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# How Might We Reimagine Transportation Technology to Combat Forced Labor: Conference Explanations and Recommendations from The Law and Mobility Program's Annual Conference 2023

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# HOW MIGHT WE REIMAGINE TRANSPORTATION TECHNOLOGY TO COMBAT FORCED LABOR: CONFERENCE EXPLANATIONS AND RECOMMENDATIONS FROM THE LAW AND MOBILITY PROGRAM'S ANNUAL CONFERENCE 2023

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## I. INTRODUCTION

The University of Michigan Law School's Law and Mobility Program (LAMP), a resource for scholarship about the legal implications of emerging transportation technology with a particular focus on connected and automated vehicles (CAVs), hosts an annual conference. The topic of the LAMP Annual Conference 2023 considered how we might reimagine transportation technology in a way that combats the systemic vulnerabilities that leave certain populations more likely to experience forced labor. This topic was selected because there are multiple lenses through which to consider the transportation equity outcomes for users, industry workers, and society at large; forced labor is just one metric. This point is twofold. First, this question matters in particular because transportation touches everything people do from shipping goods to commuting to work to recreational activities to community development. Second, the automobile industry, as was discussed during the conference's first panel, has an enormous global footprint with many layers within the supply chain, making it a great example for other industries to consider environmental, social, and governance (ESG) challenges in their own contexts. There are many notable historical examples of the impacts of emerging transportation technologies on labor conditions and access to dignified employment, and paying attention to the lessons learned from those outcomes may help policymakers better anticipate the equity outcomes of regulatory decisions.

After articulating why this topic is important in the transportation technology space, LAMP researchers identified four categories through which to understand the research. The categories are organized by population and include, 1) people working in the raw material and mining sectors harvesting the relevant materials to construct the technology such as cobalt and copper; 2) people working in the transportation industry in United States such as transit operators, truck drivers, and mechanics; 3) the user of the emerging transportation technology in their commute to work, and; 4) the nonuser community member whose access to employment or daily commute may be radically altered in an attempt to accommodate new technologies such as changes to bike lane, sidewalks, increased urban sprawl, or public transit routes. The type of analysis for each category varied. At the conference, the first and fourth panels explored many historical examples and existing law and policy tools, while the second and third panels identified questions and theoretical frameworks through which to best understand the needs of the communities.

Part II of this report will explain the methodology of this research and summarize the original literature review that was used to shape the conference format. Parts III through VI will present the findings of each respective panel. Finally, part VII will conclude with recommendations and lessons learned.

## II. METHODOLOGIES AND LITERATURE REVIEW

### A. METHODOLOGIES

#### a. DEFINITIONS

To begin, the author interviewed experts in engineering, law, human trafficking, and urban planning at the University of Michigan and soon realized there existed no shared language to discuss the research question in an interdisciplinary way. Upon learning this research was seemingly a novel topic, an immediate priority became establishing a shared vocabulary for experts in multiple disciplines to use to

meaningfully figure out where their fields of expertise overlapped. The term forced labor was selected rather than labor exploitation, slavery, modern slavery, third slavery, labor trafficking, or unethical labor though the sources in the literature review use a variety of the aforementioned terms. Forced labor was chosen because that was the term established at the Forced Labor Convention of 1930, which includes, "all work or service which is exacted from any person under the threat of a penalty and for which the person has not offered himself or herself voluntarily."[1]

Defining emerging transportation technology was likewise difficult because there are a variety of technologies with varying labor repercussions, benefits, unintended consequences, and relevance to transportation. For example, the automotive industry, public transportation, and private bicycle sharing companies could all fall under the emerging transportation technology umbrella. Another example can be found in how the collection and storage of biometric data, such as with facial recognition software, is relevant to transportation but not exclusive to the industry. To narrow the scope, this project defines emerging transportation technologies as electric vehicles (EVs) and CAVs at SAE Levels 4 and 5. This definition is intentionally narrow to keep both the literature review manageable and the conference panels timely. The findings and recommendations from panelists, however, include how to develop, regulate, and deploy EVs and CAVs alongside other technologies such as micromobility and public transit because none of these innovations exist in a vacuum and will coexist on the street.

### b. Preliminary Interviews

Drafting the literature review required interviews with interdisciplinary experts to best understand which articles the experts consider most relevant. The primary purpose of the research was not to fearmonger technology, but rather to bring experts together to best understand how AVs and EVs may potentially close the transportation equity gap. To do so, preliminary interviews were

[1] Forced Labor Convention of 1930 art. 2, May 1, 1932, I.L.O. No. 29.

used to define the scope, scale, and technological possibilities considered at the conference. Said differently, interviews with engineers and urban planners were used as an opportunity to best understand what exactly the technology can do and how it works, while interviews with lawyers and forced labor experts were used to characterize the systemic failures that have contributed to existing injustices that safe and reliable transportation options may be able to reduce. Using appropriate language and defining a manageable scope were priorities.

These interviews were particularly useful in learning which language not to use and how to maintain trauma-informed discourse that is also technically credible. It soon became clear that, due to the novelty of the research question, the framework of the conference would be born out of the intersections identified during the preliminary research. By asking each expert to identify vulnerable populations and the systemic failures that perpetuate those vulnerabilities, the author was able to develop an ethnography that highlights the intersections between transportation technology and combating forced labor. None of the interviewees were experts in both transportation technology and force labor, so the information collected in the interviews was something like a Venn diagram to find the equity questions in the overlap of the circles.

As one interviewee explained the research question, the purpose of these interviews was to develop sufficient context for asking the question in the first place. The interviews were loosely organized in three parts. First, the historical examples of relationships between transportation technologies and forced labor. An example that will be described in detail in Part III is roads in ancient Rome. As the Roman empire expanded via development of road networks, the empire enslaved people during its imperial reign and used the forced labor of those people to further build out the system enabling more imperialist conquests. Second is the impact today of new technologies on labor conditions of those working in the raw material, mining, and manufacturing spaces to make the technology itself as well as the working conditions for those who work in

transportation as drivers, operators, mechanics, and other service jobs after the technology is deployed into society. The final context is the impact of transportation technology on the user's ability to access safe, reliable and dignified transportation to get to work and the impact of changing infrastructure on the non-user community members' commute to work. In sum, history, labor in the transportation sector, and people's ability to get to work in all sectors were the three interview question categories.

Two goals that were quickly identified were to make sure this research did not contribute misinformation or harmful rhetoric about forced labor, and to depict both the positive and negative potential consequences of widely distributed new technologies. Because both of these goals required capturing nuance, the purpose of the literature review became to ask what is missing from the existing articles that falls within this conference's scope. Armed with definitions of both forced labor and transportation technology, the literature review took a deep dive into existing data about the four identified populations and ended with a call to engage experts at institutions other than University of Michigan to include factors unrepresented or, perhaps even more importantly, misrepresented.

### c. LITERATURE REVIEW

The literature review was broken into sections to showcase the scope and scale defined in the preliminary interviews, a historical section providing examples of transportation technology exacerbating the equity gap using forced labor as a metric, and sections outlining existing research related to each of the four panel topics. This report merely summarizes the findings. For a more detailed analysis please refer to *Setting the Agenda: The Legal and Historical Context to Best Understand How We Might Reimagine Transportation Technology to Combat Forced Labor*.

Beginning with the scope and scale, experts estimate that 40 million people are experiencing forced labor today.[2] As stated in the literature review article, "[Forced labor] is nearly impossible to reliably calculate [in] figures. Labor exploitation is hard to quantify and rarely prosecuted because it receives significantly less attention than sexual exploitation. Vulnerability, which is a systemic problem caused by public entities failing to meet people's needs, is at the root of the problem, and a misrepresentation of the cause and frequency of exploitation hinders meaningful solutions."[3] The transportation industry requires an overwhelming amount of labor, and it is impossible to keep track of it all. According to the US Department of Transportation's Bureau of Transportation Statistics, nearly 15 million people worked in the transportation sector in 2021 in the US alone, which is roughly 10 percent of the US workforce.[4] This statistic varies by source because the types of work that are categorized as transportation varies from survey to survey, and it is extremely difficult to calculate the global number of employees because of the sheer size and number of layers within the industry. It is unclear how many people work in the industry globally because the supply chain is made up of so many levels with so many entities on each level, some of which are not properly recorded. However, the point remains that transportation is a massive industry. Developing new transportation technology will demand a significant amount of mining of raw materials. This is partially because a car is made up of approximately 30,000 parts,[5] but also because CAVs will require more electric and computer components. Th World Bank estimates that the world will need 500 percent more "critical raw

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[2] Daniela Gross, *Over 40 Million People Still Victims of Slavery*, UN NEWS (Dec. 2, 2018), https://news.un.org/en/story/2018/12/1027271.

[3] Brittany Eastman, *Setting the Agenda: The Legal and Historical Context to Best Understand How Transportation Technology Might Be Regulated to Combat Forced Labor*, 2022 J. L. & MOB. 5.

[4] BUREAU OF TRANSPORTATION STATISTICS, EMPLOYMENT IN TRANSPORTATION: ANNUAL EMPLOYMENT IN TRANSP. AND RELATED INDUSTRIES (2022).

[5] Collectors Auto Supply, *How Many Parts Are in a Car?*, COLLECTORS AUTO SUPPLY (May 5, 2020), https://collectorsautosupply.com/blog/how-many-parts-are-in-a-car/.

materials" to complete the world's green energy transition by 2050.[6] Additional parts, particularly computer parts, require a lot of cobalt, copper, and lithium, which must be mined and processed before being produce into the desired component parts. As described in the initial article:

> [B]lue collar and manual labor positions are more vulnerable to human rights violations than white collar jobs in the industry. The Business and Human Rights Resource Center conducted a study between 2011 and 2018 on the alleged human rights violations in the transportation manufacturing industry (in which the overwhelming majority of employers were automotive part manufacturers and suppliers, but included a variety of raw material sourcing, factory work, large order, and sponsorship). The study concluded that 91.7% of alleged labor rights abuses were raised in the automotive parts manufacturing sector. Land rights issues, displacement, and inaccessible natural resources such as clean water were also reported, roughly a third of which were in the raw material mining sector. Environmental degradation and workplace health and safety reports were also overwhelmingly impacting those working in mining.[7]

The same pattern is true for the user of the technology and the nonuser members of a community in which the technology is deployed. The mass deployment of a new technology is expensive, especially in the early days. It is comparable to the release of the latest smartphone or laptop in that wealthy people are often the first to have access to the latest product. This phenomenon is also true in the transportation context, where older adults, people with disabilities, and low-income people have the greatest barriers in accessing transportation. In the US, this gap is widened by

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[6] The World Bank, *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*, p 12, https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf.
[7] Eastman, *supra* note 3, at 4.

