

CONTACT INFORMATION

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WEBSITE
www.Michigan.gov/MDOT-TRAC

- **FREE** hands-on materials for math, science, and social sciences
- **FREE** interactive software
- **FREE** training
- **FREE** replacement supplies
- **FREE** contact hours toward continued education for participating teachers
- **FREE** activities aligned to National Education Standards
- **ENGINEER VISITS** for career presentations

TRAC is a free program that provides teachers with curriculum-unhancing, hands-on tools for their math, science, and social science classes.

Teacher participation in the TRAC Program allows their students to share in two additional programs.

TRAC PIPELINE - CIVIL ENGINEERING INTERSHIP PROGRAM

The TRAC Pipeline Internship Program is a great opportunity for students who are interested in math and science to work alongside MDOT civil engineers and learn more about the rewards and challenges of a career in civil engineering.

- Internships for graduating high school seniors
 - Seven-week program
 - \$2,500 scholarship opportunities

TRAC NATIONAL AND MICHIGAN BRIDGE CONTESTS

Seventh through twelfth grade students have the opportunity to compete in national and Michigan TRAC bridge building competitions.

- Free mileage and overnight accommodations
- Judging by top engineers
- Win prizes

Currently, more than 2,100 Michigan teachers have participated in the TRAC Program. Below are a few of the many favorable comments that have been received:

- "TRAC puts excitement and content into learning."
- "I recommend TRAC to the teacher of my own child."
- "I can highly recommend TRAC training."
- "This is the best training I've had in my 15-year career."

MORE INFORMATION CAN BE FOUND ON THE WEB

www.michigan.gov/mdot-trac



MDOT: Providing the highest quality integrated transportation services for economic benefit and improved quality of life.

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TRAC

INFORMATIONAL PAMPHLET



TRAC consists of eight educational modules. Each module is free, includes quality equipment and free replacement supplies, and comes with an easy-to-use teacher's guide containing many activities aligned to National Education Standards.

1. BRIDGE BUILDER

- Use computer engineering to explore basic structural engineering concepts
- Explore concepts to determine how much force is transferred between members of a bridge
- Use Bentley Microstation PowerDraft v8i software to create a computer-aided bridge design
- Build and test student engineered bridges

2. ENVIRONMENTAL

- Consider particle size and settling rates in still water
- Conduct an experiment in filtering efficiency with respect to suspended particles
- Consider environmental impacts that are created from construction activity

3. TRAFFIC ENGINEERING AND SAFETY

- Introduces students to traffic management and road improvement planning
- Use math to explain curve design and explore concepts that are used to formulate equations
- Design a traffic route through obstacles using engineering equations

4. MAGNETIC LEVITATION

- Determine the reaction time required to perform an activity
- Verify Newton's first law by observing how a maglev car moves with minimal resistance
- Explore Newton's second law of acceleration due to gravity and how gravity affects movement on an inclined surface
- Design, build, and race a maglev vehicle

5. MOTION MODULE

- Demonstrate the Law of Conservation using collisions between maglev cars of different masses
- Calculate the velocity and momentum of maglev cars before and after collisions
- Study the concept of impulse
- Build a structure that minimizes impact during a collision
- Design and build a crash barrier

6. ROADWAY DESIGN AND CONSTRUCTION

- Study flow rates at varying traffic densities
- Design a roadway between two points
- Determine real estate costs of a roadway
- Estimate construction costs, including labor, equipment, material, overhead, and profit

7. TRAFFIC TECHNOLOGY

- Calculate reaction time using the application of linear motion
- Determine braking distance with respect to kinetic energy and work required to stop a vehicle
- Use reaction time and braking distance to determine the timing of a stop light
- Introduce software programming as it applies to traffic technology

8. CONNECTED AND AUTOMATED VEHICLES (CAV)

- Study the complexities of a transportation ecosystem
- Use programming and coding to direct an automated vehicle
- Consider the safety and mobility benefits as a result of connected vehicles



TRAC

TRANSPORTATION AND CIVIL ENGINEERING

