

2023 Mineta Summer Transportation Institute at San José State University

Alverina Eka Weinardy



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Project 2366
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Alverina Eka Weinardy

Program Administration

Host Site Name and Address:

Mineta Transportation Institute
San José State University
210 N. 4th St., 4th Floor
San José, CA 95112

Project Director:

Hilary Nixon, PhD

Length of Program:

July 10-28, 2023

Type of Program:

Non-residential

Congressional District:

19th Congressional District

Student Demographics and Other Relevant Data

Table 1. Enrollment by Grade Level (rounded to the highest tenth)

Grade	Number of Students	% of total
9th	17	53
10th	3	9
11th	10	31
12th	2	6

Table 2. Recruitment Details

	Number of Students
Number of applications received	47
Number of students selected for the program	35
Number of students at the beginning of the program	32*
Number of students who completed the program	32**
Number of students who did not pass	0
Number of students who qualify for free or reduced lunch at school	8
Number of first-generation students	5

*Three students dropped out before the program started, citing unforeseen circumstances preventing them from attending all sessions.

**One student completed the program but did not take the environmental studies course for credit (auditing).

Table 3. Enrollment by Gender

Gender	Number of Students	% of total
Male	17	53
Female	14	44
Non-binary	1	3

Table 4. Enrollment by Race/Ethnicity*

*Note that students were able to select all that applied

Race/Ethnicity	Number of Students	% of total
Hispanic/Latinx	13	41
American Indian or Alaskan Native	0	0
Asian	16	50
Black or African-American	0	0
Native Hawaiian or other Pacific Islander	0	0
White	8	25
Multiple races	1	3

Table 5. Enrollment by Learning Disability

Learning Disability	Number of Students	% of total
Students with a learning disability	3	9

Table 6. Academic Background of Students*

*Note that students are able to take multiple science courses in one academic school year

STEM Course Completed	Number of Students	% of total
Algebra	35	100
Biology	17	53
Chemistry	9	28
Physics	12	38
Environmental Science	3	9
Other Math Courses	23	72

Table 7. Academic Performance*

Based on the students' ENVS 01 final grades. One student did not receive a final grade for auditing the class.

Grade	Number of Students	% of total
A-minus - A-plus	25	81
B-minus - B-plus	4	13
C - C-plus	2	6

Executive Summary

San José State University (SJSU) conducted its eighteenth annual Mineta Summer Transportation Institute (NSTI) in July 2023. NSTI was offered as a 3-week, Monday through Friday, 15-day non-residential program for high school students (9th through 12th grades) on the SJSU campus in San José, California.

The program's primary goal was to inform and inspire students to think critically about their futures and potential for careers in the transportation industry. The program comprised three main components: (1) a college-level course in environmental studies with 6,000 words writing minimum; (2) field trips; and (3) guest speakers.

A secondary goal of the program was to inspire the students to attend a college or university after high school. Historically, the program participants were from schools with a high socioeconomically disadvantaged population, lacking college role models, thus needing to reinforce attending college. While the Mineta Transportation Institute (MTI) made a concerted effort to promote the program among Title 1 schools in the Bay Area, expanded outreach efforts to other schools in the region resulted in a more diverse cohort. This year's program cohort included 25% of students who qualified for free or reduced lunch and 16% of first-generation students. However, many expressed anxiety about applying to colleges and life after high school in general. By meeting on the SJSU campus, the students became not only familiar with the campus but could literally see themselves and their peers attending college.

SJSU is a large, urban university located in the heart of Silicon Valley. NSTI is structured in the style and format of a pre-college internship, emphasizing civic leadership and public policy, which are

MTI's anchoring principles. Thus, a balance is sought between academic and experiential learning designed to motivate high school students to expand their horizons into the field of transportation and to be connected to the University in a meaningful way.

MTI used a competitive selection process based on a comprehensive application and recommendation letter to identify participants. A screening process was used for the 47 applications received, including the timeliness and completeness of the application package, and rubric for scoring the written essay and recommendation letter. Thirty-five students were admitted into the program. Considering the challenging environmental studies requirement of 6,000 words writing minimum, students and parents were required to sign a policy acknowledgement form to ensure their understanding that students' grades would be a permanent record on their SJSU transcript. Three students dropped out a couple of days before the start of the program, citing unforeseen circumstances preventing them from attending the entire 3-week program, bringing the total number of participants to 32. Because of the SJSU enrollment process and possible technical issues in getting access to the online learning platform, while students were expected to submit assignments from Day One, the program coordinator did not reach out to the next runners-up on the waiting list.

Focusing on field trips, visiting experts, a job skills component, and a college-level three-unit environmental education course, the Mineta Summer Transportation Institute was designed to be both academically challenging and fun. The 31 participants (1 student was actively enrolled in the program without earning credits) had the opportunity to earn three units of college credit at no cost to the student through SJSU in an introductory environmental studies class with a STEM and transportation emphasis taught by Professor Amy Petersen. The course explored the need to reduce dependence on fossil fuels and toxic automobile emissions. Students learned about mass transit, and the critical role transportation serves in the environment and, in particular, in Silicon Valley and the Bay Area. The students participated in ten field trips over the course of the 15 days of the program, where they were exposed to a wide range of careers in transportation and college-readiness experiences. Students used a range of transportation options to access the field trips, including walking, public transit, charter buses, and carpools.

