



# Appendix D, Land Use Assessment Methodology

Charlotte Douglas International Airport

**DRAFT – August 2024**

PREPARED FOR  
Charlotte Douglas International Airport

PRESENTED BY  
Landrum & Brown, Incorporated



Table of Contents		Page
<b>Appendix D</b>	<b>Land Use Assessment Methodology</b>	<b>D-1</b>
D.1	Airport Environs	D-1
D.2	Land Use Mapping	D-1
D.2.1	Land Use Classifications	D-3
D.2.2	GIS Data Compilation	D-3
D.2.3	Noise Sensitive Public Facilities	D-7
D.2.4	Existing Historic Sites	D-11
D.3	Preventative Local Land Use Controls	D-13
D.3.1	Comprehensive Planning	D-14
D.3.2	Future Land Use Planning	D-14
D.3.3	General Purpose Zoning	D-14
D.3.4	Subdivision Regulations	D-16
D.3.5	Building Codes	D-16
D.3.6	Coordinated Project Review Process	D-17
D.3.7	Full Disclosure Policy	D-17
D.3.8	Transfer of Development Rights	D-17
D.3.9	Capital Improvement Programs	D-18
D.3.10	Growth Risk Assessment	D-18
D.4	Corrective Land Use Mitigation Alternatives	D-19
D.4.1	Modify Existing Use	D-19
D.4.2	Maintain Existing Use	D-19
D.5	Role of Local Jurisdictions and Planning Organizations in Noise Compatibility Planning	D-20
D.5.1	Zoning Data Compilation	D-21

List of Tables		Page
TABLE D-1	GENERALIZED LAND USE CATEGORIES	D-4
TABLE D-2	EXISTING NOISE SENSITIVE PUBLIC FACILITIES	D-7
TABLE D-3	HISTORIC RESOURCES	D-11
TABLE D-4	GENERALIZED ZONING CLASSIFICATIONS	D-21

List of Exhibits		Page
EXHIBIT D-1	AIRPORT ENVIRONS	D-2
EXHIBIT D-2	GENERALIZED EXISTING LAND USE	D-6
EXHIBIT D-3	EXISTING NOISE-SENSITIVE SITES	D-10
EXHIBIT D-4	HISTORIC RESOURCES	D-12
EXHIBIT D-5	GENERALIZED EXISTING ZONING	D-23

# Appendix D Land Use Assessment Methodology

Identifying and evaluating land uses within the Airport Environs is an important step in the Part 150 Noise Compatibility Program Study Update (Study) process. This evaluation is necessary to identify residential and other noise-sensitive land uses that may be affected by Airport noise and operations. The land use assessment includes examining land use classifications, zoning codes, and development trends within the Airport Environs; and applying the Federal Aviation Administration (FAA) Part 150 guidelines for land use compatibility and previous land use mitigation efforts conducted by the City of Charlotte Aviation Department at Charlotte Douglas International Airport (CLT or Airport). A Geographic Information System (GIS) land use database was developed to facilitate the identification of land uses that are noncompatible with Airport operations.

## D.1 Airport Environs

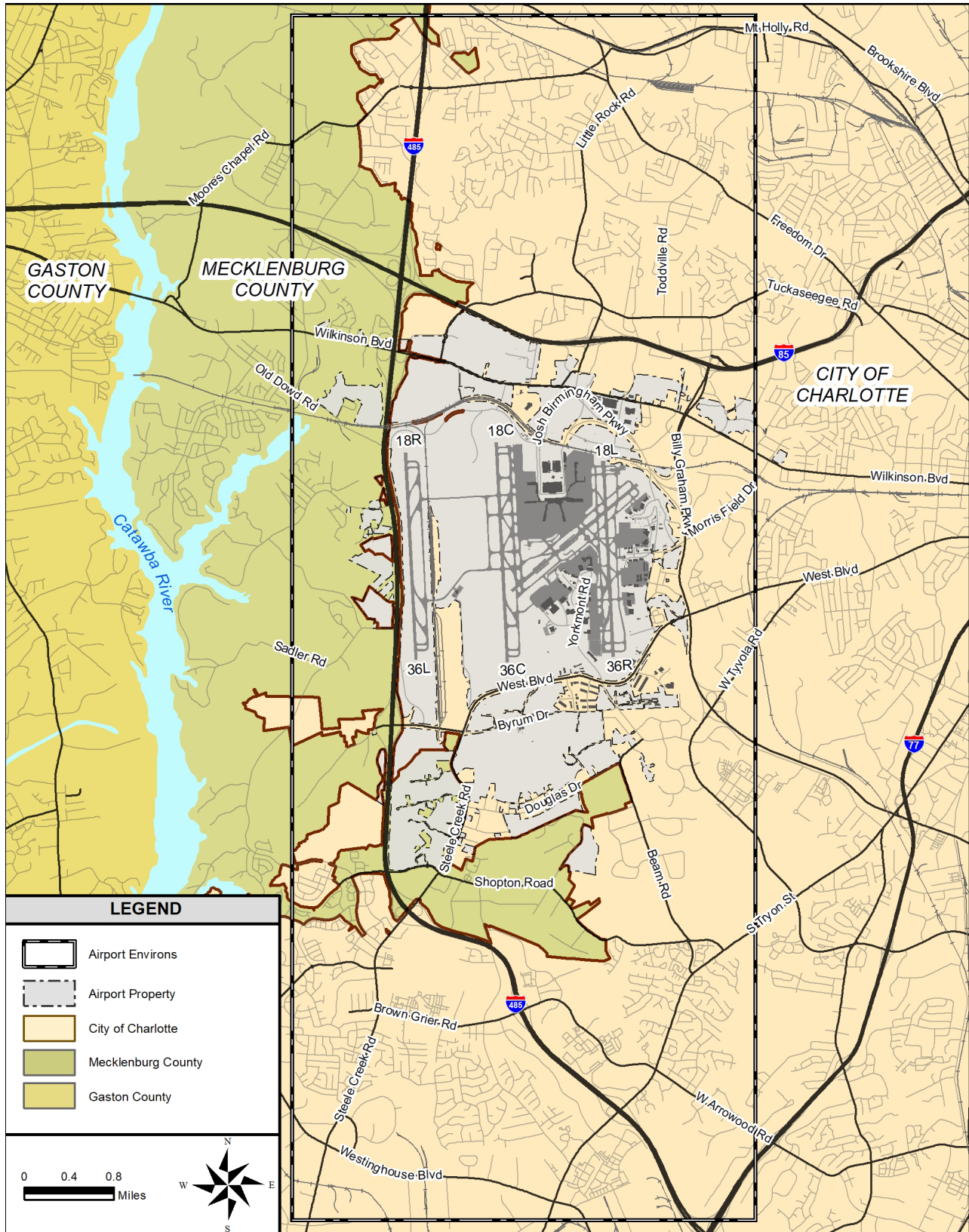
The Airport Environs, as discussed in Chapter 2, *Affected Environment*, refers to the regional area that experience most of the aircraft overflights from an airport. The Airport Environs for CLT is shown in **Exhibit D-1, Airport Environs**, and depicts the area of southwest Charlotte and Mecklenburg County. The map includes jurisdictional boundaries, local roads and major highways, the Airport property boundary, and other geographical features. The Airport Environs was delineated to identify the approximate area in which aircraft overflights occur at lower altitudes. The Airport Environs is not intended to identify areas in which overflights and noise may cause annoyance to the public since there is a degree of subjectivity to the level of annoyance that can vary among different individuals.

The Airport Environs encompasses an area of approximately 45 square miles. The boundary for this Study was determined by examining the boundaries of previous 65 day-night average sound level (DNL) noise exposure contours (the FAA-defined threshold for significant noise impacts), and by reviewing flight tracks of aircraft operating at CLT. CLT is located within the City of Charlotte, which is the largest city in Mecklenburg County. Both jurisdictions provide various government services to residents within each jurisdiction. Due to the overlapping jurisdictional boundaries, many services are delivered by a joint partnership between City and County agencies.

