

**RIDE & TRAC Modules to Bolster STEM Skills of K-12 Students to Solve
Problems in Transportation Engineering**

Samuel Cooper, Ph.D., P.E.
Director, Louisiana Transportation Research Center
Samuel.cooper@la.gov
225-767-9101

Vijaya Gopu, Ph.D., P.E.
Associate Director, Louisiana Transportation Research Center
Distinguished Professor of Civil Engineering, University of Louisiana - Lafayette
v.gopu@la.gov
225-767-9102

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ABSTRACT

Louisiana Transportation Research Center (LTRC) undertook an important outreach program by acquiring several TRAC & RIDES training modules developed by AASHTO. The modules are designed for use in Science, Technology, Engineering and Mathematics (STEM) classes in grades K-12. The hands on activities introduce students to the world of transportation and civil engineering and inspire them to consider careers in these fields. LTRC worked with several schools in six parishes with the state of Louisiana by providing the training modules to the schools and the training needed to K-12 teachers at the selected schools to effectively utilize the modules in a class room. A diverse group of students will be served by the teachers at the schools selected in the six parishes. AASHTO's TRAC and RIDES program personnel supported LTRC in this outreach activity.

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Table 1 Schools and Parishes Participating in the RIDES & TRAC Workshop **Error!**
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INTRODUCTION

The thrust of the project was to undertake an important outreach program by acquiring several TRAC and/or RIDES training modules that were developed by AASHTO. The modules were designed for use in Science, Technology, Engineering and Mathematics (STEM) classes in grades K-12. The hands on activities introduce students to the world of transportation and civil engineering and inspire them to consider careers in these fields. Louisiana Transportation Research Center (LTRC) worked with schools in six parishes in the state by providing the training modules to the schools and offered a workshop to train the teachers to effectively utilize the modules in the class room. The workshops were held at LTRC's Technology Training and Education Center (TTEC) and offered by AASHTO's TRAC and RIDES program personnel. The workshops were coordinated by TTEC staff and offered at no cost to the participating schools.

OBJECTIVE

The goal of this project was to provide the RIDES and TRAC modules developed by AASHTO to a select group of schools for use in K-12 STEM classes and offer training to K-12 teachers in the selected schools so that they can effectively use the modules in the classroom.

SCOPE

The TRAC (Transportation and Civil Engineering) program connects students to the world of transportation while enhancing their math, science, and technology skills. The RIDES (Roadways Into Developing Elementary Students) program is designed to interest K-8 students in transportation careers while improving their math and science skills. The project acquired 15 RIDES trunks that were deemed to be most effective in generating interest in transportation engineering in middle and high school students. After the modules are acquired, seventeen teachers from ten schools in six parishes were offered two days of high energy training by National Board Certified teachers. The training is important to enable the teachers to use the modules effectively in the classroom.

METHODOLOGY

The project entailed two main tasks that are described below. As mentioned in the earlier sections, the thrust of the project was to undertake an important outreach program by acquiring several TRAC and/or RIDES training modules that were developed by AASHTO and offering training to K-12 teachers involved in STEM classes so that they can make effective use of the modules.

The TRAC (Transportation and Civil Engineering) program connects students to the world of transportation while enhancing their math, science, and technology skills. The RIDES (Roadways Into Developing Elementary Students) program is designed to interest K-8 students in transportation careers while improving their math and science skills.

Task 1 – Acquisition of RIDES/TRAC Modules

The project acquired 15 RIDES trunks for use at 15 schools in various parishes in the state. The schools were selected so that a diverse group of students were impacted by the project. The resources included in the RIDES trunks enable the teachers to conduct activities that will improve the math and science skills of K-12 students.

Task 2 – Workshop for training K-12 Teachers in the use of the RIDES resources

A two-day workshop was offered on July 14-15, 2016, to fifteen teachers from ten schools in six parishes in the state. While teachers from fifteen schools were invited to participate, teachers from only ten schools were able to attend the workshop. Each of the participating schools received one RIDES trunk for use in the STEM classrooms. AASHTO's RIDES and TRAC program personnel offered the two-day workshop which was very well received. Since five RIDES trunks are still available, a second workshop will be held in the fall 2016 semester to train additional teachers from five more schools in various parishes. The training workshop will be scheduled based on the AASHTO staff availability.

The RIDES workshop teachers' manuals that were provided to all the participating teachers covered the following topics:

1. Classification, Sequencing & Graphing
2. Forms of Energy
3. Laws of Motion
4. Inertia and Safety
5. Seatbelt Safety
6. Railroad Safety
7. Transportation Careers and the Environment
8. Simple Machines, Humans & Transportation
9. Learning about Litter and Pollution
10. Trash to Treasure
11. Roadway Shapes
12. Understanding & Using Maps

13. Design in Transportation.

While every teacher received a manual, the school received one RIDES trunk – one bin of material - for the activities covered in the manual.

The list of participating schools and the parishes represented by the schools are included in Table 1

Table 1 List of Participating Schools and Parishes Represented by the Schools

Name of School	Parish in which school is located	Number of teachers participating from the school	Number of RIDES trunks delivered to the school
Abita Springs Elementary	St. Tammany Parish	2	1
Central Intermediate	East Baton Rouge Parish	2	1
Central Middle	East Baton Rouge Parish	2	1
Chamberlin Elementary	West Baton Parish	2	1
DC Reeves Elementary	Tangipahoa Parish	1	1
Devall Middle	West Baton Parish	2	1
LaSAS	Avoyelles Parish	1	1
Magnolia Woods Elementary	East Baton Rouge Parish	2	1
Westdale Heights Academic Magnet	East Baton Rouge Parish	1	1
White Hills Elementary	East Baton Rouge Parish	2	1

CONCLUSIONS

The training of the K-12 teachers involved in teaching STEM courses was successful. The teachers had a very vigorous two-day training program that provided the necessary understanding of how to effectively use the RIDES modules in enhancing the learning experience of the students. It is anticipated that the project will have a significant impact on the STEM education of the students in the schools represented by the teachers. A second training program will be offered to training additional teachers in five more schools in different parishes. The schools selected will provide the desired STEM training to a very diverse group of K-12 students.

RECOMMENDATIONS

The project team recommends that LTRC continue this outreach effort with support from both internal and external sources of funding since the impact on the both the teachers and the K-12 students is quite significant. This investment will enable the local schools to attract the young students to pursue studies in the engineering discipline and in particular in the area of transportation engineering/civil engineering.

ACRONYMS, ABBREVIATIONS, AND SYMBOLS

AASHTO	American Association of State Highway and Transportation Officials
LTRC	Louisiana Transportation Research Center
RIDES	Roadways Into Developing Elementary Students
STEM	Science, Technology, Engineering and Mathematics
TRAC	Transportation and Civil Engineering
TTEC	Technology Transfer and Education Center

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