

Truck Town Thunder FIRST Team 68



Business Plan 2012-2013

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1. Executive Summary

Vision Statement

FIRST Team 68, Truck Town Thunder's overall goal is to build a passionate team that encourages students to absorb new knowledge from dedicated team members while relentlessly having fun.

Mission Statement

"To inspire peers to be more excited about science, engineering, and technology by engaging them in a hands-on mentor guided life-changing journey that prepares everyone for the future."

–Truck Town Thunder

Team Summary

FIRST Team 68 was founded in 1998 by Tom Stevens, former Global Chief Technology Officer of General Motors. Initially known as Truck Town Terror, the team began with 20 members from schools across Oakland County and was housed at a General Motors facility in Pontiac, Michigan. At that time, there were only seven mentors, all of whom were either GM employees or parents of team members. However, the terrorist attacks of 9/11 led the team to change its name to Truck Town Thunder (T3) in 2001. In 2009, the team relocated to Brandon High School, which remains its current home.

Today, the team consists of 27 student members and a total of 31 mentors. Members are students at Brandon and Holly High Schools and mentors now include GM engineers, parents, college students, alumni, and partner representatives. Nine of these mentors are considered 'advisory mentors' because they are responsible for creating and enforcing rules and regulations, team policies, and are also responsible for the overall team organization.

Sponsors

Truck Town Thunder is currently sponsored by many large and local companies including All Sons, Inc., Brandon STEM Pathways Academy, Bueches Food World, Camp Fire Grill, LLC, Central Conveyor Company, Continental Automotive Group, Eichorn Enterprises, General Motors Foundation, Guardian Industries, H&R Block, Heller Machine Tools, Holly High School, Lasco Ford, Macphees Restaurant, Michigan Renaissance Festival, Mid Michigan Robotics Association, Milosch's Palace, Chrysler Jeep Dodge, Ortonville Rotary, R-Concepts, Inc., Royal Oak Industries, Shores Technologies, Stephen E. Hershey, D.D.S, Szott Ford, Thompson's Hardware Store, Tool Sport, Tractor Supply Company, United States Air Force, United States Army, and Village Auto Wash- Ortonville

Cultivating relationships with sponsors is an important aspect of Truck Town Thunder's agenda because part of their mission is to work with experts to both become prepared and to prepare others for the future. As such, T3 spends a good amount of time helping to publicize sponsor activities by including them on shirts, plaques, and robot decals.

Community Involvement

Truck Town Thunder provides many services to the community, through community partnerships and the creation of new FIRST teams. The team cooks turkey legs for the Renaissance Festival, raises money as a Relay for Life team, volunteers at Desert Angel packing events, and is involved in the Adopt-a-Road highway cleanup program.

Truck Town has also been immensely involved with the creation of new FIRST robotics teams by providing mentors to 6 developing teams. These endeavors help spread the message of FIRST to others in our community, through hands-on experience and promotion of FIRST ideals, such as Gracious Professionalism.

Team Growth

Moving to Brandon High School generated new growth in participation increasing it from just 9 students to 21 students in 2009. The school began recognizing the team at school assemblies which both spread the word of FIRST and recruited new team members. The high quality shop and computer labs also provide a comfortable, effective, and easily accessible environment to attract new students. Mentors were recruited to help train students on the technology which increased the number of mentors from 8 to 31.

As a result of these changes, the team has become infinitely more structured which has benefited the team's productivity and success. They also have more hands-on experience, actively learn more skills, and stay on the team longer. Finally, the efficiency generated by these increases has allowed the team to dedicate more time to community outreach projects.

Future Plans

Truck Town Thunder looks forward to continued growth in student and mentor membership, team sponsorship, and community involvement. As such, the team is actively pursuing several goals. For example, they plan to increase students' involvement in the production of the robot, as well as improve students' communication and organization skills. Similarly, the team will continue striving to uphold and improve safety standards. T3 also realizes the significant impact of team sponsors and plans to attract more large sponsors and reach out to the community for improved local support.

The team also plans to focus more on spreading the word of FIRST to a larger community. One way they hope to accomplish this goal is by improving the team's online presence. Students also hope to participate in more varied community projects that can impact and inspire a large number of people. This would involve an expanded mentorship of FIRST teams in their district, both in FRC and in the younger levels.

