### CLEARED TO LAND: PRESERVING GEORGIA'S WORLD WAR II AIRFIELDS

by

### JAMES MILLS DORN

(Under the Direction of Cari Goetcheus)

#### ABSTRACT

This thesis research crafts a historic context for Georgia's non-urban World War II airfields used to train pilots. These airfields, historically significant at a state and national level, can be preserved via documentation and identification, physical preservation, and interpretation. Evaluation of WWII airfield National Register documentation, guidance, and similar studies, along with the use of case studies to identify key character-defining features of these kinds of airfield resources, afforded the opportunity to craft a pilot study for an effort that should be applied regionally and nationwide to determine a standard approach to the preservation of these resources.

INDEX WORDS: Airfields, World War II, Historic Preservation, Army Air Corps

# CLEARED TO LAND: PRESERVING GEORGIA'S WORLD WAR II AIRFIELDS

by

### JAMES MILLS DORN

B.S, Lander University, 2017

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment

of the Requirements for the Degree

MASTER OF HISTORIC PRESERVATION

ATHENS, GEORGIA

2019

© 2019

James Mills Dorn

All Rights Reserved

# CLEARED TO LAND: PRESERVING GEORGIA'S WORLD WAR II AIRFIELDS

by

### JAMES MILLS DORN

Major Professor: Committee: Cari Goetcheus Eric MacDonald John H. Morrow, Jr. Michelle Michael

Electronic Version Approved:

Suzanne Barbour Dean of the Graduate School The University of Georgia May 2019

## DEDICATION

This thesis is dedicated to Ray Crenshaw, Jim Ashley, and Jeremy Hayden, for helping to encourage and fuel my passion for aviation and history.

# ACKNOWLEDGEMENTS

Thanks to Cari Goetcheus for mentoring me and helping me to stay on track to meet my goal and to my parents for encouraging me throughout this process.

## TABLE OF CONTENTS

Page
ACKNOWLEDGEMENTSv
LIST OF TABLES
LIST OF FIGURESx
CHAPTER
1 Introduction1
Methodology2
Research Inclusions and Exclusions4
Organization of Thesis5
2 Background History
Balloon Aviation
Heavier-Than-Air Aviation Development9
Military Aviation Development14
Military Aviation in WWI21
Military Aviation Between the Wars24
Military Aviation and WWII
Military Aviation After WWII
Airfield/Airport Development
3 HISTORIC PRESERVATION
Preservation51

Critique of Known Military Airfield National Register Nominations,	National
Register Bulletins, Reports and Inventories	56
Summary	62
4 CASE STUDIES	63
Souther Contract Pilot School	67
Bainbridge Army Air Field	
Spence Army Air Field	
Summary	153
5 FINDINGS AND PROPOSALS	154
Identification and Documentation	155
Physical Preservation	160
Interpretation	162
Summary	163
6 CONCLUSION	165
Reflections	166
Future Research	167
Conclusion	168
REFERENCES	169

# LIST OF TABLES

Table 1: Souther Contract Pilot School Basic Information
Table 2: Souther Contract Pilot School Historic Building Inventory  97
Table 3: Souther Contract Pilot School Historic Structures Inventory
Table 4: Souther Contract Pilot School Historic Objects Inventory
Table 5: Souther Contract Pilot School Historic Site Inventory
Table 6: Souther Contract Pilot School Historic Landscape Inventory  99
Table 7: Bainbridge Army Air Field Basic Information
Table 8: Bainbridge Army Air Field Historic Building Inventory  125
Table 9: Bainbridge Army Air Field Historic Structures Inventory  126
Table 10: Bainbridge Army Air Field Historic Objects Inventory  126
Table 11: Bainbridge Army Air Field Historic Sites Inventory  127
Table 12: Bainbridge Army Air Field Historic Landscapes Inventory
Table 13: Spence Army Air Field Basic Information  149
Table 14: Spence Army Air Field Historic Building Inventory  149
Table 15: Spence Army Air Field Historic Structures Inventory  150
Table 16: Spence Army Air Field Historic Objects Inventory  150
Table 17: Spence Army Air Field Historic Sites Inventory
Table 18: Spence Army Air Field Historic Landscapes Inventory
Table 19: Case Study Resources Inventory  157

Table 20: Case Study Landscape Condition Inventory	158
Table 21: Case Study Landscapes Integrity Inventory	158

# LIST OF FIGURES

Page
------

Figure 1: Location of Major and Minor Army Air Fields in Georgia
Figure 2: Civil War observation balloon being filled with hydrogen7
Figure 3: Langley's aerodrome breaking up after leaving the catapult
Figure 4: First flight of the Wright Brothers on December 17, 190314
Figure 5: Glen Curtiss in his Golden Flyer
Figure 6: Airfield at College Park, Maryland19
Figure 7: Billy Mitchell
Figure 8: Coffeyville Army Air Field42
Figure 9: Coffeyville Army Air Field parking apron and barracks area43
Figure 10: Noise Screening with vegetation
Figure 11: Location of case study airfields
Figure 12: Souther Field during its use for WWI pilot training
Figure 13: Fourth day of construction at Souther Field
Figure 14: 28 <sup>th</sup> construction day at Souther Field69
Figure 15: Souther Field construction work day 4769
Figure 16: Souther Field barracks area70
Figure 17: Souther Field canteen building70
Figure 18: Souther Field hangar row71
Figure 19: Souther Field aircraft hangar71

Figure 20: Souther Field machine shop	72
Figure 21: Souther Field hospital	72
Figure 22: Souther Field flight line	73
Figure 23: Pigeon training at Souther Field	73
Figure 24: Gunnery training at Souther Field	74
Figure 25: WWI trainer aircraft at Souther Field	74
Figure 26: Cadets at Souther Field	75
Figure 27: Souther Field circa, 1940s	
Figure 28: Souther Field aerial showing parking apron and facilities buildings	
Figure 29: Souther Field flight line and parking apron	80
Figure 30: Aircraft hangars at Souther Field	80
Figure 31: Souther Field aircraft hangar and parking apron	81
Figure 32: Souther Field parking apron and flight line	81
Figure 33: Flight tower at Southern Field	
Figure 34: Administration building and barracks at Souther Field	
Figure 35: Cadets at Souther Field during training in a Boeing PT-17 Stearman	83
Figure 36: Cadets Undergoing flight training at Souther Field	83
Figure 37: Cadets arriving at Souther Field by train	84
Figure 38: Current aerial photo of Southern Field	85
Figure 39: Hangar #1 south facade	86
Figure 40: Hangar #1 west facade	86
Figure 41: Hangar #2 west facade	87
Figure 42: Hangar #2 southwest corner	

Figure 43: Historic Parking apron on school campus now used as parking lot	88
Figure 44: Historic poured concrete on site of aircraft parking apron	88
Figure 45: Patched area of historic concrete with modern concrete	89
Figure 46: Damaged area of historic parking apron concrete	89
Figure 47: Historic tie-down hook located in concrete	90
Figure 48: Current airfield landscape facing north	91
Figure 49: Current airport facilities structures	92
Figure 50: Current airfield landscape facing northeast	92
Figure 51: Current airfield landscape facing northwest	93
Figure 52: Historic warehouse used during the WWI period of use on Souther Field	94
Figure 53: Officer's quarters now used as a private residence near airfield	94
Figure 54: Tennis court located on the site of officer's quarters	95
Figure 55: Bainbridge Army Air Field, December 1942	100
Figure 56: Bainbridge Army Air Field parking apron and facilities buildings and structures .	103
Figure 57: T-6 advanced training aircraft at Bainbridge Army Air Field	104
Figure 58: T-6 formation training over Bainbridge	104
Figure 59: Bainbridge Army Air Field parking apron with T-6 training aircraft	105
Figure 60: Flight tower on Bainbridge Army Air Field	105
Figure 61: Entrance to the military housing area at Bainbridge Army Air Field	106
Figure 62: Chapel at Bainbridge Army Air Field	106
Figure 63: Bainbridge Army Air Field headquarter building	107
Figure 64: Bainbridge Army Air Field hospital building	107
Figure 65: Cadet undergoing training in a Link Trainer at Bainbridge Army Air Field	108

Figure 66: Cadets marching along the parking apron at Bainbridge Army Air Field	108
Figure 67: T-28 training aircraft on the parking apron at Bainbridge Army Air Field	110
Figure 68: Class 58-K at Bainbridge Army Air Field	110
Figure 69: T-37 jet trainer over Bainbridge	111
Figure 70: Class 60-D at Bainbridge Army Air Field	111
Figure 71: Aerial photograph of Bainbridge Army Air Field, with notations	112
Figure 72: Hangar #1 on Bainbridge Army Air Field	114
Figure 73: Hangar #1 interior	114
Figure 74: Hangar #2 rear facade	115
Figure 75: 1950s-era barracks building	115
Figure 76: Post-WWII period Aircraft painting inside barracks building	116
Figure 77: Possible barracks at Bainbridge Army Air Field	117
Figure 78: Previous location of flight tower	117
Figure 79: View of Bainbridge Army Air Field facing southeast	119
Figure 80: Bainbridge Army Air Field facing northwest	119
Figure 81: Abandoned runway facing southwest	120
Figure 82: Runway 6/27 facing west	120
Figure 83: Abandoned runway with centerline painting	121
Figure 84: Historic wind direction indicator at northwest edge of airfield	121
Figure 85: Tie-down hook located in the parking apron of Bainbridge Army Air Field	122
Figure 86: Historic barracks building demolished by hurricane	123
Figure 87: Hurricane damage to wind direction indicator	123
Figure 88: Spence Army Air Field Historic aerial photograph	128

Figure 89: Parking apron on Spence Army Air Field
Figure 90: Parking apron on Spence Army Air Field131
Figure 91: Parking apron on Spence Army Air Field with parked T- training aircraft132
Figure 92: Hangar on Spence Army Air Field132
Figure 93: P-40 aircraft on the parking apron at Spence Army Air Field
Figure 94: Entrance into Spence Army Air Field
Figure 95: Gunnery training at Spence Army Air Field134
Figure 96: Sunbelt Agricultural Expo, 1997135
Figure 97: Aerial photograph of Spence Army Air Field, with notations
Figure 98: Southwest façade of gymnasium on Spence Army Air Field137
Figure 99: Close up of west façade of gymnasium showing mid-century design of windows137
Figure 100: Historic tennis court located southwest of gymnasium at Spence Army Air Field .138
Figure 101: WWII-era hangar previously used by Maule Flight on Spence Army Air Field138
Figure 102: Central WWII hangar located on Spence Army Air Field
Figure 103: Western most WWII-era hangar on Spence Army Air Field
Figure 104: Historic mess hall building located on Spence Army Air Field140
Figure 105: Possible historic mess hall building at Spence Army Air Field
Figure 106: Historic flight tower on Spence Army Air Field141
Figure 107: Interior of flight tower facing north142
Figure 108: Partially used historic runway at Spence Army Air Field, facing southeast
Figure 109: Remains of runway numbering on historic partially used runway143
Figure 110: Inactive runway now used by the Ag Expo, facing east144
Figure 111: Parking apron on Spence Army Air Field, facing west144

Figure 112: Parking apron on Spence Army Air Field, facing east	.145
Figure 113: Tie-down hook located in the parking apron at Spence Army Air Field	.145
Figure 114: Spence Army Air Field, facing east	.146
Figure 115: Spence Army Air Field, facing north	.146
Figure 116: South-end of airfield property now used as agricultural fields	.147

#### CHAPTER 1

#### INTRODUCTION

Ever since I was a child, I have had a passion for aviation and aviation history. I learned to fly at age 18 on an airfield that was constructed for World War II (WWII) training and was later converted for civil aviation use. After learning about that airfield's history from many mentors and friends, my interest in the topic broadened and deepened, culminating in this thesis.

The early development of military aviation in the United States was an uphill struggle, starting with the use of balloons during the American Civil War and evolving into the use of airplanes and the formation of the United States Air Force. After the use of balloons for battlefield reconnaissance, the United States Army started to slowly advance their use of aviation. Experimentation with gliders and airplanes by many pioneers in aviation culminated with the first powered flight by the Wright Brothers in 1903. After this new technology was perfected and the military was convinced of its importance, the development of military aviation began.

As the U.S. continued to finely tune their military aviation program, the first flight training started to develop. This training was pioneered by members of the Army. Soon, the U.S. was using aviation on the battlefield, starting with the first attempted use during campaigns in Mexico and later in World War I (WWI). After the conclusion of WWI, the Army's aviation program worked to match European developments. Military aviation, aided by the development of the Army Air Corps throughout the 1920s and 1930s, continued to develop and grew into a large force in preparation for entrance into WWII.

After entering WWII, the U.S. increased its use of military aviation even further. The training of Army pilots became a top priority for the U.S. Shortly after the war began, the construction of airfields exploded across the United States. In many areas of Georgia, as well as other areas of the country, training airfields became a normal sight. These airfields proved crucial to the victory that was achieved overseas during this conflict. After the war, demobilization brought these airfields into use for civil aviation. Many of these airfields are now municipal airports that serve the communities in which they are located, allowing many to be preserved and still retain integrity to convey their association with their past.

All of these facts and thoughts led me to my research question: How can historic WWII Army Air Corps Airfields in rural Georgia retain their historic built environment, while simultaneously accommodating modern aviation improvements through rehabilitation?

#### *Methodology*

The methodology used to answer this question will consist of three steps: undertake background research, identify up to five case study sites in Georgia, analyze the results of the case study sites and provide conclusions.

The background research will cover a variety of topics, including: early military aviation, WWI aviation, WWII training, and airfields after WWII. To conduct background research, I will consult archives and historic materials that pertain to the history of aviation in the military. Along with researching military aviation, I will also research the developments that have occurred in airport development after the conclusion of WWII. These developments will include



Figure 1. Location of Major and Minor Airfields in Georgia. (Map Created by Author)

any physical changes that have occurred on an airfield's landscape and structures that have been constructed. Next, I will explore past efforts that have been made to preserve airfields and

To apply my historic research of aviation history and airfield development in Georgia, I will choose up to five case study sites to study and analyze for their significance and integrity per National Register of Historic Places standards. As a part of the study, an individual survey will be created and used. This survey will be used at the airfield sites previously mentioned. Identification of historic fabric will be buildings, structures, navigational features, landscape characteristics, and the gathering of verbal information from local historians. An analysis of the case study findings will occur resulting in airfield preservation proposals and conclusions.

#### **Research Inclusions and Exclusions**

For this thesis, only airfields operated by the Army Air Corps during the WWII timeperiod will be chosen for inclusion as case studies. The time-period of focus (1939-1945) for this thesis was chosen for the significance of WWII on military aviation and future development of aviation landscapes throughout the U.S. Training airfields were created all over the country, but limitations on time and availability require that this thesis only focus on airfields in Georgia. While the United States' Navy created and used some airfields during WWII, the large majority in the state of Georgia were created by the U.S. Army Air Corps. Airfields around large cities that are currently used for commercial airports, as well as currently-used military airfields, will not be used due to the significant changes to their built environment. Finally, findings will be gathered from the information that is ascertained from the three case studies.

### **Organization of Thesis**

This thesis is organized into six chapters. Chapter One will cover the introduction of the topic and scope of the research being performed. Chapter Two will introduce the history of military aviation and airport development. The history in this chapter will set the stage for military aviation leading up to the formation of the United States Air Force and the changes in airports in the United States as well as Georgia. In Chapter Three I will introduce and critique previous efforts that have been made to preserve airfields. Chapter Four will introduce the four case studies and give brief histories of their use along with the historic significance of the sites and historic resources that are left from their time as Army Airfields. This will include an analysis of these case studies as a whole. Chapter Five will cover the proposals for how these airfields should be preserved and how similar airfields should be approached in preservation. The final chapter will present research conclusions and recommendations for future preservation initiatives.

#### CHAPTER 2

#### BACKGROUND HISTORY

The history of aviation in the United States Military covers a large range of varying types of aviation. This chapter will describe the evolution of military aviation history up to the formation of the United States Air Force in 1947. After the conclusion of World War II, a large number of airfields were turned over for public use and were updated. This evolution is covered throughout the post-WWII period until modern day, focusing on Georgia's airport developments in the current era.

#### **Balloon** Aviation

The introduction of aviation into the United States military occurred far earlier than most would expect: the U.S. Army used gas-filled balloons to carry one or two people aloft during the Civil War. The first Chief of the Union Army's Balloon Corps was Thaddeus S. C. Lowe, who commanded eight aeronauts and seven balloons. Although this small force was part of the U.S. Military, Lowe and the aeronauts were never assigned military rank and were considered civilians during their careers. During the Civil War, both armies used balloons to try and gain advantages on the battle field. Union General Benjamin F. Butler of Massachusetts was the first general to use the balloon during a military campaign: he used balloons managed by John La Mountain to observe the approach of troops on Fort Monroe in Hampton, Virginia. This was not continued by his successor, and La Mountain moved his balloons and equipment to Washington and conducted reconnaissance of Confederate positions in Northern Virginia.<sup>1</sup>



Figure 2. Civil War observation balloon being filled with hydrogen. (*Winged Shield, Winged Sword: A History of the United States Air Force*, Vol. 1, pg. 5).

As with any new technology, the military was slow to trust it and approve of its use. This hesitation was justified, as these early forms of aviation were dangerous, tended to become large targets for enemy troops on the battlefield, were not easily mobile, and required tremendous amounts of equipment to keep the balloons airborne—all of which had to be transported when the battle lines moved. Later in the war, when lines moved very quickly, it became nearly impossible for the balloons and aeronauts to keep up and the reconnaissance gained was not

<sup>&</sup>lt;sup>1</sup> Bernard C. Nalty, *Winged Shield, Winged Sword: A History of the United States Air Force*, vol. 1, 2 vols. (Washington, D.C.: Air Force History and Museums Program, United States Air Force, 1997), 4.

effective enough to justify the cost of operating the balloons. All of this eventually caused the Balloon Corps to be disbanded after the war ended.<sup>2</sup>

Although the Balloon Corps was disbanded, the Signal Corps remained in contact with several aeronauts and continued using balloons for special service assignments, including the recording of weather observations. Balloons returned to the Army as a part of the Signal Corps in 1887, as advocated by Chief Signal Officer Adolphus W. Greely. Greely took a particular interest in the use of balloons, combined with telegraph technology, to quickly convey intelligence on the battle field. The Army purchased a balloon for military use and entered it into service in 1892. Not long after, the balloon had to be replaced when it burst while being filled with gas at Camp Logan, Colorado, where it was stored. The balloon was repaired just in time to be deployed following the United States' entrance into the Spanish American War in 1898 and was sent to Cuba.

During the Spanish American War, the Army also acquired a smaller, handmade observation balloon that floated above the advancing troops. A major disadvantage to the use of this smaller balloon for that purpose was its tendency to give away troop positions to the enemy, causing some casualties on the battlefield. Furthermore, the balloon became a large target for the enemy who would aim artillery to try and take it down. Despite these challenges, the intelligence gathered about enemy positions and the mapping of roads from the balloons tended to outweigh the disadvantages. This being the case, the Signal Corps recognized the place of aviation in the military, and in 1899 the Army increased the size of their balloon force to a total of five balloons.<sup>3</sup>

<sup>&</sup>lt;sup>2</sup> Ibid., 5.

<sup>&</sup>lt;sup>3</sup> Ibid., 6.

### Heavier-Than-Air Aviation Development

Alongside the increasing success and popularity of balloons in the military, others conducted experiments in the design and use of 'heavier-than-air craft'—that is, aircraft that are heavier than the surrounding air.<sup>4</sup> Simply put, a balloon uses buoyancy with gas or hot air to make itself lighter than air, whereas an airplane uses aerodynamic forces to gain lift, thus allowing them to remain airborne despite their increased weight. The first experiments with this type of aircraft were performed by Sir George Cayley in England, who began experimenting with small-scale unmanned gliders in 1804. In 1852, a glider built by Cayley carried a small boy into the air, and one year later a full-sized version of this glider carried his coachman aloft.<sup>5</sup>

Many people would follow Cayley in the study and experimentation of heavier-than-air flight, including one German engineer named Otto Lilenthal. Lilenthal undertook research into the study of aerodynamics and produced one of the most important written works on the topic entitled, "Bird-flight as the Basis of Aviation." His work became very influential on American aviation pioneers such as the Wright Brothers. However, his influence was cut short when he died on August 9, 1896, while conducting a glider flight. His last words would become famous for the pursuit of manned flight: "Sacrifices must be made."<sup>6</sup>

In the United States, one of the pioneers of aviation was Octave Chanute. Chanute was the son of a history professor in Paris, France, and moved with his family to the United States in 1838 when his father became the president of Jefferson College in Louisiana. He studied engineering while working on the Hudson River Railroad. During his career he became a very

<sup>&</sup>lt;sup>4</sup> "Heavier-than-air," Merriam-Webster, accessed September 23, 2018, https://www.merriam-webster.com/dictionary/heavier-than-air.

<sup>&</sup>lt;sup>5</sup> Anne Marie. Millbrooke, Aviation History (Englewood, CO: Jeppesen Sanderson, 1999), 2-8 - 2-10.

<sup>&</sup>lt;sup>6</sup> Lawrence Goldstone, *Birdmen: The Wright Brothers, Glenn Curtiss, and the Battle to Control the Skies* (New York: Ballantine Books, 2014), 3 - 5.

prominent civil engineer and retired very wealthy. He began to study heavier-than-air flight during retirement and went on to publish many influential works relating to flight, building on previous information gathered by Cayley, Lilenthal, and even work done by Leonardo Da Vinci.<sup>7</sup> The work of Chanute and others became increasingly popular in the U.S. among those studying heavier-than-air flight, even catching the eye of the U.S. military. Samuel P. Langley, then Secretary of the Smithsonian Institution, began to study and design aircraft that could stay aloft under their own power. With help from Alexander Graham Bell, Langley, who was also friends with Adolphus W. Greely, pushed the Army to invest in powered flight. He argued that powered flight would increase military strength and render large weapons, such as battleships, useless against the might of airpower. The Army commissioned an investigation committee in 1903 that would propose a \$50,000 grant for the purchase of Langley's aircraft. The Secretary of War, Russel A. Alger, accepted the committee's report and Langley started work. In October 1903, Langley prepared to attempt power flight by launching his flying machine, called an aerodrome, off of a houseboat anchored in the Potomac River. The first attempt failed when it became tangled in the launching equipment and fell into the river. The second attempt also failed when the aerodrome broke up as it left the catapult.<sup>8</sup>

Simultaneous to Langley's efforts, Wilbur and Orville Wright were made similar attempts to achieve powered flight along the outer banks of North Carolina. Originally from Dayton, Ohio, the Wright Brothers were bicycle mechanics who created and repaired bicycles in their Ohio shop. On hearing the news of Lilenthal's death in 1896, the brothers became obsessed with achieving powered flight. Wilbur, the more passionate of the two, spearheaded the effort. <sup>9</sup>

<sup>&</sup>lt;sup>7</sup> Ibid., 10 - 16

<sup>&</sup>lt;sup>8</sup> Nalty, Winged Shield, Winged Sword, 7.

