Youth, Community, and the Future of Mobility: Garrett Morgan Sustainable Transportation Competition 2024-2025

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This perspective summarizes one of MTI's signature workforce development programs, the Garrett Morgan Sustainable Transportation Competition[1] for middle school students, and positions the program as a valuable model of experiential learning that bridges classroom content with real-world challenges to empower youth and build the transportation workforce pipeline. This project serves as an archive of the year's unique transportation theme and prompts, as well as participating teams and their submissions. It also documents changes to the competition, demonstrates value to stakeholders, and explores areas for improvement.

ABOUT THE COMPETITION

History of the Competition

The Garrett A. Morgan Technology and Transportation Futures Program was established in 1997 by former U.S. Secretary of Transportation Rodney E. Slater to encourage young people to consider careers in transportation.

The program has three cornerstone components:

- To establish a partnership among the U.S. Department of Transportation, state departments of transportation, public and private transportation providers, and local communities to ensure that today's students are prepared to become the next generation of transportation leaders.
- To develop a curriculum that can interest younger students in transportation and provide learning tools that can guide them to advanced academic and professional levels.
- To provide the technologies that will enable students to develop skills they can apply to future careers in transportation.

About Garrett Morgan

The competition is named in honor of Garrett Augustus Morgan Sr. (March 4, 1877 – July 27, 1963), an American inventor, entrepreneur, and community leader. A son of formerly enslaved parents, he invented the precursor to the modern traffic light and a protective "safety hood" (which also inspired the gas mask), notably used in a 1916 tunnel construction disaster rescue.

Garrett Morgan is a symbol of American ingenuity, perseverance, and creativity remembered for his essential contributions to public safety and problem solving for the common good.

Why We Started Hosting

MTI's mission is to increase mobility for all by improving the safety, efficiency, accessibility, and convenience of our nation's transportation system through research, education, workforce development, and technology transfer. The Garrett Morgan program began as part of this commitment, designed to inspire the next generation by connecting students to exciting opportunities in transportation. Through a STEAM-based (science, technology, engineering, art, math) approach, middle school students explore how innovation can solve real-world transportation challenges.

Since 2003, MTI has sponsored a competition every year with more than 1,300 students participating to date. Today, the Garrett Morgan Sustainable Transportation Competition is open to middle school classes, clubs, after-school programs, and any other youth-serving organizations in the U.S.

Why We Continue to Host / The Competition as an Innovative Experiential Learning Model

The Garrett Morgan Sustainable Transportation Competition—a transformative model of experiential learning—links traditional academic experiences with real-world challenges to engage middle school students in critical thinking, problem solving, decision-making, reflection, and growth. The competition is a cornerstone of MTI's workforce development efforts, which help build up a pipeline of talent for a passionate, skilled workforce prepared for the future of building, maintaining, and advancing safe, sustainable transportation systems.

What is Experiential Learning?

Experiential learning is an engaged learning process whereby students "learn by doing" and by reflecting on the experience.[2] While hands-on learning is often included, experiential learning goes beyond this by emphasizing learning through real-world application and reflection. Common examples of experiential learning activities include hands-on laboratory experiments, internships, field exercises, and study abroad experiences.

Experiential learning programs can promote "interdisciplinary learning, civic engagement, career development, cultural awareness, leadership, and other professional and intellectual skills."[3]

Specifically, experiential learning typically[4] includes the following elements:

1. Reflection, critical analysis, and synthesis.

2. Opportunities for learners to take initiative, make decisions, and be accountable for the results.

3. Opportunities for learners to engage intellectually, creatively, emotionally, socially, or physically.

4. A designed learning experience that includes the possibility to learn from natural consequences, mistakes, and successes.

The experiential learning process engages learners in asking questions, investigating, creatively problem solving, and constructing meaning—they may learn from natural consequences, mistakes, and successes along the way. In experiential learning, the educator or facilitator's primary responsibilities include posing problems, supporting learners, ensuring safety, and facilitating the learning process. Experiential learning often involves the natural development of relationships: learner to self, learner to others, and learner to the world.

The Garrett Morgan Competition as Experiential Learning

Throughout the competition process, middle school students engage with these core elements that make up experiential learning. The competition, in essence, asks these young learners to analyze and propose a problem to a real-world sustainability problem. They build and collaborate with their team members, with a professional mentor, and with a youth mentor under the guidance of their team lead (usually a parent or teacher) to explore the problem and the complex systems involved in it. They engage with the driving forces of the transportation industry and with the broader world through the lens of sustainability and what impact the issue and their solution might have on it.

