APAI
ASPHALT PAVEMENT ASSOCIATION of INDIANA

ASPHALT BIDMASTERS COMPETITION

A HANDS-ON COST ESTIMATION, SCHEDULING, AND PROJECT MANAGEMENT CHALLENGE

USING REAL-LIFE EXAMPLES TO TEACH REAL-LIFE SKILLS

COMPETITION OVERVIEW

Industry Context

In today's technology-driven world, it's easy to forget that everything – from your groceries to your smartphone – traveled over a road to reach you. Roads, highways, trails, and parking lots are essential to our daily lives, enabling the movement of people, goods, and services across the country. Yet few people stop to consider how these critical pieces of infrastructure are built – or who builds them. That's where the asphalt pavement industry comes in.

The asphalt pavement industry is a vital sector of our economy, employing thousands of people in every state. It brings together a wide range of skilled professionals, including civil engineers, estimators, project managers, equipment operators, safety experts, and even marketers and business development specialists. Whether in the field or the office, every role contributes to the successful planning, design, and construction of quality pavements that support modern lifestyles.

This project will give you a real-world experience that connects classroom learning with the infrastructure that shapes our communities. You'll explore how an asphalt parking lot project is estimated, scheduled, planned, and ultimately awarded to a contractor.

Project Overview

Students will be immersed in the estimation and project management aspects of an Indiana parking lot project. Mirroring industry practices, they will develop both a written proposal and oral presentation as they compete to be selected as the winning contractor team. Proposals must include a detailed cost estimate, project schedule, communications plan, safety plan, and quality assurance plan. Submissions will be evaluated based on their accuracy, creativity, and overall persuasiveness – just as they would be in a professional setting.

To successfully complete this project, students will need to demonstrate proficiency in the following skill areas:

- **Collaboration & Coordination** – Work effectively as a team to manage roles, responsibilities, and workflows.
- **Mathematics** – Apply math skills to estimate costs, analyze data, and develop accurate budgets.
- **Analytical Thinking** – Evaluate project variables and make informed decisions based on data and constraints.
- **Creativity** – Develop innovative solutions and marketing strategies that stand out.
- **Entrepreneurial Mindset** – Approach the project with initiative, ownership, and a drive to deliver value.
- **Written & Oral Communication** – Clearly express ideas in both written proposals and verbal presentations.
- **Time Management** – Meet deadlines and manage project phases efficiently and effectively.

Team Guidelines

Teams should be between three and five students from the same school. Students participating in the WorkINRoads Golden Shovel Competition are not eligible to participate in the Asphalt Bidmasters Competition. Each team must designate a Project Manager, who will be responsible for overseeing all elements of the project. While individual team members may take the lead on specific components, all members are expected to contribute equally and demonstrate familiarity with all aspects of the project.

Proposal Requirements

Each team must submit both a written report and oral presentation.

The written report must include the following elements:

- Cover Page – Clearly identify the project, project manager, and project team
- Executive Summary
- Project Cost Estimate
- Project Schedule

After submitting the written report, each team will prepare and deliver an oral presentation (maximum of 20 minutes). This presentation will:

- Utilize visual aids (e.g. PowerPoint slides).
- Expand upon the written proposal and summarize the proposed project cost and schedule.
- Include the following required elements:
    - Communication Plan
    - Safety Plan
    - Quality Plan
- Justify why the team should be selected as the winning contractor.
- Allow time at the end for a Q&A session with the judging panel.

Project Mentor

Each project team may seek guidance from Kirsten Fowler, PE, Executive Director of the Asphalt Pavement Association of Indiana (APAI). She is available to answer questions and offer suggestions based on real-world industry experience.

Contact Information:

- Email: kfowler@asphaltindiana.org
- Phone: (317) 258-0132

Project Timeline

Project materials will be emailed to prospective participating schools on **Monday, August 4, 2025**.

