



EXCITE



ENGAGE



IMPACT



**Paying It Forward to the Next Generation
of Transportation Professionals**

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Quinton Rodgers

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Nebraska Transportation Center

University of Nebraska-Lincoln

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OVERVIEW

- **The Vision**
- **Goals of the Program**
- **Structure of Typical Day**
- **Sites & Participants**
- **Stakeholders**
- **Club Impact**
- **Sustainability**
- **Expansion**
- **Future Plans**
- **Questions**



THE NEED...

- The afterschool program is designed to educate diverse leaders of tomorrow about the transportation field and infrastructure surrounding them
- Utilizes a multi-modal, multimedia approach to facilitate student engagement
 - Main focus is to improve STEM proficiency among secondary students through hands-on, inquiry- and transportation-based applications that teach students about the many career opportunities available to them

FUNDING PROVIDED BY:

- **US DOT FHWA: Garrett A. Morgan Technology and Transportation Education Program**



- **US DOT RITA: Mid-America Transportation Center**



WHAT THE AFTERSCHOOL PROGRAM IS ALL ABOUT...

- Programs include:
 - *Extensive involvement from partners*
 - LPS Teachers
 - Undergraduate and Graduate Student Mentors
 - Community & Industry Partners (PPP)
 - *Curriculum based on transportation applications that emphasizes proficiency in meeting state math and science testing standards*
 - lesson plans cover topics ranging from basic science to advanced physics, and utilize state-of-the-art technology as well as hands-on, inquiry-based activities in ways that students can relate to and understand

STRUCTURE OF TYPICAL CLUB DAY...

- meet once per week for 1 hour
- introduction of main concept of day's lesson and activity:
 - inclusive of probing questions designed to gauge student comprehension and promote lesson engagement
- multimedia presentation:
 - elaborates upon main concepts and their relationship to the transportation industry
- hands-on activities:
 - inquiry-based application of main concepts
- *optional*: presentation by transportation professionals
- end with “wrap-up” activity:
 - sum up the day's main themes or ideas and record reflections on the day's activities

6/5/2012



What is transportation?

The movement of goods, services, and people from one location to another.

- Highways
- Canals, bridges, boats
- Airplanes
- Cargo ships
- Trains
- Roads
- Trucks
- Telephones
- Water

Modes of Transportation

- Human-powered
- Animal-powered
- Air
- Rail
- Road
- Water

Elements of Transportation

- Infrastructure
 - Sails
 - Pipelines
 - Seas
 - Trails
 - Air and Sea
- Vehicles
 - Can. trucks
 - Airplanes
 - Ships

Why is transportation important?

- Work
- Food
- Socialization
- Entertainment
- Education
- Health
- Safety

The Impact

- Economic
- Planning
- Environmental

Penny Boat Challenge



The Problem:

Design a boat out of aluminum foil that will hold the most number of pennies and still stay afloat.

Rules:

- Construct your boat using **only one piece** of the heavy duty aluminum foil (30 cm x 30 cm) provided.
- Pennies are the only item you may add to your boat.
- Slowly add pennies to your boat. Once water enters the boat, or if any part of the boat touches the bottom of the container, your turn is over.
- The last penny added will not count in the total amount held.
- Predict how many pennies your boat will hold: _____
- Use your lab journal to make sketches of your boat and to keep track of your trials, errors, and successes.

After the competition:

- My boat held _____ pennies.
- If each penny had the mass of 2.5 grams*, my boat held _____ pennies.
- The boat that held the most pennies _____ pennies.
- How did _____

Reflection: Write what you did, what didn't, and why.