<sup>&</sup>lt;sup>9</sup> Millbrooke, Aviation History, 2-15, 2-16.



Figure 3. Langley's Aerodrome breaking up after leaving the catapult. (*Winged Shield, Winged Sword: A History of the United States Air Force*, Vol 1, pg. 8).

Wilbur Wright began to study the principles of controlled flight, which built upon his understanding of the bicycle and the different forces that were needed to effectively control that machine. The principles for movement-control are roll (side to side movement), yaw (lateral movement), and pitch (rocking back and forth). One of the most important realizations that he made, which was not achieved by Langley, was the use of roll. Unlike Langley, Wilbur used the roll characteristics of flight to control balance. To test his theory, Wilbur created a kite that was flexible, with wings attached to it that could be manipulated to control its stability. Throughout the process, Wilbur corresponded with Octave Chanute, gaining knowledge while sharing ideas. Soon he was ready to create a full-sized glider that could carry a man and pick a site in which to attempt a flight. Chanute recommended Wilbur look toward the East Coast of the United States, where hills were more common. Wilbur decided to use Kitty Hawk, North Carolina, due to its long stretches of sand and steady winds around fifteen miles per hour.<sup>10</sup>

Wilbur began construction of the glider, shipping some materials ahead to Kitty Hawk. Soon, Wilbur made the trip to North Carolina and boarded with a local family; later, Orville joined him and helped with the construction. This first trip lasted three weeks and showed mixed success. The device for launching the glider, using a tower and ropes that acted as a kite string that Wilbur created, failed. On the other hand, the brothers were able to solve some problems regarding control of the aircraft and mid-flight balance. The brothers completed several flights with the glider, though they only covered very short distances.<sup>11</sup>

After refining their design and making a few more trips to the dunes of Kitty Hawk for testing, the Wrights were finally ready. On March 23, 1903 the brothers applied for a "Flying Machine" patent. They used the design of the glider for the patent and soon began work on an engine to power it through the air. The patent office rejected the Wrights' patent, stating one could not be provided for a machine that could not fly. This bad news did not deter the brothers and they began to research a way to power the aircraft, studying weight-to-thrust ratios. Soon they settled on a 12-horse power engine. While the brothers made progress, they remained attentive to Langley's attempts with the aerodrome.<sup>12</sup> When he failed, Wilbur, still in contact with Chanute wrote, "It seems to be our turn to throw now, and I wonder what our luck will be,"<sup>13</sup>

<sup>&</sup>lt;sup>10</sup> Goldstone, *Birdmen*, 40-44.

<sup>&</sup>lt;sup>11</sup> Ibid., 45,46.

<sup>&</sup>lt;sup>12</sup> Ibid., 74 - 79.

<sup>&</sup>lt;sup>13</sup> Ibid., 79.

Finally, on December 14, 1903, the brothers traveled to Kitty Hawk and prepared to make their attempt at powered flight. The first attempt failed after a downhill launch when the aircraft gained too much speed and stalled at the end of the track. The machine was slightly damaged, but they were able to make another attempt on December 17. This time there was no problem with the launching of the aircraft and the winds were favorable to generate enough lift over the wings. Orville manned the controls and the aircraft took off, flying close to 120 feet, the first ever powered flight of a heavier-than-air-craft. Three more flights were made that day with the longest being flown by Wilbur at 852 feet. Unfortunately, due to a gust of wind after those flights, the machine was damaged beyond the point of repair at Kitty Hawk. The Wrights, however, were already looking to improve the design.<sup>14</sup> Soon after sending a telegram back home to their father recounting the flights, newspapers across the United States picked up the news and relayed it. In 1904, the Cincinnati Enquirer reported an accurate account given by both Wilbur and Orville.<sup>15</sup>

Even with the news of the Wright's success circulating around the country, the U.S. Army hesitated to invest due to the embarrassment they endured when Samuel Langley's aerodrome failed. Although the Wright Brothers concluded that the Army would gain the most use out of their machine, the Army repeatedly refused to invest, and the Wrights decided to market the machine themselves.

<sup>&</sup>lt;sup>14</sup> Ibid., 80 - 81. <sup>15</sup> Ibid., 82 - 83.



Figure 4. First flight of the Wright Brothers on December 17, 1903. (*Birdmen: The Wright Brothers, and the Battle to Control the Skies*. Lawrance Goldstone, pg. 80.)

They received patents for their inventions in 1906 and found interest from various militaries in Europe.<sup>16</sup>

### Military Aviation Development

Even though the U.S. Army was hesitant to buy into the Wright's "Flying Machine," they were still interested in flight. In 1907, an aeronautical division was created in the Army to explore and experiment with the use of balloons and other types of aircraft. Simultaneously, a civilian Aero Club was established and pushed the military into more experimentation of aircraft. Besides airplanes, the dirigible or airship was becoming a popular aircraft and the Army considered investing there instead of in heavier-than-air craft. As the U.S. Army considered dirigibles, they defined a set of requirements: it had to carry two people and a load of 450

<sup>&</sup>lt;sup>16</sup> Nalty, Winged Shield, 8.

pounds, not including fuel, and achieve a top speed of 20 miles per hour. Soon the Army made a purchase of Thomas Baldwin's dirigible with the assumption that he would train military personnel how to use it.<sup>17</sup>

After extended negotiations between the Wrights and the U.S. Army, the Wrights accepted an offer of \$25,000 for their aircraft. Like the dirigible, it had to meet certain criteria. The requirements were that it must carry two people with a 350-pound load, not including fuel, and reach a top speed of 40 miles per hour. In September of 1908, a display of the Wrights aircraft was made at Fort Meyer, Virginia. The official observer at the display was Lieutenant Thomas E. Selfridge. The exhibition of the airplane lasted a couple of days and many successful flights were performed by Orville, including one that lasted almost an hour. On September 17, Lieutenant Selfridge climbed into the aircraft with Orville for a ride. A problem occurred during flight with one of the propellers used to power the aircraft. A propeller came loose and hit a wire brace, causing the airplane to crash. The crash killed Lieutenant Selfridge and injured Orville leaving him hospitalized for a few months. Following the accident, trials for the aircraft were postponed until another aircraft could be built. Finally, on July 29, 1909, the trials resumed, flown by Orville, fulfilling all of the military's requirements, and on August 2nd the Army accepted the airplane.<sup>18</sup> The Army flight trials at Fort Meyer drew a large amount of attention, with widespread publicly of the newly invented airplane and its potential uses for the military. This publicity produced a public relations issue for the Army, as they struggled to promote the achievements in aviation while simultaneously attempting to downplay the cost at which they

<sup>&</sup>lt;sup>17</sup> Ibid., 7 - 12. <sup>18</sup> Ibid., 7 - 14.

came.<sup>19</sup> The focus of the Army would turn to training pilots and implementing the airplane into military service.

The Wright Brothers became the first to create and fly a successful airplane, but another person named Glen Curtiss would add their influence on American aviation. Curtiss was a motorcycle enthusiast and racer who began to manufacture motorcycles and, most importantly, their engines.<sup>20</sup> He met the Wright Brothers in 1906 and attempted to sell them a new Curtiss engine for use on their aircraft. He too became enthralled with the prospect of flight, which led to him designing and flying his own aircraft. Soon after, a legal war would erupt between Curtiss and the Wrights. The idea of "lateral stability" for managing airflow, that was first proposed and used by the Wrights in their aircraft, was believed by them to be under patent. On the other hand, Curtiss argued that it was public knowledge and a basic principal of flight, and thus only specific mechanical designs were within the control of the Wright's patent. The conflict between the Wright Brothers and Curtiss was eventually resolved, however, and both continued to manufacture aircraft and designs for aviation.<sup>21</sup>

Meanwhile, the Army continued its efforts to implement the new airplane into the military. This endeavor would contribute to the phasing-out of lighter-than-air flight. Wilbur Wright continued to train new Army pilots at an airfield in College Park, Maryland. The Signal Corps were once again the department of the Army that would use the airplane in service. The first two pilots trained by Wilbur Wright were Lieutenants Frank P. Lahm and Frederic E. Humphreys. On November 5, 1909, the two crashed without suffering any injuries but at the

<sup>&</sup>lt;sup>19</sup> Herbert A. Johnson, *Wingless Eagle, U.S. Army Aviation Through World War I* (Chapel Hill, NC: University of North Carolina Press, 2001), 29 - 31.

<sup>&</sup>lt;sup>20</sup> Millbrooke, *Aviation History*, 3-16.

<sup>&</sup>lt;sup>21</sup> Goldstone, *Birdmen*, 104, 105.

cost of the Signal Corps' only airplane. Soon, the two would be removed from the Army's flight program and return to their original assigned posting due to a rule that officers could not partake in more than four years of detached duty from their post.<sup>22</sup>

The Army, still doubting the use of aviation in the military, debated the necessity of military aircraft. Lobbying groups like the Aero Club pushed to spend more money on military aviation. Despite these efforts, the proposal for an aviation budget of \$250,000 was cut in half in 1911. Despite a lack of funding for aviation in the Army, its use would continue with the use of a Wright aircraft, rented by Benjamin Foulois, for reconnaissance and to dissuade Mexico from hostilities. The Army's focus on aviation began to shift from the Wrights to Curtiss in January of 1911 when Curtiss started a flying school in San Diego, California. He invited both the Army and Navy to send prospective pilots and soon three volunteers arrived to train.<sup>23</sup>

The aircraft that Curtiss designed for the students to train on did not have two seats like the Wright aircraft but were single seat airplanes. This early type of flight training that the pilots experienced at Curtiss's flight school was known as "grass cutting" or "short hop." The trainee would spend time taxiing the aircraft on the ground with a restricting apparatus on the throttle that would not allow the aircraft to gain enough speed to become airborne. This method would allow the students to become familiar with the controls of the aircraft. They would be allowed to actually fly the aircraft solo once they had mastered this "grass cutting" method, and even then, only at an altitude of about ten feet. These first pilots to receive training at the Curtiss aviation school were sent to Fort Sam Houston, Texas, where the Army had an aviation detachment. Pilot training needed to be streamlined because the Curtiss and Wright aircraft owned by the

<sup>&</sup>lt;sup>22</sup> Nalty, Winged Shield, Winged Sword, 14, 15.

<sup>&</sup>lt;sup>23</sup> Ibid., 18.

Army required distinct technical training—pilots trained on one could not fly the other due to differences in the control mechanisms.<sup>24</sup>



Figure 5. Glenn Curtiss in his Golden Flyer, circa. 1909. (earlyaviators.com, Curtis Album, 1909, http://www.earlyaviators.com/ecurti01.htm.)

One of the pilots that learned to fly at the Curtiss school was Lieutenant Paul W. Beck. He would soon command the Army aviation detachment at Fort Sam Houston and, with Benjamin Foulois, would help to standardize flight training techniques and maintenance. The resources that were written by Foulois were "Provisional Aeroplane Regulations" and "Flying Safety Rules." Due to the dangers of flying at this time there were still mistakes made by pilots resulting in injuries and fatalities. One particularly tragic crash, resulting from an aircraft that

<sup>&</sup>lt;sup>24</sup> Ibid., 19.

malfunctioned and dove to the ground and killed the pilot, led to a ban on flight at Fort Sam Houston. Flight training was then moved to College Park, Maryland.<sup>25</sup>



Figure 6. Airfield at College Park, Maryland. (*Winged Shield, Winged Sword: A History of the United States Air Force*, Vol. 1. pg. 21)

Opening on July 3, 1911, the new facility at College Park was the first military-controlled aviation school for the Army. For this new Army aviation school, the goal was to train pilots to become certified for their license. As time went on, and the technology of aviation became more advanced and dependable, the requirement of the trainees became more strenuous. As Army pilot training became more advanced, the Signal Corps hoped to use the school at College Park to train pilots year-round. This was prevented by heavy snowfall and flooding that, in the winter of 1912, caused the school to close the airport after the runway was deemed unfit for action. Due to the uncooperative weather at College Park, permission was granted to move the school to a better climate. The decision was made to move the school to Augusta, Georgia. The first season

<sup>&</sup>lt;sup>25</sup> Ibid., 20.

at Augusta was plagued by bad weather, as well and it, too, was abandoned. Schools were opened in other locations in the southeast to continue flight training.<sup>26</sup>

Now that the Army had developed programs for training pilots and had built an aviation program, they began to research how the technology could be implemented for use in combat. The initial view of the use of the aircraft by the Signal Corps was that planes were meant for reconnaissance. This perspective would shift after an Italian pilot named Giulio Gavotti conducted bombing of an enemy camp in Libya against Turkish soldiers in 1911. The Signal Corps began to envision new ways for the implementation of the aircraft by the Army. The main struggle faced by Army aviation was the difficulty of gaining money and approval from Congress to expand military aviation. This, along with not having a separate division of the Army for aviation, restricted progress. In 1913, a bill was proposed in Congress to remove aviation from the Signal Corps and create a separate branch of the Army for aviation, but the initiative failed. Following this struggle, however, a law passed in 1914 that allowed aviation to have a separate position within the Signal Corps. This created opportunities for more pilots and aviation personnel to be added to the aviation section of the Signal Corps, as well as more funding.<sup>27</sup>

In 1914, tensions with Mexico were on a rise and the Army began to move troops back to Texas. Along with the staging of troops, the aviation section was also moved to prepare for their use in combat. Tensions soon came to a head when Pancho Villa raided Columbus, New Mexico, causing General John J. Pershing to pursue him into Mexico. Included in this pursuit was the 1<sup>st</sup> Aero Squadron. The job of the squadron was to fly communication and

<sup>&</sup>lt;sup>26</sup> Ibid., 21-23.

<sup>&</sup>lt;sup>27</sup> Ibid., 27, 28.
reconnaissance missions for the Army. This soon proved to be a failure. Due to the height of the mountains, the aircraft were under-powered to climb over them and the wind currents in the valleys were too much for them to handle. Overall, the aircraft were unable to complete their mission. This failure in combat proved to be a savior for the Aviation Section. Congress and military officials realized how under-equipped their Aviation Section was and, in 1916, provided \$500,000 in funding for the Aviation Section of the Signal Corps.<sup>28</sup>

The Aviation Section continued to experiment with other combat uses of the airplane. In 1916, bombing experiments were conducted. Machine guns were also tested, but there was no way to mount them to the airplane and they had to be fired from the shoulder. These experiments showed the capabilities and shortcomings of the aircraft but came well before the point at which they could be used effectively in combat. As users began to expect more of the airplane, they realized that some of the problems fell on the aircraft manufacturing companies. Endless battles over licenses and patents on aircraft slowed the technological improvements of airplanes manufactured in the United States. It had become clear that Europe had passed the U.S. in aviation technology. European aircraft were faster, more maneuverable, and reliable. This advantage would become apparent as World War I drew closer.<sup>29</sup>

#### Military Aviation in WWI

Upon the entrance of the United States into World War I, the U.S. Army's Aviation Section was ill-equipped to contribute any resources to the conflict. The airplane had evolved into a pursuit role, struggling to gain dominance of the skies over the battlefield by driving away

<sup>&</sup>lt;sup>28</sup> Ibid., 30, 31.

<sup>&</sup>lt;sup>29</sup> Ibid., 32-34.

enemy aircraft. These aircraft had advanced in power and speed, capable of achieving speeds of 100 miles per hour or greater. The first American squadrons that entered combat in Europe realized these advancements and had to adapt to the environment in which they were flying.<sup>30</sup> One of the first aviation officers to enter Europe was Major Billy Mitchell, on April 10, 1917. After arrival, he noticed how behind the United States had become in aviation and set out to correct this by reporting findings and recommendations to General Pershing, the head of American troops in Europe. Hardly any action was taken by the United States in furthering the training of pilots. When the first Army pilots arrived in Europe, they were delayed in receiving training due to Allied aviation schools (operated by France and Great Britain) not having enough room to handle more trainees.<sup>31</sup>

American aviation was suffering in Europe and there were problems on the home front. The United States had been tasked with outfitting its pilots with aircraft in which to fight. Although the U.S. had a large amount of industrial power, the aviation industry was still very small and unequipped to handle this task. The allies contributed by harvesting raw materials needed to produce the aircraft. Most of this was wood, of which more than 194,420,000 board feet were harvested. An agreement was made with France to equip American pilots with French aircraft if the materials for the aircraft were supplied from the U.S., along with American Mechanics to maintain them.<sup>32</sup> The first air combat that American Airmen participated in was in the spring of 1918. Despite their inadequate supplies and heavy losses sustained before British reinforcements arrived, the American forces made great progress. Soon, U.S. pilots were

<sup>&</sup>lt;sup>30</sup> Ibid., 38, 39.

<sup>&</sup>lt;sup>31</sup> Johnson, Wingless Eagle, 188, 189.

<sup>&</sup>lt;sup>32</sup> Ibid., 189, 190.

maintaining superiority over the battlefield and conducting strafing (raking with machine-gun fire at close range<sup>33</sup>) and bombing of enemy positions.<sup>34</sup>

Although much of the emphasis in aviation was given to the use of aircraft for pursuit purposes, there was still a requirement for the use of observation and reconnaissance. The aircraft proved very valuable on the front lines of World War I due to the quickness at which enemy lines could change. In addition to observation and reconnaissance, the American pilots also proved their worth in the use of artillery. The use of aircraft to locate and range targets on the battlefield and supply the information to the troops on the ground allowed for increased accuracy of artillery fire. One of the final advancements made by the use of American aviation in World War I was the study of long-range bombing. General Billy Mitchell began to study this topic in the early entry of the United States during 1917. The belief was that this type of bombing could cause the destruction of the manufacturing and communication capabilities of the enemy. The Americans determined after such missions had been undertaken that this could only be achieved with the coordinated help of all forces. The influence of World War I on American aviation forced the Army to update and enhance the technology and experience of their pilots.<sup>35</sup>

<sup>&</sup>lt;sup>33</sup> "Strafe," Merriam-Webster, accessed January 21, 2019, https://www.merriam-webster.com/dictionary/strafe.

<sup>&</sup>lt;sup>34</sup> Johnson, Wingless Eagle, 191.

<sup>&</sup>lt;sup>35</sup> Ibid., 208-216.



Figure 7. Billy Mitchell. (Winged Shield, Winged Sword: A History of the United States Air Force, Vol. 1, pg. 73.)

## Military Aviation Between the Wars

After the end of WWI, the United States downsized their military strength. In total, the reduction accounted for 95 percent of total strength at the height of the war. This reduction led to conflicts between different members of the Army. One of these conflicts was with Billy Mitchell. During the war, Mitchell made some enemies with officers in other areas of the Army while trying to push the advancement of U.S. aviation. After the war ended, these conflicts him from getting a promotion that would have put him in charge of U.S. Army aviation.<sup>36</sup>

During this reduction effort, much of the funding for Army aviation was reduced. Mitchell fought these reductions and continued his push to increase the size and capability of the

<sup>&</sup>lt;sup>36</sup> Rondall Ravon. Rice, *The Politics of Air Power: From Confrontation to Cooperation in Army Aviation Civilmilitary Relations* (Lincoln, Neb.: University of Nebraska Press, 2009), 10 - 13.

Aviation Section. His efforts were made by appealing to members of Congress and other officials in the War Department. Mitchell competed with Army officers who sought funding for other projects. In one instance, Mitchell attempted to gain funding by the Quartermaster General of the Army through legislation.<sup>37</sup> In another attempt, after some convincing, Mitchell gathered some decommissioned warships from the Navy and used them to display bombing capabilities. After the bombing display, Mitchell moved further and staged mock air attacks on some coastal cities to show how ill equipped and vulnerable the U.S. was to air attacks. After these mock attacks and bombings were finished, Mitchell compiled his findings into a report and gave it to the War Department. The War Department refused to publish his findings, so Mitchell himself made the information public. This marked the beginning of Mitchell's loss of influence on Army Aviation.<sup>38</sup> More than just pushing for more financial support, he began to push for aviation to become independent of the Army. The War Department did not agree to the idea of Aviation being its own branch of the military. Congress decided to investigate further, but eventually also decided against the idea. Mitchell became outraged and began to attack the Army, Navy and the War Department. The aviation departments in the Army and Navy would be expanded, but after Mitchell's verbal attacks he stood trial in 1925 and, after being found guilty on the count of "Conduct Prejudicial," Mitchell resigned his post.<sup>39</sup>

The Air Corps Act, passed in 2926, led to increased funding and potential towards expanding aviation in the Army. This act promised the expansion of the Army's aviation program over a five-year period.<sup>40</sup> Under this expansion, the Air Corps were allowed to build up

<sup>&</sup>lt;sup>37</sup> Ibid., 22, 23.

<sup>&</sup>lt;sup>38</sup> Ibid., 24, 25.

<sup>&</sup>lt;sup>39</sup> Nalty, Winged Shield, Winged Sword, 96 – 100.

<sup>&</sup>lt;sup>40</sup> United States, United States Air Force Historical Research Center, Office of Air Force History, *Aviation in the U.S. Army, 1919-1939*, by Maurer Maurer (Washington D.C: United States Air Force, 1987), September 23, 2001,

their force from 9,644 men and 1,254 aircraft to 16,650 men and 1,800 aircraft. Due to some financial false-starts, the expansion did not officially begin until July of 1927. During the process, shortages of money would remain a constant struggle.<sup>41</sup> One on the greatest financial hurdles that the Air Corps faced during this expansion was the Great Depression in 1929. The military, alongside the rest of the U.S., suffered financial burdens that threatened to stifle growth. Despite these issues, the Air Corps plan remained a top priority and continued to take effect.<sup>42</sup>

Part of this build-up of the Air Corps called for updated training for pilots. Pilots would be trained in both tactical and strategic functions. The use of aviation in cooperation with ground units in a support role is tactical use. Strategic use is the use of aviation separate from ground units. Until the five-year build-up plan of the Air Corps, the lack of funding, equipment, and pilots did not allow for specialized training for aviation in specific roles and functions. One on the first exercises for training purposes for the Air Corps was the bombing of a bridge near Albemarle, North Carolina in 1927. The Air Corps would continue to conduct bombing exercises on many more targets, including a series of decommissioned naval ships in the 1930s. All of this training allowed the pilots to gain skills in aerial bombing and to experiment with bombing technology.<sup>43</sup>

Other technology used in the Air Corps training was radio equipment and new aircraft that could reach higher altitudes. With the use of new high-altitude capable aircraft, training revealed a potential future for implementation in combat. In one training maneuver in 1930, bombers from the 95<sup>th</sup> squadron attacked a training target from 15,000 feet. Soon, higher

accessed November 5, 2018, https://media.defense.gov/2010/Sep/23/2001330114/-1/-1/0/AFD-100923-007.pdf, 191.

