



## Project Background

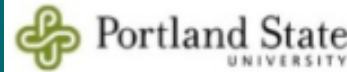
The Portland Metropolitan region is home to a high concentration of businesses from the manufacturing, construction, high tech, and computer science sectors, all of which rely on a well-educated and highly skilled STEM workforce. Many current STEM workers are also anxious to engage in the education system, but it is not always clear how they may best impact students and schools.

Through an Oregon Transportation and Research Consortium Grant, the *Elementary Investigations in Transportation* project harnessed the professional expertise, experience, and enthusiasm of transportation sector STEM workers by creating a mechanism and set of protocols by which they engaged with elementary school teachers to develop and implement an instructional unit. This STEM connected instructional unit and lessons allowed students to explore and investigate issues central to transportation.

The unit incorporated and enhanced the content and practice standards outlined by the Common Core State Standards-Math and Next Generation Science Standards, and relied heavily on the instructional and curriculum expertise and experience of classroom teachers to develop an age and interest appropriate unit of study. This collaboration resulted in the development of an *Investigations in Transportation* instructional unit that provided students with rich, engaging learning opportunities set in the context of real-world problems around a school parking lot dilemma focused on safety, sustainability, and health embedded in STEM.

# Investigations in Transportation

Science, Technology, Engineering and Math (STEM)  
Project-Based Unit with Funding Support from National  
Institute for Transportation and Communities and  
Volunteers from Oregon Department of Transportation



## UNIT PLANNING

### LEAD TEACHERS WORK WITH TRANSPORTATION PROFESSIONALS TO CREATE UNIT

Six 3-hour planning sessions with transportation professionals from Oregon Department of Transportation and Transportation consulting firms, lead teachers from Tobias and Chehalem schools, and Portland State University programming and research staff. Extended contract compensation for lead teachers.

#### Steps Taken:

1. Building relationships and trust
2. Connect to research and the Portland Metro STEM Partnership Theory of Change (See [pdxstem.org](http://pdxstem.org)) on impacting teacher effective instructional practices and student achievement in STEM.
3. Connecting and inspiring: Doing science and engineering as a group.
4. Harnessing the expertise in the group: Cultivating the professional knowledge and enthusiasm of transportation sector STEM workers and the background and experience of classroom teachers
5. Sense-making of Common Core and Next Generations Science Standards
6. Making connections to the real-world
7. Identifying effective unit components
8. Brainstorming possible dilemmas that lead to project selection.
9. Unit planning with support from professional development coordinator, grant researcher and STEM School Teachers on Special Assignment

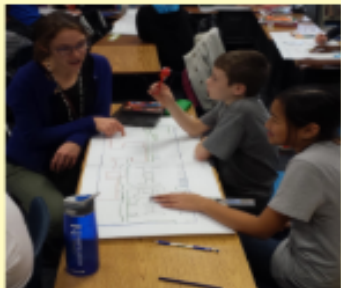
## UNIT IMPLEMENTATION

### LEAD TEACHERS BRING COLLEAGUES AND STUDENTS ON BOARD

Sub release provided for lead teachers to share units with colleagues and for data reflection. Funds provided for purchasing transportation equipment, books and drafting supplies.

#### Steps Taken:

- Sharing unit with teammates
- Unit revisions and daily plans
- Purchasing equipment and resources
- Making the unit meet schools' needs
- Sharing unit with students: Engage
- Pre-survey of academic identity and motivational resilience
- Linking STEM: science, technology, engineering, and math through instruction to standards through project based instruction
- Sharing the excitement with parents
- Using transportation professionals for real-world place-based connections, enthusiasm and expertise: Parking Lot Dilemma
- Students collecting and analyzing data
- Creating solutions to parking lot dilemma
- Post-survey and application of conceptual knowledge task



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