From the beginning, the competition asks students to think critically, to pose questions, make decisions, and be accountable for their mistakes and successes. Team lead and parent participant Renu Amitabh told MTI staff about her team's process:

> In the beginning, they had a big list of grand ideas and dreams they wanted to chase. They wanted to share and do all the things, everything. As they worked, they learned and adjusted their expectations for time and ability and resources to make their goals more realistic. At first, they just got excited, mostly about the innovations and technology. As time went on, they had to return to the prompt and the problem and revise things to think about the practical details and not just the vision they first had.

She summarized a specific moment of experiential learning when her team encountered a situation where they adjusted their expectations after some critical thinking and reflecting on natural consequences. "They spent a lot of time on the video editing; some of them felt like they were making a real documentary. One two-second shot ended up taking them hours, but they began to understand that it wasn't possible and so they applied their passion in more practical ways and still made something they could be proud of."

As a result of these processes, the students learn and practice skills that are essential to any career, including in transportation, as well as many important to personal growth and success. As the students build skills, they also frequently gain confidence and insight into themselves, the world, and the future they want in it.

"I was surprised when my kid actually talked about exploring transportation as a career," said Amitabh of her son Arya Saikia. "Transportation and the environment is something that they are aware of…but it's so good to see him aware of it and thinking about it in terms of how he can make an impact."

One core principle of experiential learning is to "let the learners do the learning." Experiential learning foregrounds the learning experience as experience "through acquaintance with rather than knowledge about something."[5] This approach to learning lays a solid foundation for connecting knowledge with application throughout a learner's life.

At its heart, the Garrett Morgan program reflects the principles of experiential learning: it places students at the center of the process, encourages them to take initiative, learn from mistakes, engage deeply with complex topics, and reflect on their journey. The program can serve as a model for impactful workforce development initiatives that can be customized, built upon, and expanded by other organizations for different ages or target groups.

Value of this Competition for the Student Participants

The Garrett Morgan Sustainable Transportation Competition offers students the opportunity to *learn by doing*—to apply and hone their creativity, critical thinking, and collaboration skills as they address real-world transportation challenges.

Students begin by forming teams and selecting a prompt that reflects a current issue in sustainable transportation. From that moment, they take ownership of the learning process. As one team lead explained, her students started with "a big list of grand ideas and dreams," but through trial, feedback, and adaptation, they narrowed their scope into a competitive project.

Through this process, students are developing and practicing problem solving, critical thinking, communication, collaboration, time management, and other skills that will prove invaluable to them throughout their academic and professional journeys. They also acquire insights into a critical national industry, build connections with industry professionals, and get a head start on their education by contributing a project for the chance to win a national competition.

They build connections with their communities as they learn more about the transportation systems the people around them rely on, and they learn the challenges of these systems and how they might contribute to resolving them.

This year's first-place winning project,[6] Evolving Technology from Graham Middle School, looked at ways to integrate emerging technologies to improve sustainability in existing transportation systems. They proposed different methods to expand the range of electric vehicles by using solar panels, structural batteries, and wireless energy. These students immersed themselves in their own personal exploration of engineering, environmental impact, systems integration, fiscal challenges, and visual storytelling.

These experiences often prove to be formative and the positive impacts lasting. A 2014 winning team participant Kyla McKinney told MTI staff about how the program exposed her to new ideas and increased her confidence. She advised youth interested in the program or similar workforce development programs, "Even if something seems just a little interesting, check it out. You might have been destined to find it. Any experience, no matter how small, could shift your future."

Value of this Competition for the Transportation Industry & Communities

The transportation industry is the backbone of the nation, and the workforce that keeps people and goods moving efficiently and safely is a critical part of any community. Recent years have revealed a startling workforce shortage,[7] exacerbated by the COVID-19 pandemic and industry shifts. Workforce development programs like the Garrett Morgan Program are a crucial part of addressing this shortage and ensuring the safe, efficient movement of people and goods across the country and in every community.

Susan Vinh has been MTI's Program Liaison since 2023. She described the importance of the program in inspiring middle school students to consider industry careers. "The best time to create awareness and spark interest in transportation careers is before they enter high school," she said. "The program shows them that no matter what, they can find a place in the industry, which needs different skill sets and personalities for train & bus operators, mechanics, engineers and management. These kids are unique, and the needs of the industry and their communities are unique, too. If we can inspire them, it helps each community have its own home-grown workforce."

