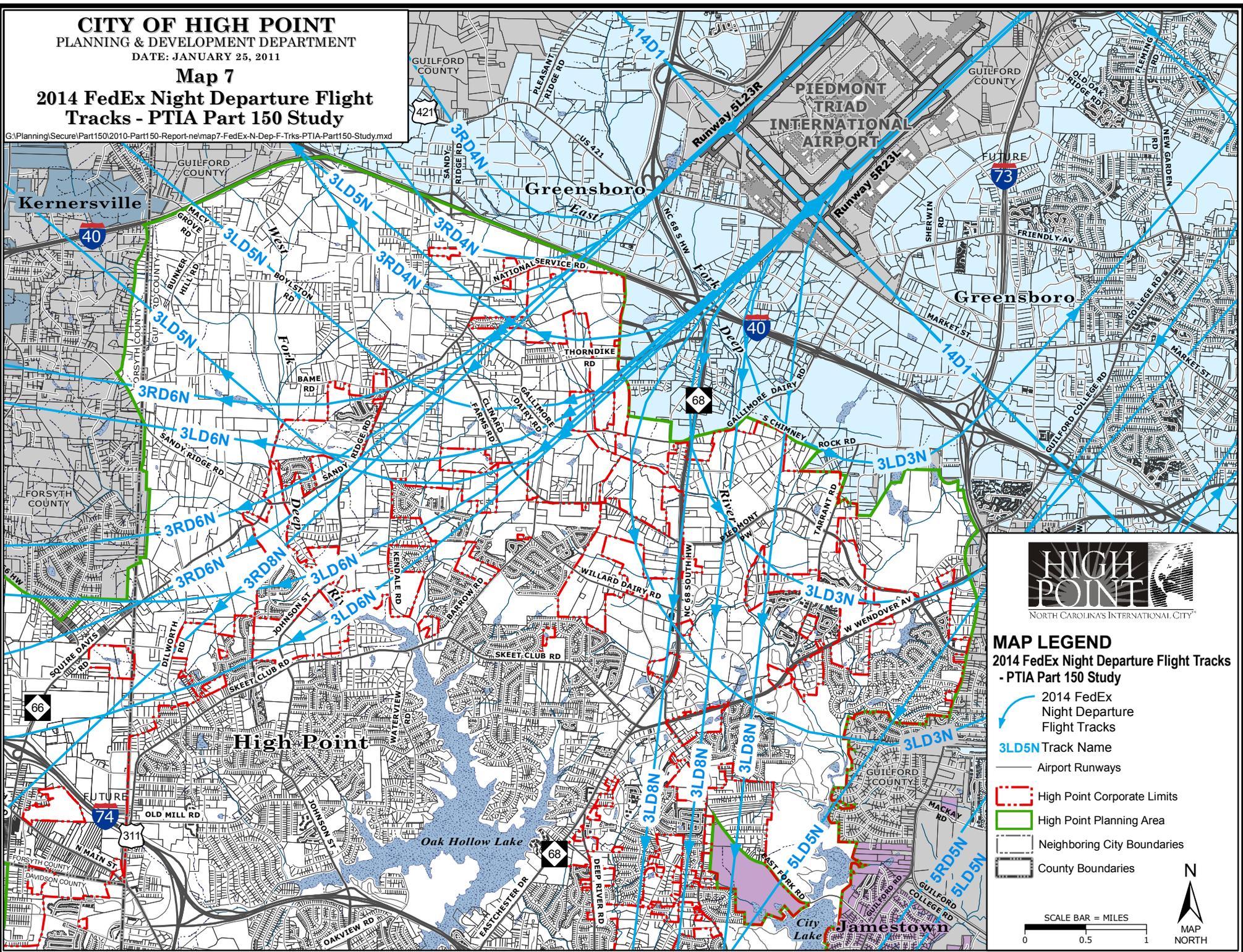
MAP LEGEND
2014 DNL Contours - PTIA Part 150 Study

-  75 DNL
-  70 DNL
-  65 DNL
-  60 DNL
-  Airport Runways
-  High Point Corporate Limits
-  High Point Planning Area
-  Neighboring City Boundaries
-  County Boundaries



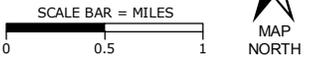
Map 7
2014 FedEx Night Departure Flight Tracks - PTIA Part 150 Study