## D.2 Land Use Mapping

Land use data was collected and incorporated into a GIS database that includes jurisdictional boundaries, roads, bodies of water, and other physical features. The database was used to identify existing land use conditions within the Airport Environs and to identify areas impacted by noise per FAA guidelines. This section describes the methodology for collecting and analyzing land use data.

**Exhibit D-1 Airport Environs**



Source: Landrum & Brown, 2024.

### D.2.1 Land Use Classifications

Existing land use data was collected from the Mecklenburg County Division of Geospatial Information Services. Land uses in the vicinity of CLT were categorized in terms of the general land use classifications as outlined in 14 CFR Part 150 and shown in **Table D-1, Generalized Land Use Classifications**. These classifications include residential (single, multi-family and manufactured housing), commercial, industrial and utility (e.g., manufacturing and production), institutional (e.g., public use), park/recreational, agricultural/open space/vacant. These land uses were identified based on each jurisdiction's GIS database, published land use and zoning maps and were verified as necessary with aerial photography and site visits. The existing land use patterns within the Airport Environs is shown in **Exhibit D-2, Generalized Existing Land Use**.

### D.2.2 GIS Data Compilation

Base mapping information; including roads, county and municipal boundaries, and existing land use; were compiled using ArcMap, version 10.8. ArcMap is an analytical software program that allows manipulation and analysis of spatial data from a variety of sources. The base map information is used for comparison to aircraft noise and operational data analyzed for this study. Flight track data obtained for this Study as described in Appendix C, *Noise Modeling Methodology*, was overlaid onto the land use base map. Noise contours generated by the Aviation Environmental Design Tool (AEDT) version 3e were superimposed over the land use base map to produce the Noise Exposure Maps (NEMs) for this Study.

Land parcel and facility data was obtained from Mecklenburg County in August 2022 for areas within and adjacent to the Airport Environs. This data was verified using existing aerial imagery and field surveying conducted through March 2023. This data was updated to reflect areas of known redevelopment that resulted in a change in land use or a change in the number of housing units or noise-sensitive facilities.

The field verified parcel data was used to identify land uses that would be considered noise-sensitive land per FAA guidelines as described in Appendix A. Data collected from the U.S. 2010 Decennial Census at the tract level was combined with the parcel data to calculate total population based on average household size. An estimated ratio of persons per household was estimated and applied to each parcel to estimate the population within each housing unit. The housing and population within each of the noise contours were determined by overlaying the noise contour and the parcel data using GIS software. The number of residential parcels/structures and population within each DNL noise contour level were then determined by an automated count using the GIS software's built-in capabilities.

**Table D-1 Generalized Land Use Categories**

Generalized Land Use	Specific Land Use Types
Single Family Residential	Rural Homesite
	Single Family Residential
	Town House
Multi-Family Residential	Condominium
	Multi Family
	Multi Family Duplex/Triplex
	Multi Family Water Access
Mobile Home Park	Mobile Home Park
	Mobile Home Subdivision
Commercial	Auto Sales and Service
	Bank
	Bill Board
	Car Wash
	Cell Tower
	Commercial
	Commercial Condominium
	Commercial Service
	Convenience Store
	Convenience/Fast Food Store
	Day Care Center
	Department Store
	Fast Food
	Forest - Commercial Production
	Horticultural - Commercial Production
	Hotel/Motel
	Laboratory / Research
	Lumber Yard
	Marina Land
	Medical Condominium
	Medical Office
	Mini Warehouse
	Office
	Office Condominium
	Parking
	Restaurant
	Service Garage
	Service Station
	Shopping Center - Strip
	Single Family Residential
	Supermarket
	Warehouse Condominium
Warehousing	
Manufacturing/Production	Industrial
	Light Manufacturing
	Mining
Institutional / Public Use	Air Rights Parcel
	Church
	Club, Lodges, Union Hall, Swim Club
	College - Public
	Fire Department
	Funeral (Mortuary, Cemetery, Crematorium, Mausoleum)

**Table D-1 Generalized Land Use Categories (Continued)**

Generalized Land Use	Specific Land Use Types
Institutional / Public Use <i>(continued)</i>	Home for the Aged
	Hospital
	Institutional
	Municipal Airport
	Municipal Education
	Nursing Home
	Other County Property
	Other Federal
	Other Municipal
	Pvt Owned Rr with Rail Row
	Right Of Way
	Roadway Corridor
	School - Public
	School, College, Private
	State Prop
	Utility (Gas, Electric, Telephone, Telegraph, Rail)
	Utility Easement
Water Plant	
Park/Recreation	Club, Lodges, Union Hall, Swim Club
	Conservation - Agricultural Comm
	Conservation - Forestry Comm
	Conservation - Woodland Excess Acreage
	Country Club
	Golf Course
	Greenway Trail
	No Land Interest
Rec Area	
Agricultural	Agricultural - Commercial Production

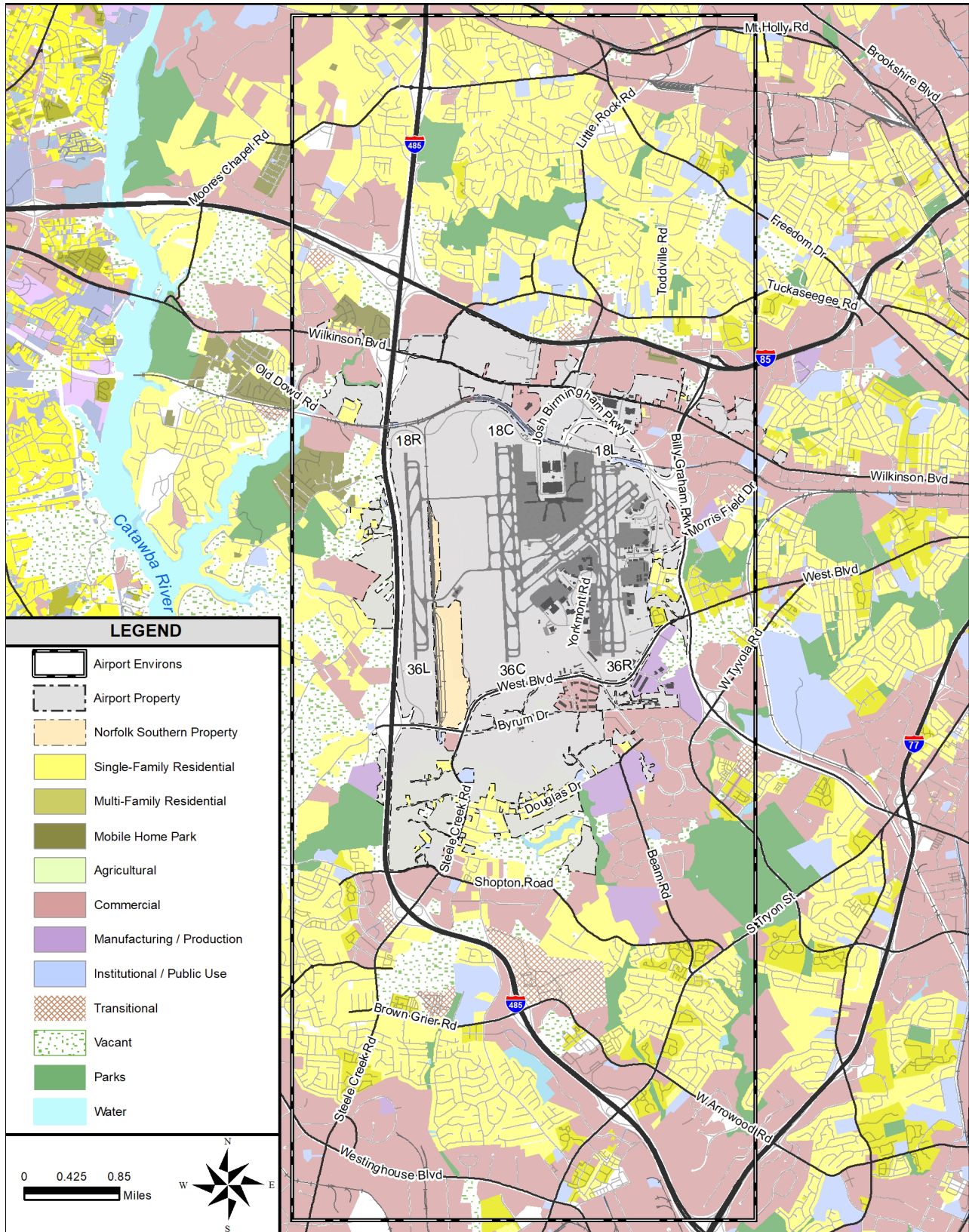
Notes:

- 1 Agricultural uses are classified as Manufacturing and Production under 14 C.F.R. Part 150 Guidelines but are identified separately for this Part 150 Noise Compatibility Program Update for ease of understanding the land uses neat the Airport.
- 2 Vacant/Open Space is not an identified use under 14 C.F.R. Part 150 Guidelines but is identified separately for this Part 150 Noise Compatibility Program Update for ease of understanding the land uses near the Airport.