The program connects participants to the industry, but also to their broader communities. They build connections with their peers, families, educators, youth mentors, industry mentors, and more. Because MTI has programs for every age, many of the students build connections through mutual efforts to grow and learn through other programs as well. Siblings, friends, and cousins often inspire each other to pursue an opportunity and check out an MTI program—further building connections and laying the groundwork for a future workforce enthusiastic about making a difference in their community.

In the 2023-2024 competition, MTI introduced a Youth Mentor volunteer opportunity. Some alumni of MTI's high school summer program have returned as mentors, giving middle school participants valuable exposure to other K-12 offerings, while providing the high schoolers an opportunity to develop leadership skills and deepen their engagement with the transportation industry.

A 2025 team lead and teacher at Elkhorn Elementary/Lodi Unified School District, Samantha McCoy spoke of the benefits to her students and its impact on her school and the community. "Teamwork is a necessary skill that must be learned. My students learn how to collaborate and share the responsibility so they all feel good about the work that they have done and the teams they have built. I am very excited for next year because I hope to see the same teams try again and do even better and get more kids and families involved."

The Garrett Morgan Program also plays an important part in laying groundwork for engaging students from all different communities, races, genders, and backgrounds. Transportation is for everyone, and MTI's women-led team works to ensure all students and their families feel supported and welcome, closing historical gaps between disadvantaged populations and opportunity.

Of the 94 student participants in the 2025 competition, 60 percent were female. In contrast, women make up about a quarter[8] of the total of the transportation and warehousing sector workforce. The racial and ethnic demographics of the participants this year were less diverse than other years overall, but still quite diverse, with 66 percent identifying as Asian, 10 percent identifying as Black, 6 percent as multiple races, and 3 percent as White. Sixteen percent selected

"prefer not to answer" on the race/ethnicity portion of the post-competition survey. Historically underrepresented groups in transportation include Black, indigenous, people of color (BIPOC) communities, and women.