"decreasing mobility and forcing individuals to rely on costly car ownership."[8] These populations spend a disproportionate amount of their income on transportation with the lowest earners making about $14,580 annually in the US spending a quarter to a third of their income on transportation.[9] The US is extremely car-centric and only about 5% of the country commutes to work on public transit, which means the expense of vehicles is an unavoidable burden for low-income people.[10] The exclusivity of emerging technologies without thoughtful regulation and deployment has the potential to exacerbate the existing injustice.

This injustice is further explained by the correlation between populations that spend a third of their income on transportation and employment statistics. Inaccessible transportation facilitates desperation. Over half of unemployed people currently applying for jobs cite unreliable transportation as the main reason they cannot maintain steady formal employment, and about one third of participants in a 2009 Department of Health and Human Services study reported they have been fired due to transportation challenges.[11]

However, the opposite is also true. While barriers to accessing transportation are exacerbated by expensive new technology and leave people vulnerable to forced labor by hindering access to safe,

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[8] Wendy Heaps, Erin Abramsohn, & Elizabeth Skillen, *Public Transportation in the US: A Driver of Health and Equity*, Health Affairs (2021), https://www.healthaffairs.org/do/10.1377/hpb20210630.810356/full/.
[9] Office of the Assistant Sec'y for Planning and Evaluation, *Poverty Guidelines*: HHS Poverty Guidelines for 2023, ASPE (2023), https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines.
[10] Richard Florida, *The Great Divide in How Americans Commute to Work,* BLOOMBERG (Jan. 19, 2019), https://www.bloomberg.com/news/articles/2019-01-22/how-americans-commute-to-work-in-maps.
[11] Office of Disability Employment Policy, Transportation, https://www.dol.gov/agencies/odep/program-areas/employment-supports/transportation (last visited: Jun. 24, 2023); OFA Peer TA, Overcoming Transportation Barriers: A Path to Self-Sufficiency, https://peerta.acf.hhs.gov/content/overcoming-transportation-barriers-path-self-sufficiency#:~:text=Findings%20include%20that%20approximately%20one,both%20find%20and%20retain%20employment (last visited: Jun. 24, 2023).

well-regulated, formal employment opportunities, creating and funding transportation systems that utilize automated and electric technology to provide more equitable service empower communities in the margins with a more reliable and affordable way to get to a wide variety of workplaces. "Existing studies are few and far between, but currently suggest that automated vehicle deployment in our current legal framework could improve mobility for older adults, teenagers, middle class rural residents, and people with disabilities."[12]

The bulk of the literature review provided examples of the impacts of emerging transportation technologies on the four identified populations' likelihood to experience forced labor, as well as some relevant metrics and statistics. While this report is unable to provide a comprehensive representation of all the illustrations and metrics covered, the remainder of this section will summarize one example for each population to provide some context for the historical section and the recommendations from panelists.

In the mining and raw material context, Congolese cobalt mines serve as an example of the potential forced labor consequences. Approximately 70% of the world's cobalt production is in Congo.[13] Cobalt is used to make the lithium-ion batteries that can be found in almost anything that advertises itself as being rechargeable, including smartphones, small appliances, and EVs. The demand for cobalt has already increased in recent years, but "is on track to skyrocket by 2050 as a result of the COP26 Climate Conference

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[12] Xinyi Wu, Jason Cao, & Frank Douma, *The impacts of vehicle automation on transport-disadvantaged people*, 11 TRANSP. RESEARCH INTERDISCIPLINARY PERSPECTIVES 1, (2021), https://www.sciencedirect.com/science/article/pii/S2590198221001536.

[13] Victoria Beaule, *Artisanal cobalt mining swallowing city in Democratic Republic of the Congo*, satellite imagery shows, ABC NEWS (Feb. 8, 2023), https://abcnews.go.com/International/cobalt-mining-transforms-city-democratic-republic-congo-satellite/story?id=96795773#:~:text=The%20Democratic%20Republic%20of%20the%20Congo%20produces%20an%20estimated%2070,those%20more%20in%2Ddemand%20minerals.

commitment to net-zero carbon emissions",[14] which may further impact labor conditions in the mines. A 2021 report from Rights and Accountability in Development (RAID), an organization seeking to hold corporations accountable for the protection of human rights, synthesized a series of interviews with Congolese cobalt miners who reported working long hours, suffering through embarrassing or degrading treatment at the hands of employers, navigating unsafe working conditions, and receiving wages very significantly lower than the local living wage.[15] The literature review also briefly calls into question whether EVs are substantially better for the environment than their internal combustion engine (ICE) counterparts considering the ecological harms of cobalt and copper mining and the fossil-fuel-powered US electric grid.

A helpful example from the section about transportation employees in the US transportation industry came from the experience of Southern California truck drivers. Hundreds of truckers have reported to lawmakers and journalists that they were coerced into labor contracts that they either did not understand, or that were not upheld after signing, and are now each approximately $100,000 in debt to their own employers.[16] The confusion is the result of a series of deregulation at both the federal and state level over the past few decades. When considering the introduction of transportation technologies such as automation to the warehouse and trucking industries there are two competing narratives: automation will result in many people losing their jobs and automation is necessary because very few people are willing to work in the industry. These predictions cannot both be true; there cannot be too many and too few workers at the same time. A study published by Forbes concluded that 60% of warehouse owners surveyed are "very likely" to implement automation technologies because of an alleged labor

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[14] Eastman, *supra* note 3, at 11.

[15] RAID, *The Road to Ruin? Electric vehicles and workers' rights abuses at DR Congo's industrial cobalt mines,* RAID (Nov. 2021), report_road_to_ruin_evs_cobalt_workers_nov_2021.pdf (raid-uk.org).

[16] Brett Murphy, *Retail Giants Enable Trucker Exploitation*, USA TODAY, Jun. 29, 2017.

shortage.[17] Other studies, however, have concluded that the significant deregulation of truck driving coupled with legal confusion about truckers' status as independent contractors has either resulted in drivers being given more work than they could ever reasonably be expected to accomplish or caused people to leave the profession in which they otherwise would have stayed.[18] If implemented meaningfully, automation has the potential to alleviate the burden of performing certain tasks such as highway driving and heavy lifting. Because the deployment of AVs in the trucking industry will require legislative involvement, lawmakers have an opportunity to study the lessons learned from previous regulatory shortcomings which have negatively impacted the labor conditions to facilitate safer and more dignified employment opportunities.

Moving onto the impact of the technology on the users' employment, it is important to reemphasize transportation's role in the systems necessary to connect vulnerable people to safe, formal, and dignified employment. Examples used in the literature review included access to transportation for people with disabilities. Transportation for people with disabilities can be expensive if it exists at all. The spectrum of accommodations needed is unfathomably large and diverse, making accessibility a difficult question to answer. Current participation by people with disabilities in the US workforce is about a third of that of the population without disabilities.[19] Though there are many initiatives to make public transportation more accessible for those with disabilities, the intersection of poverty and disability further complicates the equation because historical cuts to funding for public transit disproportionately impact low-income neighborhoods. This means "access to formal jobs is often difficult and costly for a large part of the lower-income population. As a result, low-income workers may be discouraged from commuting to

[17] Steve Banker, *Automation is the Future of Warehousing*, FORBES, Jul. 31, 2020.
[18] Michael Belzer, *Truck Drivers are overtired, overworked, and underpaid,* The Conversation (Jul. 25, 2018), https://theconversation.com/truck-drivers-are-overtired-overworked-and-underpaid-100218.
[19] Mark Wolf, *How Autonomous Vehicles Can Affect People with Disabilities*, THE NCSL BLOG, Dec. 10, 2019.

formal jobs, lack information on job opportunities, and face discrimination."[20] Not only do low-income neighborhoods experience public transit funding cuts more frequently which makes it very difficult to finance accessibility features, but only 5% of Americans commute to work by public transit due to the car-centric nature of American infrastructure.[21] Considered in contest with the high unemployment rate, the intersection of disability and poverty make it more difficult for marginalized communities to access formal employment, leaving them more vulnerable to forced labor.

Finally, the impacts of emerging transportation technology on the nonuser members of the community cannot be overstated, though it can be difficult to imagine all the possible social outcomes of unleashing a new product into society. After all, the consequences are unintended and if developers had thought of those impacts before deployment the outcomes may have been substantially different. This category includes ideas like changing infrastructure, the climate crisis, and changes in the distance between origins and destinations, which will impact everybody in a community rather than just the passengers of an AV. One example from the literature review considered the potential increase in shared automated mobility (SAM). SAM is a wonderful tool to create efficiency and to reduce the number of single occupancy vehicles (SOVs) on the road, but "SAM often excludes non-car road users, particularly those with systemic barriers to transportation. This leaves communities with poor access to transportation at risk of being forgotten and further marginalized."[22] This is especially true if AVs increase the overall vehicle miles traveled (VMTs) and, consequently, push residential neighborhoods further away from city centers to create urban sprawl. If frameworks such as SAM do not consider holistic community experiences, the widespread adoption of AVs and EVs may be doomed to follow in the footsteps of previous technologies that

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[20] Ana I. Moreno-Monroy, *Access to public transport and labor informality*, IZA WORLD OF LABOR (2016), https://wol.iza.org/uploads/articles/274/pdfs/access-to-public-transport-and-labor-informality.pdf?v=1.
[21] Florida, *supra* note 10.
[22] Eastman, *supra* note 3, at 18.

negligently widened the equity gap that leaves people vulnerable to forced labor.

