Construction Parameters

• Vehicles must be designed as a single integral device – i.e. a complete unit

• Must travel a target distance of in a range of between 9.00 and 12.00 meters
  – 0.5m intervals regional, 0.1m state, 1cm national
  – Distance made known by event supervisor after all vehicles have been impounded

• Must come to a complete stop as close as possible to a Finish Point
Construction Parameters, cont.

- Energy storage must be in an electrical source ONLY with no other sources permitted
  - No more than 6 individual cells
  - 9 volts max total or 7.2 volts max for single pack
  - Batteries need not be installed until immediately prior to run
  - Additional energy sources permitted for other functions (braking), but not for propulsion

- Wheels/Treads must fit in 35.0 cm X 60.0 cm space with no restriction on height
Construction Parameters, cont.

• No remote control or tethering
• No electrical or electronic devices used on the vehicle, alignment devices or tools are allowed
• Students must be able to answer questions about the design, construction and operation of the vehicle
  – Building policy at www.soinc.org
The Track

• More than one track may be used
• Teams can choose which track they want to use, but both runs must be on the same track
• Track to be on a smooth, level surface with room on both sides to accommodate a vehicle that turns off course
• 1.00m long X 2.5cm wide tape will mark start, target and finish lines with start and finish points marked at the center.
The Track, cont.

- Distances between start and finish points will be marked to within 1mm of target distance
- Timing marks will be made with 2.5cm wide tape at 0.50 m and 8.50 m from start line
- A Photogate will be used to time the run
The Competition

• If a team has an appeal they must leave their vehicle with the event supervisor
• The vehicle, batteries and interchangeable parts must be impounded
• Only competitors and event supervisors (track workers) will be allowed in the track area while vehicles are competing
• Team cannot leave area or receive outside assistance, materials, or communications
The Competition, cont.

• Teams will be given 8 minutes to setup their vehicle and complete up to two runs
  – If the second run starts before 8 minutes is up it will be allowed to run
• Teams may make adjustments to their vehicle before each run, but will do so within their 8 minute time slot
• Teams may use their own measuring devices to verify track dimensions
The Competition, cont.

• Substances that may damage the floor will not be allowed to be applied to wheels or floor
  – Competitors will be allowed to clean the track in their time slot, but it must be dry for their runs
• Team can start run anywhere behind the start line up to 1.00m
• Sighting/aiming devices are allowed
The Competition, cont.

- If the vehicle does not move sufficiently when trigger is actuated, it does not count as a run
  - Students may request another try at that run, but they still only get 8 minutes to complete both runs

- Run time starts when dowel passes 0.50 m and ends when dowel passes 8.50 m
  - This will be triggered by a Photogate timer
  - If the system malfunctions the track workers will also be using stopwatches as back-up
The Competition, cont.

• Competitors are not allowed to follow the vehicle through the run
  – They must wait at the start line until the judges have made measurements and given them the OK to come and get their vehicle

• 8 minute clock stops when vehicle stops to allow for judges measurements
  – Time resumes when team picks vehicle up
The Competition, cont.

• If vehicle passes 0.50 m line but stops before 8.50 m line, stop time is recorded, distance measurement is taken and run is scored with a competition violation

• A failed run is counted if:
  – Vehicle travels in wrong direction
  – Second run does not start within 8 minutes
  – Time or distance cannot be measured
    • Vehicle moves, but does not go 0.50 m
    • Vehicle starts before judges are ready
    • Team picks vehicle up before it is measured
Scoring

• Low score wins
• Score = time score + distance score + Penalties
• Time score = Run Time x 10
• Distance score = distance from measurement point to finish point in cm to 0.1 cm
  – This is a point to point measurement
• Competition violation = 1,000 point penalty per occurrence (4,000 max)
Scoring, cont.

- Construction violation = 5,000 point penalty per run (15,000 max)
- No Impound = 10,000 point penalty per run
- Ties broken in this sequence
  1. Lower non-used Run Score
  2. Lower time score of better run
  3. Lower distance score of better run
- Teams who cannot complete a run in 8 minutes or two failed runs will get participation points
Example electric vehicle
A student aiming his vehicle