Overall, the program's curriculum empowered students to embrace new experiences in some of the major transportation-related topics of the moment and allowed them to see firsthand "behind the scenes" operations of prominent Bay Area transportation sites and agencies such as the Santa Clara Valley Transportation Authority (VTA), California High-Speed Rail Authority (CAHSRA), and San Francisco Municipal Transportation Authority (SFMTA).

We are happy to note high satisfaction with the program among students, parents, and our partnering agencies this year. This year's NSTI is only the second year since MTI had to postpone in 2020 and 2021 due to the COVID-19 pandemic. Last year, SJSU implemented additional administrative requirements and class rules to keep all participants safe. The protocols were lifted a few months before NSTI 2023 started, so more indoor activities were feasible without stringent social distancing rules. Combining elements from the program's previous successes and adding new activities helped contribute to this year's overall success. Additional changes were made this year due to new community partnerships, including with Bay Area Connectors, Universities Space Research Association, Spartan Racing, and SJSU Peer Connection.

Partners and Staff Information

Partners and Sponsors

San Jose Unified School District (SJUSD) and East Side Union High School District (ESUHSD) were significant partners supporting the Mineta Summer Transportation Institute. Flyers with the link to the online application in English, Spanish, and Vietnamese were distributed to principals, vice-principals, and counselors in both districts. Furthermore, the flyer was also included in several school newsletters, increasing parents' awareness of the program. In addition, program information was posted on the Mineta Transportation Institute website and social media sites.



Figure 1. NSTI Students at Henry Cowell State Park

As part of the environmental studies component of the program, students took their lessons outdoors at Henry Cowell State Park in the Santa Cruz Mountains, led by the ENVS 01 course professor, Amy Petersen, and another lecturer from the department, Cristina Siegel. Their traversing the mountain pass allowed for a lesson on the challenges facing transportation before the technological developments of the 20th century, as well as lessons regarding the relationship between the train and lumber industry. Once at Henry Cowell, the lecturers led students on a non-strenuous hike, where they learned about the ecosystem the park seeks to conserve, including getting an interactive lecture about native plants they encountered and completing a picture scavenger hunt of these plants. In addition, students also received demonstrations and learned to use a variety of basic instruments and equipment to measure individual trees and forests, such as diameter tape, clinometer, and spherical crown densiometer.



Figure 2. NSTI Students on San Joaquin River Viaduct

The students also participated in a rewarding field trip to the construction sites of the future California High-Speed Rail in Fresno, where they were exposed to the intricacies of a public infrastructure project and how it helps revitalize the local economies of California's megaregions. MTI worked closely with the California High-Speed Rail Authority (CAHSRA) staff to organize this trip, including securing sponsorship from DB Engineering & Consulting USA, part of Deutsche Bahn AG, the Authority's Early Train Operator (DB). The Authority and DB's staff joined the students at the bus pick-up location in San José to give interactive presentations and answer questions about the train system design, construction, and operations throughout the three-hour bus ride to Fresno. They learned about the future Fresno high-speed rail station, grade separations, train interior designs, and university engineering studies on-site. They closed the day with a visit to the San Joaquin River Viaduct. The Authority released a [video](#) highlighting this special behind-the-scenes tour.



Figure 3. NSTI Students on a Tour of the San Francisco Central Subway Line

For an in-depth look at an urban transit system, MTI partnered with Bay Area Connectors (a joint venture partnership between AECOM and EPC) to lead students on a tour of the recently operating San Francisco Central Subway. Bay Area Connectors' sponsorship supported a charter bus to transport the students from San José to San Francisco. The project tour began at the above-ground 4th and Brannan Station, and then students boarded the San Francisco subway train to get to three underground stations: Yerba Buena/Moscone Station, Union Square/Market Street Station, and Chinatown - Rose Pak Station. At each station, they were able to tour facilities and admire the site-specific, large-scale public art installations. This experience provided students with ample opportunities to learn directly from engineers, planners, and other AECOM, EPC, MCK, and San Francisco Municipal Transportation Authority staff about delivering fast, smooth transit service between some of San Francisco's busiest and most densely populated areas.



Figure 4. Xiangyu Ren, an SJSU Graduate Student, Gave a Drone Demonstration to NSTI Students

The students were also exposed to innovative transportation technologies through a drone-flying session with Dr. Bo Yang from SJSU's Department of Urban & Regional Planning, a presentation on autonomous delivery robots and career pathways in transportation tech with Nuro, and an instrument demo with Aurora Innovations' engineering team.