To confirm participation, please send an email with your intent to participate by **Friday, August 22, 2025.** This email should include all team members and be sent to:

- Kirsten Fowler, APAI – kfowler@asphaltindiana.org
- Eric Fisher, ICI – efisher@indianaconstructors.org

Written project reports must be submitted via email by **3:00 pm on Friday, September 19, 2025** to both Kirsten Fowler and Eric Fisher. *Note: This is a hard deadline—no extensions will be granted or accepted after this time, mirroring real-world competitive bid submittals.*

Oral presentations will take place on **Wednesday, October 1, 2025** during the Golden Shovel competition. Presentation timeslots will be shared one week in advance.

The winning project team will be announced at the conclusion of the Golden Shovel competition.

Project Evaluation

Volunteers from APAI will serve as the Owner's Representative to evaluate both the written proposals and oral presentations.

- The written proposal will account for 50% of the team's total score.
- The oral presentation will account for the remaining 50%.

Judges will rank teams based on their responsiveness to the Project Guidelines, as demonstrated through both written and oral components.

Prize

The Asphalt Pavement Association of Indiana (APAI) will award:

- **$1,000** to the **Civil Career Pathways program** at the winning school, and
- **$100** to **each student** on the winning team.

These awards recognize excellence in project planning, teamwork, and presentation, and aim to support continued career exploration in the civil construction industry.

PROJECT GUIDELINES

Problem Statement

The Indiana Department of Transportation (INDOT) is soliciting proposals from qualified teams for the paving and reconstruction of the parking lot at the Anderson Indiana National Guard Armory, located at 125 S Scatterfield Road, Anderson, IN 46012. The scope of work includes resurfacing existing asphalt pavement and constructing a new area with full-depth asphalt pavement.

Each proposal must include both a **written report** and an **oral presentation** addressing the following components:

- **Project Cost Estimate –** Submit a comprehensive cost proposal covering all construction-related expenses. The proposal should include detailed estimates for materials, labor, and trucking associated with both aggregate and asphalt work. In addition, account for all ancillary costs such as mobilization and demobilization, traffic control and signage, overhead and profit margin, and any other necessary items to complete the project.
- **Construction Schedule –** Develop a proposed timeline that outlines the duration and sequencing of the work from start to finish.
- **Communication Plan –** Explain how you will keep local residents, nearby businesses, and project stakeholders informed about the project throughout its duration.
- **Site Safety Plan –** Describe the measures you will take to ensure the safety of both construction personnel and the public during all phases of the project.
- **Quality Assurance Plan –** Present a plan for maintaining high construction standards and delivering a durable, long-lasting final product.
- **Team Justification –** Make a compelling case for why your team is the best choice for this project, highlighting relevant qualifications, experience, and strengths.

Project Cost Estimate

To accurately determine the project cost, students will need to review the construction plans and perform calculations using key mathematical concepts, including geometry, area-to-volume relationships, and unit conversions. They will also need to analyze the construction schedule to calculate trucking and labor costs, applying the provided unit prices to their estimated quantities and durations.

Use the provided **Cost Estimate Form** to calculate the total project cost. Based on the production rates outlined in your project schedule, determine the number of trucks required and their associated costs, along with labor and equipment costs for each item. Divide these total costs by the number of units to calculate unit prices and then add material costs accordingly. The costs for mobilization/demobilization and maintenance of traffic and signage should be estimated using the project team's best judgment and research. *While typical parking lot bids may include additional components (e.g., excavation, tack coat, seeding, pavement markings, etc.), for this exercise, you are only required to calculate total costs based on the major project items specifically listed on the Cost Estimate Form.*

1) **Materials Price**

To determine the cost of asphalt and aggregate materials, each team should begin by completing a quantity take-off based on the project plans. This can be done manually using an engineering scale or digitally using take-off software such as Bluebeam or eTakeoff. Both programs offer free trial subscriptions.

Use the provided **Materials Quantity Worksheet** to calculate the required volumes of asphalt and No. 53 compacted aggregate, as well as the surface area for milling. Refer to the legend section on the plan sheets to determine the asphalt mixture depths for the existing resurfaced and new full-depth asphalt pavement sections. The worksheet is organized by project area to assist students in performing accurate quantity take-offs and material calculations. Be sure to apply appropriate unit conversion factors when calculating total quantities.