Source: Landrum & Brown, 2024.



**Exhibit D-2 Generalized Existing Land Use**



Source: Landrum & Brown, 2024.

### D.2.3 Noise Sensitive Sites

Land uses that could be considered noncompatible with airport operations include more than just residential uses. FAA guidelines define certain public facilities as noise-sensitive: places of worship, schools (and daycare facilities at which licensed education occurs), nursing homes, libraries, and hospitals. Detailed information on noise-sensitive facilities was collected within the Airport Environs. A variety of sources were obtained to compile GIS data showing the locations of noise-sensitive public facilities within the Airport Environs, including GIS data from Mecklenburg County, aerial imagery, and past studies at CLT.

Within the Airport Environs there are 18 schools, 32 daycare facilities, and 45 places of worship as identified in **Table D-2, Existing Noise Sensitive Public Facilities**, and shown on **Exhibit D-3, Existing Noise-Sensitive Public Facilities**.

**Table D-2 Existing Noise Sensitive Public Facilities**

Map ID	Facility Name	Address
<b>Schools</b>		
S1	Allenbrook Elementary	1430 Allenbrook Drive
S2	Berewick Elementary	5910 Dixie River Road
S3	Central Piedmont Community College	2201 Water Ridge Py
S4	East Voyager Academy Of Charlotte	7429 Tuckaseegee Rd.
S5	Gordon-Conwell Theology	9401 Southern Pines Blvd
S6	J.W. Wilson Middle School	7020 Tuckaseegee Road
S7	Kennedy Middle School	4000 Gallant Lane
S8	Mountain Island Day School	1209 Little Rock Rd
S9	Olympic High School	4301 Sandy Porter Road
S10	Renaissance West Elementary	3241 New Renaissance Way
S11	Renaissance West Middle School	3241 New Renaissance Way
S12	Rod of God Christian Academy	7300 South Tryon Street
S13	Southwest Charlotte STEM Academy	5203 Shopton Rd
S14	Steele Creek Elementary	4100 Gallant Lane
S15	Steele Creek Preparatory Academy	2200 Shopton Road
S16	Tuckaseegee Elementary	2028 Little Rock Road
S17	Unity Classical Charter School	1929 W Arrowood Rd
S18	West Mecklenburg High School	7400 Tuckaseegee Road
<b>Daycare Facilities</b>		
D1	Anthony's Day Care Home	2514 Nickelridge Court
D2	Beginning Years Day Care	2211 Little Rock Road
D3	Berewick Elementary A.S.E.P.	5910 Dixie River Road
D4	Busy Beez Child Care	2201 Mary Ann Drive
D5	Cadence Academy Preschool, Whitehall	2726 West Arrowood Road
D6	Children's Academy at Lakepointe	2701 Water Ridge Pkwy
D7	Dogwood Lane Children's Academy	1551 Arrowpoint Lane
D8	Ebenezer Child Care Home Sylvia Pauling	7421 Chital Dr
D9	Gallmon Family Small Day Care Home	7134 Badenoch Ct
D10	Gina's Learn-N-Play Home Day Care	5705 Silver Eagle Dr
D11	Howard Levine Child Development Center	3303 Achievement Lane
D12	Humpty Dumpty Academy I	5721 Tuckaseegee Road
D13	Jaznee's Wonderland	7300 Cormwell Lane
D14	La Petite Academy	9221 South Tryon Street
D15	Lachriston Large Day Care Home	6430 Tomahawk Lane
D16	Lacy'S Little Ones	12236 Taragate Drive
D17	Lil' Bundles of Joy	4106 Cedar Hill Dr
D18	Little Dove's In Home Day Care	1529 Eagles Landing Dr