<sup>&</sup>lt;sup>41</sup> Ibid., 196, 197.

<sup>&</sup>lt;sup>42</sup> Ibid., 201, 202.

<sup>&</sup>lt;sup>43</sup> Ibid., 223 – 228.

altitudes would be reached, and aviation technology improved, allowing pilots to take oxygen equipment to fly in thin air above 25,000 feet.<sup>44</sup> Radio and communication equipment began to evolve with the improvement of aircraft. The speed and altitude of aircraft made the need for communication between pilots and the ground a necessity. Soon, the Air Corps requested updated equipment that was lighter and more reliable. This updated equipment would allow larger flights of planes to participate in training exercises and, in one case, communication between the ground and an aircraft enabled planes to be scrambled to intercept an enemy force during an exercise.<sup>45</sup> The constant evolution and improvements of aviation technology would allow the training of these pilots to continually evolve.

While the Army Air Corps was evolving and increasing training, another branch of aviation was implementing its strength during peace time. The General Headquarters (GHQ) Air Force was founded in 1917 and was used during WWI. During peace time, the main objective of the GHQ Air Force was to defend internal coastal areas of the U.S.<sup>46</sup> By 1933, a plan was made for the GHQ's defense with six defense zones coinciding with strategic regions: Northeast, Great Lakes, North Central, Gulf, Southern, and Pacific coast.<sup>47</sup> Other than defense, the GHQ was also responsible for delivering mail by air. Starting in 1934, the Air Corps were granted orders to fly airmail for the U.S. Post Office. To start off, there were 18 routes that would be used to fly

The continued training and applications that the Air Corps pilots received through the GHQ Air Force allowed the Air Corps to remain ready for conflict. Plans for mobilization were

<sup>&</sup>lt;sup>44</sup> Ibid., 229 – 230.

<sup>&</sup>lt;sup>45</sup> Ibid., 232 – 234.

<sup>&</sup>lt;sup>46</sup> Ibid., 283 – 284.

<sup>&</sup>lt;sup>47</sup> Ibid., 289.

<sup>&</sup>lt;sup>48</sup> Ibid., 299 – 301.

made and updated to ensure readiness of the Air Corps.<sup>49</sup> The use of these other service members in the military allowed the Air Corps to increase in manpower and to commission increasingly well-trained pilots.<sup>50</sup>

#### Military Aviation and WWII

In 1939, as WWII started in Europe, the Air Corps began to quickly expand its programs. The U.S. would remain in a neutral position at the beginning of the war. Cadets entered flight training at a rate of 872 a year by 1939. With this large influx of cadets, the Air Corps began to cope with the need for more room to train and house them. Airfields and ground schools were constructed.<sup>51</sup> Aircraft production was also increased in the U.S. The production of aircraft by the U.S. increased from 2,141 in 1939 to 19,000 by 1941. Although this production of aircraft was a huge feat by the U.S., the quality of the airplanes that were produced during this time still lagged in performance compared to aircraft in Europe. The only exception was the B-17, a bomber used for high-altitude daytime bombing.<sup>52</sup>

As the U.S. entered World War II, the aviation industry was forced to grow. In 1939, the aviation industry in the U.S. produced 2,141 military aircraft. This production was relatively small in regard to the other allied and axis powers at the start of the war. President Roosevelt pushed the Army to become a major aviation player in the war and to increase the production of aircraft. Industry in the U.S. was perfectly positioned to expand the production of aircraft due to

<sup>&</sup>lt;sup>49</sup> Ibid., 427 – 428.

<sup>&</sup>lt;sup>50</sup> Ibid., 433.

<sup>&</sup>lt;sup>51</sup> Ibid., 435 – 437.

<sup>&</sup>lt;sup>52</sup> Nalty, Winged Shield, Winged Sword, 174, 175.

the mass-production of cars and other peacetime goods. Soon, companies like Ford, General Motors, and others began to expand their industrial manufacturing from automobiles to aircraft.<sup>53</sup>

Alongside than the build-up of aircraft and aviation technology, the U.S. military needed to continue to expand the training of pilots at the beginning of the War. To start, they needed to develop a network of air bases to train new pilots. The entrance of the United States into WWI led to the creation of some airbases in the country, but due to the downsizing after WWI ended, most of these bases were closed and given to local, state, or county governments. The creation of new air fields started to take effect in 1926 with the Air Corps Act, which stated that all existing airfields that were still in use by the Air Corps would be updated and included plans to create new air bases. The beginning of the modernization effort for these air bases was estimated to cost \$18,074,500.<sup>54</sup>

The Army Housing Program was placed in charge of updating and constructing these new air fields. Congress proposed that with the updating of the airfields there should be an effort to construct permanent military housing. To fund some of the work for this plan the War Department planned to sell surplus real estate that had been accumulated over time. As the modernization of the airfields and housing continued, the War Department recommended the creation of a Military Post Construction Fund. Money for the fund came from the sale of surplus property. The creation of this fund allowed for a pool of money that Congress could then divide up for specific uses in modernization and expansion. In the first few years of this program,

<sup>&</sup>lt;sup>53</sup> Ibid., 232 – 239.

<sup>&</sup>lt;sup>54</sup> Jerold E. Brown, *Where Eagles Land: Planning and Development of U.S. Army Airfields, 1910-1941* (Westport, CT: Greenwood Press, 1990), 73, 74.

between 1926 to 1932, the amount of funding appropriated for military construction was around \$72 million. Congress struggled to appropriate these funds efficiently due to split priorities.<sup>55</sup>

Leading into WWII, the Air Corps continued to expand and update its airfields. The mid-1930s brought the appearance of new aircraft and navigation equipment that expanded the need for even more changes and expansion. The Great Depression that affected the United States tended to help the efforts of airfield construction. Local economies around airfields were boosted by the associated potential industrial opportunities, resulting in political motives affecting votes in the locations of new airfields. As the country pulled itself out of the Depression, many of the relief organizations used to create jobs, including the Public Works Administration and Works Progress Administration, were employed for the construction of airfields.56

In 1935 a bill was introduced to Congress by J. Mark Wilcox, a member of the House Committee on Military Affairs. The bill came to be known as the Wilcox Bill and focused on the development of air bases in the United States and on colonial possessions of the United States. In August of 1935, an amended version of the bill was passed. In May, the War Department, along with the Office of the Chief of the Air Corps, began to establish more airfields and facilities. The first major construction to be built under this act was located in Sacramento, California—a 1,117-acre tract of land that would serve as an air depot located eleven miles from a current airfield called Mather Field. The next construction to take place was the construction of a Northwest U.S. airbase. An airfield was subsequently donated by the city of Tacoma, Washington in 1937, consisting of around 1,000-acres. The name given to this

<sup>&</sup>lt;sup>55</sup> Ibid., 74, 75. <sup>56</sup> Ibid., 93, 94.

airfield was McChord Field. After its acquisition, the Air Corps expanded and modernized the existing facilities located on the airfield.<sup>57</sup> The number of airfields increase increased very slightly between 1936 – 1937, but many improvements were made to existing fields including lengthening and surfacing runways, as well as illumination for night use. Priorities were formed by the Air Corps for improvements of the airfields. First was for heavy bomber operation, second was for medium and attack bombers, and third was for pursuit aircraft.<sup>58</sup>

The 1940s saw a significant increase in the number of airfields that were constructed in preparation for the U.S.' entry into WWII. In 1939, President Roosevelt recommended to Congress a program to massively increase military preparation and modernization. Following this recommendation, the strength of the Air Corps tripled to 145,017 personnel. At the same time, a total of \$250 million was given to the Air Corps for expansion. From 1940 until the U.S.' entry into the war, the development of airfields continued to increase monthly. By 1940, airfields were located on the east coast from New England to Louisiana and on the west coast from Seattle to Los Angeles.

As the number of personnel increased, the Air Corps struggled to maintain many of the airfields that were in use and had become overcrowded. A plan to fix the issue was enacted in mid-1940. The Air Corps began to take over parts of or whole civil airports, as well as acquiring donated municipal airports. Some airports that were used to establish tactical units by the Air Corps were Savannah and Atlanta, Georgia; San Antonio and Abilene, Texas; New Orleans, Louisiana; Miami, Florida; Tucson, Arizona; Manchester, New Hampshire; and Albuquerque, New Mexico. In the beginning, the plan stipulated temporary use of these airports until nearby

<sup>&</sup>lt;sup>57</sup> Ibid., 98-103.

<sup>&</sup>lt;sup>58</sup> Ibid., 114.

Air Corps fields completed construction. Due to the continued increase of pilots and aircraft, however, many units continued to use the civil airports even after other bases were constructed.<sup>59</sup>

This large increase of airfield sites led to some problems in site selection. The chief of the Air Corps, adjutant general, and commanding general of the GHQ Air Force managed the process by which new sites or existing airfields were selected for airfield construction or use. Together, these individuals would assemble their own separate boards or Air Corps officers to survey and select airfield sites. As the need for the airfields increased and pressure was applied to the selections, coordination between groups weakened and errors occurred in the selection process. Most of the errors that occurred were the failure to take into account any obstacles that were located in the approach paths of runways that would not accommodate the longer and flatter-angled glide-slopes of the newer, larger military aircraft. These problems were easily rectified by buying more land or purchasing easement rights to remove the obstacles. These problems came to a high point with the decision to use New Orleans Municipal Airport as a heavy bombardment group station. Due to improper site selection, the only way to extend the runway for this use was to either dredge and infill over Lake Ponchartrain or by removing a section of the Southern Railroad line. Both of these processes were extremely expensive and thus the Airport had to be used for lighter aircraft and the role of military use at this location had to be changed. The expense of this mistake led to the establishment of specific procedures and a site board was selected for each group that would be involved in selecting airfield sites. As the problems of constructing airfields were corrected and overcome, the development of airfields rapidly increased and gave rise to the development of civil airports.<sup>60</sup>

<sup>&</sup>lt;sup>59</sup> Ibid., 115 – 126.

<sup>&</sup>lt;sup>60</sup> Ibid., 129 – 137.

Following the increased development of airfields and the entry of the U.S. into WWII, the Army Air Corps began to develop plans for the future development of airfields and ground facilities. Earlier attempts to plan after WWI struggled and failed due to the push for disarmament. As funding was given by Congress to expand the Air Corps in the mid-1930s, these plans began to reemerge. The main problem faced by military airfield planning of any era is the changing technology of aviation and aircraft. The planning of airfields during the 1940s was marked by compromises between the different players involved in the development, maintenance, and support of the facilities. The overall effect of planning for future development were based on the needs of the military, Congressional funding, economic resources, and international military situations.

After the attack on Pearl Harbor, advances had to be made in aircraft technology. Many of these advances were made through adapting current aircraft designs and creating variations of the same aircraft. Examples of this can be seen in aircraft like the Douglas A-26 which was a variant of the A-20; another can be found in the Bell P-39 that evolved to have a supercharged and larger engine, renamed the P-63. Many of these aircraft were easier to mass produce due the ability of factories to make small changes in assembly line construction while continuing to produce large numbers of airplanes.<sup>61</sup> With the manufacture of these large amounts of aircraft came the need for ferry pilots to move and deliver the various types of aircraft around the country and to foreign base locations, such as England. A group of volunteers called WASPs (Women Airforce Service Pilots) were recruited to fill these needs. They were subject to military rules and discipline but could not hold a rank. The main job they undertook was

<sup>&</sup>lt;sup>61</sup> Ibid., 240 – 248.

ferrying airplanes, but their jobs extended into towing targets at gunnery schools and instructors at flight schools. A total of 25,000 women applied to be WASPs, but only 1,074 graduated to flying and over the course of the war 37 would be killed in accidents. In December of 1944, the group was disbanded due to a surplus of male aviators. Before the disbanding of the group, a total of 60 million miles had been flown on operations conducted by WASP units.<sup>62</sup>

As the Air Corps began to build up the number of airfields, they pulled in large numbers of men and women wishing to become pilots. For this reason, the Air Corps needed to start training pilots in greater numbers than had been attempted previously. Many airfields and facilities that were constructed under the funding that Congress had given to the Air Corps began building facilities to train these new pilots.<sup>63</sup>

Until 1939, the facilities used to train pilots had not seen much development. The main airfields that were used for training up to this time period were Randolph Field, Kelly Field, and Brooks Field, all located in San Antonio, Texas. As the numbers of cadets grew, these airfields became overcrowded and ill-equipped to handle the large number of trainees. Working with the GHQ Air Force and the CAA (Civil Aeronautics Authority), which later became the Federal Aviation Administration (FAA), the Air Corps helped to organize and develop training airfields and training programs. Organization started with the formation of training centers in the Gulf Coast, West Coast, and Southeast. Along with this an Amendment was passed in April of 1939 to train African American pilots for the Air Corps. The CAA undertook this directive and organized the formation of a pursuit squadron, as well as helping to develop Tuskegee Field in Alabama.<sup>64</sup>

<sup>62</sup> Ibid., 254.

<sup>&</sup>lt;sup>63</sup> Brown, Where Eagles Land, 129.

<sup>&</sup>lt;sup>64</sup> Ibid., 129, 130.

Before the build-up of the Air Corps, the age for a person to enter flight-training was twenty years old. This was reduced to eighteen, due to the need for pilots. Along with this, the requirement of scores on the general classification test were lowered and the requirement of at least two years of college was dropped if a cadet could pass a general educational test. Training cadets were required to complete a total of 175 hours of physical training, drill, organized athletics, and classroom instruction. During classroom instruction, they learned about meteorology, mathematics, photography, wireless telegraphy, map reading, and how to identify allied and enemy ships and aircraft. Due to the large influx of pilots, arrangements were made with colleges and universities to handle some of the preflight training.<sup>65</sup>

After passing preflight instruction, the next phase was primary training. During this phase a cadet would learn to fly an aircraft for the first time. The majority of cadets learned on a Boeing PT-17 because of its durability and slow speed. In this aircraft, a cadet would gain 60-65 hours of flying time and was required to perform basic flight maneuvers. On completing this portion, cadets moved to basic training conducted in the Vultee BT-13. At this point, 70-75 hours would be spent learning aerobatics, formation flying, and daytime navigation. Specialization occurred after completion and cadets entered advanced training. During advanced training, a cadet was assigned to fly either multi-engine or single-engine aircraft and this determined the type of flying they would perform in combat. If a cadet was to become a fighter pilot, their training would be conducted in the single-engine North American AT-6. Cadets that would fly bomber or transport aircraft would train in the Curtiss AT-9 or Beech AT-10. The total amount of advanced flight training for the cadet was 70 hours, along with more advanced

<sup>&</sup>lt;sup>65</sup> Nalty, Winged Shield, Winged Sword, 257.

navigation and instrument flying. Finishing advanced training, the final step for cadets was transition training. Transition training was to familiarize cadets, now Air Corps Pilots, with the aircraft they would fly in wartime. For fighter pilots, they would spend around thirty hours of time in their aircraft while bomber and transport pilots would spend one hundred hours. Once training was completed, the pilots were assigned to an operational unit in the U.S. for combat training. Before entering battle, a cadet would accumulate at total of approximately 400 hours of training.<sup>66</sup>

Not all pilots were trained through the Air Corps. In June of 1939, President Roosevelt created the Civilian Pilot Training Act. In the prewar years, the CAA started a program called the Civilian Pilot Training Program (CPTP) for the primary training of pilots. This program was divided into two parts: Ground School, lasting 72 hours, and 35 – 50 hours of flight instruction. Applications were accepted from colleges and universities who had a contract with the CAA to train a number of students. The criteria for the schools that were selected was that the location must be within 30 minutes of an airport with a minimum runway of 1,800 feet long and 300 feet wide with a glide path of 20:1 for approaches. On December 7, 1942 the CPTP became the CAA War Training Service. The service restricted its training to only the inactive reserve units of the Army, Air Forces and Navy. These units went into active service in 1943. A total of 300,000 pilots were trained by this service until its ending in 1944. In all there were 1,132 colleges associated with the service and 1,460 flight schools involved.<sup>67</sup>

<sup>&</sup>lt;sup>66</sup> Ibid., 258, 259.

<sup>&</sup>lt;sup>67</sup> United States, U.S. Department of Transportation, Federal Aviation Administration, *The CAA Helps America Prepare for World War II*, by Theresa L. Kraus, July 10, 2017, accessed January 3, 2019, https://www.faa.gov/about/history/milestones/media/The\_CAA\_Helps\_America\_Prepare\_for\_World\_WarII.pdf

During WWII, pilot training evolved to keep up with technological advances in aircraft. An example was the use of radar on bomber aircraft. The use of radar led to a new, specialized form of training and meant that previously-trained needed further instruction. Another example was the development of remote-control gunnery turrets used for defense on aircraft like the Boeing B-29; these required operation by navigators, radio operators, and gunners, all of whom underwent specialized training.<sup>68</sup>

Other advances in aircraft technology affected not just the pilots, but also the ground crews maintaining the aircraft. With the development of new engines and radio equipment, schools were established to teach specialists how to maintain and repair these new forms of technology. One of the major schools responsible for teaching this was Chanute Field in Illinois. Cadets at Chanute Field underwent advanced training that followed advancement in other operations besides flying and were trained as Navigators, Radio Operators, Mechanics, and other jobs that would be associated with the needs of the Air Corps.<sup>69</sup>

## Military Aviation After WWII

After the conclusion of World War II, the Military prepared to reorganize the Army Air Corps. The commander of the Army Air Forces before and during World War II was Henry H. Arnold. Before retiring from command, General Arnold proposed the independence of the Air Forces into a separate branch of the military that would allow for three balanced military forces. This new Air Force would focus on long range and strategic bombing operations that would prepare the U.S. for uses of new weapons like the atomic bomb used on Japan. The decision was

<sup>&</sup>lt;sup>68</sup> Nalty, Winged Shield, Winged Sword, 260.

<sup>&</sup>lt;sup>69</sup> Ibid., 260 – 263.

eventually made to reorganize the Army Air Forces into groups that would fit into an independent Air Force. This reorganization of the Air Corps started on March 21, 1946 under the command of General Carl A. Spaatz. The first organization under the new Air Force was the Strategic Air Command and was located at Bolling Field in Washington, D.C. and later moved to Andrews Field in Maryland.<sup>70</sup>

One of the first problems faced by the Air Force, as well as the other branches of the military, was the immediate rush to demobilize after the end of WWII. From the end of the war in August 1945 to May 1947, the strength of the Army Air Forces dropped in manpower from 2,253,000 to 304,000. The large numbers of aircraft and airfields that had been built up to help the U.S. and its Allies win the war were now being turned over in large number to the Reconstruction Finance Corporation that was responsible for disposing surplus federal property. The airfields under Air Corps control numbered 783 during the war, but dropped to around 177 by 1947. The Cold War progression, threat of Communism, and the Soviet takeover of Eastern Europe, along with a race to build up nuclear weapons, started to reverse the dismantling of the Air Force's resources.<sup>71</sup>

The Air Force began to organize and train for the new role it would face in the age of the Cold War. The heavy bombardment group of the Air Force that remained from the conclusion of WWII were now flying the new B-29 bomber and were designated to learn how to carry and use nuclear weapons. These units were made up of four squadrons that would train and then remain ready for combat while being furnished with the latest technology and equipment to ensure their readiness. As these atomic strike units began to form there arose a need to station squadrons in

<sup>&</sup>lt;sup>70</sup> Ibid., 372 – 377. <sup>71</sup> Ibid., 377, 378.

locations in close proximity to the threat of Communism. This led to the rotation of peace time squadrons of bombers to Air Force bases located in other areas of the world, such as Germany and Japan. Other aircraft that were used in the new state of readiness for nuclear war were reconnaissance aircraft.<sup>72</sup>

Between the demobilization of the newly-created Air Force and the move toward nuclear preparations and readiness, training programs also changed. A proposal for Universal Military Training was set forth that would require all men to undergo one year of military training after turning 18. The proposal did not pass due to debates between military planners. Instead the post-war goals were to have 574,000 men and 70 combat groups. The largest concentration of resources would remain in the United States. Later, more improvements would be made in technology, including the development of jet powered aircraft.<sup>73</sup>

The establishment of Military Aviation in the United States, resulting in the Air Force, was critical to aviation in the U.S. The establishment of aviation was challenged by many problems throughout the process. This creation and build-up of aviation resources included development of airfields in Georgia as well as the Southeast. These existing resources hold significance to the formation and development of military aviation locally, statewide, and nationally.

## Airfield/Airport Development After WWII

Development and evolution of airfields have changed a great deal over time. The high point of airfield construction took place with the build-up of airpower during the mid-1930s

<sup>&</sup>lt;sup>72</sup> Ibid., 380 – 384.

<sup>&</sup>lt;sup>73</sup> Ibid., 387.

leading into the beginning of the U.S.' entry into World War II. The layout and design of the airfields constructed during this time period were meant to serve the purpose of training and preparing U.S. Airmen and Cadets to serve overseas.

Within the U.S., the majority of airfields were located in the southeastern part of the country due to its mild climate, allowing longer time for flight training. For this reason, Georgia was targeted for the construction of 22 airfield installations. Most locations in Georgia chosen for military airfields were located in rural outskirts of cities and towns, providing a way for pilots to train in open spaces while being separated from populated areas.

Three types of airfields were constructed in the build-up of airpower for WWII: Permanent, Mobilization, and Theater of Operations. Airfields considered permanent were planned to be used over an extended period of time. Structures built on these airfields were constructed of more permanent material, such as brick and concrete construction. The mobilization airfields were planned to be less permanent, allowing for quick movement. Structures built on these airfields utilized mostly wood for building materials, along with a centrally located heater that would send heat throughout the interior via a ducting system. The greatest number of airfields constructed were considered Theater of Operations Airfields and were considered the most temporary. Materials used in the construction of structures located at these sites ranged from tarpaper to concrete blocks on concrete slabs. These airfields were fast and cheap to construct but offered little protection from the elements. The largest structures on these airfields were the hangars. Hangars of this time period were constructed of wood, steel, concrete, or a combination of all three. Due to the importance of the hangar to an airfield, these were constructed very carefully and with great attention to detail, allowing them to remain onsite after the transition of an airfield from military to public use.<sup>74</sup> All of the airfields in my case studies were permanent airfields, due to the likely existence of historic fabric.

