

# Workforce Recruitment Dilemma: Defining Transportation and Transportation Careers

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## ABSTRACT

The ambiguous definitions of “transportation” and “transportation careers” are potential obstacles to effective recruitment of high school and college students. With the transportation industry beginning to experience a serious worker shortage at all skill and education levels, attracting young people to the field has become critical.

The purpose of this study was to learn what, if any, differences exist between college students and transportation professionals in their understanding of the term “transportation.” A secondary purpose was to have both groups evaluate a list of transportation-related job titles according to how well they fit the field of transportation. This small study included 52 first- and second-year students at Iowa State University and Des Moines Area Community College and 39 transportation professionals with experience in academia, consulting, and local, state, and federal government.

Both students and transportation professionals defined “transportation” primarily as movement of people and goods. But when the groups rated job titles, students rated jobs higher (i.e., more “transportation-ish”) that were more clearly related to the modes of transportation, e.g., truck driver. Transportation professionals, on the other hand, rated engineering jobs—jobs aligned with the transportation infrastructure—higher. This difference in understanding of transportation careers suggests why the term “transportation” is so nebulous when it comes to describing possible careers. The physical, social, and political infrastructure that enables the movement of goods and people is essentially invisible to, and therefore not comprehended by, students. This invisibility is a major roadblock to effective recruitment.

**Key words: recruiting—transportation careers —workforce development**

## **INTRODUCTION**

When high school and college students hear the term “transportation,” what comes to mind? Moving goods and people? Driving somewhere? Maybe taking a plane? What generally does not come to mind is the transportation infrastructure—the roads and bridges, rail lines and runways. These elements are invisible to them.

*Transportation* can be a vague, even misleading, word, so it’s not surprising that workforce development efforts, especially those targeting children, avoid the term. The concept of transportation careers is nearly as ambiguous. What job titles does that term encompass? In the *Des Moines Register*’s help-wanted ads, for example, one category of jobs is “Automotive/Transportation.” The majority of the jobs advertised in this section is usually truck drivers. While moving goods across the country is important and necessary work, it does not reflect the breadth of the transportation career field. Misperceptions about transportation careers compound the recruiting problem.

Yet the field of transportation is a great industry for people looking for long-term work. According to the National LTAP (Local Technical Assistance Program) Association, nearly half of the current transportation workforce may retire by 2010. The U.S. is beginning to experience a serious worker shortage at all skill and education levels.

Attracting young people to transportation careers, particularly careers related to the transportation infrastructure, has become critical. But designing, developing, and maintaining the infrastructure can be an invisible function to young people and to their parents, teachers, and guidance counselors. Even when the work is visible, as in the case of road work zones, high school students (and most adults, for that matter) have no idea what kind of work and planning is done before and after that work zone goes up.

There is a fundamental communication gap between transportation professionals and laypeople about the work that goes on to keep this country moving. Because of this communication gap, recruiting young people into professional and non-professional careers in transportation can be particularly challenging.

## **PURPOSE OF THE STUDY**

The purpose of this study was to show the differences between college students’ understanding of the term “transportation” and transportation professionals’ understanding. My hypothesis was that young people think of transportation in terms of modes or means of getting around whereas transportation professionals use a broader definition to include the infrastructure. A secondary purpose was to have both groups evaluate a list of transportation-related job titles according to how well they fit the field of transportation. I anticipated that students would rate jobs higher (i.e., more “transportation-ish”) that are more clearly related to the modes of transportation, e.g., truck driver. On the other hand, I anticipated that professionals would tend to rate jobs higher that are related to the transportation infrastructure, e.g., civil engineer.

## **BACKGROUND INFORMATION**

### **Overview of Topic**

This study focused on two things: (1) people’s definitions for the term “transportation” and (2) their understanding of how “transportation-ish” certain job titles are. The study compared responses from young people, specifically college students from Iowa State University (ISU) and Des Moines Area

Community College (DMACC—Boone Campus) enrolled in first-semester English courses, and adults working in the transportation industry.

## **Previous Studies**

### *In Linguistics*

Scientists such as linguists and psychologists have wondered what the relations are between words and mental categories. Prototype theory attempts to explain how categories of words can be understood as groupings of meaning. So a word like “chair,” for example, may include a seat off the floor and a backrest. Does a prototypical chair need to have legs? If so, how many?