Figure 5. Students Participated in a Guest Lecture with Jeff Berry (United Airlines) and a Flight Simulation at SJSU's Department of Aviation & Technology

One piece of program feedback received last year was related to the lack of guest speakers from the aviation field. MTI successfully resumed collaboration with the Aviation and Technology Department at SJSU this year. The students visited the department to participate in the physics of flying lecture and hands-on activities delivered by SJSU Aviation lecturers who have experience as commercial pilots. The visit also included an opportunity to experience map-reading while

experiencing a simulated pilot experience in the Gerald Shreve Flight Simulator Lab. MTI also invited Jeff Berry, a pilot with United Airlines, to give a career presentation that included his journey as a commercial pilot and also touched upon the evolving pathways, hiring process, and airline training programs. Both experiences proved to be a vital component of the program. Not only were students able to experience lectures and simulations, but they also had the opportunity to ask real-life pilots questions that personally intrigue them about an aviation career.

Table 8. Summary of Financial Donations from Partners

Partner & Action	Estimated Dollar Value
Bay Area Connectors (a joint venture partnership between AECOM and EPC) Sponsored the field trip to the San Francisco Central Subway Project. Included bus charter, transit passes, lunch, snacks, and water service.	\$6,000
DB Engineering & Consulting USA (part of Deutsche Bahn AG) Sponsored the field trip to CAHSRA construction sites in Fresno. Included bus charter, lunch, snacks, and water service.	\$5,000
HNTB Sponsored lunch.	\$1,000

Program Staff

Table 9. List of Program Staff

Name	Position
Hilary Nixon, PhD	Deputy Executive Director, MTI
Alverina Weinardy	Director of Operations, MTI
Amy Petersen	Faculty, Department of Environmental Studies, SJSU
Nancy Urena Reid	NSTI High School Liaison, SJUSD, Abraham Lincoln High School
Rosa Bucio Arciga	Student Intern, MTI

Program Objective

The program's primary goal was to inform and inspire students to think critically about their futures and potential for careers in transportation and to increase the *knowledge* and *interest* of students in this field as a possible career choice. In addition, NSTI is designed to provide an enjoyable learning experience for the students who would, in turn, share their experiences with classmates and friends when they return to school. A key objective of the NSTI is to stimulate students to take full advantage of the range of career opportunities in the transportation industry.

To meet this goal, the program was designed to meet these three objectives:

1. Recruit 35 high-school students from diverse ethnic backgrounds to participate in the program;
2. Expose participating students to various academic and practical experiences in the transportation field in the Bay Area;
3. Provide participating students with various science, technology, and employment skills.

MTI made a concerted effort to promote the program among Title 1 schools within the ESUHSD and SJUSD and the diversity of the student population in both districts first, and then the remaining schools to follow. Marketing and recruitment of students are of critical importance. Additional efforts for recruitment were made by working closely with the high school liaison and distributing the flyers to other school districts in the Bay Area and private schools near SJSU campus. MTI also translated Spanish and Vietnamese flyers per several school counselors' requests. The additional flyers helped broaden the reach to parents whose first language is not English.

NSTI students demonstrated enthusiasm and interest during the environmental science program portion and field trips. The SJSU class was challenging with its required textbook, lecture-style presentations, and 6,000 words writing minimum. The students were evaluated through daily written assignments, reading review quizzes, midterms, a final paper, and a presentation. Students unprepared to work at the fast pace of the summer program would have difficulty passing the course. The program staff maintained close contact with the professor to ensure students made good progress throughout the course, bridging the students' expectations and the reality of a challenging university course so as not to discourage them from pursuing their college careers in the future.

A culminating survey was conducted using Google Forms after the program concluded. The survey was intended to assess various aspects of the total NSTI experience, including (1) guest speakers, (2) field trips, (3) staff, and (4) overall program effectiveness. MTI conducted these evaluations to determine success in measuring Objectives 2 and 3. (A complete discussion of the evaluation results is discussed in a separate section below.) A link to the survey was sent out to the students via email on the second to last day of the program. MTI staff also reserved 20 minutes of the last in-class activity for students to complete the survey using their devices.

Overall, the evaluations confirmed the positive impact the students experienced. Participants reported a high level of satisfaction with NSTI activities, and they found that the program helped them better understand the field of transportation. After site visits, conversations with students indicated that they might explore job opportunities similar to those presented and that they recognized college education as important.

Marketing

New flyers, available in three languages, with a lot of visual and verbal appeal, were sent out via e-mail and posted to MTI's website. The English flyer was also included in several schools'

newsletters, web pages, and social media posts. In addition, MTI staff also attended educational fairs within Santa Clara County and distributed flyers promoting MTI’s K-12 workforce development programs to raise awareness months before the recruitment process. The compilation videos and students’ testimonials from previous years’ STI were used to promote the program.