During the early period of airfield construction (1938 – 1942), the Quartermaster Corps was in charge. As the rate of expansion increased, the Quartermaster Corps could not keep up with the daunting task. At this point, the Corps of Engineers was tasked with aiding the Quartermaster Corps in choosing sites and constructing airfields for training in the United States. The military had no specific plan for how to construct or arrange an airfield and mainly based their designs off of previous airfields. Before the rapid expansion of airfields, early training airfields were specific to the landscape in which they were located, and the designs were adjusted to fit requirements of training in the location. Basic needs for training bases did allow replication of facilities between bases. An example of this replication can be seen in the construction of an initial training airfield in Coffeyville, Kansas (Figures 8 and 9). This airfield was replicated at a new base constructed in Independence, Kansas and other bases around the U.S.<sup>75</sup>

<sup>&</sup>lt;sup>74</sup> Ibid., 1.

<sup>&</sup>lt;sup>75</sup> Lou Thole, *Forgotten Fields of America: World War II Bases and Training, Then and Now*, vol. 1, 4 vols. (Missoula, Montana: Pictorial Histories Pub C, 2003), 1.



Figure 8. Coffeyville Army Air Field, circa 1943. (http://www.airfieldsdatabase.com/WW2/WW2%20bases%2028/Coffeyville\_AAF\_-\_Coffeyville\_KS\_1945AAFdir.jpg)

The construction of an airfield started with the selection of a level, open sit. An engineer or architect would oversee the construction based on plans that the military had developed. The site chosen would be surveyed and determined to be suitable by the Army Corps of Engineers' Real Estate section. Most of the land that was acquired was rural farm land and compensation was made to the owners. Once construction started, the Military would oversee the construction



Figure 9. Coffeyville Army Air Field parking apron and barracks area. (*Forgotten Fields of America: World War II Bases and Training Then and Now*. Lou Thole. pg. 14.)

and manage the work and public outreach while also maintaining the strict schedule needed to complete the construction on time. The majority of the construction would be managed by the outside engineer or architect that won the bid for construction.<sup>76</sup>

The most important feature constructed was the laying out and building of the runways. Runway construction during this time took many forms. The location and amount of intended use determined the surface. Large training airfields would be surfaced with concrete, while smaller, less frequently-used airfields or non-permanent airfields would be left as grass or dirt. The concrete surfacing of runways was a huge undertaking. Runways required large amounts of cement and aggregate that were in demand across the country for construction of similar military

<sup>&</sup>lt;sup>76</sup> Ibid., 3.

needs, due to the build-up. After the materials were acquired, the runway was poured in sections or slabs that had to follow exact specifications; this process slowed with bad weather. Along with the construction of runways, roads had to be built to ensure the transportation of supplies to the airfield. Some airfields even had rail spurs added to bring in men and equipment to supply the airfield. Finding workers to construct the airfields presented its own challenges. With these construction efforts taking place all across the U.S., people traveled around for work. The construction of an airfield was grueling work that took place while being exposed to harsh weather and did not pay very much compared to other war time jobs. Strikes were common during construction projects and posed a challenge to keeping the projects on schedule.<sup>77</sup>

Standard structures needed for an airfield and/or training bases included: barracks, hangars, post office, mess hall, flight tower, navigational aids, and a hospital. Depending on climate, the building of these structures might change in some respects. Construction of the structures on an Army Airfield were kept to the most minimal form possible. The simplistic building techniques focused on the most basic needs, which helped to speed up construction. Prefabricated building materials were used whenever possible. This led to the primary use of concrete blocks and prefabricated wood siding along with other preformed building materials. The three types of airfields that were constructed all used some variation of these materials.<sup>78</sup>

After the conclusion of WWII, many airfields constructed for the war were deactivated. This deactivation was part of the U.S. Military downsizing that occurred after the war, similar to the downsizing that occurred after WWI. Airfields that were not needed as major bases by the military were sold to the county or city in which they were located. Some were used for training

<sup>&</sup>lt;sup>77</sup> Ibid., 3 - 7.

<sup>&</sup>lt;sup>78</sup> Ibid., 1.

during other periods, but not used as full-time military facilities. After the close of an airfield, the title of the land was handed over to the county or city within which it was located. The majority of fields that were transferred into public ownership were converted to municipal airports and renamed. Other airfields were abandoned and disappeared over the years or converted to uses that are not related to aviation.<sup>79</sup>

With the transfer of airfields from the military to the public following WWII, there arose an abundance of airfields across the U.S. As a result, air travel began to expand, meaning that these airfields needed planning and updates in order to maintain operations. Communities with newly acquired airports sought ways that they could use the airport to further develop the transportation of their cities. These communities worked with the Civil Aeronautics Authority (CAA), later to become the Federal Aviation Administration (FAA), and other groups to help develop the airports to suit the needs of the community for the future.<sup>80</sup>

Airports vary in size and capacity around the country, and the population density surrounding an airport determines its needs. In 1946, airports were divided into four classifications. Class I airports were small airports for the operation of personal aircraft. Class II airports were used for industrial needs and non-scheduled commercial flights. Class III airports were for scheduled commercial flights and personal aircraft with controlled conditions. Finally, Class IV airports were owned by the federal government and used for military and research purposes. The CAA added a Class V airport during this time that consisted of airports that are located in major industrial centers or large junctions in the overall U.S. aviation system. All

<sup>&</sup>lt;sup>79</sup> Ibid., 12.

<sup>&</sup>lt;sup>80</sup> Charles Froesch and Walther Prokosch, Airport Planning (New York, NY: John Wiley and Sons, 1946), 15.

classes of airports during this time were under requirements for runway lengths and types of aircraft operations that were permitted depending on its classification.<sup>81</sup>

During this time, the size of an average airport was 383 acres: Class I airports averaged around 117 acres, Class II - 151 acres, Class III - 426 acres, Class IV - 762 acres, and Class V - 1,050 acres. Depending on their use and classification, airfield lighting changed for navigation purposes and hazard markings. Lighting consisted of an Airport Beacon, Boundary lights, Obstruction lights, illuminated wind cone, contact lights, illuminated wind tee or tetrahedron, Landing area floodlighting, Apron floodlighting, Ceiling projector Taxi lights, and Approach lights. Another need of an airport is runway markings. Runways are numbered to display their magnetic heading to an approaching aircraft and to calculate the best direction to take-off and land regarding the direction of wind. Along with the runway numbers there are center line stripes, length symbols, and taxiway centerlines. Runway symbols are painted in non-reflective white paint, and taxiways in reflective yellow paint.<sup>82</sup>

By the 1970s, approaches to the needs of an airport continued to build on previous studies and then-current needs of aircraft. Changes made to an airport are paid for by revenue that is generated from the primary municipality that owns the airport. In 1970, the amount of funds used by the state of Georgia on airport development totaled \$250,000. Most of the changes that airports underwent during this period related to the possibility for airports to expand. The expansion of most airports is accomplished by increasing the length of the runways. This allows

<sup>&</sup>lt;sup>81</sup> Ibid., 60, 61.

<sup>&</sup>lt;sup>82</sup> Ibid., 62 – 64, 151.

the airport to support larger aircraft. All proposed changes for any airport are regulated by the Federal Aviation Administration, (FAA).<sup>83</sup>

A new consideration for airports during this time was drainage. Poor drainage on airfields can cause safety hazards during the operation of the aircraft and will speed up the deterioration of paving materials. The design of drainage facilities is determined by the FAA through the determination of rainfall intensities. Designing facilities to handle storm water runoff is based on handling water from storms that have a probability of occurring once every 5 years. Such designs are meant to ensure that ponding does not occur on paved surfaces.<sup>84</sup> The storm water drainage systems that are implemented in airports consist of a combination of ditches that empty into holding ponds that store the storm water until it is discharged through the soil. The size of the land area that an airport has determines the number and size of holding ponds and the extent of drainage ditches constructed.<sup>85</sup>

Other changes made to airports in the 1970s relate to the management of noise produced by aircraft. To control noise, vegetation is planted as screens around airport facilities to minimize the amount of sound that escapes the area around the airport. The vegetation that is chosen to shield surrounding areas from noise generated is selected depending on the area in which the airport is located. Trees are the most commonly used vegetation for this purpose. The height of the trees planted, as well as the thickness of the planting, determines the amount of sound that will be absorbed. Using deciduous vegetation as a sound barrier only shields noise

<sup>&</sup>lt;sup>83</sup> Robert Horonjeff, *Planning and Design of Airports*, Second ed., vol. 1, 4 vols., McGraw-Hill Series in Transportation (New York, NY: McGraw-Hill 1975), 42, 43, 161.

<sup>&</sup>lt;sup>84</sup> Ibid., 410, 411.

<sup>&</sup>lt;sup>85</sup> United States of America, Headquarters Departments of the Army and the Air Force, *Surface Drainage Facilities for Airfields and Heliports*, 88-5 ed., vol. Chapter 1, TM 5-820-1 (Washington, D.C.: Headquarters Departments of the Army and Air Force, 1977), 11.

that is coming from close to the ground. For continuous noise absorption, coniferous and broadleafed evergreens are the most effective species to be planted for this purpose. The average recommended thickness of planting is between 50 and 100 feet.<sup>86</sup>



Figure 10. Noise screening with vegetation. (Advisory Circular Department of Transportation, Federal Aviation Administration: Airport Landscaping for Noise Control Purposes. pg. 6.)

<sup>&</sup>lt;sup>86</sup> United States of America, Department of Transportation, Federal Aviation Administration, Advisory Circular: Airport Landscaping for Noise Control Purposes, vol. 150, 5320-14 (Washington, D.C.: Department of Transportation Federal Aviation Administration, 1978), 2 – 9.

Today the FAA controls the changes that are made to airports in the U.S. through airport compliance programs that ensure that airports are updated in a uniform manner. Airports in the U.S. are divided into nine regions: Alaska Region, Central Region, Eastern Region, Great Lakes Region, New England Region, Northwest Mountain Region, Southern Region, Southwest Region, and Western-Pacific Region. Design guidelines that are put in place organize the building of different airport facilities while environmental guidelines manage Air Quality, Airport Noise, Recycling, Sustainability, Land Use, Wildlife, and Acquiring land for the purpose of expansion or relocation. Various grant programs exist that help airports acquire funding for these updates or changes.<sup>87</sup>

Georgia's airports are located in the FAA Southern Region. Currently the state has a total of 103 airports; nine of these airports are serviced by commercial aviation and 94 are used for general aviation. These airports are divided into three different levels with related standards: Level I airports are defined as Minimum standard general aviation airports; Level II, Business airports with local impacts; and Level III, Business airports with regional impacts. The planned growth of Georgia's public airports, based on their current aviation plan, will increase from 5,209 aircraft in 2003 to 6,571 by 2021.<sup>88</sup>

Goals that have been set forth by the current aviation plan are as follows: to support current and future demand, to meet applicable design standards, to respond to changes, to provide accessibility from the air and ground, and to meet facility and service objectives. The largest updates that are needed for most airports in the state of Georgia are runway and taxiway

<sup>&</sup>lt;sup>87</sup> "Airport Programs & Guidance," Www.faa.gov, December 18, 2018, accessed January 07, 2019, https://www.faa.gov/airports/.

<sup>&</sup>lt;sup>88</sup> United States of America, Georgia Department of Transportation, Aviation Program, *Georgia Aviation System Plan*, by J. Tom Coleman, Jr., Hal Wilson, Edward S. Ratigan, and Thomas B. Carr, Jr., 2003, accessed January 3, 2018, http://www.dot.ga.gov/IS/AirportAid/AviationSystemPlan.

extensions or updates to comply with the current aviation plan.<sup>89</sup> A specific plan has been set forth that manages the pavement for Georgia's airports. Georgia's airport system has been divided into three zones: Northern Georgia, Southern Georgia, and Metro Atlanta. Most of Georgia's paving requires preventive maintenance that will slow the rate of deterioration. However, 22% of Georgia's airports need extensive rehabilitation and 6% need reconstruction of pavement. To prevent further deterioration, the needs consist of crack sealing, joint sealing, patching, surface treatments, restoration, or reconstruction.<sup>90</sup>

Since WWII, changes have been made to the airfields that were once used for training pilots in the military. These airfields, once occupied by the military, have seen continual use by public aviation for recreation and travel. Looking toward the future, developments in technology and the continual maintenance of facilities impact the airfield. Historic resources and the overall landscape of these airfields, however, have the potential for future preservation.

http://www.dot.ga.gov/InvestSmart/Aviation/Documents/PavementMgtReport-ES.pdf.

<sup>&</sup>lt;sup>89</sup> Ibid.,

<sup>&</sup>lt;sup>90</sup> United States of America, Georgia Department of Transportation, Georgia Airports, 2012 Georgia Airport Pavement Management Report, by Keith Golden, Russell McMurry, Carol L. Comer, and Carla Sands, 2012, accessed January 3, 2018,

#### CHAPTER 3

## HISTORIC PRESERVATION

Following a background in military aviation and airport development after WWII, a basic understanding of historic preservation and how it has been applied to aviation resources is needed. This section will introduce the three main tasks that preservation emphasizes, including documentation, physical preservation, and interpretation. Further, an introduction to and critique of various reports and National Register nominations of airfields and military landscapes will be reviewed.

## Historic Preservation

The act of historically preserving resources consists of three main tasks: documentation and National Register nomination, physical preservation, and interpretation. In this section, these tasks will be described in detail, including descriptions establishing the connections between said tasks to historic airfields.

## **Documentation**

Documenting a historic property is the first step in its preservation. The process of documentation requires the collection of a detailed record of a historic property (research, written history, photography, drawings, etc.). This can be used for a variety of purposes, ranging from simply knowing and understanding the history of a site, to potentially nominating the property to the National Register of Historic Places. The nominating a historic property to the National Register provides recognition of the historical significance of the property on a formal level.<sup>91</sup>

As defined by the National Register of Historic Places, historic resources include buildings, structures, sites, objects, and districts. Historic airfields fall into the areas of sites and districts. Sites are locations of significant events or activities. The historical importance of a site extends beyond the buildings, structures, or objects located on the site. The historical significance of a site is drawn from the importance of the location and surrounding landscape. Districts are the concentration or linking of sites, buildings, structures, and objects that are connected with a historic plan or development. This includes the clustering of buildings or structures along with their site that all share the same significance in history.<sup>92</sup>

#### Physical Preservation

After documenting a historic resource, one may take an interest in physically preserving or reusing that resource. Using a preservation approach, one will want to make any changes contextually, so that any physical changes are consistent with the extant character of the site. Documentation can assist or guide recommendations for treatments and design solutions to physically preserve a property.

The physical conservation of a historic resource is guided by four distinct treatment approaches: preservation, rehabilitation, restoration, and reconstruction. Preservation is intended to stabilize and maintain the existing historic fabric of the resource without extensive

<sup>&</sup>lt;sup>91</sup> "Secretary's Standards--Historical Documentation," National Parks Service, accessed January 26, 2019, https://www.nps.gov/HISTORY/LOCAL-LAW/arch\_stnds\_5.htm.

<sup>&</sup>lt;sup>92</sup> United States of America, U.S. Department of the Interior, National Park Service, Interagency Resources Division, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: National Park Service, Interagency Resources Division, 1990), 5.

repair or replacement. Rehabilitation is the adaptation of a historic resource for a new use that does not require extensive changes to the original historic fabric. This treatment helps to ensure the preservation of the resource by continuing the use of the resource. Restoration is the recreation of a specific time period that is significant to the historic resource. The basis is evidence through research and using similar materials and construction techniques. Finally, reconstruction is the recreation of a resource that has been destroyed. The re-creation of the resource is accomplished through evidence collected through research, previous documentation, and archeological evidence.<sup>93</sup>

## Interpretation

Interpretation of a historic property relies on education as the primary tool for preservation. The use of interpretation is to establish a connection between people's current lives and the historical event that occurred on a historic property. This is intended to promote preservation through appreciation of the property that is gained through interpretation efforts.<sup>94</sup>

A proper understanding of interpretation requires familiarity with the basic principles of interpretation set forth by Freedman Tilden, who outlined the first theories and principles for heritage interpretation. He outlined six principles for interpretation:

 Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.

<sup>&</sup>lt;sup>93</sup> "Preservation as a Treatment and Standards for Preservation-Technical Preservation Services, National Park Service," National Parks Service, accessed January 27, 2019, https://www.nps.gov/tps/standards/four-treatments/treatment-preservation.htm.

<sup>&</sup>lt;sup>94</sup> "Telling the Stories, Part 4: National Register of Historic Places Bulletin," National Park Service, accessed January 26, 2019, https://www.nps.gov/nR/publications/bulletins/interp/int4.htm.

- 2. Information, as such, is not interpretation. Interpretation is revelation based upon information, but they are entirely different things. All interpretation includes information, however.
- Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical, or architectural. Any art is in some degree teachable.
- 4. The chief aim of interpretation is not instruction, but provocation.
- 5. Interpretation should aim to present a whole rather than a part and must address itself to the whole man rather than any phase.
- 6. Interpretation addressed to children (up to the age of twelve) should not be a dilution of the presentations to adults but should follow a fundamentally different approach. To be at its best it will require a separate program.

These principles for interpretation should be considered when interpreting historic sites to achieve the best interpretation of history to the public.<sup>95</sup>

Interpretation can be approaches through mediums such as special events, interpretive signs, indoor exhibits, and electronic media. Special events can be used to commemorate the significance of a property and engage the public. Interpretive signs can include historical markers and interpretive waysides. They help to communicate what is visually in the view of the public. Indoor exhibits have the ability to incorporate artifacts and photographs coupled with interpretive text that communicate significant events of the past. Finally, electronic media can take many different forms for interpretation. For airfields, some of the most common forms of

<sup>&</sup>lt;sup>95</sup> Freeman Tilden and R. Bruce Craig, *Interpreting Our Heritage* (Chapel Hill: University of North Carolina Press, 2007), 35.

interpretation are websites which include articles and primary sources for a visitor to navigate and learn the history of the property.<sup>96</sup>

# Preservation and Military Airfields

Following an overview of the basic areas of preservation, they may be applied to demonstrate examples of airfield documentation, physical preservation and interpretation. This section will review and critique the following documents: The National Register Nomination for Fairmont Army Air Field in Fillmore, Nebraska; *Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California*; guidelines compiled by the Department of Defense Legacy Program in 2010; *Military Context Emphasizing the Cold War Including the Identification and Evaluation of Above-Ground Cultural Resources for Thirteen Department of Defense Installations in the State of Georgia*; and The National Register Bulletin, *Guidelines for Evaluating and Documenting Historic Aviation Properties*.

Previous efforts have been conducted to preserve military airfields from WWII and other significant periods in military or aviation history. Currently there are approximately 17 WWII airfields listed on the National Register of Historic Places, with the majority located in the mid-west and pacific. In Georgia, one particular source has provided information for WWII Army airfields, *Georgia's Army Air Fields of World War II* by M.L. Shettle, Jr. This publication provides a brief context for Army airfields in the state and gives a brief history along with historic photos of the airfields in Georgia.

<sup>&</sup>lt;sup>96</sup> "Telling the Stories," National Park Service.

In the United States, the military is required to have a federal preservation officer in each of its branches who oversees the continual study of historic resources. In some cases, this research has helped define guidelines for the management and evaluation of historic resources extant from significant time periods in military history. Aside from the military, documentation and preservation attempts have also been made by the National Aeronautics and Space Administration (NASA) and the National Park Service via National Register Bulletin *Guidelines for Evaluating and Documenting Historic Aviation Properties*. These studies and guidelines provide a helpful initiation to a contextual approach to preserving historically significant military airfields and aviation facilities.

# Evaluation of Known Military Airfield National Register nominations, National Register Bulletins, Reports and Inventories

The first National Register Nomination reviewed was for Fairmont Army Airfield in Fillmore, Nebraska. This airfield was designated as a historic district in 2003 and is now used as a municipal airport and agricultural fields. The airfield was constructed and operated during the WWII time-period and the nomination covers 1,827 of the original 1,877 acres. Included in the nomination are listed a total of 16 contributing resources: buildings such as hangars, oil facilities, and a pump house; structures such as runways, taxiways, and aprons on the airfield; and the landscape within the airfield is considered as a site for the nomination.<sup>97</sup>

This nomination recognizes the variety of historic resources that make up an airfield and attempts to accommodate them all within a historic district rather than only as individual

<sup>&</sup>lt;sup>97</sup> Nebraska State Historical Society. *National Register of Historic Places Nomination: Fairmont Army Airfield*. Fillmore County, Nebraska: Nebraska State Historical Society, 2003.
elements. The runways, taxiways, and aprons are considered structures in the nomination, while the setting, feeling, and association is acknowledged when the land between the other historic resources still retains the openness that the airfield had during its military use. More could be added to describe the landscape of the airfield to help communicate the significant characteristics of the site as an Army Airfield and to explain the difference therein. These additions could include the orientation and layout of runways, cluster arrangements and locations of facility structures, and topography.

The document entitled *Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California* (2013) was an evaluation of that airfield's eligibility for the National Register. A contributing feature of the Naval Air Station Sunnyvale Historic District is that it provided a baseline for any measures that needed to take place to preserve historic features of the airfield. This airfield was used during the WWII period; however, the history of its use extends beyond the WWII period and remains significant for airfield development and aviation research. The primary contribution of this document is an identification of defining characteristics of the airfield and recognition of landscape features associated with the airfield, such as topography and orientations of runways and airfield facilities. This document also provides insights regarding management approaches to airfield preservation. The recommended management approach for the historic features of the airfield is rehabilitation.<sup>98</sup>

All described character-defining features, in conjunction with proposed treatment, further explain how the airfield should be managed. Additional material studied were guidelines

<sup>&</sup>lt;sup>98</sup> United States of America, National Aeronautics and Space Administration, Historic Preservation Office, *Historic Property Survey Report for the Airfield at NASA Ames Research Center Moffett Field, California*, 2013, 1-1, 5-4, 6-1, 6-2, accessed January 10, 2019, https://historicproperties.arc.nasa.gov/downloads/hpsr\_airfield.pdf.

compiled by the Department of Defense Legacy Program (2010). This document provides guidelines and historic contexts for military training landscapes. It emphasizes arms ranges that were used to train military personnel on the use of weapons and weapons systems. Aviation resources described in this resource primarily focus on the Cold War era (Early Cold War and Late Cold War) encompassing the time-period between 1946-1989. Five property types were defined for that period: Operational and Support Installations, Combat Weapons Systems and Combat Support Systems, Training Facilities, Material Development Facilities, and Intelligence Facilities.<sup>99</sup>

Aircraft use is covered as a specific property type within the breakdown of Combat Weapons Systems and Combat Support Systems, but little detail is offered on many of the resources associated with this use. While the document describes the steps by which these properties are evaluated, its primary emphasis is the significance of firing range landscapes. This document clearly states, however, that airfields need to be viewed as a whole that encompasses buildings, structures, and landscape elements. All of these elements collectively contribute to the overall significance of the airfield as an example of airfield development and aviation research. The importance of a property depends on the goals of the group that is conducting the research. The defined goals and period of importance will then show what resources are important to the landscape. After the period of significance has been determined, an inventory of the landscape must be taken. The distribution and quantity of resources evaluated according to this process determines the scale of the area that will be considered historic. Other considerations regarding

<sup>&</sup>lt;sup>99</sup> United States of America, Department of Defense, Legacy Resource Management Program, *Military Training Lands Historic Context*, by Dan Archibald, Adam Smith, Sunny Adams, and Manroop Chawla (Champaign, IL: Construction Engineering Research Laboratory), accessed January 8, 2019,

https://www.denix.osd.mil/cr/lrmp/factsheets/reports-and-other-products/military-training-lands-historic-context-large-arms-ranges-legacy-05-265/, 253, 254.

landscapes is the continued use that they will provide over time due to their current purpose as training landscapes. This being the case, the replacement of facilities is documented to mark any changes in historic locations.<sup>100</sup>

Integrity is evaluated by the use of the National Register criteria: Location, Design, Setting, Materials, Workmanship, Feeling, and Association. Individual resources may not meet these criteria but could contribute to the overall significance and integrity of a district. The property types defined in this document are firing ranges on military training lands. A given set of character-defining features is used to evaluate the property as a firing range. These features were unknown to until the review of this document. This list of features identifies the property type and displays with integrity its potential as a historic training landscape.<sup>101</sup>

This document provides a helpful example of the ways that a military landscape should be approached for evaluation as a historic resource. The document is limited in its view, however, only focusing on properties currently in use by the military.

