

Murfreesboro Municipal Airport Safety: Air Traffic Control Tower

Victoria N. Crouch

Middle Tennessee State University

A thesis presented to the Honors College of Middle Tennessee State University in partial fulfillment of the requirements for graduation from the University Honors College

Spring 2020

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By

Victoria N. Crouch

APPROVED:

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Tyler Babb, Associate Professor  
Department of Aerospace

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Dr. Ennio Piano, Assistant Professor  
Department of Economics and Finance

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## Disclaimer

This study was not in conjunction with Murfreesboro Municipal Airport. This study is an independent thesis project for the Honors College at Middle Tennessee State University.

It should be noted that anytime “unsafe” is mentioned it is solely as a response to the actions of other pilots and not because of the airport itself.

## Abstract

This study reveals whether or not an air traffic control tower would improve safety at Murfreesboro Municipal Airport based upon the perceptions of pilots and controllers familiar with the airport. The airport has a high amount of local traffic in comparison to nearby airports with air traffic control towers. This high amount of traffic has proven to be a hazard to other aircraft without adequate management. A safety survey was distributed to pilots who fly out of Murfreesboro Airport and to air traffic controllers who frequently interact with those pilots. The safety survey results, as well as safety reports filed by Middle Tennessee State University pilots, reveal that an air traffic control tower would be beneficial to prevent incidents that could diminish safety. The air traffic control tower would also benefit students' abilities to talk to air traffic control and possibly improve MTSU's air traffic control program by providing integrated learning with the tower.

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# **Murfreesboro Municipal Airport Safety: Air Traffic Control Tower**

## **Thesis Statement**

This study will determine if an air traffic control tower at Murfreesboro Municipal Airport will have the ability to make the airspace safer. Either the tower will have a negative effect, no effect, or positive effect on the level of safety.

## **Introduction**

### **Background**

Murfreesboro Municipal Airport (MBT) is home to Middle Tennessee State University's flight school, Murfreesboro Aviation flight school, and hundreds of general aviation pilots. MBT was founded in the early 1940s, where training for the Army Air Corps and Middle Tennessee State College was held (City of Murfreesboro, n.d.). Currently, MBT is a class G uncontrolled airport with only one runway 4753 feet long and 100 feet wide in both the 180-degree and 360-degree directions (FAA, 2019). Just recently in 2015, the runway was expanded from 3900 feet.

### **Airport Operations**

The Federal Aviation Administration (FAA) keeps records on each public airport in the United States. At MBT, a survey of operations is done each year by a third party called GCR who reports back to the FAA. Airports fill out a form called the Airport Master Record Form 5010 and submit it to GCR. Table 1 shows the relationship of operations between MBT and other related airports. Table 2 shows the number of aircraft based at MBT and other related airports.

**Table 1*****Operations at towered and local airports***

<b>airport</b>	<b>tower</b>	<b>air taxi ops</b>	<b>local GA ops</b>	<b>GA initerant ops</b>	<b>military ops</b>	<b>air carrier</b>	<b>TOTAL</b>	<b>DATE</b>
MBT	no	2000	75000	3600	100	0	80700	12/31/19
BNA	yes	31084	0	36874	2845	147743	218546	12/31/18
MQY	yes	4503	43970	41394	4443	229	94539	3/31/19
TRI	yes	9441	7737	13569	3748	1587	36082	3/31/19
JWN	planned	24345	26025	33160	420	0	83950	8/31/17

*Note.* Operations at towered and local airports are retrieved from GCR.

**Table 2*****Aircraft based at towered and local airports***

<b>Air- port</b>	<b>tower</b>	<b>single- engine</b>	<b>Multi engine</b>	<b>jet engine</b>	<b>Heli- copter</b>	<b>Ultra -light</b>	<b>military</b>	<b>TOTAL FIXED WING</b>
MBT	no	104	17	1	1	1	0	122
BNA	yes	16	15	60	1	0	21	91
MQY	yes	69	22	7	1	0	2	98
TRI	yes	22	17	11	9	0	0	50
JWN	planned	104	23	14	8	0	0	141

*Note.* Aircraft based at towered and local airports are retrieved from GCR.

MBT is compared to three controlled airports and one uncontrolled airport with an air traffic control tower (ATCT) planned. Nashville International Airport (BNA), Smyrna Airport (MQY) and John-Tune Airport (JWN) are all located in Middle Tennessee close to MBT. Tri-Cities Airport (TRI) is located in Johnson City, TN, in the upper east corner of East Tennessee. Although TRI is not located near MBT, it does have an air traffic control tower, but that airport has significantly less air traffic than MBT, hence the comparison.

Smyrna Airport (MQY) operations differ significantly from MBT despite being only 10 nautical miles away. MQY has an air traffic control tower and is home to a National Guard base, so it hosts military aircraft frequently. It also has a charter service, a flight school, and mail center. Assuming MTSU flight school students, who do multiple towered operations a day at MQY, are counted as local, they contribute heavily to the local GA operations. MQY is the only other airport in the state of Tennessee where total local GA operations even come close to MBT, but there is still a 31,030 difference in operations annually between the two, with MBT higher.

In comparison to all towered and nontowered airports in Tennessee, MBT ranks the highest in local GA operations. Tri-cities Airport (TRI) is a Class D controlled airport and has fewer total operations than all the compared airports, as shown in Figure 1. John-Tune Airport (JWN) is scheduled to get an ATC tower because of its high operations, but it only has 3,250 more total operations than MBT. Both MQY and JWN are under Nashville International Airport's (BNA) airspace with a high inflow and outflow of traffic, so it is valid why both airports will have ATC towers. However, local traffic is the most dangerous without a tower. Towers provide constant communication

and direction that pilots do not have at an uncontrolled airport. Several aircraft taking off and landing right after each other and trying to enter the traffic pattern for the airport creates more risk for a midair collision, which many pilots who frequently fly at MBT have come close to. The MBT airspace itself is not what makes MBT unsafe: it is the pilots who fly nonstandard pattern maneuvers, consistently resulting in unsafe separation.

### **Contract Towers**

Because of the size of the airport and lack of commercial operations besides GA, MBT would likely only be considered for a class D airport. At class D airports, contract towers are the most common. A contract tower is defined as an air traffic control tower with employees of private companies instead of the FAA. There are 250 contract towers that operate under the FAA Contract Tower Program (FCT) (FAA, 2019). In Tennessee, there are three contract towers: Smyrna (MQY), Millington (NQA), and McKeller-Sipes (MKL). MQY is the closest class D airport and contract tower airport to Murfreesboro.

The FAA awards grants for the FCT; the applying airports must have a cost-benefit analysis ratio, which is performed by the FAA, of 1.0 to be considered. The ratio includes safety and efficiency benefits. While an ATC tower will slow operations down slightly, ultimately, it will grant a level of safety currently unattainable at MBT.

Boulder City Municipal Airport (BVU), located at Boulder City, NV, published an article about their efforts to obtain a contract ATC tower at their uncontrolled airport. The airport manager stated that the tower was considered because of airport safety; BVU's air traffic increased past the 100,000 annual operations threshold to be considered for an ATC tower per the FAA. The FAA is paying up to 93.75% of the \$4.95 million project cost, meaning the airport has to pay only \$309,000 (Shortt, 2018). While MBT

has not reached the 100,000 annual operations threshold, JWN has not either, and JWN is planned to receive an ATC tower.

In an FAA audit evaluating the effectiveness of contract towers, the Inspector General discusses the increase in safety at airports with contract towers. In comparison to FAA towers, contract towers operate at lower costs, but they meet the same quality of safety services as FAA towers. Contract towers, on average, cost \$1.5 million less than a similar FAA tower because of lower staffing and salary. Contract towers also have a lower number of safety incidents compared to similar FAA towers (FAA, 2012). The memorandum states “240 contract towers... had 197 safety incidents in [full year] 2010, compared to 362 at 92 similar FAA towers” (FAA, 2012, p. 2). The low operating cost and proven safety benefits of a contract tower could be a significant contribution to further improve the safety of local operations at MBT.

### **Safety Surveys**

In November, the IRB request form was sent in; however, the exempt request form sent in was the wrong one and was about 2 years old. Once the correct form was found, it was sent in but was found to be incomplete and two other forms needed to be submitted along with training. Two versions of one form needed to be completed because there were two different surveys. The forms were found again to be incomplete, and the final forms did not get submitted until late January, two months after the planned survey distribution time. January 24, 2020, the survey received IRB exemption. Appendix B provides copies of all IRB forms submitted, along with the exempt designation notice. When contacting the various people to distribute the survey, one contact was worried about the wording of some of the questions and only distributed to

select people. In hindsight, he should have been contacted before the survey questions were made.

The surveys were distributed on January 30, 2020 via links to a Qualtrics survey and were open until February 10, 2020. Middle Tennessee State University Flight School, Murfreesboro Aviation, and Murfreesboro Airport received the pilot survey, and BNA air traffic control and MQY air traffic control received the air traffic control survey. Appendix C states the survey questions.

### **Pilot Survey**

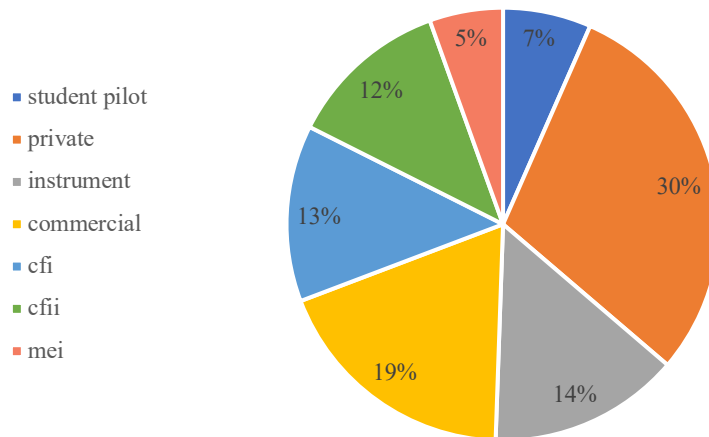
One hundred and fifteen pilot surveys were received; however, only 96 were viable, and 11 were partially incomplete. A majority of survey participants indicated they were from MTSU Flight School, with only 6 indicating they were an owner or operator of an aircraft, 1 Civil Air Patrol, and 3 from Murfreesboro Aviation. The highest certificates of participants included 6 student, 27 private, 13 instrument, 17 commercial, 12 certified flight instructor, 11 certified flight instructor-instrument, and 5 multi-engine instructor. Figure 1 shows the percentages of pilot certificates and ratings. Sixty-six pilots fly a couple times a week. Fifty-nine pilots have 51-200 total flight hours. Figure 2 shows the percentages of pilot flight hours. A majority of pilots who participated in the survey fly at MBT a couple times a week or more, as shown in Figure 3. Therefore, the experiences reported are likely to be accurate. Overall, a majority of pilots who fly at MBT have a good amount of experience with MBT airspace and operating with other pilots in an uncontrolled airspace.

However, with a lot of pilots choosing how and where they fly themselves instead of controllers directing that traffic, there have been instances where airplanes have been

cut off by others on final, have been on the runway at the same time as others, or have had to wait for several airplanes to land before they can even depart. As shown in Figure 3, 66% of pilots said they sometimes had to go around while on final because another airplane decides to takeoff in front of them, while 30% said never, and 3% said half the time. As shown in Figure 4, 61% of pilots said they never were operating an aircraft and decided to take off in front of an aircraft on final, while 34% said sometimes, and 5% said half the time. From these statements, it can be

**Figure 1**

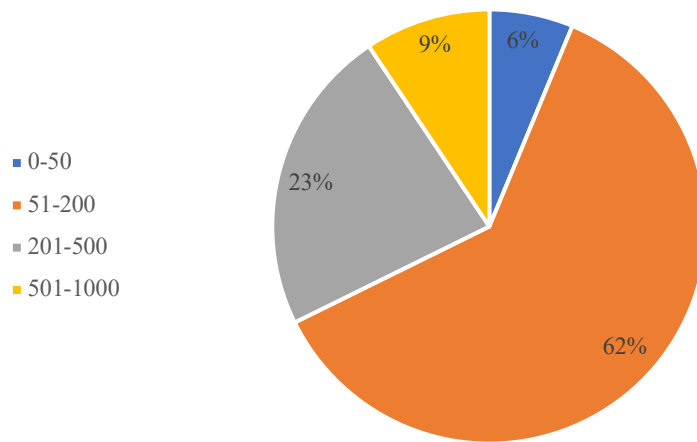
*Most advanced certificate or rating held out of 94 survey participants*



**Figure 2**

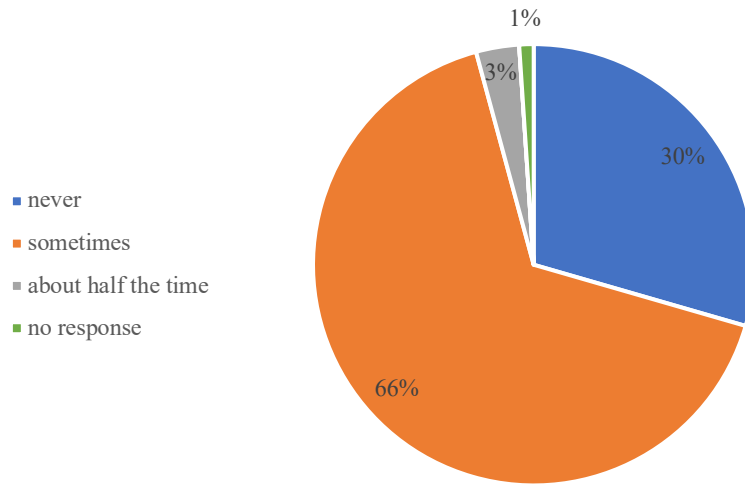
*Total flight time for 94 survey participants*





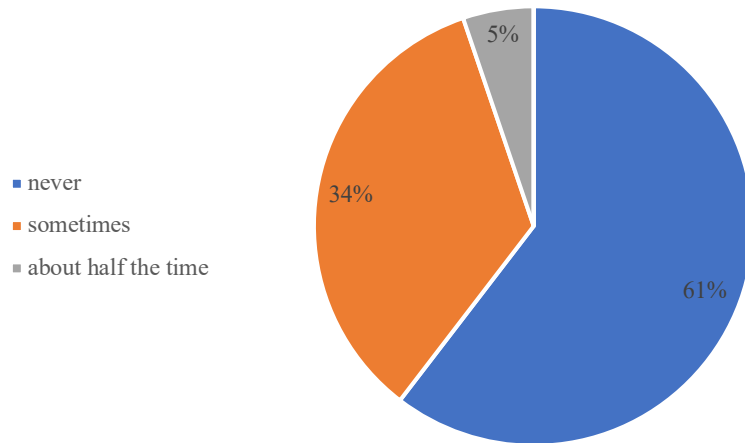
**Figure 3**

*Percentage of pilots going around on final because an aircraft takes off in front of them*



**Figure 4**

*Percentage of pilots taking off in front of aircraft on final*



assumed that a majority of pilots who took off in front of other aircraft on final were not from MTSU flight school, since that is where a majority of pilot safety survey participants are from.

