6 Environmental Overview

The purpose of this chapter is to present an overview of the existing environmental conditions at the Nashville International Airport (BNA). Such an overview does not constitute an Environmental Assessment (EA), as defined by Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, or 1050.1E, *Environmental Impacts: Policies and Procedures*. However, the analysis in this section is conducted in accordance with the guidelines set forth in the aforementioned FAA Orders. Further environmental studies, such as an EA or Environmental Impact Statement (EIS), will likely be necessary for some of the proposed development within this master plan, in accordance with NEPA requirements. Project-specific impacts and necessary mitigation measures would be determined and identified in those environmental documents.

According to the FAA orders, the following categories have been determined as possible areas of impact and must be addressed:

- Air Quality
- Coastal Resources
- Compatible Land Use
- Construction Impacts
- Department of Transportation Act: Section 4(f)
- Farmlands
- Fish, Wildlife and Plants
- Floodplains
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archaeological, and Cultural
- Light Emissions and Visual Effects
- Natural Resources, Energy Supply and Sustainable Design
- Noise
- Secondary (Induced) Impacts
- Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks
- Water Quality
- Wetlands
- Wild and Scenic Rivers

In addition to the aforementioned Federal guidance, this chapter also includes governing practices set forth by state and local government agencies including the State of Tennessee

Department of Environment and Conservation (TDEC), the Tennessee Wildlife Resources Agency (TWRA), and the Metropolitan Planning Commission (MPC) of Nashville and Davidson County. TDEC is the lead agency in State government for environmental management and stewardship with the expressed goal of safeguarding the health and safety of Tennessee citizens from environmental hazards, protecting and improving the quality of Tennessee's land, air and water, and managing the Tennessee State Parks system. TDEC has a broader mission than does the TWRA, which is to "preserve, conserve, protect, and enhance the fish and wildlife of the state and their habitats for the use, benefit, and enjoyment of the citizens of Tennessee and its visitors." The MPC's responsibilities include working with local communities to create appropriate land-use policies and community plans, making recommendations to the Planning Commission on zoning decisions and providing design services while supporting more sustainable development.

For the purposes of this study, the above-mentioned environmental categories will be addressed only as they apply specifically to BNA and will otherwise be noted as not applicable to the Airport. In considering potential environmental impacts within this framework, the following environmental overview draws attention to those categories that may warrant a more detailed analysis in the form of a formal EA for the preferred development alternatives.

Concurrently with the preparation of this Master Plan, the MNAA commissioned a Sustainability Study for BNA and was selected as one of only 10 airports in the U.S. to take part in the FAA's *Sustainable Master Plan Pilot Program*. The FAA selected the MNAA for the program because of its leadership in implementing initiatives, such as projects that promote water conservation, energy efficiency, social well-being, and community involvement at BNA.

Through this sustainability study, the MNAA has committed to a long-term, comprehensive, and integrated perspective that considers the natural environment, community interests, and economic factors as well as operational efficiency.

6.1 Air Quality

Two primary laws apply to air quality: NEPA, and the Clean Air Act (CAA). As a federal agency, the FAA is required under NEPA to review any proposed project that has the potential to affect air quality. Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The need for an air quality assessment to satisfy NEPA depends on the nature of the project, the project area's attainment status, and the size of the airport.

Guidelines for regulating air quality have been established by the CAA and all implementation and enforcement of these guidelines is the responsibility of the United States Environmental Protection Agency (EPA). The CAA Amendments of 1990 include provisions to ensure that emissions from federally funded actions within nonattainment areas comply with the goals and objectives of the State Implementation Plan (SIP) for the state in which the project is located.

In accordance with the CAA Amendments of 1990, all areas in Nashville are designated with respect to compliance or degree of noncompliance with the National Ambient Air Quality Standards (NAAQS). These standards represent the maximum allowable atmospheric concentration that may occur without negatively affecting public health and welfare, with a reasonable margin of safety. The CAA established NAAQS for six pollutants, termed "criteria pollutants." These include: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO_2). Designations include attainment, nonattainment and maintenance. An area with air quality better than the NAAQS is designated as "attainment," while one with air quality worse than the NAAQS is designated as "nonattainment." Nonattainment areas are further classified as extreme, severe, serious, moderate, and marginal. A maintenance area is one previously designated "nonattainment" but re-designated as a "maintenance area" because air pollution levels have improved above levels that would place the area in nonattainment status. An area may remain in maintenance status for up to 20 years before being re-designated as attainment.

In April 2004, the EPA developed an eight-hour standard for ozone and on December 29, 2004, the Nashville Area Metropolitan Planning Organization (MPO) region entered into an Early Action compact to defer a nonattainment designation for ozone long enough to "fast-track" towards air quality attainment. As of December 12, 2011, the counties within the Nashville Area MPO are considered by the EPA to be in compliance with NAAQS.

In addition, per FAA-AEE-04-03 Report (*Air Quality Procedures for Civilian Airports and Air Force Bases*), no air quality analysis is necessary if the proposed federal action is at a commercial service airport that has less than 1.3 million enplaned passengers and 180,000 general aviation and air taxi operations forecast annually. As stated in Chapter 2, the forecast of annual GA aircraft operations for BNA is anticipated to be 66,290 operations annually by 2030, and the number of enplaned passengers is forecast to be 9.3 million. Therefore, a NAAQS compliance assessment may be required. As initiated by the Airport Act of 1982, an air quality certification from the State of Tennessee may be also required prior to any large construction projects to ensure that Federal and State air quality standards will continue to be met. Further, coordination with TDEC and Metro Health Department should be completed prior to any type of federally-funded project at the Airport.

Temporary air quality impacts from construction related activities and their associated vehicles are expected during the construction phases of each project. These impacts are anticipated to be minimal and will be mitigated by use of best management practices. Temporary air quality impacts during these brief periods are likely to include windblown dust, and equipment exhaust.

6.2 Coastal Resources

Federal activities involving or affecting coastal resources are governed by the Coastal Barriers Resources Act (CBRA), the Coastal Zone Management Act (CZMA), and Executive Order (EO) 13089, Coral Reef Protection. This legislation prohibits the Federal government from becoming financially involved with any project that seeks to develop an area within undeveloped portions of designated coastal barrier areas. The Department of the Interior (DOI) of the National Park Service (NPS) develops and maintains maps of the Coastal Barrier Resource System (CBRS). Barrier islands occur along all coastlines of the United States, and are most prevalent in the Gulf Coast region and along the Atlantic seaboard.