Military Historic Context Emphasizing the Cold War Including the Identification and Evaluation of Above-Ground Cultural Resources for Thirteen Department of Defense Installations in the State of Georgia was also reviewed. This document includes a breakdown of specific properties in Georgia containing resources significant to the Cold War period. Airfields mentioned in this document include Hunter Army Air Field, Dobbins Air Reserve Base, Moody Air Force Base, Naval Air Station Atlanta, and Robins Air Force Base. The document mentions,

<sup>&</sup>lt;sup>100</sup> Ibid., 254, 255.

<sup>&</sup>lt;sup>101</sup> Ibid., 256, 257.

but does not study, airfields that are not currently under the ownership of the military but were once part of the larger Army Airfield system used by the military in Georgia.<sup>102</sup>

Each current military property analyzed defines a list of buildings, structures, and landscapes that exist within the property along with the history of its use and significant periods. This list further breaks down to show resources that are eligible for nomination to the National Register of Historic Places. Also mentioned as eligible resources are buildings and structures, districts, and landscapes. Other areas in the property sections list any significant architects that constructed the buildings or structures. Districts are also listed in the properties that have resources eligible for consideration together as a district.<sup>103</sup>

This document provides the process by which properties are determined to have significance in the Cold War Era of military activity. Two processes are given: one used by the United States Air Force, and one by the United States Navy. Within these processes the Air Force ranks the relationship between particular properties and the Cold War. These ranks include: direct Cold War relationship, indirect Cold War relationship, no direct Cold War relationship, and not of the Cold War Period.<sup>104</sup>

This source provides insight on a large-scale process of examining a military site with focus on a specific time period. The Air Force process for determining type of relationships can be applied to WWII airfields to determine their importance to the time period. The properties

<sup>102</sup> United States of America, Department of Defense, Legacy Program, *Military Historic Context Emphasizing the Cold War Including the Identification and Evaluation of Above Ground Cultural Resources for Thirteen Department of Defense Installations in the State of Georgia*, by Kelly Nolte, M.A., Mark A. Steinback, M.A., and Amber L. Courselle, B.A. (Tuscaloosa, AL: Panamerican Consultants, 2006), 1-9, accessed January 9, 2019, https://www.denix.osd.mil/cr/lrmp/home/projects/military-historic-context-emphasizing-the-cold-war-including-theidentification-and-evaluation-of-above-ground-cultural-resources-for-thirteen-department-of-defense-installations-

in-the-state-of-georgia-pdf-report-legacy-03-175/.

 $<sup>^{103}</sup>$  Ibid., 75 – 186.

<sup>&</sup>lt;sup>104</sup> Ibid., C-3 – D-8.

consisting of airfields mainly focused on structures, buildings and districts. Landscapes features mentioned related to the areas around districts.

The *National Register Bulletin, Guidelines for Evaluating and Documenting Historic Aviation Properties* was also reviewed as the only national guidance provided by the National Park Service for aviation. The document was created in 1998 and includes the types of aviation properties, including aircraft, aviation wrecks, aviation development and production facilities, air terminals on land and water, military airbases and stations, aids to navigation, administrative, educational and other facilities, and missile launch sites and complexes. Within the military airbases and stations types, the primary focus is on properties that are still under the control of the military. Historic districts on these sites are considered with the distinction of individual districts within the airbase.<sup>105</sup>

This document provides a starting point by which to evaluate military airfields. Areas that could be further defined and considered include military airfields that are no longer owned or used by the military. The document could cover defining landscape characteristics that make up an airfield, given that much of an airfield is made up of the landscape surrounding the buildings and structures. Finally, it should consider the introduction to an airfield as a district itself rather than as a property that includes a historic district within it.

Collectively, the reviewed documents provided a good start for an examination of Army Airfields for preservation as cultural landscapes. The general outline for the military landscapes is shown clearly through the contexts given on training landscapes and Cold War properties in

<sup>&</sup>lt;sup>105</sup> United States of America, U.S. Department of the Interior, National Park Service Cultural Resources, *National Register Bulletin: Guidelines for Evaluating and Documenting Historic Aviation Properties*, by Anne Millbrooke, Patrick Andrus, Jody Cook, and David B. Whipple (U.S. Department of the Interior, National Park Service, National Register of Historic Places, 1998).

Georgia. Even though these documents did not focus specifically on airfields, they did emphasize the continued use of the landscapes; it is unfortunate that landscapes were not focused on, as only buildings and structures were considered due to the majority of airfields' defining features reliance on the landscape in which they are located. The characteristics comprising an airfield landscape were identified clearly in the NASA Historic Property Survey Report and will be useful as I work my case study sites. These set a basis for the consideration of the working aspects of an airfield: runways, taxiways, etc., as well as the landscape features. This survey provides further consideration of the entire airfield landscape as a historic district than the documents created by the military, as the military contexts only focus on districts within the properties themselves. It is similar to the National Register nomination for Fairmont Army Airfield in Nebraska, in which the landscape of the entire airfield was considered an important contributing feature.

## Summary

In summary, given the history outlined in the background chapter of this thesis, airfield development helped to form the characteristics of WWII airfields through the runway orientations and locations of these airfields' buildings and structures. The documents that were reviewed in this chapter helped me further recognize these historical features from military airfield development and organize the documentation of the sites. Together this will help to guide my research when visiting my case study sites.

## **CHAPTER 4**

## CASE STUDIES

This chapter will attempt to cross-reference findings from previous chapters specifically the key character-defining features of WWII airfields that trained pilots in rural southern locations, identified case study sites, and basic historic preservation principals. By cross-evaluating these factors, it will determine whether and how to preserve WWII Airfields.

My methodology will depend on case studies. Case studies are a valid form of research because they allow one to focus on a resource type and perform an in-depth study, such as identifying the historic resources that remain on a historic airfield. Studies relating to sites and landscapes in this thesis are even more important. These case studies allow me to more effectively convey the research I conduct in this thesis.<sup>106</sup>

I will employ the following criteria to identify the most appropriate sites to study:

- 1. The airfield must be located in Georgia.
- Based on my research, the identified sites should primarily represent the time period 1940

   1945.
- 3. The identified sites should be under public control. Although the Army may not currently be using them, if they were turned over to another entity, it is most desirable that that entity should be a municipality or other 'public' entity.

<sup>&</sup>lt;sup>106</sup> Mark Francis, *A Case Study Method for Landscape Architecture*, publication, Landscape Architecture Program, University of California, Davis (Washington, D.C: Landscape Architecture Foundation, 1999).

- 4. The case study site must have been considered a "major airfield" for training purposes during WWII. Army airfields in Georgia consisted of two main types: major or minor airfields. Major airfields consisted of more permanent installations, whereas minor airfields were used to support the major airfields with which they were associated.
- 5. The identified case study sites should be located in rural areas. Airfields located near large cities are updated and changed more drastically to compete with increased air travel, so historic resources can be easily lost. I define "rural" as "areas in which the closest town consists of a population below 30,000 people."
- 6. The cases study sites should be predominantly used to service the needs of the general aviation community and small-scale travel for local industries and businesses. General aviation refers to all aviation uses that are not for hire, such as private pilots that fly for recreation and for their personal travel. This private aviation community is important for the preservation of these resources due to their use of the space, as well as their interest in and stewardship of the historic resources.
- 7. The identified case study sites should retain some of the design and layout features of a typical WWII airfield, such as multiple runways arranged in a triangular configuration.
- 8. The identified case study sites should have all or remnants of the original runways, preferably with intact paving and associated features. Original runway lengths are based on their use by the military. If unused runways or partially used runway exists, the footprints should still be discernable in the landscape. This can range from existing pavement being visible to open lanes in the landscape where the runway was previously extant.

64

9. The identified case study sites should have aircraft aprons. These are large areas of open pavement that are used to store aircraft when not in flight. Other than parking aircraft, they may also serve as locations of airfield facilities such as hangars and fuel facilities.

Using the nine defined criteria, three case study sites were identified as seen in Figure 11. These case studies, located in middle to southern Georgia, include: Souther Contract Pilot School, Bainbridge Army Air Field, and Moultrie Army Airfield. In the remainder of this chapter each case study site will be described, including their locations, acreages, dates of construction/use, features historically built, etc. followed by descriptions of existing conditions, i.e. extant features, changes, etc.



Figure 11. Location of case study airfields. (Map created by author).

## Souther Contract Pilot School



Figure 12. Souther Field during its use for WWI pilot training, circa. 1918. (*Georgia's Army Air Fields of World War II*. M.L. Shettle, Jr.)

Souther Army Airfield is located in Sumter County, GA, approximately 4.5 miles north of Americus. The surrounding area of Americus consists of mostly rural land under agricultural use, taking advantage of the flat, rolling topography. Construction and use of the airfield started in 1918, as a primary training airfield and aviation supply depot. On January 15, 1918, the land upon which the airfield sits was leased by the War Department from Sumter County. Before construction of the airfield this land was used as a peach orchard, so it was cleared and leveled for quick use by aircraft.<sup>107</sup> The site's original size is unknown. The airfield's construction was completed by J.B. McCrary Co. out of Atlanta, GA and the Hardaway Construction Co. out of

<sup>&</sup>lt;sup>107</sup> M.L. Shettle, Jr. Georgia's Army Air Fields of World War II (Roswell, GA: Shaertel Publishing, 2005), 105.

Columbus, GA.<sup>108</sup> The name Souther Field was given to the site to honor engineer Major Henry Souther who worked as a consultant for many WWI aviation projects and was killed in the line of duty at Ft. Monroe, Virginia.<sup>109</sup>

The initial constructed facilities for the WWI use of the field consisted of warehouses, 15 wooden aircraft hangars, housing for 2,000 trainees, and other buildings such as hospitals and cafeterias. Training aircraft were assigned to the airfield, and including a total of 71 Curtiss JN-4s, the model being referred to as the "Jenny." The first class of cadets moved to the airfield on May 29, 1918, from Fort Dick, Texas.<sup>110</sup> The first commanding officer of the airfield was Major Carlyle H. Wash, who graduated West Point on March 1, 1909, and started his command of Souther Field on May 1, 1918.<sup>111</sup> During WWI, 25 cadets arrived every week. No fatalities occurred during the WWI training at Souther Field, although there was one accident where an aircraft was destroyed when its pilot hit two mules and a plow. At the height of its occupation, the airfield had 147 officers, 1,400 cadets, and 147 aircraft. Cadets at this airfield logged more flight time during WWI than at any other airfield in the United States.<sup>112</sup> After the end of WWI, national downsizing of the Army Air Corps affected Souther Field as the aircraft at the airfield were sold as surplus. Many of the JN-4 aircraft were purchased by local farmers who discarded the airframes and used the engines to power agricultural equipment.<sup>113</sup>

 <sup>&</sup>lt;sup>108</sup> Souther Field During WWI- Americus, GA, accessed February 08, 2019, http://souther-field.com/ww1.html.
 <sup>109</sup> Shettle, *Georgia's Army Air Fields*, 105.

<sup>&</sup>lt;sup>110</sup> Ibid., 105.

<sup>&</sup>lt;sup>111</sup> Lt. Thomas G. La Blanc, ed. *The Souther Field Flipper*, November 1, 1918, accessed February 10, 2019, http://sourther-field.com/ww1\_FLIPPER\_110118.htm.

<sup>&</sup>lt;sup>112</sup> Shettle, *Georgia's Army Air Fields*, 105.

<sup>&</sup>lt;sup>113</sup> Mike Cochran, Souther Airfield Historian, "History of Souther Airfield," interview by author, December 20, 2018.



Figure 13. Forth, day of construction at Souther Field, March 1, 1918. (Southern Field Flipper, Vol. 1 No. 5, January 1, 1919. www.southern-field.com.)



Figure 14. 28<sup>th</sup> construction day at Souther Field, March 29, 1918. (Souther Field Flipper, Vol. 1 No. 5, January 1, 1919. www.souther-field.com.)



Figure 15. Souther Field Construction Work day 47, April 20, 1918. Showing construction of aircraft hangars (Souther Feild Flipper, Vol. 1 No. 5, January 1, 1919, www.souther-field.com.)



Figure 16. Souther Field barracks area, 1918. (Courtesy of Mike Saliba, www.souther-field.com.)



Figure 17. Souther Field canteen building, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 18. Souther Field hangar row, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 19. Souther Field aircraft hangar, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 20. Souther Field machine shop, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 21. Souther Field hospital, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 22. Souther Field flight line, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 23. Pigeon training at Souther Field, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 24. Gunnery training at Souther Field, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 25. WWI trainer aircraft at Souther Field, 1918. (courtesy of Mike Saliba, www.souther-field.com.)



Figure 26. Cadets at Souther Field, 1918. (courtesy of Mike Saliba, www.souther-field.com.)

One of the individuals who purchased an aircraft from Souther field was Charles Lindbergh. In May of 1923, Lindbergh traveled to Souther Field and paid \$500 for a JN-4 "Jenny" and a new OX-5 engine to run it. Lindbergh spent a week at the airfield preparing the aircraft and taking refresher training with an instructor to hone his flying skills. Curtis Pitts, creator of the Pitts Special, a high-performance aerobatics aircraft, spent time on the airfield in the 1930s while still in high school.<sup>114</sup>

All of the military resources at the airfield were disposed of between 1925-1928, with buildings on the airfield either destroyed or salvaged except for the warehouse located at the western end of the airfield. After WWI, this warehouse was used to manufacture crates and baskets. Finally, in 1928, the land was purchased by Sumter County. Lindberg was not the only

<sup>&</sup>lt;sup>114</sup> Meg Godlewski, "Historic Airport Continues to Thrive," *General Aviation News*, 2019, accessed February 10, 2019, https://generalaviationnews.com/2014/10/30/historic-airport-continues-to-thrive/.

famous aviator that can be traced to time spent at Souther Field. From 1928 through the start of WWII, Sumter County used the former military base as a local airfield.<sup>115</sup>

In 1940, William J. Graham of Pennsylvania started several private military pilot schools and flight instructor schools in the Pennsylvania area that would eventually lead to the formation of a flying school at Souther Field. With impending war on the horizon, the Army approached Graham about starting a Contract Pilot School for the military. Souther Field was suggested as an appropriate training site by a former military pilot who had learned to fly at that airfield. After visiting the site, Graham leased the airfield from Sumter County and began construction. In December of 1940, construction started at the airfield with barracks, a mess hall, workshop hangar, and a 138' x 204' steel hangar. The foundations of the previous WWI structures were removed. Training started with a flight instructor program on February 1, 1941. The first aircraft used for training consisted of five PT-15 aircraft, and on March 15<sup>th</sup> of that year 10 PT-17 Boeing Stearmans were used. The key difference between the two aircraft were the engines: the PT-15 used a Wright R-760-1 and the PT-17 used a Continental R-670-4, -5.<sup>116</sup>

The first official class of cadets to start training at Souther Field were from the 56<sup>th</sup> Army Air Forces Flying Training Detachment. On March 22, 1941, 50 cadets started at the airfield, named class 41H. They received 140 hours of ground training during a primary course, lasting 10 weeks. The schedule consisted of physical training on Monday, Wednesday, and Friday, and a four-mile hike on Tuesdays and Thursdays. Classes were divided into two sections: one group would attend ground school in the morning while the other group would fly, switching in the afternoon. On April 29<sup>th</sup> class 41-I arrived and the airfield started the training of two classes at

<sup>&</sup>lt;sup>115</sup> Shettle, Georgia's Army Air Fields, 105.

<sup>&</sup>lt;sup>116</sup> Shettle, Georgia's Army Air Fields, 105.

the airfield. Class 41-H graduated on May 31<sup>st</sup> making them the first class of cadets to graduate from Souther Field for WWII and onto further training.<sup>117</sup>

While the cadets underwent training during the week, they were free on the weekends. The citizens of Americus invited cadets into their homes for home-cooked meals, as well as planned sightseeing tours of the surrounding area for cadets to attend during their off hours.<sup>118</sup> All of these actions helped to build the cadets' morale.

In 1942, the contract between Graham Aviation and the U.S. Army was modified to include British cadets into the flight training program at Souther Field. The first class of British cadets was class 42-A, traveling to Americus from Canada in June. Coming from Britain, which had been at war for a longer period than the U.S., the cadets were accustomed to going without certain luxuries in their home country. However, they were pleased to indulge in the abundance of goods they were able to obtain while in Americus, apparently consuming large quantities of Coca-Cola, ice cream, and orange juice. The locals in Americus were very welcoming to the cadets and greeted them as they arrived to the airfield.<sup>119</sup> During Christmas of 1942, the people of Americus organized holiday entertainment for the cadets and even sent gifts to Souther Field.<sup>120</sup> In total, twelve classes of British Cadets were trained at Souther Field with one British officer to handle discipline and administration within the class, as well as to give lectures.<sup>121</sup>

<sup>&</sup>lt;sup>117</sup> Ibid., 105.

<sup>&</sup>lt;sup>118</sup> Ibid., 105.

<sup>&</sup>lt;sup>119</sup> Ibid., 105.

<sup>&</sup>lt;sup>120</sup> Bryan S. McCann ed. *The Souther Cadet,* January 1942, accessed February 11, 2019, http://souther-field.com/Neal%20Wellons/souther%20cadet/P-1.jpg

<sup>&</sup>lt;sup>121</sup> Shettle, *Georgia's Army Air Fields*, 105.



Figure 27. Souther Field, circa 1940s. showing the historic aircraft parking area located at the top left (*Georgia's Army Airfields of World War* II, M.L. Shettle, Jr., USAF.)

The school was expanded during the war to 644 acres, with the area of hangars and other buildings occupying an area of 51 acres. Within these 51-acres were two two-story barracks, a recreational hall, an administration building, a link trainer building, a ground school building, a mess hall, a cold storage plant, and a hospital. Alongside all of this, the airfield also had two auxiliary fields for practice flights away from the main airfield. The last class of British cadets left the airfield in the fall of 1942, but U.S. pilots continued to train on the airfield during the war. At its greatest occupation, during the winter of 1943 to 1944, the airfield hosted 600 cadets, 450 civil employees and 100 flight instructors. In terms of aircraft, there were 122 PT-17s, four PT-19, and one BT-13. The last class to graduate from Souther field was class 45-B in October of 1944. Approximately 4,500 cadets trained at Souther Field.<sup>122</sup> After the war, the school closed, and the process of disposing of surplus military aircraft began again. This process was similar to the period following WWI, contributing to the use of WWII training aircraft in agricultural aviation.<sup>123</sup>

In 1946, the airport was returned to the ownership of Sumter County and used as a civil aviation airport along with continued use by Graham Aviation for flying lessons to the general public. In 1948, a trade and vocational school was opened on the area where the original parking apron was located. Today, that school is called South Georgia Technical College. In 1958, the airport facility was moved to the east side of the airfield, and in 2009, the name was changed from Souther Field to Jimmy Carter Regional Airport.<sup>124</sup>



Figure 28. Souther Field aerial showing parking apron and facilities buildings, circa.1940s. (Graham Aviation Souther Field, Americus, Georgia, www.souther-field.com)

<sup>&</sup>lt;sup>122</sup> Ibid., 106.

<sup>&</sup>lt;sup>123</sup> Mike Cochran, Souther Airfield Historian, "History of Souther Airfield," interview by author, December 20, 2018.

<sup>&</sup>lt;sup>124</sup> Souther Field During WWI- Americus, GA, accessed February 12, 20019, http://souther-field.com/index.html.



Figure 29. Souther Field flight line and parking apron, circa 1940s. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, Jr., USAF.)



Figure 30. Aircraft hangars at Souther Field, circa.1940s. (Graham Aviation Souther Field, Americus, Georgia, www.southerfield.com)



Figure 31. Souther Field aircraft hangar and parking apron, circa. 1940s. (*Georgia's Army Air Fields of World War II*, M. L. Shettle, Jr., USAF.)



Figure 32. Souther Field parking apron and flight line, facing south. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, Jr., USAF.)



Figure 33. Flight tower at Souther Field, circa.1940s. (Graham Aviation Souther Field, Americus, Georgia, www.souther-field.com)



Figure 34. Administration building and barracks at Souther Field, circa.1940s. (Graham Aviation Souther Field, Americus Georgia, www.souther-field.com)



Figure 35. Cadets at Souther Field during training in a Boeing PT-17 Stearman, circa. 1940s. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, Jr., USAF.)



Figure 36. Cadets undergoing flight training at Souther Field, circa.1940s. (Graham Aviation Souther Field, Americus Georgia, www.souther-field.com)



Figure 37. Cadets arriving at Souther Field by train, circa.1940s. (Graham Aviation Souther Field, Americus Georgia, www.souther-field.com)



Figure 38. Current aerial photo of Souther Field, with notations of specific elements. (Google Earth, notes made by author.) *Existing Conditions* 

The current landscape of historic Souther Field is divided into two main parts totaling 553 acres: local airport and technical school property. Many of the historic resources are no longer extant, but there are several extant historic features on both the airport and school property, as well as outside those boundaries. South Georgia Technical College is located due north of the currently used airport runways. Located at the western end of the school property are two historic aircraft hangars: Hangar #1, facing northeast, is the western-most hangar while to its east is Hangar #2, facing west. To the east of the hangars is a large parking lot divided

lengthwise down the center by planted trees and other decorative plantings. This parking lot is the original paving where aircraft were parked during WWII-era use of the airfield.



Figure 39. Hangar #1 south facade. (photo taken by author, December 20, 2018.)



Figure 40. Hangar #1 west facade. (photo taken by author, December 20, 2018.)