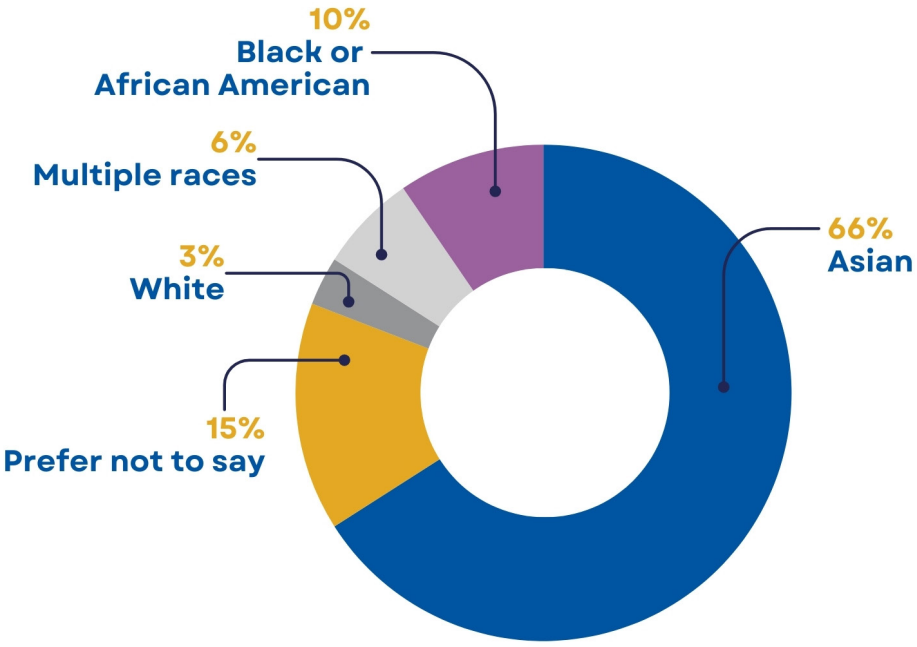

Figure 1. Participants by Race/Ethnicity

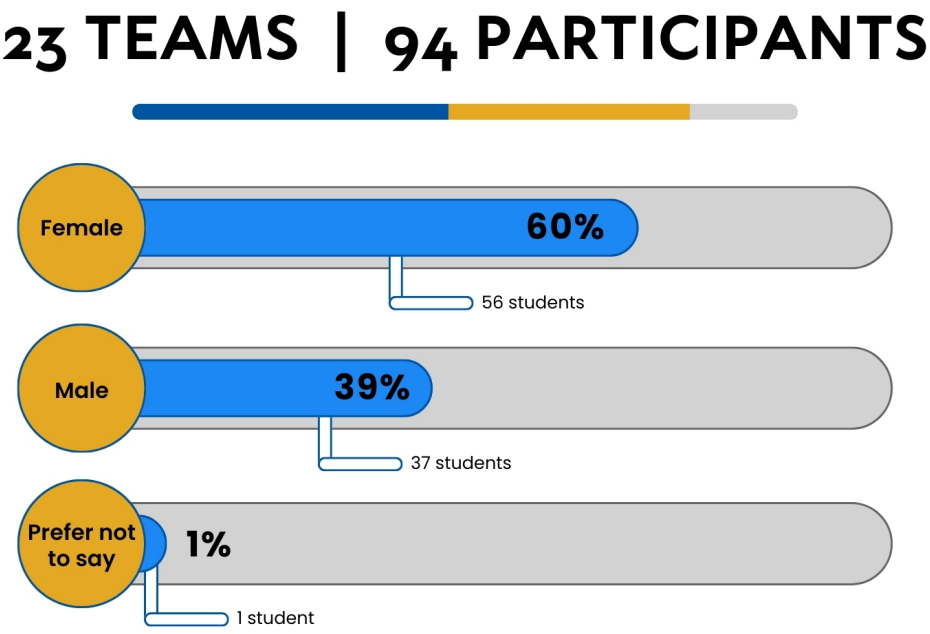

Figure 2. Participants by Gender

Workforce development programs like the Garrett Morgan Sustainable Transportation Competition immerse participants of all backgrounds in hands-on experiences, helping to introduce them to potential careers in the industry and creating opportunities to actively engage with the skills, challenges, and rewards of the work. These experiences extend beyond the event itself, creating lasting friendships with peers and connections with professionals, fostering community and empowering individual and industry success.

2024-2025 COMPETITION

This year's competition—themed around *Get Going, Go Green!*—brought new energy and meaningful connections, marked by an inspiring Career Night webinar, our virtual winner announcement, and the introduction of an exciting new award category.

The Career Night webinar and virtual winner announcement added a special dimension to the Garett Morgan program, giving students the chance to showcase their hard work while connecting with leaders in the field. This year's guests included Andrea Mosqueda, a Project Engineer with a multidisciplinary civil engineering firm Ardurra and MTI Research Associate Dr. William (Billy) Riggs, who serves as director of the Autonomous Vehicles and the City Initiative at the University of San Francisco.

A major change to the program this year was the addition of a new winning category—Most Creative—to celebrate innovation in how students present and express their ideas.

The addition of this award recognizes that impactful problem solving doesn't always look the same. It creates space to honor fresh approaches, bold storytelling, and unique project formats that may not always score highest in traditional technical categories and instead embrace beneficial out-of-the-box thinking. By nominating and selecting a team for this distinction, judges acknowledge the importance of creativity in problem solving and implementing meaningful solutions. This award expands the definition of excellence and opens doors for teams with participants who might bring different strengths, experiences, and voices to the table. In doing so, we strengthen the pipeline for a more inclusive, innovative, and future-ready transportation workforce.

The industry workforce may come from our team's communities, which include Greensboro, a small community of around 2,400 residents compared to Mountain View and Fremont, which have populations closer to 87,000 and 228,000, respectively. Greensboro's median household income ($31K) and per capita income ($20K) reflect economic challenges, with poverty rates well above average. Meanwhile, Mountain View's median household income of nearly $100K and Fremont's ~$170K place them among the more affluent cities in the state. These differences highlight the wide economic divide between a small rural city like Greensboro and booming tech-adjacent communities in California and underscores the varying resources and opportunities available to students and families in these areas.

Highlighting Greensboro students through the Most Creative award demonstrates that not only does innovation emerge from communities of all sizes and economic backgrounds but that innovation and positive impact necessitate diverse perspectives. It also reinforces the program's broader mission: to increase equity in transportation workforce development by encouraging creativity, amplifying a variety of young voices, and empowering talent and potential in our communities.