2. Team Summary

2.1 History

FIRST Team 68, originally known as Truck Town Terror, was founded in 1998 by Tom Stevens, former Global Chief Technology Officer of General Motors. Under the direction of Mr. Stevens, the team's financial support was provided solely by General Motors Foundation. The team was provided a build home at a General Motors facility in Pontiac, Michigan. In its first year, the team recruited and gained the membership of students from 14 different schools across Oakland County, Michigan. The team earned the Rookie All Star award at the Great Lakes Regional this year. This was the first of many successful experiences and opportunities for Truck Town Terror.

In the wake of the September 11th terrorist attacks, Truck Town Terror changed its name to Truck Town Thunder so as to remove negative connotations associated with the name. However, this was not the only challenge T3 members were to face. In the early 2000s, General Motors Corporation (GMC) which was responsible for funding General Motors Foundation, the team's main sponsor, began to face continuous financial problems, which subsequently brought about many changes for Truck Town Thunder. For example, Truck Town Thunder had a particularly successful season in 2009 and became a finalist in the FIRST World Championship held in Atlanta, Georgia. During that same time, however, GMC filed bankruptcy, which had severe implications for the General Motors Foundation. The bankruptcy forced GMC to close their Center Point Campus which was T3's home at the time. Fortunately, a developing relationship between Brandon High School's STEM teachers and T3 mentors led to the possibility of an alternative facility for the team at Brandon High School. In the summer of 2009, T3 packed up their belongings in Pontiac and moved to their new home at Brandon High School.

2.2 Team Statistics

Since it was formed in 1998, FIRST Team 68 has fluctuated greatly in size. Starting with just 20 members, T3 has had as few as nine members and as many as 27 members. In general, however, the team has strived to maintain about 20 to 25 students since its origin. Currently, the team has a total of 27 student members.

Mentorship has also fluctuated quite a bit over the years. In general, the team has always had seven or more mentors typically made up of GM employees, parents, college-aged team alumni, and sponsors. In recent years, however, mentorship has skyrocketed and the team currently has 31 mentors, nine of which make up the team's advisory board. Advisory board members are responsible for creating and enforcing program rules and team policies, and are responsible for the overall team organization.

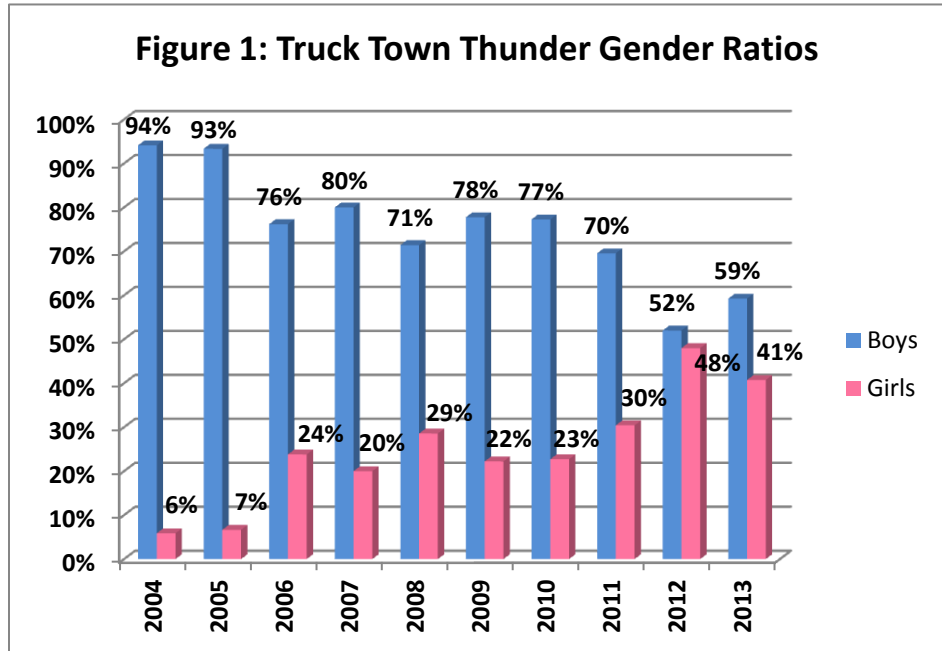
2.3 Student Team Members

The students of Truck Town Thunder represent a number of diverse backgrounds with students coming from two different schools: Brandon High School (three students) and Holly High

School (24 students). This has brought together students from different communities and creates a melting pot of ethnicities, ages, genders, talents, interests, and geographical locations. Through FIRST Robotics, these students learn to work together as a single team, despite their differences.