Figure 6. Program Flyers in English, Spanish, and Vietnamese

Applications

Applications were received from the following SJUSD schools:

- Abraham Lincoln High School
- Pioneer High School
- Willow Glen High School

Applications were also received from the following ESUHSD schools:

- Evergreen Valley High School
- Independence High School
- KIPP San Jose Collegiate
- Piedmont Hills High School
- William Overfelt High School
- Yerba Buena High School

Students attending schools outside of both districts also submitted applications to the program. Those schools are listed below:

- Adrian Wilcox High School (Santa Clara Unified School District)
- American High School (Fremont Unified School District)
- Aragon High School (San Mateo Union High School District)
- Branham High School (Campbell Union High School District)
- Christopher High School (Gilroy Unified School District)
- Cupertino High School (Fremont Union High School District)
- Design Tech High School (San Mateo Union High School District)
- Foothill High School (Pleasanton Unified School District)
- Fremont High School (Fremont Union High School District)
- Irvington High School (Fremont Union High School District)
- Kennedy High School (Fremont Union High School District)
- Los Gatos High School (Los Gatos-Saratoga Joint Union High School District)
- Mission San Jose High School (Fremont Union High School District)
- Monta Vista High School (Fremont Union High School District)
- Ocean Grove Charter (San Lorenzo Valley Unified)
- Palo Alto High School (Palo Alto Unified School District)
- Prospect High School (Campbell Union High School District)
- Summit Denali High School (Santa Clara County Office of Education)

MTI also received applications from students attending private schools in the areas surrounding the SJSU campus:

- Bellarmine College Preparatory (San José, CA)
- Cristo Rey (San José, CA)
- Notre Dame San José (San José, CA)
- Oakwood School (Morgan Hill, CA)
- Saint Francis High School (Mountain View, CA)
- Valley Christian High School (San José, CA)

Student Selection Process

Interested students were required to complete an application and obtain a letter of recommendation from faculty. MTI staff, in partnership with high school teachers and counselors, distributed and emailed the recruitment flyer (see Figure 6) to students and parents who expressed an interest. All applications were submitted online via Google Forms. While academic information was requested,

other criteria were also applied to the pool of applicants. Sincere interest, recommendations from school faculty, and evidence of extracurricular interests were considered for acceptance to the program. The written essay was given the most significant weight in student selection. Since college-level writing is expected in the class, students who did not submit a short essay with their application were not considered. Similarly, since time commitment and willingness to work hard were an issue for some students in the past, resulting in early drop-outs from the program, a lack of a recommendation letter also disqualified a student from being considered a candidate.

A few technical issues affected the selection process. Some of the students provided incorrect personal or guardian contact information. While attempts were made to contact the students with the missing information, ultimately, without the contact information, some of the students had to be removed from the list because they could not be reached. Acceptance notices were distributed by email, and students were required to notify their receipt of acceptance within one week before MTI staff proceeded with the enrollment process.

Program Curriculum

9am-3pm**	Mon.	Tues.	Wed.	Thurs.	Fri.
Week 1 Morning 9am-12pm**	7/10 Introductions, Overview of Program <u>Field Trip: SJSU Campus Tour</u>	7/11 Environmental studies lecture @ BBC 225 <u>Field Trip: SJSU MLK Library & Writing Center</u>	7/12 Environmental studies lecture @ BBC 225	7/13 Environmental studies lecture @ BBC 225	7/14 <u>Field Trip: Henry Cowell Redwoods State Park</u> (9.00-9.45am) Bus ride to Henry Cowell <i>Students must wear closed-toe shoes appropriate for long walks on the trail.</i>
Lunch break 12pm-1pm**					<i>Bring a picnic lunch. Students can bring frisbee or football for lunch entertainment.</i>
Afternoon 1pm-3pm**	Environmental studies lecture @ BBC 225	<u>Field Trip(s):</u> 1. SJ Dept of Transportation @ City Hall 2. 4th Street & San Fernando	GIS Presentation & Drone Flying Activity with Dr. Bo Yang (SJSU)	Guest Speaker: Nuro https://www.nuro.ai/ Guest Speaker: SJSU Transportation Solutions	(2.00-2.45pm) Bus ride back to SJSU
Week 2 Morning 9am-12pm**	7/17 Environmental studies lecture @ BBC 225	7/18 Environmental studies lecture @ BBC 225	7/19 <u>Field Trip: San Francisco Central Subway</u> (9:00-10:30a.m.) Bus ride to SF <i>Snacks will be provided. Students must wear closed-toe shoes.</i>	7/20 Environmental studies lecture @ BBC 225	7/21 (7.45am-4.30pm) <u>Field Trip: California High-Speed Rail, Fresno</u> (8:00-11:00a.m.) Bus ride to Fresno <i>Snacks will be provided. Students must wear closed-toe shoes.</i>
Lunch break 12pm-1pm**			***Lunch will be provided		***Lunch will be provided
Afternoon 1pm-3pm**	College Readiness Workshops: 1. Surviving on a Student Budget: Smart Spartan Spending 2. Treat Yo'Self: Self-Care	Guest Speaker: Hyo-Sang Yoo (NASA, Universities Space Research Association) Guest Speaker: Jeff Berry (United Airlines)	(2:30-4:30p.m.) Bus ride back to SJSU	(Industrial Studies Building) <u>Field Trip: SJSU Aviation Dept. & Gerald Shreve Simulation Lab</u>	(1:30-4:30p.m.) Bus ride back to SJSU