As for airplanes being on the same runway as other airplanes, only 29 pilots said yes, they have seen or been involved in an instance with two airplanes on the runway. There is some controversy whether or not this can be considered a “runway incursion” because MBT is uncontrolled. Nonetheless, this can still pose a safety issue, as stated in safety reports by MTSU flight school.

When pilots are waiting to take off, 43% stated they had to wait for more than two planes to land to finally depart a moderate amount. Twenty-nine percent of pilots stated this occurred often. Twenty-four percent of pilots stated this occur every once in a while. Two percent of pilots stated that this occurred all the time, and two percent said never. This comparison is shown in Figure 5. This common occurrence of waiting for several aircraft to land while trying to depart is caused by the large numbers of traffic during busy times at the airport, likely because of repeating traffic patterns at MBT by the same aircraft or returning traffic from other airports or practice areas.

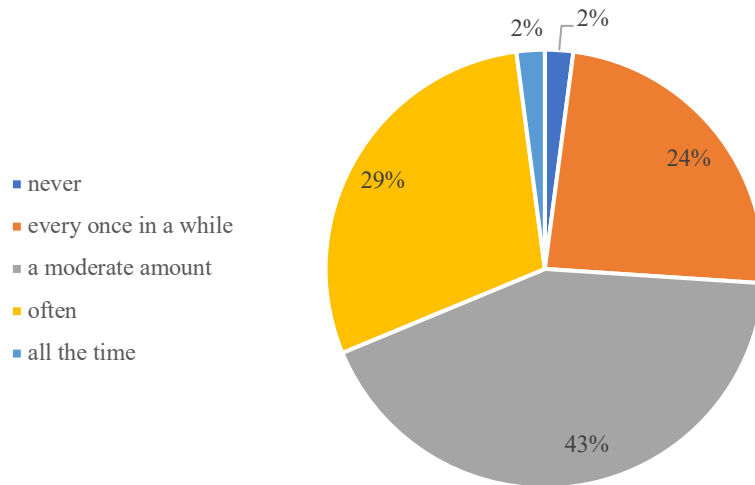
This high traffic level can decrease how safe pilots feel in the airspace. All MTSU aircraft have ADS-B, or Automatic Dependent Surveillance Broadcast. ADS-B transmits an aircraft’s GPS location to air traffic controllers as well as other aircraft who have an ADS-B receiver (AOPA, 2020). Forty-four percent of pilots stated that ADS-B increased their safety comfort level “a great deal,” and 25% of pilots stated that ADS-B increased their safety comfort level “a lot.” Overall, as shown in Figure 6, ADS-B

increases safety comfort level a substantial amount in comparison to not having ADS-B.

Without a tower, ADS-B is very useful in

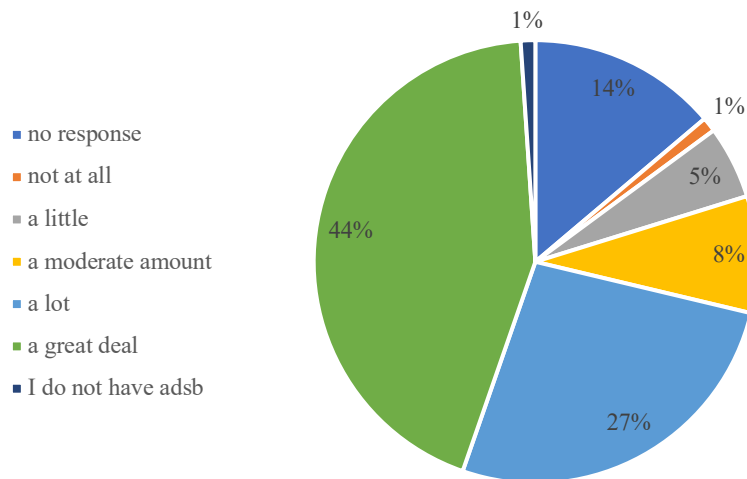
**Figure 5**

*Percentage of pilots who had to wait for more than two planes to land before taking off*



**Figure 6**

*Participants perception of increased safety due to ADS-B equipment*



uncontrolled airspace; however, pilots need to be aware that not all aircraft have ADS-B and traffic vigilance is still important.

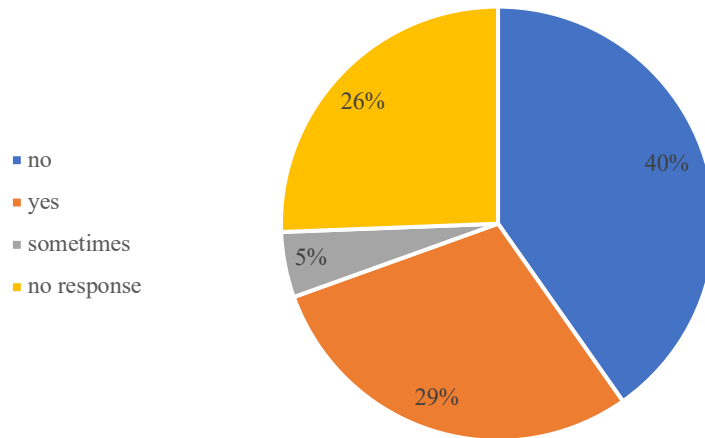
Pilots also reported their feelings of safety at MBT, as shown in Figure 7. Forty percent of pilots felt safe, 29% of pilots felt unsafe, and 5% of pilots sometimes felt unsafe. When given an option for additional comments about why pilots felt safe at and around MBT, pilots stated that the increased traffic was not necessarily unsafe, but it was stressful at times; pilots simply need to be vigilant when looking for traffic. When expecting MBT to be busy, pilots can increase their situational awareness. Out of the pilots who stated that they felt safe, private pilots composed 34%, the highest percentage. Student pilots made up 12%. This is shown in Figure 8. This statement is ironic because student pilots and private pilots have the least amount of flight time. However, this could simply be the result because private pilots make up a majority of pilots who took the survey.

When given an option for additional comments on why pilots felt unsafe at and around MBT, common responses included congested patterns, near collisions, no radio calls, difficulty seeing other aircraft, and nonstandard procedures. As shown in Figure 9, the highest percentage of pilots who felt unsafe were the pilots with their private pilot certificate at 24%. The difference in private pilots feeling safe versus unsafe was made up by commercial pilots. Twenty percent of commercial pilots stated they felt unsafe, a 5% increase. There is also an increase in instrument pilots and instrument instructors

feeling unsafe. The pilots who stated they sometimes felt unsafe gave situational-based reasons, such as “only with heavy traffic” and “only with inexperienced pilots.” A caveat to “inexperienced pilots” is that MBT is a training ground for new pilots, so there are always inexperienced pilots flying.

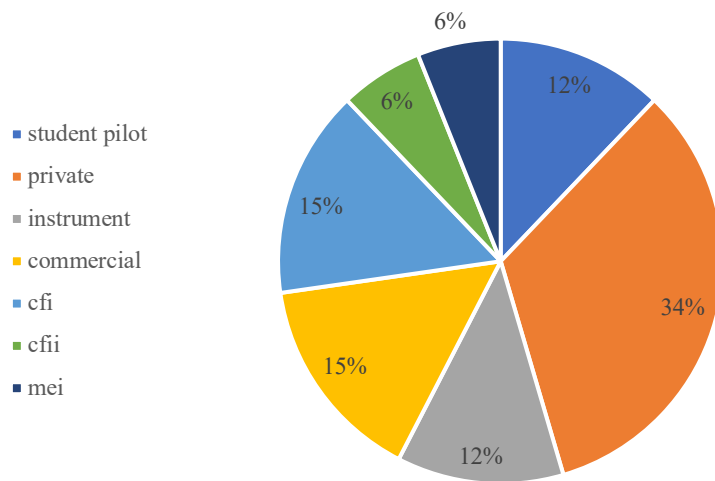
**Figure 7**

*Percentage of pilots feeling safe at MBT*



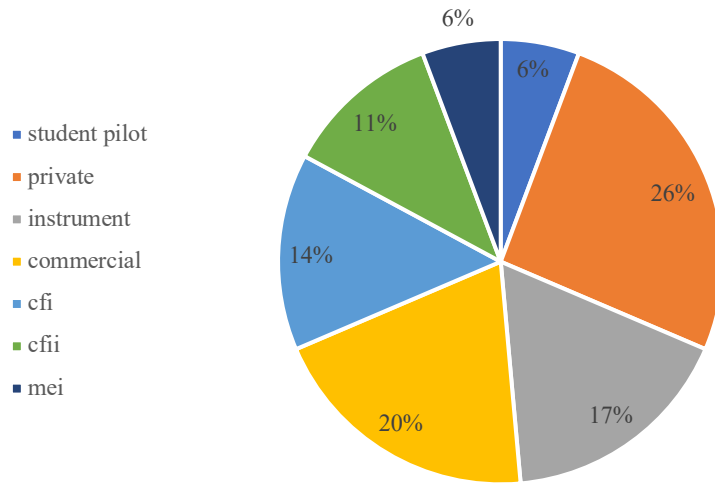
**Figure 8**

*Percentage of certificates of pilots who stated they felt safe at MBT out of 24 participants*



**Figure 9**

*Percentage of certificates of pilots who stated they felt unsafe at MBT out of 33 participants*



**Figure 10**

*Number of hours of pilots who stated if they felt safe or unsafe at MBT*

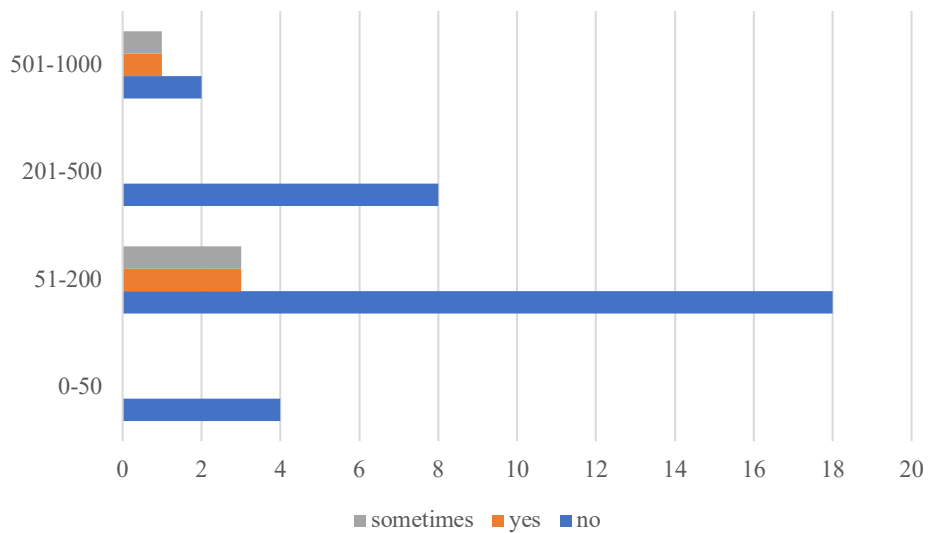




Figure 10 shows the number of hours pilots reported having versus their response to feeling safe at MBT. The majority of pilots who said no were within the 51-200 hour range.

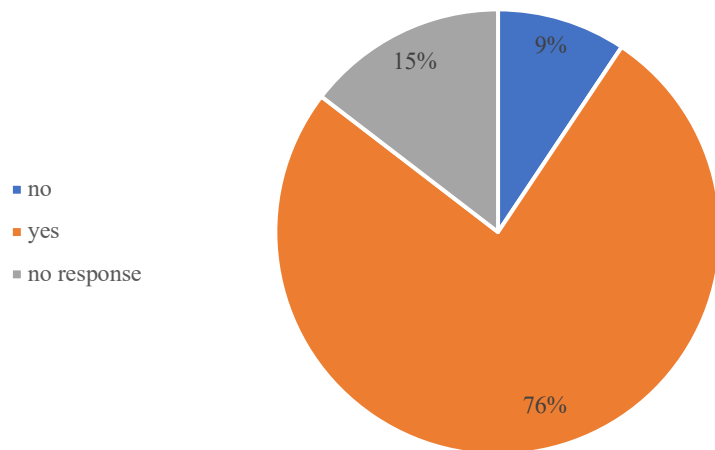
The 51-200 hour range was the most common of pilots who participated in the survey, so this is to be expected. The next highest “no” response was the 201-500 hour range; however, the surprising result was that no pilots within that range stated they felt unsafe at any time, yet in the 501-1000 hour range there were at least two pilots who stated they felt unsafe. There is not enough data to determine if this is a coincidence or a trend of the pattern where the pilots have passed a threshold of invulnerability after 500 hours.