Of particular importance is the changes in the team’s gender ratios. Figure 1 below shows how the team constituency by gender has changed over time. As can be seen here, the proportion of girls on the team has steadily increased over the past decade.

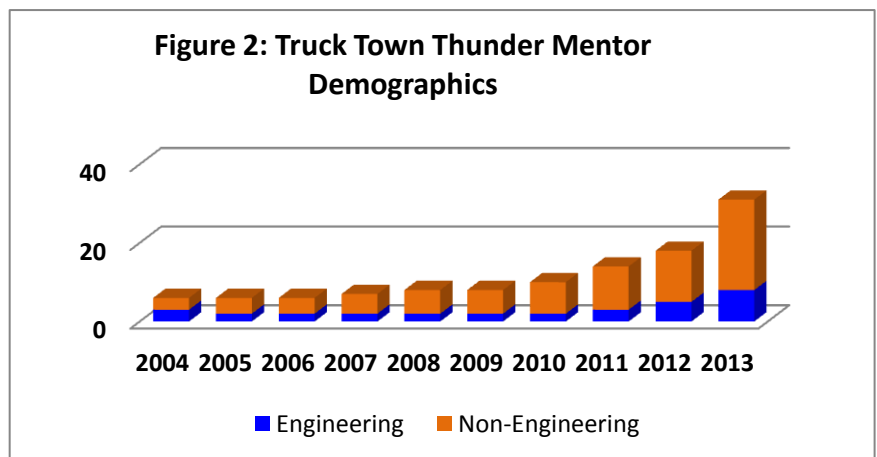
Whereas only 6-7% of the team was female in 2004 and 2005, 2012 and 2013 have seen record breaking numbers with young women making up 48% and 41% of the team. In addition to increasing the overall diversity of Truck Town Thunder, the team also aspires to maintain a more equal gender constituency into the future.



Another factor in maintaining an experienced student membership is the team’s replacement policy. Each student is required to find at least one replacement member for the team. The students are must teach the new team member skills the graduating student has mastered. This has helped the new students in adjusting to not only being a member on Truck Town Thunder but the intense work schedule many of the team members endure throughout the year.

2.4 Team Mentors

Mentors currently outnumber student members which include GM employees, parents, college-aged team alumni, and sponsor/partnership mentors. Of the 31 mentors currently working with the team, seven are parents of current team members. Three of the seven parent mentors are Science, Technology, Engineering, and Mathematics



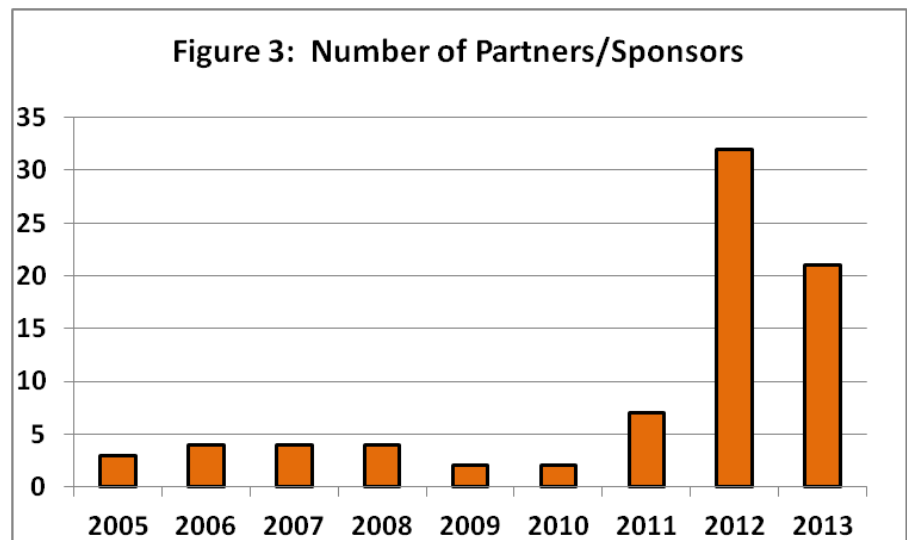
(STEM) professionals and two are employed by General Motors. Three of the mentors are T3 alumni. They are currently attending college in the area and are majoring in STEM fields. Seven mentors are employed with one the team’s sponsors, two teach at the Brandon High School, and the remaining are non-engineering professionals in the community who volunteer their time working with the team. Nine mentors constitute the team’s advisory board, which is responsible for creating and enforcing program rules and team policies, and overseeing the overall team organization.