TEACHER RESOURCE WEBSITE

The screenshot shows a search interface on a website. On the left is a navigation menu with links: Home, Help Center / FAQ, Lesson Plans (Search by Grade, Search by Teacher, Complete List), Standards Search (Nebraska State Standards Search, Transportation Curriculum Standards Search), Picture Galleries, Log In, and Contact Us (Need help with a lesson?, Having trouble with the website?). The main search area has a 'Clear Filter Options' link at the top. Below it are three filter sections: 'Filter By Primary Teacher' with a dropdown menu; 'Filter By Grade' with checkboxes for 6th, 7th, 8th, 9th, 10th, 11th, and 12th; and 'Filter By Subjects' with checkboxes for Math, Science, Industrial Tech., and Engineering. A 'Search For:' text box contains 'Enter keywords here.' and an 'In Category:' dropdown menu is set to 'Lesson Title'. A 'Search' button is at the bottom of the filter area. Below the search area, the 'Search Results:' section shows a single result for the lesson 'How Fast and How Far' with a description and metadata.

Navigation

Home

Help Center / FAQ

Lesson Plans
Search by Grade, Search by Teacher, Complete List

Standards Search
Nebraska State Standards Search, Transportation Curriculum Standards Search

Picture Galleries

Log In

Contact Us
Need help with a lesson?, Having trouble with the website?

Clear Filter Options

Filter By Primary Teacher:

Search For:
Enter keywords here.

In Category:
Lesson Title

Filter By Grade:
 6th 7th 8th 9th
 10th 11th 12th

Filter By Subjects:
 Math Science
 Industrial Tech. Engineering

Search

Search Results:

Lesson Name: [How Fast and How Far](#) (Click to view lesson)

Description:
The basic goal of this project is for students to practice measuring a variety of speeds. They are required to choose at least one speed to measure from each of three lists and they are encouraged to measure additional speeds of their own choosing.

Developed By: Barry Newman
Suggested Grades: 8
Subjects: Science

- May the Forces be with You...
- Off Road Math
- RFID and the Future
- Stopping Sight Distance
- Let's Talk Logistics
- Lava!
- Damaging Angles
- Got Inertia?

Lesson located online at:

http://tse.unl.edu/trc/lesson_plans.php

STUDENTS & MENTORS



Mentors and students work together on each activity.

HANDS ON ACTIVITIES



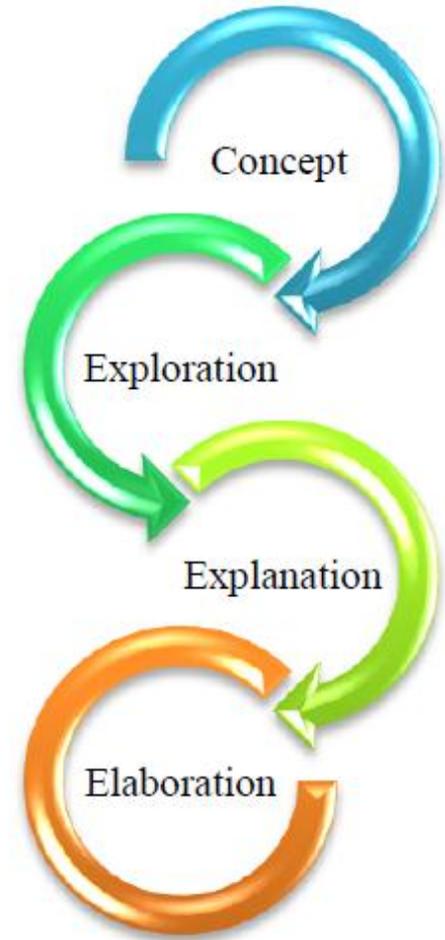
*After-School Program
Mentor, Carrie Mohlman
gives student, Autumn, a ride
in the Nebraska Safety
Council's Simulated
Impaired Driving Experience
go-cart at Culler Middle
School.*