**Table D-1 Existing Noise Sensitive Public Facilities (Continued)**

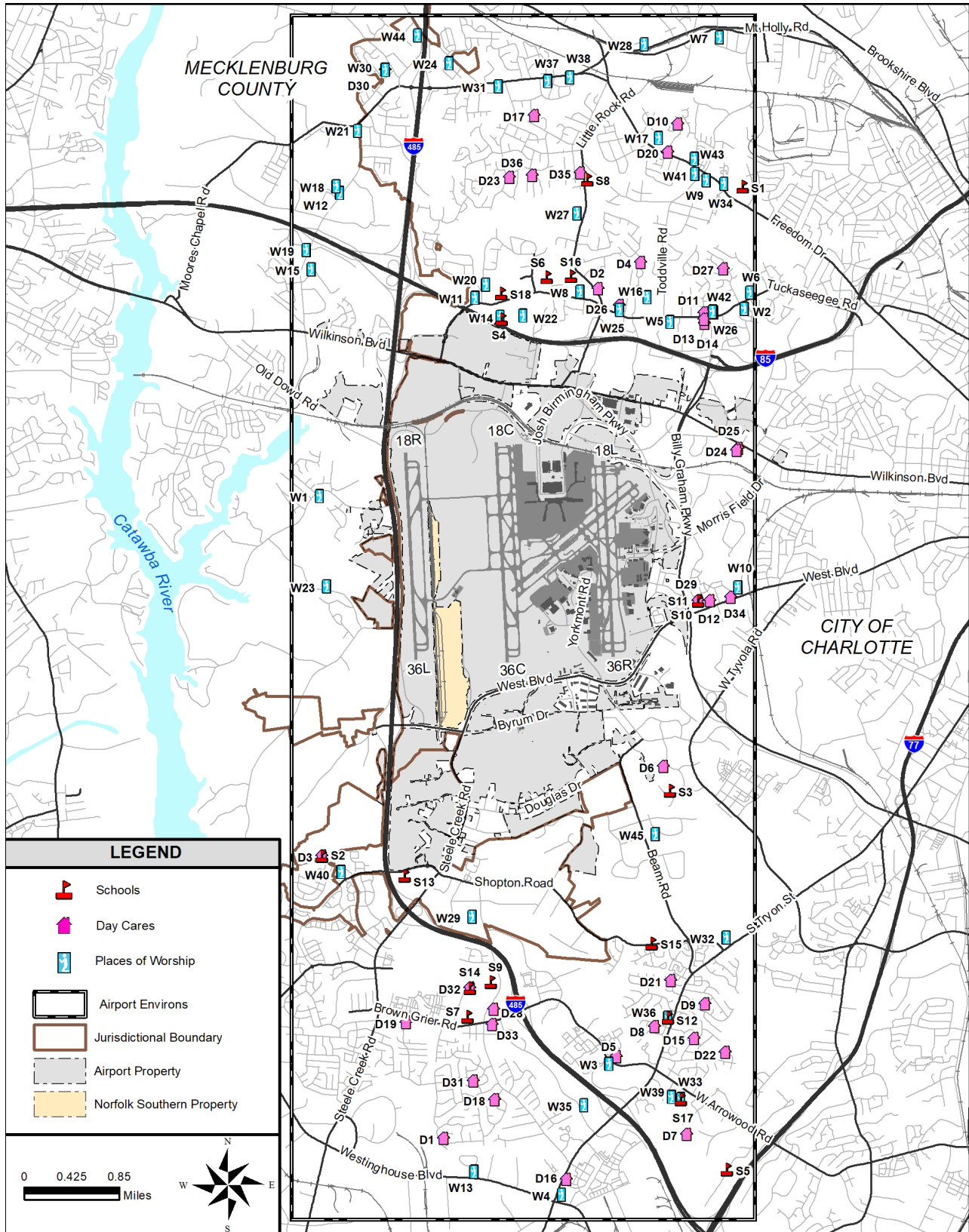
Map ID	Facility Name	Address
<b>Daycare Facilities (continued)</b>		
D19	Little Miracles Home Day Care	2500 Yorkdale Drive
D20	Miss Ethel's Day Care Home	1722 Ranchwood Dr
D21	Miss Miss C's Child Care	7327 Crossridge Road
D22	Mrs. Chris Play and Learn #2	4613 Wilkinson Blvd
D23	Mrs. Chris Play and Learn Preschool	4609 Wilkinson Blvd
D24	Mulberry Head Start	6450 Tuckaseegee Road
D25	Precious Little Angels	2424 Heather Glen Lane
D26	Primrose School of Lake Wylie	3960 W Arrowood Road
D27	Shady Brook Baptist Child Care Center	2940 Belmeade Drive
D28	Spectrum Kids	12122 Red Hickory Lane
D29	The Learning Experience	3937 West Arrowood Road
D30	The Learning Tree Child Care Center	3124 West Boulevard
D31	Tiny Treasures Child Development Center	1136 Little Rock Rd
D32	Vantoinette J. Savage Small Day Care Home	7007 Hunters Glen Drive
<b>Places of Worship</b>		
W1	Berryhill Baptist Church	9791 Walkers Ferry Rd.
W2	Blessed Assurance Community Church	5303 Tuckaseegee Rd.
W3	Bold Church	2735 West Arrowood Rd.
W4	Central Steele Creek Presbyterian Church	9401 Tryon St.
W5	Charlotte Chin Baptist Church	6031 Tuckaseegee Rd.
W6	Charlotte Immanuel Church of All Nations	5216 Tuckaseegee Rd.
W7	Connections - An Assurance Faith Community	6729 Old Mt Holly Rd.
W8	Covenant United Methodist Church	6824 Tuckaseegee Rd.
W9	Durham Memorial Baptist Church	1601 Toddville Rd.
W10	Epic Church Charlotte/ Hedges and Highways Church	3000 Nobles Av.
W11	Every Nation Church	7700 Tuckaseegee Rd.
W12	Garden Memorial	2324 Sam Wilson Rd.
W13	Greater Newbirth Fellowship	9333 Forsyth Park Dr.
W14	Harvest Church	7429 Tuckaseegee Rd.
W15	Hope Community Church of Metrolina	3205 Sam Wilson Rd.
W16	Iglesia Catolica Nuestra Senora de Guadalupe	6212 Tuckaseegee Rd.
W17	Kingdom Christian Church	5832 Freedom Dr.
W18	Kingdom Embassy International	2324 Sam Wilson Rd.
W19	Liberty Baptist Church	3000 Sam Wilson Rd.
W20	Montagnard Alliance Church	3215 Westerwood Dr.
W21	Moore's Chapel	10601 Moore's Chapel Rd.
W22	Mt. Carmel Baptist Church	7237 Tuckaseegee Rd.
W23	Mt Olive Presbyterian Church	5125 Mt Olive Church Rd.
W24	Mt Zion Missionary Baptist Church	821 Hawley St.
W25	Mulberry Baptist Church	6450 Tuckaseegee Rd.
W26	Mulberry Presbyterian Church	5600 Tuckaseegee Rd.
W27	New Bethel Church of God in Christ	1520 Little Rock Rd.
W28	Paw Creek Presbyterian Church	7400 Mount Holly Rd.
W29	Saint Joseph Catholic Church	4925 Sandy Porter Rd.
W30	Shadybrook Baptist Church	2940 Belmeade Dr.
W31	St. Johns Chapel Baptist Church	8833 Moore's Chapel Rd.
W32	Steele Creek AME Zion Church	6414 Tryon St.
W33	Steele Creek Church	1929 Arrowood Rd.
W34	The Church of Pentecost Charlotte Central	5024 Freedom Dr.
W35	The Restoration Place Church	2520 Whitehall Park Dr.
W36	The Rod of God Ministries	7300 Tryon St.

**Table D-2 Existing Noise Sensitive Public Facilities (Continued)**

Map ID	Facility Name	Address
<b>Places of Worship (continued)</b>		
W37	Thrift Baptist Church	8415 Moores Chapel Rd.
W38	Thrift United Methodist Church	8245 Moores Chapel Rd.
W39	Trinity Baptist Church	2009 Arrowood Rd.
W40	Trinity Worship Center	5735 Dixie River Rd.
W41	West Charlotte Church at Freedom	1646 Toddville Rd.
W42	West Charlotte Spanish SDA Church	5600 Tuckaseegee Rd.
W43	Westview Christian Church	5414 Freedom Dr.
W44	Woodland Presbyterian Church	900 Rhyne Rd.
W45	World Worship Church	3925 Rose Lake Dr.

Source: Mecklenburg County parcel data, Landrum & Brown analysis, 2024.

**Exhibit D-3 Existing Noise-Sensitive Sites**



Source: Landrum & Brown, 2024.

### D.2.4 Existing Historic Sites

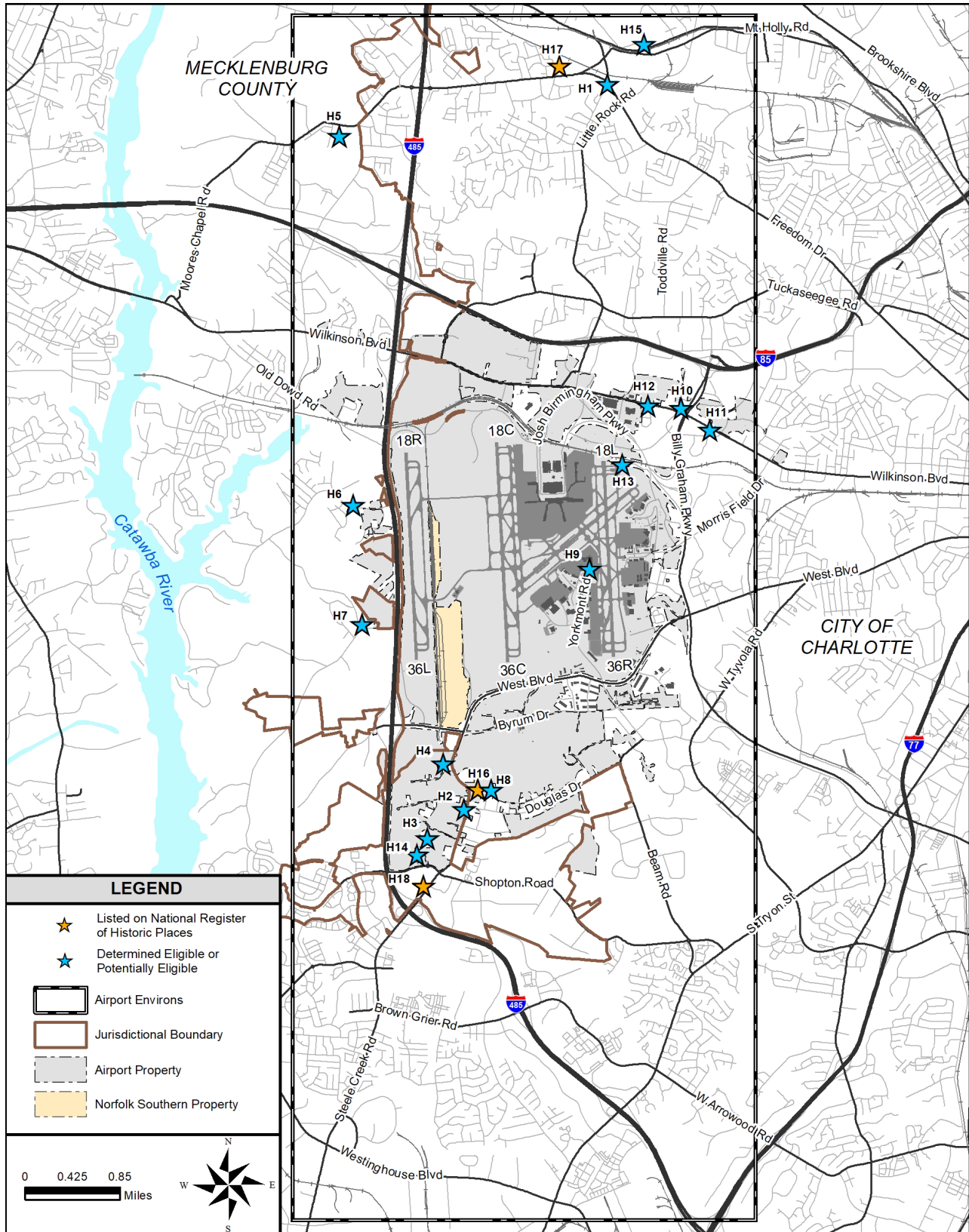
Historic properties listing in or eligible for inclusion in the National Register of Historic Places (NRHP) should be identified on the NEMs per 14 CFR Part 150. The NRHP is the official list of historic places worthy of preservation in the U.S. as authorized by the National Historic Preservation Act of 1966. Within the Airport Environs, there are 18 properties that are listed on or that have been determined eligible for the NRHP as identified in **Table D-3, *Historic Sites***, and shown on **Exhibit D-4, *Historic Resources***.