Davidson County, and the State of Tennessee as a whole, is not contiguous with any coastal waters or lands protected under the identified regulations. Furthermore, the Airport is located several hundred miles from the Great Lakes, Atlantic Ocean, and the Gulf of Mexico, which are the nearest coastal water bodies covered under the regulations. Therefore, Airport development initiatives are not subject to the provisions of the coastal zone management program and a coastal zone management consistency determination will likely not be required prior to any airport development projects.

6.3 Compatible Land Use

The properties near an airport are often affected by airport operations, most commonly by noise pollution. Tennessee Code, Title 42, Chapter 6, Section 103 requires that local governing entities establish future land use and zoning regulations to ensure compatible land use around airports. These regulations consider height, noise compatibility and safety. The current and future zoning maps for the areas surrounding the airport are depicted in the Airport Layout Plan (ALP) set.

A key goal of the master planning process is to ensure compatible land uses between the Airport and the surrounding community. This ensures that the land usage near airports does not pose risks to the safety of aircraft operations at those Airports. It is recommended that prospective city land use policies consider existing and future Airport activities over the course

of the planning period, including compatibility issues such as development on and off Airport property, aircraft operations, and other activities.

6.4 Construction Impacts

Airport construction may cause various environmental effects primarily due to dust, aircraft and heavy equipment emissions, storm water runoff containing sediment and/or spilled or leaked petroleum products, and noise. Generally, these effects are subject to Federal, State, or local ordinances or regulation. While the long-term impacts of the proposed action are usually greater than the construction impacts, sometimes construction may also cause significant short-term impacts. Construction activities may include, but are not limited to, earthmoving activities, delivery of equipment and materials, and removal of debris. Additionally, should local air traffic be routed to a less often used runway or be vectored to the airfield on courses not normally used, some temporary noise and emission impacts may be noticed in areas generally not commonly affected by aircraft activity. The potential for impacts to off-Airport communities near the Airport is greatest during the initial phases of development. These impacts may consist of increased traffic on local roads, noise, mud, dust, and other effects associated with the activity of heavy construction vehicles.

All potential impacts related to the proposed development projects at BNA are expected to be minor and temporary. Nevertheless, Airport management should exercise best practices at BNA to contain and minimize the impacts of construction during building phases of projects proposed in the development plan.

6.5 Department of Transportation Act: Section 4(f)

The United States Code (USC) Title 49 – Transportation, Subtitle I – Department of Transportation (DOT), Chapter 3 – General Duties and Powers, Subchapter I – Duties of the Secretary of Transportation, Section 303 – Policy on lands, wildlife and waterfowl refuges, and historic sites was formerly known as Section 4(f) of the DOT Act. This law establishes that it is the policy of the U.S. Government to make special effort to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.

It is the responsibility of the Secretary of Transportation to cooperate and consult with the states and the Secretaries of the Interior, Housing and Urban Development, and Agriculture in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities.

The law provides that no approval be given by the Secretary to a program or project that requires the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance unless there is no prudent and feasible alternative to using that land, and the project includes all possible planning to minimize harm to such lands. Enforcement of this legislation is the primary responsibility of the DOI, though the U.S. Fish and Wildlife Service (FWS) and United States Army Corps of Engineers (USACE) may provide assistance.

The proposed development at BNA will primarily be confined to existing airport property and does not seek to acquire land that is applicable under Section 4(f) of the DOT Act. Additionally, it is anticipated that the development program will not adversely affect any public park; recreation areas; historic site; or wildlife or waterfowl refuge of national, state, or local significance. Therefore, the proposed Airport development described in this document is not expected to adversely impact any of the previously mentioned lands.

6.6 Farmlands

Prime farmland is defined as land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agriculture crops with minimal use of fuel, fertilizer, pesticides, or products. Unique farmland is that land which is capable of producing high-value food and fiber crops and the special combination of soil quality, location, growing season, and moisture necessary to produce such crops economically.

According to FAA Order 1050.1E, if farmland is to be converted to a nonagricultural use by a federally funded project, consultation with the U.S. Department of Agriculture's (USDA), Natural Resources Conservation Service (NRCS) should occur to determine if the Farmland Protection Policy Act (FPPA) classifies the land as "prime" or "unique." If it is found to be prime or unique, the FPPA requires rating the farmland conversion impacts based on length of time farmed, amounts of farmland remaining in the area, level of local farm support services, and the level of urban land in the area.

The majority of the proposed development will be located within the existing Airport property boundary and therefore will not encroach upon any prime or unique farmland. However, acquisition of some property surrounding the Airport is planned in the future. The USDA soils map presented in Chapter 1 (Figure 1-34) of this Master Plan Update reveals that the Airport property is predominantly Stiversville-Urban land complex, Stiversville loam, Talbott-Rock outcrop complex, Maury-Urban land complex, and Hampshire silt loam of varying slopes.

The NRCS provides farmland classifications and their percentage of the Airport's area as follows:

- Stiversville-Urban land complex (SvD): 28.0 percent of the area; "Not prime farmland"
- Stiversville loam 3 to 12 percent slope (StC): 10.3 percent of the area; "prime farmland"
- Maury-Urban land complex (McB): 10.0 percent of the area; "Not prime farmland"
- Hampshire silt loam (HmD): 9.2 percent of the area; "Not prime farmland"
- Stiversville loam 12 to 25 percent slope (StD): 8.6 percent of the area; "Not prime farmland"
- Talbott-Rock outcrop complex (TrC): 7.8 percent of the area; "Not prime farmland"

A small portion of the Airport's existing and proposed property is delineated as "prime farmland" by the NRCS. As such, coordination with the NRCS is recommended during an EA and/or EIS phase of the Airport's future development projects.

6.7 Fish, Wildlife, and Plants

The Fish and Wildlife Coordination Act (FWCA) (48 Statute 401 as amended; 16 USC 661-667e.) provides the basic authority for the FWS involvement in evaluating impacts to fish and wildlife from proposed development. To comply with the legislation, the FAA must coordinate with the FWS to assess the effects of proposed FAA actions on aquatic areas. Also, the FAA or the airport sponsor, as appropriate, must consult with state wildlife agencies having jurisdiction over affected biotic resources. Further, state agencies such as TDEC and the TWRA should be consulted for their input on proposed development and its potential effects on the local biotic communities.