9am-3pm**	Mon.	Tues.	Wed.	Thurs.	Fri.
Week 3 Morning 9am-12pm**	7/24 Environmental studies lecture @ BBC 225	7/25 Environmental studies lecture @ BBC 225	7/26 Environmental studies lecture @ BBC 225	7/27 Environmental studies lecture @ BBC 225 (Final Presentation) Return your textbook.	7/28 <u>Field Trip: VTA Tour</u> <i>Drop-off at VTA River Oaks, 3331 North First Street, San Jose.</i> <i>Students must wear closed- toe shoes.</i>
Lunch break 12pm-1pm**	***Lunch will be provided				***Lunch will be provided
Afternoon 1pm-3pm**	<i>Guest Speaker: HNTB activity hubs @ SU Meeting Room 2A & 2B (2nd floor)</i>	Guest Speaker: Aurora Innovation https://aurora. tech/	(Engineering Building) <u>Field Trip: Spartan Racing presentation & shop tour</u> https://www.sjsuformulasae. com/	(Washington Square Hall) <u>Field Trip: Urban Planning Dept. presentation & group activity</u>	MSTI Graduation Celebration @ VTA

Program Components

Three distinct elements made up the NSTI curriculum, which are listed below:

1. Academic Component (SJSU Environmental Studies Course)

The academic component of the program focused on ENVS 01, Introduction to Environmental Studies, taught by Professor Amy Petersen, an adjunct faculty member in the Department of Environmental Studies at San José State University. The course met for a total of 11 sessions, or 32 hours of instructions, condensing a semester-worth of class into just three weeks. Assignments included daily reading review questions, daily article evaluation summary, two midterms, a research paper proposal, two drafts of the research paper, and a presentation on the student's paper. The 11 sessions were spread throughout the three weeks to accommodate the numerous field trips and guest speaker sessions. As much as possible, the lecture sessions were held in the morning to ensure students received 3 hours of instructions per day.

Students who completed the 32 hours of coursework, fulfilled the 6000 minimum written words and passed the course with a C- (70%) or better received three transferable general education units from San Jose State University. This year, the cohort did exceptionally well, with a 100% passing rate and 81% of the class achieving A-minus or higher.

Factors contributing to the outstanding success rate for the NSTI in 2023 include: (1) the overall preparedness of the students to take a college-level course, (2) the ability to focus on only one class, (3) the pacing of the class, which allowed students' progress to be assessed while they were still able to recall the material, and (4) additional college-readiness workshops and activities planned for students to adapt to their course load. Participants could register as SJSU students about a month before the start date. While this was mainly driven by the need to obtain an SJSU ID card for classroom access, it also allowed students access to the Canvas learning platform, helping them familiarize themselves with the system. In addition, the students were introduced to the SJSU library system and the Writing Center to help them with their writing assignments. During NSTI, the students were not distracted by having to study for other classes as they would during the school year. They developed a camaraderie during the 3-hour intensive lectures and transportation-related field trips, helping make the entire program an enjoyable learning experience.

College Readiness

In addition to fostering an interest in careers in transportation, the MTI/SJSU NSTI program is designed to help students succeed in all areas. College readiness is the theme of our practical enhancement component. MTI collaborated with several entities on campus to give workshops and tours to help students complete the program successfully and take charge of their personal development beyond NSTI. In the program's first week, Professor Petersen collaborated with the Environmental Studies librarian Peggy Cabrera from the [Martin Luther King, Jr. Library](#), a unique public/university library partnership, to provide a workshop on how to conduct library research. Further into the program, tutors from the [Writing Center](#) provided a 10-15 minute "house call" to discuss their services with the students and facilitated "Personal Statements for Applications" and "Un-Blurring Plagiarism and Paraphrasing" workshops.

SJSU's [Peer Connections Program](#) also supported the NSTI program. Peer Connections staff are trained and nationally certified to teach learning skills to achieve academic excellence and empower students to understand and navigate academic material, as well as their holistic development. Students learned valuable tools and information to help them make informed decisions about their financial health during the “Surviving on a Student Budget: Smart Spartan Spending” workshop. In addition, they also learned the importance of time and stress management through the “Treat Yo’Self: Self-Care” workshop.

2. Field Trips

Students participated in ten field trips over the three-week NSTI period, listed in Table 10. Field trips represented an experiential learning environment. These trips involved meeting with key personnel and agency staff and participating in career presentations, with few exceptions. Field trips were a significant component of the program. They were used to both offset the confines of the classroom experience and reinforce the concepts taught in class. Most of the field trips were first-time experiences for the students.

