Mousetrap Vehicle - 2020

NCSO Coach’s Clinic - October 5th, 2019

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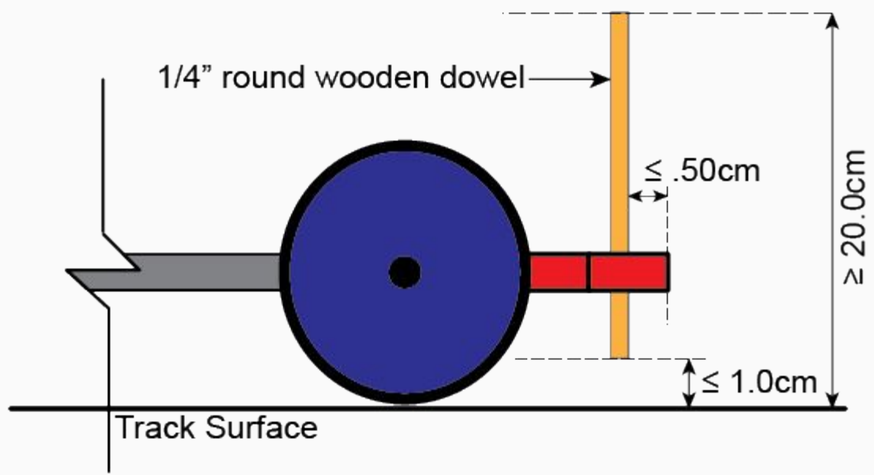
Disclaimer: This presentation is meant to be an overview and a basic guide. Official rules take precedence.

What is Mousetrap Vehicle?

- Description: Teams will design, build, and test one vehicle using one mousetrap as its sole means of propulsion to reach a target as quickly and accurately as possible.
- Team Size: 1 or 2
- Event Time: 8 min to perform up to two runs
- Impound:
  - One vehicle
  - Practice log
  - Alignment devices (if used)
  - Additional/spare parts
  - Check tournament schedules for times of impound!!!
- Not needed to impound but can bring:
  - Tools, measuring devices, stand-alone calculator, **SAFETY GLASSES!!!!**
- Do not bring or impound: Any electric or electronic tools