The Airport lands can be characterized as a series of generalized vegetative communities, many of which have been disturbed from their natural state for several decades as a result of prior airport development actions, agricultural activity, or other human interaction. The character of vegetative communities is significant because the varying classes of vegetative cover provide habitat for wildlife, some of which are identified as species of note or of special concern by the relevant ecological legislation. Soil types, comparative elevation, and drainage characteristics help determine the wetland or upland characteristics and, thereby, the type of dominant vegetation and subsequent habitat provided.

A site survey to assess specific vegetative community types on-site and the possible presence of threatened and endangered species should be completed during the EA and/or EIS process for each development project.

6.7.1 Federal and State Listed Endangered Species

The Endangered Species Act of 1973 requires each federal agency to ensure that actions authorized, funded, or carried-out by that agency do not jeopardize continued existence of any endangered or threatened species, or result in destruction or adverse modification of any endangered or threatened species' habitat. Section 7 of the Act states that federal agencies must review their actions and, if those actions will affect a listed species or its habitat, they must consult with the FWS. The FWS has the responsibility of identifying, listing, and protecting endangered and/or threatened species.

According to the FWS and a review of the list of rare species compiled by the Tennessee Division of Natural Areas in its Biotics Database, the species of animals and plants identified in **Table 6-1** occur in Davidson County and could potentially be witnessed on, or in the vicinity of the Airport property. Additional species may be present in Davidson County, but have not been observed.

A detailed flora and fauna review will be necessary for each major development project to identify the specific types and numbers of threatened and endangered species within the project area and recommend appropriate mitigation measures. However, based on the size and location of development initiatives proposed for BNA, and this preliminary review of protected biotic communities, no impacts to endangered species are anticipated as a result of the planned growth of the Airport.

6.8 Floodplains

Chapter 1, *Inventory of Existing Facilities and Conditions*, discussed the various laws and regulations that regulate floodplains in the United States, and Figure 1-36 depicts the floodplains in the vicinity of BNA as identified by the Federal Emergency Management Agency (FEMA).

The proposed future development at BNA does not have the potential to impact FEMA identified Floodplains for a 100-year flood (Zone A). However, the proposed Ultimate Fourth Parallel Runway is likely to encroach upon the defined floodways found along the Airport's eastern borders. A more detailed analysis of the potential impacts of disrupting floodplains around BNA will be required as part of a Fourth Parallel Runway EA/EIS process.

Table 6-1 - Endangered, Threatened, and Species of Special Concern in Davidson County TN

Common Name	Scientific Name	State Status	Federal Status
Invertebrate Animals:			
Baker Station Cave Beetle	Pseudanophthalmus insularis	Rare, Not State Listed	Candidate species
Orangefoot Pimpleback	Plethobasus cooperianus	Endangered	Endangered
Pink Mucket	Lampsilis abrupt	Endangered	Endangered
Salamander Mussel	Simpsonaias ambigua	Endangered	No Status
A Cave Obligate Planarian	Sphalloplana buchanani	Rare, Not State Listed	No Status
Cumberlandian Combshell	Epioblasma brevidens	Endangered	Endangered
Tan Riffleshell	Epioblasma florentina walker	Endangered	Endangered
Helmet Rocksnail	Lithasia duttoniana	Rare, Not State Listed	No Status
Nashville Crayfish	Orconectes shoupi	Endangered	Endangered
Vascular Plants:			
Pope's Sand-parsley	Ammoselinum popei	Threatened	No Status
Leafy Prairie-clover	Dalea foliosa	Endangered	Endangered
White Water-buttercup	Ranunculus aquatilis var. diffuses	Endangered	No Status
Thicket Parsley	Perideridia Americana	Endangered	No Status
Tennessee Milk-vetch	Astragalus tennesseensis	Special Concern	No Status
Willow Aster	Symphyotrichum praealtum	Endangered	No Status
Eggert's Sunflower	Helianthus eggertii	Special Concern	Deemed in Need of Management
Price's Potato-bean	Apios priceana	Endangered	Threatened
Western Wallflower	Erysimum capitatum	Endangered	No Status
Sand Grape	Vitis rupestris	Endangered	No Status
Limestone Fame-flower	Phemeranthus clacaricus	Special Concern	No Status
Tennessee Coneflower	Echinacea tennesseensis	Endangered	Endangered
Glade Cleft Phlox	Phlox bifida ssp. stellaria	Threatened	No Status
Water Stitchwort	Stellaria fontinalis	Special Concern	No Status
Yellow Sunnybell	Schoenolirion croceum	Threatened	No Status
White Prairie-clover	Dalea candida	Special Concern	No Status
Braun's Rockcress	Boechera perstellata	Endangered	Endangered
Duck River Bladderpod	Paysonia densipila	Threatened	No Status
Glade Onion	Allium stellatum	Endangered	No Status
Svenson's Wild-rye	Elymus svensonii	Endangered	No Status
Davis' Sedge	Carex davisii	Special Concern	No Status
Butternut	Juglans cinerea	Threatened	No Status
Goldenseal	Hydrastis Canadensis	Special Concern	No Status

Common Name	Scientific Name	State Status	Federal Status
Limestone Blue Star	Amsonia tabernaemontana var.	Special Concern	No Status
Glade-cress	Leavenworthia exigua var. exigua	Special Concern	No Status
Pale Umbrella-wort	Mirabilis albida	Threatened	No Status
American Ginseng	Panax quinquefolius	Special Concern	No Status
Prairie Parsley	Polytaenia nuttallii	Threatened	No Status
Evolvulus	Evolvulus nuttallianus	Special Concern	No Status
Carolina Anemone	Anemone caroliniana	Endangered	No Status
Short's Bladderpod	Physaria globosa	Endangered	Candidate species
Appalachian Bugbane	Cimicifuga rubifolia	Threatened	No Status
Short's Rock-cress	Boechera shortii	Special Concern	No Status
Pyne's Ground-plum	Astragalus bibullatus	Endangered	Endangered
Canada Lily	Lilium canadesnse	Threatened	No Status
Harbison's Hawthorn	Crataegus harbinsonii	Endangered	No Status
Pubescent Sedge	Carex harbisonii	Endangered	No Status
American Chestnut	Castanea dentate	Special Concern	No Status
Northern Prickly-ash	Zanthoxylum americanum	Special Concern	No Status
Yellow Honeysuckle	Lonicera flava	Threatened	No Status
Michigan Lily	Lilium michiganense	Threatened	No Status
Purple Prairie-clover	Dalea purpurea	Endangered	No Status
Tennessee Purple Coneflower	Echinacea tennesseensis	Rare, Not State Listed	Candidate species
Shaggy False Gromwell	Onosmodium hispidissimum	Endangered	No Status
American Water-pennywort	Hydrocotyle americana	Endangered	No Status
Vertebrate Animals:			
Indiana Bat	Myotis sodalist	Endangered	Endangered
Slenderhead Darter	Percina phoxocephala	In Need of Management	No Status
Bachman's Sparrow	Aimophila aestivalis	Endangered	No Status
Bewick's Wren	Thryomanes bewickii	Endangered	No Status
Least Bittern	Ixobrychus exilis	In Need of Management	No Status
Smallscale Darter	Etheostoma microlepidum	In Need of Management	No Status
Allegheny Woodrat	Neotoma magister	In Need of Management	No Status
Barn Owl	Tyto alba	In Need of Management	No Status
Hellbender	Cryptobranchus alleganiensis	In Need of Management	No Status

