b. Notice to FAA: nothing in this section shall be construed as relieving any property owner, sponsor or agent from the requirement for filing a notice of proposed construction or alteration with the appropriate Federal Aviation Administration.

c. A copy of a determination of no hazard or similar documentation will be required from the FAA, and the NAS FW JRB, as applicable, before release of a building permit by the City of Fort Worth.

(6) Marking of nonconforming structures. The owner of any nonconforming structure or object of natural growth deemed an operational hazard by the City of Fort Worth and/or Naval Air Station Joint Reserve Base is required to install and maintain thereon markers and lighting to indicate to the operators of aircraft in the vicinity of the airport the presence of such airport hazards. Such markers and lights shall be installed, operated and maintained at the expense of the property owner, as required by the FAA.

(c) Naval Air Station Fort Worth Joint Reserve Base.

(1) Purpose and intent. The City of Fort Worth has designated a NAS FW JRB compatible use zone (AO-CUZ) in order to promote the public health, safety, peace, comfort, convenience and general welfare of the inhabitants of and near military airport environs and to prevent the impairment of military airfields and the public investment therein. The land areas below military airport take off and final approach paths are exposed to significant danger of aircraft accidents. It is, therefore, necessary to limit the density of development and intensity of uses in such areas. The NAS FW JRB compatible use zone is intended to: guide, control and regulate future growth and development; promote orderly and appropriate use of land; protect the character and stability of existing land uses; enhance the quality of living in the areas affected; protect the general economic welfare by restricting incompatible land uses; prevent the
establishment of any land use which would endanger aircraft operations and the continued use of the NAS FW JRB.

(2) **Boundaries.** The specific boundaries of the NAS FW JRB compatible use zone are shown on the official zoning map maintained by the city and depicted and attached as Exhibit B.27. The compatible use zones include the clear zones and accident potential zones (APZs).

(3) **Use restrictions in accident potential zones and clear zone.**

a. Permitted uses shall be allowed in accordance with Table 1, attached and incorporated hereinto the zoning ordinance.

b. Certain uses, unless stated otherwise, within Table 1 shall be prohibited within the APZs. Prohibited uses include, but are not limited to, new residences, schools, places of public assembly and outdoor recreation uses. Other prohibited uses include the manufacture of flammable or combustible liquids or materials, the generation of any substance that would impair visibility or otherwise interfere with the operation of aircraft including steam/dust/smoke; and uses that may encourage the congregation of birds or waterfowl increasing the chance of a bird strike including landfills.

c. Above ground fuel storage facilities shall be permitted only in accordance with the Uniform Fire Code.

d. All new nonresidential uses indicated on the table as “N” Not Compatible on Table 1 are considered prohibited.

(4) **Residential uses.** In lieu of the requirements of Chapter 7, Nonconformities regarding construction, the following shall be allowed within the AO-CUZ.
a. Existing residential one-family uses located within a platted residential subdivision will be permitted to reconstruct a single-family residential structure.

b. New residential construction shall be permitted only on vacant lots that are within an existing platted residential subdivision. This section does not apply to residential properties located within the clear zone.

c. Tracts or lots may not be subdivided.

(5) **Existing nonresidential uses and structures.** In lieu of the requirements of Chapter 7, nonconformities regarding construction and continuation of use, the following shall be allowed within the AO-CUZ

a. Existing nonresidential uses or structures may reconstruct a structure for the same nonconforming use with equal or less square footage that had previously existed on the property or for such other use that has a density equal to or less than the prior use. Density will be measured from the occupancy count as determined by the city’s building official.

b. A nonresidential structure that is vacant for any period of time will be allowed to request a certificate of occupancy for a new tenant or property owner provided that the use requested is identical to the use identified on the last certificate of occupancy for the structure, or is for a use that has a density equal to or less than the previous use of the structure. Density will be measured from the occupancy count as determined by the city’s building official.

c. A certificate of occupancy may be issued for new tenants or property owners and changes of use for any use allowed in a shopping center with multiple tenant spaces or an existing regional mall site, as stated in Table 1, Note 7 and Note 8.
d. In an existing structure, a use not allowed in Table 1 will be allowed provided that the proposed nonconforming use has a density equal to or less than the previous use of the structure. A use changed to a lower density than had previously existed may not thereafter be returned to a use of higher density, provided however the aforementioned shall not apply to a shopping center or an existing regional mall site.

e. Any tenant or property owner of a building within an existing regional mall site shall be permitted to construct, re-construct, relocate and redevelop the square footage existing within the APZ-I area as of the effective date of this ordinance plus an additional 25,000 square feet of building improvements at any location solely within 400 feet of the eastern APZ-I boundary. The additional 25,000 square feet within 400 feet of the eastern APZ-I boundary shall be allocated to and located upon the applicable portion of the property described as Parcel 1 in the special warranty deed filed of record under Instrument No.D205100827, Real Property Records, Tarrant County, Texas (the “developer’s parcel”) or such other tract within 400 feet of the eastern APZ-I boundary designated by the owner of the developer’s parcel.

f. A nonconforming use if changed to a conforming use may not thereafter be changed to a nonconforming use, provided however the aforementioned shall not apply to a shopping center or an existing regional mall site.

(6) **Boundaries.** The specific boundary of the Naval Air Station Fort Worth Joint Reserve Base Airport Overlay is shown on the official zoning map maintained by the city and depicted and attached as Exhibit B.27A.

(7) **Communications facilities and electrical interference.** No use shall cause electrical interference with navigational signals or radio communications at the airport or with radio or electronic communications between the airport and aircraft. Proposals for the location of new or expanded radio, radio-telephone, television transmission facilities, electrical transmission
lines and wind turbines shall be coordinated through the Department of the Navy Representative, FAA Central Service Area prior to approval.

(8) **Outdoor lighting.**

a. No use shall project lighting directly onto an existing runway or taxiway or into existing airport approach and landing paths except where necessary for safe and convenient air travel. Lighting for any new or expanded use shall incorporate shielding in their designs to reflect light away from airport approach and landing paths. Control of outdoor lighting shall be achieved primarily through the use of such means as cutoff fixtures, shields and baffles, and appropriate application of fixture mounting height, wattage, aiming angle and fixture placement.

b. **Criteria.** Lighting shall meet the following criteria:

1. **Lighting arrangement.** Lighting arrangements that mimic runway lighting (i.e., long linear parallel rows of lighting) that could be confused with runway or taxiway lighting are not permitted.

2. **Illumination levels.** Lighting shall have intensities, uniformities and glare control in accordance with the recommended practices of the Illuminating Engineering Society of North America (IESNA), unless otherwise directed by the City of Fort Worth.

3. **Lighting fixture design.**

   i. Fixtures shall be of a type and design appropriate to the lighting application.

   ii. For the lighting of predominantly horizontal surfaces such as, but not limited to parking areas, roadways, vehicular and pedestrian passage areas, merchandising and storage areas, automotive-fuel dispensing facilities, automotive sales areas, loading docks, cul-de-sacs,
active and passive recreational areas, building entrances, sidewalks, bicycle and pedestrian
paths, and site entrances, fixtures shall be aimed straight down and shall meet IESNA full-
cutoff criteria. Fixtures, except those containing directional lamps, with an aggregate rated
lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional
40-watt incandescent lamp, are exempt from the requirements of this subsection. In the case
of decorative street lighting, the City of Fort Worth may approve the use of luminaires that are
fully shielded or comply with IESNA cutoff criteria.

   iii. For the lighting of predominantly non-horizontal surfaces such as, but not
limited to, facades, landscaping, signs, billboards, fountains, displays and statuary, fixtures
shall be fully shielded and shall be installed and aimed so as to not project their output past the
object being illuminated or skyward. Fixtures, except those containing directional lamps, with
an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a
standard non-directional 40-watt incandescent lamp, are exempt from the requirements of this
subsection.


4. Billboards and signs.

   i. Externally illuminated billboards and signs shall have fixtures mounted at the top
of the billboard or sign and aimed downward. The fixtures shall be designed, fitted and aimed
to shield the source from off-site view and to place the light output onto and not beyond the
sign or billboard. The face of the sign or billboard and the illumination shall not exceed 30-
vertical footcandles during the hours of darkness.

   ii. The light source for internally illuminated signs and billboards shall not exceed
1,000 initial lumens per square foot of sign face.
iii. Rotating, traveling, pulsing, flashing or oscillating light sources, lasers, beacons, searchlights or strobe lighting shall not be permitted.

iv. The use of highly reflective signage that creates nuisance glare or a safety hazard is not permitted.

(9) Glare.

a. No use shall cause glare by highly reflective materials, including but not limited to unpainted metal or reflective glass, on the exterior of structures located within airport approach and landing paths or on nearby lands where glare could impede a pilot’s vision. Proposed solar arrays shall be coordinated through the Department of the Navy Representative, FAA Central Service Area prior to approval. The control of glare shall meet the following criteria:

b. Criteria.

1. Vegetation screens shall not be employed to serve as the primary means for controlling glare. Rather, glare control shall be achieved primarily through the use of such means as cutoff fixtures, shields and baffles, and appropriate application of fixture mounting height, wattage, aiming angle and fixture placement. Glare surface suppressants that effectively reduce glare may also be utilized.

2. All lighting shall be aimed, located, designed, fitted and maintained so as not to present a hazard to pilots or the safe operation of aircraft.

3. Directional fixtures such as floodlights and spotlights shall be shielded, installed and aimed that they do not project their output past the object being illuminated or skyward.
4. Except as permitted for certain recreational lighting, fixtures not meeting IESNA full-cutoff criteria shall not be mounted in excess of 16 feet above finished grade. Fixtures meeting IESNA full-cutoff criteria shall not be mounted in excess of 20 feet above finished grade.

5. Flag lighting sources shall have a beam spread no greater than necessary to illuminate the flag and shall be adequately shielded.

   (10) *Emissions.* No use shall, as part of its regular operations, cause emissions of smoke, ash, vapor, gas, dust, steam or other emissions that could obscure visibility of pilots or conflict with airport operations.

   (11) *Wildlife attractants.* No use shall foster an increase in wildlife population and thereby increase the likelihood of a bird impact problem.

   (12) *Waste disposal facilities.*

     a. No new waste disposal facilities shall be permitted with 10,000 feet of any airport unless approval is obtained from the FAA.

     b. Expansions of existing land disposal facilities within these distances shall be permitted only upon demonstration that the facility is designed and will operate so as not to increase the likelihood of bird/aircraft collisions. Timely notice of any proposed expansion shall be provided to the City of Fort Worth, Texas DOT and the FAA, and any approval shall be accompanied by such conditions as are necessary to ensure that an increase in bird/aircraft collisions is not likely to result.
ORDINANCE NUMBER 17688-08-2007

AN ORDINANCE AMENDING THE FORT WORTH BUILDING CODE, BY PROVIDING FOR SOUND ATTENUATION CONSTRUCTION REQUIREMENTS NEAR THE NAVAL AIR STATION JOINT RESERVE BASE; PROVIDING PENALTIES FOR THE VIOLATION THEREOF; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A SAVINGS CLAUSE; PROVIDING FOR PUBLICATION IN PAMPHLET FORM; PROVIDING FOR PUBLICATION IN THE OFFICIAL NEWSPAPER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Fort Worth has determined that it is appropriate to protect persons within designated noise sensitive buildings from excessive exterior noise near airports through regulations of design and construction of such new buildings in the vicinity of the designated airports;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS, AS FOLLOWS:

SECTION 1.