Use the following pricing information:

- Asphalt Surface (QC/QA-HMA, 2, 58S, Surface, 9.5mm): $80 per TON
- Asphalt Base (QC/QA-HMA, 2, 58S, Base, 19.0mm): $70 per TON
- No. 53 Compacted Aggregate: $30 per CYS

Note that the cost for milling should include trucking, labor, and equipment only (no material cost).

2) **Trucking Price**

The asphalt producer is located 8.6 miles from the project site. The asphalt tri-axle dump truck cycle time (loading at the plant, travel to the project site, delivering load to the project site, and travel back to the plant) is about one hour. The asphalt tri-axle dump truck cost is $140 per hour per truck. A fully loaded tri-axle dump truck can transfer 20 tons of asphalt in one cycle.

The aggregate supplier is located 8.6 miles from the project site. The aggregate tri-axle dump truck cycle time (loading at the quarry, travel to the project site, delivering load to the project site, and travel back to the quarry) is about one hour. The aggregate tri-axle dump truck cost is $140 per hour per truck. A fully loaded tri-axle dump truck can transfer 12 cubic yards of No. 53 compacted aggregate in one cycle.

The asphalt millings will be hauled off the project site and brought back to the asphalt producer's plant. The asphalt millings tri-axle dump truck cycle time (loading at the project site, travel to the asphalt plant, delivering load to the plant, and travel back to the project site) is about one hour. The asphalt milling tri-axle dump truck cost is $140 per hour per truck. A fully loaded tri-axle dump truck can transfer 20 tons of asphalt millings in one cycle. It is estimated that an average depth of 0.5 inches of existing asphalt pavement will be removed during the scarification process.

3) **Labor and Equipment Price**

The construction schedule will be used to determine the total labor hours required to complete the project. Labor and equipment costs are as follows:

- Asphalt Paving Crew:
  - Regular time: $800 per hour
  - Overtime (applies to hours beyond 40 per week): $1200 per hour
- Aggregate Crew:
  - Regular time: $450 per hour
  - Overtime (applies to hours beyond 40 per week): $675 per hour
- Milling Crew:
  - Regular time: $300 per hour
  - Overtime (applies to hours beyond 40 per week): $450 per hour

Construction Schedule

Creating an effective project schedule requires both analytical thinking and creativity. To develop your team's construction schedule, complete the following steps:

1. Determine the Sequence of Work – Decide the logical order in which construction activities will be performed.
2. Plan for Community Notification – Estimate how much time and the type of communication that will be needed to inform neighbors and the surrounding community of the project construction.
3. Estimate Task Durations – Calculate how long each major task will take, based on the scope of work and available resources.
4. Develop a Bar Chart Schedule – Create a clear, easy-to-read bar chart (also known as a Gantt chart) that shows the timeline for each major activity.

Scheduling tools available through Microsoft Office, Google Workspace, or other free online platforms may be useful for creating your chart.

The construction project timeframe will depend on available workers and equipment, length of shifts, and applying the amount of work that a crew can do in a shift to the total amount of work that needs to be completed. Project teams should use the below assumptions when estimating productivity.

Asphalt

- Setup and Cleanup Time: Each shift requires approximately 1.5 hours to set up the work zone before paving begins, and one hour at the end of the shift to clean up and adjust fencing and signage. (*Example:* An 8-hour shift provides about 5.5 hours of actual paving time.)
- Asphalt Paving Rates:
  - QC/QA-HMA, 2, 58S, Surface 9.5 mm: 40 TONS per hour
  - QC/QA-HMA, 2, 58S, Base, 19.0 mm: 50 TONS per hour
- Available Shift Lengths: 8 hours, 10 hours, or 12 hours

Aggregate

- Setup and Cleanup Time: Each shift requires approximately 0.5 hours to set up and one hour for end-of-shift cleanup and adjustments.
- No. 53 Compacted Aggregate Placement Rate: 40 CYS per hour
- Available Shift Lengths: 8 hours, 10 hours, or 12 hours