Common Name	Scientific Name	State Status	Federal Status
Redband Darter	Etheostoma luteovinctum	In Need of Management	No Status
Peregrine Falcon	Falco peregrines	Endangered	No Status
Meadow Jumping Mouse	Zapus hudsonius	In Need of Management	No Status
Eastern Slender Glass Lizard	Ophisaurus attenuates longicaudus	In Need of Management	No Status
Blue Sucker	Cycleptus elongates	Threatened	No Status
Alligator Snapping Turtle	Macrochelys temminckii	In Need of Management	No Status
Lake Sturgeon	Acipenser fulvescens	Endangered	No Status
Cerulean Warbler	Dendroica cerulean	In Need of Management	No Status
Bald Eagle	Haliaeetus leucocephalus	In Need of Management	No Status
Streamside Salamander	Ambystoma barbouri	In Need of Management	No Status
Highfin Carpsucker	Carpiodes velifer	In Need of Management	No Status

Sources: TDEC, Division of Natural Areas, Rare Species by County, October, 2012; U.S. Fish & Wildlife Species Reports, February, 2013.
Notes: 1/ Species with no State/Federal status still have non-legal state and/or global rankings which expresses the rarity and vulnerability of the species.

6.9 Hazardous Materials, Pollution Prevention and Solid Waste

FAA Order 1050.1E states that four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances, and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facilities Compliance Act of 1992, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund) and the Community Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment. The Pollution Prevention Act of 1990 and the Toxic Substances Control Act of 1976 (TSCA), as amended, also apply to FAA under FAA Order 1050.1E. The Pollution Prevention Act calls for pollution prevention through source reduction, recycling, and safe disposal. The TSCA grants the EPA authority to track the use of hazardous industrial chemicals and use control methods to prevent chemicals from posing an unreasonable health risk.

FAA Order 1050.1E defines hazardous material as any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. Hazardous waste is defined by that Order as a waste that is listed in or meets the characteristics described in 40 CFR Part 261, including ignitability, corrosivity, reactivity, or toxicity. A hazardous substance is defined as any element, compound, mixture, solution, or substance defined as a hazardous substance under CERCLA and listed in 40 CFR Part 302. If released into the environment, hazardous substances may pose substantial harm to human health or the environment.

The potential for handling hazardous waste must be evaluated when determining the impacts associated with Airport development. The Assistant Administrator for Security and Hazardous Materials (ASH) is responsible for considering the environmental impacts for all actions arising out of ASH initiatives that require NEPA compliance and other Federal and Departmental environmental laws, regulations, and orders.

None of the proposed development projects contained in this document are anticipated to create or require the handling of hazardous materials other than normal fueling and operations procedures conducted on an airport. However, proper coordination with federal, state, and local officials should be completed during the EA and/or EIS phases of each project to identify the potential hazardous waste impacts and ensure proper mitigation is completed, if required.

RCRA regulates solid waste impacts. It grants authority to the EPA to control hazardous waste from the "cradle-to-grave" including its generation, transportation, treatment, storage, and disposal. In addition to hazardous waste impacts, RCRA grants authority to the EPA to control solid waste impacts. RCRA also provides for safe disposal of discarded materials, regulates hazardous waste, promotes recycling, and establishes criteria for sanitary landfills. An amendment was made to RCRA in 1986 that enabled the EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous materials. TDEC has primary responsibility for regulating landfills and overseeing programs associated with solid wastes.

Increases in solid waste will likely be seen during periods of construction and upon completion of the proposed facilities. These facilities will likely increase the production of solid waste and solid waste disposal at the Airport. However, coordination with state and local officials should be completed to ensure that adequate capacity for the increase in solid waste disposal exists and is readily available to support the new facilities at BNA.

6.10 Historical, Architectural, Archaeological, and Cultural Resources

The Archaeological and Historic Preservation Act of 1974 provides for the preservation of historic American sites, buildings, objects, and antiquities of national significance by providing for the survey, recovery, and preservation of historical and archaeological data that might otherwise be destroyed or irreparably lost due to a Federal, Federally licensed, or Federally funded action.

The National Register of Historic Places is a list of the Nation's cultural resources considered worthy of preservation. The staff of the Tennessee Historical Commission administers this program for the state. The State Review Board meets three times a year to recommend properties for listing in the National Register.

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. They include archaeological resources (both prehistoric and historic), historic architectural resources, and Native American sacred sites and traditional cultural properties. Historic properties (as defined in 36 CFR 60.4) are significant archaeological, architectural, or traditional resources that are either listed or eligible for listing in the National Register.

The National Historic Preservation Act (NHPA) of 1966 and the Archaeological and Historic Preservation Act of 1974 provide protection against development impacts that would cause changes in the historical, architectural, archaeological, or cultural qualities of the property.

Under NHPA, the Airport Sponsor is required to consider the effects of its undertakings on historic properties listed, or eligible for listing, in the National Register. NHPA obligations for a federal agency are independent of NEPA and must be complied with even when an environmental document is not required.

Other applicable guidance and directives associated with cultural resource management include EO 11593, *Protection and Enhancement of the Cultural Environment*; EO 13006, *Locating Federal Facilities on Historic Properties in Our Nations Central Cities*; and, EO 13287, *Preserve America*.

BNA is not located in close proximity to any known nationally or locally significant historic sites. However, there are a few cemeteries located near the Airport's borders and five cemeteries located within the Airport's border. It is improbable that any of the proposed airport improvements or expansions would require displacement of offsite cemeteries. It is, however, more likely to occur with the cemeteries located on Airport property. In the event that this becomes necessary, the procedures outlined in Tennessee Code Title 46 Chapter 4, *Termination of Land Use as Cemetery in the State of Tennessee* must be followed. Thorough review of State protocol for relocating cemeteries would be required as part of the EA/EIS process for airport expansion requiring the use of cemetery property.