Section 7-47 of the Code of the City of Fort Worth (1986) is amended by adding a new Division II to Chapter 12 as follows:

CHAPTER 12
DIVISION II
SOUND INSULATION REQUIREMENTS FOR NOISE SENSITIVE USES NEAR AIRPORTS

SECTION 1211
GENERAL

1211.1 Scope. The regulations and requirements shall apply to all new residential buildings and new noise-sensitive non-residential buildings, as defined herein, that are located wholly or partially within the boundaries of the 65 DNL or greater noise contours as designated in Figure 1211.1(1).
The term "new" shall apply to new detached buildings built after the effective date of this ordinance, and shall include later additions or modifications to those same buildings. The term shall also include a Change of Occupancy in existing buildings from a non-protected occupancy to one of the protected occupancies listed herein.

Buildings in existence prior to the effective date, and additions to or modifications of those same buildings, shall not be required to comply, except when a Change of Occupancy from a non-protected occupancy to one of the protected uses is involved.

SECTION 1212
DEFINITIONS

1212.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

Aircraft noise – is generally expressed in terms of its A-weighted sound level, in units called “decibels.” Strictly speaking, the decibel unit should be abbreviated only by “dB”, however, for clarity “dBA” and “dBA(A)” are often used to highlight the fact that the sound level measurement has been A-weighted.

Noise exposure – in areas around airports is expressed in terms of the Day-Night Average Sound Level, which is abbreviated by “DNL” in text and “L_{eq}” in equations.

NOISE-SENSITIVE NON-RESIDENTIAL BUILDINGS –
1. Nursing homes and hospitals, generally classified as Group I; and
2. Child day care centers, Adult day care centers and schools, generally classified as Group E and Group I-4.

RESIDENTIAL STRUCTURES: Single-family, Two-family, Townhouse, Multi-family, and Assisted Living uses, generally classified as Group R, whether in a single occupancy or mixed occupancy.

Sound insulation properties – of building construction materials are described by Sound Transmission Loss (TL) or Sound Transmission Class (STC). The higher the TL or STC value, the less sound will be transmitted through the building material.

SECTION 1213
PURPOSE

1213.1 General. All buildings and structures with protective uses, as applicable under this Division, shall be required to have minimum sound insulation standards and requirements to protect the persons within designated noise sensitive buildings from excessive exterior noise through regulation of design, construction and modification of such buildings. After proper sound insulation measures are taken, the interior sound level, attributable to exterior sources, shall not exceed 45 dB.
With the request for a building permit application, or Change of Use permit application, submitted plans shall show evidence of compliance with the sound insulation requirements. Compliance shall consist of submittal of an acoustical analysis report as follows:

1. In accordance with the prescriptive requirements of Section 1214 or the default ratings of Section 1215; or
2. Any qualified design prepared under by a person experienced in the field of acoustical engineering or a registered architect.

SECTION 1214
BUILDING REQUIREMENTS

1214.1 General. Compliance with the following prescriptive provisions shall be deemed to be in compliance with this Division.

1214.2 Building requirements for construction in the 65 dB zone.

1. Exterior Walls.
   Walls that form the exterior envelope may be as listed below and shall be constructed as follows:
   a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over ½-inch solid sheathing.
   
   Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.
   
   Interior wall finish shall be at least ½” gypsum wallboard
   b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by item a above.
   c. Or, it is permitted to use any wall designated in Section 1215 with a default STC value of 25" or greater.

2. Exterior Windows
   Windows in the exterior envelope shall be constructed as follows:
a. All operable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 30 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283; or, shall be double thermopane windows meeting the requirements of the Energy Code.

b. All fixed windows in the exterior walls shall be at least ¾-inch thick and shall be set in non-hardening glazing materials; or, shall be double thermopane windows meeting the requirements of the Energy Code.

c. Or, it is permitted to use any window designated in Section 1215 with a default STC value of 25* or greater.

d. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

3. Exterior Doors
   a. Exterior hinged doors shall be as follows:
      1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 30 dB; or
      2. a door, other than a hollow core wood door, that complies with the Energy Code; or,
      3. any door installed with a storm door; or,
      4. doors installed as part of a vestibule.
   b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 30 dB; or, shall be a sliding glass door that complies with the Energy Code.
   c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.
   d. Or, it is permitted to use any door designated in Section 1215 with a default STC value of 25* or greater.
   e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

4. Roof/Ceiling Construction
   a. Roof rafter shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
   b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.
   c. Cathedral ceilings are discouraged but, if installed, must have enough space to install the insulation of Item d below, with a minimum of 6” air space between the insulation and the roof deck.
   d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
   e. Attic ventilation, when installed, shall be:
1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,

2. Eave vents that are located under the roof overhang.

f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick;
   or,
   ½" gypsum board on resilient channels (RC) installed 16" o.c. perpendicular to the joists. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than ½" if occurring over the stud location;
   or,
   a lay-in ceiling with an airspace.

g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary operable glazing panel shall be mounted at the ceiling line and shall be glazed with at least 3/16-inch plastic, tempered or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

5. Floors
   The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

6. Ventilation
   a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each room without opening any windows, door or other opening to the exterior. Operable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.
   b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
   c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-opening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
   d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.
7. **Fireplaces**
   Each fireplace constructed of masonry units shall be fitted with a spark arrester, a damper as required by code and shall have glass doors across the front of the firebox.

8. **Wall and Ceiling Openings**
   Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

   At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 25 STC rating is less of 20 is mandated.

1214.3 **Building requirements for construction in the 70 dB zone.**

1. **Exterior Walls**
   Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

   a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over 1/4-inch solid sheathing.

   Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

   Interior wall finish shall be at least 5/8-inch gypsum wallboard or plaster; or, 1/2" gypsum wallboard installed on resilient channels (RC) installed 16" o.c. perpendicular to the studs. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than 1/4" if occurring over the stud location.

   b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.

   c. Or, it is permitted to use any wall designated in Section 1215 with a default STC value of 30* or greater. When using door/window openings with a default STC
value of less than 30 STC but not less than 25 STC, the STC of the wall shall be
downrated by 20%.

2. Exterior Windows
Windows in the exterior envelope shall be constructed as follows:
   a. All operable windows in the exterior walls shall have a laboratory sound
      transmission class rating of at least STC 35 dB and shall have air infiltration rate
      of no more than 0.5 cubic feet per minute when tested according to ASTM E-
      283.
   b. All fixed windows in the exterior walls of rooms shall:
      1. Have a laboratory sound transmission class rating of at least STC 35 dB, or
      2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating
         of at least STC 35 dB and shall be set in non-hardening glazing materials, or
      3. Be glass block at least 3-1/2 inches thick.
   c. Or, it is permitted to use any window designated in Section 1215 with a default
      STC value of 30 or greater.
   d. The total area of glazing in rooms used for sleeping shall not exceed 20 percent
      of the floor area.

3. Exterior Doors
   a. Exterior hinged doors shall be as follows:
      1. a door and edge seal assembly that has a laboratory sound transmission class
         rating of at least STC 35 dB; or
      2. a door, other than a hollow core wood door, that complies with the Energy
         Code and installed with a storm door; or,
      3. doors installed as part of a vestibule.
   b. Sliding glass doors shall have glass that has a laboratory sound transmission
      class rating of at least STC 35 dB.
   c. Access doors from a garage to a room within a dwelling shall have a laboratory
      sound transmission rating of at least STC 30 dB; or, shall comply with the
      Energy Code as a door in the exterior envelope.
   d. Or, it is permitted to use any door designated in Section 1215 with a default STC
      value of 30 or greater.
   e. View windows in doors and sidelights shall comply with item 2 above, unless
      used in a door as listed in 3a above.

4. Roof/Ceiling Construction
   a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their
      top surface with 1/4-inch solid sheathing and any roof covering allowed by this
      code. An accessible attic space shall be provided above rooms on the uppermost
      level of Group R buildings.
   b. Commercial type flat roofs are permitted if insulated as required by the Energy
      Code and a separate lay-in ceiling is added below with an airspace between the
      two.
c. Cathedral ceilings are discouraged but, if installed, must have ¼" solid decking above, enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck.

d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.

e. Attic ventilation, when installed, shall be:
   1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
   2. Eave vents that are located under the roof overhang.

f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick. Ceiling materials shall be mounted on resilient channels; or,
   a lay-in ceiling with an airspace.

g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line or at a point that provides at least a 4-inch space between the skylight glazing and the secondary glazing and shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

5. Floors
   The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

6. Ventilation
   a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each room without opening any windows, door or other opening to the exterior. Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.
   b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
   c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-
opening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.

d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

7. Fireplaces
Each fireplace constructed of masonry units shall be fitted with a spark arrester, a damper as required by code and shall have glass doors across the front of the firebox.

8. Wall and Ceiling Openings
Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 30 STC rating is fine if 25 is mandated.

1214.4 Building requirements for construction in the 75 dB or greater areas.

1. Exterior Walls
Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over 3/4-inch solid sheathing.

Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

Interior wall finish shall be at least 5/8-inch gypsum wallboard installed on resilient channels (RC) installed 16" o.c. perpendicular to the studs. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than 1/4" if occurring over the stud location.

b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.
c. Or, it is permitted to use any wall designated in Section 1215 with a default STC value of 35* or greater. When using door/window openings with a default STC value of less than 35 STC but not less than 30 STC, the STC of the wall shall be downrated by 20%.

2. Exterior Windows

Windows in the exterior envelope shall be constructed as follows:

a. All operable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 40 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.

b. All fixed windows in the exterior walls of rooms shall:
   1. Have a laboratory sound transmission class rating of at least STC 40 dB, or
   2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating of at least STC 40 dB and shall be set in non-hardening glazing materials, or
   3. Be glass block at least 3-1/2 inches thick.

c. Or, it is permitted to use any window designated in Section 1215 with a default STC value of 35* or greater.