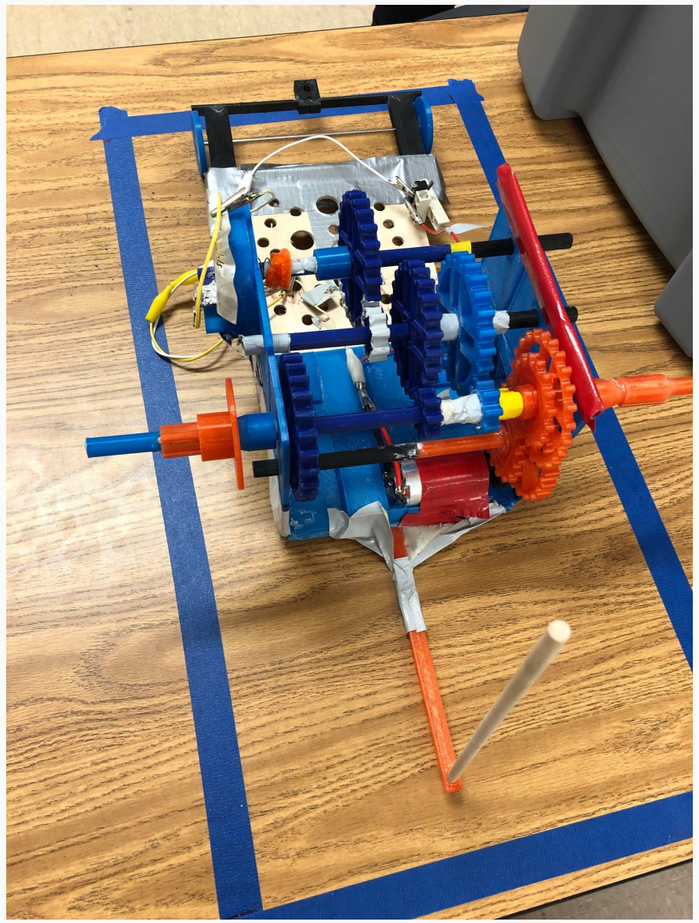
Vehicle Construction Parameters

- Wheels / Treads fit in a 40cm x 40cm space of any height and any orientation.
  - Axles and other parts may extend beyond
- Mousetrap must be 6cm x 12cm or smaller
  - No part of the jaw/hammer may extend more than 1cm from the base
- ¼” wooden dowel
  - Must be approximately perpendicular to the floor, extend down to within 1cm of the track at least 20 cm above the floor, and be easily accessible by the Event Supervisor
  - No part of the vehicle except the drive string and drive arm may extend beyond 0.5 cm of the front of the dowel.