Several researchers, particularly Rosch, Armstrong, and Gleitman have conducted studies using well-defined categories of concrete nouns such as fruit, furniture, vegetables, etc. Subjects rated exemplars of a given category on a seven-point scale. Fruit, for example, might have the following exemplars: apple, banana, orange, plum, lemon, and kiwi. Each type of fruit would be rated individually according to how “fruity” it seemed to each subject.

To my knowledge, however, “transportation” has not been studied in this way.

### *In Workforce Development*

Researchers exploring workforce development issues in the field of transportation have not tried to define “transportation.” Instead they’ve focused on the more easily definable “civil engineer” (easier because it refers more clearly to a person rather than a whole field; i.e., *doctor* rather than *medicine*).

From a brief review of literature related to recruitment, it’s clear that careers in transportation are not generally known or understood by most high school students or by the adults in their lives. Other research and outreach projects have focused on more readily identifiable careers.

In a recent project sponsored by Minnesota’s Local Road Research Board, researchers developed recruiting materials about careers as a civil engineer and civil engineering technician. An older (1992) National Cooperative Highway Research Program (NCHRP) report also focused on civil engineering. According to researchers for NCHRP Report 347, *Civil Engineering Careers: Awareness, Retention, and Curriculum*, “The term ‘civil engineer’ means almost nothing to those who are uninformed. The image of the civil engineer is related typically to road construction or maintenance, or working for local government at a low salary.”

For the past several years, the Federal Highway Administration has been promoting careers in construction by helping sponsor “Construction Career Days” for high school students across the country. These events are not restricted to transportation-related construction (dry-wall hanging and electrical work are some of the suggested hands-on activities). While these recruiting efforts are certainly useful, they ignore the breadth of transportation careers available and needed within the industry. One reason for this may be the difficulty with defining the terms *transportation* and *transportation careers*.

## **PROCEDURE**

Two separate one-page surveys were prepared—one for students and one for professionals in transportation. The student survey included questions about gender, age, year in school, and the following questions:

- What does the word “transportation” mean to you?
- How is transportation (based on your definition above) part of your daily life?

Students were also asked to rate 14 different job titles on a scale of 1 to 7 to show how well they felt each title fit the career field of transportation. These job titles were selected to represent the breadth of the transportation industry, from those responsible for building and maintaining the infrastructure to those responsible for moving goods and people using that infrastructure, and included the following titles:

- Civil Engineer
- Truck Driver
- Traffic Safety Engineer
- Public Policy Analyst
- Land Surveyor
- Motor Grader Operator
- Urban Planner
- State Trooper
- Bridge Engineer
- Construction Inspector
- Fleet Dispatcher
- County Engineer
- Airline Pilot
- Pavement Materials Technician

The specific instructions were these: “Following is a list of job titles. Please rate each one on a scale of 1 to 7 to show how well you feel a title fits the career field of transportation. A 1 rating means you feel the job title is a very good example of your idea of a career in transportation while a 7 is a poor example. A 4 means you feel the job title fits moderately well. Use the other numbers to indicate intermediate judgments. Circle your rating for each.”

The survey of transportation professionals included the same questions about gender, the definition of transportation, and the rating of job titles, as well as the following questions:

- How many years of work experience do you have in the field of transportation?
- Within the field of transportation, what types of organizations have you worked for? (options included public agency (city, county, state, federal); private; education/training; research; and other)

## **Subjects**

One of the purposes of this study was to compare young people’s definitions of transportation with those of transportation professionals. First-year college students were chosen since their high school attitudes and experiences are likely recent and their responses can be extrapolated to high school students, a primary target population for recruitment into the transportation workforce. Two separate groups of students were surveyed—ISU students and DMACC students.

Both groups of students were selected based on their enrollment in their schools' respective required first-semester English courses. At ISU, two sections of English 104 were surveyed. Thirty-nine surveys were completed and returned out of 45 enrolled in the courses. At DMACC, three sections of English 110 were surveyed, a potential enrollment of 60 students; 13 surveys were completed and returned.

In total, approximately 100 students were surveyed; 52 surveys were returned. Sixty percent of the students were female, and 40 percent were male. Of the 52 students, 75 percent were in their first year of school. The majority of the students (80 percent) were 18 or 19 years old. Nine students were in their twenties, two in their late twenties, and one was 45. Of the three non-traditional students (i.e., older than 25), two were female, including the 45-year-old.