3. Exterior Doors

a. Exterior hinged doors shall be as follows:
   1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 40 dB; or
   2. a solid-core wood or insulated metal door at least one (1) inch thick separated by an airspace of at least four (4) inches from another door, which can be a storm door. Both doors shall be tightly fitted and weather-stripped; or,
   3. doors installed as part of a vestibule.

b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 40 dB; or,
   a double sliding glass door, separated by a minimum four-inch airspace. Each door shall comply with the air leakage rate of the Energy Code. Glass shall be at least three-sixteenths (3/16) inch thick but not equal in thickness between the two doors, and tempered or laminated.

c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.

d. Or, it is permitted to use any door designated in Section 1215 with a default STC value of 35* or greater.

e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

f. The joint between the wall opening and the door frame shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint.
4. Roof/Ceiling Construction
   a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their
top surface with 1/2-inch solid sheathing and any roof covering allowed by this
code. An accessible attic space shall be provided above rooms on the uppermost
level of Group R buildings.
   b. Commercial type flat roofs are permitted if insulated as required by the Energy
Code and a separate lay-in ceiling is added below with an airspace between the
two.
   c. Cathedral ceilings are discouraged but, if installed, must have 1" solid decking
above, have enough space to install the insulation of Item d below, with a
minimum of 6" air space between the insulation and the roof deck. Structural
information shall be provided confirming adequate support of the decking.
   d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a
minimum R-30 rating applied between the ceiling joists.
   e. Attic ventilation, when installed, shall be:
      1. Gable vents or other attic vents that penetrate the attic enclosure shall be
         fitted with a 1/2" plywood panel, with 1" semi-rigid insulation attached to the
         surface facing the vent, so that the panel is at least six inches larger than the
         vent opening on all sides and is attached to prevent direct line-of-site
         perpendicular to the vent. The new panel shall also be positioned so that the
         amount of ventilation is not reduced. Or,
      2. Eave vents that are located under the roof overhang.
   f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch
      thick. Ceiling materials shall be mounted on resilient channels;
or,
      a lay-in ceiling with an airspace.
   g. Skylights shall penetrate the ceiling by means of a completely enclosed light well
that extends from the roof opening to the ceiling opening. A secondary operable
glazing panel shall be mounted at the ceiling line or at a point that provides at
least a 4-inch space between the skylight glazing and the secondary glazing and
shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-
side skylight shall be any type that is permitted by this code. The total size of
skylights shall be no more than 20 percent of the roof area of the room.

5. Floors
   The floor of the lowest occupied rooms shall be slab on fill, below grade or over a
fully enclosed basement or crawlspace. All door and window openings in the fully
enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a
1/2" plywood panel, with 1" semi-rigid insulation attached to the surface facing the
vent, so that the panel is at least six inches larger than the vent opening on all sides
and is attached to prevent direct line-of-site perpendicular to the vent. The new panel
shall also be positioned so that the amount of ventilation is not reduced.

6. Ventilation
   a. A ventilation system shall be provided that will provide at least the minimum air
circulation and fresh air supply requirements of the Mechanical Code, in each
room without opening any windows, door or other opening to the exterior. Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.

b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.

c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-opening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.

d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

7. Fireplaces
Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

8. Wall and Ceiling Openings
Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be sealed at the pipe duct or conduit or filled with mortar to the wall.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 35 STC rating is fine if 30 is mandated.

SECTION 1215
DEFAULT COMPONENT RATINGS

1215.1 General. The acoustical performance of the building depends on the combined performances of each of the elements. The final result depends on the transmission loss (or STC) and the relative surface areas of the elements. If any of the components has poor insulation properties the overall performance can be seriously weakened. Windows are usually one of the weakest elements in the dwelling’s sound insulation performance.

The following default STC ratings may be used in determining the sound envelope of the building. The required combined default values are as follows:
Zone 65 dB – The sound enclosure must be comprised of all components, wall, window, doors and roof that each have a default STC rating of 25* or higher.

Zone 70 dB – The sound enclosure must be comprised of all components, wall, window, doors and roof that have a default STC rating of 30* or higher. It is permitted to use windows and doors of less than 30 STC but not less than 25 STC rating, provided the wall STC shall be downrated by 20% and the non-compliant window/door area shall not exceed 20% of the floor area per room.

Zone 75 or higher dB – The sound enclosure must be comprised of all components, wall, window, doors and roof that have a default STC rating of 35* or higher. It is permitted to use windows or doors with less than 35 STC but not less than 30 STC rating, provided the wall STC shall be downrated by 20% and the non-compliant window/door area shall not exceed 20% of the floor area per room.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, all STC rating requirements are upgraded by 5.

<table>
<thead>
<tr>
<th>Walls</th>
<th>STC</th>
<th>STC when under-rated windows or doors are used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior siding, ( \frac{3}{4})&quot; solid sheathing, 2 x 4&quot; nominal stud 16&quot; o.c., fiberglass insulation, ( \frac{3}{4})&quot; interior gypsum attached directly to studs</td>
<td>39</td>
<td>31</td>
</tr>
<tr>
<td>7/8&quot; stucco, No. 15 felt building paper and 1&quot; wire mesh, 2 x 4&quot; nominal stud 16&quot; o.c., fiberglass insulation, ( \frac{3}{8})&quot; gypsum board attached directly to stud.</td>
<td>46</td>
<td>37</td>
</tr>
<tr>
<td>Face Biscuit, ( \frac{3}{4})&quot; air space with metal ties, ( \frac{3}{4})&quot; insulation board sheathing, 2 x 4&quot; nominal studs 16&quot; o.c., fiberglass building insulation, ( \frac{3}{4})&quot; gypsum board attached directly to studs</td>
<td>56</td>
<td>45</td>
</tr>
<tr>
<td>1&quot; stucco, 8&quot; thick hollow concrete block, ( \frac{3}{4})&quot; gypsum attached to furring strips</td>
<td>49</td>
<td>39</td>
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<tr>
<td>Exterior siding, 7/16&quot; solid sheathing, 2 x 4&quot; nominal stud 16&quot; o.c., batt insulation, resilient channels, ( \frac{3}{8})&quot; gypsum board</td>
<td>43</td>
<td>34</td>
</tr>
<tr>
<td>Exterior siding, 7/16&quot; solid sheathing, 2 x 6&quot; nominal stud 16&quot; o.c., batt insulation, resilient channels, ( \frac{3}{8})&quot; gypsum board</td>
<td>47</td>
<td>37</td>
</tr>
<tr>
<td>Exterior siding, 7/16&quot; solid sheathing, 2 x 4&quot; staggered studs 16&quot; o.c. on 2 x 6&quot; base plate, batt insulation, ( \frac{3}{8})&quot; gypsum attached directly to studs</td>
<td>50</td>
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<table>
<thead>
<tr>
<th>Windows</th>
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<tbody>
<tr>
<td>Wood double hung, closed but unlocked, single glazing</td>
<td>23</td>
</tr>
<tr>
<td>Aluminum sliding, latched, single glazing</td>
<td>24</td>
</tr>
<tr>
<td>Description</td>
<td>STC</td>
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<tr>
<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Wood double hung, closed but unlocked, glazed with 7/16&quot; insulating glass</td>
<td>22</td>
</tr>
<tr>
<td>1/8&quot; double glazed window with ¼&quot; airspace</td>
<td>26</td>
</tr>
<tr>
<td>¼&quot; single glazed window</td>
<td>30</td>
</tr>
<tr>
<td>¼&quot; laminated glass single glazed window</td>
<td>34</td>
</tr>
<tr>
<td>¼&quot; + 1/8&quot; double glazed window with 2&quot; airspace</td>
<td>39</td>
</tr>
<tr>
<td>¼&quot; + 1/8&quot; double glazed window with 4 ⅛&quot; airspace</td>
<td>43</td>
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<tr>
<th>Doors</th>
<th>STC</th>
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<tbody>
<tr>
<td>Wood, flush solid core, with brass weather stripping</td>
<td>27</td>
</tr>
<tr>
<td>Wood, flush solid core, plastic weather stripping, aluminum storm door</td>
<td>34</td>
</tr>
<tr>
<td>Wood, French door, brass weather stripping</td>
<td>26</td>
</tr>
<tr>
<td>Steel, flush, with urethane foam core, with magnetic weather stripping</td>
<td>28</td>
</tr>
<tr>
<td>Wood, solid core</td>
<td>26</td>
</tr>
<tr>
<td>Steel or fiberglass</td>
<td>25</td>
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<tr>
<td>Sliding glass</td>
<td>27</td>
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<td>STC</td>
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SECTION 2.

This article shall be cumulative of all provisions of ordinances and of the Code of the City of Fort Worth, Texas (1986), as amended, except where the provisions of this article are in direct conflict with the provisions of such ordinances and such Code, in which event conflicting provisions of such ordinances and such Code are hereby repealed.

SECTION 3.

It shall be unlawful for any person to erect, construct, enlarge, alter, repair, move, improve, remove, convert, demolish, equip, use, occupy, or maintain any building or structure in the City or cause the same to be done contrary to or in violation of any of the provisions of this Code. Any person, firm or corporation violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine not to exceed Two Thousand Dollars ($2,000.00) for all violations involving fire safety, or public health and sanitation and shall be fined not more than Five Hundred Dollars ($500.00) for all other violations of this ordinance. Each day or any portion thereof during which any violation of this ordinance occurs or continues shall be deemed a separate offense and upon conviction thereof shall be punishable as herein provided.

SECTION 4.

It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses, and phrases of this ordinance are severable, and, if any phrase, clause, sentence, paragraph, or section of this ordinance shall be declared void, ineffective, or unconstitutional by the valid judgment or final decree of any court of competent jurisdiction, such voidness, ineffectiveness, or unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this ordinance, since the same would have been enacted by the City Council without the incorporation in this ordinance of any such void, ineffective, or unconstitutional phrase, clause, sentence, paragraph, or section.

SECTION 5.

This ordinance constitutes a digest and revision of the Building Code of the City of Fort Worth, as provided in Section 2, Chapter XXV, and Section 9, Chapter XXVII, of the Charter of the City of Fort Worth. The Development Department of the City of Fort Worth, Texas, is hereby authorized to publish this ordinance in pamphlet form for general distribution among the public, and the operative provisions of this ordinance, as so published, shall be admissible in evidence in all courts without further proof than the production thereof, as provided in Chapter XXV, Section 3, of the Charter of the City of Fort Worth, Texas.
SECTION 6.

The City Secretary of the City of Fort Worth, is hereby directed to publish the caption, penalty clause, and effective date of this ordinance for two (2) days in the official newspaper of the City of Fort Worth, Texas as authorized by Section 2, Chapter XXV of the Charter of the City of Fort Worth, Texas and by Section 52.013 (a) of the Texas Local Government Code.

SECTION 7.

This ordinance shall take effect upon adoption and publication as required by law.

APPROVED AS TO FORM AND LEGALITY:

[Signature]

Adopted: August 9, 2007

Effective: August 24, 2007
City of Fort Worth, Texas
Mayor and Council Communication


DATE: Thursday, August 09, 2007
LOG NAME: 06AIRPORT NOISE
REFERENCE NO.: PZ-2747

SUBJECT:
Adopt Ordinances Amending the Building Code and Residential Code to Add Noise Attenuation Provisions for Noise-Sensitive Uses in the Naval Air Station Joint Reserve Base Noise Impact Areas

RECOMMENDATION:
It is recommended that the City Council adopt the attached ordinances amending the Building Code and the Residential Code by adding construction provisions for attenuation of airport noise for certain uses in the Naval Air Station Joint Reserve Base noise impact areas.

DISCUSSION:
The City of Fort Worth, other adjacent municipalities, and Tarrant County are participating in a Joint Land Use Study (JLUS) associated with the Naval Air Station Joint Reserve Base. The purpose of the JLUS is to promote compatible community growth that supports military training and operational missions at the Joint Reserve Base. A JLUS Policy Committee is overseeing the study and will issue recommendations in October 2007. The recommendations will seek to minimize incompatible development in the noise impact areas, which are depicted in the attached ordinances. Each municipality will then review the recommendations and revise their development regulations on an individual basis.