To counteract the safety concern at the airport, pilots were asked if they believed an air traffic control tower would increase safety at MBT. As shown in Figure 11, 76% of pilots said that it would. Out of the 9 pilots who said an ATC tower would not increase safety, 4 were instrument students and 3 were instrument instructors. This is interesting because instrument students and instructors are the ones who talk to ATC the most. The reasons given included “MTSU already does what it can with safety” and the airspace would be more “hectic” instead of safe. On the other hand, pilots who said yes had more substantial reasons, as shown in Figure 12. The greatest cause for concern among pilots was aircraft separation, with 25 pilots stating that increased separation between aircraft would increase safety. The second most common reason was traffic organization; an ATC tower would better organize traffic. Less common reasons, but still substantial, include required communication, improved training, and “extra eyes” to avoid traffic.

Another question asked whether or not an ATC tower would or would not benefit MBT overall. Although most pilots stated that an ATC tower increases safety, fewer said that a tower would benefit MBT. The number of people who said no to a tower increased from 4 to 17.

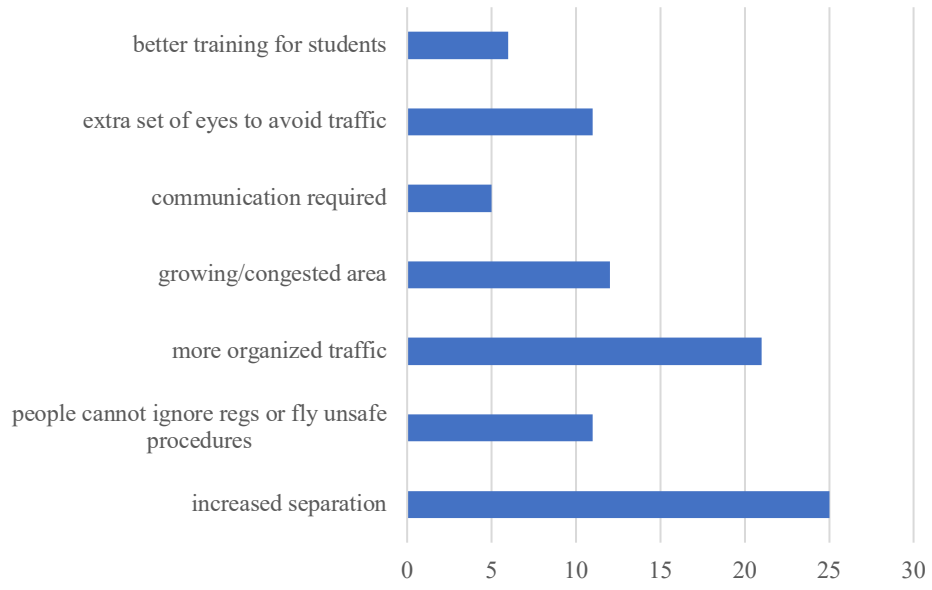
**Figure 11**

*Percentage of pilots who believe an air traffic control tower would increase safety at MBT*



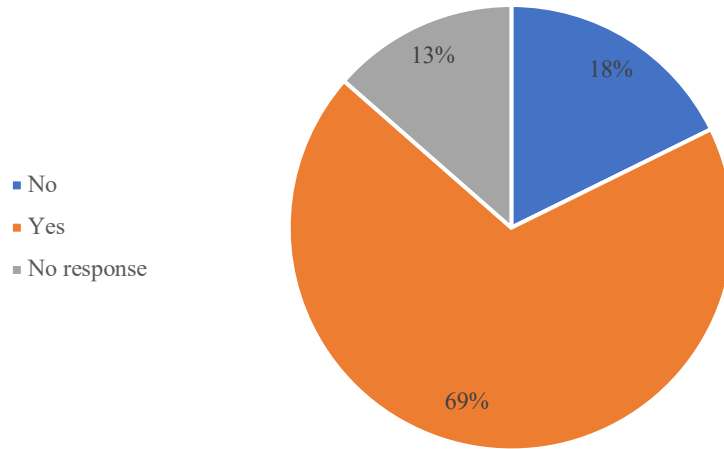
**Figure 12**

*Reasons given on why an ATC tower would increase safety at MBT*



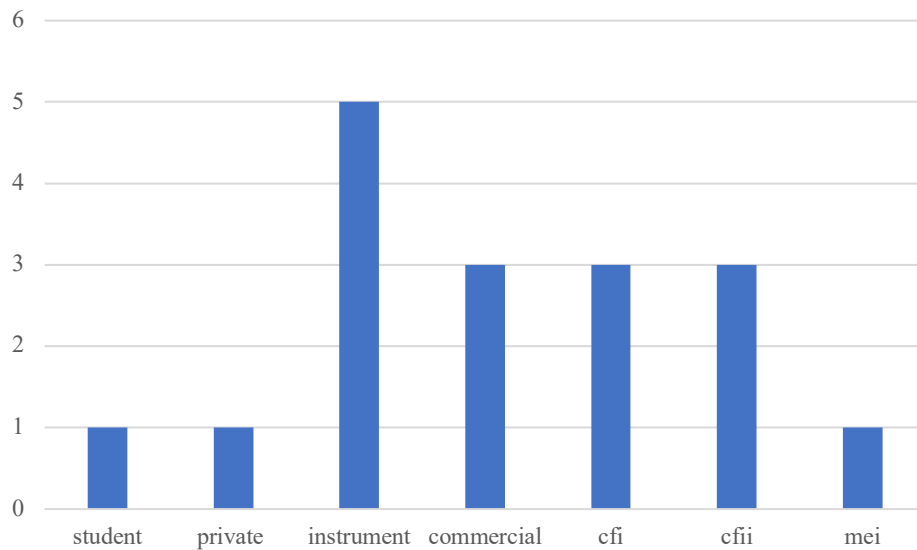
**Figure 13**

*Percentage of pilots on whether an ATC tower would or would not benefit the MBT aviation community*



**Figure 14**

*Number of certificates and ratings of pilots who do not think an ATC tower is beneficial to MBT*





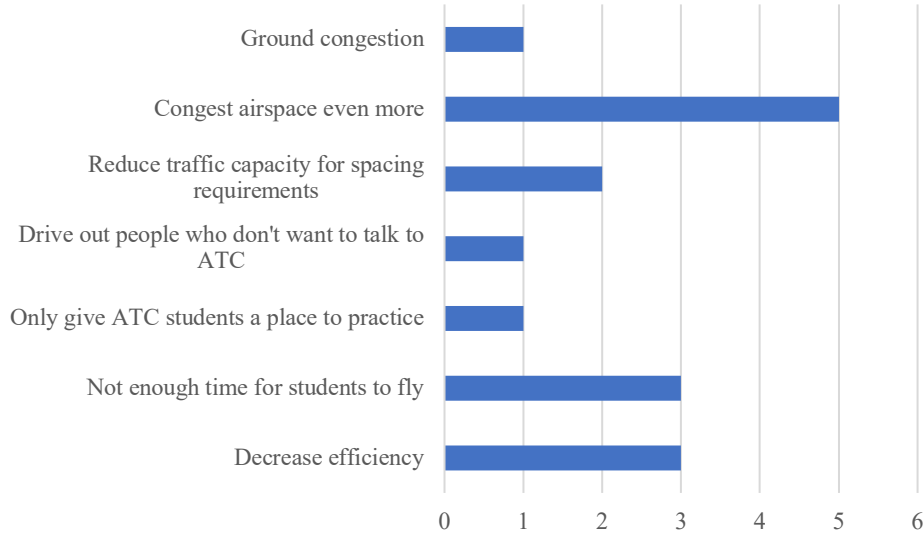
As shown in Figure 13, the reason for the increased number of no responses is because more people responded to the question. The corresponding certificates and ratings that do not think a tower is beneficial is shown in Figure 14. Seven flight instructors do not want a tower, while 5 instrument pilots and 3 commercial pilots do not want a tower. The reasons pilots don't believe a tower would benefit MBT are shown in Figure 15, the most common being congested airspace. However, several instructors are worried about the decreased efficiency, leading to students not having enough time to fly or even increased training costs because of spending longer in the air getting sequenced by ATC. Increased training cost was also mentioned a couple times in the additional comments section of the survey. However, there are several reasons why pilots want the tower, the most common reason being general safety as shown in Figure 16, but other reasons include improved traffic flow, better understanding of controlled airspace, and education and better training quality. Several pilots who participated said that talking to ATC was a weakness in their training. In addition, ATC minors at MTSU could receive real-life experience with ATC on a daily basis, improving quality of training among MTSU Aerospace students other than pilots.

In the additional comments section of the survey, other suggestions included encouraging instructors to take students to other local airports to practice pattern work instead of flying at MBT. This solution is already in effect; the problem with congestion lies when all the airplanes at the other airports decide to return to MBT at the same time and when several airplanes are trying to depart MBT. Another suggestion was adding an additional runway parallel to 18-36. However, this brings up the issue of nearby

neighborhoods right next to the airport. The airport has a limited amount of space it can grow because it is bordered by neighborhoods on two sides,

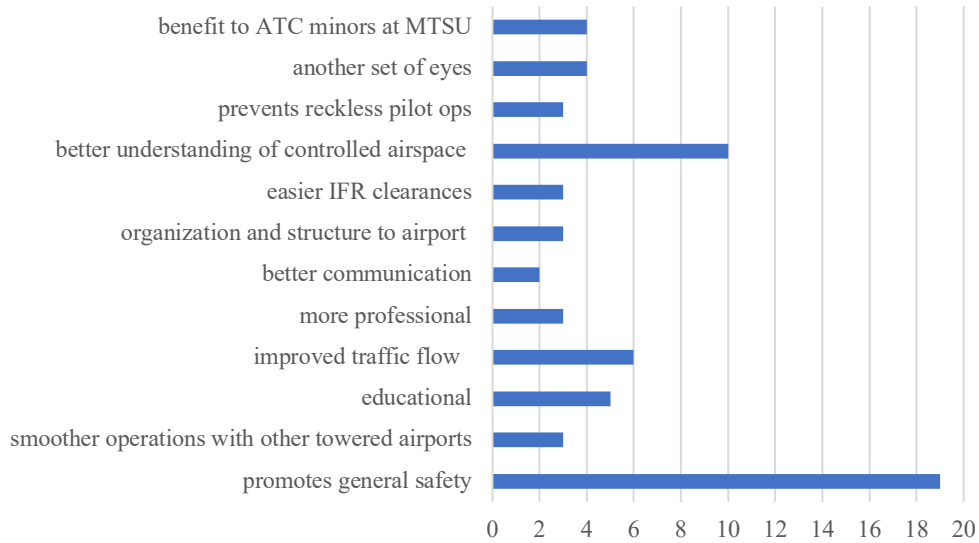
**Figure 15**

*Reasons an ATC tower would not benefit MBT*



**Figure 16**

*Reasons an ATC tower would benefit MBT*





commercial venues and city parks on one side and a road on another side. Compliance with FAA requirements means that parallel runways must have a separation of 700 feet between both centerlines just for VFR operations (FAA, 2014). IFR operations require more separation. Additional suggestions include that the tower is only open for certain hours, which is most common for contract towers. Other comments include how much a tower at MBT would help out BNA and SYI ATC.

### **Air Traffic Controller Survey**

Eight air traffic controllers participated in the ATC survey. Seven participants were from BNA and one participant was from MQY. Five controllers have been controllers for over ten years. Five controllers from BNA have worked their 1-5 years, 1 controller from BNA has worked there for 5-10 years, one controller from MQY has worked there for 5-10 years, and one controller from BNA has worked there for more than ten years. All controllers stated that they talked to an aircraft from MBT every day, with the busiest time of day at 1-4pm.

Regarding a possible ATC tower at MBT, seven controllers said that would not increase their workload, and the tower would increase safety at MBT and surrounding airspace. When asked why an ATC tower would increase safety, three responded that there is too much uncontrolled traffic in a small area to be considered safe. Adding control and standardized procedures will increase safety greatly and will add efficient traffic flow into the busy airport. All eight agree that the tower would benefit MBT overall because of increased safety, more practice with ATC, and would benefit MTSU's flight training quality.

Seven controllers either agree or strongly agree that pilots at MBT are less experienced than most professional pilots, likely because our pilots are still students. Five controllers either agree or strongly agree that this inexperience makes the controllers' job more difficult; however, they all agree that pilots as pilots gain more experience communicating with air traffic control, flight safety increases. Other comments include acknowledging that a tower will make the pattern at MBT less efficient, but it will help prevent any possible accidents that will likely happen if the airport flight population continues to grow.

### **MTSU Safety Reports**

Middle Tennessee State University provides an online safety reporting system that anyone can use. Between April 22, 2010, and January 30, 2020, there have been a total of 484 reports. Over the last couple years, the frequency of reports has increased after transitioning from paper reports to electronic reports. For the purpose of this study, 148 reports relate directly to the safety of MBT. The reports deleted were outside 5 miles from MBT, maintenance issues, unsafe practices on the ramp not controllable by a tower, or repeat reports. Each report was divided into one of 7 categories:

- Two aircraft on the runway at the same time
- No radio calls or communications
- Too-close separation
- Aircraft cut off in pattern/takeoff/landing
- Maneuvers to avoid other aircraft
- Inactive runway used
- Nonstandard or unsafe procedures

Nonstandard or unsafe procedures reported include:

- Entering traffic pattern not on the 45 (including crossing over midfield)
- 360 degree turn in the pattern
- UAS operations
- Conversations on frequency

- Incorrect radio calls
- Flying too close to downtown Murfreesboro or MTSU's campus
- Low approach while other aircraft are on the runway
- Aircraft above/below other aircraft in the pattern

The most common nonstandard or unsafe procedures include five reports of traffic not entering the pattern on the 45, four reports of a 360 turn in the pattern, and two reports of flying too close to downtown Murfreesboro or MTSU's campus.