COMMUNITY INVOLVEMENT

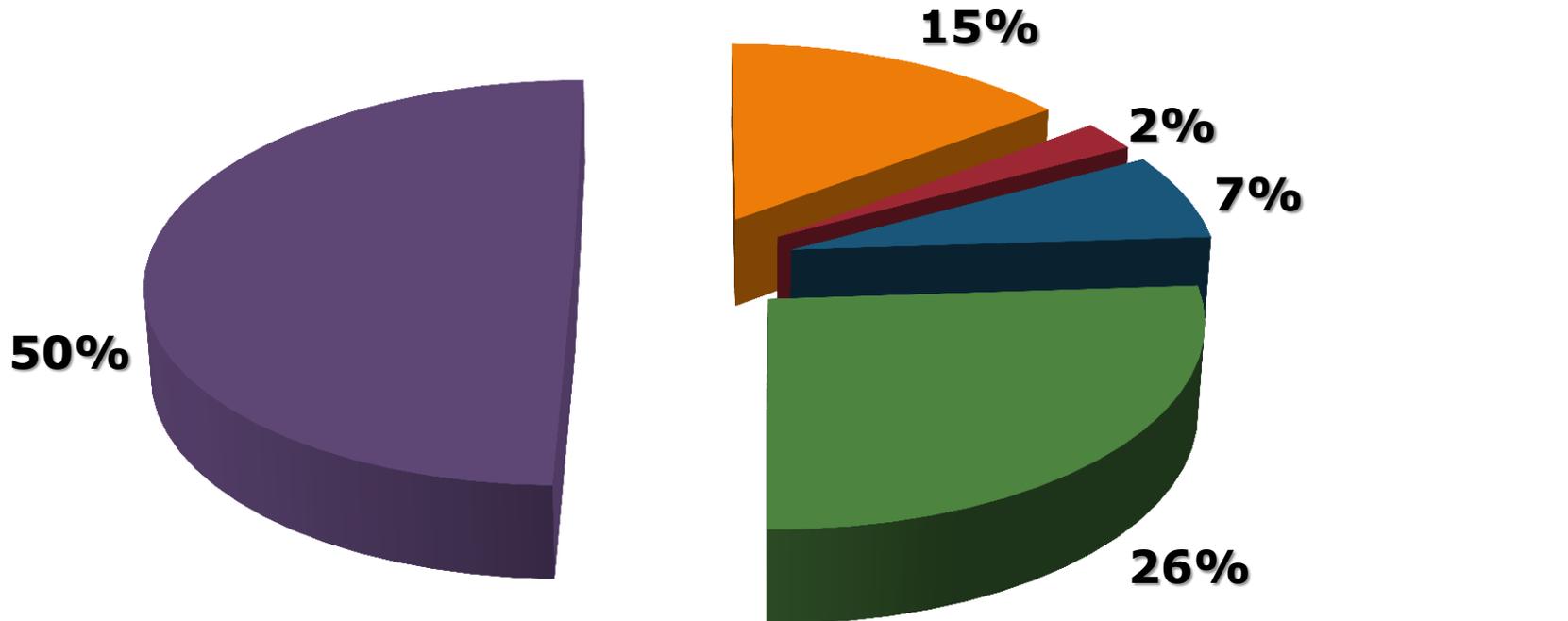


*After-School
Program students
demonstrate “The
Proof is in the
Pudding” to guests
at a celebration.*

