



# Long-Term Pavement Performance Data Analysis Student Contest

2019–2020 Guidelines



U.S. Department of Transportation  
Federal Highway Administration



# 2019–2020

## Long-Term Pavement Performance Data Analysis Student Contest Guidelines

### CONTEST BACKGROUND AND SCOPE

Initiated in August 1998, the Federal Highway Administration’s (FHWA) Long-Term Pavement Performance (LTPP) program has sponsored an annual data analysis contest to encourage students to use the LTPP data collected over the past three decades. The student contest is a joint effort between the LTPP program and the American Society of Civil Engineers’ (ASCE) Transportation and Development Institute (T&DI).

The contest offers a unique opportunity for contestants to work individually or in a team to perform research that will benefit the highway transportation community. Contestants must document their findings in a written paper. Authors of winning papers will receive a cash prize and an all-expenses paid trip to Washington, DC, to be nationally recognized at the 2021 Transportation Research Board (TRB) 100th Annual Meeting. Winners will also present their research topic at one or more TRB meeting sessions and will be given the option to have FHWA publish their winning paper, which will be available to researchers worldwide. All contestants will receive a letter of recognition for their participation.

### LTPP PROGRAM OVERVIEW AND OBJECTIVES

The LTPP program began in 1987 and is an ongoing effort for gathering high-quality data needed to understand pavement performance—and the variables affecting it—and make the data available for research and development of high-value products well into the future. The LTPP program is the largest and longest lasting pavement monitoring program, and it has assembled one of the most comprehensive pavement performance databases in the world.

#### Goal and Objectives

The goal of the LTPP program is to increase pavement life by investigating various designs and rehabilitated pavement structures using different materials and under different loads, environments, subgrade soil, and maintenance practices. The specific objectives of the LTPP program are to:

1. Evaluate existing design methods.
2. Develop improved design methodologies and strategies for the rehabilitation of existing pavements.
3. Develop improved design equations for new and reconstructed pavements.
4. Determine the effects of (a) loading, (b) environment, (c) material properties and variability, (d) construction quality, and (e) maintenance levels on pavement distress and performance.
5. Determine the effects of specific design features on pavement performance.
6. Establish a national long-term pavement database to support the program’s objectives and future needs.

For a complete history of the LTPP program, refer to [The Long-Term Pavement Performance Program Book](#).

## LTPP DATABASE

The LTPP program has successfully developed a national long-term pavement performance database. The database has evolved over the years to accommodate data collected over the past three decades. The data are stored using a relational database design that involves over 4,000 unique data elements in over 600 tables. This approach greatly enhances the system's ability to store massive amounts of data in a very organized method. The LTPP InfoPave™ web portal provides easy access to the LTPP data as well as access to LTPP software tools, research reports, and additional program information. The web portal can be accessed at <https://infopave.fhwa.dot.gov/>. For questions about the database, contact LTPP Customer Support Service Center at [ltppinfo@dot.gov](mailto:ltppinfo@dot.gov) or 202-493-3035.

## CONTEST DETAILS

Students are required to use LTPP InfoPave™ to compete in the contest and provide a summary of how the data were extracted and which data elements, experiment types, and/or tables were used to perform the analysis. Students must focus their analysis and paper topic around the theme, or may choose to address the challenge topic and enter their paper in that category. The challenge topic focuses on a more specialized component related to ongoing LTPP research with the potential to contribute to other pavement-related research areas.

### Theme

**Use the LTPP Data to Evaluate a Question or Concern for a Region or State**

### Challenge Topic

**Assess the Effect of Overweight Vehicles on Pavement Performance Using LTPP Traffic Data**

Many highway agencies still need to gain a better understanding of which pavement data elements have the most impact on highway system performance. How well a pavement performs is a function of several factors. The findings from the challenge topic should provide highway managers with a clear understanding of how the traffic data elements affect pavement performance over time. A review of the LTPP data should be performed along with a thorough literature review of traffic data studies performed by Federal and State governments, researchers, and academia.

### Categories

The four categories for the LTPP Data Analysis Student Contest are:

- *Undergraduate Category.* A team will consist of one to four undergraduate students. The principal author(s) must be the undergraduate student(s) who conducts the analysis; a faculty advisor cannot be a contributing author. The analysis is restricted to using only LTPP data.
- *Graduate Category.* A team will consist of one to four students, which may include undergraduate students. The principal author(s) must be the graduate student(s) who conducts the analysis; a faculty advisor cannot be a contributing author. The analysis is restricted to using only LTPP data.
- *Partnership Category.* This category is for undergraduate and/or graduate students working in partnership with a highway agency, private company, other government agencies, or transportation organizations. The team shall consist of one to four students, the external partner, and faculty advisor, if appropriate. The principal author(s) must be the undergraduate and/or graduate student(s) who conducts the analysis and not the external partners or faculty advisor. However, the external partners and faculty advisor may review and provide suggestions to the author(s) on the paper contents, and they may be included as authors. In this category, the LTPP data may be supplemented with additional highway agency data if desired.
- *Aramis López Challenge Category.* This category is for any team willing to tackle the challenge topic. A team shall consist of one to four students at any level (undergraduate and/or graduate), external partners if applicable, and may include the faculty advisor as a contributing author. The principal author(s) must be the student(s) who primarily conducts the analysis and not the external partners or faculty advisor. In this category, the LTPP data may be supplemented with additional highway agency data if desired.

The review committee reserves the right to move a paper into a different category if the committee thinks the paper is a better fit in that category.