Figure 17 shows the percentages of each category of the reports. Aircraft cut off in the pattern had the most reports at 49 reports, making up 21%. This is likely a result of a large amount of traffic during the busy times of the day. Pilots make their own decisions, which results in other pilots having to go around or even make a 360 degree turn while in the pattern. The second most common category was nonstandard and unsafe procedures, including the 360 degree turns in the pattern. Again, this is a result of pilots making their own decisions in the traffic pattern during busy times of the day.

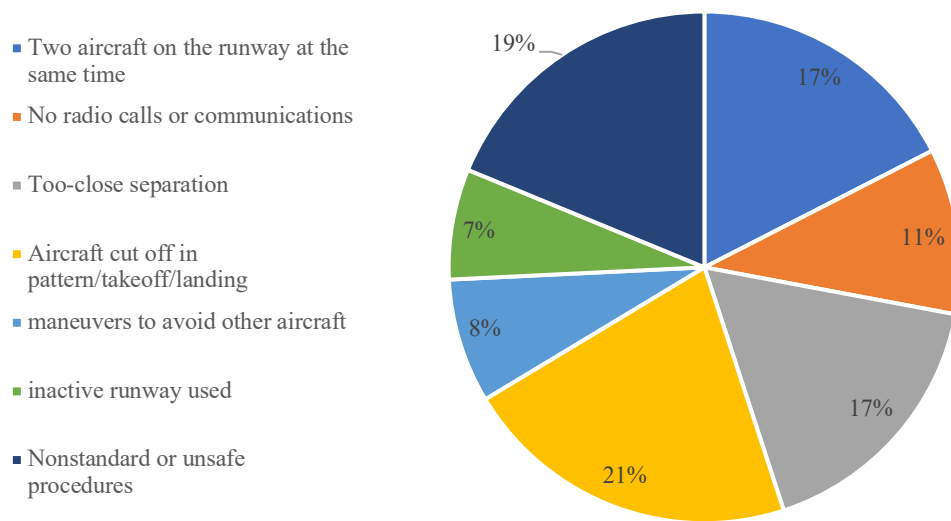
Several reports fall under multiple categories because one action can lead to another result, such as two aircraft on the runway at the same time causing too-close separation or no radio calls causing the inactive runway to be used. The most common combination is too-close separation resulting from nonstandard or unsafe procedures, with twelve reports. Two aircraft on the runway at the same time resulting in too-close separation has nine reports. Maneuvers to avoid other aircraft because of nonstandard or unsafe procedures have eight reports. Appendix D provides a table with all applicable MTSU safety reports and respective categories.

It should be noted that all the data gathered is just from what is reported. All safety reports may not show an accurate number of the number of times a pilot encounters any of the categories listed because a pilot does not report it. There is a trend

of traffic at MBT increasing; thus, likely an increase of incidents similar to what has been reported in the past. Although the implementation of electronic safety reports has allowed easier access to report such incidents, there is a chance where those who do not report see these incidents simply as a normal

**Figure 17**

*Percentage of MTSU safety report categories*



occurrence at MBT. This is normalization of deviance, which is the gradual process of potential safety risks becoming “acceptable in the absence of adverse consequences” (Rosenkrans, 2015). As reported by air traffic controllers in the air traffic control safety survey, if the trend continues of the increasing traffic and close calls, an accident is likely to occur.

### **Other Safety Factors**

The ILS 32 into MQY descends between 3,000ft mean sea level (MSL) and 2,000ft MSL over MBT between the fixes JOPIV and OXCUH, as shown in the ILS 32 MQY instrument approach chart in Figure 18. The ILS 32 MQY initial approach fix JOPIV is just before MBT. If MBT has a tower, the airspace will likely end at 3,100ft MSL because of standard Class D airspace dimensions being 2,500ft above the airport elevation and MBT’s elevation is 614ft MSL (FAA, 2020). This would mean that the ILS 32 MQY will cut into MBT airspace. However, with a tower at MBT, communication between MQY and MBT would be crucial, so this will actually increase safety. MBT ATC will be able to control aircraft from interfering with other air traffic flying the ILS 32 into MQY.

### **Conclusion**

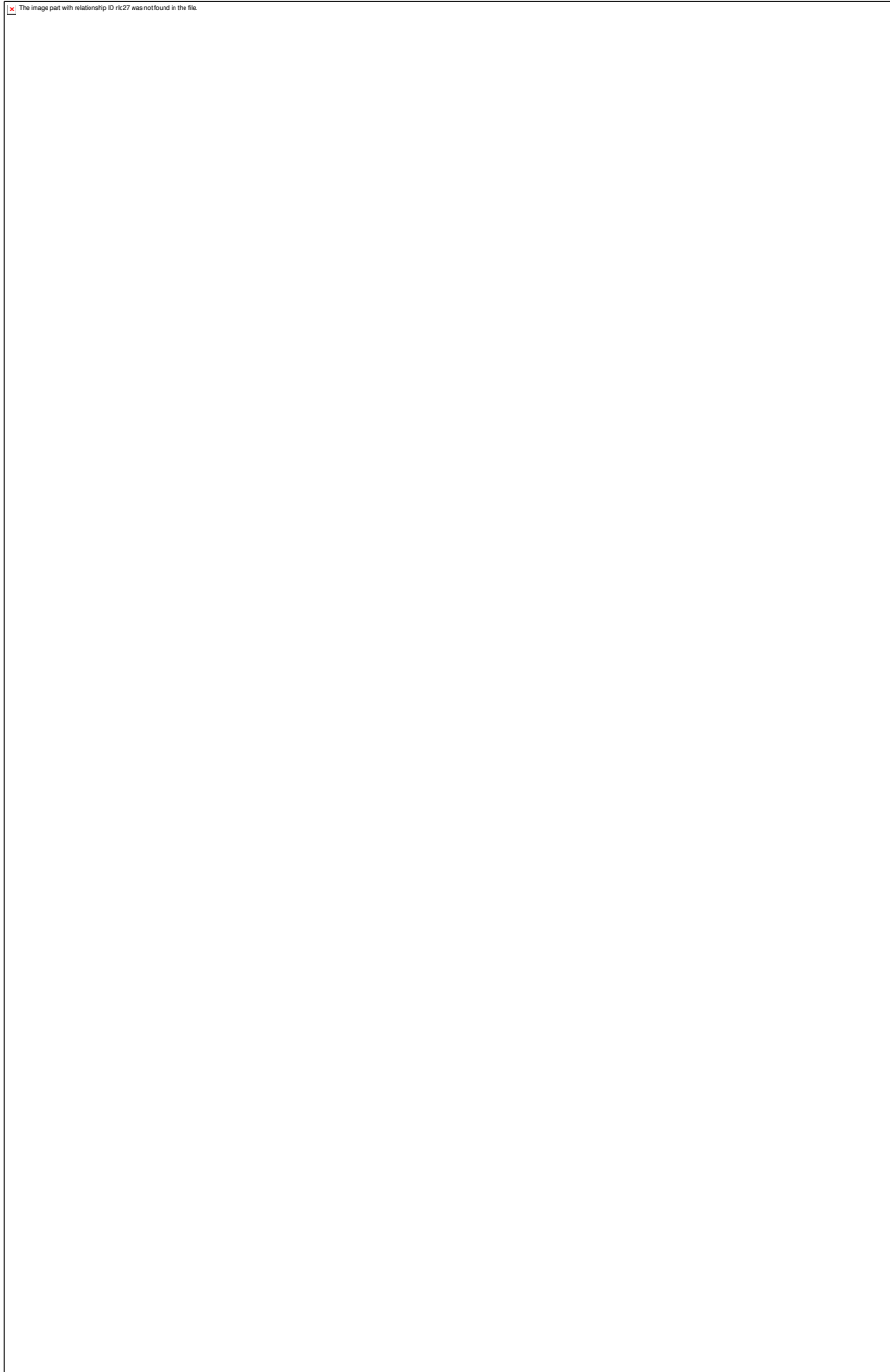
To conclude, an air traffic control tower will have a positive effect on the level of safety at MBT. The ATC tower will better organize traffic and improve communication, which will provide a safer environment for aircraft. The tower would also give a sense of security to pilots and nonpilots by providing an extra set of eyes for traffic alerts. Communications between MBT, MQY, and BNA will be easier for both pilots and controllers, which can reduce the workload for both parties. Threats, such as no radio

calls in a high traffic environment, will be limited during busy times of the day.

Unfortunately, there are also drawbacks, such as reduced overall efficiency, but in aviation, safety is the number one priority. Therefore, based upon the increased safety benefits, MBT would benefit overall from an ATC tower.

**Figure 18**

*Instrument Approach ILS 32 MQY*



*Note.* Retrieved from <https://aeronav.faa.gov/d-tpp/2004/00895ILD32.PDF>

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## Appendix A. Terms and Definitions

ADS-B: Automatic dependent surveillance – broadcast; broadcasts an aircraft's GPS position to

air traffic controllers and other aircraft that have ADS-B receivers

Air taxi operations: Operators carrying passengers or mail

ATC: Air traffic control; keeps separation of aircraft in the sky and at controlled Airports

BNA: Nashville International Airport

Controlled airspace: airspace that has air traffic control services and requirements; classes A, B, C, D, E

Commerical operations: defined by the FAA as scheduled operations by certified carriers

FAA: Federal Aviation Administration; part of the United States Department of Transportation; makes and enforces aviation rules and regulations

GA: general aviation; not commercial or military aviation operations

IFR: instrument flight rules

Itinerant operations: defined by the FAA as operations not qualifying as local, but not air taxi

or commuter

JWN: John-Tune Airport

Local operations: defined by the FAA as operations within the local traffic pattern of an airport or within 20 nautical miles of the airport

MBT: Mufreesboro Municipal Airport

MQY: Smyrna Airport

Uncontrolled airspace: airspace that does not have air traffic control services and requirements;

class G

VFR: visual flight rules

## Appendix B – IRB Documents

### IRB Exempt Request Form

#### **IRB**

**INSTITUTIONAL REVIEW BOARD**  
Office of Research Compliance,  
010A Sam Ingram Building,  
2269 Middle Tennessee Blvd  
Murfreesboro, TN 37129



#### IRBN007 – EXEMPTION DETERMINATION NOTICE

Friday, January 24, 2020

Principal Investigator **Victoria N. Crouch** (Student)  
Faculty Advisor Tyler Babb  
Co-Investigators NONE  
Investigator Email(s) *vc3a@mtmail.mtsu.edu; tyler.babb@mtsu.edu*  
Department Aerospace

Protocol Title ***Murfreesboro municipal airport safety: Air traffic control tower***  
Protocol ID **20-1082**

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the **EXEMPT** review mechanism under 45 CFR 46.101(b)(2) within the research category (2) *Educational Tests*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated as shown below:

IRB Action	EXEMPT from further IRB review***	Date	1/24/20
Date of Expiration	12/31/2020		
Sample Size	1,000 (ONE THOUSAND)		
Participant Pool	Healthy adults (18 or older) - MTSU students (Professional Pilot Program), Professional Pilots (Murfreesboro Aviation), and Air Traffic Controllers (Nashville and Smyrna)		
Exceptions	Online consent followed by internet-based survey using Qualtrics is permitted (Qualtrics links on file)		
Mandatory Restrictions	<ol style="list-style-type: none"> <li>1. Participants must be 18 years or older</li> <li>2. Informed consent must be obtained from the participants</li> <li>3. Identifying information must not be collected</li> </ol>		
Restrictions	<ol style="list-style-type: none"> <li>1. All restrictions for exemption apply.</li> <li>2. Mandatory active informed consent with age-verification.</li> <li>3. NOT approved for in-person data collection.</li> </ol>		
Approved IRB Templates	IRB Templates: Online Informed Consent and Email Recruitment Non-IRB template: NONE		
Funding	NONE		
Comments	NONE		

\*\*\*Although this exemption determination allows above defined protocol from further IRB review, such as continuing review, MTSU IRB will continue to give regulatory oversight to ensure compliance.

**Summary of Post-approval Requirements:**

The investigator(s) indicated in this notification should read and abide by all applicable post-approval conditions (refer "Quick Links" below for more information):

- PI must close-out this protocol by submitting a final report before **12/31/2020**; if more time is needed to complete the data collection, the PI must request an extension. **NO REMINDRES WILL BE SENT. Failure to close-out (or request extension) may result in penalties** including cancellation of the data collected using this protocol or withholding student diploma.
- IRB approval must be obtained for all types of amendments, such as:
  - Addition/removal of subject population and sample size
  - Change in investigators
  - Changes to the research sites – appropriate permission letter(s) from may be needed if the study will be conducted at a non-MTSU location
  - Alternation to funding
- Modifications to procedures must be clearly described in an addendum request form and the proposed changes must not be incorporated without an approval
- The proposed change must be consistent with the approved protocol and comply with exemption requirements
- Research-related injuries to the participants and other events, such as, deviations & misconduct, must be reported within 48 hours of such events to [compliance@mtsu.edu](mailto:compliance@mtsu.edu)

**Post-approval Protocol Amendments:**

The current MTSU IRB policies allow the investigators to implement minor and significant amendments that would not result in the cancellation of the protocol's eligibility for exemption. **Only THREE procedural amendment requests will be entertained per year. This amendment restriction does not apply to minor changes such as language usage and addition/removal of research personnel.**

Date	Amendment(s)	IRB Comments
NONE	NONE.	NONE

**Post-approval IRB Actions:**

Date	IRB Action(s)	IRB Comments
NONE	NONE.	NONE

**Mandatory Data Storage Requirement:** All research-related records (signed consent forms, investigator training and etc.) must be retained by the PI or the faculty advisor (if the PI is a student) at the secure location mentioned in the protocol application. The data must be stored for at least three (3) years after the study is closed. Additionally, the Tennessee State data retention requirement may apply (refer "Quick Links" below for policy 129). Subsequently, the data may be destroyed in a manner that maintains confidentiality and anonymity of the research subjects. **The IRB reserves the right to modify/update the approval criteria or change/cancel the terms listed in this notice.** Be advised that IRB also reserves the right to inspect or audit your records if needed.