The transportation professionals were selected based on my own knowledge of their backgrounds. Thirty surveys were distributed to staff and graduate students (with significant professional experience outside of academe) at Iowa State University's Center for Transportation Research and Education (CTRE). The same day the surveys were distributed, a course was being held at CTRE for transportation professionals (the course was Designing Pedestrian Facilities for Accessibility). On the spur of the moment, I asked the instructor if I could survey his students in order to get an even broader range of responses. In all, 52 surveys were distributed to professionals, and 39 were completed and returned.

Of the 39 professionals, 18 percent were female and 82 percent were male. Their years of experience in the transportation field range from two years to 44 years. The average number of years of experience is 16.9. Women averaged 8.6 years of experience while the men averaged 18.3 years.

Ninety-five percent of the professionals surveyed have worked in a public agency at the city, county, state, and/or federal levels. Thirty percent of the group with public sector experience has worked only in the public sector while the other 70 percent has worked in one or more additional sectors, such as private industry, education, and/or research.

## RESULTS

### Students' Definitions of Transportation

Students overwhelmingly defined the word "transportation" in terms of movement from one place to another. The words "move" or "moving" were used in 17 percent of the definitions while "get" or "getting," as in "get around," were used in 73 percent of the definitions. Sample student definitions are as follows:

- Means of getting from point A to point B.
- A means of getting around or moving from one place to another.
- Getting in some sort of vehicle to go somewhere. Getting from place to place.
- Transportation is a way to get from one place to another.
- Means to get from one place to the next without complications.

The fact that all of the student surveys were completed in a classroom setting may account for much of the similarity in the definitions. That is, students may have shared their thoughts. Nevertheless, it's interesting to note that a small handful of students suggested a broader definition beyond moving from one place to another. For example, some students mentioned the route and mode, as well as what or who gets transported. See the following examples:

- The way you get from one place to the next and **what route you take**.
- Getting around or going from place to place by a **means of either a car, bus, train, plane, etc.**

- This word means to me a process of getting from one place or another whether it is **people, goods, or nutrients in a plant, etc.**
- **A device used** to get you from one destination to another.

The survey question about how transportation is used in daily life sheds more light on students' individual understanding of the word. Answers to this question were more diverse. Forty-six percent of the students referred either to "class," "school," or "work" in their responses to this question as destinations and/or reasons for using transportation. Forty-eight percent referred to walking, driving, riding a bike, or taking the bus. Student responses to this question emphasized transportation as a means to move from place to place, such as from home to work or school, via several modes. One response hinted at a broader definition of transportation that would include the infrastructure: "It is everywhere whether it is cars, buses, bicycles, walking, airplanes, streetlights, roads, sidewalks."

### **Professionals' Definitions of Transportation**

Of the 37 responses to this question, 76 percent of transportation professionals included either "get" or "move" or "movement" in the definition. Examples of the most common definitions are as follows:

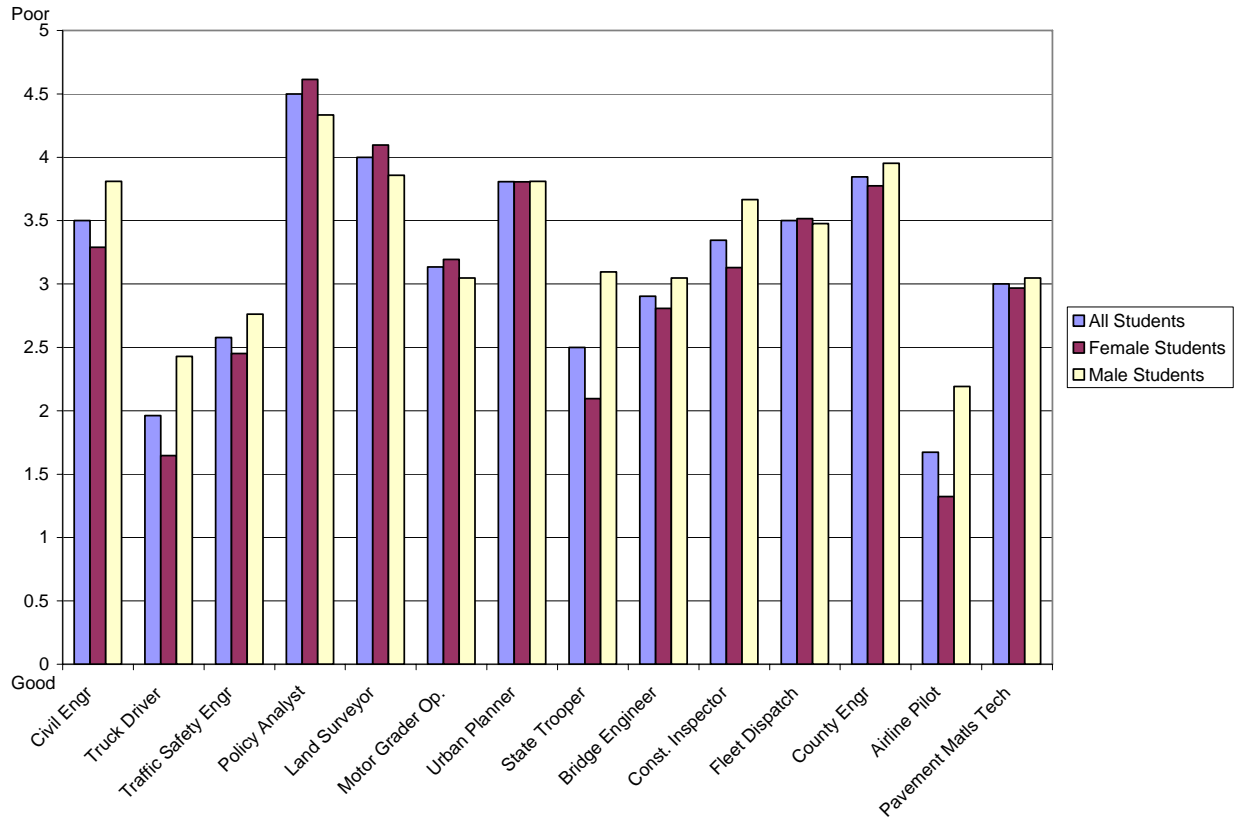
- Transportation is an organized way to move people or goods.
- The movement of people or things in an efficient manner.
- Anything related to the movement of goods or people from one place to another.
- A means of getting from one location to another.

A few definitions included infrastructure-related terms such as the following:

- Pedestrian facilities, roadway design, traffic management.
- **Design and development of systems** for moving goods and people from place to place.
- Things related to roads/highways.

### **Students' Ratings of Job Titles**

Students rated 14 job titles on a seven-point scale, with 1 being a "good" example of a transportation career and 7 being a "poor" example. Averaged together, students rated those jobs closer to 1 (good) that were involved in moving people or goods, e.g., airline pilot (1.67) and truck driver (1.96). Jobs that were rated closer to 7 (poor) were land surveyor (4.0) and public policy analyst (4.5). Ratings ranged widely between students. Most of the job titles received at least one rating on each point of the scale. See the averaged student ratings for all job titles in Figure 1. The difference in average ratings between male and female students was one point or less (on the seven-point scale). The jobs with the largest difference were state trooper, airline pilot, and truck driver.