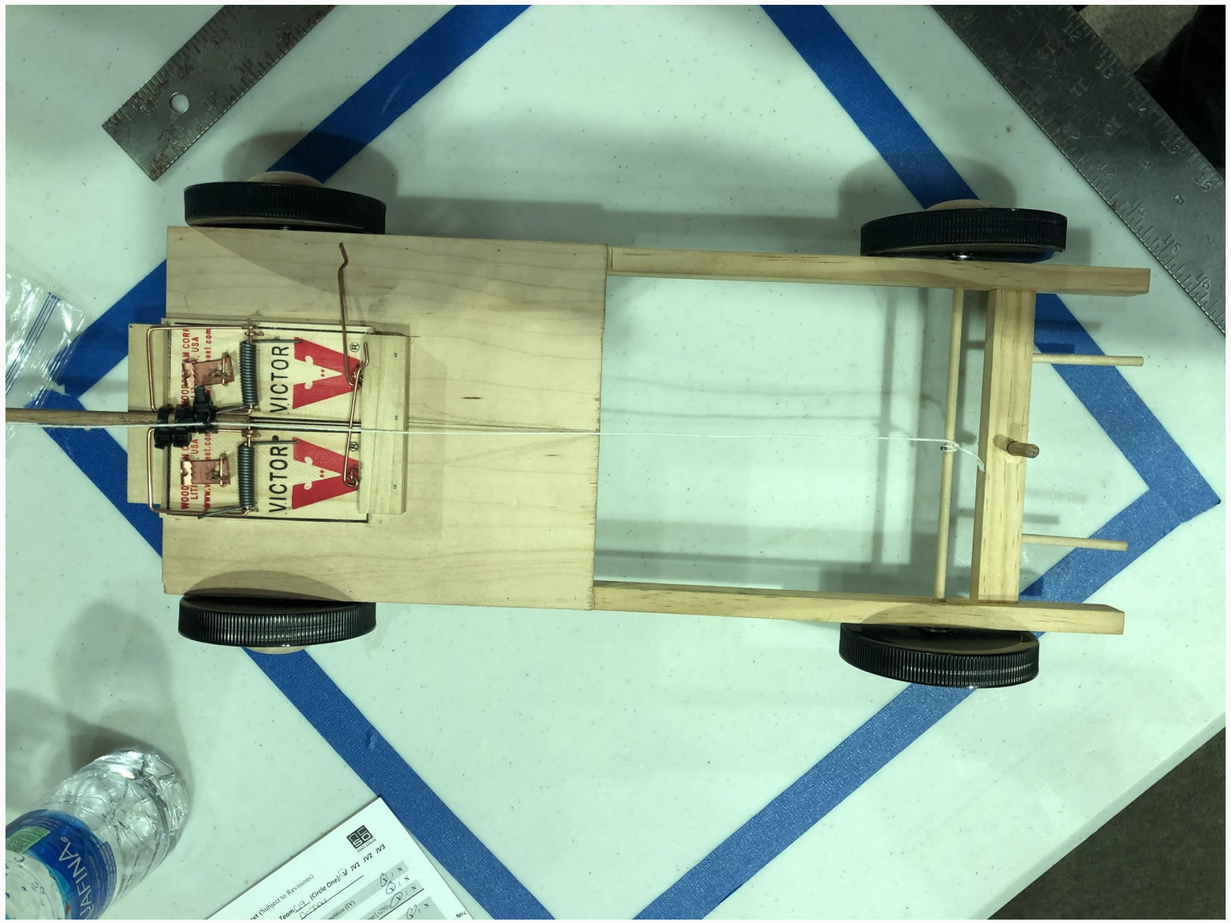


40 cm x 40 cm Box

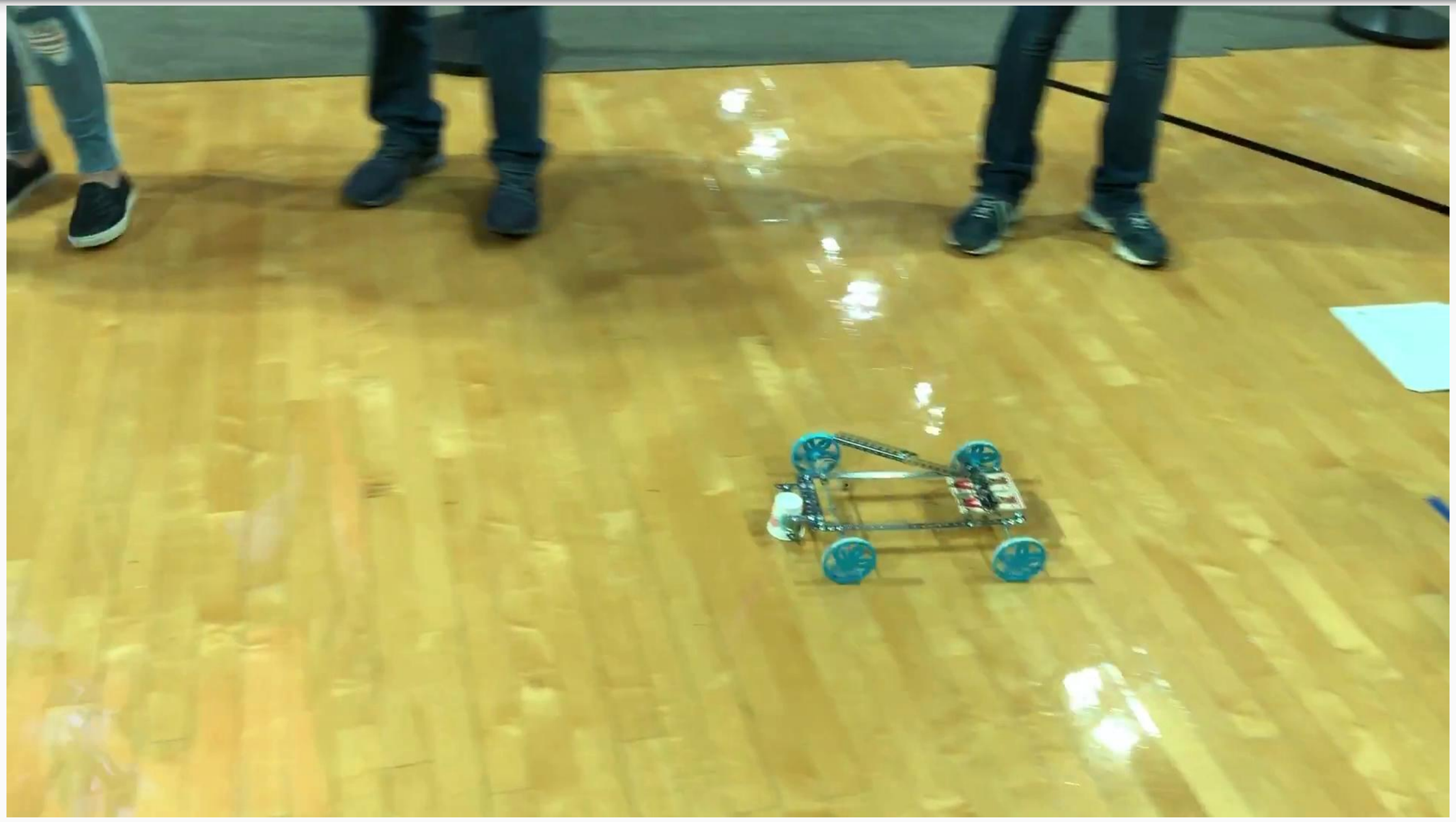
Acceptable



Not acceptable