Sincerely,

Institutional Review Board  
Middle Tennessee State University

**Quick Links:**

- Post-approval Responsibilities: <http://www.mtsu.edu/irb/FAQ/PostApprovalResponsibilities.php>
- Exemption Procedures: <https://mtsu.edu/irb/ExemptPaperWork.php>
- MTSU Policy 129: Records retention & Disposal: <https://www.mtsu.edu/policies/general/129.php>

## IRB Email to Participants

**IRB**  
INSTITUTIONAL REVIEW BOARD  
Office of Research Compliance,  
010A Sam Ingram Building,  
2269 Middle Tennessee Blvd  
Murfreesboro, TN 37129



### IRBF007b – PARTICIPANT RECRUITMENT EMAIL

All the fields are mandatory. The IRB will not make changes to the font size or style. No images will be allowed and there will be no exceptions to all the requirements. The IRB may impose additional restrictions and requirements during the review. This front page can be omitted after IRB approval is obtained.

#### Subject line(s) for email recruitment:

RE: MTSU Research: Invitation for Murfreesboro Airport Safety Survey

Body of the script/email:

---

**Primary Investigator:** Victoria Crouch  
**PI Department & College:** Aerospace Department, College of Basic and Applied Sciences, **Middle Tennessee State University**  
**Faculty Advisor (if PI is a student):** Tyler Babb  
**Protocol Title:** Murfreesboro Municipal Airport: Air Traffic Control Tower  
**Protocol ID:** 20-1082      **Approval Date:** 01/24/2020      **Expiration Date:** 12/31/2020

Dear pilots and air traffic controllers,

I am currently working on an Honors Thesis project to determine the current levels of safety at Murfreesboro airport to learn if an air traffic control tower would be beneficial for safety

**Study Description & Purpose** – Two surveys are available for air traffic control towers and pilots. Your responses to these surveys will be used to determine the current level of safety at Murfreesboro Airport and to determine if an air traffic control tower at Murfreesboro Airport will increase safety.

**Target Participant Pool** – Pilots who fly at Murfreesboro Airport may participate in the pilot survey. Air traffic controllers who work at Nashville Airport or Smyrna Airport may participate in the air traffic control survey. People who do not meet the previous qualifications may not participate in the surveys.

**Risks & Discomforts** – In the survey, you will be providing opinions and personal experiences about Murfreesboro Airport, however, no names will be gathered.

**Benefits** – There are no direct benefits to survey participants.

**Additional Information** – Each survey will take about 20 minutes. Participation in the survey is not required, and participants may discontinue the survey at any time.

**Compensation** – There is no compensation for completing this survey.

**Contact Information** – If you have any questions, contact the Principal Investigator, Victoria Crouch, at 865-360-3334 or vc3a@mtmail.mtsu.edu, or contact the faculty advisor, Tyler Babb, at tyler.babb@mtsu.edu. .

Separate surveys are given below for air traffic controllers and student pilots. Please enter the appropriate survey by clicking one of the link in the bottom of the email. You will be given a chance to read the entire informed consent to assist you make a final determination.

Yours Sincerely,

Victoria Crouch

**Qualtrics link for Survey**

Air Traffic Control Survey: [https://mtsu.ca1.qualtrics.com/jfe/form/SV\\_3U8fuwaQtbhIDF3](https://mtsu.ca1.qualtrics.com/jfe/form/SV_3U8fuwaQtbhIDF3)

Pilot Survey: [https://mtsu.ca1.qualtrics.com/jfe/form/SV\\_cXSfJNrXsFie7H](https://mtsu.ca1.qualtrics.com/jfe/form/SV_cXSfJNrXsFie7H)

Applied



# IRB Consent Form

## IRBF024 - INFORMED CONSENT for ONLINE STUDIES

(Use this consent template when recruiting adult participants when online data are collected)

### Mandatory Consent Requirements for online use:

- a. Use the same text used in this form when requesting online consent from the participants – Provide the online consent link for IRB review
- b. The first page of the survey must display this informed consent text.
- c. Participants' consent to participate must be entertained by two distinct responses: one to consent and one to decline.
  - i. The participant age must be verified through a separate question
  - ii. Agreeing to consent and age verification must both be true before the online instrument can be administered.
  - iii. Additional questions may be asked for filtering ineligible participants

### IRBF024 – Participant Informed Consent (ONLINE)

Language to be used for online surveys that qualify for “no more than minimal risk”

**Primary Investigator:** Victoria Crouch

**PI Department & College:** Aerospace, College of Basic and Applied Sciences

**Faculty Advisor (if PI is a student):** Tyler Babb

**Protocol Title:** Murfreesboro Municipal Airport: Air Traffic Control Tower – Pilot Survey

**Protocol ID:** 20-1082      **Approval Date:** 01/24/2020      **Expiration Date:** 12/31/2020

### Information and Disclosure Section

1. **Purpose:** This research project is designed to help us evaluate the current level of safety at Murfreesboro Municipal Airport through the personal experiences of pilots and air traffic controllers.
2. **Description:** There are several parts to this project. They are:
  - Pilot certificates (if a pilot flying out of Murfreesboro Airport)
  - Duration of experience at Murfreesboro Airport
  - Personal opinions on the level of safety at Murfreesboro Airport
  - Experiences flying at Murfreesboro Airport
3. **Duration:** The whole activity should take about 20 minutes/hours. / **The participants will not compensated** / The subjects must take at least 0 minutes/hours to complete the study.
4. **Here are your rights as a participant:**
  - Your participation in this research is voluntary.
  - You may skip any item that you don't want to answer, and you may stop the experiment at any time (but see the note below)
  - If you leave an item blank by either not clicking or entering a response, you may be warned that you missed one, just in case it was an accident. But you can continue the study without entering a response if you didn't want to answer any questions.
  - Some items may require a response to accurately present the survey.



5. **Risks & Discomforts:** In the survey, participants will be providing opinions and personal experiences about Murfreesboro Airport; however, no names will be gathered.
6. **Benefits:** There are no direct benefits to survey participants.
7. **Identifiable Information: You will NOT be asked to provide identifiable personal information/**You may provide contact information for follow-up / We may request your contact information for compensation purposes
8. **Compensation: There is no compensation for participating in this study**
9. **Confidentiality.** All efforts, within reason, will be made to keep your personal information private but total privacy cannot be promised. Your information may be shared with MTSU or the government, such as the Middle Tennessee State University Institutional Review Board, Federal Government Office for Human Research Protections, *if you or someone else is in danger or if we are required to do so by law.*
10. **Contact Information.** If you should have any questions about this research study or possibly injury, please feel free to contact Victoria Crouch by telephone (865)-360-3334 or by email [vc3a@mtmail.mtsu.edu](mailto:vc3a@mtmail.mtsu.edu) OR my faculty advisor, Tyler Babb, at [tyler.babb@mtsu.edu](mailto:tyler.babb@mtsu.edu). You can also contact the MTSU Office of compliance via telephone (615 494 8918) or by email ([compliance@mtsu.edu](mailto:compliance@mtsu.edu)). This contact information will be presented again at the end of the experiment.

#### **Participant Response Section**

- No  Yes I have read this informed consent document pertaining to the above identified research
- No  Yes The research procedures to be conducted are clear to me
- No  Yes I confirm I am 18 years or older
- No  Yes I am aware of the potential risks of the study

By clicking below, I affirm that I freely and voluntarily choose to participate in this study. I understand I can withdraw from this study at any time without facing any consequences.

- NO I do not consent  
 Yes I consent

## Appendix C – Survey Questions

### Pilot Survey Questions

1. Welcome to the research study! This research project is designed to evaluate the current level of safety at Murfreesboro Municipal Airport through the personal experiences of pilots and air traffic controllers. The study should take about 20 minutes to complete. Participation is voluntary. You have the right to withdraw at any point during the study for any reason, and without any prejudice. You may skip any item you don't want to answer. If you leave an item blank by either not clicking or entering a response, you may be warned that you missed one, just in case it was an accident. But you can continue the study without entering a response if you didn't want to answer any questions. Some items may require a response to accurately present the survey. Participants will not be compensated in any way. There is no minimum time limit to complete the survey. If you would like to contact the Principal Investigator in the study to discuss this research, please email Victoria Crouch at [vc3a@mtmtail.mtsu.edu](mailto:vc3a@mtmtail.mtsu.edu). Participants must be a pilot with experience in the airspace surrounding the Murfreesboro area. However, you will not be asked to provide identifiable information. All efforts, within reason, will be made to keep your personal information private, but total privacy cannot be promised. By continuing with this survey, participants consent to releasing their answers for research purposes. Please be entirely truthful. This survey is anonymous. Do not reveal your name or the names of others. Participants must be at least 18 years old. By clicking "I consent" below, you acknowledge that your participation in the study is voluntary and that you are aware that you may choose to terminate your participation in the study at any time and for any reason. Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device
  - a. I consent, begin the survey
  - b. I do not consent, I do not wish to participate
2. Are you at least 18 years old?
  - a. Yes
  - b. No
3. Do you participate in flight operations at Murfreesboro Municipal Airport (MBT)?
  - a. Yes
  - b. No
4. Choose the best description of your primary MBT flight operations below.
  - a. Owner/operator of an aircraft
  - b. MTSU Flight School
  - c. Murfreesboro Aviation flight school
  - d. Other (please describe)
5. How long have you been participating in flight operations at MBT?
  - a. 0-6 months
  - b. 6 months – 1 year

- c. 1 – 3 years
  - d. 3 – 5 years
  - e. 5+ years
6. How often do you fly at KMBT?
    - a. Every day or more than once a day
    - b. A couple times a week
    - c. Once a week
    - d. A couple times a month
    - e. Once a month
    - f. A couple times a year
    - g. Once a year
  7. What kind of pilot certificate(s) or rating(s) do you have? (choose all that apply)
    - a. Airplane single-engine land
    - b. Multi-engine land
    - c. Helicopter
    - d. Student pilot certificate
    - e. Private pilot certificate
    - f. Instrument rating
    - g. Commercial certificate
    - h. CFI certificate
    - i. MEI certificate
    - j. ATP certificate
  8. How many total flight hours do you have?
    - a. 0-50
    - b. 51-200
    - c. 201-500
    - d. 501-1000
    - e. 1000+
  9. While flying in the traffic pattern at KMBT, how often do you fly a non-standard procedure to avoid traffic, such as a 360-degree turn while in pattern or on the 45, slowing down or speeding up faster than normal, or extending approach legs beyond normal length?
    - a. Never
    - b. Every once in a while
    - c. A moderate amount
    - d. Often
    - e. All the time
  10. At KMBT, how often have you been number one for takeoff but have had to wait for more than two planes to land?
    - a. Never
    - b. Every once in a while
    - c. A moderate amount
    - d. Often
    - e. All the time
  11. Have you ever seen or been involved in an instance where two airplanes were on the runway simultaneously at KMBT?

- a. Yes
  - b. No
12. At KMBT, how often do you go around while on final because an airplane begins to takeoff in front of you?
- a. Never
  - b. Sometimes
  - c. About half the time
  - d. Most of the time
  - e. Always
13. Have you ever filed a NASA ASRS report due to a traffic conflict near KMBT?
- a. Yes
  - b. No
14. How often have you filed a NASA ASRS report due to a traffic conflict near KMBT?
- a. Never
  - b. Sometimes
  - c. About half the time
  - d. Most of the time
  - e. Always
15. Why did you file a NASA ASRS report due to a traffic conflict near KMBT?
16. Have you ever filed a MTSU safety report due to a traffic conflict near KMBT?
- a. Yes
  - b. No
17. How often have you filed a MTSU safety report due to a traffic conflict near KMBT?
- a. Never
  - b. Sometimes
  - c. About half the time
  - d. Most of the time
  - e. Always
18. Why did you file a MTSU safety report due to a traffic conflict near KMBT?
19. How much does ADS-B increase your comfort level while flying near airports like KMBT?
- a. Not at all
  - b. A little
  - c. A moderate amount
  - d. A lot
  - e. A great deal
  - f. I do not have ADS-B equipment
20. Have you ever felt unsafe flying at or near KMBT (within 10 n.m.) and why?
21. Do you think that an air traffic control tower would increase safety for KMBT and the surrounding airspace?
- a. Yes
  - b. No
22. Why do you believe that an air traffic control tower would or would not increase safety for KMBT and the surrounding airspace?

23. Would an air traffic control tower benefit the KMBT aviation community overall?
  - a. Yes
  - b. No
24. Why do you believe an air traffic control tower would or would not benefit the KMBT aviation community overall?
25. Do you have any other comments regarding flight safety and a potential ATC tower at KMBT?