The examples in the literature review provide an opportunity to consider how existing transportation accessibility gaps leave people vulnerable to forced labor. As the panelists discuss the deployment of AVs and EVs, these examples serve as a tangible way to think about the relationship between transportation and forced labor rather than specific examples to be solved on the spot. Said differently, the purpose of the literature review was to get the multidisciplinary panelists on the same page about how access to transportation is one system in an extremely complicated list of institutional barriers that can be improved to reduce forced labor. The meaningful, thoughtful, and intentional regulation of AVs and EVs has the potential to close those equity gaps and contribute to a variety of more formal and dignified employment opportunities. For the first time in human history, policymakers are equipped with the tools to simultaneously create efficient and exciting technological advancements while closing the equity gaps for both those who develop the technology and those who use the technology.

## III. BRIEF HISTORY

Many historical examples were called upon in the literature review to offer context about how transportation technology has historically exacerbated the systemic vulnerabilities that facilitate forced labor. Additionally, a few panelists and interviewees provided different historical examples during their presentations and Q&A sessions. The examples mentioned by panelists will be included in Parts III through VI.

The earliest cited example was roads in Rome. As previously mentioned, "[e]nslaving people was a common practice in ancient Rome and the labor of enslaved people largely implemented the technologies that were stolen via imperialism."[23] It may not be

[23] *Id*. at 7.

entirely accurate to describe the Roman system of roads as transportation "technology" as that implies a certain level of innovation and Romans were mostly capturing the technological advancements of their colonies.[24] This is an example of how the development and deployment of transportation systems thought to be a massive advancement actually contributed to the plight of marginalized populations. The construction of the roads allowed the Roman empire to expand more rapidly, and the infrastructure built by enslaved people's labor enabled the enslavement of more people in more distant places with outward expansion.[25]

Another historical example of transportation technology's relationship with forced labor comes from the early days of the American railroad. The development of American rail would have been impossible without the use of Black people's forced labor in the mid nineteenth century.[26] The same railroads built by Black people did not allow Black ridership for approximately another century and, when ridership was permitted, access to trains was limited, underserved Black communities, and utilized poor infrastructure.[27] This failing infrastructure, as well as the racist policies that kept the railroad segregated and underserviced, widened the transportation equity gap significantly and are the foundation upon which modern transportation systems rest.

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[24] THE BRITISH MUSEUM, SLAVERY IN ANCIENT ROME, https://www.britishmuseum.org/exhibitions/nero-man-behind-myth/slavery-ancient-rome; *Ancient Roman Slaves: A Life of Bondage*, HIST. ON THE NET (2022), https://www.historyonthenet.com/ancient-roman-slaves (last visited Oct. 20, 2022).

[25] SLAVERY INJUSTICE, SLAVERY IN ANCIENT ROME, https://slaveryinjustice.wordpress.com/slavery-in-ancient-rome/ (last visited Oct. 4, 2022)

[26] Steven G. Collins, *Progress and Slavery on the South's Railroads*, 181 R.R. HIST. 6, 7-16 (1999).

[27] Mitchell v. United States, 313 U.S. 80 (1941); Alex Palmer, *This Segregated Railway Car Offers a Visceral Reminder of the Jim Crow Era*, SMITHSONIAN MAG. (Jun. 13, 2016), https://www.smithsonianmag.com/smithsonian-institution/segregated-railway-car-offers-visceral-reminder-jim-crow-era-180959383/.

Lastly, the 41,000 miles of highway infrastructure that were created after the enactment of the Federal Aid Highway Act of 1956 in strategic locations to support and convenience upper-middle class white neighborhoods.[28] Many highways were built directly through nonwhite communities, cutting those residents off from easily accessing resources or, in some instances through the government's power of eminent domain, demolishing their houses to make space for new infrastructure.[29] "The psychological and communal harm caused by the displacement disrupted the development of nonwhite communities by limiting access to employment, education, and other resources."[30] This point is particularly salient in the context of transportation equity because it goes beyond the devices and streets people use by considering the disruptive impacts of transportation policies on communities in the margins.

## IV. TRANSPORTATION TECHNOLOGY AND MINING

The first panel of the conference considered the impact of the increased demand for raw materials and component parts on the labor conditions of those working in mines in light of widespread electrification and automation.[31] Relatedly, the panel also discussed potential regulatory options throughout the various levels of the supply chain to better understand where forced labor exists, why it continues to exist, and which voluntary versus mandatory contract terms may have the most impact.[32]

First, the discussion began with additional historical examples specific to the transportation technology space, which expanded on

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[28] Richard F. Weingroff, Dep't of Transp., Fed. Highway Admin., *Federal-Aid Highway Act of 1956: Creating the Interstate System,* 60 1 PUBLIC ROADS (1996).
[29] *E.g.* Kohl v. United States*,* 91 U.S. 367 (1875); Loretto v. Teleprompter Manhattan CATV Corp. 458 U.S. 419 (1982); Kelo v. City of New London, Connecticut, 545 U.S. 469 (2005).
[30] Eastman, *supra* note 3, at 9.
[31] Daniel Crane, Louis C. de Baca, Chavi Nana, & Jennifer Dukarski, Technology and Mining, Panel at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[32] *Id*.

those provided in the literature review to identify lessons learned that must be incorporated in any AV regulatory framework to combat the use of forced labor. Two prominent examples came from the Triangle Trade and the production of pitch and turpentine for naval stores in the southeast US.[33] The Triangle Trade offers perhaps the most obvious explanation.[34] The Triangle Trade was a transportation model that, at its most basic, used the newest, fastest, and most reliable ships to bring goods to parts of the world which previously had no access.[35] The name Triangle Trade does not refer to a specific route but rather the new connection through the Atlantic Ocean between Europe, Africa, and North America.[36] Of course, the Triangle Trade infamously required a monumental amount of labor to operate and maintain, and approximately 13 million Black people were used as currency for goods from Europe and enslaved and transported to North America.[37] This model was replicated throughout the 18th and 19th centuries.[38] The enslaved people who survived the journey to North America were sold to landowners, where forced labor became commonplace in countless industries, including transportation.[39] Ironically, forced labor of enslaved people during and after the Triangle Trade created cycles such as naval stores producing and selling pitch and turpentine, which were used to seal ships so the most modern ships were watertight.[40] The forced labor of people kidnapped and purchased using the latest transportation technology harvested the tools to build even more advanced ships to perpetuate the cycle faster, better, and with more

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[33] Louis C. de Baca, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[34] Ben Phelan, Explainer: *What Was the Triangular Trade?*, PBS (Jan. 11, 2016), https://www.pbs.org/wgbh/roadshow/stories/articles/2016/01/11/triangular-trade (last visited June 30, 2023).
[35] *Id*.
[36] *Id*.
[37] Bryan Stevenson, *The Transatlantic Slave Trade*, EQUAL JUSTICE INITIATIVE (2022), https://eji.org/report/transatlantic-slave-trade/new-orleans/#resistance-and-violent-response.
[38] Phelan, *supra* note 34.
[39] de Baca, *supra* note 33.
[40] Robert B. Outland III, *Slavery, Work, and the Geography of the North Carolina Navel Stores Industry, 1835-1860*, 62 J. of Southern Hist. 27, 31 (1996).

lucrative outcomes. Lastly, federal legislation has historically not provided enough protection for those experiencing forced labor.[41] Laws such as the Tariff Act of 1930 Section 307 state the US cannot import goods made with forced labor but provide an exception for products that cannot be manufactured or mined in the US.[42]

Though there is more work to be done especially with each ubiquitous innovation, lessons from these historical events have started to inspire legal regimes that support more ethical labor conditions. There are a variety of legal and policy tools in place today to encourage corporate entities to combat forced labor in their supply chains.[43] In the 21st century, supply chains have gotten so complicated, though not necessarily sophisticated, that OEMs cannot follow their supply chain all the way to the mines.[44] Many have been accused of knowingly and unknowingly using component parts made with forced labor.[45] The Trafficking Victims Protection Act was the first comprehensive piece of legislation to provide support for people experiencing forced labor by creating legal mechanisms for prevention, protection, and prosecution.[46] Though this legislation is a huge social advancement, domestic law often has little impact in the international arena and the automotive supply chain is multinational to say the least.[47]

Of note, the UN Sustainable Development Goals (SDG) and the UN Guiding Principles on Business and Human Rights of 2011 were pointed out by panelists as promising international tools to combat forced labor in the supply chain as automation and electrification increase the demand for materials like cobalt, lithium, and copper.[48]

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[41] de Baca, supra note 33.
[42] de Baca, supra note 33; *see* Tariff Act of 1930, 19 U.S.C § 1307 (1930).
[43] Chavi Keeney Nana, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[44] Jennifer Dukarski, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[45] *Id*.
[46] Nana, *supra* note 43; *see* Trafficking Victims Protection Act of 2000, Pub. L. No. 106-386 (2000).
[47] Dukarski, *supra* note 44.
[48] Crane et al,, *supra* note 31.

SDG 8.7 pledges to "take immediate and effective measures to eradicate forced [labor]... and by 2025 end all forms of child labor."[49] The UN Guiding Principles on Business and Human Rights is a set of best practices laid out by the UN for states to consider in the pursuit to eradicate forced labor.[50] These principles are not binding or mandatory. International law typically is not enforceable because there is really no mechanism to do so, and states are almost never under any obligation to comply.[51] International law operates on the basis of consent.[52] However, for reasons of policy and diplomacy, states often choose to comply. In the instance of the Guiding Principles, the terms of the document are clearly stated to be informational rather than enforceable.[53] The Guiding Principles include the state's duty to protect human rights, the corporate responsibility to protect human rights, and remedies.[54] Though helpful for states and corporate entities already concerned, the language is frankly too weak to make substantial change in the states where forced labor is most common or in states outsourcing unethical labor and importing unethically made goods.[55] For example, Principle 23(c) states "in all contexts, business enterprises should treat the risk of causing or contributing to gross human rights abuses as a legal compliance issue wherever they operate."[56] Inviting massive corporate entities to imagine legal frameworks with which to comply is likely insufficient. As one panelist explained the issue, the unenforceable nature of the General Principles does not aid in