SCIENCE INQUIRY BASED LESSONS

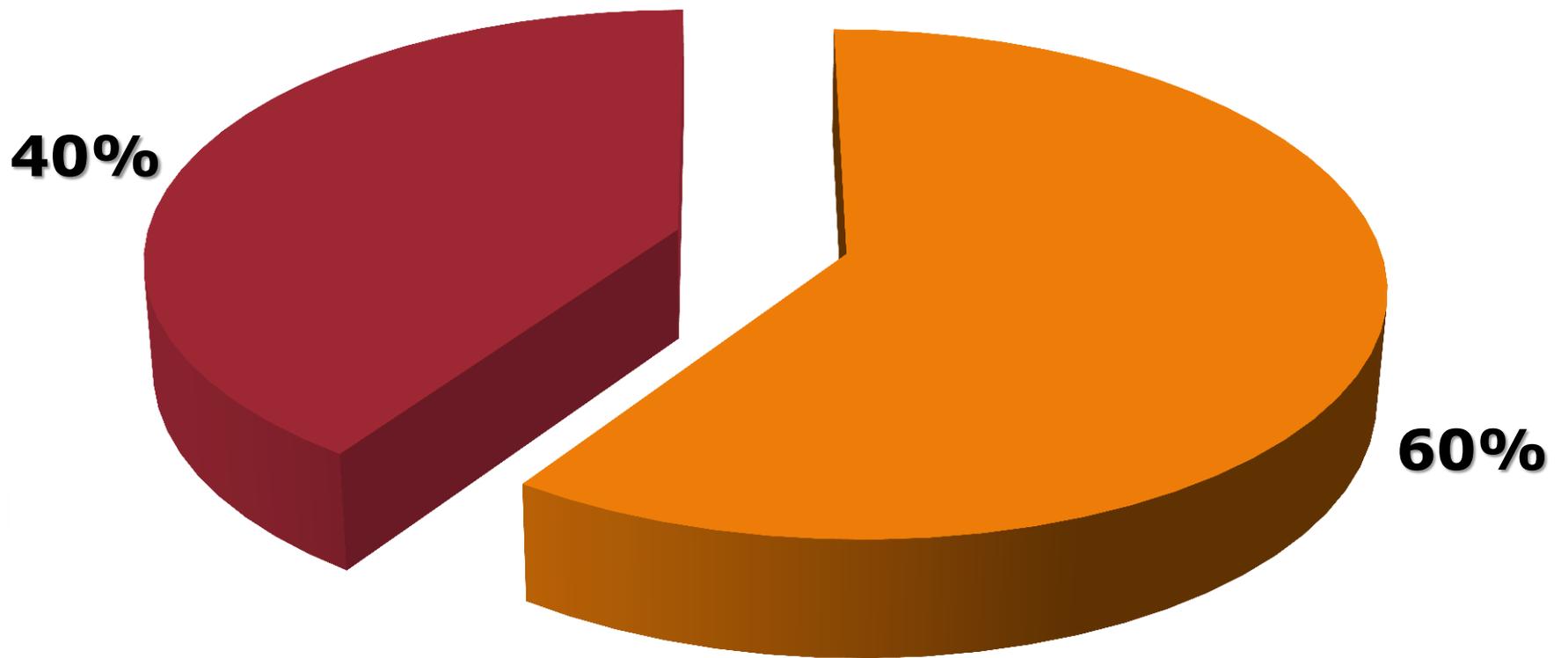


RACIAL DISTRIBUTION FOR ALL CLUBS 2011-2012



- African American/Black: 49
- American Indian: 8
- Asian: 23
- Other, (including Hispanic or Latino and Multi-Racial): 88
- White: 166