6.11 Light Emissions and Visual Effects

There are no special purpose laws or standards for light emission impacts and visual impacts. Because of the relatively low levels of light intensity compared to background levels associated with most air navigation facilities (NAVAIDs) and other airport development actions, light emissions impacts are unlikely to have an adverse impact on human activity or the use or characteristics of protected properties. Whenever the potential for an annoyance exists, such as site location of lights or light systems, pertinent characteristics of the particular system and its use, and measures to reduce any annoyance, such as shielding or angular adjustments information should be included in the appropriate environmental document.

Visual (i.e., aesthetic) impacts are inherently more difficult to define because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable. Public involvement and consultation with appropriate federal, state, and local agencies and tribes may help determine the extent of these impacts. The visual sight of aircraft,

aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact. The art and science of analyzing visual impacts is continuously improving and the responsible FAA official should consider, based on scoping or other public involvement, the degree to which available tools should be used to more objectively analyze subjective responses to proposed visual changes for a given development project.

None of the proposed Airport development items described in this document are expected to have significant light or visual related impacts.

6.12 Natural Resources, Energy Supply, and Sustainable Design

EO 13123, *Greening the Government Through Efficient Energy Management* (64 FR 30851, June 8, 1999), encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. EO 13123 also requires each Federal agency to reduce petroleum use, total energy use and associated air emissions, and water consumption in its facilities.

The FAA's policy to encourage the development of facilities that exemplify the highest standards of design including principles of sustainability is consistent with NEPA and the Council of Environmental Quality (CEQ) regulations. As such, all elements of the transportation system are encouraged to be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the travelling public.

The proposed development at the Airport is not anticipated to significantly affect the energy supply or natural resources. The largest demand requirements are expected to result from increased electrical requirements from airfield lighting, navigational equipment, and tenant facilities. To limit and/or eliminate any possible negative impacts associated with increased energy demands from the proposed development, proper planning and coordination with the Metro Government of Nashville and Davidson County, Tennessee (Metro) and other necessary agencies should be conducted.

6.13 Secondary (Induced) Impacts

Secondary, or induced, impacts are those impacts which evolve organically after some major development. Shifts in historic patterns of population movement and growth, public service demands, and changes in business and economic activity, to the extent influenced by the airport development initiative, represent examples of secondary or induced impacts by BNA.

Following are the secondary or induced impacts expected to occur as a result of the proposed airport development:

- Proposed southern extension of the Runway 2L approach end:
    - Potential closure and demolition of a portion of the former Johnston & Murphy factory. The primary functions of the factory were the production of footwear, apparel, leather goods, and luggage. It is currently leased to METRO.
    - Potential closure and demolition of the Monell's at the Manor restaurant.
    - Purchase and demolition of 20 homes located in or near Airport Estates, which is currently west of the Runway 2C touchdown zone.

The proposed Airport development should not affect patterns of population movement in Davidson County nor should the development have a notable effect on public service demands or the business environment in the area.

6.14 Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks

Analyses of socioeconomics include addressing the following: economic activity (employment and earnings), population, housing, and public schools. The principal social impacts that must be considered are the relocation of businesses and/or residences, alteration of surface transportation patterns, division or disruption of established communities, disruption of orderly planned development, and the creation of an appreciable change in employment. If any relocation of residential or commercial properties is required, compensation shall be made under the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Surface Transportation and Uniform Relocation Act of 1987 and its implementing regulations (49 CFR Part 24).

If any potentially impacted properties cannot be acquired through a land acquisition program prior to the start of each specific project, the guidelines set forth in the documents described previously must be followed to mitigate impacts on the affected residences. Additionally, any areas with concentrated populations of people belonging to a single race, national origin, or low income bracket must be identified and evaluated under the requirements of Environmental Justice (Section 7.14.1) to ensure that they are not receiving a disproportionate share of adverse environmental impacts (e.g., high levels of noise exposure) in relation to other areas in the vicinity of the Airport.

The only significant social impact expected to occur as a result of the implementation of the proposed Airport development is the land acquisition of 20 residential properties that will be required to follow the guidelines of the Uniform Relocations Assistance and Real Property Acquisition Policies Act of 1970, as discussed above, to mitigate impacts associated with proposed development. The Johnston and Murphy structures and Monell's at the Manor building and associated property are located on Airport property. Additionally, further analysis to identify the extent and total number of properties impacted must be completed in the environmental studies associated with each specific project.

The following sections describe legal requirements for evaluating impacts to environmental justice, special risks to children, and induced socio-economic impacts.

6.14.1 Environmental Justice

Concern that minority populations and/or low-income populations bear a disproportionate amount of adverse health and environmental effects led to the issuance of EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, in 1994. The Environmental Impact Analysis Process, 32 CFR 989, addresses the need for consideration of environmental justice issues during impact analysis. An Environmental Justice analysis identifies disproportionately high and adverse human health and safety and environmental impacts on minorities and low-income communities and identifies appropriate alternatives. EO 12898 also requires the application of equal consideration for Native American populations.

As previously discussed, the proposed southern extension of Runway 2L could have social impacts related to relocation, community disruption, surface transportation patterns, or planned development. As such, that and other airport projects that require an EA or EIS would need to address such impacts.

6.14.2 Special Risk to Children

President Clinton signed EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, in 1997. EO 13045 mandated that all Federal agencies assign a high priority to addressing health and safety risks to children, coordinating research priorities on children's health, and ensuring that their standards take into account special risks to children. The EO states that "environmental health and safety risks" means risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to).

Children are more sensitive to some environmental effects than the adult population, such as airborne asbestos and lead paint exposures from demolition, safety with regard to equipment, trips/falls/traps within structures under demolition, and noise. Activities occurring near areas that tend to have a higher concentration of children than the typical residential area during any given time, such as schools, churches, and community childcare facilities, may further intensify potential impacts to children.

None of the development alternatives proposed in this document should have adverse impacts upon the health or safety risks of children. However, development projects requiring an EA or EIS would require further analysis to verify that probability.

6.14.3 Induced Socioeconomic Impacts

Induced socioeconomic impacts are those impacts on surrounding communities that are generally produced by large-scale development projects. The scope of such development may create shifts in population movement and growth patterns, public service and demand, and changes in commercial and economic activity.

Given the relatively minor development initiatives proposed for the Airport, no induced socio-economic impacts are expected to occur as a result of their implementation.