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[49] U.N. Office on Drugs and Crime, *UNODC and the Sustainable Development Goals* (2015), https://www.unodc.org/roseap/en/sustainable-development-goals.html#:~:text=Target%208.7%20%2D%20Take%20immediate%20and,labour%20in%20all%20its%20forms (last visited Jun. 21, 2023).
[50] U.N. Office of the High Commissioner, Guiding Principles on Business and Human Rights (Jan. 2012), https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf [hereinafter, Guiding Principles].
[51] Daniel Bodanski & J. Shand Watson, *State Consent and the Sources of International Obligation*, 86 Am. Soc'y of Int'l Law 108, 108-109 (1992).
[52] *Id*.
[53] Guiding Principles, *supra* note 50, at 1.
[54] *Id*. at 6-27.
[55] Crane et al., *supra* note 31.
[56] Guiding Principles, *supra* note 50, at 25.

experts' mission to "close the loopholes" that allow forced labor to persist.[57]

Because of the unenforceable nature of the General Principles, the panelists suggested a list of contract terms to which corporate entities may agree with their suppliers.[58] Because of the size and complexity of the automotive supply chain, there are several layers of contracts between the OEMs and the tier one suppliers, the tier one suppliers and the tier two suppliers, and so on.[59] By the time the contractual chain is chased down to the mine, the contracts become significantly less sophisticated if they can be identified at all.[60] It becomes very hard to cancel those contracts on the basis of human rights violations especially when the terms include noncommittal words such as "aspire"; in the words of one panelist, "you cannot aspirationally cancel a contract", even if it becomes clear that the increased demand for new vehicles is facilitating forced labor.[61] Panelists cautioned against voluntary compliance, pointing out that systemic change hinges on enforcement, which remains to be seen in the world of voluntary social auditing.[62] Mandatory compliance may be the only path forward. Though contract terms are not the same as criminal sanctions imposed by a governing entity such as the state, contract terms are legally enforceable and keep the parties obligated to perform as they have agreed with one another.[63] One source of model terms for such contracts is the ABA Model Contract Rules.[64] "The Model Contract Clauses (MCCs) are designed as a practical tool to

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[57] Nana, *supra* note 43.
[58] Dukarski, *supra* note 44.
[59] *Id*.
[60] *Id*.
[61] *Id*.
[62] Crane et al., *supra* note 31.
[63] *Id*.
[64] Dukarski, *supra* note 44; *see* Davis V. Snyder, Susan A. Maslow, & Sarah Dadush, *Balancing Buyer and Supplier Responsibilities: Model Contract Clauses to Protect Workers in International Supply Chains, Version 2.0*, Am. Bar. Ass. Section of Business Law (2021), https://www.americanbar.org/content/dam/aba/administrative/human_rights/contractual-clauses-project/abstract-balancing-buyers.pdf [hereinafter Model Contract Clauses].

help buyers and suppliers protect the human rights of workers in international supply chains."[65] The second version of the terms, which were released after the beginning of the COVID-19 pandemic which exposed numerous labor concerns, included the responsibility of buyers to protect human rights in collaboration with their suppliers and sub-suppliers.[66] This is notable because, as panelists pointed out, the decision to include contract terms that protect workers within the supply chain is an economic decision based on the contractor, which often results in deluded terms. Because the model rules are merely an example of how companies may choose to implement their human rights policies, mandatory compliance legislation is needed.

The panel also highlighted some countries that are taking mandatory compliance seriously by ratifying legislation. Germany, for example, already has a Supply Chain Due Diligence Act in which NGOs have standing to report labor law violations and bring suit on workers' behalf.[67] The law requires businesses in Germany with more than 3,000 employees to take "appropriate measures" to ensure they are not causing undue environmental or human rights harms.[68] With regards to model contract terms to further minimize the risks associated with mining, panelists noted that from their professional experiences their German counterparts are leading the charge seeking more specific and binding contract terms.[69] Though a private corporation, panelists also mentioned OEMs interested in interim voluntary compliance ratified should look to Ford's 2021 Supplier Code of Conduct, which outlines Ford's expectations for suppliers' commitment to protecting the human rights of workers in the supply chain.[70] Technological developments such as block chain were also

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[65] Snyder et al., *supra* note 64.
[66] Mine Health & Safety Administration, *US Department of Labor Issues Stronger Mine Safety Guidance on Coronavirus* (2021), https://www.dol.gov/newsroom/releases/msha/msha20210310 (last visited: Jul. 1, 2023).
[67] Nana, *supra* note 43.
[68] Supply Chain Due Diligence Act art. 1, §§ 1, 3 (2021).
[69] Crane et al., *supra* note 31.
[70] Crane et al., *supra* note 31; Ford, Supplier Code of Conduct (2023), https://corporate.ford.com/operations/governance-and-policies/supplier-code-of-conduct.html (last visited: Jul. 1, 2023).

mentioned as a potential tool for both the private and public sectors so long as the data collected can be anonymized, though panelists were adamant that this type of technology could only be part of a larger legislative initiative rather than a comprehensive solution.[71]

The panelists concluded in agreement that the increased demand for AVs and EVs holds much potential to bring the human rights concerns of miners around the world to the forefront of the national and international law stages because of the sheer size of the automotive industry and the number of parts required to build a vehicle.[72] However, panelists cautioned that to realize these positive outcomes, lawmakers have to understand the historical examples as well as the complicated intricacies of both the industry as it stands today and as it will exist in the future.[73] One panelist ended their remarks by urging participants to stay involved even when the work is uncomfortable and daunting, saying "anyone with a sense of conscience wants to look away from slavery but anyone with a sense of responsibility must look at it."[74]

## V. TRANSPORTATION TECHNOLOGY AND US TRANSPORTATION WORKERS

The second panel of the conference considered the labor conditions of people who work in the US transportation sector, including transit operators, taxi drivers, truck drivers, and mechanics among others. The discussion was broken into several sections, including job loss as a result of automation, job retraining, the role of labor unions, and the independent contractor and gig worker models. Panelists dispelled many myths about the impacts of transportation technology on workers in their respective fields and offered recommendations about how to best protect workers in the transportation industry

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[71] Crane et al., *supra* note 31.
[72] *Id*.
[73] *Id*.
[74] de Baca, *supra* note 33.

while championing new technologies.[75] The biggest concerns with respect to transportation technology and potential forced labor are the technology somehow exacerbating already exploitative labor conditions such as long hours, workplace violence, or unfair wages, or facilitating an uptick in job loss which creates desperation and leaves transportation employees vulnerable to forced labor.[76]

Panelists discussed the idea of job loss extensively, pointing out the competing narratives both in the industry and the greater community.[77] Some sources claim we have too many workers and automation will take away many jobs, while other sources explain that we have too few workers and automation will actually alleviate the pressure on a workforce that is already stretched very thin.[78] While panelists reported that it is nearly impossible to predict all the unintended consequences technology has on labor, two things that are undoubtedly true are that many jobs cannot lose their human touch and will continue to need laborers and that any successful restructuring of labor demands must be both gradual and detailed. An example of jobs in the transportation industry that cannot afford to lose their human touch is transit attendants.[79] The role of an attendant serves many purposes. First, it is not unlike an elevator attendant at the turn of the twentieth century.[80] In fact, that is a job that still exists today in luxury buildings in large cities, though admittedly those positions are few and far between.[81] In the context of AVs, an

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[75] Tifani Sadek, Valerie Lefler, Jean Ruestman, Frank Houston, & Matt Daus, Transportation Technology and US Transportation Workers, Panel at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[76] *Id*.
[77] *Id*.
[78] *Id*.
[79] *Id*.
[80] Jacopo Prisco, *A short history of the elevator*, CNN.com (Feb. 9, 2019), https://www.cnn.com/style/article/short-history-of-the-elevator/index.html (last visited: Jul. 23, 2023).
[81] Chegg CareerMatch, Elevator Operator, https://www.careermatch.com/job-prep/career-insights/profiles/elevator-operator/ (last visited Jul. 23, 2023); Ernesto Londoño, Rio de Janeiro Elevator Attendants 'Adore' Their Dying, Chatty Trade, NY Times (Nov. 25, 2018), https://www.nytimes.com/2018/11/25/world/americas/brazil-rio-de-janeiro-elevator-attendants.html#:~:text=RIO%20DE%20JANEIRO%20—

attendant could be present to ensure safety and equity such as for people with disabilities or unaccompanied children. Panelists pointed out that society developed a certain level of comfort with the elevator because it is a closed system, but an AV is an open system that could go anywhere so the variety of circumstances that might require a human understanding is seemingly higher.[82] Panelists predicted that the transportation sector will still need many employees despite eliminating the need for a driver, however jobs such as a vehicle attendant will still require some type of retraining.[83]

Retraining was perhaps the largest focus of the panel because the question is politically savory but not necessarily politically ripe. Panelists identified the feeling from their professional experiences that large corporate entities, and by extension legislators, do not want to draft new labor or sustainability policies until the issues are politically salient, which may be the 2024 presidential primaries but could realistically be even later as fully automated technology has yet to be released for general public use.[84] Panelists urged the need for just transition plans for charges in the employment market before automation and electrification are commonplace, which do exist in a few states such as Colorado, but the scope of the plans tends to be quite narrow.[85] The Colorado plan, for example, almost exclusively applies to power plant employees at electric plants moving away from coal.[86] Other states such as Illinois, California, and New York have organized commissions or boards within the state government "to guard workers and communities against loss of livelihoods and

%20The%20elevator,for%20a%20few%20more%20years (last visited: Jul. 23, 2023).

[82] Sadek et al., *supra* note 75.

[83] Valerie Lefler, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023); Frank Houston, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).

[84] Sadek et al., *supra* note 75.

[85] *Id*.