The highlight of the virtual winner announcement was an address by former U.S. Secretary of Transportation Rodney Slater,[9] who not only offered words of encouragement but also has a unique connection to the program—he first established the Garett Morgan program during his time at the Department of Transportation. His presence made the event especially meaningful, reminding participants that their work carries forward a legacy of supporting young people to envision and build a safer, more equitable, and innovative transportation future.

Participants

A short compilation of all team submissions can be viewed for free online.[10] Links to the full versions of the winning submissions are also available.[11]

Table 1. List of Participating Schools/Organizations

School/Organization	City, State
Silicon Valley Monterey Bay Council, Scouting America (Note: two separate teams represented this organization, each overseen by a different team lead)	San José, CA
Cupertino Middle School	Cupertino, CA
Cupertino Rotary Club	Cupertino, CA
Elkhorn Elementary School (Note: two separate teams represented this school, each overseen by a different team lead)	Stockton, CA
Graham Middle School & Saint Simon Parish School	Mountain View & Los Altos, CA
Greensboro Middle School	Greensboro, AL
KAI Associates Transportation Club	San José, CA
Jane Lathrop Stanford Middle School	Palo Alto, CA
Juan Cabrillo Middle School	Santa Clara, CA
Hyde Middle School	Cupertino, CA
Major STEM Academy	Arcadia, CA
Evergreen, Horner, and Hyde Middle Schools	San Francisco Bay Area, CA
The Hamlin School	San Francisco, CA
William Hopkins Middle School (Note: eight separate teams represented this school, each overseen by a different team lead)	Fremont, CA

List of Chosen Prompts, Project Description

1. Silicon Valley Monterey Bay Council, Scouting America, Girl Troop 492 (Team 1)

Team Lead: Viswanadham Bokkisam

City & State: San José, CA

Prompt: Prompt 5

Project Title: Steam Project 2025: Resilient Transportation Systems

Project Description: This project proposes resilient road infrastructure using permeable pavement, heat-resistant materials, and elevated designs. It includes emergency routes and vehicle lanes, electric public transport, and smart cars, along with public education and grant partnerships.

2. Silicon Valley Monterey Bay Council, Scouting America, Girl Troop 492 (Team 2)

Team Lead: Sreelatha Chigurupati

City & State: San José, CA

Prompt: Prompt 3

Project Title: Drive to Thrive

Project Description: This project offers a sustainable alternative to the gas tax using VMT and EV charging taxes, as well as offering incentives for switching to electric vehicles. The goal is to reduce emissions while maintaining funding for infrastructure.

3. Cupertino Middle School

Team Lead: Nelson Leung

City & State: Cupertino, CA

Prompt: Prompt 4

Project Title: Magnacharge

Project Description: Magnacharge supports a large-scale EV transition by expanding efficient, convenient charging infrastructure. It promotes sustainability by lowering emissions and encouraging renewable energy use.

4. Cupertino Rotary Club

Team Lead: George Denise

City & State: Cupertino, CA

Prompt: Prompt 3

Project Title: Garret Morgan Sustainable Transportation

Project Description: This project replaces declining gas tax revenue with new funding models like VMT and congestion pricing. It promotes EV adoption, renewable energy sources, and low-emission travel modes through incentives and smarter policy.

5. Elkhorn Elementary School (Team 1)

Team Lead: Samantha McCoy

City & State: Stockton, CA

Prompt: Prompt 5

Project Title: Safety Station & Emergency Subway

Project Description: This project introduces underground emergency subways powered by renewable energy to evacuate people during natural disasters safely. The system ensures accessibility, resilience, and sustainability.

6. Elkhorn Elementary School (Team 2)

Team Lead: Jennifer O'Neill

City & State: Stockton, CA

Prompt: Prompt 5

Project Title: The Porous Reservoir

Project Description: The Porous Reservoir strengthens roads against floods and stores water for droughts using porous pavement and water tanks. It enhances sustainability and reliability during extreme climate events.

7. Graham Middle & Saint Simon Parish Schools

Team Lead: Renu Bhattar

City & State: Mountain View, CA

Prompt: Prompt 4

Project Title: Evolving Technology

Project Description: This project integrates cutting-edge transportation innovations tailored to local needs, emphasizing renewable energy sources and minimal environmental impact. Solutions address both public and personal transportation challenges.