Figure 41. Hangar #2, west facade. (photo taken by author, December 20, 2018.)



Figure 42. Hangar #2 southwest corner. (photo taken by author, December 20, 2018.)



Figure 43. Historic parking apron on school campus now used as parking lot, facing east. (photo taken by author, December 20, 2018.)



Figure 44. Historic poured concrete on site of aircraft parking apron. (photo taken by author, December 20, 2018.)



Figure 45. Patched area of historic concrete with modern concrete. (photo taken by author, December 20, 2018.)



Figure 46. Damaged area of historic parking apron concrete. (photo taken by author December 20, 2018.)



Figure 47. Historic tie-down hook located in concrete. (photo taken by author, December 20, 2018.)

Due south of South Georgia Tech. lies the historic airfield. Pine trees, planted for noise control, separate the two properties. There are two active runways: runway 10/28 running east to west parallel with the layout of the school, and runway 5/23, running southwest to northeast. The longest of the two runways is runway 5/23 with a length of 6,011' and a width of 100'. This runway is lighted with Precision Approach Path Indicator (PAPI) lights on both ends, while an Approach Lighting System (ALS) is located at the northeast approach end of the runway. The shorter runway is runway 10/28, which is 3,786' long and 75' wide. These runways intersect each other near the halfway point of runway 5/23. These runways are paved in asphalt and, based on historic images, mark the approximate footprint of the historic WWII-era runways. Current airport facilities lie south of the runway intersection, consisting of offices, hangars, fuel

facilities, aircraft parking areas, and automotive parking areas.<sup>125</sup> In total, the school and airport span 553.18 acres.<sup>126</sup>



Figure 48. Current airfield landscape facing north. (photo taken by author, December 20, 2018.)

<sup>125</sup> United States of America, Georgia Department of Transportation, Division of Intermodal Aviation Programs (Atlanta, GA: Georgia Department of Transportation, 2018 – 2019).
 <sup>126</sup> QPublic.net – Sumter County, GA, December 2, 2019, accessed February 1e, 2019,

https://qpublic.schneidercorp.com/Application.aspx?AppID=849&LayerID=15775&PageTypeID=1.



Figure 49. Current airport facilities structures. (photo taken by author, December 20, 2018.)



Figure 50. Current airfield landscape facing northeast. (photo taken by author, December 20, 2018.)


Figure 51. Current airfield landscape facing northwest. (photo taken by author, December 20, 2018.)

As mentioned earlier, other historic airfield related resources lie outside the boundaries of the airport and school. A factory building that was used during the WWI period, currently used for the manufacture of crates and baskets, is located east of the airport. On the east side of that building runs a still-active rail line used during both WWI and WWII periods for the movement of material and travel of cadets to the airfield. Located south of the airport at 224 GA Hwy 49 is a house historically used as an officer's club and quarters during the WWII period. Other historic resources located on the site of the officer's club and quarters include a tennis court from the WWII-era.



Figure 52. Historic warehouse used during the WWI period of use on Souther Field. (photo taken by author, December 20, 2018.)



Figure 53. Officer's quarters now used as a private residence near airfield. (photo taken by author December 20, 2019.)



Figure 54. Tennis court located on the site of officer's quarters. (photo taken by author, December 20, 2018.)

Currently, two interpretive spaces commemorate Charles Lindberg's connection with the site. One is located on the campus of South Georgia Tech., near the entrance of the campus, consisting of a monument and a historical marker. The other, a sculpture along with a historic marker, can be found outside the main airport office.

### Assessment of Historic Significance and Integrity

Now that the process of listing a property to the National Register of Historic Places has been introduced, this section will cover the criterion under which this property might be nominated, as well as aspects of integrity that apply to the property.

The historic significance of the site is based on its uses as a training airfield during World War I (1918) and World War II (1940 – 1945). Other areas of significance are the use of the

location by Charles Lindberg for the purchase of his first aircraft and flight lessons. The presence of Curtiss Pitts at the airfield during the 1930s provides additional significance. Areas of Significance for Souther Field are military, transportation, and architecture.

The integrity of the site has been impacted, yet integrity remains in the form of materials and design through historic paving on the campus of South Georgia Technical College where the aircraft parking area was located and the two hangars that are used as classroom facilities. The hangars located here have been altered from their original state to accommodate new uses, but their basic design remains the same. The two existing runways at the airport lack the original paving material, and have been extended over time, but retain their feeling. One runway, which enclosed the eastern side of the airfield, has been removed. The two remaining runways still occupy the approximate footprints of the originals, however. The feeling of the airport remains the same, consisting of open views along the runways and flat topography. Trees planted along the northern end of the airfield do compromise the visual connection between the historic aircraft parking area and the currently-used airport.

Outside of the airport and technical school, the historic factory building from the WWI period retains exterior integrity of materials through location, design, and workmanship. The connection with the rail line to the east of the building still shows the historic feeling of the railroad's importance to the airfield during its use for military training. The house located south of the airport still retains integrity of historic materials and footprint along with features such as a tennis court used by the soldiers training at the airfield during WWII.

Souther Contract Pilot School										
Date of	Date of         Range of Use         Currently         Owner         Original Size         Current Size									
Construction	Construction Active									
1918	1918         1918, 1940 - 1944         Yes         Sumter County         407 acres         626.35 acres									

Table 1. Souther Contract Pilot School Basic Information. (created by author.)

Historic Buildings											
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)					
Barracks	0	N/A	N/A	N/A	N/A	N/A					
Mess Hall	0	N/A	N/A	N/A	N/A	N/A					
Hospital	0	N/A	N/A	N/A	N/A	N/A					
Flight Control Tower	0	N/A	N/A	N/A	N/A	N/A					
Officer's Quarters	1	c. 1940s	Balloon frame with Brick Veneer	Officer Housing	Private Residence	Good					
Chapel	0	N/A	N/A	N/A	N/A	N/A					
Warehouse	1	c. 1918	Brick Bearing Walls	Aircraft Assembly	Industrial Use	Fair					
Office Building	0	N/A	N/A	N/A	N/A	N/A					
Gymnasiums	0	N/A	N/A	N/A	N/A	N/A					
Unknown	0	N/A	N/A	N/A	N/A	N/A					

Table 2. Souther Contract Pilot School Historic Building Inventory. (created by author.)

	Historic Structures											
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)						
Hangars	2	с. 1940s	Steel Frame, Modern Exterior Materials	Storage and Maintenance of Aircraft	Classrooms	Poor						
Runways	2	с. 1940s	Modern Asphalt Paving	Takeoff and Landing of Aircraft	Takeoff and Landing of Aircraft	Fair						
Parking Aprons	1	с. 1940s	Historic Poured Concrete	Parking Aircraft	Vehicle Parking Area	Fair						
Street Patterns	0	N/A	N/A	N/A	N/A	N/A						
Sport Facilities	1	c. 1940s	Poured Concrete	Tennis Court	Unused	Fair						

Table 3. Souther Contract Pilot School Historic Structures Inventory. (created by author.)

	Historic Objects										
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)					
Navigatio n Aids	0	N/A	N/A	N/A	N/A	N/A					
Tie-Down Hooks	+/- 60	c. 1940	Metal in Concrete	Secure Parked Aircraft	Unused	Good					

Table 4. Souther Contract Pilot School Historic Objects Inventory. (created by author.)

			Sites			
Туре	Number Extant	Date	Description	Historic Use	Current Use	Integrity (Good, Fair, Poor)
Airfield	1	1918	Open landscape with runways and taxiways for aircraft use, as well as tree noise buffer and drainage elements.	Aircraft Operation	Aircraft Operation	Fair
Airport Facilities Area	1	1918	College campus with many non-historic buildings and structures mixed within.	Aircraft Storage and Military Training	College Campus	Poor
Military Housing Area	1	c. 1940	Private residence with historic home with tennis court area.	Military Housing	Private Residence	Good
Ruins	0	N/A	N/A	N/A	N/A	N/A

Table 5. Souther Contract Pilot School Historic Site Inventory. (created by author.)

	Cultural Landscape Characteristics									
Туре	Type Description									
		(Good, Fair, Poor)								
Spatial Organization	Historic features are located surrounding the airfield. The runways are organized in an intersecting pattern, enclosing the what would have been half of the original triangular pattern. This area is the focal	Fair								
	point for all buildings and structures surrounding the landscape.									
Natural Systems and Features	The natural systems and features of the landscape consists of wide flat open spaces around the runways and surrounding landscape with the runways placed slightly above the surrounding landscape for water	Good								
i catures	drainage									
Vegetation	Vegetation on the landscape are grasses in the open spaces mostly broom sage. Bordering the runways and the school is wide row of pine trees that shield noise from airport activity.	Good								
Views/Vistas	Vistas on the landscape are located on line with the runways on the airfields extending past the end of the	Fair								
	paving.									
Cluster	Buildings and structures surrounding the airfield are in clusters, consisting of hangars and parking aprons.	Good								
Arrangements	Runways are also located in a cluster.									

Table 6. Souther Contract Pilot School Landscape Inventory. (created by author

# Bainbridge Army Air Field



Figure 55. Bainbridge Army Airfield, December 1942. (Georgia's Army Air Fields of World War II, M.L. Shettle, Jr. pg. 24.)

Bainbridge Army Airfield is located in Decatur County, Georgia, northwest of the city of Bainbridge, surrounded by a small industrial area and agricultural fields. In 1940, the Southeast Training Center began searching for areas to construct training airfields under the direction of the Army Air Corps. An officer working for the photographic section of the training center suggested Bainbridge, Georgia as a possible site for a new airfield. An airfield constructed during the 1930s for civil aviation use in the area was called the Commodore Decatur Municipal Airport. The military was interested in a different site northwest of the city, however. City leaders learned of the plans for an Army Airfield to be constructed in the area and formed a committee to lobby for the airfield.<sup>127</sup>

The site was officially approved for construction on March 16, 1942. The city purchased 2,070 acres of land for the airfield and leased it to the U.S. Army. A total of \$9.9 million was allocated to construct a basic flight training base on the location. On March 25, 1942, the organization of Bainbridge Army Airfield started at Gunter Army Air Field in Montgomery, Alabama. "Project Bainbridge" was led by Colonel Robert Choate, and four squadrons were formed from squadrons at Gunter AAF with the first airfield personnel trained there.<sup>128</sup>

Construction started on April 3, 1942. Initial construction called for the airfield buildings to be in the form of Theatre of Operations, mentioned in chapter 2. These buildings were constructed using tar paper roofing and walls. Other built features were three 5,000 ft. runways, oriented in a triangular pattern, and three steel hangars. Offices for airfield administration were initially located in the city of Bainbridge. Bad weather delayed the completion of the runways for three weeks. Given the setback, the first cadets moved to the airfield on July 4, 1942, commanded by Colonel Robert Choate. Completion of the airfield was reached on August 25.<sup>129</sup>

The first flight training began on August 2<sup>nd</sup> with class 42-K. This class consisted of 150 cadets and 10 student officers, using 75 Vultee BT-13 aircraft. Most of the cadets in this first class came from a primary flight school in Lakeland, Florida. By September 1<sup>st</sup>, the allotment of aircraft had reached 132 BT-13s and 14 BT-15s. After class 42-K graduated from basic flight training at Bainbridge, they were divided up and sent to advance training: 64 students were sent to single-engine advance training at Moultrie Army Air Field, while 79 students went to multi-

<sup>&</sup>lt;sup>127</sup> Shettle, Georgia's Army Airfields, 25.

<sup>&</sup>lt;sup>128</sup> Ibid., 25.

<sup>&</sup>lt;sup>129</sup> Ibid., 25.

engine training in Columbus, Mississippi. Fourteen of the students had been eliminated from flight training and one was killed in training. During the first year of operation the airfield suffered three deaths in two aircraft accidents. For a short period during 1942, the airfield held twin-engine advanced training using BT-10s until other airfields were completed.<sup>130</sup>

Bainbridge continued to expand during WWII. The size increase accommodated 321 officers, 704 cadets, and 3,017 enlisted men. Along with the increase in men came auxiliary landing facilities, (airfields used to support a main airfield) with hard-surface runways built at the Commodore Decatur Municipal Airport in Bainbridge, while others were built in Boykin, Donaldsonville, Faceville, Reynoldsville, and Vada, Georgia. During the airfield's highest point of activity during the war, new classes of 340 cadets arrived every five weeks. Basic flight training on the base consisted of 70 hours of flying time, divided into 40 hours of transition time (six of which were at night), 14 hours of instrument flying, four hours of formation flying, and eight hours of navigational flying. On the ground, the cadets also received 10-20 hours in a Link Trainer (a small, early form of flight simulator). In 1943, the airfield received a commendation for the lowest accident rate for basic flight schools in the Eastern Flying Training Command.<sup>131</sup>

During the last year of its operation during WWII, the airfield housed a total of 260 BT-13s. The last class to attend Bainbridge Air Field for basic flight training was class 45-A on September 11, 1944. The school closed after the class graduated on December 24, 1944 with 84 cadets moving on to twin-engine advanced training in Columbus, Mississippi, 128 moving to single-engine advanced training in Moultrie, Georgia, and another 46 training in Dothan, Alabama. Class 45-B travelled to Bainbridge on November 21, 1944 but was transferred to

<sup>&</sup>lt;sup>130</sup> Ibid., 25.

<sup>&</sup>lt;sup>131</sup> Ibid., 25.

Shaw Army Air Field in Sumter, South Carolina and Cochran Army Air Field near Macon, Georgia to complete training.<sup>132</sup>



Figure 56. Bainbridge Army Air Field parking apron and facilities buildings and structures, December 1942. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, pg. 27.)

<sup>&</sup>lt;sup>132</sup> Ibid., 25.



Figure 57. T-6 advanced training aircraft at Bainbridge Army Air Field, circa 1940s. (*Georgia's Army Air Fields of World War II, M.L.* Shettle, pg. 28.)



Figure 58. T-6 formation training over Bainbridge, circa.1940s. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, pg. 28.)



Figure 59. Bainbridge Army Air Field parking apron with T-6 training aircraft, circa.1943. (First Anniversary Bainbridge Army Air Field, June 15, 1943.)



Figure 60. Flight tower on Bainbridge Army Air Field, circa.1940s. (Georgia's Army Air Fields of World War II, M.L. Shettle, pg. 28.)



Figure 61. Entrance to the military housing area at Bainbridge Army Air Field, circa.1940s. (*Georgia's Army Air Fields of World War II*, pg. 29.)



Figure 62. Chapel at Bainbridge Army Air Field, circa. 1940s. (Bainbridge Army Air Field Basic Flying School, Bainbridge, Georgia.)



Figure 63. Bainbridge Army Air Field headquarters building, circa. 1940s. (Bainbridge Army Air Field Basic Flying School, Bainbridge, Georgia.)



Figure 64. Bainbridge Army Air Field hospital building, circa.1940s. (Bainbridge Army Air Field Basic Flying School, Bainbridge, Georgia.)



Figure 65. Cadet undergoing training in a Link Trainer at Bainbridge Army Air Field, circa. 1940s. (Bainbridge Army Airfield Basic Flying School, Bainbridge, Georgia.)



Figure 66. Cadets marching along the parking apron at Bainbridge Army Air Field, circa. 1940s. (Bainbridge Army Air Field Basic Flying School, Bainbridge, Georgia.)

After the use of the airfield by the Army during WWII, the property was transferred back to Decatur County. Because there were two airfields located in the area around Bainbridge, the

Commodore Decatur Municipal airport was used more regularly because of its proximity to the city. This being the case, farmers began to lease the open areas of the airfield for crop production.<sup>133</sup>

With the entrance of the U.S. into the Korean War, the Air Force resumed use of the airfield as a contract flight school. Frank Hulse from Southern Airways operated a Contract Pilot School at the airfield. In January of 1951, the airfield was rehabilitated for its new use. The construction of new facilities for the rehabilitation included barracks, an academic building, a cadet club, a flight tower, briefing rooms, a chapel, a canteen, and two new runways. The first training to occur on the airfield was instructor training using six T-6 advanced trainer aircraft. In August of 1951, the first class of cadets, class 52-F, began flight training, and the official name of the airfield changed to 3306<sup>th</sup> Pilot Training Squadron.<sup>134</sup>

During the height of training during the Korean War, the airfield housed six classes of cadets, each numbering 140, at one time. After the war, this number reduced to four. Between 1954-1955, the aircraft transitioned from the T-6 to the T-28 and T-34. During this period of training, the airfield housed American, German, Japanese, French, and Vietnamese students. In 1958, the training aircraft were changed again to the T-37, a jet-powered trainer. This made Bainbridge the first ever all-jet primary training airfield. Finally, in 1961, the Air Force ended the use of contract flying schools and the aviation cadet program. Training ended at Bainbridge on December 21, 1961, with a total of 6,226 cadets trained during the period after WWII.<sup>135</sup>

<sup>&</sup>lt;sup>133</sup> Ibid., 25.

<sup>&</sup>lt;sup>134</sup> Ibid., 26.

<sup>&</sup>lt;sup>135</sup> Ibid., 26.



Figure 67. T-28 training aircraft on the parking apron at Bainbridge Army Air Field, circa. 1950s. (Down and Locked.)



Figure 68. Class 58-K at Bainbridge Army Air Field. (Touch and Go 58-K.)



Figure 69. T-37 jet trainer over Bainbridge, circa.1960. (Why Yes, I Fly Jets 60-D)



Figure 70. Class 60-D at Bainbridge Army Air Field, circa.1960. (Why Yes, I Fly Jets 60-D.)

Today, the airfield is used as a civil aviation airport renamed Decatur County Industrial Air Park. Many manufacturing plants were constructed in the area around the airfield. North of the airfield are the Southern Airways buildings, which were used by a mental health facility and by the Georgia Department of Corrections as a prison. A golf course was also constructed in the 1950s near the airfield but is no longer in use.<sup>136</sup>



Figure 71. Aerial photograph of Bainbridge Army Air Field, with notations, 2018. (Google Earth, notations made by author.)

<sup>&</sup>lt;sup>136</sup> Ibid., 26.

#### Existing Conditions

The boundaries of Bainbridge Airfield are delineated by Colquitt Highway as the eastern boundary and Eldorado Road on the west; the northern and southern boundaries are nondescript agricultural fields. The historic parcel has been subdivided into two separate properties, both owned by Colquitt County: the Southern Airways buildings, constructed in the 1950s, are located north of Industrial Boulevard, which divides the original historic parcel in two. The Southern Airways structures are now located on property operated by the Georgia Department of Corrections as a prison. Contemporary aerial imagery shows building footprints north of Industrial Boulevard, possibly from historic structures that date to the 1950s.

South of Industrial Boulevard is the active Bainbridge Airfield. Located on the north side of the airfield is a large poured concrete apron, currently used for parking aircraft, that was constructed during the WWII period. This apron runs parallel with Industrial Boulevard and is bordered to the north by airport facilities buildings. Located in the surface of the runways are historic tie-down hooks for parked aircraft. A main airport office, or Fixed Base Operator (FBO), is located west of the center point of the airfield. Two historic hangars, constructed during WWII, are located to the east. The hangar closest to the FBO is used for aircraft storage, while the furthest is unused with a large front addition extending to the south. West of the FBO previously stood a third historic hangar that has since been demolished, though the foundation is still extant. Directly west of the FBO are two 1950s era barracks used currently for storage space; these buildings are constructed of concrete blocks for the wall structure and a wooden truss system for the roof sheathed in pressed metal sheeting as roof material. Between the eastern-located barrack buildings are four concrete foundation piers from a historic flight tower that is no longer extant.



Figure 72. Hangar #1 on Bainbridge Army Air Field. (photo taken by author, December 17, 2018.)



Figure 73. Hangar #1 interior. (photo taken by author, December 17, 2018.)



Figure 74. Hangar #2 rear elevation. (photo taken by author, December 17, 2018.)



Figure 75. 1950s-era barracks building. (photo taken by author, December 17, 2018.)



Figure 76. Post-WWII period Aircraft painting inside barracks building. (photo taken by author, December 17, 2018.)



Figure 77. Possible barracks at Bainbridge Army Air Field. (photo taken by author, December 17, 2018.)



Figure 78. Previous location of flight tower. (photo taken by author, December 17, 2018.)

South of the airfield apron lie the airfield's runways. Two of the five runways are actively used: runway 6/27, running parallel with the apron, and runway 14/32. These two runways have been updated to accommodate modern aviation needs. Both runways have been re-paved with modern asphalt. Runway 6/27 has received the majority of improvements, including PAPI lighting on both ends and runway lighting for nighttime use. The eastern end of the runway has been extended and an MALSR (Medium Approach Lighting System with Runway Alignment Indicator Lights) has been added. Three now-abandoned runways are also extant on the airfield. The first is located east of the current runway configuration intersecting runways 6/27 and 14/32 at a 45-degree angle, forming the last leg of the original WWII era triangle configuration related to the two currently used runways. The first abandoned runway is located at the southern end of the airfield, running parallel with runway 6/27 and intersecting the second abandoned runway, running parallel with the first previously mentioned runway. At the point of intersection between the first and third runway, a bank of solar panels has been erected on top of the existing runway footprints.

Connecting the runways are a series of taxiways. Extending from the center of the apron south is a taxiway that crosses the center of runway 6/27, terminating at the southern end of runway 14/32. Two other taxiways that intersect runway 6/27 are located to the right and left of the central taxiway. After intersecting runway 6/27, the western taxiway terminates into runway 14/32. Other historic taxiway footprints are located across the landscape connecting unused runways. One historic feature that is located on the airfield is a wind direction indicator located to the northwest of the airfield.



Figure 79. View of Bainbridge Army Air Field facing southeast. (photo taken by author, December 17, 2018.)



Figure 80. Bainbridge Army Air Field facing northwest. (photo taken by author, December 17, 2018.)



Figure 81. Abandoned runway facing southwest. (photo taken by author, December 17, 2018.)



Figure 82. Runway 6/27 facing west. (photo taken by author, December 17, 2018.)



Figure 83. Abandoned runway with centerline painting. (photo taken by author, December 17, 2018.)



Figure 84. Historic wind direction indicator at northwest edge of airfield. (photo taken by author, December 17, 2018.)



Figure 85. Tie-down hook located in the parking apron of Bainbridge Army Air Field. (photo taken by author December 17, 2018.)

Following Hurricane Michael in October of 2018, some damage was sustained to both historic and modern resources on the airfield. Both hangars were undamaged from the storm, but a barracks building from the Korean War period, located east of the FBO, was destroyed. Storm damage also impacted the historic wind direction indicator, damaging the sheet metal covering and tipping it from its mounting. Despite numerous changes to the airfield, many historic features still remain on the site.



Figure 86. Historic barracks building demolished by hurricane. (photo taken by author, December 17, 2018.)



Figure 87. Hurricane damage to wind direction indicator. (photo taken by author, December 17, 2018.)

