



# TRANSPORTATION MODELING

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## OVERVIEW

Using only designated materials and following required specifications, participants research, design, and produce a scale model of a vehicle that fits the annual design problem, which is posted on the TSA website under Competitions/Themes and Problems. The entry must take appearance and realism into consideration.

## ELIGIBILITY

Participants are limited to one (1) individual per chapter, one (1) entry per individual.

## TIME LIMITS

Entries must be started and completed during the current school year.

## LEAP LEADERSHIP RESUME/INTERVIEW

An Individual LEAP Leadership Resume is required for this event and must be submitted at event check-in. Semifinalists will respond to interview questions related to their submitted LEAP Resume for a maximum of five (5) minutes.

## ATTIRE

Competition attire, as described in the [National TSA Dress Code](#) section of this guide, is required for this event.

## PROCEDURE

- A. Participants check in their entries and submit LEAP Leadership Resumes at the time and place stated in the conference program.
- B. Evaluators review entries. Neither students nor advisors are present at this time.
- C. Semifinalists will be determined and posted by the CRC.



- D. Semifinalist teams will report at the time and place stated in the conference program to sign up for a semifinalist LEAP interview.
- E. The LEAP interview will last a maximum of five (5) minutes.


**It is essential that students and advisors routinely check the TSA website ([www.tsaweb.org](http://www.tsaweb.org)) for updated information about TSA general rules and competitive events. This information is found on the website under [Competitions/Updates](#). When students participate in any TSA competitive event, they are responsible for knowing of updates, changes, or clarification related to that event.**

## REGULATIONS

- A. Entries must include a scale model, a display, and documentation (a portfolio).
- B. The model, display and documentation must meet the following specifications:

### Model

1. The scale model must accurately reflect the annual design problem.
2. The model must be designed and produced as original work by the student during the current school year. The model may be made from wood or it may be 3D-printed.
3. Using commercially produced (store-bought) model vehicle body parts (including hoods, fenders, wings, propellers, frames, etc.) is prohibited.
4. It is permissible to use pre-manufactured parts such as body strengtheners, tires and wheels, plastic canopy, exhausts, mirrors, head and tail lights, windshields, and antennae. They may be attached to or enclosed within the vehicle and may be constructed from materials other than wood, excluding glass or liquids. These parts must be fastened securely. It is also permissible to use 3D printers in the production of the parts of this model.
5. The finished vehicle must fit inside the display space of 24"x24"x24".
6. The designer must choose a scale for the vehicle so that it meets Regulation 3 above and must be specified in the notebook.
7. Wheels: Dimensions should be consistent with the scale of the body. Wheels must roll.

 Read the General Rules and Regulations section in the front of this guide for information that applies to all of TSA's competitive events.

### Documentation

1. Documentation materials (comprising a “portfolio”) are required and should be secured in a [clear front report cover](#). In addition to the 11" x 17" pages noted below, the report cover must include the following single-sided, 8½" x 11" pages, in this order:
  - a. Title page with the event title, the conference city and state, and the year; a picture of the vehicle may be included as well; one (1) page
  - b. Table of contents; pages as needed
  - c. Description of designer’s vehicle, **making note of the scale used**, inspiration for the choice and design of the vehicle, research about the history and evolution of the original vehicle, and design elements that set the vehicle apart from others (e.g. fuel used, unique features); one (1) page
  - d. Photo examples of current or past vehicles that are similar to the current year’s theme or that inspired the entry; one (1) page
  - e. Concept drawings/detailed sketches or 3D CAD modeling; two (2) pages (11" x 17" size)
  - f. Photos of the clay, foam, wax, or 3D-printed mock-up; one (1) page
  - g. Final technical illustrations (orthographic); two (2) pages (11" x 17" size)
  - h. Photos of the production of the model; one page
  - i. Documentation for this event must not include the name of the chapter or state.
  - j. All ideas, text, or images from sources other than the designer must be cited.
  - k. Cited works should be in MLA format.
  - l. Pages that are 11" x 17" in size should be folded to fit in the notebook.