[86] Colo. Dep't of Labor and Emp't, Colorado Just Transition Plan, https://cdle.colorado.gov/offices/the-office-of-just-transition/colorado-just-transition-action-plan (last visited: Jul. 23, 2023).

income from climate protection policies."[87] One panelist in particular urged the importance of fostering relationships between legislators and labor union leaders as electrification becomes more common, pointing out that if the US did nothing to retrain people at risk of losing their jobs to automation and electrification, the US would see more jobs in the industry created in the next two years but have catastrophically high numbers of jobs lost in about eight to ten years.[88]

Though not mentioned at the panel, it is also important to note that transit agencies are already having a difficult time finding workers even before the large-scale changes that will come to the industry in light of increased automation and electrification. Nine out of ten transit agencies struggle to fill job openings with bus drivers being the hardest to find.[89] The need to consider the desirability, working conditions, and current overworking of those already in understaffed positions is dire, and emerging technology may be able to lessen the burden if implemented with workers' needs mindfully incorporated into the solutions. Ultimately, the deployment of new technologies as well as job protection and retraining in relevant industries relies on trust between community stakeholders, labor unions, and environmental justice organizations to collectively advocate for well-informed, meaningful regulation. Panelists also strongly recommended that stakeholders partner with community colleges that can reach the entire state's workforce when retraining is the only path forward.[90]

Relatedly, the role of unions in the automotive, trucking, and public transit industries was considered heavily. Much like the discourse

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[87] Labor Network for Sustainability, States Protecting Workers and Communities in a Just Transition, https://www.labor4sustainability.org/articles/states-protecting-workers-and-communities-in-a-just-transition/?utm_source=rss&utm_medium=rss&utm_campaign=states-protecting-workers-and-communities-in-a-just-transition (last visited: Jul. 23, 2023).
[88] Houston, *supra* note 83.
[89] CHRIS VAN EYKEN, BUS OPERATORS IN CRISIS 5 (Transit Ctr. Stephanie Lotshaw et al. eds., 2022).
[90] Sadek et al., *supra* note 75.

surrounding transit operators being retrained as transit attendants, labor unions such as Teamsters have advocated in recent years for truck drivers to remain safety drivers in automated trucks.[91] However, the unions argue the truckers do not require retraining because their most important roles as safety drivers are actually already part of their experiences as truck drivers. In January of 2023, the Teamsters, the California Labor Federation, and state lawmakers rallied at the state capitol to show support for proposed legislation requiring automated trucks weighing over 10,000 pounds to have a human operator present during use.[92] The unions hosted many speakers who pointed out that this requirement makes practical sense when truck drivers have years of experience helping people who have been in highway accidents, putting out highway fires, helping people and animals who are stuck in the roadway, assisting unsheltered people in crisis, and helping stranded drivers perform basic vehicle maintenance such as changing a tire or jumping a battery.[93] The human touch is simply not provided by an automated system. Regulating AVs and EVs thoughtfully can simultaneously protect formal, dignified jobs while maximizing public safety.

Lastly, the panelists considered how to best protect the labor rights of gig economy workers.[94] The gig economy refers to non-employee workers, such as temporary workers, freelancers, or contract workers.[95] This work can make people particularly vulnerable because there is less security in the gig economy than in traditional employment. Generally, gig workers have no employee benefits, which may also leave them vulnerable to systemic concerns such as inaccessible health care, childcare, paid leave, or retirement. In the

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[91] Houston, *supra* note 83.
[92] Matt McQuad, *Teamsters, California Labor Federation, Lawmakers Announce New Autonomous Vehicle Legislation*, TEAMSTER.ORG (Jan. 31, 2023), https://teamster.org/2023/01/teamsters-california-labor-federation-lawmakers-announce-new-autonomous-vehicle-legislation-to-protect-workers-and-california-roads/ (last visited: Jul. 23, 2023).
[93] *Id*.
[94] Sadek et al., *supra* note 75.
[95] Elka Torpey & Andrew Hogan, *Working in the Gig Economy*, U.S. Bureau of Labor Statistics (2016), https://www.bls.gov/careeroutlook/2016/article/what-is-the-gig-economy.htm (last visited Jul. 23, 2023).

US, gig workers are more likely to be nonwhite, with 31 percent of Hispanic adults and 27 percent of Black adults working in the gig economy compared to 21 percent of white adults.[96] Gig workers are also more likely to be young adults and those who work in the gig economy as their primary source of income are most likely to report high anxiety about their financial situation.[97] This is related to transportation technology for two reasons; first, many gig workers use their cars to earn money by delivering food or provided ride shares, and 60 percent of people whose primary income is from the gig economy report feeling concerned they will be unable to make a car payment.[98] Gig workers who provide transportation services such as rideshare are not unionized.[99] In fact, unions for cab drivers do not really exist. Drivers' unions were dismantled for the independent contractor model and the government has had to step in to establish wage laws as general minimum wage laws generally do not apply to the drivers.[100] For example, the NYC Taxi and Limousine Commission's Driver Income Rules establish a minimum per-trip payment to drivers but do not establish a minimum wage.[101]

Moreover, data collection and storage practices may negatively impact the rights of gig workers more than their employee counterparts. A study by Workers' Information Exchange, which is a labor rights advocacy group campaigning for workers to retain the rights to data their employers collect on employees, found that delivery and rideshare platforms that dispatch gig workers are misclassifying workers under employment laws as independent contractors to avoid tax and insurance obligations.[102] The study also notes that the increase in worker surveillance in the name of fraud

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[96] LAURA IVEY, THE GIG ECONOMY: FROM THE MARKETPLACE 4 (Edison Research eds. 2018).
[97] *Id*. at 3, 6.
[98] *Id*. at 9.
[99] Matthew Daus, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[100] *Id*.
[101] Driver Income Rules, 19-503 Admin. Code of City of NY. Local L. No. 149 (2018).
[102] CANSU SAFAK & JAMES FARRAR, MANAGED BY BOTS: DATA-DRIVEN EXPLOITATION IN THE GIG ECONOMY 10 (Worker Info Exchange eds. 2021).

prevention is used as a tool to manage employee job performance while simultaneously denying workers any right to how these recordings are stored and used.[103] Another study by the New School also concluded that drivers in New York City spend an average of 42 percent of their time at work waiting to be called by a rider, which is unpaid time that benefits the dispatching app's brand by promising promptness to the user without any compensation for the driver.[104] As such, gig workers must be beneficiaries of any protective legislation, job retraining, job retention, universal basic income, or benefits packages intended to protect transportation workers from forced labor throughout the transportation technology revolution.

Panelists were asked to each summarize one recommendation with which they would leave policy makers after this rich and diverse discussion. One panelist said the industry and government agencies need to prioritize finding strong leadership in the regulatory space because there is currently a lot of confusion and distrust from the public.[105] Another concluded that experts need to have conversations with each other about tangible action items rather than abstract ideas because concrete plans might get the industry comfortable with the idea of pivoting after making mistakes.[106] A third panelist said we have to get workers with disabilities and workers from low-income Black and Brown neighborhoods involved in the decision-making process because diversity must be a priority at the beginning of a retraining project.[107] Lastly, a panelist said the public sector needs to identify strong leaders in local and state regulatory agencies, create new leadership positions such as an AV czar, and promote better inter-and-intra agency communication.[108] All panelists unanimously commented that experts and industry leaders must stop being afraid

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[103] *Id*. at 15-17.
[104] James A. Parrott & Michael Reich, An Earnings Standard for New York City's App-based Drivers: Economic Analysis and Policy Assessment, THE NEW SCHOOL, 22, 54 (2018).
[105] Jean Ruestman, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[106] Houston, *supra* note 83.
[107] Lefler, *supra* note 83.
[108] Daus, *supra* note 99.

to put ideas out there so workers know what types of skills will be required in the near future, allowing workers to make educated decisions about their employment opportunities.[109]

## VI. TRANSPORTATION TECHNOLOGY AND THE USER'S COMMUTE TO WORK

The third conference panel switched gears from considering how emerging technologies will impact those who make and use the technology at their jobs, to considering how other people in the community will use the technology to commute to their jobs. While the first half of the conference discussed people who work in transportation or automotive, the second part of the conference was dedicated to the social implications of automation and electrification on a community's access to transportation to get to work. The third panel considered how AVs and EVs might be deployed and regulated in ways that connect vulnerable populations to job opportunities that were previously not practical to commute to daily.[110] The hypothesis being tested is whether better access to consistent, reliable, and dignified transportation can connect those most vulnerable to forced labor to more formal job opportunities.[111] If yes, are there implementation strategies that best ensure automation and electrification can be tools to better facilitate those connections?

The panelist began by identifying the most appropriate government agencies to address issues of access to transportation to commute to work.[112] They listed DOT, HUB, DOJ, DOE, and EPA by identifying numerous sub agencies, bureaus, and offices already working on relevant initiatives.[113] Panelists explained it is best to contextualize this research question through the responsible government agency because any transportation program applying for federal funding that

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[109] Sadek et al., *supra* note 75.
[110] Brittany Eastman, Karlyn Stanley, Jim Sayer, & Reuben Sarkar, Transportation Technology and the User's Commuter to Work, Panel at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[111] *Id*.
[112] *Id*.
[113] *Id*.

requires an equity-based purpose must demonstrate how that program is closing the equity gap to receive the funding.[114] Panelists also mentioned that subsidies, tax credits, and government mandates are excellent tools, but must be distributed equitably across many neighborhoods with varying needs and cannot merely focus on one mode of transportation such as the bus.[115]

The introduction of a mobility wallet was one proposed solution.[116] A mobility wallet is a token, card, app, or other tool that provides universal access to a variety of transportation options, such as the train, the bus, rideshare services, bicycles, scooters, and more.[117] A pilot program to experiment with the mobility wallet has been launched in Los Angeles by providing $150 monthly subsidies to approximately 2,000 residents.[118] The mobility wallet is a form of universal basic mobility (UBM) that seeks to close the equity gap experienced by those who cannot own a vehicle for a variety of reasons.[119] City officials strongly consider the mobility wallet to be a tool to promote economic mobility and job security as technology threatens to raise the cost of transportation for those who already struggle to afford the commute to work.[120] As the general manager of the Los Angeles Department of Transportation explained the project, "[w]e want to make sure that transportation is never the barrier to the people in this city being able to accomplish their dreams."[121] Ultimately, the panelists urged that mobility solutions cannot be one-size-fits-all, though if an initiative is dynamic and holistic, AVs and

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[114] *Id*.
[115] *Id*.
[116] Rueben Sarkar, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[117] ITS America, Mobility Wallet Primer, https://itsa.org/wp-content/uploads/2021/09/Mobility-Wallet-Primer-2021.pdf (last visited: Jul. 23, 2023).
[118] TAP, Mobility Wallet Pilot Program, https://www.taptogo.net/mobilitywallet (last visited: Jul. 24, 2023); Susan Carpenter, *LA Launches Universal Basic Mobility pilot program*, SPECTRUM NEWS 1 (Apr. 26, 2022), https://spectrumnews1.com/ca/la-west/transportation/2022/04/26/la-announces-universal-basic-mobility-pilot-program.
[119] Carpenter, *supra* note 118.
[120] *Id*.
[121] *Id*.