Table 10. List of Field Trips, Mode of Transportation, and Topics

Site	Mode of Transportation	Topics
1. San José Department of Transportation 1a. 4th Street & San Fernando	Walking	Presentation and Q&A with employees in the transportation department Bike & pedestrian infrastructure, active transportation, transportation planning, city planning
2. Henry Cowell State Park	Charter bus, walking	Train system, environmental impact, conservation, harmonic balance of transportation and nature
3. San Francisco Central Subway	Charter bus, public transit, walking	Subway system, public transit, surface transportation, urban planning, public policy, local economy
4. Department of Aviation & Gerald Shreve Simulation Lab	Walking	Aviation, physics, map reading, flight simulator
5. California High-Speed Rail construction sites and office, Madera & Fresno	Charter bus, walking	High-speed rail, public transit, surface transportation, local economy
6. Spartan Racing shops (SJSU engineering building)	Walking	Tour of the Spartan Racing shop areas, competition race vehicles, electric vehicles
7. Department of Urban Planning	Walking	Urban planning, public policy, housing and transportation
8. VTA Headquarter and Cerone Bus Yard	Students were dropped off at VTA headquarter, VTA (electric) bus	Presentation of VTA officials, tour of maintenance facilities and microgrid and electric bus charging station, closing ceremony with parents
9. SJSU Campus Tour	Walking	Tour of SJSU main campus with emphasis on facilities students will visit during the program and other places that enrich campus life
10. SJSU MLK Library & Writing Center	Walking	Academic research, literature review, reference citation

Table 11a summarizes the students' evaluations of the field trips. Overall, students expressed high satisfaction with the field trips. They also expressed support for offering similar experiences in the future. In addition, many students noted that the field trips made them more likely to consider careers in transportation and/or engineering as seen in Table 11c.

Table 11a. Summary of Student Evaluations of Transportation-Related Field Trips

Site	Percentage of students who rated trip a 3 or better on a scale of 1-5	Percentage of students who recommend the trip for next year
1. San José Department of Transportation	91%	75%
1a. 4th Street & San Fernando	91%	66%
2. Henry Cowell State Park	97%	75%
3. San Francisco Central Subway	100%	100%
4. Department of Aviation & Technology and Gerald Shreve Simulation Lab	97%	91%
5. California High-Speed Rail construction sites and office, Madera & Fresno	91%	59%
6. Spartan Racing shops (SJSU engineering building)	91%	66%
7. Department of Urban Planning	97%	78%
8. VTA Headquarter and Cerone Bus Yard	95%	79%

Table 11b. Summary of Students' Satisfaction of the NSTI Program

	Percentage of affirmative student responses	Percentage of students who rated "Very Satisfied" and "Satisfied"
Overall Program Satisfaction	97%	97%

Table 11c. Summary of Students' Interest in a Career in Transportation

	Percentage of affirmative student responses	Percentage of students who rated "Strongly Agree" and "Agree"
This program has encouraged me to consider a career in transportation.	97%	75%

3. Guest Speakers

Students received key presentations from guest speakers, primarily at our field trip sites. Guest speakers also visited the class at SJSU and participated in or facilitated hands-on activities related to their expertise.

Table 12. List of Guest Speakers (in order of speaking appearance)

Name/Title	Topic
Alverina Weinardy MTI Director of Operations, SJSU Alum	Opening remarks during orientation on the first day of the program. Welcomed students and gave an overview of the Mineta Transportation Institute. Also delivered remarks at NSTI graduation.
Peggy Cabrera, Subject Librarian, SJSU Library	Gave a workshop on conducting library research.
San José Department of Transportation Lily Lim-Tsao, Deputy Director Jason Hu, Engineer Ryan Smith, Active Transportation Program Manager Carla Suryamega, Engineer Jessica Zenk, Deputy Director	Gave an overview of the Department of Transportation and answered students' questions about transportation projects happening in the city. Also guided a "mini tour" along San Fernando and 4th Street to show traffic and bikeway improvements in real life.
Bo Yang, PhD Assistant Professor, Urban & Regional Planning, SJSU Xiangyu Ren, SJSU Graduate Student	Provided an overview of how autonomous drone mapping is applied in environmental science and transportation. Facilitated a drone-flying practice.
Nuro Yara Dwidar, Lead Technical Program Manager, SJSU Alum Katie Stevens, Head of Policy	Provided an overview of Nuro's delivery robot technology and career pathways in an autonomous vehicle company. Facilitated a group activity with a real-life problem related to launching a new technology in the transportation industry to help the students deepen their understanding of transportation issues.
Carlina Rose SJSU Transportation Solutions TDM Coordinator, MTI Graduate Student Research Assistant, SJSU Graduate Student	Provided an overview of Transportation Demand Management. Also shared her background and story of her start in transportation and current academic pursuit.