**Table D-3 Historic Resources**

Map ID	Facility Name	Status
H1	Love's Service Station	Determined Eligible for the NRHP
H2	Steele Creek Presbyterian Church Manse	Determined Eligible for the NRHP
H3	Spratt-Grier Farm	Determined Eligible for the NRHP
H4	Byrum-Croft House	Determined Eligible for the NRHP
H5	Moore-Sadler House	Determined Eligible for the NRHP
H6	Rogers House	Determined Eligible for the NRHP
H7	Cooper Log House	Determined Eligible for the NRHP
H8	John Douglas House	Determined Eligible for the NRHP
H9	Charlotte Municipal Airport (International Airport Cargo Terminal)	Determined Eligible for the NRHP
H10	Oakden Motel	Determined Eligible for the NRHP
H11	Split Rail Lodge	Determined Eligible for the NRHP
H12	Two Guys Auto Repair Body Shop	Determined Eligible for the NRHP
H13	W.P.A. Douglas Airport Hangar (current site)	Determined Eligible for the NRHP
H14	William Grier House (current site)	Determined Eligible for the NRHP
H15	Paw Creek Presbyterian Church	Determined Eligible for the NRHP
H16	Steele Creek Presbyterian Church	Listed on the NRHP
H17	Thrift Mill	Listed on the NRHP
H18	Hayes-Byrum Store and House (house no longer standing)	Listed on the NRHP

Source: National Register of Historic Places data, Landrum & Brown analysis, 2024.

**Exhibit D-4 Historic Resources**



Source: Landrum & Brown, 2024.

### D.3 Preventative Local Land Use Controls

The evaluation of land use planning techniques is intended to address the potential for future development in areas located within and in the vicinity of the DNL 65 decibel (dB) noise exposure contour where aircraft overflights continue.<sup>1</sup> The responsibility for controlling and managing the development and redevelopment of land outside the Airport boundary is the responsibility of each community. Therefore, it is incumbent upon the local planning and elected officials to monitor and plan for new development in a manner that is compatible with aircraft operations.

According to an FAA land use guidance manual, Land Use Compatibility and Airports,<sup>2</sup> the FAA recognizes that aircraft noise does not stop at the DNL 65 dB noise exposure contour.

*“While the FAA can provide assistance and funding to encourage compatible land development around airports, it has no regulatory authority for controlling land uses that would protect airport capacity. The FAA recognizes that state and local governments are responsible for land use planning, zoning and regulation, including that necessary to provide land use compatibility with airport operations. However, pursuant to the Federal Airport and Airway Development Act, as a condition precedent to approval of an FAA-funded airport development project, the airport sponsor must provide the FAA with written assurances that “...appropriate action, including the adoption of zoning laws have been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations including the landing and takeoff of aircraft...”*

*FAA has required the phasing out of noisy Stage 1 and Stage 2 aircraft consequently, the aviation industry has spent substantial monies to meet this requirement. To assist in the compatible land use efforts, the FAA, local airport sponsors, and state aviation agencies have expended significant funds related to airport planning and off-airport noise and land use compatibility planning throughout the United States. Airport master plans have been prepared to identify the near-term and long-range projections for airport activity and the development necessary to meet these activity demands. In addition, noise and land use studies (Part 150 studies) have been conducted to evaluate ways to minimize impacts of aircraft noise, and the FAA and airport sponsors have financed land acquisitions and other noise compatibility measures throughout the United States.”*

Therefore, the FAA encourages airport sponsors and local governments to work together to establish local land use controls in areas adjacent to an airport and within the flight corridors that extend beyond the DNL 65 dB contour.<sup>3</sup> A brief discussion of typical preventive land use management techniques, and their application by the jurisdictions within the Airport Environs, is provided in the following sections.

---

<sup>1</sup> Note that per Part 150 regulations, all land uses are compatible with outdoor noise levels below DNL 65 dB; however, local planning efforts may, at the discretion of local jurisdictions, consider noise below DNL 65 dB independent of the Part 150 process.

<sup>2</sup> Land Use Compatibility and Airports: A Guide for Effective Land Use Planning, FAA Airports Division, Southern Region Office, Atlanta, Georgia, Jacqueline Sweatt-Essick, et al, July 1999.  
[http://www.faa.gov/about/office\\_org/headquarters\\_offices/aep/planning\\_toolkit/media/III.B.pdf](http://www.faa.gov/about/office_org/headquarters_offices/aep/planning_toolkit/media/III.B.pdf)

<sup>3</sup> Note that per Part 150 regulations, all land uses are compatible with outdoor noise levels below DNL 65 dB; however, local planning efforts may, at the discretion of local jurisdictions, consider noise below DNL 65 dB independent of the Part 150 process.



### D.3.1 Comprehensive Planning

A comprehensive plan sets forth goals, policies, and programs intended to guide the present and future physical, social, and economic development of land within that jurisdiction. A land-use plan uses text and maps to designate the expected future use or reuse of land. A comprehensive plan or land-use plan is intended to guide coordinated, efficient, and orderly development within the planning jurisdiction based on an analysis of present and future needs and expected growth trends. The jurisdiction may then enact other programs or ordinances to further the development goals of the comprehensive land use plan.

In accordance with Chapter 160D, Article 5 of the North Carolina General Statutes, as a condition of adopting and enforcing zoning regulations, a local government shall adopt and reasonably maintain a comprehensive plan or land-use plan. A local government may prepare and adopt other plans as deemed appropriate. This may include, but is not limited to, small area plans, neighborhood plans, hazard mitigation plans, transportation plans, housing plans, and recreation and open space plans.<sup>4</sup>

The City of Charlotte Long Range Planning Division is responsible for developing plans and policies to guide development within Charlotte and unincorporated Mecklenburg County. The Charlotte Future 2040 Comprehensive Plan was adopted in June 2021. In addition to the Comprehensive Plan, the City prepares community area plans for specific communities within its planning jurisdiction.

A comprehensive plan in and of itself does not and cannot control development or relieve noise noncompatibilities without implementing a development plan, but there are other tools available, which are discussed subsequently.