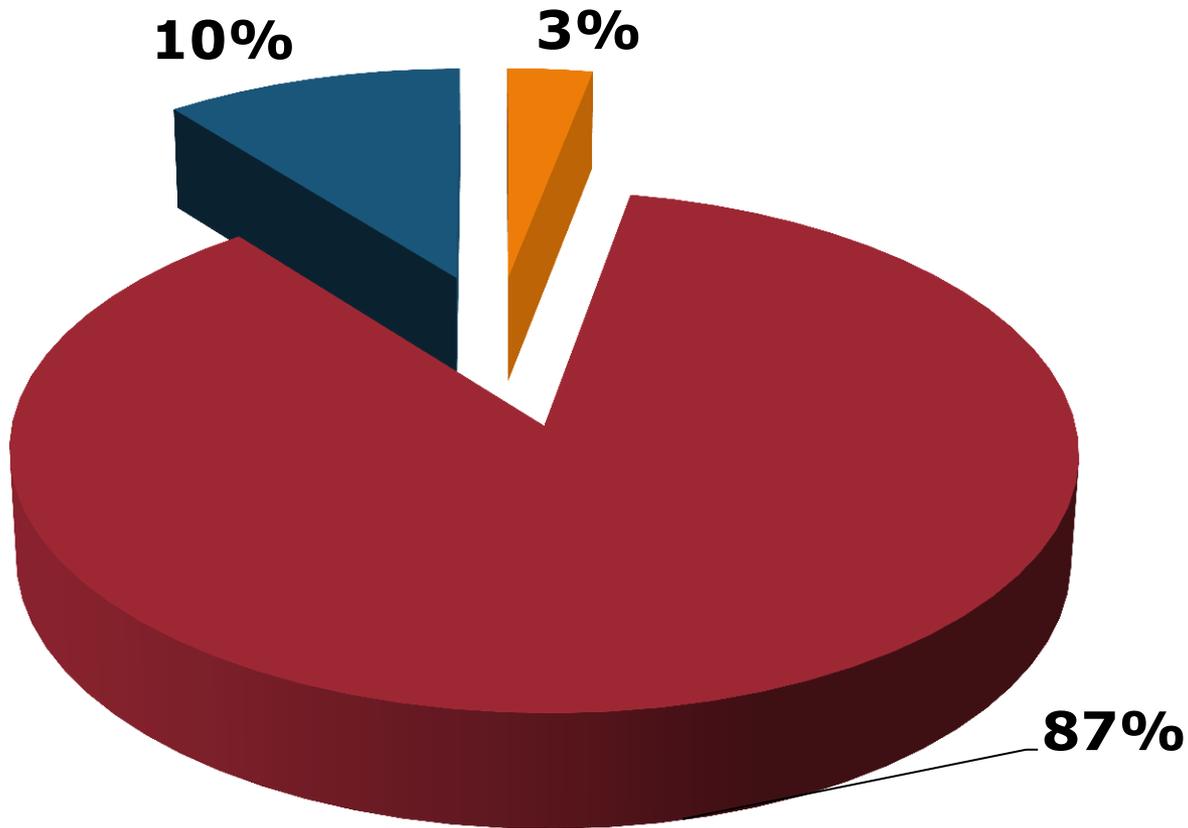
GENDER DISTRIBUTION OF ALL CLUBS 2011-2012



■ Male: 199

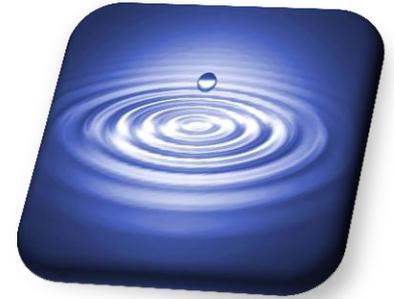
■ Female: 135

DISTRIBUTION OF GRADE LEVELS ATTENDING CLUB 2011-2012



- Grades K-5th Elementary: 10
- Grades 6th-8th: 289
- Grades 9th-12th: 35

CLUB IMPACT...



- ***Impact on students:***
 - Developed an increased awareness of transportation careers and issues and have demonstrated improved science and math testing scores as a possible result of club participation
- ***Impact on mentors:***
 - Experienced satisfaction of giving back to the community, and have improved interpersonal and public speaking skills
- ***Impact on teachers:***
 - Extended many of the joys and impacts that teachers already receive from working with students, ranging from instilling hope in their students to feeling a sense of self-fulfillment

WHAT THE STUDENTS HAD TO SAY...



“The program has changed what I thought about science and math because it makes me think more about engineering and what the field really requires.” – Zach Harris, 8th grader.

“I like the hands-on learning more because I get to experiment and see how things work, which is beneficial to me.” – Qui’Niah Lee, 8th grader

“I like the college mentors because they can relate to me and my peers.” – Josh Gerdes, 8th grader.

WHAT THE MENTORS HAD TO SAY...

“Being a mentor for RRRC has given me the opportunity to share my experience and knowledge with the next generation of students. Being able to help students understand what’s really going on when a traffic light changes or how the shoes they’re wearing got to the store is a fascinating and fulfilling experience.