8. Greensboro Middle School

Team Lead: Myra Harris

City & State: Greensboro, AL

Prompt: Prompt 3

Project Title: Future Roads: Sustainable Transportation Policy for Tomorrow

Project Description: This project aims to educate on transportation policy, sustainability, and funding models. It promotes awareness of clean transportation and the shift away from fossil fuels.

9. KAI Associates Transportation Club

Team Lead: Billy Newton

City & State: San José, CA

Prompt: Prompt 3

Project Title: Automated Electric Vehicle Toll Collection and Congestion Pricing for California

Project Description: This proposal recovers lost gas tax revenue by tolling high-traffic roads and charging EVs based on miles driven. The system ensures sustainable funding for transportation infrastructure.

10. Jane Lathrop Stanford Middle School

Team Lead: Haripriya Ganta

City & State: Palo Alto, CA

Prompt: Prompt 4

Project Title: Green Energy Infra for EVs and AI Data Centers

Project Description: This project leverages cost-effective, eco-friendly energy sources for EVs and AI data centers. It supports a sustainable energy ecosystem by making renewable power financially viable.

11. Juan Cabrillo Middle School

Team Lead: Michelle Scilingo

City & State: Santa Clara, CA

Prompt: Prompt 5

Project Title: Dynamic Traffic Control System for Environmental Optimization

Project Description: This project proposes adaptive traffic patterns that prioritize emergency vehicles during disasters. It aims to reduce congestion, fuel consumption, and greenhouse gas emissions for safer, more efficient evacuations.

12. Hyde Middle School

Team Lead: Harsha Awtaney

City & State: Cupertino, CA

Prompt: Prompt 4

Project Title: Project Green Link

Project Description: This project aims to redesign electric bus charging to enable faster, solar-powered charging at bus stops. It supports clean transit through renewable energy sources and reduced emissions.

13. Major STEM Academy

Team Lead: Simon Pei

City & State: Arcadia, CA

Prompt: Prompt 1

Project Title: City of Arcadia EV Master Plan

Project Description: The City of Arcadia's EV Master Plan outlines strategies for widespread EV adoption. It promotes sustainable growth, cleaner air, and improved public health, while supporting the city's climate goals and improving the overall quality of life for all residents.

14. Evergreen, Horner, and Hyde Middle Schools

Team Lead: Sanjeev Agarwal

City & State: San Francisco Bay Area

Prompt: Prompt 4

Project Title: Charging Lots

Project Description: This project creates accessible EV charging lots with mobile booking to ease range anxiety and encourage EV adoption. The platform supports clean energy use and efficient infrastructure planning.

15. The Hamlin School

Team Lead: Julia Fiedler-Ross

City & State: San Francisco, CA

Prompt: Prompt 2

Project Title: Integration of Electric Buses in San Francisco

Project Description: This plan outlines the transition of 850 San Francisco buses to electric by 2040. Electric buses reduce emissions by 96% compared to diesel, cutting millions of metric tons of greenhouse gases.

16. William Hopkins Middle School (Team 1)

Team Lead: Divya Eswarawaka

City & State: Fremont, CA

Prompt: Prompt 3

Project Title: Sustainable Transit, Sustainable Future: Crafting New Policy For A Cleaner Future

Project Description: This project proposes replacing the fuel tax with environmentally friendly funding solutions. It highlights the benefits of EVs, public transit, and mobility hubs to create a more connected transit system.

17. William Hopkins Middle School (Team 2)

Team Lead: Randa Matar

City & State: Fremont, CA

Prompt: Prompt 5

Project Title: Rescue Ready

Project Description: "Rescue Ready" uses Hydroblocks—recycled, water-storing, earthquake-resistant bricks—to protect infrastructure and store water. It includes emergency sensors and an app to improve disaster response and community safety.

18. William Hopkins Middle School (Team 3)

Team Lead: Keyurkumar Parikh

City & State: Fremont, CA

Prompt: Prompt 3

Project Title: Finance for the Eco-Friendly Future

Project Description: This project proposes a per-mile surcharge and mandates EV bus service from large employers. It aims to reduce congestion and emissions while ensuring sustainable road funding.

19. William Hopkins Middle School (Team 4)

Team Lead: Ravneet Sandhu

City & State: Fremont, CA

Prompt: Prompt 3

Project Title: Drive Smart, Pay Fair

Project Description: This policy offers a fair, simple way to support public transportation and infrastructure by raising transportation revenue that encourages sustainable modes.