### D.3.2 Future Land Use Planning

The formal adoption of a local land use plan by the jurisdictions within the Airport Environs provides the basis for zoning determinations and evaluations regarding the suitability of various development proposals for implementation. The land use plan element of the comprehensive plan should take into account the compatibility of proposed development and the identification of developable lands while also taking into account the existing and anticipated aircraft noise levels in order to plan future land uses accordingly. The land use plan should serve as the basis to guide the development of the community's Capital Improvement Program (CIP) and zoning decisions.

### D.3.3 General Purpose Zoning

Zoning is one of the primary tools available to local communities to ensure land use compatibility. Zoning ordinances and regulations are intended to promote public health, safety, and welfare by regulating the use of the land within a jurisdiction based on factors such as land use compatibility and existing and expected socioeconomic conditions. The regulation of land through a zoning ordinance is granted to local jurisdictions pursuant to Chapter 160D, Articles 1 through 14, of the General Statutes of North Carolina.<sup>5</sup>

---

<sup>4</sup> North Carolina General Statutes - Chapter 160D Article 5, Available online at: [https://www.ncleg.gov/EnactedLegislation/Statutes/PDF/ByArticle/Chapter\\_160D/Article\\_5.pdf](https://www.ncleg.gov/EnactedLegislation/Statutes/PDF/ByArticle/Chapter_160D/Article_5.pdf)

<sup>5</sup> City of Charlotte Zoning Ordinance, Chapter 1, Section 1.102.

Zoning can be a useful tool for controlling land use development and promoting compatibility with airport operations while supporting private land ownership. Typically, a zoning ordinance will identify what types of land use development are and are not permitted in the respective zoning districts. Zoning cannot be relied upon as a “corrective land use management measure” as it can only be applied prospectively and not retroactively. Also, because zoning is a construct of a political body and subject to changing conditions and situations, the zoning classification of any particular tract of land is always subject to change and its implementation and enforcement must be monitored to ensure continuing compatibility and effectiveness.

### **Overlay Districts**

Overlay Districts are zoning districts, which are applied only in conjunction with standard zoning districts, and may grant additional use or development requirements upon the underlying zoning districts. The effect is to have both the overlay district and the underlying zoning controlling the use and development of a lot. According to the City of Charlotte Zoning Ordinance, Overlay Districts are applicable on an area wide basis to support specific public policy objectives and should be consistent with the Generalized Land Plan, District Plans and Area Plans. Overlay districts may be applied to general and conditional districts.

### **Airport Overlay Zoning**

An airport overlay zone establishes a set of development guidelines on areas designated as highly sensitive to aircraft noise. Such a district would serve as an overlay of the underlying land use zoning and would impose various guidelines on the development of land within its boundaries. These constraints may include a requirement for the sound insulation of new or rehabilitated properties, disclosure of the susceptibility of the property to elevated aircraft noise levels, the dedication of an aviation easement for new development, the requirement of development densities for noncompatible uses in concordance with the level of noise exposure, the coordinated review of development proposals, etc. The boundaries of the overlay zone may be established by the local jurisdiction having land use control at any level deemed to be appropriate to the management of the risk of adverse effects and noncompatible land uses between aircraft and noise-sensitive development.

The City of Charlotte Zoning Code includes Airport Zone Overlay Districts that regulate building height and place requirements for airport noise disclosure for residential property owners and prospective residential property owners.<sup>6</sup> The airport height zones include the following zones:

- Approach Zones – established at each end of a runway used for landings and take-offs.
- Transitional Zones – A surface extending outward and upward, at right angles to the runway centerline and runway centerline extended, from the sides of the Primary Surface and the Approach Surfaces.
- Horizontal Zone – This zone shall include that area within a circle whose center is the airport reference point and whose radius is eleven thousand five hundred (11,500) feet.
- Conical Zone – The conical zone includes that area within a ring, seven thousand (7,000) feet wide, around the horizontal zone, measured from the periphery of the horizontal zone.

No structure or tree shall be erected, altered, allowed to grow, or maintained in an approach zone, transition zone, horizontal zone, or conical zone to a height which projects above the upper surface

---

<sup>6</sup> City of Charlotte Zoning Ordinance, Chapter 1, Part 3, Section 10.301 through Section 10.314.

of any such zone. Any tree or structure may go up to a height of 40 feet. The owner of any tree or structure which exceeds the above height limitations and is allowed to continue as nonconforming under the ordinance shall permit the City of Charlotte to install, operate, or maintain thereon, at the City's expense, any markers and lights necessary to indicate the presence of such a hazard to aircraft operators.

See Section D.3.7 for more information about the Airport Noise Overlay District.

#### D.3.4 Subdivision Regulations

Subdivision regulations apply in cases where a parcel of land is proposed to be divided into lots or tracts, usually for the purpose of allowing new development. Subdivision regulations are established to ensure the proper arrangement of streets, adequate and convenient open space, efficient movement of traffic, adequate and properly-located utilities, access for fire-fighting apparatus, avoidance of congestion, and the orderly and efficient layout and use of land.

Subdivision regulations can be used to enhance noise-compatible land development by requiring developers to plat and develop land so as to minimize noise impacts or reduce the noise sensitivity of new development. The regulations can also be used to protect the airport proprietor from potential litigation for noise impacts at a later date. The most common requirement is the dedication of a noise or aviation easement to the local government by the land subdivider as a condition of the development approval. The easement authorizes overflights of the property with the noise levels attendant to such operations. Subdivision regulations may also require the developer to disclose the aircraft noise levels over the property through the use of a plat notice or other means, or to provide information on noise insulation criteria to be used in the construction of any building on the property.

The City of Charlotte Subdivision Regulations require that if a request for subdivision is wholly or partially located in the Airport Noise Disclosure Overlay District, a disclosure notice as per the requirements of Section 14.8 shall be inscribed on the plat.<sup>7</sup>

#### D.3.5 Building Codes

Building codes regulate building construction and construction practices ensuring that all safety standards are met and resulting in the issuance of a building permit from the local governing body. (A building code is most easily enforced through a local building permit process.) Sound insulation may be required in new homes, offices, and institutional buildings to mitigate the effects of high aircraft noise levels. Building code requirements intended for energy efficiency may also provide acoustical insulation benefits. Caulking of joints, continuous sheathing, dead air spaces, ceiling and wall insulation, solid core doors, and double-pane windows can attenuate aircraft noise while conserving energy used for home heating and cooling.

Not all sound insulation needs are met by typical energy-conserving building methods. For example, field research has found that some modern and highly energy-efficient storm window designs are less efficient for sound insulation than some older designs that allow for larger dead air spaces. Other sound insulation measures that may not be justifiable for energy efficiency are vent baffling and year-round, closed-window ventilation systems. Building codes apply to existing

---

<sup>7</sup> City of Charlotte Unified Development Ordinance, Article 30, Subdivision, Available online at: <https://read.charlotteudo.org/articles/article-30-subdivision/>

buildings only when remodeling or expansion is contemplated. Amendments to building codes do not help to correct noise problems in existing buildings in developed areas.

The City of Charlotte and Mecklenburg County have adopted the North Carolina State Building Code. North Carolina has mandatory statewide code enforcement and these codes adopt the International Building Codes 2015 (IBC2015). The North Carolina Building Code Council is the overall authority responsible for overseeing the code process.<sup>8</sup> The North Carolina State Building Code does not have any provisions that specifically addresses airport noise attenuation.

### D.3.6 Coordinated Project Review Process

The coordinated review of proposals for zoning changes, subdivision development, or building permits may be conducted as a means for consideration of the potential effects of aircraft noise on proposed development actions. The coordination assumes the review by both airport and land use management personnel of project compatibility, and may result in a report on each item under consideration which is attached to the project file and reported to the governing bodies as part of their consideration of the suitability of the project action for approval or denial. Such measures may be included in an NCP as separate measures or incorporated into a broader measure such as an Airport Overlay Zone.