2.5 Partners/Sponsors

Truck Town Thunder is currently sponsored by a couple of large corporations and a number of local companies and organizations. The team considers many of the sponsors as partners because of their team involvement. The current partners/sponsors include all of the following:

- | | |
|--------------------------------------|---|
| All Sons, Inc. | Mid Michigan Robotics Association |
| Brandon STEM Pathways Academy | Milosch's Palace Chrysler Jeep Dodge |
| Bueches Food World | Ortonville Rotary |
| Camp Fire Grill, LLC | R-Concepts, Inc. |
| Central Conveyor Company | Royal Oak Industries |
| Continental Automotive Group | Shores Technologies |
| Eichorn Enterprises | Stephen E. Hershey, D.D.S |
| General Motors Foundation | Szott Ford |
| Guardian Industries | Thompson's Hardware Store |
| H&R Block | Tool Sport |
| Heller Machine Tools | Tractor Supply Company |
| Lasco Ford | United States Air force |
| Macphees Restaurant | United States Army |
| Michigan Renaissance Festival | Village Auto Wash- Ortonville |

With a total of 28 partners/sponsors this year, Truck Town Thunder is down slightly from last year’s sponsorship. Figure 3 shows the number of partners/sponsors involved with the team since 2005. These relationships provide a range of support such as invaluable mentorship, generous financial support, and internship opportunities for both students and



mentors. Truck Town Thunder strives to create meaningful working relationships with both partners and sponsors.

Cultivating relationships with sponsors is an important aspect of Truck Town Thunder's agenda because part of their mission is to work with experts to both become prepared and to prepare others for the future. As such, T3 spends a good amount of time helping to publicize sponsor and partners activities by including them on shirts, plaques, and robot decals. The team also participates in robotic demonstrations for current sponsors, new sponsors/partners, and future team members. T3 believes the more exposure the team is able to provide for the FIRST robotics program, everyone will come out ahead. This year the team was able to present to several companies that were not involved in the FIRST program and were eager to join the team as a partner.

A strong partnership T3 has developed over the years is the relationship with the Michigan Renaissance Festival. The team works the last two months of the summer season cooking turkey legs. This is more than a team fundraiser for T3. It is an opportunity for team building, because every student and at least one parent must work eight times during the festival. It provides an opportunity for new parents to meet fellow team parents and learn what the team is about. As well as new student team member meet their team mates. It also provides Truck Town Thunder a chance to spread the word of FIRST. The work ethic of the team has impressed the management of the festival. T3 was asked to recommend another robotics team in Florida to assist with the Florida Renaissance Festival. This past season the management asked the team to take on additional responsibilities or possibly recommend another team or organization to assist the festival. The relationship between the Michigan Renaissance Festival and T3 is important to both organizations which is why we have formed a partnership with them.

3. Team Management

3.1 Team Membership

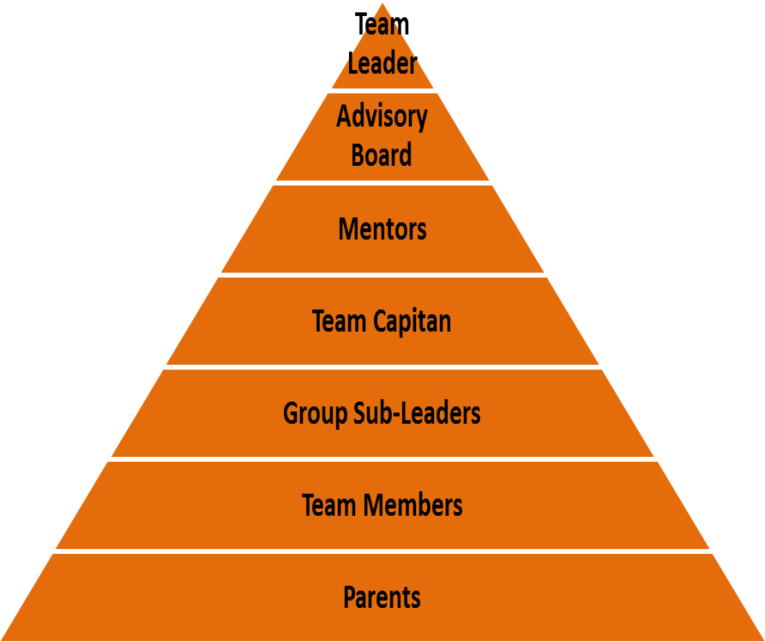
Membership on Truck Town Thunder is a year-round commitment. The team strives to prepare all new team members and parents of the obligations required of T3 members. If the students are still interested in joining the team, the process begins by obtaining an application on-line. The application requires three recommendations: 1 each from a teacher, non-family member, and parent. The next step is the interview process.