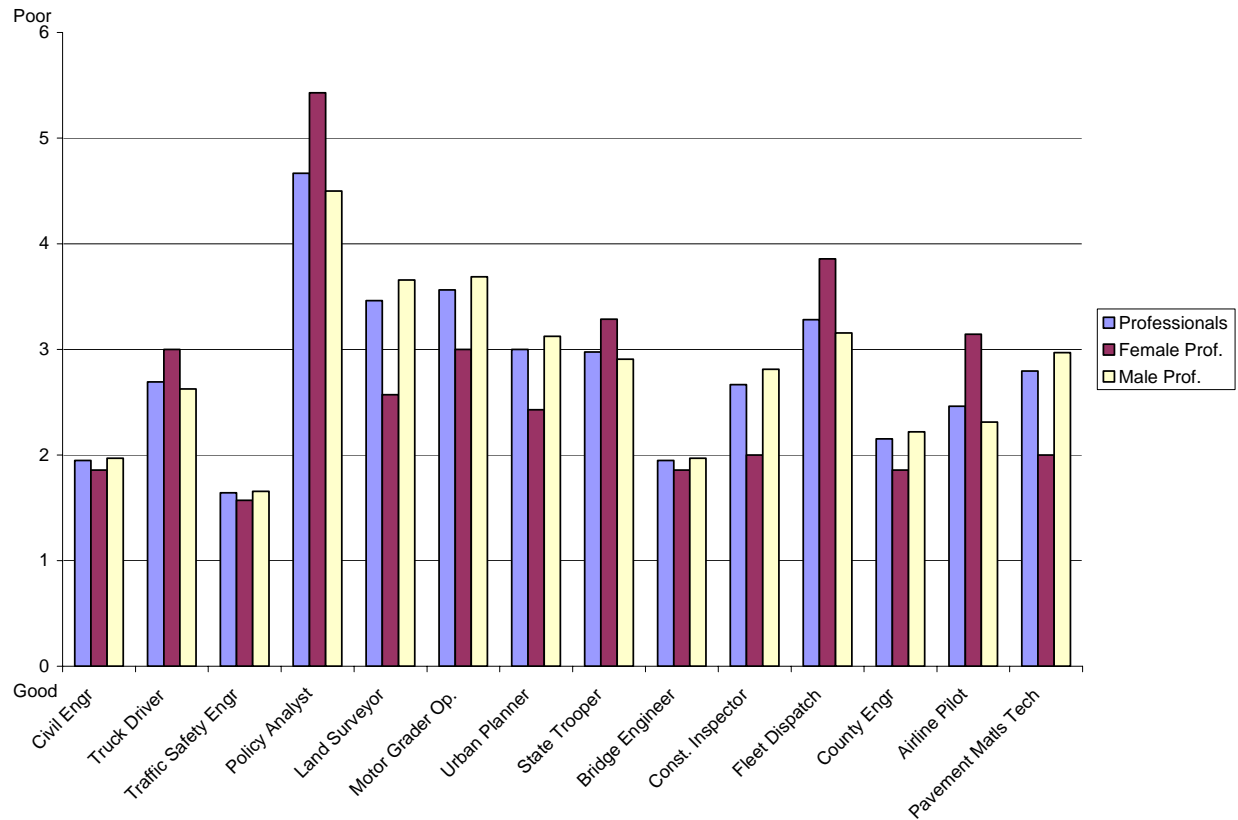


**Figure 1. Students' average ratings of job titles**

### Professionals' Ratings of Job Titles

When their ratings were averaged, professionals tended to rate positions related to the infrastructure as “good,” including traffic safety engineer, civil engineer, and bridge engineer (see Figure 2). The title of public policy analyst earned the most “poor” ratings, as it did among the students.

Since there were relatively few women professionals surveyed, it's difficult to know whether the differences in ratings show any particular trends based on gender. Other factors may be at work, such as years of experience and/or experience with different types of organizations.