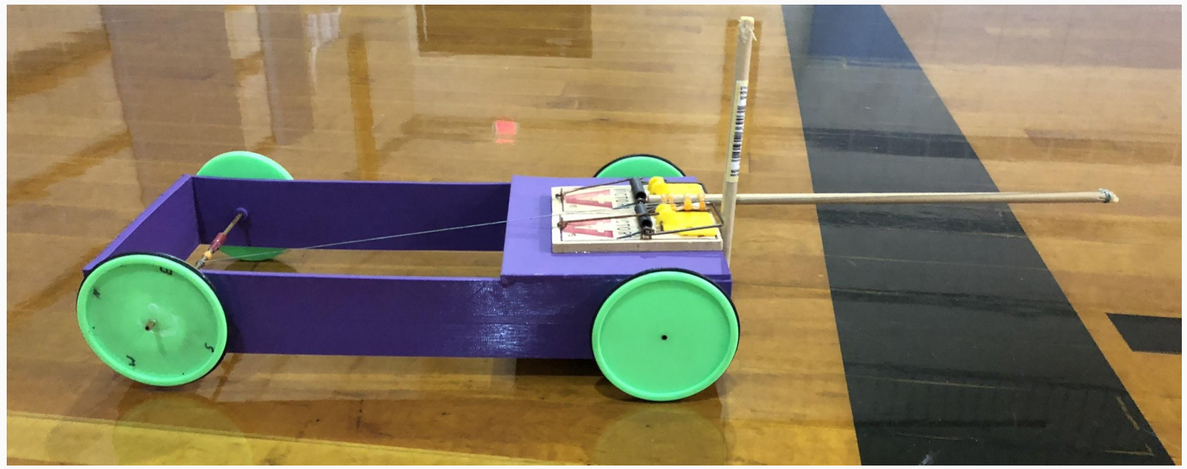


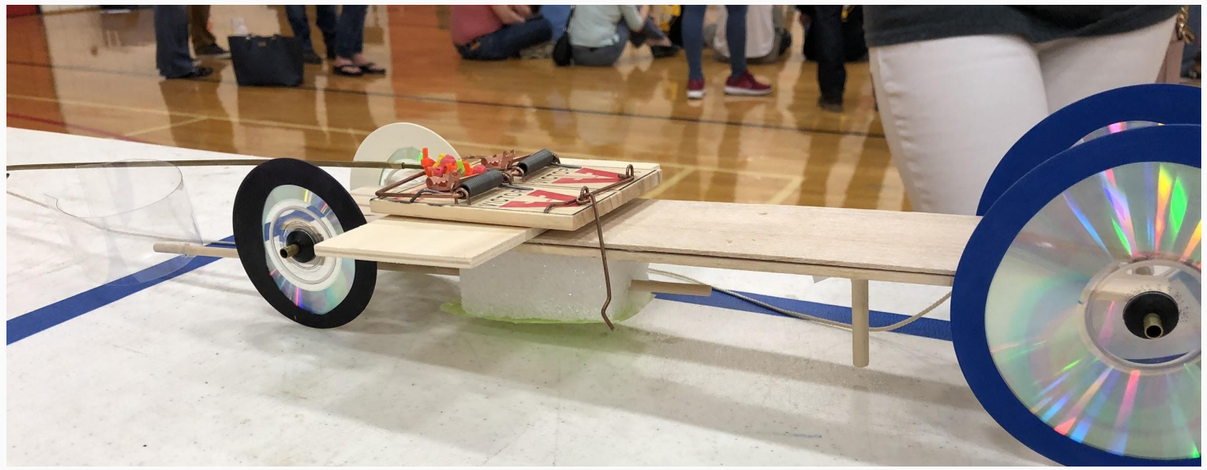
Video Example

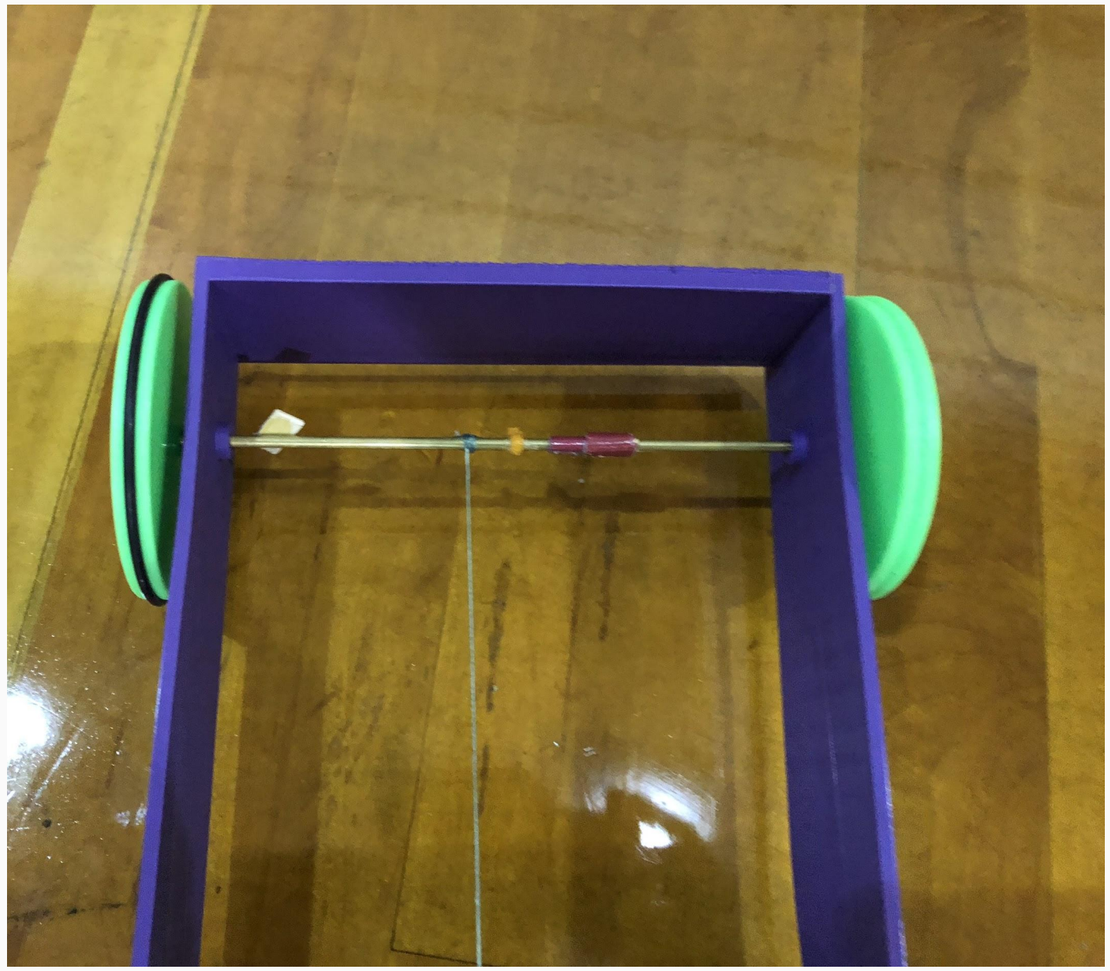


What can I use in my vehicle?

- Wheels: CDs, roller wheels, plastic
- Chassis: Wood, metal, aluminum, 3D print, laser cut, etc