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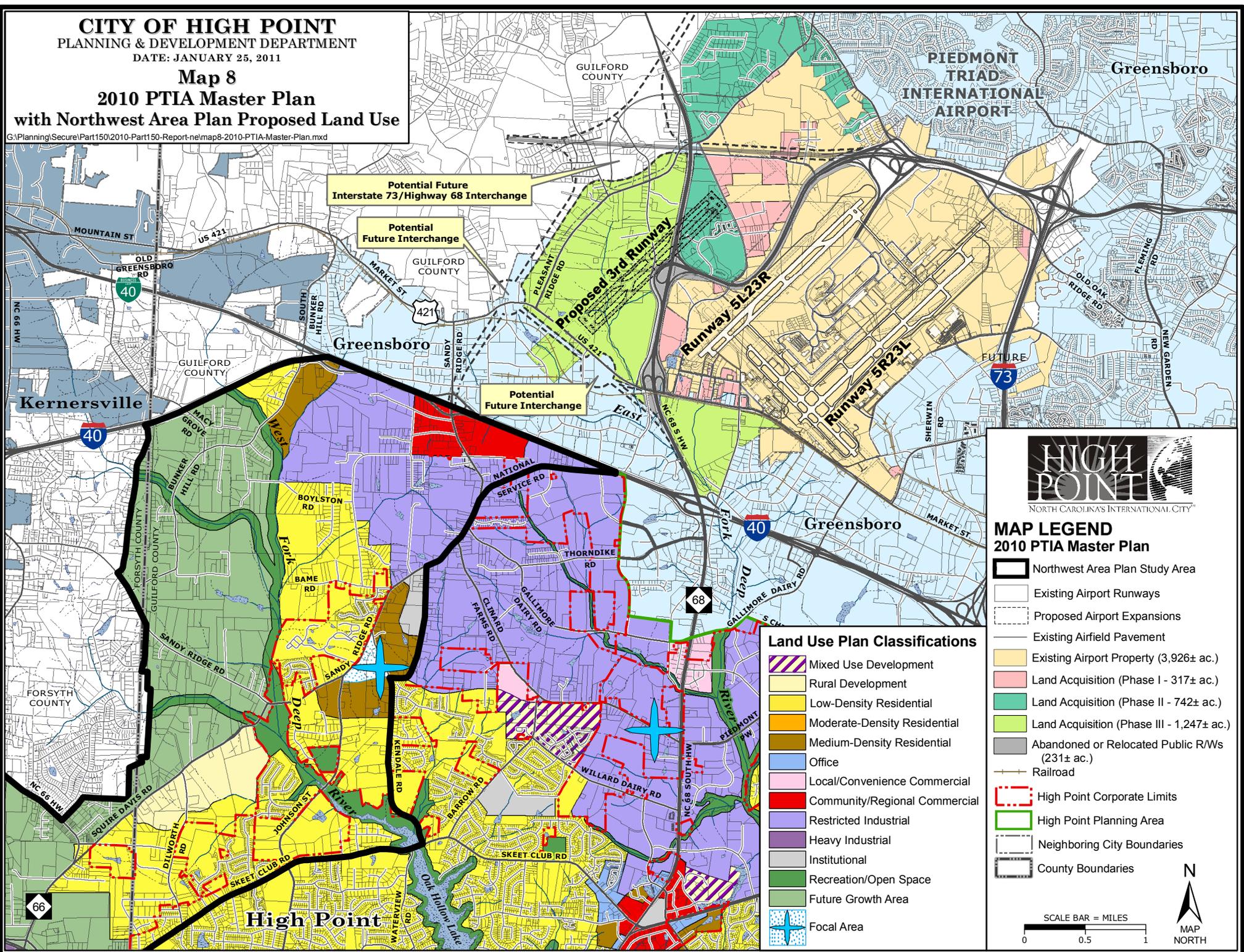
MAP LEGEND
 2014 FedEx Night Departure Flight Tracks - PTIA Part 150 Study

- 2014 FedEx Night Departure Flight Tracks
- 3LD5N** Track Name
- Airport Runways
- High Point Corporate Limits
- High Point Planning Area
- Neighboring City Boundaries
- County Boundaries



Map 8
2010 PTIA Master Plan
with Northwest Area Plan Proposed Land Use

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MAP LEGEND
 2010 PTIA Master Plan

- Northwest Area Plan Study Area
- Existing Airport Runways
- Proposed Airport Expansions
- Existing Airfield Pavement
- Existing Airport Property (3,926± ac.)
- Land Acquisition (Phase I - 317± ac.)
- Land Acquisition (Phase II - 742± ac.)
- Land Acquisition (Phase III - 1,247± ac.)
- Abandoned or Relocated Public R/Ws (231± ac.)
- Railroad
- High Point Corporate Limits
- High Point Planning Area
- Neighboring City Boundaries
- County Boundaries

Land Use Plan Classifications

- Mixed Use Development
- Rural Development
- Low-Density Residential
- Moderate-Density Residential
- Medium-Density Residential
- Office
- Local/Convenience Commercial
- Community/Regional Commercial
- Restricted Industrial
- Heavy Industrial
- Institutional
- Recreation/Open Space
- Future Growth Area
- Focal Area