EVs may have the potential to connect vulnerable people to more formal job opportunities.[122]

Panelists urged that infrastructure equity is a key component in transportation equity because it promotes safety and makes it easier to deploy multimodal devices.[123] Infrastructure equity would require state and local officials to upgrade and maintain low-to-moderate-income neighborhoods streets.[124] This would also include the development of resources such as sidewalks and bike lanes.[125] Diversity in engineering and urban planning is also a key priority and must include woman, nonwhite people, people with disabilities, and people from rural communities.[126] If it becomes a legal requirement for municipalities to incorporate multimodal technology, panelists caution it will be most difficult in large, densely populated areas and that local governments may be better suited to make these types of nuanced plans than the federal government.[127] To expand on the infrastructure equity point, panelists also suggested that there may be no real paradigm shift for suburban residents and their commute to work in light of automation and electrification.[128] While some articles from the 2010s suggested AVs would be great for suburban lifestyles because the vehicles would make the commute to the city less boring by allowing users to do a hobby or sleep during the ride,[129] panelists suggested that the people who would experience those types of benefits were the ones most likely to be able to afford a new vehicle no matter the features, so the equity outcome when considering how to connect vulnerable people to job opportunities from the suburbs is not really part of the equation because those neighborhoods may care more about personally-owned luxury

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[122] Eastman at al., *supra* note 110.
[123] *Id*.
[124] *Id*.
[125] *Id*.
[126] *Id*.
[127] *Id*.
[128] *Id*.
[129] Joel Kotkin, Autonomous Cars Are About To Transform The Suburbs, FORBES (Feb. 21, 2018), https://www.forbes.com/sites/joelkotkin/2018/02/21/autonomous-cars-are-about-to-transform-the-suburbs/?sh=d8812d7e62dd.

features.[130] The suburbs are also inherently outside the city, so these neighborhoods play a different role in the discussion of urban sprawl because they are already "sprawled".[131] Panelists noted lastly that the aforementioned point about suburban users does not mean there will be no shift in the commuter model.[132] Though private ownership will likely still be a priority for the upper and upper middle class, AVs will provide the opportunity for shared ownership for those who were previously unable to afford a vehicle on their own.[133] Fleet models offer an opportunity for better connections to mobility hubs, giving low-to-moderate income laborers more control over their commute and potentially providing more flexibility to find new employment.[134]

Related to fleet modeling, panelists expressed concern about how some models of liability and insurance may impact vulnerable users.[135] Panelists noted that while many questions of liability will need to be identified as deployment becomes more widespread, it is reasonable to assume that fleet models and shared ownership will lessen the financial burden of insurance and liability on low-to-moderate income users, reducing the overall cost of vehicle ownership.[136] Though the questions of liability remain largely unanswered as the technology continues to develop and the case law is nonexistent, panelists urged that no matter what the liability framework will be, shared mobility is likely the best tool for connecting vulnerable workers with more formal employment opportunities.[137] Shared or public ownership could empower workers by giving them independence; people may be less likely to rely on their employers for transportation or to lose employment opportunities due to tardiness or absence. Automated fleets may best

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[130] Eastman at al., *supra* note 110.
[131] *Id*.
[132] *Id*.
[133] *Id*.
[134] *Id*.
[135] *Id*.
[136] *Id*.
[137] *Id*.

facilitate this empowerment by providing rides at nontraditional times and underserved transit deserts.

The points highlighted by the panelists have been known to experts for many years. A study from the Brookings Institute which was published in 2015 summarized the sociopolitical consequences of the growing distance between Americans and their job opportunities.[138] The study pointed out that statistically, having available jobs closer to home makes people more likely to remain employed and shortens the length of unemployment when people are looking for jobs.[139] "Proximity to employment is especially important for low-income workers, who may have fewer choices about where to live, or how to get to work (given the cost of owning and maintaining a car). Finally, nearby jobs also support the local tax base for schools and other critical public services that support social mobility."[140] Perhaps even more on point, the IZA Institute of Labor Economics published a study in 2016 showcasing the relationship between access to public transportation and job formality.[141] ILO and countless academic institutions have published numerous studies, articles, and essays about the variety of reasons the informal economy is rife with forced labor.[142] Though the details of those findings are outside the scope of this panel, the important conclusion is that the informal economy facilitates particular vulnerability to forced labor because of the

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[138] Natalie Holmes & Alan Berube, *Close to home: Social mobility and the gowning distance between people and jobs*, THE BROOKINGS INSTITUTE (2015), https://www.brookings.edu/articles/close-to-home-social-mobility-and-the-growing-distance-between-people-and-jobs/.
[139] *Id*.
[140] *Id*.
[141] Moreno-Monroy, *supra* note 20.
[142] Press release, International Labor Organization, More than 60 per cent of the world's employed populations are in the formal economy (Apr. 30, 2018) https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_627189/lang--en/index.htm; Jack Barrat & Nidhi Sharma, *How has Covid-19 affected the informal economy?*, Nottingham Trent University, https://www.ntu.ac.uk/about-us/news/news-articles/2020/12/how-has-covid-19-affected-the-informal-economy (last visited: Aug. 1, 2023); Donella Caspersz et al., Modern slavery in global value chains: A global factory and governance perspective, 64 J. of Industrial Relations 165 (2022); International Labor Organization, Informal economy, https://www.ilo.org/global/topics/employment-promotion/informal-economy/lang--en/index.htm (last visited: Aug. 1, 2023).

opacity, desperation of workers, and lack of auditing or reporting mechanisms. The IZA study concluded that "[b]ecause low-income workers are particularly dependent on public transport, better access to public transport can reduce inequality by improving labor market outcomes."[143] The panelists' points about cost and the development of a mobility wallet are also reflected in the IZA study's conclusions, which note, "[i]f there is indeed a connection between inadequate access to formal jobs and higher levels of informality, other policy interventions may be needed to take into account any possible intended or unintended effects of these policies on the incentives to work informally. Examples include residential vouchers and transport subsidies that take into account the location patterns of new low-skilled jobs and transport options."[144]

Lastly, in 2015 Harvard University published a study in which commute time was determined to be the single most important indicator of the potential for upward social mobility.[145] That research, which was titled *The Impacts of Neighborhoods on Intergenerational Mobility*, has since grown into a larger Program at Harvard called Opportunity Insights. Opportunity Insights' purpose is to create an intersection where practitioners, policymakers, and the communities they serve have access to data for evidence-based economic mobility policies.[146] The program has now published a wide variety of papers about societal factors that best facilitate economic mobility, including a study about the importance of exposure to emerging technology for women, people of color, and low-income people (preferably from a young age) being the most effective way to ensure people in the margins become innovators themselves.[147] This finding complements the panelists' point about

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[143] Moreno-Monroy, *supra* note 20.
[144] *Id*.
[145] James Brasuell, *Study Finds New Evidence that Place Determines Income Mobility*, Planetizen (2015), https://www.planetizen.com/node/76341.
[146] HARVARD UNIVERSITY, OPPORTUNITY INSIGHTS, https://opportunityinsights.org.
[147] Raj Chetty, Alex Bell, Xavier Jaravel, Neviana Petkova, & John van Reenan, *Who Becomes an Inventor in America? The Important of Exposure to Innovation*, 134 Quarterly J. of Econ. 1, (2018).

the importance of diversity in engineering and urban planning, creating a cyclical relationship where young people in vulnerable communities who are exposed to emerging technologies are most likely to work in the industry which not only creates a more diverse perspective in the development and deployment phases of transportation technology but also increases the likelihood of economic mobility for those exposed to technology early.

## VII. TRANSPORTATION TECHNOLOGY AND THE COMMUTE OF THE NONUSER

The final panel considered how transportation technology may impact the commute of the nonuser. Defining the purpose and scope of this panel was the most difficult for a variety of reasons. First, it was difficult to define the nonuser. Are they pedestrians or cyclists? Or are they driving a human-operated vehicle? Are they a person who is familiar with automated and electric technologies but is not currently using the technology in the instance being studied? Or have they never used the technology because of apprehension or inaccessibility? Second, it was difficult to maintain a reasonable scope. Because transportation is a fundamental component of all human activity, it was easy to begin to consider questions of environmental injustice or public health among other policy initiatives. For example, questions of the disproportionate impacts of the transportation's sector's emissions on low-income communities of color mirror the law and policy initiatives using labor as a metric of AVs' and EVs' equity impact. Ultimately, the author and panelists agreed that keeping the scope narrower was beneficial and allowed panelists to consider how to best capture the nonuser communities' needs. This panel took the opportunity to reflect on the existing legal and policy tools to provide better access to transportation for all vulnerable communities, including those who will not be early adopters of the technology, and to examine how transportation equity fits into the larger network of social justice questions.[148] Considering

[148] Emily Frascaroli, Frank Douma, Lev Breydo, & Valerie Lefler, Transportation Technology and the Commute of the Nonuser, Panel at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).

intersectionality was a priority for the panelists.[149] The two most important takeaways from this panel were the negative impact of legacy infrastructure on equity initiatives and the historical lack of enforcement for transportation equity.[150]

Beginning with the negative impact of infrastructure on transportation equity initiatives, panelists began their discussion by noting that moving goods and people around required good infrastructure regardless of the level of automation.[151] Three obvious categories of nonusers were identified: people driving human-operated ICE vehicles, pedestrians and micromobility users, and public transportation users.[152] Panelists discussed how legacy infrastructure is suboptimal and is in the worst condition in low-income communities.[153] Legacy infrastructure is any existing infrastructure as well as additions made that maintain the status quo, such as large highway systems for example, and are often characterized by their displacement of low-income communities of color.[154] "In some cases, these critical infrastructure gaps are the result of decades of underinvestment and poor maintenance. In others, they represent a much more direct legacy of harm and deliberate racial and economic exclusion."[155] Many of the legacy infrastructure systems were built out in the 1950s and 1960s among the sociopolitical backdrop of the Civil Rights Movement and were built with the goal of economic growth for upper middle class white

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[149] *Id*.
[150] *Id*.
[151] *Id*.
[152] *Id*.
[153] *Id*.
[154] Shalini Vajjhala & Joseph W. Kane, *Prioritize people not projects: Addressing the harms of legacy infrastructure in the COVID-19 recovery,* THE BROOKINGS INSTITUTE (2020), https://www.brookings.edu/articles/prioritize-people-not-projects-addressing-the-harms-of-legacy-infrastructure-in-the-covid-19-recovery/#:~:text=Legacy%20infrastructure%20systems%20include%20roads,inequities%20in%20our%20built%20environment [hereinafter Vajjhala & Kane, *Prioritize people not projects*].
[155] Shalini Vajjhala & Joseph W. Kane, *Four steps to undo the harms of legacy infrastructure in the COVID-19 recovery,* THE BROOKINGS INSTITUTE (2020), https://www.brookings.edu/articles/four-steps-to-undo-the-harms-of-legacy-infrastructure-in-the-covid-19-recovery/.