Given the potential for incompatible development while the study recommendations are prepared and implemented, the City Council authorized staff to prepare building code amendments for noise sensitive uses in the noise impact areas. These uses include residences, nursing homes, hospitals, day care centers, and schools. The code amendments would require noise attenuation in the construction of new buildings to achieve an interior noise level of 45 DNL. The requirements will apply to exterior walls, exterior windows, exterior doors, roof/ceiling construction, wall and ceiling openings, floors, ventilation and fireplaces. The attached ordinances would amend the Building Code and the Residential Code.

In June and July, City staff briefed affected property owners, the Development Advisory Committee, and representatives of the Fort Worth Builders Association, Greater Fort Worth Association of Realtors, and the Fort Worth Chamber of Commerce. The City Council endorsed the proposed code amendments at the pre-Council meeting on July 31.

The ordinance amendments would affect property in COUNCIL DISTRICTS 3 and 7.

FISCAL INFORMATION/CERTIFICATION:
The Finance Director certifies that this action will have no material effect on City funds.
<table>
<thead>
<tr>
<th><strong>TO Fund/Account/Centers</strong></th>
<th><strong>FROM Fund/Account/Centers</strong></th>
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</thead>
<tbody>
<tr>
<td>Submitted for City Manager's Office by:</td>
<td>Dale Fisseler (6296)</td>
</tr>
<tr>
<td>Originating Department Head:</td>
<td>Fernando Costa (8042)</td>
</tr>
<tr>
<td>Additional Information Contact:</td>
<td>Al Godwin (7825)</td>
</tr>
</tbody>
</table>
City of Benbrook - "NAS" OVERLAY DISTRICT

Sections:

17.78.010 - Purpose.

The purpose of this overlay district is to provide uses that are compatible with the aircraft operations at the Naval Air Station Fort Worth Joint Reserve Base. The boundaries of the district will be adopted by the city council and will approximate the area within the city that may be affected by day-night level (DNL) noise levels of sixty-five decibels (dB) or greater. The basis for the determination of the area affected by the sixty-five DNL will be the most recently-adopted Air Installation Compatible Use Zone (AICUZ) for NAS Fort Worth JRB adopted by the Department of Defense.

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

17.78.020 - Use regulations.

In addition to the zoning restrictions contained within the underlying zoning district and not withstanding any other provisions in the underlying district, no new building or newly-developed land shall be used and no buildings shall be hereafter erected, reconstructed, altered, or enlarged, within the "NAS" Overlay District unless they comply with the following restrictions.

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

17.78.022 - Permitted uses allowed only with sound attenuation (minimum of 25 dB. reduction).

A. Public, private, and parochial elementary and secondary schools.
B. Higher education institutions.

C. Religious institutions.

D. Museums, libraries and fine arts centers (including auditoriums and concert halls).

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

17.78.026 - Prohibited uses.

A. One- and Two-family dwellings are prohibited.

B. Multiple-family dwellings.

Exception: One-, two- or multiple family dwellings that were constructed or occupied on the date of the adoption of this Ordinance, or any existing platted lot that is zoned for one-, two- or multiple family dwellings, may construct or reconstruct within the NAS Overlay zone provided that construction methods are used to achieve an inside sound level reduction of thirty decibels (30 db (A)) from the outside noise level.

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)
MODEL MILITARY OVERLAY ZONE ORDINANCE

SUMMARY.

A. The Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB) Overlay Zoning Districts are intended to provide for uses and unique design requirements for lands adjacent to and within accident potential zones, noise zones, noise zones and restricted airspace zones, for NAS Fort Worth JRB. Site design and other standards are necessary to protect navigable airspace and may include height limitations, smoke limitations, lighting limitations, and other standards necessary to ensure protection of the airspace. These environs have been identified through data provided by NAS Fort Worth JRB and by the Joint Land Use Study conducted by the city.

B. The following documents are hereby adopted by reference as is fully set forth within this Ordinance:

1. NAS Fort Worth JRB Air Installations Compatible Use Zone (AICUZ) Report.

2. Joining Forces Joint Land Use Study

PURPOSE

The purpose of the NAS Fort Worth JRB Zoning Districts is to:
1. Ensure safety to people and property within the zones;

2. Prohibit the establishment of incompatible structures within the designated zones;

3. Protect the airspace, approach zones, inner horizontal zones, conical zones, outer horizontal zones, and transitional zones from the establishment of structures or placement of objects that interfere with the safe operation of aircraft;

4. Limit land uses within the zones to those uses that are compatible with military operations; and

5. Protect people and property from the potential adverse effects of aircraft noise and aircraft crashes;

**ADMINISTRATION.**

The following administrative requirements apply to the airport/airfield environs.

Notification of NAS Fort Worth JRB. All applications for rezoning and development approval, including site plans, building permits, subdivision plats, and other permits and plans in the zones shall be subject to review by a representative at NAS Fort Worth JRB. Such review shall be limited to issues of compatibility with NAS Fort Worth JRB and issues affecting the safety of persons and property related to aircraft take-offs, landings, and flight
operations. Comment shall be received in the form of a recommendation to the final approving authority.

**NAS FORT WORTH JRB ZONING DISTRICTS.**

A. Description of NAS Fort Worth JRB Zoning Districts. NAS Fort Worth JRB Zoning Districts include the established accident potential and noise zones of the airfield and extend outward from those zones at varying distances specific to the installation and its use. Districts include and define areas that are close enough to the installation to affect or to be affected by the mission of the airfield. Because of the relationship of these areas to the airfield, they are subject to additional restrictions on development. The regulations and densities adopted herein are based on the AICUZ findings, the recommendations in Department of Defense Instruction (DoDI) 4165.57 (Air Installations Compatible Use Zones), Office of the Chief of Naval Operations Instruction (OPNAVINST) 11010.36C, and the Joint Land Use Study.

1. Accident Potential Zones (APZs) I

2. Accident Potential Zones (APZs) II
B. General requirements for all zones.

1. *Avigation easements*. All applications for subdivision approval and/or building permits for any structure requiring plan approval shall include the dedication of an avigation easement to the city. The dedicated avigation easement allows property owners to develop land in accordance with the applicable zoning district and regulations. However, military airfields receive a clear right to maintain flight operations over the parcel. The easement is recorded with the deed to a property and runs in perpetuity with the land.

2. *Real Estate Disclosure*. The Seller's Disclosure Notice shall include information that a property may be located near a military installation and may be affected by high noise or air installation compatible use zones or other operations.

3. *Noise reduction standards*. All new buildings shall be constructed with sound protection based on the level of noise exposure, which can be determined by the location of the building within the adopted AICUZ map. Sound attenuation is not required if the site is located outside the 65 decibel (dB) noise contour. Noise reduction standards, construction and methods are specified in
Naval Facilities Engineering Command’s Sound Insulation Guidelines for Residences Exposed to Aircraft Operations.

a. The Department of Defense (DoD) recommends an outdoor-to-indoor noise level reduction (NLR) of at least 25 dB for homes in the 65 and 70 dB Day-Night Sound Level (DNL) noise contours.

b. The DoD recommends an outdoor-to-indoor NLR of at least 30 dB for homes in the 70 and 75 dB DNL noise contours.

4. *Uses interfering with aircraft.* It is unlawful to establish, maintain or continue any use within the city in such a manner as to interfere with the operation of aircraft. The following requirements shall apply to all lawfully established uses within the city.

a. *Height.*

b. *Obstruction marking and lighting.* Notwithstanding the provisions of any other article of this ordinance or any other ordinance, the owner of any structure or obstruction over 200 feet above ground level shall install marking and lighting on the structure in accordance with the specific standards established by Federal Aviation Advisory Circular 70/7460-1L - Obstruction Marking and Lighting with Change 1. In
addition, the owner shall install high intensity white obstruction lights on a structure which exceeds 800 feet above ground level (AGL). Towers less than 200 feet may require lighting after Navy evaluation.

c.  *Dangerous lighting.* All lights or illumination used in conjunction with street, parking, signs or use of land and structures shall be arranged and operated in such a manner that is not misleading or dangerous to aircraft operating from the airfield as determined by the NAS Fort Worth JRB airfield operator.

d.  *Smoke or glare.* No operations of any type shall produce smoke, glare or other visual hazards within three statute miles of any usable runway of NAS Fort Worth JRB.

e.  *Electronic interference.* No operations of any type shall produce electronic interference with navigation signals or radio communication between the airfield and the aircraft.

f.  *Aircraft-wildlife strike hazards.* Human-made or natural areas, such as poorly-drained sites, retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants,
agricultural or aquacultural activities, surface mining, or wetlands, may be used by wildlife for escape, feeding, loafing, or reproduction. Wildlife use of areas within an airfield's approach or departure airspace, aircraft movement areas, loading ramps, or aircraft parking areas may cause conditions hazardous to aircraft safety. These uses shall be sited in accordance with the following criteria to achieve adequate separate between the attractant and aircraft movement:

i. A distance of 10,000 feet from any runways, loading ramps, or aircraft parking areas used or planned to be used by turbojet or turboprop aircraft.

ii. A distance of five (5) miles from any runways, loading ramps, or aircraft parking areas if the use places the runways and/or approach and departure patterns of the airfield between bird feeding, water or roosting areas.

5. Split parcels. For purposes of regulating parcels split by the MAZ lines, only that portion of a parcel that falls within the MAZ shall be subject to the conditions of the MAZ.
ZONE REGULATIONS

A. APZ 1 regulations. Areas within the APZ 1 overlay are subject to the following additional restrictions:

1. The following uses are prohibited:
   a. All residential uses
   b. Any non-residential uses that concentrate, within a structure on a regular basis, more than 25 people per acre. This limitation applies to: sports stadiums, amphitheaters, auditoriums, clubhouses, churches, schools, hospitals, assisted living and other medical facilities, hotels and motels, restaurants and other eating and drinking establishments and strip commercial centers built to such a scale that gatherings of more than 25 people per acre would be expected on a regular basis.

2. The following uses are permitted:
   a. Any non-residential use permitted in the underlying zoning district.
      All permitted uses must comply with the following development standards:
      I. Maximum building footprint shall be 8,000 square feet
      II. Maximum gross acreage lot coverage shall be 20%
III. Minimum side yard setback shall be 15 feet

B. APZ 2 regulations. Areas within the APZ 2 overlay are subject to the following additional restrictions:

1. The following uses are prohibited:
   a. All multi-family residential uses
   b. Manufactured home parks
   c. Any non-residential uses that concentrate, within a structure on a regular basis, more than 50 people per acre. This limitation applies to: sports stadiums, amphitheaters, auditoriums, clubhouses, churches, schools, hospitals, assisted living and other medical facilities, hotels and motels, restaurants and other eating and drinking establishments and strip commercial centers built to such a scale that gatherings of more than 50 people per acre would be expected on a regular basis.

2. The following uses are permitted:
   a. The maximum density of single-family residential uses shall not exceed one (1) unit per acre.
b. Any non-residential use permitted in the underlying zoning district.