### Display

1. The model should be presented for evaluation on a display not to exceed 24" tall x 24" deep x 24" long (including the model). The portfolio is not considered part of the display but is placed with it. No electrical access will be provided by TSA for displays. Use of dry cell batteries is permissible, but they must be contained within the stated display space.
- C. LEAP Leadership Resume (see Forms Appendix or TSA website)/Interview — Students document, in the LEAP leadership resume (see resume template), the leadership skills that they have developed and demonstrated while working on this event. Semifinalists will respond to questions about the content of their



resume as part of their LEAP interview. The LEAP Leadership Resume/Interview guidelines and other resources can be found on the [TSA website](#).

## EVALUATION

Entries are evaluated on the quality of the notebook, model, display, and LEAP requirements. Please refer to the official rating form for more information.



### STEM INTEGRATION

This event aligns with the STEM educational standards noted below. Please refer to the STEM Integration section of this guide for more information.

Science, Technology, Engineering, Mathematics

### TSA AND CAREERS

This competition connects to one or more of the career areas featured in the TSA AND CAREERS section of this guide. Use *The Career Clusters* chart and the *TSA Competitions and The Career Clusters* grid as resources for information about careers.

### CAREERS RELATED TO THIS EVENT

- Automotive designer
- Automotive engineer
- Digital modeling technician
- Industrial designer
- Industrial engineer

# TRANSPORTATION MODELING

## EVENT COORDINATOR INSTRUCTIONS

### PERSONNEL

- A. Event coordinator
- B. Assistants, two (2)
- C. Evaluators, two (2) or more
- D. Evaluators for semifinalist interviews, two (2) or more

### MATERIALS

- A. Coordinator's packet containing:
  - 1. Event guidelines, one (1) copy for the coordinator and for each evaluator
  - 2. TSA Event Coordinator Report
  - 3. List of evaluators/assistants
  - 4. Pre-populated flash drives for evaluators
  - 5. Results envelope
  - 6. Envelope for LEAP Leadership Resumes
  - 7. LEAP Interview Judging Protocol

### RESPONSIBILITIES

- A. Upon arrival at the conference, report to the CRC room and check the contents of the coordinator's packet. Review the event guidelines and check to see that enough evaluators/assistants have been scheduled.
- B. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- C. Check in the entries and collect LEAP Leadership Resumes at the time stated in the conference program. Anyone reporting who is not on the coordinator's report may check in only after official notification is received from the CRC. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control. Requirements for attire do NOT apply during check-in.
- D. Secure the entries in the designated area.
- E. One (1) hour before the event is scheduled to begin, meet with evaluators/assistants to review time limits, procedures, and



- regulations. If questions arise that cannot be answered, speak to the event manager before the event begins.
- F. For participants who violate the rules, the decision either to deduct 20% of the total possible points or to disqualify the entry must be discussed and verified with the evaluators, event coordinator, and a CRC manager.
  - G. Collect and position the documentation portfolios and models for viewing by the evaluators, and assist them as necessary during the event.
  - H. When it is necessary to move models, only evaluators and official personnel should handle the models. Extreme care should be taken to avoid damage to the entries.
  - I. Semifinalists will be determined and posted by the CRC.
  - J. Semifinalist teams will report at the time and place stated in the conference program to sign up for a semifinalist LEAP interview.
  - K. The LEAP interview will last a maximum of five (5) minutes.
  - L. Evaluators determine the ten (10) finalists in rank order and discuss and break any ties.
  - M. Review and submit the finalist results and all items/forms in the results envelope to the CRC room.
  - N. At the designated time, return models, displays, and portfolios to student owners after verifying official conference identification.



Participant/Team ID# \_\_\_\_\_

# TRANSPORTATION MODELING

## 2017 & 2018 OFFICIAL RATING FORM

## HIGH SCHOOL

Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box. If an item is missing, leave the box blank and place a check mark in the box labeled ENTRY NOT EVALUATED. If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- Vehicle scale model is present.
- The model is made of appropriate materials.
- The portfolio is present.
- The display size is no more than 24"x 24"x 24".
- Completed LEAP Leadership Resume is present.
- ENTRY NOT EVALUATED