## Air Traffic Control Survey Questions

1. Welcome to the research study! This research project is designed to evaluate the current level of safety at Murfreesboro Municipal Airport through the personal experiences of pilots and air traffic controllers. The study should take about 20 minutes to complete. Participation is voluntary. You have the right to withdraw at any point during the study for any reason, and without any prejudice. You may skip any item you don't want to answer. If you leave an item blank by either not clicking or entering a response, you may be warned that you missed one, just in case it was an accident. But you can continue the study without entering a response if you didn't want to answer any questions. Some items may require a response to accurately present the survey. Participants will not be compensated in any way. There is no minimum time limit to complete the survey. If you would like to contact the Principal Investigator in the study to discuss this research, please email Victoria Crouch at [vc3a@mtmtail.mtsu.edu](mailto:vc3a@mtmtail.mtsu.edu). You will not be asked to provide identifiable information. All efforts, within reason, will be made to keep your personal information private, but total privacy cannot be promised. By continuing with this survey, participants consent to releasing their answers for research purposes. Please be entirely truthful. This survey is anonymous. Do not reveal your name or the names of others. Participants must be at least 18 years old. By clicking "I consent" below, you acknowledge that your participation in the study is voluntary and that you are aware that you may choose to terminate your participation in the study at any time and for any reason. Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device
  - a. I consent, begin the survey
  - b. I do not consent, I do not wish to participate
2. Are you at least 18 years old?
  - a. Yes
  - b. No
3. How long have you been a controller?
  - a. Less than a year
  - b. 1-5 years
  - c. 5-10 years
  - d. 10+ years
4. Do you work at KBNA or KMQY?
  - a. KBNA
  - b. KMQY
5. How long have you worked at KBNA or KMQY?
  - a. Less than a year
  - b. 1-5 years
  - c. 5-10 years
  - d. 10+ years
6. How often do you talk on frequency (in any position) to pilots flying to or from Murfreesboro Municipal Airport (KMBT)?
  - a. Everyday

- b. A couple times a week
  - c. Once a week
  - d. A couple times a month
  - e. Once a month
7. If a control tower existed at KMBT, would this increase your workload?
    - a. Yes
    - b. No
  8. Based upon your experience, what is the busiest time of day for air traffic at KMBT?
    - a. 6am -10am
    - b. 10am-1pm
    - c. 1pm-4pm
    - d. 4pm-7pm
    - e. 7pm-10pm
  9. Do you think that an air traffic control tower would increase safety at KMBT and the surrounding airspace?
    - a. Yes
    - b. No
  10. Why do you believe that an air traffic control tower would or would not increase safety at KMBT and the surrounding airspace?
  11. Would an air traffic control tower benefit the KMBT aviation community overall?
    - a. Yes
    - b. No
  12. Why do you believe an air traffic control tower would or would not benefit the KMBT aviation community?
  13. Generally speaking, pilots at KMBT are less experienced than most professional pilot.
    - a. Strongly disagree
    - b. Disagree
    - c. Neutral
    - d. Agree
    - e. Strongly agree
  14. Your job is more difficult as a result of the relatively inexperienced pilots that operate at KMBT.
    - a. Strongly disagree
    - b. Disagree
    - c. Neutral
    - d. Agree
    - e. Strongly agree
  15. The airspace near KMBT is unsafe due to high traffic volume.
    - a. Strongly disagree
    - b. Disagree
    - c. Neutral
    - d. Agree
    - e. Strongly agree

16. As pilots gain more experience communicating with air traffic control, flight safety increases.
  - a. Strongly disagree
  - b. Disagree
  - c. Neutral
  - d. Agree
  - e. Strongly agree
17. If KMBT had an operating control tower, then KMBT pilots would be better prepared to communicate with ATC facilities such as yours when necessary.
  - a. Strongly disagree
  - b. Disagree
  - c. Neutral
  - d. Agree
  - e. Strongly agree
18. Provide any other comments you have related to KMBT flight safety and the impact of a potential control tower at this airport.



Appendix D - Safety Reports

date of report	report	two a/c on runway at same time	no radio calls	too-close separation	Aircraft cut off	maneuvers to avoid other aircraft	inactive runway used	Non-standard procedures
3/21/12	MTSU aircraft had taxied onto runway 18 and observed another aircraft on approach to runway 36. Other aircraft was using the "old" CTAF advisory frequency and made a go-around.		x				x	x
3/25/12	N586MT was midfield downwind for runway 36 when a non-MTSU aircraft announced that they were on a 3-mile right base for 36. N586MT advised the other aircraft that left pattern was required, but aircraft proceeded to turn final.							x
4/2/12	Non-MTSU aircraft was using runway 18 for touch and go landings while two planes were doing run-ups at 36 and another aircraft on final for 36. The aircraft was not making any radio calls.		x				x	

9/27/ 12	Non-MTSU aircraft use profane language on the radio and attempted to convince an MTSU aircraft to depart instead of waiting for landing traffic. MTSU aircraft waited until landing aircraft cleared, C-172 followed onto runway and did not provide adequate spacing after DA-40 takeoff	x		x				x
10/4/ 12	Instructor observed flight team aircraft flying very closely in the pattern and using the radio frequency to complain about busy traffic.			x				x
10/21/ 12	MTSU aircraft landed and was still on runway when another non-MTSU aircraft taxied onto runway and took off.	x						
4/12/ 13	MTSU aircraft landed and was still on runway when another non-MTSU aircraft taxied onto runway and took off. Unprofessional radio comments and unsafe pattern procedures by the non-MTSU aircraft.	x						



2/7/14	An MTSU aircraft was on final approach to land. A Piper Archer had made a full-stop landing and was rolling out. The MTSU aircraft landed and made a touch-and-go while the Archer was still on the runway.	x						
3/7/14	Instructor and student were in the traffic pattern. Instructor observed another airplane following very closely behind. After landing, that airplane touched down before the instructor and student were completely clear of the runway.	x		x				
3/13/14	Instructor and student in PA-28 had a near collision with another aircraft. Instructor took controls to maneuver clear.					x		
4/17/14	Traffic in the pattern was using 18. Instructor and student landed on 18 and crossed the hold short line just before another aircraft landed on 36.						x	

9/30/ 14	Instructor was doing run-up with student next to 2 other aircraft at 18 end of runway. Another DA40 taxied to 36 and took off while the winds were variable. The aircraft that took off from 36 circled the pattern, landed on 36 and rolled down to 18 without exiting the runway, and took off from 18.					x	x
10/16/ 14	Three aircraft taxied to 36 for departure and received their IFR clearance on the GCO. On the takeoff roll of one aircraft, they reached 50 kts and noticed a plane on final for 18. They aborted takeoff and exited the runway, and made a radio call.					x	
1/16/ 15	Instructor and Student were in the traffic pattern. Another non-MTSU aircraft was behind them not making radio calls. MTSU aircraft landed and was in the process of clearing the runway. The other aircraft proceeded to land even though the runway was not clear.	x	x				

1/31/15	MTSU aircraft was on downwind when another non-MTSU aircraft joined the downwind in close proximity. Non-MTSU aircraft was not making radio calls.		x	x				
2/24/15	MTSU aircraft was on base for Runway 36. Winds were calm and another MTSU aircraft was departing on Runway 18. Radio calls were not heard being made.		x				x	
3/15/15	MTSU aircraft had landed runway 36 and was in the process of clearing the runway. Non-MTSU aircraft entered runway and started takeoff roll while MTSU aircraft was still on the runway.	x						
3/17/15	N125MT was on short final when a non-MTSU aircraft took the runway cutting off N125MT and creating an issue with spacing.			x	x			
3/25/15	Student was on final approach for Runway 18. An aircraft was on the runway still. To create separation the student did a 360 turn on final instead of doing a go-around.							x

	Also had an instructor make a report about this incident							
4/4/15	MTSU aircraft was taking the runway to do a high speed taxi for training purposes. Another non-MTSU aircraft took the runway behind the MTSU aircraft and proceeded with a takeoff run which created a lack of safety separation.			x				
4/4/15	MTSU aircraft was rolling out after landing. Another non-MTSU aircraft landed and was on the runway at the same time creating a lack of safety separation.	x		x				
4/10/15	MTSU aircraft was on a one mile final; another DA-40 taxied onto runway and started takeoff roll, creating reduced separation.			x				
4/10/15	Student was on the initial solo flight; Aircraft on the GPS 36 approach was on a 3 mile final and did not give way to the traffic in the pattern which caused reduced separation.			x				

6/20/ 15	MTSU aircraft was turning crosswind. Non-MTSU aircraft entered the pattern on a crosswind instead of midfield downwind, creating minimal separation. Non-MTSU aircraft followed closely and then landed while MTSU aircraft was still on the runway.	x		x				x
6/20/ 15	MTSU aircraft was on short final doing a power off 180. A Non-MTSU aircraft took the runway to take-off causing the MTSU aircraft to do a go-around.				x			
9/25/ 15	MTSU aircraft was on crosswind, when another non-MTSU aircraft cut them off in the pattern; was not making radio calls, and was setting up for the inactive runway.		x		x		x	
10/6/ 15	MTSU aircraft was on base making the turn to Final when a non-MTSU aircraft took the runway forcing the MTSU aircraft to go-around				x			
10/18/ 15	A Non-MTSU aircraft was flying a right pattern and cut in front of a MTSU Seminole forcing				x			



	the Seminole to do a go-around.							
10/23/15	MTSU aircraft was doing a circle to land approach when a non-MTSU aircraft maneuvered underneath the MTSU aircraft and followed in at a close proximity for landing.			x				x
11/19/15	The Cub was in the pattern doing a stop-and-go on runway 36. A twin engine turboprop performed a low approach and passed over the top of the cub while they were on the runway.							x
1/30/16	MTSU aircraft landed on Runway 18 and was on rollout when a non-MTSU aircraft landed behind them and reduced safety separation.	x		x				
2/27/16	MTSU aircraft was holding short of Runway 18. Took the runway without realizing another aircraft had not cleared the runway on the far side by the numbers of 36.							

3/18/16	N125MT was turning onto a downwind for 36 from the 45 entry. During the turn they noticed N586MT come out from under them from the approach end of the runway. N125MT did not hear any radio calls from N586MT.		x					x
3/26/16	A DA-40 was on the GPS 18 approach into MBT at 3000' on a West heading between ITZEB AND UZFER in VFR conditions making radio calls on the CTAF. A Cessna came under the right wing at the same altitude Southbound. The DA-40 climbed to increase separation. The Cessna did not make any radio calls until after passing the DA-40		x	x				
4/5/16	One of the Piper Arrow's landed and was still on the runway when the Cub taxied onto the runway prior to the Arrow exiting.	x						
4/9/16	A MTSU DA-40 was practicing the GPS 18 approach into MBT. A non-MTSU aircraft took off out of MBT and flew the reciprocal			x	x		x	

	course away from MBT causing the original DA-40 to break off the approach to maintain separation.							
6/8/16	MTSU DA-40 was on a left base for landing when an C-172 also called a left base. The DA-40 did not have visual so executed a go-around.			x	x			
6/8/16	MTSU DA-40 was on short final for Runway 36 when another non-MTSU aircraft pulled out onto the runway and stated he was holding for takeoff. The DA-40 initiated a go-around.				x			
6/18/16	MTSU DA-40 was on short final for Runway 36 when another non-MTSU aircraft pulled out onto the runway for takeoff. The DA-40 initiated a go-around.				x			
6/24/16	MTSU aircraft was on short final behind another MTSU aircraft that had just landed and was rolling out. Another MTSU aircraft took the runway causing the aircraft on short final to do a go-around and	x			x			

	put 2 aircraft on the runway at the same time.							
7/10/16	MTSU Arrow had just landed and was rolling out on the runway still when a non-MTSU aircraft took the runway and started the takeoff run reducing separation.	x		x				
7/17/16	MTSU aircraft was inbound on the GPS 36 approach when they got a traffic alert for an aircraft about 400' above them. Approach was broken off to maintain separation between other aircraft.			x				
7/23/16	MTSU Arrow was on base for a Power-Off 180 on Runway 18. A C-172 entered the runway for T/O. The Arrow had to do a go around due to the C-172.				x			
9/9/16	A non-MTSU aircraft was on about a 2 mile final for 18 with calm winds. A MTSU DA-40 took off runway 36 into landing traffic.						x	



	conversation ensued by the MTSU aircraft.							
1/28/17	5-7 aircraft in the pattern. A non-MTSU aircraft took off while an MTSU DA-40 was still on the runway rolling out after landing.	x						
1/31/17	A non-MTSU aircraft landed on the runway while another aircraft was still on the runway. Aircraft then made 180 on the runway going towards aircraft on short final in order to get off at the taxiway.	x						
2/4/17	A MTSU DA-40 was on base for 18. A non-MTSU aircraft announced they were on a downwind leg, but were actually on a Final leg which caused confusion for the aircraft on base.							x
2/17/17	A MTSU plane landed on 18 and was still on the runway for rollout. Another non-MTSU aircraft landed on the runway and exited on A2 but stayed on the	x						

	runway side of the hold short line. A third aircraft then landed on the runway also.							
2/17/17	A DA-40 was on a 1 mile final when another non-MTSU aircraft turned a short base in front of the DA-40.				x			
3/16/17	A DA-40 was on Final with another DA-40 on a GPS approach for 18. A third DA-40 turned base in front of the GPS traffic and continued to land while the first DA-40 was still on the runway.	x			x			
3/19/17	A MTSU DA-40 was turning base to final. Another MTSU DA-40 had just touched down when a non-MTSU aircraft took the runway for a line-up and wait. The DA-40 on final went around and sidestepped to the upwind leg.	x			x			