All permitted uses must comply with the following development standards:

I. Maximum building footprint shall be 15,000 square feet

II. Maximum gross acreage lot coverage shall be 35%

III. Minimum side yard setback shall be 10 feet
Technical Appendix J.
Model Advisory/Coordinating Body Structure and Bylaws
BYLAWS AND OPERATING PROCEDURES
Naval Air Station Fort Worth, Joint Reserve Base Regional Coordination Committee

Adopted March 2008
Amended October 2015

STATEMENT OF PRINCIPLES
1. Naval Air Station Fort Worth, Joint Reserve Base is a vital national military asset that serves the operational needs of the United States Navy (as the host unit), United States Air Force, United States Army, United States Marine Corps, and the Texas Air National Guard.

2. Naval Air Station Fort Worth, Joint Reserve Base is home to thousands of Civilian, Reserve, Guard and full time military jobs.

3. Naval Air Station Fort Worth, Joint Reserve Base is required to be open and operational in order to maintain the adjacent presence of Lockheed Martin which employs thousands of civilians, in the manufacturing and testing of aircraft and aircraft technology.

4. Local leaders recognize that the mutual well being of the Naval Air Station Fort Worth, Joint Reserve Base and the surrounding communities is contingent upon cooperative strategic planning.

5. Land use near a military base can complement or compromise the utility and effectiveness of the installation and its mission.

6. Local leaders entered into a Joint Land Use Study committed to a fair and open process of examining land use and development issues around the installation; enhancing communication between the installation and the community; and implementing practical policies, programs, and projects geared to sustaining and enhancing the installation and the quality of life in the neighboring communities.
7. A resolution in support of the expansion of missions at Naval Air Station Fort Worth, Joint Reserve Base was adopted by the Joint Land Use Study Policy Committee on September 24, 2007. Similar resolutions were adopted by the surrounding entities in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base.

DEFINITIONS

Section 1. The following definitions shall apply to terms used in these Bylaws and Operating Procedures:

A. Encroachment. The Department of Defense defines "encroachment" as the cumulative result of any and all outside influences that inhibit normal military training and testing.

B. Joint Land Use Study. The Joint Land Use Study (JLUS) was a cooperative planning initiative between the Naval Air Station Fort Worth, Joint Reserve Base, City of Benbrook, City of Fort Worth, City of Lake Worth, City of River Oaks, City of Westworth Village, City of White Settlement, and Tarrant County. The goal of the Joint Land Use Study was to promote compatible community growth that supports military training and operational missions. This inter-jurisdictional partnership resulted in the identification of actions that can be taken jointly by the community and installation to promote compatible development and address current and future encroachment.

C. Study Sponsor. In the event of study or grant awards, the study sponsor is defined as the agency that administers the grant, performs coordinating activities related to the successful completion of the grant, maintains accountability for grant activities, and reports on activities associated with the grant. The North Central Texas Council of Governments has been selected to fulfill this role at the discretion of the Regional Coordination Committee.

D. Voting Entity. A voting entity is defined as a city or county that:
   - Is located in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base as described in Section 3, Section A "Membership," and
Has expressed intent to participate in the Regional Coordination Committee by passing a resolution in support of the study and assigning voting representatives as described in Section 3, Section A, "Membership."

- Voting entities must be in good standing to cast votes. To maintain a "good standing" status, entities shall not be more than 90 days in arrears of required financial contributions.

ORGANIZATION

Section 2. Implementation efforts related to JLUS recommendations shall be overseen by the Naval Air Station Fort Worth, Joint Reserve Base Regional Coordination Committee (RCC).

A. RCC Purpose The RCC is comprised of local governments located in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base. The RCC is charged with implementing land development recommendations, performing public outreach, and providing direction to staff. The RCC shall be the forum for the cooperative development of recommendations related to issues impacting the Naval Air Station Fort Worth, Joint Reserve Base.

NAVAL AIR STATION FORT WORTH, JOINT RESERVE BASE REGIONAL COORDINATION COMMITTEE

Section 3. The following rules shall govern the procedure, membership, and records of the Naval Air Station Fort Worth, Joint Reserve Base Regional Coordination Committee (RCC). In all other cases, the rules contained in the current edition of Robert's Rules of Order Newly Revised shall guide the RCC to which they are applicable and in which they are not inconsistent with these bylaws and any special rules of order the RCC may adopt.

A. Membership Membership on the RCC is open to the local governments in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base listed here: City of Benbrook, City of Fort Worth, City of Lake Worth, Town of Lakeside, City of River Oaks, City of Sansom Park, Town of Westover Hills, City of Westworth Village, City of White Settlement, and Tarrant County. In order to become a voting entity, the governing body of the entity must pass a resolution supporting the Joint Land Use Study recommendations adopted by the JLUS Policy Committee.
on September 24, 2007, and it must assign representatives to the RCC. Each voting entity shall be allotted two voting members that may vote on all matters of the RCC. The RCC voting members may vote to include the following organizations as Non-voting members: Department of Defense Office of Economic Adjustment, Naval Air Station Fort Worth, Joint Reserve Base, area Chambers of Commerce, Lockheed Martin, Independent School Districts, Economic Development Corporations, the North Central Texas Council of Governments, and other local, state, or federal agencies as appropriate.

B. Appointees Voting representatives of voting entities shall be appointed by and serve at the pleasure of their mayor, city councils, and/or Commissioners' Court. Each mayor, city council, and Commissioners' Court may appoint two members from their jurisdiction, including but not limited to; elected officials, an appointed member of another local government board, or a citizen representative of the applicable entity to serve on the RCC. The term of each assigned member will be determined by the appointing entity. Appointing authorities may appoint or delegate an alternate to attend and vote at a meeting for which their appointed member is not available. Delegate appointments shall be made to the Secretary or the Secretary's designee prior to the start of the meeting.

C. Standards of Conduct RCC (voting and non-voting) members shall not:

- Appear before the RCC while acting as an advocate for any other person, group, or business entity;
- Knowingly use their position on the RCC for their own private gain, or for the financial gain of their business;
- Engage in debate or vote on matters affecting a person, entity, or property in which that individual has a conflict of interest; or
- Accept or solicit any gift or favor that would tend to influence that individual in the discharge of official duties.

All RCC members must adhere to Chapter 171 of the Local Government Code and to the Code of Ethics from their respective local governments and public agencies.

D. Attendance Records of attendance of RCC meetings shall be kept and presented as part of each meeting summary. Entities with members that have missed at least three consecutive
meetings will be notified and the appointing bodies shall be asked to review the continued service of their representatives. Members shall notify the Committee Secretary or staff if they are unable to attend regular RCC meetings.

E. Quorum The quorum rule shall be: At least fifty-percent of all voting members must be present to conduct the business of the RCC. Once a quorum has been determined to exist, any business of the membership may be accomplished by a simple majority vote of the members making up the required quorum unless otherwise specified in these Bylaws.

F. Officers The RCC shall elect a Chair, Vice Chair, Secretary, and Treasurer for a term of two years. Regular elections shall be held in the first quarter of every odd calendar year, or at the first Committee meeting that takes place thereafter. Any appointed representative of a voting entity is eligible for officer positions. The Chair may rotate between various entities at the pleasure of the Committee. Chair, Vice Chair, Secretary, and Treasurer are considered for reelection every two years. No officer may serve more than two consecutive regularly-elected terms in any one position. The Chair shall preside over meetings of the RCC. When possible, and at the Chair’s discretion, the Chair may be advised by the Immediate Past Chair throughout his or her tenure. In the event that the Immediate Past Chair is not re-appointed by his or her entity, at the Chair’s discretion, he or she will serve as advisor for one two-year term in a non-voting capacity if they so desire.

G. Executive Committee The Executive Committee shall be comprised of the current Chair, Vice Chair, Secretary, Treasurer, and the Immediate Past Chair. In the event the Immediate Past Chair is not reappointed, the fifth Executive Committee member will be voted on by the RCC. The Executive Committee may be convened at the discretion of the Chair to seek consensus about RCC correspondence. The RCC will be briefed on Executive Committee actions at the regular RCC meetings.

H. Elections Regularly scheduled elections shall take place the first quarter of every odd calendar year. Special elections shall be held on an as-needed basis due to mid-term vacancies of any length of time. A vacancy in either the office of the Vice Chair, Secretary, or Treasurer shall be filled by the RCC by means of a special election in the first meeting of the Committee after the
vacancy becomes known. A nominating committee as appointed by the Chair shall provide at least one candidate for each position. Candidates shall be announced to the Committee in the meeting prior to scheduled elections. Write-in candidates are allowed during the scheduled elections. The incumbent officers shall preside over the entire meeting during which officer elections are held, with the newly elected officers beginning their duties at the conclusion of the meeting.

In the event that the offices of Chair, Vice Chair, Secretary, and Treasurer all become vacant, new officers shall be elected by means of a special election at the next regularly scheduled meeting of the RCC with nominations from the floor. In the event that the Chair of the RCC cannot continue to serve at any time during the term of election, the Vice Chair shall automatically become the Chair, and the Secretary shall automatically become Vice Chair. If an officer declines to fill a vacancy in these circumstances, a special election shall be held for the vacant position(s).

I. Meeting Schedule At least one meeting shall be held annually by the RCC, but the Committee shall meet as often as necessary for the purpose of transacting the business at hand. The Chair shall call the meeting and shall designate in the written notice of the meeting the business to be transacted or considered. Regular meetings shall be held on the third Monday of a month at 1:30 p.m., or as designated by the Committee, and will be hosted on a rotating basis by the voting entities.

J. Open Meetings Written notice of the meeting, accompanied by an agenda, shall be posted at least 72 hours prior to the meeting. All meetings shall be held as open meetings as defined in Chapter 551 of the Texas Government Code.

K. Meeting Summary Summaries of the meetings shall be kept and shall be submitted to the members of the RCC for approval.

L. Staff Support Staff support for the RCC shall be provided by the North Central Texas Council of Governments as long as they are able to provide this service. The RCC is able to contract for staff support as needed. Officers may assign administrative functions to the staff.
M. RCC Functions The function of the RCC shall be to review and vote on all matters related to implementation of the Joint Land Use Study recommendations surrounding the Naval Air Station Fort Worth, Joint Reserve Base in accordance with the RCC mission statement. This includes but is not limited to: providing direction to staff, implementing land development recommendations, and performing public outreach events.

INTENT

Section 4 These Bylaws and Operating Procedures are intended to provide rules and procedures to assure the orderly function of the Joint Land Use Study implementation surrounding the Naval Air Station Fort Worth, Joint Reserve Base.

ADOPTION

Section 5 These Bylaws and Operating Procedures shall be in full force and effect at such time as they have been approved by two-thirds vote of the RCC at a meeting at which a quorum, as defined herein, is present.

REVISION

Section 6 These Bylaws and Operating Procedures may be revised by approval of two-thirds of the members of the RCC at a meeting in which a quorum, as defined herein, is present. Changes in the Bylaws must be presented at one regularly scheduled meeting and voted on at a following regularly scheduled meeting. No Bylaw change shall be made that has not been presented at a previous meeting. The Chair shall vote on Bylaw changes.
Technical Appendix K.

Stormwater Management Memo

Appendix K
Prepared by Hayden Consultants, Inc.
Executive Summary

The purpose of this memo is to document current stormwater drainage conditions and develop stormwater management recommendations to address flooding impacts within the Farmers Branch Watershed. Analysis includes a review of previous studies, reports, and modeling, and a summary of ongoing stormwater management efforts within the region. This memo is a supporting element of the Joining Forces Regional Joint Land Use Study, which analyzes a range of potential issues, including flooding that could affect military operations at NAS Fort Worth JRB.