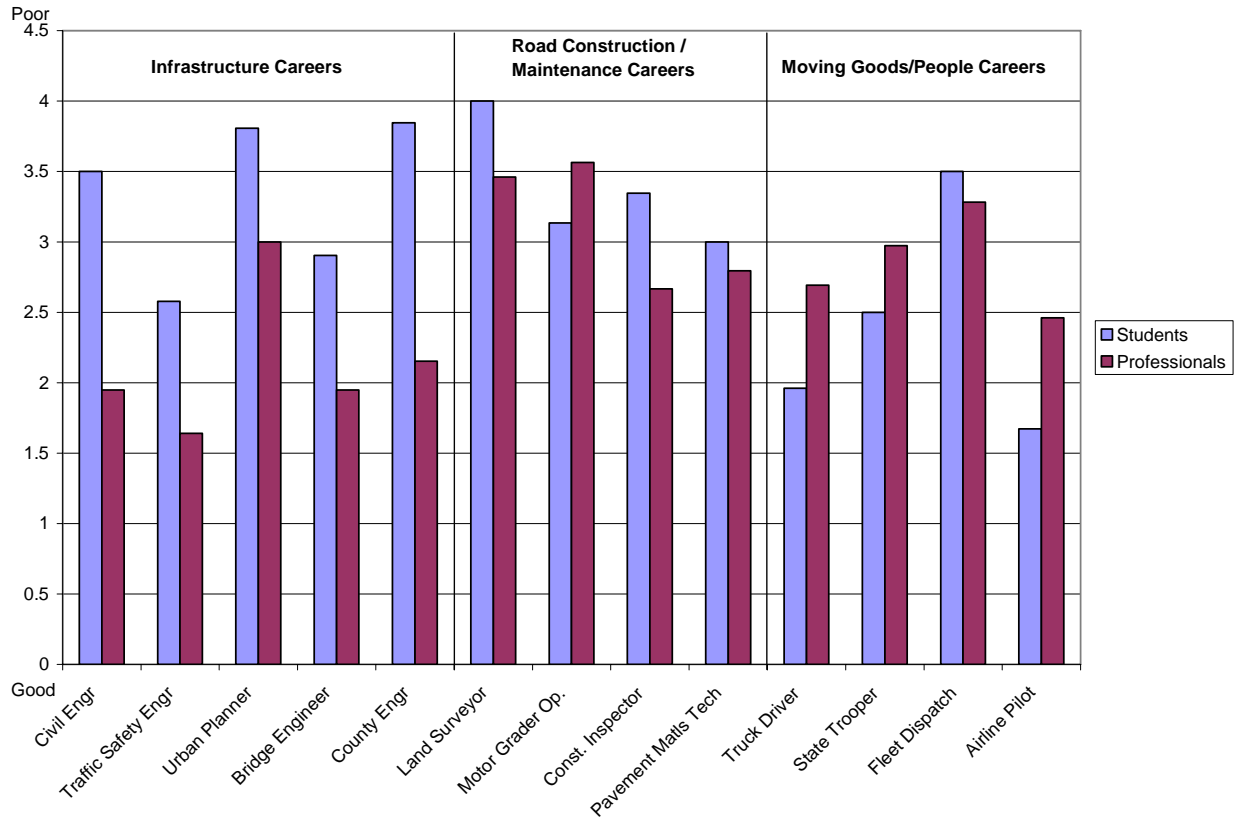


**Figure 2. Professionals' average ratings of job titles**

### Students' and Professionals' Ratings Compared

Differences in the way students and professionals rated the various job titles stand out more clearly when the jobs are grouped together, as in Figure 3. The infrastructure careers grouping includes professional-level jobs requiring a four-year degree or more. Within this grouping, the job titles of county engineer and civil engineer had the widest difference in average rating between students and professionals. Professionals rated both titles considerably higher than students did. This difference may be due to professionals' greater familiarity with the jobs. It was noted in another study, mentioned earlier, that young people are typically unfamiliar with the term "civil engineer."

For jobs related to moving goods/people, the differences in ratings were less pronounced, although students tended to rate these jobs closer to "good" than professionals. For jobs related to road construction or maintenance, the difference in ratings was probably the least pronounced of all. Both groups rated land surveyor, motor grader operator, construction inspector, and pavement materials technician in the 2.5 to 4 range (on a seven-point scale), with slight differences between groups for any particular job.



**Figure 3. Students’ and professionals’ average ratings compared across groups of careers**

## DISCUSSION AND CONCLUSIONS

People already in the business of transportation infrastructure, i.e., city, county, and state transportation agencies, have a decidedly different understanding of “transportation” and “transportation careers” than young people. Knowing how laypeople, especially people who are potential recruits to the field of transportation, define “transportation” and understand transportation careers will help recruiters develop more effective recruiting materials.

Students defined “transportation” in ways that I anticipated—primarily as movement rather than as the infrastructure that supports the movement. I was somewhat surprised, however, by the transportation professionals’ definitions. Generally, they defined it in terms of movement of goods and people. As people who are mostly engaged in work related to the transportation infrastructure, I expected their definitions to include more about the infrastructure or about transportation systems. So, the fact that the differences in the groups’ definitions were not pronounced was surprising.

Given the professionals’ general definitions of transportation, I expected their ratings of jobs related to moving people or goods to be higher (i.e., more “good” ratings). Instead, they rated engineering jobs more highly. This seems inconsistent with their definitions of transportation. It also suggests why the term “transportation” is so nebulous when it comes to describing an industry with a vast array of jobs.

This small glimpse into how students and transportation professionals think about transportation and transportation-related jobs should be useful for workforce recruiters. The only context students were provided for the job titles they rated was the term “transportation.” If students aren’t even aware of the transportation infrastructure that helps them to “get around,” it’s unlikely they’ll be drawn to careers in that sector of the industry.

Interviewing students after they completed this survey may have shed light on how and why they rated different jobs. This is something I would add to this project were I to do it again. Similar interviews with transportation professionals would shed light on their thought processes as well.

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