Milling

- Setup and Cleanup Time: Each shift requires approximately 0.5 hours to set up and one hour for end-of-shift cleanup and adjustments.
- Milling Rate: 300 SYS per hour
- Available Shift Lengths: 8 hours, 10 hours, or 12 hours

Communication Plan

Effective communication is critical to the success of any construction project. As part of the project team's oral presentation, teams must present a comprehensive Communications Plan that outlines how information will be shared with the community, stakeholders, and the owner's representative throughout the duration of the project. The Communications Plan may address the following elements:

- **Community and Stakeholder Outreach**
  - Identify potential impacts on neighboring businesses, residents, and pedestrians.
  - Outline strategies to communicate anticipated delays, detours, noise, dust, and general disruptions.
  - Specify how advance notice will be provided for planned work phases or major traffic changes.
  - Describe if any utility coordination is needed and how utility work may impact the surrounding area or project schedule.
- **Owner's Representative Coordination**
  - Define how the project manager will maintain regular contact with the owner's representative.
  - Include a schedule for check-ins, site meetings, and periodic status updates.
  - Describe how any issues or deviations from the plan will be communicated and resolved.
- **Communication Methods and Tools**
  - Identify the primary channels of communication (e.g., email updates, printed notices, social media, signage, community meetings).
  - Specify the frequency of updates and responsible team members for managing communications.
  - Include a sample communication timeline or schedule, if possible.

The goal of the Communications Plan is to ensure transparency, minimize disruptions, and maintain strong relationships with the community and all stakeholders throughout the construction process.

Site Safety Plan

Safety is the highest priority on any construction project. Each project team must develop and present a comprehensive safety plan that outlines how both the construction crew and general public will be protected throughout all phases of the project. This plan should be clearly communicated during the team's oral presentation. Because the Anderson Indiana National Guard Armory will remain open during construction, teams must carefully sequence construction activities to minimize disruption and ensure continuous, safe access to the facility. The safety plan should address the following:

- Signage and Traffic Control: Identify appropriate signage and safety measures to guide and protect individuals entering or exiting the site.
- On-Site Crew Requirements: Specify the personal protective equipment (PPE) that will be required for all personnel on the jobsite.
- Construction Zone Management: Outline how work areas will be secured to separate construction activities from public spaces.

Quality Assurance Plan

The project owner expects a long-lasting, high-quality asphalt pavement parking lot upon project completion. To meet this expectation, the project team must demonstrate during the oral presentation a clear understanding of what defines quality in asphalt pavement construction and identify specific strategies they will implement to ensure superior results at every stage of the project.

Teams should describe how they will monitor the overall project quality. This may include quality control procedures for testing and verifying materials at the project site and coordination with suppliers and subcontractors to maintain a balanced construction operation. Emphasizing crew training, equipment readiness, and clear quality assurance protocols will further demonstrate a commitment to delivering a durable and high-performing final product.

Team Justification

In both the written proposal and oral presentation, project teams must clearly articulate why their company should be selected over competing firms. The explanation should effectively showcase the team's strengths, capabilities, and unique qualifications that set them apart in delivering a successful project.

Your explanation should be persuasive, well-organized, and may address any of the following:

- **Team Credibility and Trustworthiness –** Provide a general explanation of why the owner can trust your team to successfully complete the project on time and within budget.
- **Personnel Availability –** Highlight the availability and involvement of key team members during the project timeline, ensuring that critical roles are adequately staffed.
- **Relevant Experience –** Share examples of the team's experience in completing complex or high-priority projects, whether in academic, work-based, or extracurricular settings.
- **Attention to Detail and Follow-Through –** Provide specific examples where individual team members demonstrated reliability, precision, and accountability in completing important tasks or projects.

- **Additional Considerations –** Include any other factors the team believes the owner should consider—such as innovation, efficiency, value-added services, commitment to quality, or strong communication practices.

Remember: *This project is your chance to make a strong impression. Be clear, confident, and persuasive in both your written and verbal communication. Your goal is to earn the owner's trust and show why your team is the best choice for the job.*