1. Description of Watershed

NAS Fort Worth JRB is bounded by Lake Worth to the north, the West Fork of the Trinity River on the east, and the Farmers Branch Watershed to the west (see Appendix SW-A Vicinity/Location Map). Farmers Branch Creek also flows east through the City of White Settlement, ultimately flowing into the West Fork of the Trinity River. The creek flows under the southern runways of the base airfield through two large culverts, which end at the Westworth Village golf course. Interstate 820 (IH 820) splits the watershed. The City of River Oaks is downstream of the base on the east side of the Trinity River.

Prior hydraulic modeling conducted by the U.S. Army Corps of Engineers (USACE) identified five main reaches in the Farmers Branch Watershed: MS-1, MS-2, MS-3, Las Vegas Trail (LVTrail), and West Trib. A reach describes the distance along a channel between cross sections. It is significant because it defines the length between left over bank, main channel, and right over bank. Rainfall over an extended period and area can cause creeks to overflow the banks and create overtopping conditions or flooding in surrounding areas.
With the current condition of the hydraulic structures in the Farmers Branch Watershed, most area roads overtop at the 2-year frequency\(^1\) except for IH 820 and Dale Lane, which pass the 2-year event, and the Meadow Park Drive Bridge, which passes the 50-year flow (Q).

According to the USACE Section 205 – Local Flood Damage Report, the hydraulic structures in the watershed performed as follows:

- Nine structures in reach MS-1, with eight overtopping with the 2-year Q
- Two structures in MS-2, both overtopped by the 2-year Q
- Five structures in MS-3, with 3 overtopped with the 2-year Q
- Three structures in LVTrail Trib, all overtopped with the 2-year Q
- Four structures in West-Trib, with 2 overtopped with the 2-year Q

Note: (Using the USACE fully developed flow)

A typical roadway stream crossing should pass a minimum of the 2-year frequencies, while typical Texas Department of Transportation (TxDOT) criteria require passing a higher frequency based on the roadway classification. Local streets should pass the 10-25 year frequency, while highways, such as IH 820 should pass a minimum of 50-year frequency.

2. History and Background

The USACE completed an update to the original Federal Emergency Management Agency (FEMA) Hydrology and Hydraulics for the Farmers Branch Watershed in November of 2005 as part of a Section 205 report. The Section 205 Report can be found in Attachment I-K.3.

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\(^1\) The frequency otherwise known as Annual Exceedance Probability (AEP) is the probability that a given storm will occur in a given year, i.e. a 100 year frequency or 1% AEP, will have a 1 in 100 chance of occurring in any single year; likewise a 2 year frequency will have a 50% and will have a 1 in 2 chance of occurring in any single year. The higher the frequency the larger the rainfall amount as expressed in depth (inches).
The study focused on measures to reduce flooding along Farmers Branch Watershed as part of a National Economic Development Plan (NED). The findings indicated that Farmers Branch Creek experienced repetitive loss damages (50% Annual Exceedance Probability – “AEP”) even during minor storm events (2-year frequency storm). The report identified several mitigation options, including replacement of bridge and culvert structures along the floodplain, detention ponds near IH 820, and widening of the existing channels. The study hydraulically modeled each of these options and prepared a cost benefit analysis (see Appendix B, Table 2 Cost/Benefit of options from Section 205). The USACE determined that the project with the highest benefit relative to cost and reduction of flood risk was re-channelization and widening of a reach of Farmers Branch Creek between White Settlement Road, including a widening of LVTrail. The study designates this option as the Locally Preferred Plan (LPP). The project has since been constructed.

3. Existing Conditions

The climate in Fort Worth, Texas is generally mild with annual rainfall averages of 32.46 inches. The area is prone to flooding due to a high percentage of impervious surfaces in the watershed.

During a rain event, Farmers Branch Creek initially flows through the culverts. With increased discharge, the water had the potential to pool on the west side of the runway and eventually overtop the runway.

The community upstream of NAS Fort Worth JRB has also performed some channel reconstruction along the property line near White Settlement City Hall to reduce flooding. The channel was widened between Meadow Park Drive and White Settlement Road to a 90-foot bottom width and a 170-foot top width.
4. Prior Studies

FEMA/National Flood Insurance Program (NFIP) Coordination

The USACE performed a study of Farmers Branch Creek for FEMA as a part of Flood Insurance Study (FIS) number 48439C in 2009. The FIS hydrologic and hydraulic analyses for the FIS study of all streams within the City of White Settlement became effective in 1986. The stream reach study limits range from the confluence with the West Fork of the Trinity River downstream to 1,690 feet upstream of Little Fox Lane. NAS Fort Worth JRB is within this study limit. See Appendix SW-C for a map showing the 100-year FEMA floodplain with an aerial background. The full FEMA Flood Insurance Rate maps (FIRM) and Flood Insurance Study (FIS) report are in Attachment I-K.2.

Table 1 shows the hydrologic study values found within the FIS report. NAS Fort Worth JRB is downstream of the crossing of Grant Lane and upstream of the confluence with the West Fork Trinity River. The FEMA flows are significant since they reflect the amount of water placed in the channel, which determines the limits of the floodplain boundary and Base Flood Elevation (BFE), and in turn establishes flood risk for adjacent properties.
### Table 1: Summary of FEMA Flows

<table>
<thead>
<tr>
<th>Flooding Source and Location</th>
<th>Drainage Area</th>
<th>Peak Discharges</th>
<th>10% Annual Chance</th>
<th>2% Annual Chance</th>
<th>1% Annual Chance</th>
<th>0.2% Annual Chance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers Branch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at confluence with West Fork Trinity River</td>
<td>11.40</td>
<td>11,200</td>
<td>14,400</td>
<td>15,900</td>
<td>20,350</td>
<td></td>
</tr>
<tr>
<td>Upstream of confluence of Kings Branch</td>
<td>6.70</td>
<td>5,870</td>
<td>6,870</td>
<td>7,430</td>
<td>9,540</td>
<td></td>
</tr>
<tr>
<td>*At Grant Lane</td>
<td>5.14</td>
<td>5,010</td>
<td>6,450</td>
<td>7,100</td>
<td>8,540</td>
<td></td>
</tr>
<tr>
<td>Approximately 420 feet upstream of Las Vegas Trail</td>
<td>3.69</td>
<td>4,990</td>
<td>6,740</td>
<td>7,510</td>
<td>9,450</td>
<td></td>
</tr>
<tr>
<td>Approximately 460 feet upstream of Las Vegas Trail</td>
<td>3.11</td>
<td>4,400</td>
<td>5,970</td>
<td>6,650</td>
<td>8,370</td>
<td></td>
</tr>
<tr>
<td>Approximately 50 feet upstream of Loop 820</td>
<td>3.02</td>
<td>1,090</td>
<td>1,440</td>
<td>1,600</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Upstream of Redford Road</td>
<td>2.21</td>
<td>2,400</td>
<td>3,200</td>
<td>3,550</td>
<td>4,500</td>
<td></td>
</tr>
<tr>
<td>At Alemeda Boulevard</td>
<td>1.30</td>
<td>2,050</td>
<td>2,700</td>
<td>3,000</td>
<td>3,800</td>
<td></td>
</tr>
<tr>
<td>Approximately 50 feet upstream of Little Fox Lane</td>
<td>0.50</td>
<td>1,500</td>
<td>2,000</td>
<td>2,200</td>
<td>2,800</td>
<td></td>
</tr>
</tbody>
</table>

*Upstream of NAS Fort Worth JRB
As a part of the the FIS study, Farmers Branch Creek was modelled hydraulically in May 1991. The model analyzes the 10, 50, 100, and 500 year event based on surveyed topographic cross sections. These cross sections utilize differing roughness coefficients based on observations when the model was created. For the channel sections, a Manning’s roughness coefficient\(^2\) of 0.020 to 0.065 was used. For the overbanks, a roughness ranging from 0.040 to 0.80 was used, as the overbank typically has greater vegetation. See Appendix SW-C for the flood profile displaying the studied water surface elevation at the site of the NAS Fort Worth JRB.

**USACE Section 205 – Local Flood Damage Report**

Major flooding events have been recorded in 1984, 1989, and 2000. The flood in June 2000 resulted in flooding damages exceeding $2,000,000. Because of these flooding events, a detailed Section 205 Flood damage report was prepared. See Attachment I-K.3. The objectives of the study were to determine measures that can reduce the flooding along Farmers Branch Creek in White Settlement. The report did not evaluate potential improvements on the installation.

The planning team gathered the most current modeling for Farmers Branch Creek as part of this analysis, as well as portions of the Section 205 report containing the summary of options for various reaches.

The 205 hydrologic study evaluated the 6.8 square mile watershed contributing to the Farmers Branch Creek. The watershed was broken into 17 subbasins for analysis. As a part of the

\(^2\) This is the friction factor between the water and the surface the water is flowing over. It comes from the Mannings Equation, which is used to model the volumetric flow rate in a channel or closed conduit. The higher the roughness factor the slower the water will travel measured in velocity in feet/second in a given stretch of channel.
analysis, land use of the watershed was updated to evaluate existing land use based on North Central Texas Council of Governments (NCTCOG) land use maps. The fully developed flows were created based on 2008 City of White Settlement and City of Fort Worth zoning maps.

Table 2: Comparison of FEMA vs the existing flows in the *Section 205

<table>
<thead>
<tr>
<th>Flooding Source and Location</th>
<th>Drainage Area (sq. mi.)</th>
<th>FEMA 100 Year (cubic feet per second)</th>
<th>Section 205 Existing Condition (June 2002)</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers Branch at Grant Lane</td>
<td>5.14</td>
<td>7,100</td>
<td>9,530</td>
<td>34%</td>
</tr>
<tr>
<td>Farmers Branch at Kings Branch</td>
<td>6.7</td>
<td>7,430</td>
<td>10,340</td>
<td>39%</td>
</tr>
</tbody>
</table>

Table 3: Comparison of the existing and fully developed flows in the Section 205

<table>
<thead>
<tr>
<th>Flooding Source and Location</th>
<th>Drainage Area (sq. mi.)</th>
<th>Section 205 Existing Condition (cubic feet)</th>
<th>Section 205 Fully Developed Condition (cubic feet)</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers Branch at Grant Lane</td>
<td>5.14</td>
<td>9,530</td>
<td>9,730</td>
<td>2%</td>
</tr>
<tr>
<td>Farmers Branch at Kings Branch</td>
<td>6.7</td>
<td>10,340</td>
<td>10,510</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Section 205 refers to the hydraulic report prepared by the USCAE
The Section 205 study broke the main stem stream into five hydraulic regions: MS-1, MS-2, MS-3, LVTrail and West Trib. See location map in Appendix SW-A. The region affecting the NAS Fort Worth JRB is MS-1. Reach MS-1 begins just downstream of the base runways and extends to the confluence with the LVTrail tributary. MS-2 begins at the confluence with the LVTrail Tributary and ends at the confluence with the West Tributary. Lastly, MS-3 begins at the confluence with the West Tributary and ends at the crossing at highway IH 820, and reach LVTrail follows the North LVTrail road, and begins at Westpoint Boulevard, to the confluence at the intersection of Roland and the North LVTrail.