20. William Hopkins Middle School (Team 5)

Team Lead: Dr. Neelima Sangeneni

City & State: Fremont, CA

Prompt: Prompt 3

Project Title: EV-olving the Future: A Policy Proposal for Sustainable Road Funding in a Greener Tomorrow

Project Description: This project proposes a road user charge system that funds infrastructure while supporting EV adoption. It aims to reduce emissions and requires minimal startup costs.

21. William Hopkins Middle School (Team 6)

Team Lead: Alison Tan

City & State: Fremont, CA

Prompt: Prompt 3

Project Title: Funding Sustainable Transportation: Making Transport in California Economically and Environmentally Efficient

Project Description: This project proposes a policy that replaces declining fuel tax revenue with sustainable funding strategies. It encourages the use of EVs and public transit to support both environmental goals and long-term infrastructure investment.

22. William Hopkins Middle School (Team 7)

Team Lead: Brijesh Tyagi

City & State: Fremont, CA

Prompt: Prompt 4

Project Title: Innovating EV Infrastructure: Tech-Driven Solution for Sustainable Transportation

Project Description: This project uses robotics, AI, and automation to develop a smart, scalable EV charging system. It focuses on improving access in underserved areas while supporting faster, more efficient EV adoption.

23. William Hopkins Middle School (Team 8)

Team Lead: Hayzell van der Lowe

City & State: Fremont, CA

Prompt: Prompt 1

Project Title: EVolve Your City: Accelerating EV Adoption

Project Description: This project outlines practical strategies to help cities increase EV adoption while managing costs and ensuring equity. By repurposing existing infrastructure, it reduces environmental impact and supports a smoother transition to electric transportation.

Competition Results

The twenty-three submissions were scored by a panel of three judges from the transportation industry.

Each team can score a maximum point of 130 based on the following criteria:

- Organization (15 points)
- Content (45 points)
- Presentation (40 points)
- Overall Fit with Competition Goals (30 points)

In the first place, Graham Middle School from Mountain View, California, scored 120 out of 130 points with their project "Evolving Technology."[12] The team with members from Evergreen Elementary School, Hyde Middle School, and John M. Horner Middle School from the San Francisco Bay Area, California, came in second place with a score of 119 for their project "Charging Lots."[13] In third place, a team from William Hopkins Middle School from Fremont, California, scored 117 for their project "Innovating EV Infrastructure: Tech-Driven Solution for Sustainable Transportation."[14] This year, the team from Greensboro Middle School from Greensboro, Alabama, won the inaugural Most Creative award for their project "Future Roads: Sustainable Transportation Policy for Tomorrow."[15] This team submitted their project as if it were a live news segment, complete with creative video editing and lively interviews. This out-of-the-box thinking and imaginative collaboration inspired the judges to award them Most Creative.

The top three winners and the Most Creative winner were announced in a virtual award ceremony featuring former U.S. Secretary of Transportation Rodey E. Slater as the keynote speaker.

CONCLUSION & MOVING FORWARD

Feedback about the 2025 competition reveals the positive impacts of the competition on participants, their families, teachers, professional and youth mentors, and broader communities. In the post-competition survey, the majority of students indicated their primary reason for participating in the program was the opportunity to explore transportation careers while solving real-world problems. Building their college and career portfolio, receiving support from MTI, their team lead, and industry and youth mentors were also important.

Overall, feedback indicates the program effectively facilitated meaningful connections and practical learning opportunities. The competition offers participants valuable experiences of self-reflection and growth. The competition supports the industry by offering a replicable model of workforce development through experiential learning, helping to build a pipeline of diverse, skilled talent early on who will grow into roles and make positive contributions to their communities and mobility.

Team leads (parents, teachers, and coaches) and professional mentors commented on the benefits to the students as well as to the industry in the survey. One stated, “The best time to spark interest in transportation careers is before high school, when students are still forming ideas about their future and are highly observant of the world around them.”

Many of the adults emphasized the importance of exposing students to the wide range of transportation careers, from operators and mechanics to engineers and managers—each with distinct skill sets and educational paths. More than one parent expressed surprise at their child’s interest in transportation due to the program. They also expressed that connecting students with professional mentors, most of whom were part of the same community as the teams they worked with, makes the industry feel more accessible.

Many students enjoy the program so much that they compete the following year, encourage younger siblings or cousins to do the same, or otherwise continue to involve themselves in the competition. Aryan Agarwal, who was a part of the 3rd-place winning team last year, returned this year as a youth mentor and helped his team win 2nd place.