### Student Participants

Graduate and undergraduate students who graduate anytime during the academic year are eligible for awards within one year of graduation, but all contest requirements and paper submission must occur while enrolled at the university. Students who are working on LTPP-related contracts are eligible to participate in the contest. The student's paper submission cannot, however, be related to the subject matter of the contract. Students who wish to participate in the contest must be sponsored by at least one faculty advisor. Student participants must submit a letter of sponsorship from the faculty advisor showing the advisor's support and that the paper was neither published nor previously submitted for publication elsewhere. However, after submission for the contest, students may choose to submit their papers for publication elsewhere, either before or after the contest review process is complete.

**Note: Unlike previous years, only students attending colleges and universities in the United States are eligible to participate in the contest.**

### Faculty Participants

Faculty advisors are NOT permitted to be coauthors with students in the undergraduate or graduate categories, but their names can be listed as "Faculty Advisors" on the submitted paper manuscript. The award prize goes to the student(s). Faculty members, however, can participate as contributing authors after the lead student authors and any partners in the partnership and challenge categories.

### Awards

LTPP DATA ANALYSIS STUDENT AWARD CATEGORIES			
<i>Undergraduate</i>	<i>Graduate</i>	<i>Partnership</i>	<i>Aramis López Challenge</i>
<b>Best Undergraduate Paper</b>  FIRST PLACE WINNER: <ul style="list-style-type: none"> <li>• All-expenses paid trip to attend TRB Annual Meeting.</li> <li>• \$1,000 cash prize.</li> <li>• Award certificate.</li> <li>• Option to have FHWA publish paper.</li> </ul> SECOND PLACE WINNER: <ul style="list-style-type: none"> <li>• \$500 cash prize.</li> <li>• Award certificate.</li> </ul>	<b>Best Graduate Paper</b>  FIRST PLACE WINNER: <ul style="list-style-type: none"> <li>• All-expenses paid trip to attend TRB Annual Meeting.</li> <li>• \$1,000 cash prize.</li> <li>• Award certificate.</li> <li>• Option to have FHWA publish paper.</li> </ul> SECOND PLACE WINNER: <ul style="list-style-type: none"> <li>• \$500 cash prize.</li> <li>• Award certificate.</li> </ul>	<b>Best Partnership Paper</b>  FIRST PLACE WINNER: <ul style="list-style-type: none"> <li>• All-expenses paid trip to attend TRB Annual Meeting.</li> <li>• \$1,000 cash prize.</li> <li>• Award certificate.</li> <li>• Option to have FHWA publish paper.</li> </ul> SECOND PLACE WINNER: <ul style="list-style-type: none"> <li>• \$500 cash prize.</li> <li>• Award certificate.</li> </ul>	<b>Best Challenge Paper</b>  FIRST PLACE WINNER: <ul style="list-style-type: none"> <li>• All-expenses paid trip to attend TRB Annual Meeting.</li> <li>• \$2,000 cash prize.</li> <li>• Award certificate.</li> <li>• Option to have FHWA publish paper.</li> </ul> SECOND PLACE WINNER: <ul style="list-style-type: none"> <li>• \$1,000 cash prize.</li> <li>• Award certificate.</li> </ul>

**Note: For all teams (regardless of the category in which the paper is being presented), only one student will receive the all-expenses paid trip to Washington, DC, to present the findings and accept the award on behalf of the team. The cash prize will be divided evenly among the student team and each team member will receive an award certificate.**

## Timeline

Papers must be submitted by **July 1, 2020**. Winners will be notified by September 30, 2020, and will receive their awards at the TRB 100th Annual Meeting in January 2021.

## PAPER GUIDELINES

### Paper Requirements

Paper submissions for all contest categories require that the principal author(s) and investigator(s) be a student or a team of students. The paper preparation guidelines are provided in the [appendix](#). Each paper must have a cover page including authors' names, affiliations, and addresses. The cover page must also list the category in which the paper is being submitted. Papers are reviewed anonymously; therefore, names and affiliations of authors should appear **only** on the cover page. An example of the cover page format is shown in the appendix. Each paper must have a cover page as described in the appendix, and be submitted in Microsoft® Word format only. Papers submitted in any other format will not be considered.

### Length of Paper

The length of the paper, including the abstract and references, **may not exceed 7,500 words**. A paper that is only text should contain no more than 7,500 words. Each figure, photograph, or table accompanying the text counts as 250 words. For example, if 2 figures (500 words) and 3 tables (750 words) are submitted, the text may be no more than 6,250 words.

**Note: Authors are encouraged to keep paper length to a minimum and limit the number of figures and tables, providing only essential information of interest to the reader. Papers that exceed the maximum word count will NOT be considered by the review committee.**

### Length and Content of Abstract

Each paper must have an abstract. The abstract **may not exceed 500 words**. It must clearly present the primary objectives and scope of the analysis and not require reference to the paper to be understood. It should not contain undefined, unfamiliar terms, undefined acronyms, reference citations, or displayed equations or lists.

### Footer

All pages of the submitted paper must have a footer that contains the following information:

- Contest Year (2019–2020 LTPP Data Analysis Student Contest).
- Contest Category (Undergraduate, Graduate, Partnership, or Aramis López Challenge Category).
- Page Number.

### Paper Submission

Participants must submit their papers to T&DI of ASCE via email in **ELECTRONIC FORMAT ONLY**. The email subject line should read: 2019–2020 LTPP Data Analysis Student Contest. All papers must be sent to Debi Denney at [ddenney@asce.org](mailto:ddenney@asce.org) or [ltp@asce.org](mailto:ltp@asce.org) no later than July 1, 2020. The review committee will screen the papers to check eligibility status. The review committee will then transfer all files to Adobe® Acrobat PDF format prior to sending to reviewers, to ensure anonymity and to prevent the contest papers and their contents from being lost or altered in the process of file copying and/or transfer via email.