3/21/17	A MTSU DA-40 was in the pattern for 36. A Murfreesboro Airport truck was making passes on the runway looking for FOD. They departed the runway for landing traffic. A DA-40 announced they were taking off while the truck was on the runway side of the hold short line, but clear of the actual runway.							X
4/13/17	An MTSU Arrow was on final, when a non-MTSU aircraft departed cutting the Arrow off. Arrow went around and had multiple other traffic issues causing deviations and close proximity issues.			X	X	X		
4/14/17	Seminole was taxiing to the ramp. Non-MTSU aircraft cut them off and purposely went in the grass to get around the Seminole.				X			X
4/20/17	A non-MTSU aircraft took off 18 and exited the pattern early crossing into the 45 entry causing two MTSU aircraft to do 360 to avoid collisions.				X	X		X



4/25/17	Seminole had just landed when another non-MTSU aircraft also landed right behind the Seminole in close proximity.	x		x				
5/8/17	MTSU Arrow had just landed and was in the process of back taxiing to exit the runway. N565MT (which was down for MX) took the runway at the same time.	x						
6/8/17	DA-40 was 2nm NE of the airport. Another DA-40 was spotted within a mile of them circling to get to a 45 entry.			x				
6/20/17	MTSU DA-40 was taking the 18 runway for takeoff. MTSU Arrow calls short final for 18. The DA-40 stops prior to landing portion of runway but past the hold short lines; Arrow continues to land on the runway.	x						
7/7/17	A MTSU Arrow was on final and landed on Runway 36. A non-MTSU aircraft then took off while the Arrow was still on the runway.	x						

7/8/17	<p>MTSU DA-40 was inbound on the GPS 18 approach. Another aircraft had taken off 36 and proceeding North causing the DA-40 to break off the approach to maintain separation.</p>				x		x	
7/10/17	<p>The MTSU Piper Cub had just landed and was rolling out on the runway. Another non-MTSU aircraft landed while the cub was still on the runway.</p>	x						
7/13/17	<p>A MTSU DA-40 was on the GPS 18 approach. The MTSU Piper Cub turned base when the DA-40 was on a short final. The Piper Cub had to do a go-around to maintain separation.</p>				x			
7/15/17	<p>An MTSU Arrow was rolling onto the runway for takeoff when a non-MTSU aircraft followed right behind announcing they were doing a "high speed taxi on the runway" The Arrow took off and the other aircraft used the whole runway causing an aircraft on final to do a go-around</p>	x			x			

7/18/ 17	A MTSU DA-40 was not making proper radio calls in the pattern and caused another MTSU DA-40 to divert to maintain separation.			x			x
7/20/ 17	A MTSU DA-40 was on the GPS 36 approach and had just landed. A non-MTSU aircraft entered the pattern on a base leg cutting off an aircraft on downwind and then landing while the DA-40 was still on the runway.	x			x		
7/31/ 17	A non-MTSU aircraft entered a pattern for Runway 18 and did a power-off 180 when Runway 36 was the active runway in use. The aircraft then did an high speed taxi back through the ramp.					x	
8/8/17	A MTSU DA-40 was inbound on the GPS 36 approach, when another non-MTSU aircraft turned base when the DA-40 was on a 2 mile Final. The DA-40 broke off the approach and entered the upwind.				x		

8/8/17	<p>An MTSU Arrow was on the upwind for 36 after a touch and go. A MTSU DA-40 on the GPS 18 approach was breaking off the approach at 2 miles and was going head on with the Arrow. The Arrow deviated to the right and followed in behind the DA-40.</p>				x			
9/6/17	<p>An MTSU DA-40 aborted their takeoff and was rolling out on the runway. A non-MTSU aircraft taxied onto the runway and took off over the MTSU aircraft.</p>	x						
9/11/17	<p>An MTSU DA-40 was turning crosswind and heard a muffled call with "Smyrna" at the end of it. Turned downwind and noticed a non-MTSU aircraft 300' below going the opposite direction. The DA-40 climbed to increase separation, and landed with no incident.</p>			x				
9/15/17	<p>The Seminole taxied onto the runway while another aircraft was still on the runway.</p>	x						

9/16/ 17	An MTSU DA-40 was inbound on the GPS 36 approach making radio calls. A non-MTSU aircraft cut in front of them on final. Then a MTSU DA-40 took the runway when they were short final.				x			
9/16/ 17	MTSU Arrow turned final for 36 when a MTSU DA-40 took the runway for takeoff, causing the Arrow to do a go-around.				x			
9/17/ 17	The Cub was in the pattern on a base leg, when a DA-40 took the runway for takeoff, causing the Cub to do a go-around.				x			
9/25/ 17	An Arrow had just landed and was taxiing off at A3 when a non-MTSU aircraft took the runway for takeoff.	x						
9/27/ 17	A DA-40 was on climb out and noticed a traffic alert above heading left to right. During level off, they noticed a CRJ deviating due to them. Confirmed with ATC that the CRJ was executing a Resolution Advisory (RA).			x		x		

9/28/ 17	DA-40 just departed runway 36 with the Seminole on a left base. A non-MTSU aircraft called taking the runway while the DA-40 was rotating and caused the Seminole to do a go-around due to separation issues.				x			
9/28/ 17	Student was on a solo IFR cross country and had an issue with a non-MTSU aircraft on their same path not making radio calls. No further issue arose.		x					
9/30/ 17	Multiple DA-40's were in the run-up area, one was on final for 36, one started taxiing for 18. Confusion was created as to which runway was in use when the winds were calm. 36 is the Calm Wind Runway for KMBT as noted in the AFD.						x	
10/3 /17	A DA-40 was on downwind for 18 when a non-MTSU aircraft came in off the 45 entry and got about 200 feet away from the DA-40. When the DA-40 was getting ready to turn Base leg, the other aircraft cut them off and turned base inside of them,			x	x			

	causing the DA-40 to do a go-around.							
10/5/17	An MTSU DA-40 was shooting the GPS 18 approach when runway 36 was in use. As the DA-40 was breaking off the approach, another non-MTSU aircraft was on crosswind which created a lack of separation between the two aircraft. They both deviated with no issues.			x		x		
10/6/17	An MTSU DA-40 entered the left downwind for Runway 18 from the GPS 36. When the DA-40 was midfield, a non-MTSU aircraft entered downwind closely to the right and 100 feet above. The DA-40 did a short field landing and exited quickly to avoid any further issue with the other aircraft.			x				x
10/14/17	An MTSU DA-40 had just landed on Runway 18 and was still in the process of	x						

	clearing the runway when an MTSU Seminole landed behind them.							
10/18/17	An MTSU DA-40 was on a short base leg about to turn final when another DA-40 pulled out onto the runway to take off. The DA-40 on final was high on the glide path and had to slip the aircraft to get below the takeoff path of the other DA-40.							
11/10/17	Coming from MQY, we were on a 45 for the downwind for 36. A non-MTSU aircraft called extended crosswind leg as we passed the water tower. I noticed that the non-MTSU aircraft was in fact on a short crosswind, and was head-on with us. As he was 20 knots faster, and closer to the runway, I assumed he was going to turn downwind before us, and I turned the aircraft left to give him some space to fly downwind. As I turned to the left, he turned the same direction to re-enter the pattern, as he was following							

x

x

x



	<p>the head-on converging rule (which I should have done). We immediately turned back to the right to avoid him and enter the downwind. The non-MTSU aircraft re-entered the downwind leg behind us, and on the ground we both apologized for the confusion.</p>							
11/10/17	<p>A non-MTSU aircraft followed close behind a PA28R in pattern and landed on runway as PA28R was on landing rollout.</p>	x						
11/17/17	<p>Receiving vectors for ILS &amp; talking to BNA approach. Off our right wing I noticed an airplane at the same altitude converging. We were approximately 0.5 nm away. I took the flight controls and chopped the power &amp; descended as they passed over</p>				x		x	

	us. We received no traffic advisories from BNA.							
1/21 /18	Non-flight school aircraft runway incursion. They were departing and rotated before we were off the runway after we landed. (I also have video of event)	x						

<p>1/24 /18</p>	<p>While flying and taxiing at and around MBT I heard multiple MTSU aircraft stating that they were "clear of the active" after taxiing clear of the runway. Runway 36 was in use. Another non MTSU airplane was arriving into MBT and had to ask which runway was in use. This is a safety hazard to me. An arriving aircraft may not know which runway is the "active" and may create a collision hazard in the pattern attempting to set up for the opposite runway. It could also create a runway conflict with arriving and departing traffic. This could be avoided simply by stating which runway an airplane is clearing. If it occurs at an airport with only 1 runway it probably occurs at airports with multiple runways only adding to the confusion. MTSU pilots in my opinion have a higher standard to set and maintain than the average pilot.</p>							<p>x</p>
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	Our radio, safety, and courtesy etiquette should be the best at all times.							
1/27/18	A DA40 went around from botched landing attempt. Turning crosswind, it was noted that there was an aircraft on the 45 near to the downwind. Unsure of how to best handle the situation, The DA40 proceeded to turn downwind in front of the other aircraft. Separation between the aircraft was less than desirable.		X	X				

	Continuing through the traffic pattern, the DA40 successfully landed but was unable to clear the runway before the other aircraft was forced to perform a go-around.							
2/2/18	A DA40 just landed rwy 36, yet to clear, Cessna departed runway regardless of other aircraft having active	x						
2/2/18	My CFI and I just took off runway 36, we were on the upwind and about to turn crosswind for 36. As we were on our upwind about to turn we saw a DA40 entering the pattern but not on the 45 degree entry they were on departure side of 36 just in front of the pattern and entering the pattern via the left downwind for 36. We altered our course and then turned downwind at 1600' they were lower than us as well by probably 300'. It					x		x

	<p>all worked out but if we didn't see them something could've happened.</p>							
2/6/18	<p>There were two MTSU aircraft in the pattern. One aircraft was on downwind about to turn left base, when the other aircraft came on to the radio stating they were doing a left base over downtown. The downwind aircraft saw the base aircraft below and to the right of them, and immediately executed a right 360 turn for spacing, and then re-entered the pattern on a very wide left base to create spacing for the lower aircraft. The lower aircraft landed full-stop and no other incident occurred.</p>							x

2/23/18	Drones/RC planes were spotted by several MTSU planes, including us rolling out on 18. RC planes were being flown from T-Hangars and were diving and climbing on departure end of 18, over runway and between taxiways.							x
2/27/18	Allowed to many UAS in the air at one time. Also allowed multirotors and fixed wing UAS in the same area. Several students flew outside of the designated area and over people. During debrief asked students if we safe - several answered no.							x
2/27/18	Departing KMBT to the south (HDG) 180. At 2,000 ft, a right turn to 220 climb to 3,000 was made. At 2,200 ft, a aircraft was spotted off our 12:30 on an easterly heading. Altitude of other aircraft approximately 2,500 ft. When aircraft was spotted, instructor initiated descending right turn to avoid traffic. Other aircraft view was limited by: 1.)					x		

	<p>Sun 2.) Possibly by the bill on my hatt. Corrective Action to take in future: 1.) Take into consideration that the bill of a hat limits the upward view of the pilot. 2.) Take hat off when flying. 3.) Consider sun limiting view of other aircraft. (Drawing included)</p>							
3/3/18	<p>A non-MTSU aircraft announced it was crossing midfield to join downwind, did not specify altitude. A DA40 assumed it would cross midfield at 3500' and enter a teardrop entry to the downwind. The DA40 decided on final to abort landing for unrelated reasons and initiated go around. The DA40 realized the non-MTSU aircraft was at traffic pattern altitude, The DA40's current heading and climb would cause collision. The non-MTSU aircraft</p>					x		x





	<p>not see each other until they were relatively close (1 mile away from each other). Both A/C took proper Action of Altering their course to the right, even though the crosswind traffic had the right of way.</p>							
3/16/18	<p>After crossing the hold short line of runway 18, we realized there was traffic on final. We stopped prior to any conflict. We heard no final radio call from the traffic and did not see the aircraft prior to crossing the hold short line.</p>		x					
3/16/18	<p>There were two a/c on base and short final when an MTSU aircraft started to pull onto the runway for take-off. I told CTAF "there is a plane on final "after they passed the hold short line. They stopped,</p>							x

	<p>turned around and went behind hold short. I believe it was due to their wings causing a blind spot on final.</p>							
3/21/18	<p>On the RNAV 18 circle to land 36. We were descending from FAF to minimums, we made 3 radio calls after handoff from Nashville App. A non-MTSU aircraft was departing straight off of RWY 36, not paying attention and listening to radio calls and was coming straight at us. Pilot in non-MTSU aircraft due not paying attention said they never heard a radio call. We replied saying we had made 3, they replied we should have made a fourth. CFI in another MTSU aircraft confirmed he heard our radio calls and that the other pilot wasn't paying attention.</p>							x