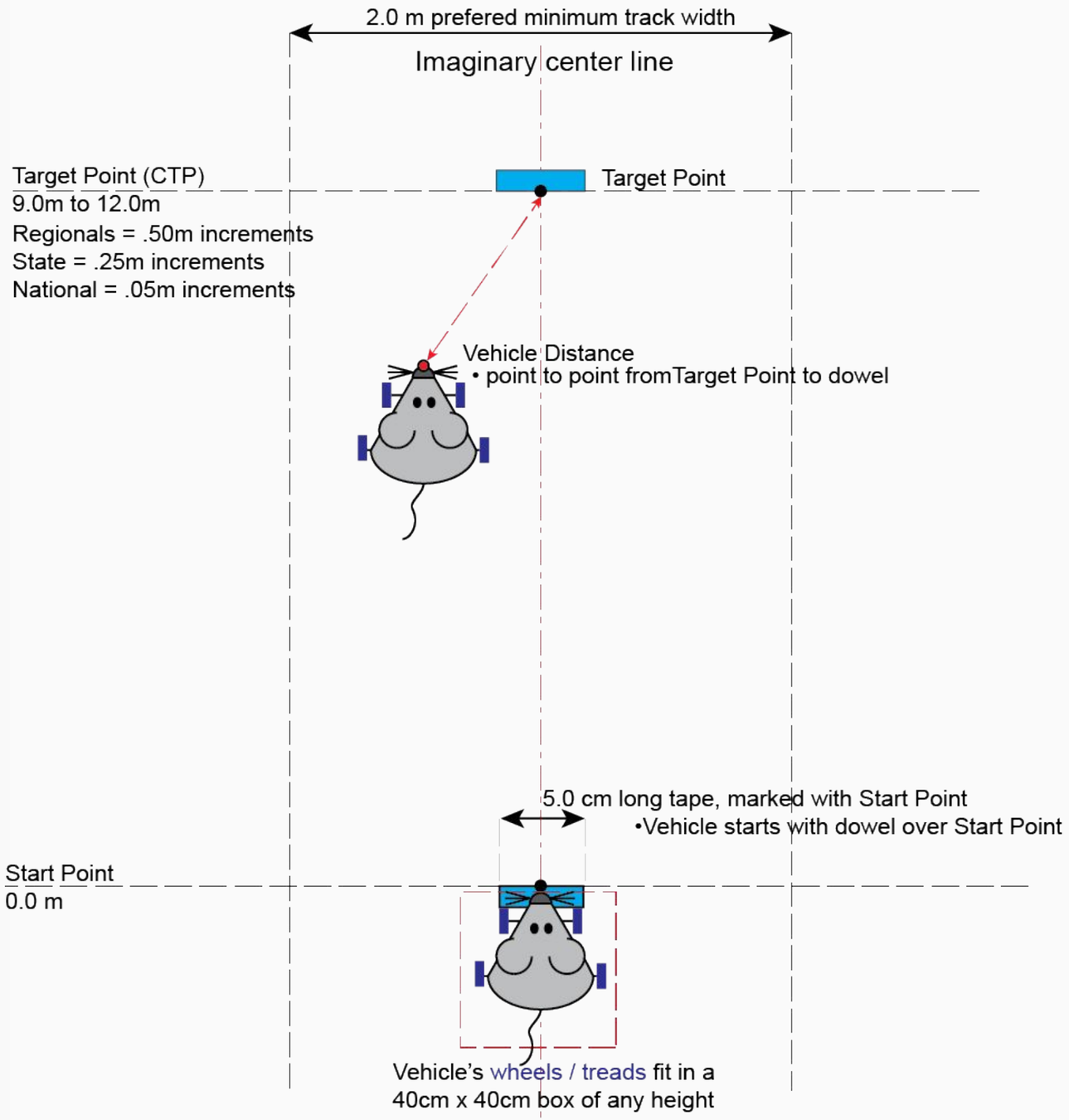






Track layout

- Track will be on a smooth, level, and hard surface.
  - Typically this is on a basketball court
- The Target Point will be between 9.0 and 12.0 m from the Start Point.
  - The Target Distance (chosen after impound) will be chosen in the following intervals:
    - Regionals: 0.5m
    - State: 0.25m
    - Nationals: 0.05m