The interview process begins with students meeting with advisory board to discuss team objectives and requirements and allow the student to ask questions. The parents are then brought in for the second part of the interview. The parent is explained team objectives and requirements with their child present. Upon acceptance to the team, student and parents are then invited to the team's first meeting of the year. At this meeting students and parents have an opportunity to meet all of the mentors, team members, and parents.

3.2 Team Structure

T3 is led by a STEM teacher and shop teacher from Brandon High School. The team leader is supported by eight senior advisors, comprised of engineers, teachers, and business leaders. Additional leadership is provided by 22 mentors, made up of parents, interested professionals, and three college student team alumni. The students elect a team Captain that will be the go-between for student members and all mentors. The team is reshuffled several times during a season. The season starts out with team building and new students learning their way around the Truck Town workspace.

Figure 4: T3 Structure



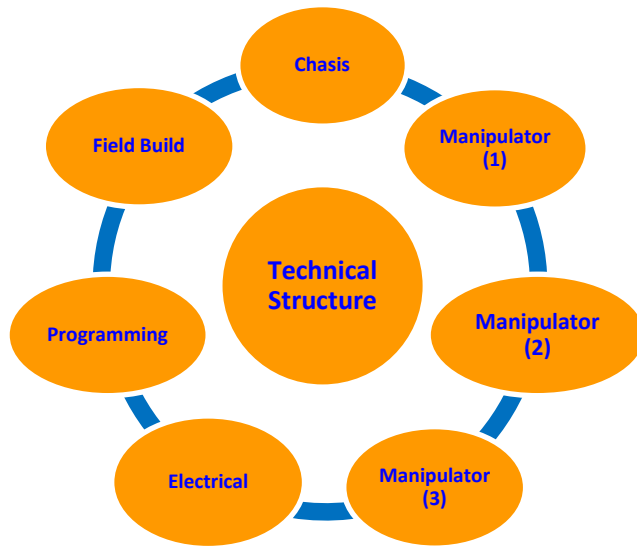
In October, Robot 101 training is started where new and returning students are exposed to the basic skills in all the following areas: robot build, CAD design, scouting, animation, safety, business responsibilities, and Chairman’s Award. After the basic training students are provided the opportunity to apply for one of the 16 sub-team leadership roles during the build season. These students work directly with mentors and students to make sure deadlines are being met and problems that arise are brought to the attention of mentors, and the advisory board if needed.

Students interested in applying for a sub-leader position must submit a resume and follow-up with an interview with the advisory board. The students sign a Duties and Responsibilities Agreement stating they understand the commitment involve with this position. After the sub-leaders are selected, students are given the opportunity to choose a work group from the Technical Structure and the Managerial Structure. T3 feels students should have an opportunity to experience as many operations of a business as they are able to fit in during a season. The team captain works with the two structures to make sure deadlines are being met and team members are accomplishing their groups’ responsibilities.

Team Captain

The team captain supports and unites the team as well as maintains the flow of communication and information from one sub team to another. The captain is responsible for keeping all sub teams informed on what is happening throughout the team. This leader shares his/her knowledge with each of the sub teams so they may act as a singular cohesive team instead of operating as individuals. When the whole team is working together, it can run at its highest potential efficiency, allowing it to strive to be the ideal team and set the example for other FRC teams.

Technical Structure (Figure 5)



Chassis

The chassis group designs the frame and transmissions of the robot. Their main accomplishment this year is the Thunder Box, which is a custom-made transmission. Members of the Chassis group are trained to use the lathe, mill parts, and weld, as well as be able to use all shop tools. Many Chassis members can also use CAD software.