### D.3.7 Full Disclosure Policy

A program can be developed to ensure that the buyers of residential property within the Airport Environs receive full disclosure of the location of the property relative to an airport. This would require that the sellers of residential property located in the Airport Environs deliver to buyers a purchase disclosure notice referencing the airport overlay zone language. It may also require that all advertisements and listings for sale of residentially zoned or improved property in the airport noise overlay zone include a statement about aircraft noise, such as, “Not recommended for persons who may easily be disturbed by aircraft noise.” Finally, solicitation of the voluntary inclusion of the notice in the Multiple Listing Services by the real estate profession alerts potential buyers of property to aircraft noise conditions.

### D.3.8 Transfer of Development Rights

The Transfer of Development Rights (TDR) is a land use regulatory tool under which development rights can be severed from a tract of land and sold in a market transaction. The parcel from which the rights are transferred is then permanently restricted as to future development, and the purchaser of the rights may assign them to a different parcel to gain additional density. A TDR program would allow landowners in a designated “sending” area to transfer the development rights assigned to their property to a landowner in a designated “receiving” area where the community would like to concentrate development. In this case, the designated “sending” district would be residentially-zoned land located in areas substantially affected by aircraft noise. The designated “receiving” district would be in a location not greatly affected by airport noise. The designated “receiving” area would be allowed to develop at a higher density than would be permitted by the underlying zoning. Though the community defines the requirements and parameters associated

---

<sup>8</sup> North Carolina Building Codes. Available online at <https://codes.iccsafe.org/codes/north-carolina>.

with establishing the sending and receiving districts, any actual transfer is negotiated between the landowner in the sending district and landowner in the receiving district.

### D.3.9 Capital Improvement Programs

A Capital Improvement Program (CIP) is a plan created by a jurisdiction outlining major capital improvements planned to be undertaken during each year of the CIP. Most capital improvements have no direct bearing on noise compatibility; few municipal capital improvements are noise-sensitive. The obvious exceptions to this are schools and, in certain circumstances, libraries, medical facilities, and cultural/ recreational facilities.

Some capital improvements may have an indirect, but more profound, relationship to noise compatibility. For instance, the development of new sewer and water facilities may open up large vacant areas for the private development of noise-sensitive residential uses. In contrast, the same types of facilities, sized for industrial users, could promote commercial or industrial development in a noise-impacted area that might otherwise be attractive for residential development.

Mecklenburg County typically updates its CIP every five years. Mecklenburg County is updating its current CIP dated 2018-2023.

### D.3.10 Growth Risk Assessment

When evaluating the impact of aircraft noise within the Airport Environs, it is important to understand the likelihood for the future development of residential and other noise-sensitive land uses, especially in the planning timeframe. Understanding development trends in the airport vicinity is of critical importance in noise compatibility planning, because future residential growth can potentially constrain airport operations, if that growth occurs beneath aircraft flight tracks and within areas subject to high noise levels.

The growth risk analysis focuses primarily on undeveloped land which is planned and zoned for residential use. It is recognized that additional development may occur through in-filling and redevelopment of currently developed areas.

The methodology for analyzing potential growth risk is as follows:

- Identify all vacant, unplatted tracts of land zoned for future residential development with the greatest potential for being developed within the next five years.
- Calculate the area of the tracts; apply a factor accounting for development inefficiencies and the platting of streets; multiply by dwelling unit densities specified in the zoning ordinance; and multiply by household size to obtain the population holding capacity of presently vacant, unplatted land.
- Sum the above population holding levels to determine the total population holding capacity of the study area.

The final step in the growth risk analysis is to estimate whether the development is likely to occur before or after the year for which future noise exposure has been calculated. This tends to be quite speculative and should be regarded only as a general indicator of the potential risk of increases in noncompatible land uses.

## D.4 Corrective Land Use Mitigation Alternatives

Corrective or remedial measures are intended to convert existing, non-compatible uses to compatible uses. Generally, corrective uses fall into two categories: modify existing use, and maintain existing use. The following is a brief discussion of typical corrective or remedial land use mitigation alternatives included in Part 150 studies.

### D.4.1 Modify Existing Use

#### **Land Acquisition to Change Land Use**

If the acquisition of property results in a change in land use, from noncompatible to compatible with airport operations (e.g., airport/transportation, commercial, or industrial), the property owner would be eligible for relocation assistance and moving expenses, consistent with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act*. The property would be acquired, residents would be relocated, and the property would be converted to a compatible land use. This would prevent further development of noncompatible land uses. The land acquisition program should assure that the subsequent land use is consistent with local land use plans and policies, including compatibility with noise exposure levels in the area. Because the acquisition is to result in a change in land use, the local jurisdiction may decide to apply its power of eminent domain.

### D.4.2 Maintain Existing Use

#### **Sound Insulation of Homes**

A program for sound insulation of residences is always voluntary on part of the homeowner and is generally focused on residences located in a 65 DNL to 70 DNL noise contour. Other than the obvious benefit of reducing interior noise levels, a sound insulation program maintains the land use of the area and generally increases the value of the properties. Unfortunately, sound insulation treatments do not reduce the noise outside the residence and as such the benefits of the treatments are reduced when doors and windows are open.

#### **Land Acquisition without Change to Land Use**

The acquisition of noncompatible property where no change in land use would result would be a “voluntary” acquisition program, where participation in the program would be voluntary on the part of the property owner. The reason for such a voluntary program is most often due to the owner’s inability to sell the property at fair market value. Acquisition procedures would be implemented in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* and relocation benefits would not apply.

#### **Purchase Guarantee**

Purchase guarantee is a program whereby the airport sponsor agrees to purchase a residence for fair market value should the owner be unable to sell the property on the open market because of noise impacts. Participation in this program is voluntary on the part of the property owner and is implemented in areas where the land use is not going to change. In order to protect potential buyers a stipulation of this program requires that the seller disclose to the buyer the airport noise exposure on the property and the intention of the airport sponsor to retain an easement on the property. Acquisition procedures would be implemented in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* and relocation benefits would not apply.

### **Sales Assistance**

Under a sales assistance program, the airport sponsor guarantees that the property owner will receive the appraised value, or some increment thereof, regardless of final sales value that is negotiated with a buyer. However, unlike purchase guarantee, the airport sponsor does not take ownership of the property in the event that it does not sell. In return for the assistance, the airport sponsor retains an avigation easement on the property and will typically require sound insulation before the sale.

### **Avigation Easements**

Acquisition of avigation easements should be used to alleviate conflicts if no other land use controls are viable or in some cases, in lieu of outright acquisition of the land. The easement would be noted on the property deed and passed on to any subsequent owners of the property.

Amending local zoning and subdivision regulations to provide for the dedication of an easement to the airport sponsor as a condition of approval for residential rezoning or subdivision plats within the 65 DNL noise contour would alert developers, lenders, and prospective purchasers to the proximity of the airport and to the existence of a potential noise issue. The avigation easement would also protect the airport from future litigation by purchasers of the rezoned or subdivided property.

There is a constitutional issue raised by requiring dedication of an easement as well as imposing more vigorous and expensive standards for construction within the airport environs. Governments may not require a person to give up a constitutional right (i.e., a public use) in exchange for a discretionary benefit conferred by the government unless there is a reasonable relationship between a legitimate governmental objective and the condition that is imposed on the developer. Moreover, the exaction demanded by the permit or condition must be in proportion to the impact of the proposed development that is sought to be alleviated. Whether that balance exists requires an individualized determination. If it were determined not to meet these standards, then the legislation would either be unenforceable, or its enforcement would constitute a taking requiring the payment of just compensation.

## **D.5 Role of Local Jurisdictions and Planning Organizations in Noise Compatibility Planning**

Local planners and elected officials are typically responsible for local land use zoning and control. These entities and individuals prepare comprehensive plans, as well as review and implement zoning and land use regulations in a manner that may consider the effect of those actions as they relate to aviation activity and noise exposure.