Not many people can ask in-your-face questions like middle school students can! Leading a lesson and activity has also helped foster creativity and flexibility in my schoolwork and work in general.”



WHAT THE TEACHERS HAD TO SAY...



“Being a teacher for RRRC is the best part of my day. I get to interact with students on a different level than the academic classroom. In our competitive society it is important for students to not only receive a solid education, but to work with someone who builds hope for their future. That is why collaboration with the UNL graduate and undergraduate students, as well as community members, is exciting, meaningful, and rewarding. They provide the expertise to run the lessons and I rely on them for support and guidance. All in all, it is a very special time between adults and club students and I could not ask for a better experience.”

WHAT THE INDUSTRY PARTNERS HAD TO SAY...



“Our country, in order to maintain our TDL advantage and bring advanced manufacturing jobs back to our shores, must continue to invest in our infrastructure, transportation technology, and lifelong learning opportunities for our future transportation workforce. If not, the transportation field will be in jeopardy.”

2012-2013 LEADERSHIP COUNCIL

Name	Title	Organization
Jeff Cole	Associate VP of School-Community Partnerships	Nebraska Children and Families Foundation
Mary Davie	Co-President	Flatbed Express
Emily Faubel	President	Faubel Financial Services
Larry Johnson	President	Nebraska Trucking Association
Laurence Rilett	Director	Mid-America Transportation Center
Amy Starr	Research Engineer V	Nebraska Department of Roads
Lea Ann Johnson	Co-coordinator	Lincoln Community Learning Centers (LPS)
Carl Fielder	Dean of Applied Technology	Metropolitan Community College
Dennis Headrick	VP for Instruction	Southeast Community College

PUBLIC, PRIVATE, PARTNERSHIPS



SITES AND PARTICIPANTS...

- **First implemented at Culler Middle School, Fall 2010 – Spring 2011**
- **Currently implemented in 5 schools throughout the Lincoln Public School (LPS) district:**
 - **Maxey Elementary School**
 - **Culler Middle School**
 - **Lefler Middle School**
 - **Mickle Middle School**
 - **North Star High School**
- **Attendance on club day has ranged from 2 to 27 students per session, with a total attendance of 1,366 across all sites by 235 different students**

JANUARY 2013 EXPANSION



Lincoln, Nebraska:

3 Elementary Schools;
4 Middle Schools;
2 High Schools

Omaha, Nebraska:

2 Middle Schools

Boone, Iowa:

1 Middle School

Madison, Wisconsin:

1 Middle School

14 Schools!

SUSTAINABILITY OF RRRC...

- The clubs have been designed in manner that lends self to expansion to other schools, cities, and states
 - Lesson plans organized into:
 - Quarterly binders – include presentations, instructions for program implementation, and handouts used during lessons and activities
 - On-line repository – houses lessons and worksheets created by STEM middle school teachers during the Summer Institutes
 - Connections have been made through various avenues including:
 - Student Organizations
 - UTC's/personal contacts at different universities
 - Community businesses and professionals

INITIAL (INFORMAL) EVALUATION

- On a scale of 5 (Strongly Agree) to 1 (Strongly Disagree)
 - 3.83 (Agree) I feel RRRC/STEM Engineering Club has increased my motivation to work hard in school
 - 3.8 (Agree) I tell others about what I do in RRRC/STEM Engineering Club
- 81.5% - RRRC/STEM Club increased my interest in science & technology
- 44.4% - RRRC/STEM Club increased my interest in math



NEXT STEPS FOR RRRC...

IRB Approved Data Collection

- Next steps is to collect information in pre, post, and follow-up formats regarding:
 - student knowledge
 - interest
 - engagement
 - attitudes
 - career self-efficacy
 - career identification

Apply for additional funding... NSF, FHWA, Etc...

“CONNECT WITH US”



VISIT US ON SLIDESHARE!