6.15 Water Quality

The Clean Water Act (CWA) (33 U.S.C. 1151 et seq., 1251 et seq.), was passed in 1972 and significantly reorganized and expanded the Federal Water Pollution Control Act of 1948. CWA is the basic Federal legislation governing wastewater discharges. The implementing Federal regulations include the National Pollutant Discharge Elimination System (NPDES) permitting process (40 CFR 122), general pre-treatment programs (40 CFR 403), and categorical effluent limitations, including limitations for pre-treatment of direct discharges (40 CFR 405, et seq.).

To the extent possible, FAA Order 5050.4B requires consideration of the following: storm and sanitary sewer design, requirements for additional water supply or water treatment capacity, erosion controls to prevent siltation, provisions for containing oil spills and wastewater from aircraft washings, designs to preserve existing drainage or minimize dredge and fill, and locations with regard to surface and subsurface aquifers or sensitive ecological areas such as wetlands.

Additionally, overall water quality at BNA is regulated by other Federal and State legislation. CWA requires property owners to establish water control standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and for dredged or filled materials into surface waters. The Fish

and Wildlife Coordination Act requires consultation with the FWS and the appropriate State agency when any alteration and/or impounding of water resources is expected. Additionally, the NPDES provides regulations that govern the quality of storm water discharged into water resources of the U.S.

The most important water quality impact at an airport is related to storm water discharge and runoff as the pavement surfaces may contain chemicals that cannot be discharged freely into either streams or sewer systems. In addition, construction that exceeds one acre requires a NPDES permit administered by TDEC. Construction projects must also adhere to stormwater policies and permitting requirements set forth by Metro. Though none of the development included in the master plan is anticipated to adversely impact water quality, coordination with TDEC and Metro will likely be necessary to identify preventative measures and ensure water quality. As part of this coordination, development of the following may be required: a spill prevention control and counter measures plan, a storm water pollution prevention plan, and an erosion control plan and/or grading plan. Elements of such a plan that may be used during and after construction and that apply to all Airport tenants and users include:

- Good Housekeeping – Includes conscientious housekeeping and preventative maintenance programs for minimizing the potential for the release of contaminants into the storm drainage system.
- Preventative Maintenance – Includes regularly scheduled inspections and maintenance of areas used to store hazardous materials on a continuous basis.
- Materials Compatibility List – Includes a hazardous materials list including the use, storage location, and identification of any incompatible chemicals that must be stored away from the hazardous materials.
- Security – Monitoring of facilities to deter any intentional or accidental intrusion onto the site
- Employee Training – Ensures proper training of employees at all levels of responsibility to ensure prevention of contaminant release and minimization of water quality impacts.
- Inspections – Includes regular inspections of the site to ensure adequate mitigation and prevention methods are in place.

6.16 Wetlands

Section 1.11.5 of this report discusses the various laws which regulate wetlands in the United States, and Figure 1-35 depicts the size and location of wetlands in the vicinity of BNA as denoted by the U.S Fish and Wildlife service.

The proposed development plan at BNA may not impact any existing and delineated wetland areas. An ultimate fourth parallel runway, east of Runway 2R/20L, could possibly have an impact on such. Thorough site-specific evaluations as part of an EA or EIS prior to any construction projects at BNA should examine in more detail the potential for wetland areas to be affected by Airport development initiatives.

6.17 Wild and Scenic Rivers

The National Wild and Scenic Rivers Act (NWSRA) of 1968 describe those river segments designated, or eligible to be included, in the Wild and Scenic Rivers System. The Department of the Interior (DOI) National Park Service (NPS) River and Trail Conservation Assistance Program (RTCA) within NPS's National Center for Recreation and Conservation (NCRC) maintains a Nationwide Rivers Inventory (NRI) of river segments that appear to qualify for inclusion in the National Wild and Scenic River System. Under the provisions of the NWSRA, Federal agencies cannot assist, by loan, grant, license, or otherwise, in construction of any water resources project that would have direct and adverse impacts on river values. River segments protected under this legislation are administered by the NPS.

According to the NRI, the only designated wild and scenic river in the State of Tennessee is the Obed River, located in Morgan and Cumberland Counties in East Tennessee on the Cumberland Plateau. That river is not anticipated to be negatively impacted by the proposed development at BNA. However, there are several Davidson County rivers listed in the NCRC's NRI. They include the following:

- Harpeth River
- South Harpeth River
- Stones River

Stones River is the closest river to the Airport's ultimate proposed development. The J. Percy Priest Reservoir, which is the largest body of water in Nashville's vicinity, is formed by the Percy Priest Dam on the Stones River. A tributary of Stones River is McCrory Creek, the headwaters of which are located on Airport property, which would be impacted by the construction of the proposed ultimate fourth parallel runway. The Stones River is not yet protected by the provisions of the NWSRA, although it is eligible to be included in the Wild and Scenic Rivers System. As such, any future EA or EIS associated with an Airport project which impacts McCrory Creek should ensure that the Stones River has not been added to the Wild and Scenic Rivers System, which could inhibit federal funding of the project.

6.18 Cumulative Impacts

NEPA requires the evaluation of the environmental consequences, including secondary and cumulative impacts, of all federal actions. Secondary impacts are defined as those that are "caused by an action and are later in time or farther removed in distance but are reasonably foreseeable" (40 CFR 1508.8). Cumulative impacts are broadly defined as those that "result from the incremental impacts of an action when added to other past and reasonably foreseeable future actions" (40 CFR 1508.7).

The overall and total development plan included in the preferred alternative, as presented in the preceding pages of this document, will likely result in some level of future secondary and cumulative impacts as Airport capacity, operations, and overall activity increases. Such impacts are likely to include, but may not be limited to, areas such as, local transportation routes and traffic volumes, land use and community growth, industrial and commercial business activity, and overall demand for public services. Additionally, disruptions to area residences and businesses from periodic construction associated with Airport development are anticipated. Coordination with state and local officials will be necessary during each project to ensure any future secondary and/or cumulative impacts are identified and adequate public facilities and services are planned to meet the long-term needs of the Airport and local community.

6.19 Noise Analysis

The MNAA recently completed a FAA Part 150 Noise Exposure Map (NEM) Update. The NEM Update was submitted to the FAA in December of 2012 and approved by the FAA on February 4, 2013. The FAA determined that the NEMs submitted for BNA comply with applicable requirements of Title 14 Code of Federal Regulations (CFR) Part 150.

The NEM update is available on the MNAA's website and administrative offices.