## Assessment of Historic Significance and Integrity

The historic significance of Bainbridge Army Airfield justifies Criterion A: military, transportation, and architecture. For Criterion C, distinct design and construction, the runways are unique to WWII airfields. Potential exists for archeological remains to be located below the surface that could answer questions relating to life on the airfield during the long periods of use during the two periods of training on the airfield, so Criterion D is applicable.

This airfield retains many aspects of integrity, including location, design, materials, and feeling. The historic hangars and other structures located on the airfield maintain their original materials from the WWII and Southern Airways period. Two of the historic runways are currently active. These runways have been resurfaced with non-historic paving asphalt material. Runway 6/27 has been extended to the east. All of the other runways that are not currently used show footprints with extant paving materials. The airport apron retains historic concrete paving materials and tie-down hooks from the WWII period. The historic wind direction indicator located on the airfield is original to the airfield's construction and remains in its original state with some hurricane damage. The integrity of extant buildings and structures located on the property north of the airport, owned by the prison, are unknown due to the author's inability to physically access them during this study.

Bainbridge Army Airfield									
Date of Construction	Date of Construction         Range of Use         Currently         Owner         Original Size         Current Size								
1942         1942 – 1944, 1951 – 1961         Yes         Decatur County         2,070 acres         1,162.27 acres									

#### Table 7. Bainbridge Army Air Field Basic Information. (created by author)

Historic Buildings									
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)			
Barracks	4	c. 1950s	Concrete Block with Wooden Roof Trusses and pressed metal roofing	Military Housing	Unused, Storage	Fair			
Mess Hall	0	N/A	N/A	N/A	N/A	N/A			
Hospital	0	N/A	N/A	N/A	N/A	N/A			
Flight Control Tower	0	N/A	N/A	N/A	N/A	N/A			
Officer's Quarters	0	N/A	N/A	N/A	N/A	N/A			
Chapel	Unknown	c. 1950s	Balloon Frame, Wooden Construction	Chapel	Unknown	Unknown			
Warehouse	0	N/A	N/A	N/A	N/A	N/A			
Office Building	0	N/A	N/A	N/A	N/A	N/A			
Gymnasiums	0	N/A	N/A	N/A	N/A	N/A			
Unknown	0	N/A	N/A	N/A	N/A	N/A			

Table 8. Bainbridge Army Air Field Historic Building Inventory (created by author

Historic Structures											
Туре	Number	Date	<b>Construction Materials</b>	Historic Use	Current Use	Integrity					
	Extant					(Good, Fair, Poor)					
Hangars	2	с.	Steel Frame, Corrugated	Storage and Maintenance	1: Aircraft Storage and	Good					
		1940s	Sheet Metal Exterior	of Aircraft	Maintenance						
					1: Unknown						
Runways	5	с.	2: Modern Asphalt Paving	Takeoff and Landing of	2: Takeoff and Landing of	Good					
		1940s	3: Historic poured	Aircraft	Aircraft						
			Concrete		3: Abandoned						
Parking	1	с.	Historic Poured Concrete	Parking Aircraft	Parking Aircraft	Fair					
Aprons		1940s									
Street Patterns	0	N/A	N/A	N/A	N/A	N/A					
Sport Facilities	0	N/A	N/A	N/A	N/A	N/A					

Table 9. Bainbridge Army Air Field Historic Structures Inventory (created by author)

	Historic Objects										
Туре	Number	Date	<b>Construction Materials</b>	Historic Use	Current Use	Integrity					
	Extant					(Good, Fair, Poor)					
Navigation Aids	1	c. 1942	Metal Framing	Wind Direction	Wind Direction	Good					
				Indicator	Indicator						
Tie-Down	+/- 100	c. 1940	Metal in Concrete	Securing Parked	Securing parked	Good					
Hooks				Aircraft	Aircraft						

Table 10. Bainbridge Army Air Field Historic Objects Inventory (created by author)

	Sites											
Туре	Number Extant	Date	Description	Historic Use	Current Use	Integrity (Good, Fair, Poor)						
Airfield	1	1942	Open landscape with runways and taxiways for aircraft use, as well as tree noise buffer and drainage elements.	Aircraft Operation	Aircraft Operation	Good						
Airport Facilities Area	1	1942	Cluster of historic and non-historic buildings and structures that sit north of the airfield runways	Aircraft Operation and Training	Aircraft Operation	Good						
Military Housing Area	1	c. 1950s	Unknown Condition	Military Housing	Prison Facility	Unknown						
Ruins	2	c. 1950s	1: Aircraft Hangar Foundation 1: Airport Control Tower Foundation	1: Aircraft Hangar 1: Control Tower	Unused	Fair						

Table 11. Bainbridge Army Air Field Historic Sites Inventory. (created by author.)

Cultural Landscape Characteristics									
Туре	Type Description								
		(Good, Fair, Poor)							
Spatial Organization	Historic resources are located surrounding the airfield. The runways are organized in an intersecting triangular	Good							
	pattern. This area is the focal point for all buildings and structures surrounding the landscape. Outside of the								
	airfield are the previous military housing lots organized by intersecting streets.								
Natural Systems and	The natural systems and features of the landscape consists of wide flat open spaces around the runways and	Good							
Features	surrounding landscape, now used as agricultural fields.								
Vegetation	Vegetation on the airfield landscape are crops and grasses in the open areas. In the military housing area open	Good							
_	spaces are broken up with tall pine trees.								
Views/Vistas	Vistas on the landscape are located on line with the runways on the airfields extending past the end of the	Good							
	paving.								
Cluster Arrangements	Buildings and structures surrounding the airfield are in clusters, consisting of hangars and parking aprons.	Good							
	Runways are also located in a cluster arrangements.								

Table 12. Bainbridge Army Air Field Landscape Inventory. (created by author.)

## Spence Army Air Field



Figure 88. Spence Army Air Field historic aerial photograph, circa.1940s. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, Jr. pg. 110.)

### History

Spence Army Air Field is located in Colquitt County, Georgia five miles southeast of the city of Moultrie. This site was located in an area surrounded by agricultural fields. In 1940, local leaders within the city established a committee to contact the Civil Aeronautics Authority about the construction of a modern airport in Moultrie. Then-current airport, Clark Field, could not be expanded to fit the needs of a modern airfield, so the city pursued options to purchase land northeast of the city. During this time, the U.S. Army began to explore areas to construct
training fields for the Air corps. The committee from Moultrie met with General Walter Weaver, the commander of the Southeast Training Center, about constructing a training field on the acquired land. In March of 1941, General Weaver and his staff visited the area and inspected several sites, eventually settling on the current location of Spence Field.<sup>137</sup>

In June of 1941, the site was approved by the War Department and 1600 acres were purchased by the Army for construction. Construction began on July 15, 1941, to establish Moultrie Advanced Flying School, led by Major Y.H. Taylor. Heavy rain delayed construction, causing damage to the site. On January 26, the site was renamed Spence Army Air Field to honor Lt. Thomas Lewis Spence, from Thomasville, Georgia who was killed in aircraft accident in France in 1918. Initial squadrons and personnel were formed at Craig Field in Selma, Alabama. On February 15, 1942, the first group of aircraft, consisting of 20 North American AT-6 advanced trainer aircraft, was delivered to the airfield. On February 22<sup>nd</sup>, 42-D, the first class, arrived from Shaw Army Air Field in South Carolina. This class consisted of 80 cadets who all graduated and received their wings, which was very unusual for advanced pilot training due to the challenge of advanced training.<sup>138</sup>

The school continued to increase in size. In 1942, it contained 146 AT-6s located on the airfield. At the high point of training during WWII, between 1942 – 1943, the class sizes ranged from 80 to 242. Advanced training was much more strenuous for cadets than the primary flight training at Bainbridge and Souther. Over the training period at Spence during WWII, there were 3,169 students trained, while 369 washed out of training, giving the school a 11.6% failure rate. Moultrie also operated several auxiliary fields for takeoffs and landings, located at Berlin,

<sup>&</sup>lt;sup>137</sup> Shettle, Georgia's Army Air Fields, 111.

<sup>&</sup>lt;sup>138</sup> Ibid., 111.

Norman, New River, Tifton, and Moultrie Municipal Airport. Instrument flight training was conducted primarily at Moultrie Municipal. Spence Airfield was lacking in that it did not have a gunnery range. This meant that classes had to be moved to Eglin Army Air Field in Florida for two weeks to conduct gunnery training.<sup>139</sup>

In 1944, Spence received its first group of P-40s, the first frontline fighter aircraft used during WWII by the U.S. Initially, only the most proficient cadets at the airfield were able to get flying time in the aircraft. Later, more P-40s were brought to the airfield and all cadets received five hours of flying time in the aircraft. Issues arose with the use of both AT-6 and P-40 aircraft on the airfield. To remedy this, the auxiliary field located in Tifton, Georgia was converted to handle P-40 training. A control tower, operations building, and barracks were built to handle training at Moultrie. The addition of P-40 training led to the extension of the single-engine training from ten to fifteen weeks. After 70 hours of AT-6 flying time and five hours of P-40 time, cadets were commissioned and given an additional five hours of flying time in the P-40.<sup>140</sup>

Alongside training military cadets, Spence airfield was also home to a contingent of Women's Auxiliary Service Pilots (WASPS). These groups were small, consisting of four or five members, performing utility flying, test flights, mail flights, flying military personnel, as well as ferrying aircraft and mechanical parts. After the graduation of the last class in March 11, 1945, the training program at Spence was closed on November 30, 1945. The airfield property was used for many different purposes afterward, even hosting a circus, with elephants housed in one of the hangars.<sup>141</sup>

<sup>&</sup>lt;sup>139</sup> Ibid., 111.

<sup>&</sup>lt;sup>140</sup> Ibid., 112.

<sup>&</sup>lt;sup>141</sup> Ibid., 112.



Figure 89. Parking apron on Spence Army Air Field, circa.1940s. (*Georgia's Army Air Fields of World War II*, M.L. Shettle. pg. 114.)



Figure 90. Parking apron at Spence Army Air Field facing west, circa.1940s. (*Georgia's Army Airfields of World War II*, M.L. Shettle, pg. 114.)



Figure 91. Parking apron on Spence Army Air Field with parked T-6 training aircraft, circa.1940s. (*Georgia's Army Airfields of World War II*, M.L. Shettle, pg. 114.)



Figure 92. Hangar on Spence Army Air Field, circa.1940s. (Georgia's Army Air Fields of World War II, M.L. Shettle, pg.117.)



Figure 93. P-40 aircraft on the parking apron at Spence Army Air Field, circa.1944. (*Georgia's Army Air Fields of World War II*, M.L. Shettle, pg. 117.)



Figure 94. Entrance into Spence Army Air Field, circa.1940s. (Georgia's Army Air Fields of WWII, M.L. Shettle, pg. 113.)



Figure 95. Gunnery training at Spence Army Air Field, circa.1940s. (*Georgia's Army Airfields of World War II*, M.L. Shettle, pg. 116.)

With the U.S. entrance into the Korean War, the USAF opened a training school at Moultrie on March 15, 1951 awarding the contract to Hawthorn Flying Service of Charleston, South Carolina. The first class of the Korean War era was class 52-C, in May 1951. For the first two years, training was conducted with the North American T-6 Texan aircraft. Later, in 1953, flight training was changed to a two-aircraft system using the Piper PA-18 Cub and later transitioning students to the T-6. That same year, the T-6 was gradually phased out for the North American T-28 trojan. Starting in July of 1957, jet-powered Cessna T-37s replaced the T-28, with the last T-28 retired at Spence in August of 1959. During this period, three auxiliary bases were used by the airfield, including Sunset to the south, as well as Tifton and Thomasville.<sup>142</sup>

Between 1954-1959, the base was used for Air Force One, Lockheed Constellation *Columbine*, approximately six times by President Eisenhower travelling to the plantation owned

<sup>&</sup>lt;sup>142</sup> Ibid., 112.

by former Secretary of the Treasury George Humphreys in Thomasville, Georgia. Classes 62-A and 62-B graduated on December 21, 1960, ending flight training at the airfield. During this period, over 6,000 pilots trained at Spence. For a time, the airfield was used by Moody Air Force Base, near Valdosta, Georgia, as an auxiliary field, extending the northwest/southeast runway to 8,000 feet for use by the T-33 and T-38 aircraft. After the Korean War, part of the property was used as the Moultrie Regional Industrial Park and county correctional institution. In 1968, Maule Aircraft constructed a manufacturing plant at Spence to build aircraft. Moody ended use of the airfield in 1975. Starting in 1978, the airfield hosted the Sunbelt Agriculture Expo. Today, it has become the largest farm show in the world with over 1,000 exhibitors. Many of the visitors fly to the show and today one runway is still in use for the event. The Sunbelt Expo maintains a year-round administration center at the airfield.<sup>143</sup>



Figure 96. Sunbelt Agricultural Expo, 1997. (photo located in Sunbelt Ag Expo Main Office.)

<sup>&</sup>lt;sup>143</sup> Ibid., 112.

### Existing Conditions



Figure 97. Aerial photograph of Spence Army Air Field, with notations, 2018. (Google Earth, notes by author.)

Today, Spence airfield is bordered to the west by GA Highway 133 and by agricultural fields on all other sides. When entering the airfield from the south, one can see a historic street network that was constructed during the field's use as a training airfield. A historic gymnasium and tennis courts are also located in this area. One enters the airfield apron from the center of the south-facing side. The apron forms the shape of a U, opening to the south, and is surfaced with historic concrete paving and tiedown hooks located within. Along the southern end of the apron are three WWII-era aircraft hangars. Between the central hangars are two historic mess hall

buildings constructed with concrete blocks. East of the center entrance stands a flight tower from the WWII era training on the airfield.



Figure 98. Southwest facade of gymnasium on Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 99. Close up of west facade of gymnasium showing mid-century design of windows. (photo taken by author, December 18, 2018.)



Figure 100. Historic tennis court located southwest of gymnasium at Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 101. WWII-era hangar previously used by Maule Flight on Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 102. Central WWII hangar located on Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 103. Western most WWII-era hangar on Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 104. Historic mess hall building located on Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 105. Possible historic mess hall building at Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 106. Historic flight tower on Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 107. Interior of flight tower facing north. (photo taken by author, December 18, 2018.)

Scattered throughout the airfield landscape are current day buildings and structures used by the Sunbelt Agriculture Expo. Current structures used by Maule Aircraft mark the west end of the historic airport parking area. The extant runways extend to the north of the airfield. There are three runways north of the airfield apron, forming a triangular pattern. Only one runway is currently active: runway 14/32. At the southeastern end of this runway lies a fourth runway no longer in use. All runways, except for the currently-active runway, are paved in historic concrete. All runways are also connected by intersecting taxiways. North of the runways is open land now used for crop fields harvested for the Sunbelt Expo.



Figure 108. Partially used historic runway at Spence Army Air Field, facing southeast. (photo taken by author, December 18, 2018.)



Figure 109. Remains of runway numbering on historic partially used runway. (photo taken by author, December 18, 2018.)



Figure 110. Inactive runway now used by the Ag Expo, facing east. (photo taken by author, December 18, 2018.)



Figure 111. Parking apron on Spence Army Air Field, facing west. (photo taken by author, December 18, 2018.)



Figure 112. Parking apron on Spence Army Air Field, facing east. (photo taken by author, December 18, 2018.)



Figure 113. Tie-down hook located in the parking apron at Spence Army Air Field. (photo taken by author, December 18, 2018.)



Figure 114. Spence Army Air Field, facing east. (photo taken by author, December 18, 2018.)



Figure 115. Spence Army Air Field, facing north. (photo taken by author, December 18, 2018.)



Figure 116. South-end of airfield property now used as agricultural fields. (photo taken by author, December 18, 2018.)

### Assessment of Historic Significance and Integrity

Spence army airfield is historically significant in many different areas. The use of the airfield to train pilots during WWII and the Korean War makes the airfield significant under Criterion A. Along with the training programs, the airfield and buildings constructed on the airfield are representative of WWII- and Cold War-era military constructed airfields, making it significant under criterion C for its construction. Finally, the airfield is significant for the resources that are potentially located underneath the airfield. This qualifies the airfield as significant under criterion D. Themes of significance, under which this airfield is significant, are military, architecture, agriculture, and transportation.

Spence airfield shows a large amount of integrity in location, materials, feeling, and design. All of the buildings still located on the airfield retain their integrity and use of historic exterior materials from the WWII era and post-WWII era. A large amount of the historic paving material is still extant on the hard-surfaced features within the airfield. Only the active runway lacks its historic paving materials.

The unused runways still show open views. Within the runways and taxiway area, much of the open space has been compromised by the construction of modern buildings and structures. Within the open area north of the runways, the addition of crop fields mimics the open areas that were historically present, thus retaining the feeling of the landscape. Overall, the integrity of Spence field remains largely intact. retaining its location, materials, feeling, and design.

Spence Army Airfield						
Date of	Range of Use	<b>Currently Active</b>	Owner	Original Size	Current Size	
Construction	_	-				
1941	1941 - 1975	Partially	Colquitt County	1,600 acres	1,158.58 acres	

Table 13. Spence Army Air Field Basic Information. (created by author.)

Historic Buildings								
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)		
Barracks	0	N/A	N/A	N/A	N/A	N/A		
Mess Hall	2	c. 1950s	Concrete Block	Mess Hall	Miscellaneous	Good		
Hospital	0	N/A	N/A	N/A	N/A	N/A		
Flight Control Tower	1	c. 1950s	Steel Framing	Flight Tower	Unused	Good		
Officer's Quarters	0	N/A	N/A	N/A	N/A	N/A		
Chapel	0	N/A	N/A	N/A	N/A	N/A		
Warehouse	0	N/A	N/A	N/A	N/A	N/A		
Office Building	0	N/A	N/A	N/A	N/A	N/A		
Gymnasiums	1	c. 1950s	Steel Framing with Corrugated Sheet Metal Exterior	Gymnasium	Abandoned	Good		
Unknown	1	c. 1950s	Unknown Framing with Corrugated Sheet Metal Exterior	Unknown	Abandoned	Good		

Table 14. Spence Army Air Field Historic Buildings Inventory. (created by author.)

	Historic Structures									
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)				
Hangars	3	с. 1940s	Steel Frame, Corrugated Sheet Metal Exterior	Storage and Maintenance of Aircraft	1: Storage 2: Abandoned	Good				
Runways	3	c. 1940s c. 1950s	1: Modern Asphalt Paving 2: Historic poured Concrete	Takeoff and Landing of Aircraft	1: Takeoff and Landing of Aircraft 2: Event Space	Good				
Parking Aprons	1	с. 1940s	Historic Poured Concrete	Parking Aircraft	Partial Aircraft Parking and Event Space	Good				
Street Patterns	1	с. 1950s	Asphalt	Vehicular Travel	Vehicular Travel	Good				
Sport Facilities	1	с. 1950s	Poured Concrete	Tennis Court	Abandoned	Fair				

Table 15. Spence Army Air Field Historic Structures Inventory. (created by author.)

	Historic Objects								
Туре	Number Extant	Date	Construction Materials	Historic Use	Current Use	Integrity (Good, Fair, Poor)			
Navigatio n Aids	0	N/A	N/A	N/A	N/A	N/A			
Tie-Down Hooks	+/- 500	c. 1940	Metal in Concrete	Securing Parked Aircraft	Unused	Good			

Table 16. Spence Army Air Field Historic Objects Inventory. (created by author.)

	Sites								
Туре	Number Extant	Date	Description	Historic Use	Current Use	Integrity (Good, Fair, Poor)			
Airfield	1		Open landscape with runways and taxiways for aircraft use, as well as tree noise buffer and drainage elements.	Aircraft Operation	Aircraft Operation	Good			
Airport Facilities Area	1	1941	Cluster of historic and non-historic buildings and structures that sit on the edge of the airfield runways	Aircraft Operation and Training	Aircraft Operation Event Space	Good			
Military Housing Area	1	c. 1950s	Network of street patterns and open lots outside of the airfield property	Military Housing and Activities	Event Space	Fair			
Ruins	2	c. 1950s	2: Historic Building Foundations	1: Military Housing 1: Airfield Structure	Unused	Fair			

Table 17. Spence Army Airfield Sites Inventory. (created by author.)

Cultural Landscape Characteristics					
Туре	Description	Integrity (Good, Fair, Poor)			
Spatial Organization	Historic resources are located surrounding the airfield. The runways are organized in a intersecting triangular pattern. This area is the focal point for all buildings and structures surrounding the landscape.	Good			
Natural Systems and Features	The natural systems and features of the landscape consists of wide flat open spaces around the runways and surrounding landscape with the runways placed slightly above the surrounding landscape for water drainage.	Good			
Vegetation	Vegetation on the landscape are grasses in the open spaces, mostly consisting of broom sage.	Good			
Views/Vistas	Vistas on the landscape are located on line with the runways on the airfields extending past the end of the paving.	Good			
Cluster Arrangements	Buildings and structures surrounding the airfield are in clusters, consisting of hangars and parking aprons. Runways are also located in a cluster arrangement.	Good			

Table 18. Spence Army Air Field Landscape Inventory. (created by author.)

# Summary

Together, these airfields show the significant features of training airfields constructed or used during the WWII-era in Georgia. Many of these airfields' historic features still remain. Other historic features also exist, giving the properties significance for periods before or after the WWII period. The continual use of these properties for aviation has helped to preserve their historic features, enabling the preservation of their historic resources.

#### CHAPTER 5

### FINDINGS AND PROPOSALS

This thesis has methodically answered the research question, "How can historic Army Air Corps airfields in rural Georgia retain their historic built environment, while simultaneously accommodating modern aviation improvements through rehabilitation?" The second chapter provided much of the context and justification for historic significance of Army Air Corps airfields as well as introducing the three fundamental preservation tasks. Chapter Three described the diversity of historic features that remain at three case study airfields in Georgia as well as how they might be eligible for the National Register of Historic Places. This chapter will combine the information gained from these chapters, providing overarching findings and proposals from this comprehensive research effort to fully answer the research question.

The remainder of the chapter is organized by the three fundamental preservation tasks discussed in Chapter 2: Identification and Documentation, Physical Preservation, and Interpretation. The Identification and Documentation section will focus primarily on the author's interpretation of key features that identify a WWII airfield and the eligibility of those resources under the National Register. The Physical Preservation section will discuss the author's ideas on overall physical preservation of airfields, and the final section will discuss the author's thoughts on interpretation of airfields.

### Identification and Documentation

Nominating historic airfields to the National Register of Historic Places can be done under several different criterion of significance. Through the previously conducted background research, it has been determined that the areas of significance can include Military, Engineering, and Transportation.

The three airfields chosen as case study examples share key similarities that help distinguish them as historic airfields. Specifically, they all share some of the following character-defining features: runway configuration, large parking aprons, and organization of buildings and structures surrounding runways and parking aprons. Comparisons between the airfields will show how much significance and integrity each has.