The report analyzed two detention options – a large basin between IH 820 and West Tributary and a medium basin between IH 820 and Dale Lane. The analysis determined that detention would have negative economic net benefits and, therefore, was not recommended.

The study was based on the original FEMA HEC-2 model created in 1984. The existing model was supplemented with 2-foot integral topographic aerial contours obtained from NCTCOG. The modeling approach was run utilizing a mixed flow regime mode to produce more accurate results. Multiple hydraulic alternatives were analyzed to provide flooding relief upstream of NAS Fort Worth JRB but none on the base. Other alternatives evaluated were structural modifications to existing culverts and detention basins along the main stem. Small, medium, and large trapezoidal channels were modelled with the fully developed flows with 3:1 side slopes and a 0.035 Manning’s roughness value. Channel improvements were only upstream of White Settlement Road, as it was found that Water Surface Elevation (WSEL) is increased if channel improvements are applied downstream of White Settlement Road.
In addition, gabions\(^3\) were modeled on LVTrailTrib since it has high erosive velocities. Results showed ponding upstream of structures at South Judd and Redford Lane and increased WSEL just upstream of each structure. The study concluded that the best configuration was the medium channel along Farmers Branch and LVTrailTrib called the LPP model. The consultant team used the LPP model as the base hydraulic model, which has a medium sized channel improvement along Farmers Branch and LVTrailTrib, as it provides the highest cost benefit ratio. See Appendix SW-B, Table 2 - Cost/Benefit of Options from Section 205.

**Adjacent Corridor Studies**

Members of the public participating in outreach for the *Joining Forces* effort around NAS Fort Worth JRB identified drainage and flooding as a significant priority. Meeting attendees in particular noted flooding issues along the State Highway 183 corridor near Roberts Cut Off Road and along State Highway 199.

Previous NCTCOG corridor master plan efforts, specifically State Highway 183 (River Oaks Boulevard or SH 183) and State Highway 199 (Jacksboro Highway or SH 199) have assessed flooding issues related to Farmers Branch Watershed. The drainage assessment for the SH 199 Corridor Master Plan studied the corridor running northwest to southeast, just northeast of NAS Fort Worth JRB, along the banks of the West Fork of the Trinity River, and then crossing near the Panther Island Bypass Channel, and Clear Fork Trinity River. It identifies surface drainage along the SH 199 corridor as poorly defined with inadequate drainage collection, minimal storm drain inlets, and insufficient upstream and on-system capture areas, which may flood the roads. The study detailed 14 outfalls, which have varying capacity from <2-year frequency to 100-year frequency, and many of which contained silt. Two creeks were identified: the Menefee Creek (647 acres) – 5-year capacity and the WF-5 tributary (473 acres) – 2-year

\(^3\) wire mesh boxes filled with rock used for stormwater conveyance
capacity. These creeks will see flooding during large events along SH 199 at the confluence of Menefee Creek and Stream WF-5, and where SH 199 crosses the unnamed creek. Three large bridges are along SH 199: West Fork of Trinity River, Panther Island Bypass Channel, and Clear Fork of Trinity River, which all convey the 100-year floods.

Comments collected from public meetings in River Oaks as part of Joining Forces indicate that several locations along SH 183 are also prone to flooding and that there are issues regarding the sizing of stormwater facilities. Currently, the corridor is characterized by wide swaths of impervious cover, consisting of roadway pavement and parking areas, which limit infiltration of stormwater and generate both high volumes of stormwater runoff and high loadings of stormwater pollutants. In addition, in certain locations, box culverts or storm sewers crossing under River Oaks Boulevard may be undersized, limiting the conveyance of water under the roadway and causing elevated water surface elevations on the upstream side of the roadway that may contribute to both roadway and structural flooding during severe rain events. Existing internal drainage along the corridor typically consists of incised roadside or median ditches, connected across intersections and driveways by culverts.

As a result, the SH 183 Corridor Master Plan recommended that immediate short-term solutions from the TxDOT would be necessary, including re-grading ditches and cleaning out culverts along the highway. Long-term solutions for flooding in River Oaks include a regional drainage and hydrology study and preliminary engineering to improved facilities.
5. Hydrologic Modeling of Farmers Branch Creek

Updated Conditions

The planning team conducted an independent analysis for the hydrology within the Farmers Branch Watershed to determine if flow has increased relative to the USACE Section 205 – Local Flood Damage Report based on the most recent land use maps.

See Appendix SW-D.1 for the drainage area map for the analysis, which splits Farmers Branch into 18 sub-basins. The map uses the latest Digital Elevation Model (DEM) information, downloaded from the TINRIS.org website. The background of the map shows the United States Geological Survey (USGS) contour elevation layer.

See Appendix SW-D.2 for the 2014 land use map. The NCTCOG 2014 land use dataset shows that the Farmers Branch Watershed consists of 1/4-acre residential, 1/8-acre residential, industrial, commercial/business, streets and road, and open space land uses. The NAS Fort Worth JRB runways are included as an industrial and street and road land use category.

Appendix SW-D.3 shows the United States Department of Agriculture Natural Resources Conservation Service soil groups associated with the Farmers Branch Watershed. The predominante group is Type D Soil, consisting of impervious and expansive clays. Within the channels a Goodland formation limestone is evident due to erosion the steep slopes and high velocities throughout the reaches.

The planning team developed an independent hydrologic analysis of the Farmers Branch Watershed incorporating 2014 future land use for Fort Worth and White Settlement to enable comparison with Section 205 flows. Table 4 shows the amount of water in cubic feet per second (cfs) for a given storm frequency based on the updated land use. The comparison of flows between the Section 205 study and the current analysis is shown in Appendix SW-D.4,
Table 6. The comparison shows that the updated hydrology is very close to the flows originally calculated for the future development, and overall slightly lower, with flows tending to converge as the storm frequency increases. The results validate the modeling conducted as part of the USACE Section 205 – Local Flood Damage Report.
### Table 4: Updated Drainage Area Flow Analysis

<table>
<thead>
<tr>
<th>Drainage Area</th>
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Farmers Branch Creek has a total of 19 existing structures. Farmers Branch, LVTrail, and West Trib are the major channels, with Manning’s roughness (velocity) values ranging from 0.04 to 0.08 for Farmers Branch. Farmers Branch has a contributing area of 6.8 acres. Farmers Branch includes economic damage reaches FB-1, FB-2, FB-3, FB-4, and FB-7, while LVTrailTrib and West Trib include economic damage reaches FB-5 and FB-6, respectively. High erosive velocities are seen upstream of Old Railroad Bridge crossing, the South Judd Street, Redford Lane, and Dale Court Lane culvert crossings. See Appendix SW-E for an exhibit on the economic damage reaches. Economic damage reaches reflect the results of Flood Damage Analysis, which integrates hydrologic, hydraulic, and floodplain characteristics with expected annual damages to strictures due to a flooding event.

6. Watershed Strategies

In addition to analyzing physical infrastructure capacities in areas surrounding NAS Fort Worth JRB, this memo identifies planning and development strategies for implementation within the broader watershed and region. Regulatory tools and best management practices (BMPs), such as Low Impact Development (LID) can both play a major role in reducing flooding risks.

The NCTCOG hosted a Countywide Watershed Management Roundtable in March 2017 to provide information about the importance of understanding flood risk, concepts such as freeboard, and floodplain management. Nine counties in North Central Texas participated in the Roundtable survey of local floodplain management practices (Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Palo Pinto, Tarrant, and Wise). See Attachment I-K.4 for discussion materials.
Regulatory Requirements

Floodplain management is a critical step in reducing flood damage to surrounding residential areas. FEMA maps determine the flood risk for a given area based on engineering studies and BFE. The BFE represents the height to which flood waters are anticipated to rise and it is the regulatory basis for flood-proofing structures. Areas that have a one percent chance of being inundated by flood waters in any given year are designated as a Special Flood Hazard Area (SFHA). The SFHA designation requires regulation of development in or near flood prone areas and flood insurance.

Within these areas, freeboard is a critical concept. Freeboard is the vertical distance between the flood level and the crest of a waterway bank, dam or embankment, the underside of a bridge, or floor of a building. In these areas, codes require at least one foot of freeboard. Stronger regulatory policies call for freeboard in excess of one foot. Higher freeboard compensates for unknown factors, such as increased urbanization in the watershed that could contribute to higher than calculated flood heights. Stronger regulatory policies, therefore, would contain higher freeboard requirements.

BMP Implementation

Structural stormwater controls are facilities designed to treat stormwater runoff and/or mitigate the effects of increased stormwater runoff peak rate, volume, and velocity due to urbanization. The focus of such systems is water quantity control and flood prevention and/or mitigation.

LID goes beyond designing systems to convey certain quantities of water to techniques that maintain a site's ability to filter, store, evaporate, and detain runoff close to its source. Instead
of conveying stormwater in large end-of-pipe facilities at the bottom of drainage areas, LID addresses stormwater through small, cost-effective landscape features at the site level.

One of the primary objectives of LID site design is to preserve as much as possible a site’s pre-development hydrologic functions by infiltrating and temporarily storing runoff water. LID techniques include:

- Bioretention, which consists of a grass buffer strip, sand bed, or ponding area that collects and treats stormwater
- Green roofs, also known as vegetated roof covers that filters, absorbs, and/or detains rainfall
- Permeable paving materials that allow rainwater to infiltrate the ground and reduce the runoff leaving a site
- Constructed stormwater wetlands, which are manmade shallow-water ecosystems designed to treat and store stormwater runoff
- Vegetated swales, which are used to convey and treat stormwater runoff from parking lots, roadways, and residential and commercial developments

iSWM™ stands for integrated Stormwater Management. The iSWM™ Program for Construction and Development is a cooperative initiative that assists cities and counties to achieve the goals of water quality protection, streambank protection, and flood mitigation, while also helping communities to meet their construction and post-construction obligations under state stormwater permits. The iSWM™ program consists of four parts: Criteria Manual, Technical Manual, Tools, and program guidance.

4 www.iswm.nctcog.org
iSWM™ promotes the most comprehensive approach to stormwater management by linking stormwater planning with informed land use and transportation decisions. This framework recommends that planning take place at both the watershed and smaller sub-watershed scales. While traditional stormwater management emphasizes techniques, such as peak discharge control, volume reduction, groundwater recharge, channel protection, and flood protection, watershed based planning promotes a broader range of goals, including streambank and stream corridor restoration, habitat protection, protection of historical and cultural resources, enhancement of recreational opportunities, and community design.

The tools of watershed management include:

- Zoning and land use planning
- Land acquisition and land conservation
- Riparian buffers and greenways
- Site design practices (LID techniques)
- Structural stormwater controls
- Site erosion and sediment control
- Elimination of non-stormwater discharges
- Watershed stewardship

**Conclusion**

Historically, poor drainage has produced localized flooding in surrounding communities. Prior modeling indicated that the culverts beneath the NAS Fort Worth JRB runway were undersized relative to flow. Stakeholders at the base have indicated that the placement of storm drains in strategic locations has largely mitigated previous flooding issues. Additionally, recent improvements such as channel reconstruction have reduced flood events in the White
Settlement area. NAS Fort Worth JRB has confirmed that there are no currently no significant, or recurring, flooding concerns within the fence line.