Manipulator (1, 2, and 3)

The manipulator groups are designated to make as many mechanical attachments that are required for the robot that will accomplish a specific subtask. This sub task varies from year to year and can range from the construction of the whole robot. Members will use metalworking and design skills to develop the specified assembly the six weeks season. Traditionally, the team only has two manipulator groups; a third was added due to the increasing complexity and number of tasks that needed to be accomplished in the FIRST games. This year manipulator 1 is responsible for building the climber, manipulator 2 is responsible for building the feeder, and manipulator 3 is responsible for building the shooter

Electrical

Working mostly with the programmers, the electrical group orchestrates the electrical wiring of the robot motors, actuators, and sensors. The group organizes the layout of physical objects such as the battery, main circuit breaker, and other electrical components. The group is also responsible for the inventory and organization of electrical components and pneumatic solenoid valves.

Programming

Programming is the group that is responsible for converting the rules of the game and the abilities of the robot into a game-winning strategy. The group has to take human rules, strategies, and ideas and convert them into a form that the robot can understand. Programming works with every technical group to ensure that their requirements are implemented in the finished robot.

Field Build (Field, Bumpers, Driver Station, Decals)

The Field Build, Bumpers, Driver Station, and Decals(FBBDS) group is in charge of building the important field components in the first few weeks of build season. This sub team also creates the robot's control panel and driver's station. When nearing the end of build season, they then build the bumpers of the robot and the decals for the team trailer.

Managerial Structure (Figure 6)



Entrepreneurship

The entrepreneurship group gathers information that is needed for a weekly blog post. Then the group organizes the information to give to the Media group. Sometimes, the group has to find sponsors for the team and write them thank-you notes. The group organizes events to get publicity. For example, the group organizes a science fair for the elementary school. Another example is Desert Angel, which is a program where volunteers send care packages for soldiers that are serving across the ocean. The group also keeps track of time during the build season to monitor build progress. This group is responsible for making continuous improvement on the Business Plan.

Awards

The awards group is in charge of writing the Woodie Flowers award, which credits an inspirational mentor on the team. The awards group is also in charge of the Chairman's award, which includes an essay, a video, and a presentation.

Animation

The animation group helps the team by assisting with the creation of the team's digital media. Some of the responsibilities of the animation group include the creation of short films to promote team activities, the team's website, and making the Chairman's video along with other team business.

Safety

The main goal of the safety group is to make the team as safe as possible. This includes constantly reminding team members about always taking safety precautions when in the shop, forming a safety plan, and placing safety related posters in as many places as possible in the environment.

Scouting and Strategy

The scouting and strategy group is mainly in charge of the team's data. During the team's competitions, this sub-team is responsible for recording every match's data. This includes filling out the excel spreadsheet and making match sheets for the drive team (so they can prepare for upcoming matches). The scouting sub-team is in charge of coming up with a game winning strategy and introducing it to the team. With this system everyone can be included before competitions and during the build season.

Media

Media manages the team's Facebook and Twitter accounts, plans and executes the production of videos (which is edited by the Animation Group), as well as takes photographs of the team's activities. Its partner, the website group, manages the website as well as brainstorming ideas for winning the Digital Media Award, which as of the 2013 season replaces the website award.

Design

The design group develops ideas and drawings to construct the robot. These drawings are not only used for fabrication, but are also used for to show the judges how the mechanical components of the robot move.

Website

The website group focuses on spreading the word of our team and FIRST by showing what we do by maintaining the website. This sub team is also in charge of keeping the website up to date on any documents that might need to be communicated to the team.

4. Impact of Community

4.1 Community Events

T3 participates in many community events throughout the year. This past year T3 volunteered at Relay for Life, the EngiNERDS Extra Life fundraiser, Septemberfest Festival in downtown Ortonville, assisted at Brandon High School's athletic concession stands well as helped with the sales of raffle tickets, and the Desert Angel packing parties. We also attended the Brandon and Holly Homecoming parades and participate in all school assemblies. The adoption of Dixie Highway between Brandon and Holly High Schools has the team cleaning up trash along the

roadside three times a year. T3 also supports the STEM program in the Brandon High School which many team members are participants. Truck Town Thunder requires each team member to complete 20 hours of community service, with 15 of those hours being done with the team or at team-related events.

4.2 Fundraisers

A major fundraiser for T3 is working at the Renaissance Festival cooking turkey legs. This requires each student to work 8 shifts, which take place over seven or eight weekends during the summer. The team also does fundraising activities partnering with the Davisburg Rotary and Brandon and Holly Parks and Recreation. Truck Town Thunder also requires each student to coordinate and execute a community fundraiser for \$200.00.