Each airfield reveals different levels of intact historic fabric; they may have been changed slightly over time, giving them different overall opportunities for preservation. The feeling of the landscape and retention of primary landscape characteristics of an airfield, flat open topography, and the feeling of aviation activity consisting of sights, sounds, and smells all maintain key importance. Feeling of the landscape can be retained by the airfield still being actively used. Important aspects of integrity to retain are the locations of the runways, runway patterns, and the flat and open topography of the airfield sites. These characteristics are the main resources that are required for an aviation facility to be considered historically intact. For this reason, existence of these resources is extremely important for the site to retain their integrity. The secondary features of importance are historic buildings and structures from the time period. The most important of the structures are hangars and runways, although other secondary buildings, structures, and objects can also be found, such as barracks, navigational aids, and

parking aprons. The tables below show a comparison of all three case studies across several aspects.

Case Study Airfields Resources									
Name	Date of Construction	Currently Active	Number of Historic Buildings	Number of Historic Structures	Number of Historic Objects	Number of Historic Sites	Total		
			Quarters: 1	Hangars: 2	Tiedown Hook	Airfield: 1			
			Warehouse: 1	Runways: 2	Group: 1	Facilities Area: 1			
~ -				Parking Apron:		Housing Area: 1			
Souther	1918	Yes		1			12		
CPS			T ( 1 )	Sport Facilities:		π. 1.2			
			I otal: 2	1	Total, 1	I otal: 3			
				Total: 6					
			Barracks	Hangars.	Navigational	Airfield: 1			
			4	2	Aids: 1	Facilities Area: 1			
			·	Runways:	Tiedown Hook	Housing Area: 1			
				5	Group: 1	Ruins: 2			
Bainbridge	1942	Yes		Parking Aprons:	1		19		
AAF				1		Total: 5			
			Total: 4						
					Total: 2				
				Total: 8					
			Mess Hall: 2	Hangars: 3	Tiedown Hook	Airfield: 1			
			Tower: 1	Runways: 3	Group: 1	Facilities Area: 1			
			Gym: 1	Parking Apron:		Housing Area: 1			
Spence	10/1	V	Unknown: I	I Stars et Detterment 1		Ruins: 2	20		
AAF	1941	res		Street Pattern: 1 Sport Equilities:			20		
			Total: 5	sport racinities.		Total: 5			
			Total. J	1	Total· 1	I Otal. J			
				Total: 9	10001.1				

Table 19. Case Study Resources Inventory. (created by author.)

## Landscape Condition Intactness Definitions

Good: The site shows a majority of feelings associated with the historical intent of the environment.

**Fair:** The feeling of the landscape is intact in some areas but lacking in others; small modern changes have disturbed the environment.

Poor: The feeling of the landscape's historical intent is no longer extant, modern changes have disrupted the landscape completely.

Case Study Airfields Landscape Condition								
Name	e Spatial Natural Systems Vegetation Views/Vistas Cluster Overall							
	Organization	and Features			Arrangements			
Souther CPS	Fair	Good	Good	Fair	Good	Fair		
Bainbridge AAF	Good	Good	Good	Good	Good	Good		
Spence AAF	Good	Good	Good	Good	Good	Good		

 Table 20. Case Study Landscapes Condition Inventory. (created by author.)

# Landscape Integrity Definitions

**Good:** A majority of the historical fabric is intact in the environment; a majority of the landscape elements are in original condition. **Fair:** Some of the fabric has been changed but the location and overall purpose has remained the same.

Poor: The fabric has been completely altered and the purpose of the environment is no longer used for its original intent.

Case Study Airfields Landscape Integrity								
Name	NameSpatialNatural SystemsVegetationViews/VistasClusterOverall							
	Organization	and Features			Arrangements			
Southern CPS	Poor	Fair	Fair	Fair	Good	Fair		
Bainbridge AAF	Fair	Good	Good	Good	Good	Good		
Spence AAF	Good	Fair	Fair	Fair	Fair	Fair		

Table 21. Case Study Landscapes Integrity Inventory. (created by author.)

All three airfields are currently active for aviation use. The current use for aviation helps to strengthen the historic feeling. Based on information gathered, the most common feature of airfields from the WWII time period (1939-1945) is the triangular-shaped runway configurations. Other similarities between airfields were the hangars located at Bainbridge Army Air Field and Spence Army Air Field; they are similar in construction, using steel framing with two arched sections connected by a long center ridge. The presence of five similarly constructed hangars on two airfields offers a good example of hangar construction technique during WWII.

Other similarly-constructed features shared all three airfields include the large open areas of flat level topography. Around the runways there are also a series of taxiways connecting the runways. A central parking apron on the northern side of the properties is surrounded by hangars and other historic buildings and structures. Within the parking areas, there are tie-down hooks that are placed into the paving material. These historic tie-down hooks are identical in all three airfields, making them a character-defining feature for airfields during this time period.

Many of the buildings and structures that remain from Bainbridge Army Air Field and Spence Army Air Field are from the post-WWII (1945-1962) period of use on the airfields. These two airfields are significant for more than just the WWII-era of use and possibly show as much significance and integrity for post-WWII military training as well as the WWII-era of use. These two fields have undergone changes for this time period and still retain the integrity of these changes. After all of these changes, these airfields have become important landscapes to preserve for post-WWII training in Georgia as well as WWII training.

Out of all the airfields that were surveyed for this thesis, Bainbridge Army Air Field is the best example of a training airfield from the WWII-era. The historic fabric from this time period is largely intact and shows most of its original layout and design without being largely changed by the post-WWII use of the airfield. Spence Army Air Field is the airfield that shows the second-best example of a WWII-era airfield. The larger significance of the airfield is during the post-WWII military use of the airfield. Souther Contract Pilot School ranks the lowest out of these three airfields for intact examples of WWII-era training airfields. Even though this airfield is a poor example in this study, the long period of use and its use by Charles Lindbergh makes it a significant site for aviation history. For this reason, documentation should be undertaken for further preservation of the airfield. Nomination to the National Register of Historic Places should be explored for this airfield.

These airfields have become significant for more than just WWII training. Their significance spans many different areas of military, transportation, community planning, and development. The airfields share many similarities, but each shows its own differences given their locations and small changes in their designs and histories. Nominating these airfields to the National Register of Historic Places provides the ability for documentation and the properties to be acknowledged for their significance. For some properties, this is not the right option and more direct preservation should be pursued through physical preservation or interpretation.

#### **Physical Preservation**

Bainbridge Army Air Field offers an example of a very intact WWII Army Airfield. Currently it is being used as an airport servicing the local area around the town of Bainbridge and the industrial facilities around the airfield. This airfield should undergo physical preservation. The historic runways that are no longer active should be stabilized and kept clear of construction. One of the hangars located on the airfield has currently undergone physical preservation to retain its use for storing aircraft. The concrete parking apron on the airfield is still currently used for parking aircraft. If this concrete is repaired in places, special care should be made to attempt to match the repaired concrete to the original material.

The barracks buildings on the airfield should be preserved via adaptive reuse to help ensure they remain on the site. This should include careful vetting of proposed uses that will not harm the footprints or the exterior or the buildings. Finally, the ruins and historic wind direction indicator should be preserved. The ruins should be preserved in their original condition, while the wind direction indicator should be repaired from storm damage and preserved by continuing its current use as an aid to pilots landing at the airfield. The landscape of the airfield should be kept intact in its original condition. To do this, it should be left open and the property should remain part of the airfield.

Physical preservation of the site should also be undertaken to ensure that resources are left on the site. The most appropriate way to ensure that the site is physically preserved is to continue the use of the airfield by the Sunbelt Agriculture Expo and Maule Aviation. These businesses use the site without demanding large changes on the environment within and around the airfield. In the future, if use is transferred to other organizations or businesses, design guidelines should be created to ensure these new changes are congruent with the historic feeling associated with the site. Current measures that need to be undertaken are the maintenance of existing buildings and structures. The three historic aircraft hangars should be preserved by maintaining their exterior materials and replacing broken or damaged materials with similar fabric. The runways, taxiways, and parking apron should be maintained in their original condition. To ensure that the feeling remains the same, modern constructions should not be placed directly on the center of these structures to ensure that their views are not compromised. One runway that is still currently active on the site should remain in use to protect its integrity and the overall feeling of the property.

Outside of the airfield in the historic military housing area, remaining structures and buildings should be maintained and reused for purposes that do not compromise their exterior materials. The historic street pattern should be maintained. The replacement of paving materials is appropriate, but they should mimic the original materials.

### **Interpretation**

Souther Field has used interpretation in many currently-active ways. Several commemorative markers have been erected on the site that commemorate the use of the airfield by Charles Lindberg to purchase and fly his first aircraft. Besides these commemorative and interpretive panels, there is also a website devoted to the history of the airfield and its uses for training during WWI and WWII. This website gives a narrative history of the airfields as well as showing historic photographs and documents. Along with the website, an airshow was conducted to celebrate the 100<sup>th</sup> anniversary of the airfield's construction. This event helped to further promote the interpretation of the site's history.

Proposals for this airfield to further its preservation would be to increase the amount of interpretation done on the site. Currently, most interpretation at the site is focused around Charles Lindberg. Efforts need to be made for interpretation of the other historic time periods of the airfield's use. Given that part of the historic area of the airfield is located on the campus of

South Georgia Technical College, interpretive panels could be erected on the campus to help tell the full history of the site.

Interpretation has been done on the Bainbridge airfield by display cases in the main airport offices with historic materials on display, as well as by an interpretive panel located in the parking lot outside the office. Further interpretation can be done with more depth in the airport office. Outside the office near the hangar and located on the edge of the parking apron, more interpretive panels could be erected to focus on the pilots traveling in and out of the airfield. Interpretation for the aviation community that is using the airport would also promote preservation of the airfield with the active use of the site.

The last airfield visited for this thesis was Spence Army Air Field. The current use of this airfield as exhibition space for the Sunbelt Agriculture Expo provides ample opportunity for historical interpretation. The large number of visitors to the site could allow for large numbers of visitors to be introduced to the history of military flight training at the airfield. This could be accomplished through the placement of interpretive panels near historic buildings and structures that could tell about the history of the site and use of the buildings and structures during the periods of use. Documentation and nomination of the property to the National Register can be done, but for current preservation purposes, this option would be less important than physical preservation and interpretation.

#### Summary

These airfields require different combinations of preservation techniques to ensure that their history is still portrayed into the future. These preservation techniques will ensure that their significance to aviation history is maintained in their physical appearance in the landscape in which they are located.
# CHAPTER 6

### CONCLUSION

The question that originally compelled this research was, "How can historic Army Air Corps Airfields that trained pilots in rural Georgia retain their historic built environment, while simultaneously accommodating modern aviation improvements through rehabilitation?" The methodology used to answer the question included background research on a variety of topics. To provide a context for the significance of historic Army Air Corps Airfields, preservation fundamentals and ultimately case studies afford a deep dive into similar types of sites to see what similarities may exist. Differences might be found so that an assessment could be made to determine how to retain the historic built environment of an airfield.

The methodology used in this thesis helped in understanding the significance of these sites to military and aviation history, as well as Georgia's contribution to military flight training. Examining previous preservation efforts through identification and documentation by the military and National Register Nominations of airfields helped to guide the process of identifying case studies and narrowing down the characteristics of an airfield that make them significant. Reviewing National Register Nominations helped to point out significant features of airfields. Providing a baseline for further exploration of characteristics that the case study airfields had to offer.

The use of case studies helped answer this research question by giving primary examples of airfields that were important to this time period. After analyzing these airfields, the

conclusion was made that these particular airfields have longer periods of significance than just the WWII-era. These case studies also enable a study of them collectively and comparatively to suggest ways that WWII airfields in Georgia. They may be preserved and interpreted as well as how the airfields have changed with modern aviation improvements. These improvements have seemed to fit in with the historic characteristics of these airfields, and their historic characteristics have become integrated into the current use of the airfields.

#### **Reflections**

On reflecting on the methodology and whether anything could or should have been done differently, hindsight indicates that more airfields should be addressed in Georgia from the time period of WWII. To do this, the case study criteria should have been revised to allow more airfields to be studied. This could have been achieved by looking at airfields that were used by the Navy or Other Army Airfields that were not considered "Major" airfields. This would help to broaden the scope of locations of these airfields and to gather information from airfields located in different regions and land types. Further, expanding the research question of this thesis to include post-WWII military training could also help to expand the significance of these airfields within aviation history in Georgia. For this thesis, only Army Air Corps Airfields were used in this analysis. Naval airfields also existed in Georgia dating from the WWII-era of aviation. These Naval airfields could have been evaluated in a separate section comparing any different characteristics and uses that these airfields had with the Army Airfields that were evaluated in this thesis. This might have revealed different characteristics that airfields from WWII show.

Through conducting this research, the importance of Georgia's airfields in relation to a national context became clear. Even though WWII airfields in Georgia did not train as many pilots as other airfields in states like Texas, Georgia's airfields are historically significant to understand the breadth of the size and scale of Army pilot training for WWII. Because no national or state historic context has been crafted for airfields such as the ones of focus in this thesis, this research can be considered a "pilot study" on how to provide such a context and the related preservation actions that should be considered. One of the possible future actions that could be undertaken to assist in developing a national or state historic context would be to craft a multiple property nomination for these kinds of airfields. This would allow for these airfields to be recognized as a whole and their significance to the entire state of Georgia.

# Future Research

Considering how this research might be enhanced by others in the future, some topical areas still need research. Airfields constructed for WWII encompassed most of the southeastern United States. Future research of WWII airfields should be done by identifying the characteristics over this area to gain a better understanding of preservation efforts for these airfields. Other research that should be done is an update of the National Register Bulletin on Aviation Resources. This bulletin should be updated to include military airfields that are now publicly used airports. The bulletin should include landscape features that are found on airfields along with the inclusion of runways, taxiways, and parking aprons as structures to be evaluated. With such enhanced material, a context could be created for WWII and post-WWII-era training

airfields specific to the Southeastern United States. This would help to further acknowledge and preserve historic airfields that fit into this context.

# Conclusion

This thesis has shown that WWII-era airfields should be continually used for aviation to help retain their historic features and feeling. The modern aviation improvements the airfields have undergone in these rural airports have not significantly affected their historic character and integrity, but these should be taken into account when dealing with the reuse of historic features. Finally, the period of significance of the airfields should be evaluated before and after the time period of WWII-era training to fully grasp the importance of the airfield to aviation and military aviation history. These airfields show their importance to Georgia's history, as well as the history of the United States' development of aviation as a whole and should therefore be preserved into the future.

### REFRENCES

- "Airport Programs & Guidance." FAA Seal. February 26, 2019. Accessed March 15, 2019. https://www.faa.gov/airports/.
- Brown, Jerold E. Where Eagles Land: Planning and Development of U.S. Army Airfields, 1910-1941. New York: Greenwood Press, 1990.
- Cochran, Mike. Souther Airfield Historian, "History of Souther Airfield," interview by author, December 20, 2018.
- Francis, Mark. "A Case Study Method for Landscape Architecture." *Landscape Journal*20, no. 1 (1999): 15-29. doi:10.3368/lj.20.1.15.
- Froesch, Charles, and Walther Prokosch. *Airport Planning*. New York, NY: John Wiley and Sons, 1946.
- Godlewski, Meg, and Jerry Battle. "Historic Airport Continues to Thrive." General Aviation News. December 15, 2018. Accessed February 10, 2019.
- https://generalaviationnews.com/2014/10/30/historic-airport-continues-to-thrive/.
- Goldstone, Lawrence. *Birdmen: The Wright Brothers, Glenn Curtiss, and the Battle to Control the Skies.* New York: Ballantine Books, 2014.
- Google Earth. Accessed March 10, 2019. https://earth.google.com/.
- Google Maps. Accessed March 15, 2019. https://maps.google.com/.
- "Heavier-than-air." Merriam-Webster. Accessed March 15, 2019. https://www.merriam-webster.com/dictionary/heavier-than-air.
- Horonjeff, Robert. *Planning and Design of Airports*. Second ed. Vol. 1. 4 vols. McGraw-Hill Series in Transportation. New York, NY: McGraw-Hill, 1977.
- Johnson, Herbert Alan. *Wingless Eagle: U.S. Army Aviation through World War I.* Chapel Hill (N.C.): University of North Carolina Press, 2001.
- La Blanc, Lt. Thomas G. ed. *The Souther Field Flipper*, November 1, 1918, accessed February 10, 2019, http://souther-field.com/ww1\_FLIPPER\_110118.htm.

- Maurer, Maurer. "Aviation in the U.S. Army, 1919-1939,." 1987. Accessed September 23, 2018. doi:10.21236/ada195714.
- McCann, Bryan S. ed. *The Souther Cadet*, January 1942, accessed February 11, 2019, http://souther-field.com/Neal%20Wellons/souther%20cadet?P-1.jpg

Millbrooke, Anne Marie. Aviation History. Englewood, CO: Jeppesen, 1999.

- Nalty, Bernard C. Winged Shield, Winged Sword: A History of the United States Air Force. Washington, D.C.: Air Force History and Museums Program, United States Air Force, 1997.
- Nebraska State Historical Society. *National Register of Historic Places Nomination: Fairmont Army Airfield.* Fillmore County, Nebraska State Historical Society, 2003.
- "Preservation as a Treatment and Standards for Preservation-Technical Preservation Services, National Park Service." National Parks Service. Accessed March 15, 2019. https://www.nps.gov/tps/standards/four-treatments/treatment-preservation.htm.
- QPublic.net Sumter County, GA. Accessed February 10, 2019. https://qpublic.schneidercorp.com/Application.aspx?AppID=849&LayerID=15775&Page TypeID=1.
- Rice, Rondall Ravon. *The Politics of Air Power: From Confrontation to Cooperation in Army Aviation Civil-military Relations*. Lincoln, Neb.: University of Nebraska Press, 2009.
- "Secretary's Standards--Historical Documentation." National Parks Service. Accessed January 26, 2019. https://www.nps.gov/HISTORY/LOCAL-LAW/arch\_stnds\_5.htm.
- Shettle, M. L., Jr. *Georgia's Army Air Fields of World War II*. Roswell, GA: Shaertel Publishing, 2005.
- Souther Field The Early Years (Southerfield) Americus, GA. Accessed February 12, 2019. http://souther-field.com/index.html.
- Souther Fild During WWI-Americus, GA accessed February 08, 2019, http://souther-field.com/wwl.html
- "Strafe." Merriam-Webster. Accessed March 15, 2019. https://www.merriamwebster.com/dictionary/strafe.
- "Telling the Stories, Part 4: National Register of Historic Places Bulletin." National Parks Service. Accessed March 15, 2019. https://www.nps.gov/nr////publications/bulletins/interp/int4.htm.

- Thole, Lou. *Forgotten Fields of America: World War II Bases and Training, Then and Now.* Vol. 1. 4 vols. Missoula, Montana: Pictorial Histories Pub., 2003.
- Tilden, Freeman, and R. Bruce Craig. *Interpreting Our Heritage*. Chapel Hill: University of North Carolina Press, 2007.
- United States. Department of Defense. Legacy Program. *Miitary Historic Context Emphasizing the Cold War Including the Identification and Evaluation of Above Ground Cultural Resources for Thirteen Department of Defense Installations in the State of Georgia*. By Kelly Nolte, M.A., Mark A. Steinback, M.A., and Amber L. Courselle, B.A. Tuscaloosa, AL: Panamerican Consultants, 2006. Accessed January 9, 2019. https://www.denix.osd.mil/cr/lrmp/home/projects/military-historic-context-emphasizingthe-cold-war-including-the-identification-and-evaluation-of-above-ground-culturalresources-for-thirteen-department-of-defense-installations-in-the-state-of-georgia-pdfreport-legacy-03-175/.
- United States. Department of Defense. Legacy Resource Management Program. *Military Training Lands Historic Context*. By Dan Archibald, Adam Smith, Sunny Adams, and Manroop Chawla. Champaign, IL: Construction Engineering Research Laboratory. Accessed January 8, 2019. https://www.denix.osd.mil/cr/lrmp/factsheets/reports-andother-products/military-training-lands-historic-context-large-arms-ranges-legacy-05-265/, 253, 254.
- United States. Department of Tranportation. Federal Aviation Administration. *Advisory Circular: Airport Landscaping for Noise Control Purposes*. Vol. 150. 5320-14. Washington, D.C.: Department of Transportation, Federal Aviation Administration, 1978.
- United States. Georgia Department of Transportation, Division of Intermodal Aviation Programs. Atlanta, GA: Georgia Department of Transportation, 2018 – 2019.
- United States. Georgia Department of Transportation. Aviation Program. *Georgia Aviation System Plan*.By J. Tom Coleman, Jr., Hal Wilson, Edward S. Ratigan, and Thomas B. Carr, Jr. Accessed January 3, 2018. http://www.dot.ga.gov/IS/AirportAid/AviationSystemPlan.
- United States. Georgia Department of Transportation. Division of Intermodal Aviation Programs. Atlanta, GA: Georgia Department of Transportation, 2018-2019.
- United States. Georgia Department of Transportation. Georgia Airports. 2012 Georgia Airport Pavement Management Report. By Keith Golden, Russell McMurry, Carol L. Comer, and Carla Sands. 2012. Accessed January 3, 2018.

http://www.dot.ga.gov/InvestSmart/Aviation/Documents/PavementMgtReport-ES.pdf.

- United States. Headquarters Department S of the Army and the Air Force. *Surface Drainage Facilities for Airfields and Heliports*. 5th ed. Vol. 88. Washington, D.C.: Headquarters Departments of the Army and Air Force, 1977.
- United States. National Aeronautics and Space Administration. Historic Preservation Aoffice. *Historic Property Survey Report for the Airfield at NASA Ames Research Center Moffett Field, California.* Accessed January 10, 2019. https://historicproperties.arc.nasa.gov/downloads/hpsr\_airfield.pdf.
- United States. U.S. Department of the Interior. National Park Service Cultural Resources. *National Register Bulletin: Guidelines for Evaluating and Documenting Historic Aviation Properties*. By Anne Millbrooke, Patrick Andrus, Jody Cook, and David B. Whipple. U.S. Department of the Interior, National Park Service, National Register of Historic Places, 1998.
- United States. U.S. Department of the Interior. National Park Service, Interagency Resources Division. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*. Washington, D.C.: Interagency Resources Division, 1990.
- United States. U.S. Department of Transportation. Federal Aviation Administration. *The CAA Helps America Prepare for World War II*. by Theresa L. Kraus. July 10, 2017. Accessed January 3, 2019. https://www.faa.gov/about/history/milestones/media/The\_CAA\_Helps\_America\_Prepare \_for\_World\_WarII.pdf.