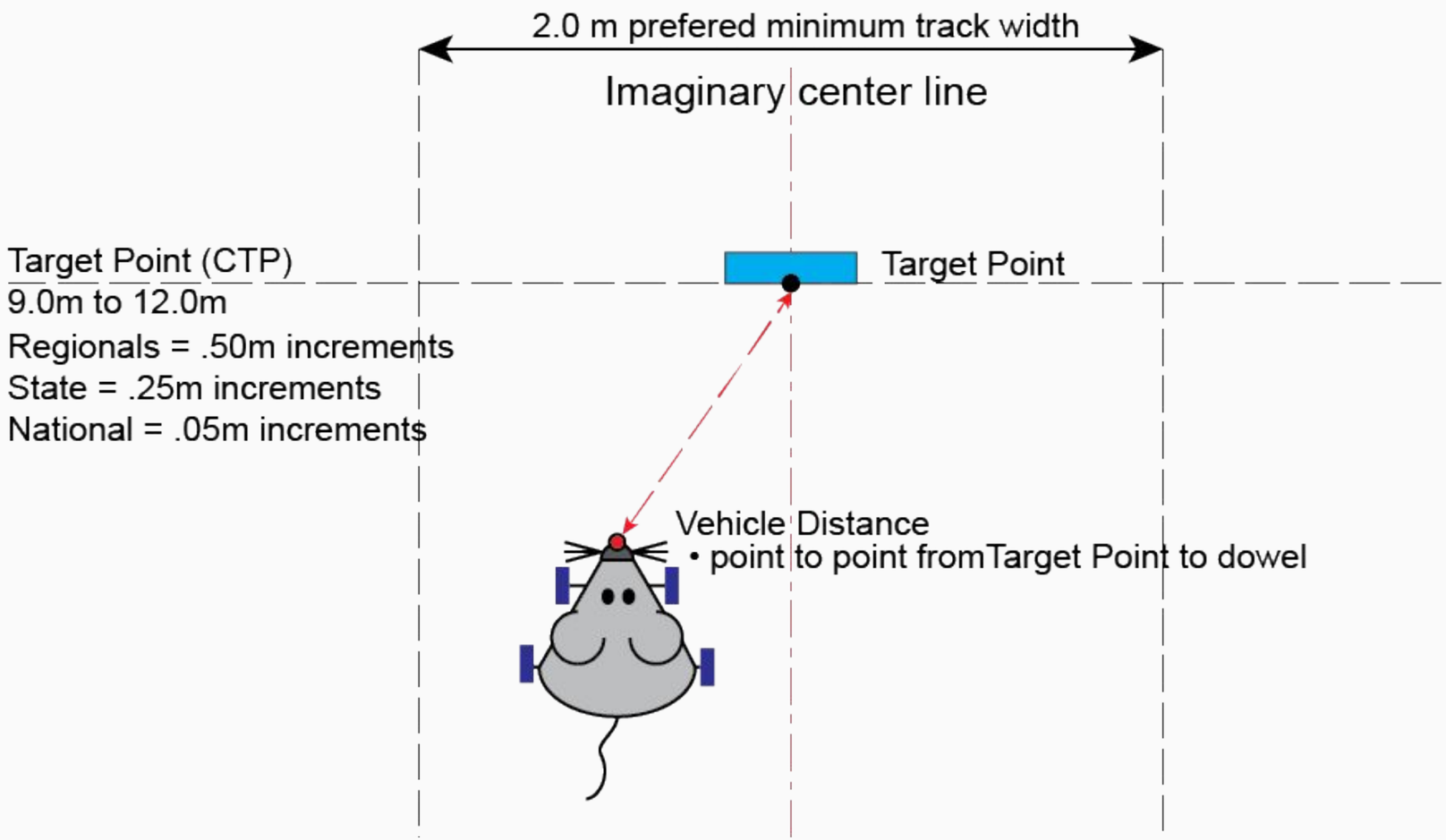
Scoring - Tier System

- Low Score Wins
- Run Score = 2 pts/cm x Vehicle Distance + 1 pt/sec x Run Time + Penalties
- Will be using a Tier System.
  - Tier 1: A run with no violations
  - Tier 2: A run with any Competition Violations
  - Tier 3: A run with any Construction Violations
  - Tier 4: Teams with 2 Failed Runs
  - Tier 5: Vehicle not impounded during the impound period