While NAS Fort Worth JRB and surrounding areas have been able to reduce flooding, a regional emphasis on stormwater management is necessary to maintain manageable rates of stormwater flow as development in the watershed continues, and to ensure the effective function of current stormwater infrastructure. Substantial increases in future stormwater flow and any degrading of the capacity of the stormwater system could generate new flooding risks at the base or affect access and safety due to flooding in surrounding areas.

This memo identifies the following planning, infrastructure, and maintenance related strategies to provide adequate, ongoing management of stormwater and promote the overall health of the region’s watershed.

- Strengthen awareness and promote the implementation of iSWM™ strategies and LID techniques to reduce flooding risks across the watershed
  - Conduct community outreach on the effects of additional impervious areas on stormwater quality and quantity
  - Connect communities and private sector developers with informational resources on iSWM™ and LID techniques
  - Develop an outline for a Stormwater Master Plan utilizing iSWM™ and LID components for use by city and county governments
  - Highlight regional best practice examples of iSWM™/LID techniques
  - Encourage creation of stream buffers, the preservation of open space, and limitations on clearing and grading to enhance natural drainage functions
  - Build on the efforts of the Countywide Watershed Management Roundtable to facilitate continued regional dialogue on stormwater issues and strategies
• Enforce NFIP Regulations for the Farmers Branch Watershed to establish freeboard requirements above FEMA BFE
  - Require developments to file a Letter of Map Revision (LOMR) if a project effects the established FEMA BFE

• Increase the capacity and function of existing stormwater infrastructure through the re-grading of ditches and cleaning out culverts along highway corridors and the implementation of engineering improvements in storm drain inlets and upstream and on-system capture areas
  - Clearly define ongoing operation and maintenance responsibilities
  - Additional HH modeling will determine the appropriate sizing of the storm drain infrastructure, which can be put into an overall storm-water masterplan. The City of Fort Worth and White Settlement will need to work together on develop a Capital Improvement Plan, that will identify areas that need improvement since they both are effected by the Farmer’s Branch Watershed. The plan should include improvement to streets and roads to increase the size of crossing structures, upgrading the size of storm drain systems, as well as identifying areas of re-occurring flooding, which may need to be bought out and kept as floodplain land use by restricting development.
  - The existing road in the watershed, will need to be up-sized to prevent overtopping. The new culverts or bridges will need to meet a higher frequency storm event based on their functionality; local cross-streets will use a lower 5 to 10-year frequency, while highways such as IH 820 should be able to pass the 50 to 100 year frequencies.
  - It is not clear if White Settlement has adopted a stormwater program to address these flooding issues, whereas the City of Forth Worth on the west side of IH 820 within the Farmer’s Branch Watershed has a very active Stormwater management
(http://fortworthtexas.gov/stormwater/) to address floodplains, system maintenance, flood insurance, management and regulations, flood safety, flood warning systems, and lot grading. Additionally, the City of Fort Worth adopted an iSWM™ program.

- Enhance erosion control to assist in maintaining the function and capacity of stormwater infrastructure through the use of measures, including:
  - Drop structures
  - Baffle blocks
  - Rock riprap downstream of culverts and bridge abutments
  - Concrete line ditches

- Conduct a detailed hydrology and hydraulic study for the Farmers Branch Watershed within the City of While Settlement
  - Incorporate best available information from Light Detection and Ranging (LIDAR) data and new survey for channels and bridge, culverts and storm drains, overtopping elevations, gutters, flowlines and pipe inverts
  - Use the analysis to set higher design standards for state and city facilities, including providing freeboard at roadway crossings

- Maintain pre-development site runoff levels through the use of strategies, including:
  - Detention ponds or underground storage
  - Vegetated swales
  - Rain gardens
  - Re-routing of storm drain systems
  - Maintenance of green space
  - Buyout of properties in floodplains

Appendix SW-A – Vicinity/Location Map
Appendix SW-B – Cost/Benefit of Options from Section 205
Appendix SW-C – FEMA Maps and FIS Profiles
Appendix SW-D – Updated Hydrology with 2014 land use

D.1 – Drainage Area Map
D.2 – 2014 Landuse Map
D.3 – NRCS Soils Map
D.4 – Table 6 - Hydrologic Comparison
Appendix D.1: Drainage Area Map
Appendix D.2: 2014 Land Use Map
Appendix D.3: USDA NRCS Soils Map
Appendix SW-E- Economic Damage Reaches
Appendix SW-F – Acronyms
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Attachment I – Technical References

These attachments are included within the enclosed CD.

K.1 - FinalJLUSReportMarch2008

K.2 – FEMA FIRM and FIS Report

K.3 – Section 205

K.4 – Watershed Roundtable

K.5 – SH199 Corridor Master Plan

K.6 – River Oak (SH 183) Drainage Summary
Attachment II – Digital Modeling

These attachments are included within the enclosed CD.

II.1 – HEC-HMS Model – USACE

II.2 – HEC-HMS Model – Revised Hydrology

II.3 – GIS Modeling
DEPARTMENT OF THE NAVY
COMMANING OFFICER
NAVAL AIR STATION FORT WORTH
JOINT RESERVE BASE
1510 CHENNAULT AVENUE
FORT WORTH, TEXAS 76127-5000

5223
Scr N00/607
August 30, 2017

Ms. Amanda Wilson
616 Six Flags Drive
Arlington, Texas 76011

Dear Ms. Wilson:

Subj: JOINT LAND USE STUDY – STORM WATER AND FLOODING ISSUES

I understand an objective of the current, regional Joint Land Use Study (JLUS) sought to understand storm water and flooding impacts, if any, to the base and surrounding municipalities. In addition to previous communication from Naval Air Station Fort Worth Joint Reserve Base, Command and Public Works staff, this letter constitutes further confirmation there are currently no significant, or recurring, flooding concerns within the fence line.

However, to help uphold the positive, long-standing trend towards compatible development between the installation and communities, future low-impact development and integrated storm water management strategies are critical due to forecast growth expected in west Tarrant County.

For any related concerns or questions please contact Mike Branum, Community Planning and Liaison Officer, at 817-782-7609 or michael.branum@navy.mil.

Sincerely,

J. A. TURNER
By direction of the
Commanding Officer
NAS Fort Worth JRB
Technical Appendix L.

Comprehensive Plan Guidelines
Comprehensive Plan Guidelines

Comprehensive Plans are designed to serve as the jurisdiction’s blueprint for future decisions concerning land use, infrastructure, public services, and resource conservation. The plan identifies the development policies of the jurisdiction in the form of goals, policies, standards, implementation measures, maps and diagrams.

The purpose of these guidelines is to assist cities and counties in addressing military compatibility issues when developing, updating or significantly amending their Comprehensive Plans. Local governments can add the following narrative, goals, and policies to their plans either as a separate element or as supplementary language to strengthen existing goals and policies.

Goal: Health, Safety, and Welfare

Protect public health, safety and welfare near military installations from hazards associated with aerial and land-based military operations.

Policy: Compatible Land Use

Designate compatible land use in areas adjacent to military installations and where military operations, testing, and training activities occur.

Goal: Compatibility with the Military

Promote future development that protects the public health, safety, and welfare by minimizing risk to life, property and the well-being of residents from military training and testing operations and maintaining compatibility with current and foreseeable missions at [military installation].
Policy: Role of [military installation]

Continue to support the unique and vital mission capabilities of [military installation] and the significant contribution of the installation to the economic base of the community and region.

Policy: Military-Community Partnerships

Partner with [military installation] to anticipate and meet community growth and service demands related to military mission change and to ensure that residents of participate in economic opportunities and outreach activities associated with the installation.

Goal: Communication/Coordination

Foster meaningful, ongoing communication among, residents, [military installation] and regional partners to increase awareness of Department of Defense and other federal and state missions and activities and to coordinate on ongoing compatibility planning and management activities.

Policy: Support for Compatibility Implementation

Continue [City/County] participation in the Joint Land Use Study (JLUS) by appointing primary points of contact to facilitate the communication and coordination strategies recommended in the JLUS Report.

Policy: Information Exchange with [military installation]

Work with [military installation] to establish ongoing communication mechanisms for issues of mutual concern, including mission or operational changes that could affect the
surrounding community or specific development and infrastructure projects that could affect compatibility with training operations.

**Policy: Regional Coordination**

Schedule regular meetings with other jurisdictions and the military to ensure regional military compatibility issues are addressed throughout the region.

**Policy: Increase Public Awareness**

Partner with [military installation] to make information on the potential impacts of training operations available to residents.

**Policy: Development Review**

Review community development and infrastructure proposals for interaction that could produce compatibility challenges with training operations, including: noise sensitive uses in areas of known exposure to aviation and range noise; physical infrastructure that could interfere with low-level flight operations; and sources of electrical emissions that could interfere with military communications or navigation systems.

**Policy: Military Involvement and Planning Process**

Provide notice to [military installation] for review and comment on [County/City] discretionary land use actions to include, but not be limited to, Comprehensive/Area Plan amendments or updates, zoning changes, land development code changes, and subdivision plats.
Goal: Land Use Compatibility

Enhance land use compatibility between [military installation] and property in the surrounding area and to protect public health and safety.

Policy: Military Influence Area (MIA) Overlay

Define and maintain a Military Influence Area (MIA) as an overlay to the zoning map. The MIA will consist of areas based on noise and safety guidance from the [Air Installation Compatible Use Zone] study, as well as other compatibility factors evaluated in the JLUS program. Within the MIA, the [County/City] will implement a variety of land use, communication and other mitigation techniques to reduce possible land use conflicts and protect the health and safety of people and property in affected areas. The appropriate strategies will vary based upon the particular operational impacts associated with sub-areas of the MIA.

Policy: Military Training Routes and Special Use Airspace

Where appropriate, designate lands adjacent to military installations and under low level flight paths as open space or low density commercial/light industrial zoning with building height restrictions which facilitate military aviation.

Policy: Support for Buffering Activities

Open space, agriculture, and low-density uses adjacent to military activities provide a critical buffer that protects surrounding areas from the nuisance and safety risks of nearby military operations; therefore, as part of overall compatibility strategies, the [County/City] will, whenever feasible, use open space and conservation planning to assist in establishing buffers in proximity to [military installation and training areas].
Policy: Noise Mitigation

Minimize noise impacts by designating compatible land uses and establish development standards in areas exposed to high noise levels.

Policy: Aviation Hazards

Consult with military planners on the siting of energy infrastructure or other infrastructure to minimize flight hazards in military airspace, particularly in low-level flight corridors, and to reduce the risk of interference with military communication systems.

Goal: Transportation

Ensure adequate circulation routes are maintained between the installation and related operational areas (e.g., training areas and supply depots), and to ensure these activities do not interfere with safety and civilian transportation needs.

Policy: Circulation

Ensure the protection of community and military transportation corridors to maintain viability of the installation and its operations and provide for safe circulation and access.

Policy: Transportation Planning

Consider the needs of military installations when planning transportation and infrastructure projects by consulting regularly with the military to ensure military routes are depicted accurately on the plan diagrams and maps.