Name/Title	Topic
<p>Hyo-Sang Yoo Senior Research Engineer, Universities Space Research Association/NASA Ames Research Center</p>	<p>Provided an overview of NASA's transportation-related innovations and technology. Also shared his background and research projects that led him to work for NASA.</p>
<p>Karen Philbrick, PhD MTI Executive Director</p>	<p>Gave a short remark about MTI's work in research and workforce development.</p>
<p>Jeff Berry Airline Pilot, United Airlines</p>	
<p>AECOM & EPC Ena Jade Aczon, Associate Amanda Behner, Senior Marketing Coordinator Tiffany Cole, Engineer Angie Myrechuck, Construction Project Manager Veronica Siranosian, Senior Vice President</p>	<p>Coordinated a field trip to visit the Central Subway in San Francisco, where engineers and planners gave a brief overview of each station on the route and shared their background and career pathways.</p>
<p>Edgar Mora, Lecturer, Aviation & Technology, SJSU Wendy Hales Mora Lecturer, Aviation & Technology, SJSU Alexander Cicmanec, SJSU Student Assistant</p>	<p>Led three different hands-on activities involving aviation using geographical mapping, flight simulators, and flight physics.</p>
<p>Hayden West Lead Procurement Advisor, Business Development, DB Engineering & Consulting USA</p>	<p>Provided overview of the California High Speed Rail project and led the Train Interiors breakout activity.</p>

Name/Title	Topic
<p>California High-Speed Rail Authority (CAHSRA)</p> <p>Augie Blancas, Information Officer II</p> <p>Yaqeline Castro, Outreach & Student Engagement Specialist</p> <p>Ramiro Merino, Public Information Officer</p> <p>Van Tieu, Public Information Officer</p> <p>Jean-Paul Torres, Senior Outreach Specialist</p>	<p>Coordinated a field trip with CAHSRA office in Fresno. Led Station Walk Through/Area Boards and Safety and Grade Separations breakout activities as well as San Joaquin Viaduct tour.</p>
<p>HNTB</p> <p>Michael Blake, Mechanical Engineer</p> <p>Melody Chen, Civil Engineer</p> <p>Monique Fuhrman, Project Manager - Engineer</p> <p>Jordan Hayashi, Structure Engineer</p> <p>Lacy Vong, Senior Project Manager/San Jose Group Director</p> <p>College Interns:</p> <p>Jeanette Felmlee-Gartner, Structures Engineer Intern</p> <p>Adriana Reyes Martinez, Civil Engineer Intern</p> <p>Neil Warke, Mechanical Engineer Intern</p> <p>Gandari Galindo, Planning Intern</p>	<p>Provided overview of HNTB transportation projects and facilitated design challenges & discussion hubs. Also facilitated a bridge-building contest among student participants.</p>
<p>Rachel Gardner</p> <p>Machine Learning Engineer, Aurora Innovations</p> <p>Other Aurora Innovations engineers participating in the presentation: Gayatri Joshi, Anchal Sinha, Vaishnavi Shukla, and Hannah He</p>	<p>Provided an overview of autonomous technology and the challenges in research and development, as well as equipment and sensor demonstration in class. Facilitated guided discussion throughout the presentation.</p>

Name/Title	Topic
<p>Spartan Racing</p> <p>Asher Aldinger, Engineer</p> <p>Aaron Hylton, Treasurer</p> <p>Alyssa Froelich, President</p> <p>Patrick McGowan, Business Lead</p> <p>Ashwin Viswesvaran, Engineer</p>	<p>Provided overview and history of Spartan Racing, the Formula Student team at SJSU. Led tour of the team's shops and vehicle showcase.</p>
<p>Richard Kos, AICP</p> <p>Practitioner-in-residence & Graduate Advisor, Urban & Regional Planning, SJSU</p>	<p>Provided overview of urban planning as a field of study and profession, facilitated a Site-Suitability Analysis group activity and presentation.</p> <p>Gave opening remarks during the graduation at VTA Headquarters.</p>
<p>VTA</p> <p>Marina Chakmakjian, Media Spokesperson</p> <p>Carolyn Gonot, General Manager & CEO</p>	<p>Welcomed students and introduced VTA General Manager. Facilitated the tour throughout Cerone Bus Yard.</p> <p>Gave opening remarks during the VTA field trip and answered students' questions about leading a transit agency.</p>
<p>Amy Petersen</p> <p>Lecturer, Environmental Studies, SJSU</p>	<p>Gave closing remarks as the ENVS 01 lecturer during the graduation ceremony at VTA Headquarters.</p>

Table 12b. Summary of Student Evaluations of Guest Speaker Sessions and Activities

Guest Speaker/Activity	Percentage of students who rated trip a 3 or better on a scale of 1-5	Percentage of students who recommend the trip for next year
1. Drone presentation and flying practice with Dr. Bo Yang	88%	69%
2. Nuro autonomous delivery robot presentation & group activity	81%	53%
3. TDM presentation with Carlina Rose (SJSU Transportation Solutions)	97%	63%
4. NASA transportation-related projects presentation with Hyo-Sang Yoo (Universities Space Research Association)	94%	69%
5. Airline pilot careers presentation with Jeff Berry (United Airlines)	94%	84%
6. HNTB activity hubs and design challenges	91%	67%
7. Aurora Innovation autonomous freight presentation	87.1%	44%