The most fundamental elements of the NEMs submission are cumulative exposure noise contours for annual operations at the airport for: (1) data representing the year of submission and (2) data representing a forecast year at least five years from the year of submission.[1]

The year of submission for the NEMs update is 2012. Therefore, the existing conditions noise contours are for 2012 and the 5-year forecast case contours are for 2017.

[1] As required in §III.A and §III.B of the FAA's "Part 150 Noise Exposure Maps Checklist."

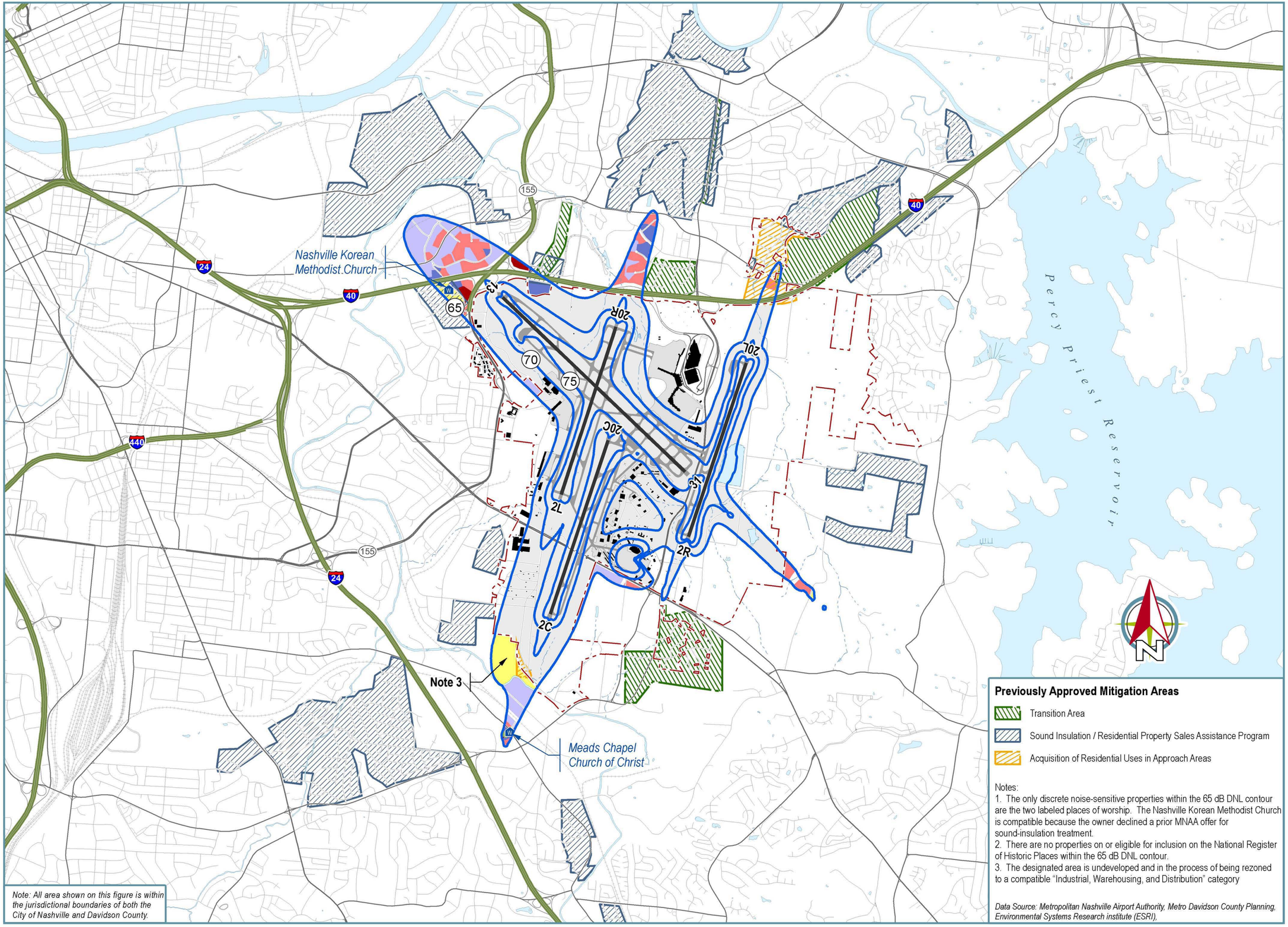
6.19.1 Noise Exposure Map Figures

Figure 6-1 and **Figure 6-2** present the NEM figures for existing (2012) and five-year forecast (2017) conditions, respectively**.** These are the official NEMs that the MNAA submitted under Part 150 for appropriate FAA review and determination of compliance, pursuant to §150.21.

The two figures identify the following items, as required in Part 150 (in the sections cited):

- Runway layout as required in §A150.103(b)(1).
- Calendar year 2012 and 2017 noise contours (for 65, 70, and 75 dB DNL) resulting from aircraft operations, as required in §A150.101(e)(3).
- Outline of the airport boundaries, as required in §A150.101(e)(4) and §A150.103(b)(1).
- Non-compatible land uses within the contours, as required in §A150.101(e)(5), including Part 150 land use categories and discrete sensitive land uses. As noted on the figures, the only non-compatible land uses within the 65 dB DNL contours are residential dwelling units to the east of the airport under the approach to Runway 31 and a place of worship on the approach to Runway 2L (the Meads Chapel Church of Christ).[2]
- Locations of noise sensitive public buildings, as required in §A150.101(e)(6).
- Some RNP procedures were in place and modeled in the 2012 NEM, but SIDS and STARS were included in the 2017 NEM. Details and a more in-depth discussion are available in Appendix B.
- It is important to note that there are no properties within the contours that are on or eligible for inclusion in the NRHP, as required in §A150.101(e)(6).
- It is important to note that the entire area depicted on the map (the boundaries of which extend well beyond the 65 dB DNL contours), is within the jurisdictional boundaries of Metro Government of Nashville and Davidson County, as required in §A150.105

[2] As noted on Figures 6-1 and 6-2, one other place of worship within the 65 dB DNL contour (the Nashville Korean Methodist Church) is compatible because the owner declined a prior MNAA offer for sound-insulation treatment, and a currently undeveloped residentially zoned area south of the airport under the approach to Runway 2L is in the process of being rezoned to a compatible “industrial, warehousing, and distribution” category.



Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Nashville and Davidson County.