Survey and interview feedback also informed plans for the 2025-2026 competition, with a focus on supporting educators and team leads. MTI staff are developing new resources to support the accessibility of the competition’s prompts and implementation of the program in the classroom. The competition’s prompts will include more context and background information. Pre-competition lesson plans are also in the works. This competition will continue to evolve to meet the needs of students and the industry.

The impact of this program, although measured qualitatively in surveys, is also told in stories as the effects of student collaboration, inspiration, and connections grow and ripple over the years. This year, MTI staff interviewed Kyla McKinney, who in 2014 was a part of the winning team from Juan Crespi Middle School. She spoke about how the program helped her improve her confidence and inspired her to intern with the West Oakland Environmental Indicators Project[16] (WOEIP) before moving into another STEM field. She said, “I was a reserved kid, but I was eager to be involved in this work, in real problems that grown-ups were interested in. We were excited to have our voices heard. The adults were listening.” As she recalled her experience in the program over a decade ago, she stressed the importance of the Garrett Morgan program as a unique learning opportunity for middle school students that can lay new foundations for them and for the industry. “Kids might be able to participate or contribute differently, but if they want to do it—let them! We can engage young people and new voices and learn from each other.”

Through experiential learning that includes mentorship, collaboration, and public presentation, the Garrett Morgan Sustainable Transportation Competition provides a replicable framework for engaging middle school students. Participants build essential skills, form interpersonal connections and industry knowledge, and increase confidence and a deeper understanding of their role in shaping the future. Exposure to the transportation industry sparks early awareness of career pathways, strengthening the pipeline of diverse, capable, and future-ready talent. Ultimately, this program connects young people to their communities and the broader world, helps them build skills for the lives they want, and empowers them to contribute to MTI’s greater mission: to increase mobility for all.

This perspective positions the Garrett Morgan Sustainable Transportation Competition as a transformative model of experiential learning that bridges classroom content with real-world challenges to empower youth. Through mentorship, teamwork, and public presentation, the program offers a replicable framework for engaging middle schoolers in building essential skills like problem-solving, critical thinking, public speaking, and long-term collaboration. While strengthening these skills, students also form interpersonal connections and increase confidence and a deeper understanding of their role in shaping their community. This exposure to the industry cultivates early awareness of transportation careers, building the industry pipeline and a diverse, capable, and future-ready workforce. The Garrett Morgan Sustainable Transportation Competition connects young people to their communities and the broader world, helps them build skills for the lives they want, and empowers them to contribute to the greater good.

Endnotes

1. https://transweb.sjsu.edu/workforce-development/garrett-morgan-program
2. https://www.bu.edu/excellence/
3. https://www.bu.edu/excellence/
4. https://www.aee.org/what-is-experiential-education
5. Beard, Colin. Experiential Learning Design: Theoretical Foundations and Effective Principles. 1st ed., Routledge, 2022. https://doi-org.libaccess.sjlibrary.org/10.4324/9781003030867
6. https://www.youtube.com/watch?v=Rw40bXZ7O-M&t=41s
7. https://www.apta.com/research-technical-resources/research-reports/transit-workforce-shortage/
8. https://www.bts.gov/data-spotlight/unemployment-transportation-remains-above-pre-pandemic-levels-women-experiencing
9. https://transweb.sjsu.edu/Rodney-Slater
10. https://www.youtube.com/watch?v=WpE6oGtyreo
11. https://transweb.sjsu.edu/workforce-development/garrett-morgan-program
12. https://www.youtube.com/watch?v=Rw40bXZ7O-M&t=41s
13. https://www.youtube.com/watch?time_continue=1&v=F2KtvUzreHI&embeds_referring_euri=https%3A%2F%2Ftransweb.sjsu.edu%2F&source_ve_path=MzY4NDIsMjg2NjY
14. https://www.youtube.com/watch?v=--m9uWI_wAU
15. https://www.youtube.com/watch?v=ih8MU2CWhes
16. https://woeip.org/

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This report can be accessed at
transweb.sjsu.edu/research/2561

MTI MINETA TRANSPORTATION INSTITUTE

The Mineta Transportation Institute (MTI) is a university transportation center located within the Lucas Graduate School of Business at San José State University. MTI supports the advancement of safe, efficient, and innovative surface transportation through research, education, workforce development, and technology transfer.