Table 12c. Summary of Student Evaluations of College-Readiness Workshops

Guest Speaker/Activity	Percentage of students who rated trip a 3 or better on a scale of 1-5	Percentage of students who recommend the trip for next year
1. Surviving on a Student Budget: Smart Spartan Spending	84%	72%
2. Treat Yo' Self: Self-Care	72%	59%

Table 12d. Summary of Students' Evaluation of the Hands-On Class Activities

	Percentage of students who rated the class activities a 3 or better on a scale of 1-5
How do you feel about the hands-on activities the class offered?	100%

Closing Ceremony

Given the previous success of holding graduation in collaboration with the VTA field trip, the closing ceremony was once again held at VTA headquarters. VTA continues to be a valuable partner in offering a comprehensive last field trip of the program and graciously provided an outdoor auditorium for the closing ceremony. Certificates of completion were handed to the participants by Nancy Reid (the program's High School Liaison), Amy Petersen (ENVS instructor), and two Caltrans representatives, Annette Goudeau and Marjani Rollins. Richard Kos and Alverina Weinardy highlighted the program's events and the students' achievements. During the graduation ceremony, the students were asked to share their answers to the following questions:

1. What's your favorite field trip/activity and why?
2. What's the most impactful lesson you learned from this program?

Family members were particularly pleased to hear the combination of staff and students' remarks.

Recommendations

Recommendations for any future programs include:

- A. Due to challenges with the contracting process, MTI had to delay the recruitment efforts. This resulted in a later application start date as well as an end date. In the future, MTI will continue to work with Caltrans to resolve contracting issues early to avoid potential delays.
- B. Continue to promote the program early and supplement the traditional methods with the on-line marketing scheme so that the school districts can again include the information in their parent literature, school websites, parent and student emails, and school announcements.
- C. Continue to create a video of the program that integrates students' testimonials to recruit students for the next year.
- D. Continue the 3-week format, avoiding Juneteenth and Independence Day holidays, which causes absenteeism. Also, avoid scheduling too close to the start of a new Academic year, which reduces students' interest.
- E. Emphasize the component of the program that comprises an undiluted college course with a significant amount of work compressed into a relatively brief time.
- F. Keeping a class size to a maximum of 35 allowed for more personal interaction with staff and the instructor.
- G. Give parents more opportunities to participate by asking them to volunteer or chaperone the field trips and identify any parents working in the transportation industry to attend as a guest speaker.
- H. Pending contracting, ensure that field trips are coordinated as early as possible to ensure availability and diversity of experiences.

Additional comments made by students on the final student survey

(Note that the comments are written by the students in their own vernacular. Grammatical errors were not corrected. Responses with "No" or "N/A" type of comments were omitted.)

- I enjoyed the course a lot :)
- I had a lot of fun.
- Make sure next year's students don't feel too intimidated by the research paper

- Great course overall
- More course related trips, more activities in lectures
- i would love to have more transportation focused activities and relate the envs class more to transportation. my favorite activities involved meeting with transportation focused groups. i would also have liked to have more icebreakers, i feel like i didn't get a chance to know a lot of the other people in the program
- The pilot presentation was awesome
- it would have been nice if we could have done something related to Caltrain
- Better provided lunch
- Thank you so much for bringing us such a wonderful program!
- One of the field trips should be exploring boats since they are also a way of transportation.
- Nothing was missed
- This is a wonderful opportunity that you all have given to me and I am thrilled to explore more on occupations and the pathway towards transportation related materials. You have missed essentially nothing.
- I enjoyed doing this course, and I thought it was really fun with all the activities there were, especially going to see the SF subway station and the Fresno High-Speed rail station. Thank you all so much for your time!

Additional comments made by parents via email

(Note that reference to specific students were removed.)

- Thank you for this wonderful program. [Student] really enjoyed it and I think it confirmed his desire to study transportation civil engineering at the University of Washington. Also, thanks to all the speakers and field trip hosts. All the swag [student] brought home - they really treated the kids like VIPs!
- Just wanted to say thank you personally for leading all of the coordination and planning for the NSTI 2023 class. There were a wide variety of events and speakers every week and letting H.S. students have this opportunity really helps to open them to understand the community they live in. I was at the graduation on Friday and was very touched to see all of participants, SJSU professors, Caltrans, VTA and MTI give very passionate speeches. [Student] really enjoyed this program.

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About the Authors

Alverina Weinardy first joined MTI as a graduate student research assistant in 2017. Currently, she serves as MTI's Director of Operations. In this role, Alverina manages the institute's online presence through newsletters, social media campaigns, press releases, blogs, and web content creation. Alverina plays a vital role in the execution of MTI's workforce development programs and other public-facing events. She holds a Master of Urban and Regional Planning, with a focus on Affordable Housing and Community Development Finance, from San José State University.

This report can be accessed at transweb.sjsu.edu/research/2366



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