Previously Approved Mitigation Areas

- Transition Area
- Sound Insulation / Residential Property Sales Assistance Program
- Acquisition of Residential Uses in Approach Areas

Notes:
1. The only discrete noise-sensitive properties within the 65 dB DNL contour are the two labeled places of worship. The Nashville Korean Methodist Church is compatible because the owner declined a prior MNAA offer for sound-insulation treatment.
2. There are no properties on or eligible for inclusion on the National Register of Historic Places within the 65 dB DNL contour.
3. The designated area is undeveloped and in the process of being rezoned to a compatible "Industrial, Warehousing, and Distribution" category

Data Source: Metropolitan Nashville Airport Authority, Metro Davidson County Planning, Environmental Systems Research institute (ESRI).

Nashville International Airport℠

ARMSTRONG

LEGEND

- 65-75 dB DNL Contours
- Airport Property
- Runway
- Taxiway
- Apron
- Buildings
- US / State Highways
- Local Roads
- Interstate
- Collector Roads
- Railroad
- River / Streams
- Water Bodies
- County Boundary
- Residential
- Mobile Home
- Transient Lodging
- Recreational / Open Space
- Commercial
- Manufacturing and Production
- Public Use

SOURCE: HARRIS MILLER MILLER & HANSON, INC.

Figure 6-1
Noise Exposure Map (2012)

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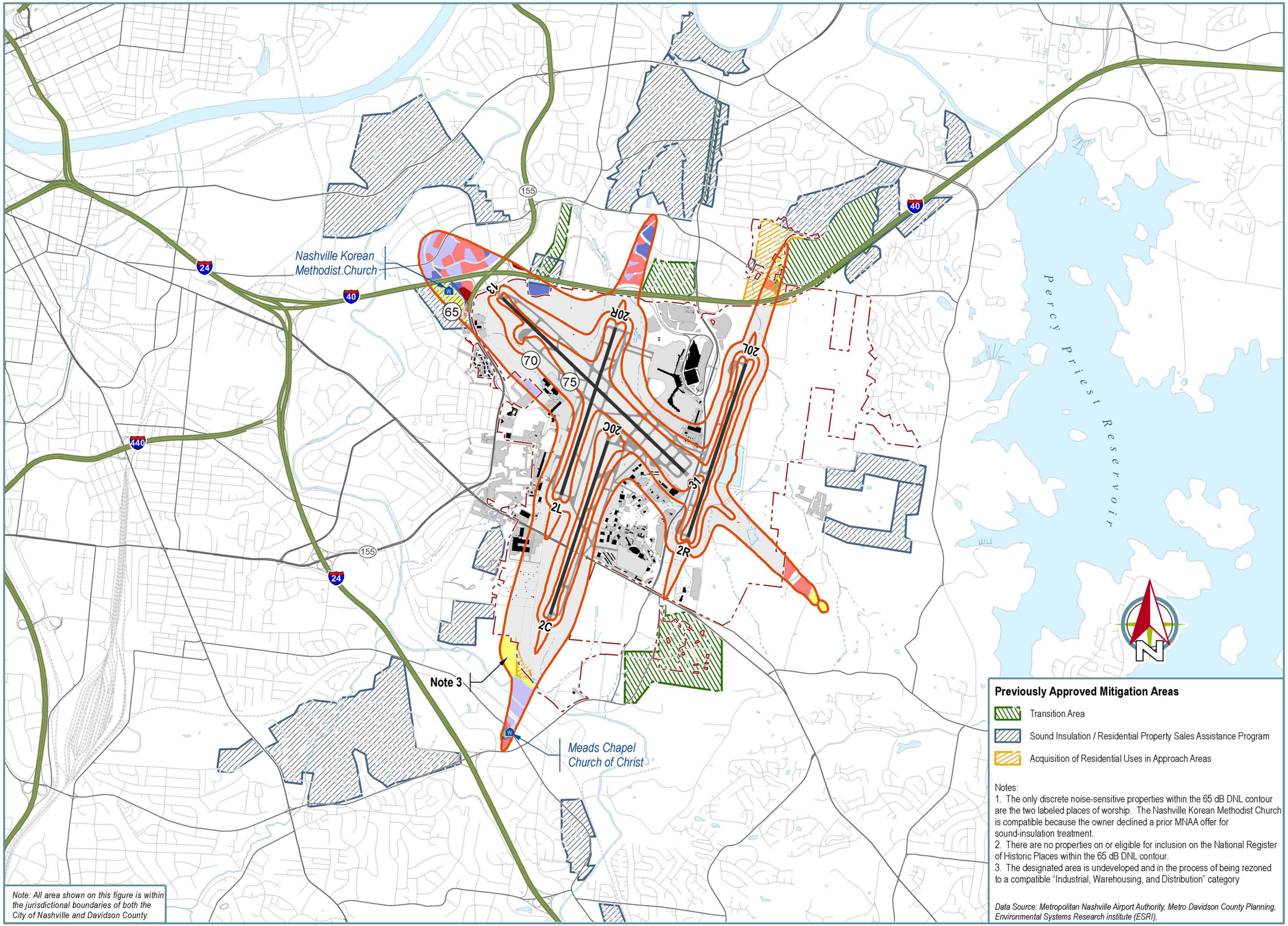

Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Nashville and Davidson County.

Previously Approved Mitigation Areas

- Transition Area
- Sound Insulation / Residential Property Sales Assistance Program
- Acquisition of Residential Uses in Approach Areas

Notes:
1. The only discrete noise-sensitive properties within the 65 dB DNL contour are the two labeled places of worship. The Nashville Korean Methodist Church is compatible because the owner declined a prior MNAA offer for sound-insulation treatment.
2. There are no properties on or eligible for inclusion on the National Register of Historic Places within the 65 dB DNL contour.
3. The designated area is undeveloped and in the process of being rezoned to a compatible "Industrial, Warehousing, and Distribution" category

Data Source: Metropolitan Nashville Airport Authority, Metro Davidson County Planning, Environmental Systems Research institute (ESRI),

Nashville International Airport℠

ARMSTRONG

LEGEND

- 65-75 dB DNL Contours
- Airport Property
- Runway
- Taxiway
- Apron
- Buildings
- US / State Highways
- Local Roads
- Interstate
- Collector Roads
- Railroad
- River / Streams
- Water Bodies
- County Boundary
- Residential
- Mobile Home
- Transient Lodging
- Recreational / Open Space
- Commercial
- Manufacturing and Production
- Public Use

Figure 6-2
Noise Exposure Map (2017)

SOURCE: HARRIS MILLER MILLER & HANSON, INC.

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