4.3 Fostering the Growth of FIRST Teams

Truck Town Thunder is always available to help in the development of other FIRST teams and spreading the word of FIRST. Since 2005 T3 has been involved with hosting a Junior FIRST Lego League competition. The team coordinates the setup, judges the competition, makes competing team name banners, and most of all make it fun for the kids. T3 presents awards to all participating teams. Some of the awards presented are Excellence in Engineering, Presentation, Programming, Performance, Team Energy, Teamwork, Imagery, Innovation, Creativity, Spirit, Gracious Professionalism, Research, and Judges Award.

Truck Town Thunder currently mentors approximately two FLL, one Jr. FLL, and one FTC team this year.

5. Resource Requirements/Budget

5.1 Budget

Our budget encompasses both team revenue and expenses. It is a living document, constantly changing. This is a rough approximation of the current budget. Saving money on some projects, such as transportation and uniforms, whenever possible, is a constant goal. The current budget is included in Appendix 1.

5.2 Materials and Tools

In making the robot, many different materials are used. Most commonly used are aluminum, electrical wires and batteries, pneumatics tubes and equipment, wood, toolboxes, welding equipment, etc. The students also make use of the wood and metal shop, and use band saws, welding equipment, electrical drills, and many other electrical tools. For team safety, we use safety glasses, welding helmets, and gloves and follow all the safety rules of the shops. Of course, students only begin using this equipment after thorough training has taken place.

6.0 Team Values, Mission, and Goals

6.1 Values

Truck Town Thunder lives by the values of FIRST. Gracious Professionalism® and Coopertition both provide a foundation for all team members to be leaders that learn and work together to make the world a better place for everyone.

The team members of Truck Town Thunder have a reputation for being helpful, knowledgeable and respectful. Gracious Professionalism® is an important value to Truck Town Thunder and the team has been recognized for displaying this value at past competitions.

The value of coopertition was reinforced for team members playing Rebound Rumble. T3 believes working with your opponent to achieve something greater than you alone can do is what coopertition is all about. The team balancing the bridge could not have happened without either opponent agreeing to work together. The coopertition lesson learned has helped team members understand how they will make a difference in the world by working together whether they are attending school or working.

6.2 Vision and Mission

The vision statement of Truck Town Thunder, “The overall goal is to build a passionate team that encourages students to absorb new knowledge from dedicated team members while relentlessly having fun,” will be accomplished with coopertition. The team will not only work with teammates, but everyone they encounter to make a difference.

The team’s mission statement, “To inspire peers to be more excited about science, engineering, and technology by engaging them in a hands-on mentor guided life-changing journey that prepares everyone for the future,” will be accomplished with gracious professionalism® and coopertition. The team strives for a better society where teams, companies, and countries are all willing to work together for the betterment of the world. The two brains are better than one theory is felt by team members as they relate the fact that our team is a marriage of two schools which has increased the brain power when problem solving on the team, but also the collaboration of ideas to make life a little bit easier for both communities.

6.3 Goals

Short Term: T3 beings each year with the goal of building a united team. Team members join the team from different education backgrounds united by the common interest of science and engineering. One of the ways T3 is spreading the word of FIRST is by increasing the team’s online presence.

Long Term Goals: Truck Town Thunder has a goal of 100% participation for team members to pursue post-high school secondary education and/or career services to benefit mankind. We encourage T3 alumni to further pursue mentoring/helping other teams and continuing FIRST involvement. The team also plans to focus spreading the word of FIRST to a larger community.

The goals of having every senior student either start or mentor a first Junior Lego League team. Truck Town Thunder plans to host a Jr. First Lego League event at Brandon High School

T3 believes in continuous improvement. A goal of the business plan is to include a Balanced Scorecard to assist the team with strategies and objectives. The SWOT analyses were included as tool used to identify internal and external challenges the team may encounter (See Appendix 2).