3/27/ 18	<p>During instrument stage 2 check, we were flying GPS 18 back into MBT. We were making standard radio calls (10 miles out, 7 miles out, 5 miles out). We were doing the LNAV step down fixes so we were slightly below the GS. At 4.7 miles from MBT, we hear a non-MTSU aircraft report a 5 mile final for RW 18. We ask the non-MTSU aircraft his position, no response, ask again, no response. I look behind my shoulder and see him coming down us &lt;20' approaching. I immediately take the controls and break off the approach. Once the non-MTSU aircraft is on the ground he calls up 123.075 for a radio test. After a couple attempts he determines a button was not pushed in so he could transmit but not receive. All this time I did not see him on ADS-B. I talked to him on the ground, come to find out the plane he was working on didn't have ADS-</p>		x			x		
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	B. Moral of the story not all planes will have ADS-B out, even after 2020.							
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<p>3/31 /18</p>	<p>While on the 45 about to enter the downwind for Runway 18 in an Arrow, a Non-MTSU aircraft called crosswind immediately after taking off. We had been making radio calls since approximately 3 miles out on the 45. We called the non-MTSU aircraft in sight when we first saw it with no response. As we turned downwind, the non-MTSU aircraft made an unannounced turn directly toward our aircraft at the same altitude. We deviated to the right in order to remain clear of the non-MTSU aircraft. We repeatedly attempted to make contact with the non-MTSU aircraft upon visual ID, with no response. While able to maintain visual contact with the non-MTSU aircraft the entire time, the unannounced turn in the pattern forced us to make a course deviation in order to remain safely clear.</p>		<p>X</p>			<p>X</p>		
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4/5/18	<p>At approximately 6:15-6:25 we, in an arrow, had turned base to an extended final, number 3 to land behind a non-MTSU aircraft to Runway 18 at KMBT.</p> <p>Everyone in the pattern had been making frequent radio calls and were aware of the traffic congestion and agreed upon flow to land. At approximately 1.5mi from the TDZ, while scanning for traffic, we spotted another non-MTSU aircraft that had entered downwind without a call, and had turned base, again without a call.</p> <p>The A/C continued to descend, and was on a direct intercept course with our A/C. We attempted to radio the aircraft, without receiving a response. As separation was now reduced to an absolute minimum, and the aircraft continued to descend toward us, we deviated to the right and entered a right 360* turn to avoid a collision. We re-entered</p>		x	x	x			
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	<p>final behind them, who had by now finally made a position call, completely unaware of our A/Cs position or their position within the flow of traffic into KMBT. We continued in behind and landed without incident.</p>							
<p>5/24 /18</p>	<p>We were on base and making radio calls. An aircraft was holding short and then proceeded to takeoff. We called that we were doing a go-around. We executed the go-around and re-entered the pattern.</p>				<p>x</p>			



6/11/18	Saw one of the Seminoles fly over campus extremely low. Low enough to where noise drowned out my conversation, and I could make out "N12-" but the angle was wrong for me to see the rest of the tail number.							x
6/13/18	We were holding short doing our before takeoff checklist, then my student entered the runway (and I hadn't looked on final) + he stopped on the hold line and saw an a/c on short final. The a/c saw us and went around, while we taxied off the runway, however the other aircraft could not hear us, while we could hear them. Other aircraft on frequency could confirm they heard us and relayed info to the go-around aircraft. The flight continued without issue.				x			
6/19/18	We were making radio calls in the pattern. We made our base call and a non-MTSU aircraft told us they were taking off. We initiated a go-around and side-stepped the runway.				x			

6/29/ 18	MTSU aircraft not using STD pattern.								<b>x</b>
7/8/18	We were on final for runway 18. We were making radio calls. A non-MTSU aircraft cut right in front of us for their final leg. We executed a go-around immediately to maintain separation.								
7/11/ 18	A vehicle (Red 3-wheel Polaris Slingshot) was waiting at the end of taxiway A near the beginning of runway 36 waiting on an aircraft to approach runway 36. When the MTSU DA40 was over the threshold and abeam the vehicle, the vehicle started to accelerate and "race" the landing aircraft while the car was on the taxiway speeding attempting to match the landing speed.								
7/14/ 18	We were holding short of the runway on the taxiway for 18. There was a non- mtsu airplane in front of us holding short. There was an MTSU DA40 on final. Suddenly, the non-MTSU airplane taxied								

	onto the runway forcing the DA40 to do a go-around.							
8/31/18	DA-40 taxied out onto the runway + continued takeoff while another aircraft was on final, causing the other aircraft to go around. DA-40 proceeded to fall behind the Arrow in the pattern, separation was maintained.				x			
9/5/18	Murfreesboro airport golf cart was doing a FOD check without a radio call. We had to go around because cart did not clear runway while we were on short final. Cart made radio call after we went around...		x		x			

9/12/ 18	<p>To send an official report of the incident today. On 9/12/18 around 10:00am a Cessna 140 (appeared to be a cessna 140) created a safety hazard by taking off at the same time an MTSU aircraft departed. When the MTSU aircraft (DA-40) started his ground roll for takeoff, the taildragger (xxx, I know this is the last 3 of the N#) called he was taking the active. When the MTSU DA-40 was about halfway down the runway the taildragger already added power and the tailwheel was up. Both aircraft lifted off at the same time. I called on the radio and told him that it wouldn't be good if the MTSU aircraft in front of him had to abort takeoff or have an engine fail. Cessna 140 returned with, "well, it'll be good experience for him." He also turned crosswind around 100-200ft off the ground very close to the softball fields not allowing room for engine failure</p>	x		x				x
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	<p>or error himself if something bad were to happen. Not only did he endanger the lives of the 2 students in the MTSU aircraft, he also endangered his own life and all those kids on the ground at the softball fields off the departure end of runway 36 at KMBT. This type of flying is careless and unacceptable. This is also a copy and paste of the email sent to the FAA for further investigation.</p>							
9/18/18	<p>Was simulated single engine short final in the Seminole and a non-MTSU aircraft pulled out onto the runway without making a callout forcing us to do a go around</p>	x	x					

9/21/ 18	<p>During operations in a busy traffic pattern, an MTSU DA40 extended downwind to allow traffic holding short of Runway 18 to depart after another MTSU DA40 on final landed. The aircraft did this with two other faster aircraft behind it (one unknown, possibly a Baron, the other a Skymaster). The pilot of the "Baron" did not apparently realize that the DA40 was ahead of him on a very extended downwind, possibly confusing the DA40 on extended downwind/base with the DA40 on final. The Baron then turned a base just ahead of the DA40 turning from an extended base/downwind to final. The Baron pilot saw the other aircraft and veered his airplane back onto a downwind ahead of the Skymaster. Part of the issue was neglectful radio communication on the part of the Baron, but the</p>	x						x
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	DA40 should not have extended a downwind for courtesy purposes with two other aircraft behind it, severely disrupting the traffic flow at a busy time.							
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10/5/ 18	<p>An MTSU DA40 took the active runway (36) for departure while my student and I were on a one mile short final for runway 36. We had made all of our radio calls as we should have, yet the DA40 still took the active runway in front of us to depart. My student and I initiated a go-around and had to depart the pattern towards the east and then rejoin the 45 on the North West side of the field to enter the pattern once again. We noticed the same DA40 that had caused us to go-around also decided to depart the pattern towards the southwest directly on the active 45 for runway 36. (I believe that DA40 was a solo student also).</p>				x			x
10/11/ 18	<p>DA40 #1 was on downwind for RWY 36. DA40 #2 was maneuvering for the 45* and flew so close to the downwind for 36 that DA40 #1 got a traffic alert. Please see drawing on back. Instructor said he could not find</p>			x				





	<p>radio check from UNICOM). We paralleled at this point (us on downwind for 18, them on the departure leg for 36) so we let them climb above pattern altitude (showing 2100') and depart south of the field on their downwind before we committed to landing 18. No contact was able to be made with them but nothing ever arose from the situation.</p>							
2/3/19	<p>We were on a single-engine RNAV to 18 in the Seminole making routine calls when a DA40 was on downwind + said they didn't have RNAV traffic in sight, and then turned base about 1/4 mile in front of us, having us do a go around + abandon the approach.</p>				x			

3/15/ 19	I was doing a power off 180 onto 36, turning onto base. Before I turned final, I checked the path behind me as TCAS went off and I saw an aircraft, who made no radio calls about being on final. He made other radio calls throughout previous patterns (we were both doing pattern work), but not this one. I immediately climbed up to pattern altitude, side stepped, and proceeded onto my next pattern.		x	x	x			
4/3/19	Student taxied onto active runway.	x						

4/6/19	<p>Me and my instructor were on the RNAV 18 into Murfreesboro making regular radio calls (9nm, 5nm, 3nm, 1.5nm), a Skyhawk entered the pattern for 18 at the 45 around the time of our 5nm radio call, we continued our approach, the skyhawk made a downwind call near the same time of our 3nm full stop call, my instructor reached out over the radio to see if the skyhawk saw us but they did not respond. Saw the Skyhawk turning base as we had passed the 2 mile final. Instructor tried to reach the skyhawk again saying saying we were on 1.5nm final full stop landing with no response. We landed on 18 and the skyhawk also landed on 18 before we were able to exit on the second taxiway, resulting in two aircraft on the runway at the same time for about 15sec. In hindsight, me and my instructor could have recognized the oncoming</p>	x	x	x				
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	<p>conflict of separation and broken off the approach to enter the pattern through the 45 for 18</p>							
4/10/19	<p>We were turning a 2.5 mile left base got traffic spacing made our radio call then a DA40 turned right in front of us on a left base about a 2.0 mile left base. Asked if he/she had us in sight but they never responded we did a go around and avoided them.</p>		x		x			

4/10/ 19	<p>An RV-1 came in from another airport and was practicing landings in KMBT. First landing, he miss judged the distance between him and another plane on final and had to go around. The problem was that the go-around happened within 500 ft close proximity of the landing aircraft. The next event happened when my student was landing (it was his first solo). My student had just landed (full stop landing) and was rolling down the runway what the RV-1 came too quick and had to do another go-around. This time, the RV-1 stayed over the runway, on ground-effect (about 5 ft over the runway), while my student was still on the runway. The RV-1 did a side step over the grass still at 5 ft over the ground, and once e was to the right of my student's plane, the RV-1 did an abrupt pull up and climbed up to traffic pattern altitude, then left KMBT. The RV-1 got within</p>							x
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	<p>5 ft of my student's aircraft, while going over 90 knots.</p>							
<p>4/27/ 19</p>	<p>A Cessna was not being aware of the traffic ahead in the traffic pattern. I was wanting to extend the downwind for 18 to let the aircraft holding short of final take off and not have to wait for me and the aircraft behind me. I heard on the radio of another aircraft on downwind and so I had to cancel the extended</p>			<p>x</p>				

	<p>downwind and turn a left base. While on left base for 18, I look back behind me and see the other aircraft and how close he was to me on downwind. He was too close and probably did not see me ahead of him.</p>							
7/5/19	<p>Was joining the downwind while an MTSU aircraft was on the departure leg. The aircraft turned a tight crosswind and then again turned towards us to join downwind. It was close enough to warrant reaction from my student. I asked if they saw us they said yes. I felt uncomfortable with them so close behind and broke off to the east to rejoin the 45. Correct procedure is to extend departure leg for 45 traffic and to observe for 45 traffic before committing to crosswind turn.</p>					x		x



6/13/19	On final for 36 at MBT with inoperative comms, low of glide slope. Airplane holding short took the runway for takeoff, requiring a go around to be performed.		x		x			
9/10/19	I was walking on campus when a DA-40 made an aggressive steep turn directly above campus at an extremely low altitude with a wide open throttle. It appeared way below pattern altitude. I did not hear or see any other aircraft around besides the DA-40.							x
9/12/19	While on the RNAV 36, we watched an MTSU DA40 enter runway 36 with a Skyhawk on short final (less than a mile). The Skyhawk continued to land behind the departing DA40 while it was still on the runway.	x						

<p>9/16/ 19</p>	<p>Citation, cut off cross wind and 45 traffic by interning on the downwind. Cut off extended downwind traffic by turning base early, and requested that I “hurry up and get off the runway”</p> <p>This caused major disruption and caused the crosswind to extend into the 45 traffic, they got pretty close to each other.</p>			<p>X</p>	<p>X</p>			<p>X</p>
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9/19/19	<p>We entered a 4 mile 45 for RWY 18 and announced our position. A Tecnam aircraft came on the radio and said he was on a 5 mile 45. I was unsure of his altitude and speed, and did not have a visual. I was concerned he might be descending on top of us, I instructed the student to circle to the right as to come in behind the Tecnam with better separation, we announced our intentions on the radio. While we were looking to the right in an attempt to establish visual contact, he appeared directly in front of us, he was not at all on a 45 entry and was more or less perpendicular to downwind. Once our circle was complete, we reestablished on the 45. Another MTSU aircraft had departed RWY18 and was turning crosswind to downwind. The Tecnam was positioned in the downwind at least 3-4 miles out, causing parallel downwind</p>							
				x	x			x

	<p>traffic. As the Tecnam continued into the base leg about 3-4 miles out, another MTSU aircraft was arriving into the final approach area from the RNAV 18 around the same time causing a second event. I advised the two aircraft which I could see converging to watch out for one another. The Tecnam turned final in front of the RNAV traffic, causing the RNAV aircraft to execute a go-around.</p>							
9/21/19	Cut off 45 traffic by departing on a crosswind.				x			

<p>9/27/ 19</p>	<p>The traffic pattern was messed up. People did not want to break off and re-enter when it became congested. As we were taxing in, there was a call for "turning final 18 number 5." Extending out this far is not a safe operation. If someone was to lose their engine, they would not make the runway and have to ditch the aircraft. I know everyone wants to come in and land, but flying 3+ mile finals is ridiculous. AC 90-66A states that the "base leg should commence when the airplane is at a point 45* relative bearing from the runway threshold." If you are number 5 on final, you are way past the 45* degree bearing from the threshold. What was going on today was unacceptable.</p>							<p>x</p>
<p>10/3/ 19</p>	<p>DA-40 took off of inactive runway, I did not check the weather carefully enough. I course corrected and there was no one on final during takeoff. Serious mistake on my</p>						<p>x</p>	

	part, won't happen again.							
1/30/20	near midair collision in mbt pattern caused by traffic exiting the pattern on crosswind while someone was on the 45 - pattern had 5+ planes					x		x
<b>TOTALS</b>	<b>148</b>	<b>40</b>	<b>24</b>	<b>39</b>	<b>49</b>	<b>18</b>	<b>16</b>	<b>43</b>