Americans and maintaining the US's status among the richest and most innovative countries in the world.[156] It is now well documented particularly after the start of the COVID-19 pandemic that this infrastructure strategy has irreparably damaged the environment, hurt the economic development of countless communities, and caused public health crises.[157] How policymakers choose to implement automated and electric technologies will likely determine society's ability to replace decades old transportations systems that are not meeting people's needs.

Panelists used many mid-sized cities in Ohio and Michigan as examples because these two states have a high number of declining population cities.[158] Detroit was the largest majority-Black city in the United States until March of 2023 when the census data revealed the title now belongs to Memphis.[159] Though Detroit still has a higher percentage of Black residents than Memphis (76 percent compared to 63 percent) the overall population of Detroit is declining, including Black people.[160] Since 2020, Detroit has lost almost 300,000 Black residents with job loss, underemployment, underpayment, and better employment opportunities elsewhere being listed as some reasons for moving.[161] The white population in Detroit has grown by about 5,000

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[156] Emily Badger & Darla Cameron, *How railroads, highways, and other manmade lines racially divide America's cities*, THE WASHINGTON POST (Jul. 16, 2015), https://www.washingtonpost.com/news/wonk/wp/2015/07/16/how-railroads-highways-and-other-man-made-lines-racially-divide-americas-cities/.
[157] Vajjhala & Kane, *Prioritize people not projects*, *supra* note 154.
[158] Frascaroli et al., *supra* note 148; *see* J ALFREDO GÓMEZ ET AL., WATER INFRASTRUCTURE: INFORMATION ON SELECTED MIDSIZE AND LARGE CITIES WITH DECLINING POPULATIONS 6 (US Government Accountability Office 2016), https://www.gao.gov/assets/gao-16-785.pdf.
[159] UNITED STATES CENSUS BUREAU, CITY AND TOWN POPULATION, https://www.census.gov/data/tables/time-series/demo/popest/2020s-total-cities-and-towns.html (last visited Aug. 1, 2023); Andrea Plaid, *Detroit is No Longer the Largest Majority-Black City,* MICHIGAN CHRONICAL (May 24, 2023), https://michiganchronicle.com/2023/05/24/detroit-no-longer-the-largest-majority-black-city/.
[160] Plaid, *supra* note 159.
[161] Steve Neavling, Black Detroiters are fleeing the city at an alarming rate, Detroit Metro News (Mar. 29, 2023), https://www.metrotimes.com/news/black-detroiters-are-fleeing-the-city-at-an-alarming-rate-

people and this growth is largely due to high-paying, stable jobs going to white employees.[162] "In a recent report, Detroit Future City found that metro Detroit's fastest-growing, well-paying jobs are disproportionately going to white workers. About 16% of Black workers in the region are in so-called growth occupations, compared to 26% of white workers."[163] But what does this have to do with transportation technology?

Cities with declining populations are left with oversized infrastructure systems that were meant to be both used and funded by many more people than now currently reside in these communities. The decrease in collected taxes and economic underdevelopment make the burden of rising costs unbearable to communities that are now seeing fewer job opportunities. Coupled with the fact that legacy infrastructure was never made to serve vulnerable populations, the commute to work for many people in these neighborhoods is crumbling, expensive, and does not take them to the available jobs.[164] Panelists identified low-income families of color, immigrants, people with disabilities, and rural populations as the most vulnerable to forced labor as a result of the commuting obstacles created by legacy infrastructure.[165] The infrastructure equity crisis sits at the intersection of many failing public institutions with inequitable histories, highlighting the original difficulty defining the scope of this panel in particular.[166] When considering such a large and dynamic policy question, where does the transportation equity component begin and end?

Panelists agreed that the priorities from the transportation sector must be meaningful community engagement and developing

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32716634#:~:text=Some%20moved%20to%20Detroit%27s%20suburbs,they%20plan%20to%20move%20back.

[162] *Id*.

[163] *Id*.

[164] Noel King, *A Brief History of How Racism Shaped Interstate Highways*, NPR (Apr. 7, 2021), https://www.npr.org/2021/04/07/984784455/a-brief-history-of-how-racism-shaped-interstate-highways.

[165] Frascaroli et al., *supra* note 148.

[166] *Id*.

deployment strategies that meet the needs of a particular community.[167] To do this, engineers, urban planners, and regulators must intentionally place pilot programs in neighborhoods that are historically underserved. These neighborhoods are difficult places in which to deploy new technology; there is little funding, legacy infrastructure is falling apart, and people in low-to-moderate income communities of color are less likely to trust emerging technology and the people making it.[168] Some studies from the last five years suggest the AV adoption will follow a similar trend as early EV adoption, which saw a small population of early adopters who were wealthier, whiter, and more technologically savvy than society as a whole.[169] One panelist pointed out that Level 5 AV technology is on the same track as early EV deployment, noting that after almost two decades in the transportation sector this panelist did not know of one pilot program originating in a majority Black or Brown neighborhood, much less low-income.[170] Panelists identified two action items: engaging trusted community members at every step of deployment and building multimodal infrastructure for hybrid scenarios.[171]

Trusted community members can bridge the gap between AV companies, government agencies, and communities who have been consistently failed by their institutions.[172] Trusted community members are also able to be the voice of local problems that are unique to a particular neighborhood or that have been consistently ignored by officials.[173] As one panelist put it, "it's one thing to do [a] notice and comment [period] when we don't listen to a single thing people say, but it's another thing to ask if the community even wants to optimize the system in the way being proposed… institutions

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[167] *Id*.
[168] *Id*.
[169] Scott Hardman, Rosaria Berliner, & Gil Tal, *Who will be the early adopters of automated vehicles? Insights from a survey of electric vehicle owners in the United States*, 71 TRANSPORTATION RESEARCH PART D: TRANSPORT AND THE ENVIRONMENT 248 (2019).
[170] Valerie Lefler, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023) [hereinafter Lefler, *Nonuser*].
[171] Frascaroli et al., *supra* note 148.
[172] *Id*.
[173] *Id*.

[need to be] transparent and accountable about the time, money, [and] quality [of a transportation project]."[174] A trusted community member must be consulted at every decision to ensure the needs of the community are at the forefront of the deployment strategy.[175] Panelists agreed that nobody understands the needs of a community as well as the people who use local transportation services and drive on local roads daily, however trust and engagement are lacking because of decades of underinvestment and the deprioritizing of vulnerable communities' needs and ideas.[176] Public meetings such as town halls or community center parties are often held during the day which prevents the engagement of the working class.[177] One panelist pointed out that in rural communities it is often still required to publish a change in transit rate in the local newspaper, for example, which makes it difficult to identify a system where smart infrastructure has been successfully implemented in a nontraditional early adopter community; the processes are frankly archaic in many communities with the greatest transportation barriers to accessing formal dignified job opportunities.[178] Perhaps most importantly, panelists noted that the engagement of trust community members will not only make people more comfortable with deployment but will also be more likely to inspire participation in places with historically low community input because people currently do not feel called to participate from the margins.[179] A town hall meeting to discuss new infrastructure does not rise to the level of a priority when people are desperately scrambling to make ends meet, especially after generations of exclusion from decision making.[180] Conscious investments in understanding who a community is yield the best turnout for infrastructure projects.

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[174] Lefer, *Nonusers*, *supra* note 170.
[175] Frascaroli et al., *supra* note 148.
[176] *Id*.
[177] *Id*.
[178] Lefer, *Nonusers*, *supra* note 170.
[179] Frascaroli et al., *supra* note 148.
[180] *Id*.

Relatedly, panelists also highlighted developing multimodal infrastructure for hybrid scenarios as a priority for serving the nonuser community.[181] An important insight that bridges the gap between including a trusted community member and building multimodal infrastructure for hybrid scenarios is that the purpose is not to force nonuser communities to be users.[182] While it might be beneficial in many ways to make automated and electric technology available to current nonusers, the goal is not to make the technology the only option.[183] For a variety of reasons, people walk, bike, or take public transit to work and that is not something transportation technology experts should want to eliminate. Relatedly, experts have no real timeline for a fully automated world so there will be an unspecified amount of time where automated and human driven vehicles share the road. If the prediction that AV adoption will follow the early trend of EV adoption, then perhaps hybrid driving scenarios will be most common and exist for the longest period of time in marginalized communities; these neighborhoods are where multimodal infrastructure may be the most crucial.[184] This is where back and forth engagement with the community becomes the most important. Developers and regulators must meaningfully rely on the trusted community members to help describe where people need to go and what is preventing them from getting there seamlessly today.[185] As one panelist said, experts must understand every institution involved "because when [an expert] decides one is not important, that is where [the community] will find a gap" in equity.[186] Successful infrastructure in underserved communities needs to keep pedestrians and micromobility users safe while supporting both automated and human driven vehicles and considering the many other systemic barriers that are currently preventing people from accessing formal employment and leaving them more vulnerable to forced labor.

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[181] *Id*.
[182] *Id*.
[183] *Id*.
[184] *Id*.
[185] *Id*.
[186] Frank Douma, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).