### Model and Display (50 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
Evaluators: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.			
<b>Production quality</b> (X1)	The model exhibits poor production quality; the surface is rough; there is little or no attention to detail.	There is some evidence of proper production techniques; the model appearance is adequate.	The model demonstrates excellent production techniques with obvious effort and attention to detail.
<b>Paint and finish</b> (X1)	Surface imperfections are evident; the model is sticky, and/or the painting quality is low.	The quality of the painted surface is acceptable, with some imperfections visible.	The painted surface is exceptional, with little or no visible imperfections.
<b>Appropriate to designated problem</b> (X1)	The model does not relate to the stated annual design theme.	The model generally relates to the stated annual design theme.	The model effectively represents and portrays the stated annual design theme.
<b>Details</b> (X1)	There is a very weak and limited attempt to include identifying characteristics and/or additional parts to help create a realistic appearance.	The model includes some identifying characteristics and/or additional parts that give it a sense of realism.	The model displays exemplary effort to include identifying characteristics and/or additional parts that give it a realistic appearance.
<b>Display</b> (X1)	The quality of the display is poor, and/or it exceeds the size requirements.	The display is adequately created and meets the size specifications.	The display is exemplary, includes eye-catching details, and meets the size specifications.
<b>SUBTOTAL (50 points)</b>			

### Documentation (70 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>Portfolio components</b> See Regulation B Documentation (X1)	The portfolio is missing several components, and/or it is unorganized; it is messy and lacks quality.	Most components are included in the portfolio; it is adequately organized.	All portfolio components are included and completely organized; effort and quality of work are evident.

Record scores in the column spaces below.





Documentation (continued) (70 points)			
<b>Vehicle description</b> (X1)	The description is inadequate; research references are lacking; the scale is incomplete.	The description is adequate, research is evident with some documentation, and the scale is stated and accurate.	An excellent description is included, with necessary research referenced to support the model solution; the scale is stated and accurate.
<b>Concept drawings, detailed sketches, or 3D CAD modeling</b> (X1)	The drawings are not to scale, and/or the the quality is poor, and/ or there are missing parts and dimensions; the drawings are not on 11" x 17" paper.	The drawings are acceptable, true to scale, and representative of the vehicle, with some details/ dimensions included; the drawings are produced on 11" x 17" paper.	The drawings are accurate and complete; they include all necessary details/dimensions and are drawn on 11" x 17" paper.
<b>Photo examples of current/past similar vehicles</b> (X1)	There is only one photo example of current or past similar vehicles.	There are two or three photo examples of current or past similar vehicles.	There are a number of photo examples of current or past similar vehicles, showing that in-depth research was done.
<b>Photos of clay, foam, wax, or 3D-printed model</b> (X1)	There is only one photograph of the clay/foam or wax model included.	Two or three photographs of the clay/foam or wax model are included, but more are needed to adequately document the model.	There are a number of photographs included that effectively document the preliminary clay/foam/wax model.
<b>Final technical illustrations (orthographic plans)</b> (X1)	Orthographic plans are poorly executed, and/or the plans are not on 11" x 17" paper.	Adequate orthographic plans are included; the plans are on 11" x 17" paper.	Complete orthographic plans are included; they are of excellent quality on 11" x 17" paper.
<b>Photos of production of the model</b> (X1)	Only one photograph of the model production is included.	Two or three photographs of the model production are included, but they are not enough to provide full documentation.	The photographs included fully and effectively document and describe the model production process.
<b>SUBTOTAL (70 points)</b>			

Rules violations (a deduction of 20% of the total possible points in the sections above) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: \_\_\_\_\_

Semifinalist LEAP Interview (20 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>LEAP Leadership Resume/Interview</b> See Regulation C and instructions on TSA website (X2)	The individual's efforts are not clearly communicated, lack detail, and/or are unconvincing. Few, if any, attempts are made to identify and/or incorporate the LEAP Be. Know. Do. criteria.	The individual's efforts are adequately communicated, include some detail, are clear, and/or are generally convincing. Identification and/or incorporation of the LEAP Be. Know. Do. criteria is adequate.	The individual's efforts are clearly communicated, fully-detailed, and convincing. Identification and/or incorporation of the LEAP Be. Know. Do. criteria is excellent.
<b>SUBTOTAL (20 points)</b>			

Rules violations (a deduction of 20% of the total possible points in the semifinalist section) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: \_\_\_\_\_



(To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.)

**TOTAL (140 points)**

Comments:

I certify these results to be true and accurate to the best of my knowledge.

Evaluator

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_