Appendix 1

FIRST Team 68 - Truck Town Thunder Budget Expenses

Competition Registration Fees

FIRST Districts (2 Events and Kit of parts)	\$5,000
Michigan State Championship	\$4,000
FIRST Championship	\$5,000
Off-Season FIRST Events	\$2,000

Robots, Practice Field Parts, Tools

Purchased robot parts and materials for FIRST	
Drive train parts	\$15,000
Aluminum	
Electrical parts	
Electronic Control replacement parts from FIRST	
Pneumatics	
Practice field building materials	
Tools for building and for the competitions	
	\$1,000
	\$2,000

Uniforms, Marketing

Team Uniforms	
2 T-Shirts, each with sponsor logos and team name	
Team Marketing	
Items to trade with other teams at competitions	\$3,000
Banners with sponsor logos	
Graphics for robot with sponsor logos	\$2,500

Travel Expenses

First Championship Event	
Bus	
Air fare for select mentors	\$16,000
Lodging 4-5 nights	
Food	

Appendix 2

FIRST Team 68 – SWOT Analysis

The SWOT analysis was used to evaluate the **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats to FIRST Team 68 Truck Town Thunder’s organization. The strengths and weaknesses refer to internal factor of the team. The opportunities and threats refer to external factors the team may encounter.



Appendix 3

FIRST Team 68

Truck Town Thunder

Business Plan

Risks and Actions Plan

2013

Risks and Actions

The following is a disaster recovery plan for potential situations that might have severe implications for team continuity. The first step is to make sure that a team leader and student leader are responsible to put the plan into action if needed.

Risk: Loss of Corporate Sponsor

Impact:

- Loss of major funds
- Possible loss of GM mentors
- Loss of facilities
- Higher participation cost for students
- Less competitions attended

Action:

- Reevaluate current budget
 - Obtain new corporate sponsor
 - Have more than one corporate sponsor
 - Find new corporate sponsor
 - Team and parent meeting to discuss avenues to approach new businesses
 - increase team sponsorship
-

Risk: Loss of Student Leader

Impact:

- Loss of passing on knowledge and experience
- Loss of a role model

Action:

- New student will step up to fill the position
 - Cross training
 - Students are training other students on the team and sharing their skills and experiences
 - Team member replacement plan
 - Seniors are required to recruit new team members to replace them upon graduation.
-

Risk: Loss of Key Team Mentors

Impact:

- Loss of experience and knowledge
- Loss of a role model
- Loss if competitive edge
- Possible higher cost for the robot (welding, machining, etc.)

Action:

- New mentor recruited
 - Current mentors step up for responsibilities
 - Call out to parents for specific talents
 - Cross-train mentors
 - Canvass parents to find interested potential mentors
-

Risk: Loss of School Mentors (Teachers)

Impact:

- Possible loss of building use
- Difficulty in coordination of travel, student info
- Less effective communication between school administration and the team
- Possible loss of computer lab
- Possible loss of financial support from school

Action:

- Maintain good relations with mentors
 - Keep two mentors from school on team
 - Document all procedures in case loss of a leader
 - Maintain relations with school administration
-

Risk: Student Leaders Not Able to Travel

Impact:

- Less experience with driving, robot controls, repairs
- Limited experience in pits (judges, schedule, visitors)

Actions:

- Cross-train multiple students in all main areas (Pits, Scouting, Driving)
 - Always have back-ups assigned an understudy
-

Risk: Loss of Building Use

Impact:

- Reduced to smaller workspace
- Loss of machines/tools, practice field space, etc.
- Loss of marquee for advertising
- Team may fold

Action:

- May result in reduction of team size
 - Find a new meeting/work space
 - Keep area clean/organized
-

Risk: Serious Injury in the Lab

Impact:

- Temporarily cease all team building activities
- The school may put all limitations on student use of machines and shop

Action:

- Highest priority is to seek attention
 - Analysis of accident would be required and the determination of corrective actions would be necessary before beginning of building activities
 - Analyze all safety procedures and improve or change as needed
 - Present to school administration new safety procedures to convince that necessary safety procedures are met to allow use of machines and shop
 - Keep all students training on safe work practices and informed of possible consequences of neglecting safe practice
 - Have a safety book for reference
-

Risk: Loss of Auto Desk Inventor (Computer Aided Design) Software at School

Impact:

- Get machine fixed
- Seek other FIRST teams assistance for sharing of equipment
- Call out to sponsors and community for assistance compromised
- Would isolate Computer Aided Design (CAD) team members by requiring off site working arrangements

Action:

- Redefine scope of work
 - Reevaluate time frame needed to accomplish new scope of work
-

Risk: Broken Machines, Broken Equipment

Impact:

- Cease work on robot until fixe
- Replacement of machine may not be possible
- Temporarily move to new build site

Action:

- Get machine fixed
 - Seek other FIRST teams assistance for sharing of equipment
 - Call out to sponsors and community for assistance
-