Scoring - Vehicle Distance Score

- Run Score = **2 pts/cm x Vehicle Distance** + 1 pt/sec x Run Time + Penalties

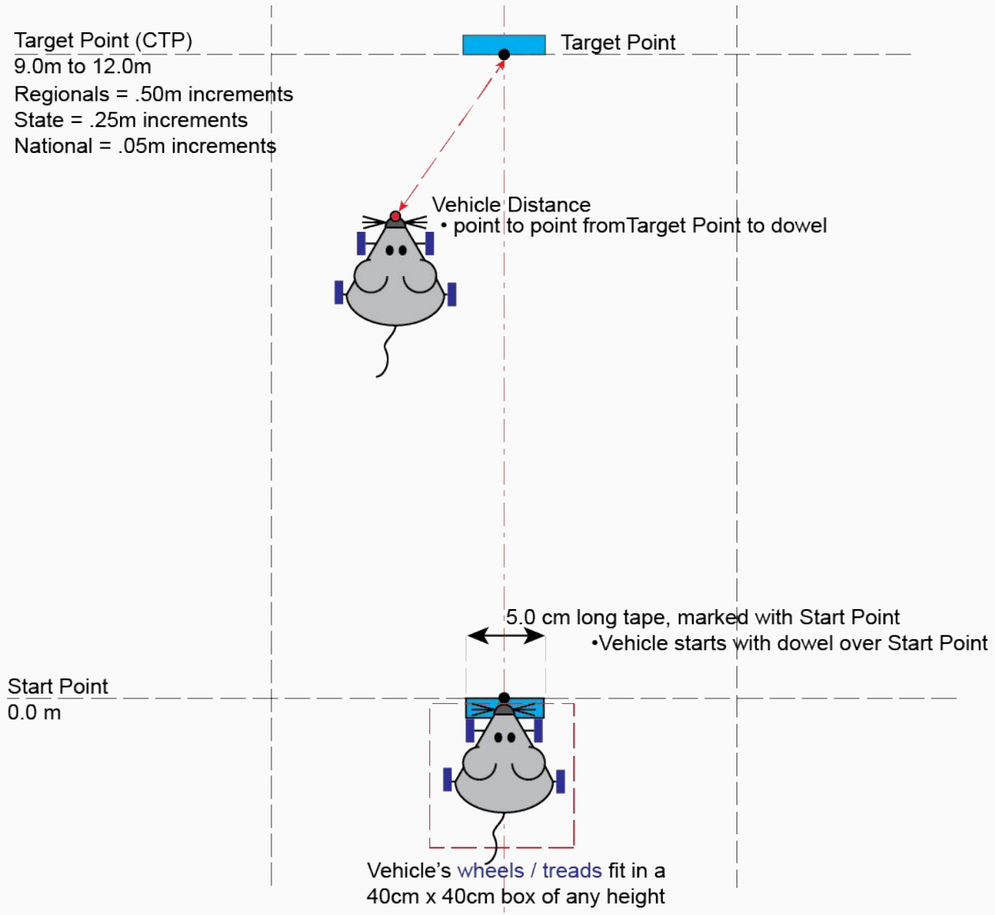
- Point to point measurement from dowel (Measurement Point) to Target Point, rounded to the nearest 0.1cm



Scoring - Run Time

- Run Score = 2 pts/cm x Vehicle Distance + **1 pt/sec x Run Time** + Penalties

- Timed in seconds from the time the vehicle starts moving to the time it stops moving.



Practice Log

- Run Score = 2 pts/cm x Vehicle Distance + 1 pt/sec x Run Time + Penalties

- Impounded with vehicle, will be returned when team's run
  - Teams without impounded logs are penalized 500 points
  - Teams with incomplete logs are penalized 250 points
- Intent is to show that teams are testing prior to competition and varying parameters while testing
- Practice log must record the Target Distance, Vehicle Distance, Run Time, and one additional parameter. (example: # of string wraps around the axle)
- Minimum of 10 runs

Run Number	Target Distance	Vehicle Distance	Run Time	(additional parameter)
1	10.5 m	75.6 cm	15.67 seconds	[data entry]
2	11.5 m	37.5 cm	14.54 seconds	[data entry]
...	...	...	...	...

Common Mistakes / Tips and Tricks

- Dowels - NEED TO HAVE THEM! Have extras, and even better if it is adjustable!
- Start mechanism does not start with a pencil
- Not reading the rules
- Phones, can not be used as a calculator, can not be used during competition for any reason
- Let the students do it! Parents and coaches want to help, but once students are in the event area, they can not receive assistance with the competition
- Check the NCSO website for any rule clarifications and any updated diagrams, scoresheets, this presentation!
- Not reading the rules
- Remember to have fun and learn!

Resources:

National website videos, youtube videos