The screenshot shows a Slideshare presentation slide with a dark background and a central white text box. The slide features three small images at the top: 'EXCITE' (a group of people), 'ENGAGE' (a person at a computer), and 'IMPACT' (a person in a truck). The main text reads: 'Paying It Forward to the Next Generation of Transportation Professionals', 'Valerie Lefler, Manager of Research & Development', 'Cynthia Baker, K12 Educational Programs Coordinator', and 'Nebraska Transportation Center, University of Nebraska-Lincoln'. The Slideshare interface includes a search bar, navigation icons (Email, Favorite, Save file, Collect Leads, Embed), and a sidebar with social media sharing options (Like, Tweet, Share, Pin it, WordPress). A 'More' section on the right lists other presentations.



Transportation Awareness After School Presentation

by [Mid-America Transportation Center](#). on Sep 13, 2012 [Edit](#)

0 views

Valerie Lefler and Cynthia Baker present to the Region 3 National Association of Publicly Funded Truck Driving Schools Conference on September 13, 2012 in Hastings, Nebraska.

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Valerie Lefler Unl

Voice

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You are posting, commenting, and liking as Valerie Lefler Unl — [Change to Mid-America Transportation Center \(MATC\)](#)

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Region VII: University Transportation Center

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Lincoln

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Uploads (13) Date added (newest - oldest)

Uploads

Railroad Violation: Under stopped ...
24 views 2 months ago 0:56

Railroad Violation: Over stopped tr...
20 views 2 months ago 0:37

Railroad Violation: Grade Crossing
17 views 2 months ago 0:28

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A screenshot of a web browser displaying the Twitter profile page for @MATCNews. The browser's address bar shows the URL "twitter.com/MATCNews". The page features a dark navigation bar with icons for Home, Connect, and Discover, along with a search bar. The profile card includes the MATC logo, the name "MATC", the handle "@MATCNews", and a bio: "In 2006, and again in 2011, MATC won the US DOT RITA competition for Region VII University Transportation Center. Lincoln, Neb · <http://matc.unl.edu>".

MATCNews) on Tv x MATC_vimeo.jpg (300x300 x (6) Twitter / Search - #NE x

twitter.com/MATCNews

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← → ↻ <https://vimeo.com/matc/videos>

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45 Videos 0 Appearances 45 Total

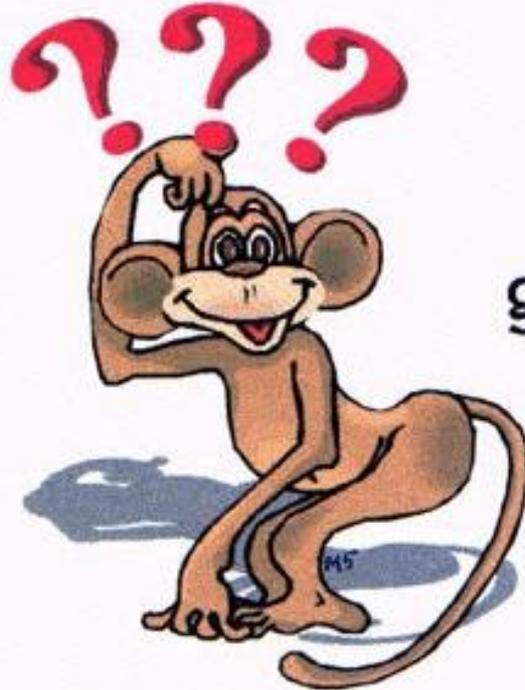
Sort: [Date](#) / [Alphabetical](#) / [Plays](#) / [Likes](#) / [Comments](#) / [Duration](#)

Lincoln

QUESTIONS?



Questions
are
guaranteed in
life;
Answers
aren't.

THANK YOU!

Thank You Thank You Thank You
Thank You Thank You Thank You
Thank You Thank You Thank You

CONTACT INFO:

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- **Email me: mherrin@lps.org**
- **Call anytime: 402-436-1210**



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