The task at hand is obviously complicated and overwhelming because meaningful solutions require experts to look for ideas and funding in places they have never worked before. However, that is the most vital point as the aforementioned panelist pointed out that the shadows of the institutions deemed least worthy of inclusion in the deployment strategy are where we find the root of transportation injustices.[187] To begin solving this problem, panelists pointed to the philanthropic and small business communities. While panelists said the most ideal world would involve state and federal agencies for funding as well as legitimizing policy initiatives, those agencies are out of touch with the needs of the most vulnerable communities because policy is experienced hyper-locally.[188] Though a bit cynical, one panelist pointed out that federal and state elected officials are not particularly useful because it is expensive to run for those offices and the communities with the largest transportation needs are probably not contributing much to campaign funds.[189] Though largely in agreement that federal and state elected officials have not done enough in the transportation equity space, another panelist pointed out that the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA) both provide funding for some of the projects identified by this panel, so there must be a place for the feds somewhere even if it is reviewing grant applications.[190] A panelist offered that federal funding made available by the IIJA could be supplemented by the philanthropic community and perhaps experts should leverage their relationship with trusted community members to organize a meaningful mobility fundraising event the way organizations currently do for cancer research or public school programs.[191]

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[187] *Id*.
[188] Frascaroli et al., *supra* note 148.
[189] *Id*.
[190] Lev Breydo, Address at the Law and Mobility Program Annual Conference 2023 (Mar. 10, 2023).
[191] Lefer, *Nonusers*, *supra* note 170.

Lastly, panelists felt hopeful about the potential of mobility solutions companies such as Via or Share to eliminate fixed route transit that is not meeting community needs, as reflected by low ridership, and to promote shared-use mobility.[192] Panelists lamented that if the US is truly committed to its current economic model of the free market, the transportation technology sector does not need to be so committed to federal and state funding to make equity initiatives happen and should instead learn to leverage the competition of the private sector.[193] There is quite a bit of capital available for infrastructure in the private sector and, as one panelist pointed out, other countries such as Italy have had some success with creating public private partnerships to foster better infrastructure.[194] Panelists noted that using a service like this in a rural or low-income neighborhood with limited resources might save the municipality money by offering mini-van shuttles that take users where they need to go, maximizing the efficiency of limited tax dollars and increasing ridership thanks to convenience.[195]

Lastly, panelists urged the need for UBM. Much like the discussion of the mobility wallet during the third panel, this panel pointed out the benefits of providing a certain subsidy for each resident to have a variety of decent transportation options.[196] This is particularly important for the nonuser community because those mobility options will not be exclusively AVs. UMB provides dignified options and not just for vulnerable communities. UMB is for everybody. One panelist mentioned that regulators could invent a legislative tool that requires infrastructure to facilitate both UBM initiatives as well as luxury experiences that may cost the user an additional fee and those luxury funds could be used to partially maintain the infrastructure.[197] The infrastructure might include sidewalks or protected bike lanes, as

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[192] Frascaroli et al., *supra* note 148.
[193] *Id*.
[194] *See* Simone Egidi, *A general introduction to public-private partnerships in Italy*, LEXOLOGY, https://www.lexology.com/library/detail.aspx?g=9fdfeab7-f7df-4752-a146-14924bcdaa4d (last visited: Aug. 1, 2023).
[195] Frascaroli et al., *supra* note 148.
[196] *Id*.
[197] *Id*.

well as smart infrastructure to support V2X communication.[198] The priority must be meeting people where they are at financially while maintaining the dignity of the experience for users.[199] Offering the option to purchase luxury experiences may also combat some of the stigma of transportation programs, which have surrounded the US public bus systems since before the era of the Montgomery Bus Boycott.[200] As one panelist explained the stigma of subsidized UBM, "when the tide raises all ships, some ships that were already risen don't appreciate the company" and it is local officials' jobs to use the perspective of trusted community members to find creative ways to make a seat at the mobility justice table for everyone without continuing the stigmatization born out of legacy infrastructure.[201] The point is not to force the adoption of AVs and EVs but to create a deployment scenario where the existence of AVs and EVs does not widen the transportation equity gap in marginalized communities while offering the same opportunities to vulnerable populations to use the technology as traditional early adopters have had at the start of every historical mobility revolution.

## VIII. RECOMMENDATIONS AND CONCLUSIONS

This conference served as an opportunity to explore the intersections of multidisciplinary experts' professional experiences to best understand how transportation technology may be used as a tool to combat the systemic vulnerabilities that leave people at-risk of forced labor. The panelists used many historical examples of how transportation inequity has been exacerbated by transportation technologies, leaving marginalized communities more likely to experience the force, fraud, or coercion that constitutes forced labor by creating desperation, inaccessible opportunities, and discriminatory institutions. However, these examples were contextualized as lessons learned and the overall tone of the conference was hopeful. All-in-all, panelists were in agreement about

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[198] *Id*.
[199] *Id*.
[200] *Id*.
[201] Douma, *supra* note 186.

the potential of AV and EV technology when coupled with meaningful regulation and deployment frameworks to shrink the equity gap.

The first two panels of the conference considered the impact of AVs and EVs on workers in the transportation industry, including both in the supply chain for production as well as mobility services. Panelists recommended enforceable domestic federal legislation that seeks to fill gaps created by previous statutory exceptions in light of the increased demand for raw materials and manufacturing. The legislation should have a very clear enforcement mechanism and should grant standing to bring suit for labor law violations to a wide class of parties including perhaps nonprofits. While panelists urged that mandatory compliance is always preferred over voluntary compliance, they also noted that such legislation will take a significant amount of time and voluntary corporate compliance in the meantime is a tool in the interim. Panelists pointed to a variety of contract terms that are voluntary to incorporate, but legally enforceable as any other contract term if violated. Panelists pointed out the policy and diplomacy benefits of states ratifying international agreements but noted that international law is consent based and lacks enforcement, so this solution is not as desirable as federal legislation.

During the second panel considered technology's impact on the employment status and labor conditions of workers in the US performing transportation industry jobs such as truck driving, transit operation, and mechanic work. Panelists concluded that transparency from state elected officials about job retraining is a priority. Related recommendations included partnerships between labor unions, industry leaders, and environmental organizations to create a concrete and honest representation of the skills that will be required as labor demands change. Including gig workers in any retraining or benefits negotiations was a substantial recommendation by panelists, noting that if desperation and vulnerability are indicators of a person's likelihood to experience forced labor then gig workers have no notable institutional protection. Panelists also suggested that

community colleges should be tasked with developing programs to ensure drivers and mechanics maintain dignified employment during and after the widespread deployment of AVs and EVs. Panelists recommended that protecting jobs throughout a revolution boils down to having strong leadership in elected political positions and in industry board positions, which included frequent and honest communication about the skills needed in the industry and the ability to vocalize tangible action items instead of abstract ideas.

The last two panels considered the impact of transportation technology on everybody's commute to work no matter the industry in which they work. While the first two discussed how to maintain dignified jobs are the demand for AVs and EVs increased, the second two discussed how to deploy and regulate the use of the technology in a way that serves vulnerable populations by empowering them to access more formal, safe jobs. The third panel was about empowering the user, and by extension their ability to get to work, by using emerging technology as an opportunity the transportation inequity gap. Panelists recommended that policymakers prioritize underserved neighborhoods who typically been denied to opportunity to be early adopters of the technology. This recommendation includes standardizing infrastructure, which is a particular challenge in cities with decreasing populations as the Panelists also suggested a mobility wallet for all residents rather than just low-income residents to combat the stigma of UBM. To reduce the expense of the technology, panelists suggested fleet models and shared ownership to reduce the cost of maintenance, insurance, and electricity per user.

Lastly, the final panel considered the effects of AV and EV technologies on those who are not using the technology but are impacted due to changing infrastructure and transportation patterns. Panelists agreed these groups may include people in human-driven vehicles, pedestrians and cyclists, and public transit users. The panel stressed the point that the goal should not be forcing nonusers to become users, but rather ensuring that the deployment of emerging transportation technology does not exclude and further marginalized vulnerable people. This includes the opportunity for people to decide

whether to be users. To prevent the technology from widening the equity gap and, by extension, worsening transportation inaccessibility, panelists recommended several strategies. First, they noted that legacy infrastructure needs to be overhauled into something that meets the needs of the community by beginning to repair the psychological and communal harms of displacement. They recommended turning to the private sector and the philanthropic community, noting that other countries such as Italy have had some success with public private partnerships for infrastructure projects. Panelists also urged the involvement of trusted community leaders in all stages of decision making to meaningfully incorporate the ideas and experiences of the people who use local transportation systems and drive on local roads daily. Establishing relationships with trusted community leaders may also begin to heal the deep and complicated distrust many communities have for transportation officials. Lastly, panelists emphasized the importance of multimodal infrastructure for hybrid scenarios to ensure all road users have equally safe and accessible routes for their commute, and so that the infrastructure does not become obsolete or out of date with the next technological innovation.

This conference did not serve as a holistic solution to forced labor, but rather considered transportation as one systemic barrier that makes vulnerable people more susceptible to the force, fraud, or coercion facilitating forced labor. The purpose of the conference was to best understand how safe, reliable, consistent, and dignified transportation can empower people. Additionally, this conference considered the diverse impacts that increased demand for new technologies will have on the labor conditions of those who mine raw materials and produce those technologies. Advocating for and protecting the rights of vulnerable workers and users can and should happen simultaneously with many of the same legal tools. Emerging transportation technology is an opportunity to improve many of the poor equity outcomes existing transportation systems have facilitate. This technology, however, runs the risk of exacerbating existing equity gaps if implemented without meaningful and intentional consideration for the historical example’s shortcomings. All four

panels pointed out that a transportation revolution is an ideal opportunity to write or amend laws that do not offer enough protection.

By expanding upon the literature review and preliminary interviews, this conference was able to bring together multidisciplinary experts who do not often work together to discuss where their work intersects. These intersections identified patterns and commonalities about who is most vulnerable and how those various vulnerabilities compound, making people more likely to experience forced labor. The recommendations provided by the culmination of the experts' experiences may have the potential to inform legislation, policy initiatives, and contract terms that bring society greater transportation equity while guaranteeing safer and more dignified working conditions for those who make the technology a reality. Perhaps above all, this conference serves as a starting point to give various relevant industries a means to talk about the equity concerns in their respective fields. The preliminary research required a lot of consideration to figure out where and how the various disciplines interact, and experts have the incredible opportunity to continue this conversation while added more relevant disciplines. After all, transportation is a part of everything society does, so all imaginable communities have a seat at the table to parse out how transportation technology can be used as a tool to combat forced labor.