The responsibility of regulating land use around an airport, in order to minimize existing and prevent future noncompatible land uses, is traditionally delegated to state and local governments. In addition to regulating land uses, local municipalities may facilitate the acquisition of property or the initiation of sound insulation programs as a means to mitigate and prevent future noncompatible land uses resulting from airport noise. At airports with an approved Part 150 Study, an airport sponsor may apply directly to the FAA for funding of noise mitigation projects.

Local land use planners and elected officials were included in the membership of the Technical Advisory Committee (TAC). Appendix G, *Public Involvement*, includes a summary of coordination with the land use planners and elected officials.

### D.5.1 Zoning Data Compilation

Specific zoning information for each jurisdiction within the Airport Environs was collected and reviewed in order to identify tools for prohibiting noncompatible development and encouraging compatible development near the airport. **Table D-4, Generalized Zoning Classifications**, shows the generalized zoning categories, and the specific zoning classifications included in each generalized category, by jurisdiction. **Exhibit D-5, Generalized Existing Zoning**, graphically depicts the generalized zoning districts within the Airport Environs around CLT.

**Table D-3 Generalized Zoning Classifications**

Generalized Zoning	Zoning District Code
Single-Family Residential	SINGLE FAMILY - R-3
	SINGLE FAMILY - R-4
	SINGLE FAMILY - R-5
	SINGLE FAMILY - R-8
	SINGLE FAMILY - R-9
	SINGLE FAMILY - R-15
	NEIGHBORHOOD 1 - N1-A
	NEIGHBORHOOD 1 - N1-B
	NEIGHBORHOOD 1 - N1-C
	NEIGHBORHOOD 1 - N1-D
Multi-Family Residential	MULTI-FAMILY - R-6
	MULTI-FAMILY - R-8
	MULTI-FAMILY - R-9
	MULTI-FAMILY - R-15
	MULTI-FAMILY - R-12
	MULTI-FAMILY - R-17
	MULTI-FAMILY - R-20
	MULTI-FAMILY - R-22
	NEIGHBORHOOD 2 - N2-A
	NEIGHBORHOOD 2 - N2-B
	NEIGHBORHOOD 2 - N2-C
	URBAN RESIDENTIAL - UR-2
	URBAN RESIDENTIAL - UR-3
	URBAN RESIDENTIAL - UR-C
Manufactured Home	MANUFACTURED HOME - MHP
Mixed Use	MIXED USE - CAC-2
	MIXED USE - MUDD
	MIXED USE RESIDENTIAL - MX-1
	MIXED USE RESIDENTIAL - MX-2
	MIXED USE RESIDENTIAL - R-12
Institutional	INSTITUTIONAL - IC-1
	INSTITUTIONAL - INST
Transit Oriented	TRANIST ORIENTED - TOD
Commercial / Industrial	BUSINESS - B-1
	BUSINESS - B-2
	BUSINESS - CG
	BUSINESS - NS
	BUSINESS - UR-C
	BUSINESS PARK - BP
	BUSINESS PARK - OFC
	BUSINESS-DISTRIBUTION - B-D
	BUSINESS-DISTRIBUTION - ML-1

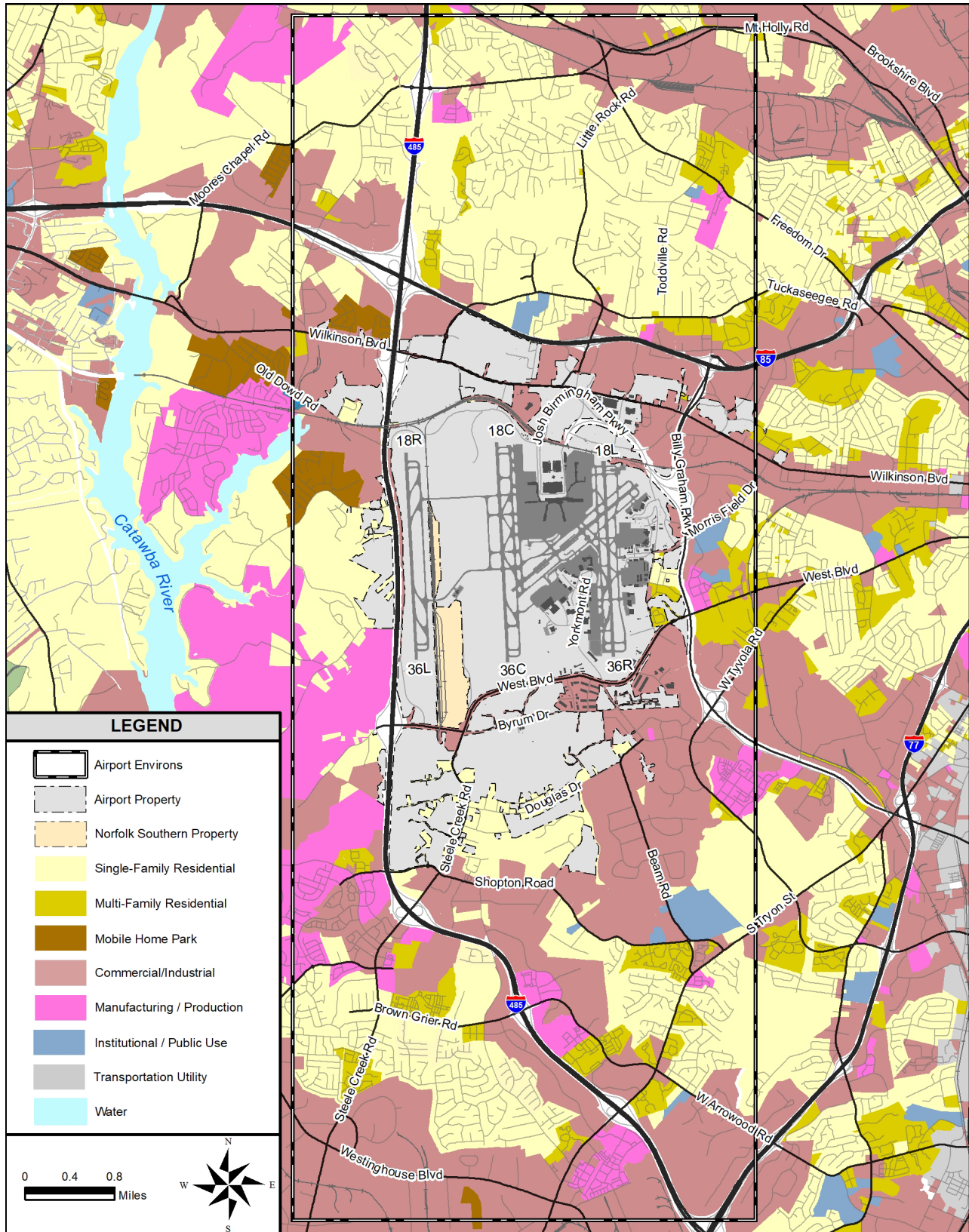


**Table D 4 Generalized Zoning Classifications (Continued)**

Generalized Zoning	Zoning District Code
Commercial / Industrial (continued)	COMMERCIAL CENTER - B-1
	COMMERCIAL CENTER - CC
	GENERAL INDUSTRIAL - I-2
	HEAVY INDUSTRIAL - I-2
	HEAVY INDUSTRIAL - ML-2
	LIGHT INDUSTRIAL - I-1
	LIGHT INDUSTRIAL - ML-1
	MANUFACTURING AND LOGISTICS - ML-2
	OFFICE - O-1
	OFFICE - O-2
	OFFICE - O-6
	OFFICE - O-15
OFFICE - OFC	

Source: City of Charlotte Zoning Ordinance, Available online at <https://www.charlottenc.gov/Growth-and-Development/Planning-and-Development/Zoning/Zoning-Ordinance>; City of Charlotte Zoning, Mecklenburg County GIS, Date updated, 8/31/2023; Landrum & Brown analysis, 2024

### Exhibit D-5 Generalized Existing Zoning



Source: Landrum & Brown, 2024.