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Promoting Transportation Equity through Curriculum Interventions

Mehri M. Mohebbi, Ph.D., University of Florida
Virginia P. Sisiopiku, Ph.D., University of Alabama at Birmingham
Dimitra Michalaka, Ph.D., The Citadel
William J. Davis, Ph.D., The Citadel

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LIST OF AUTHORS

Lead PI:

Mehri M. Mohebbi, Ph.D.
University of Florida (UFTI)
mmohebbi@ufl.edu
0000-0001-6033-3526

Co-PIs:

Virginia P. Sisiopiku, Ph.D.
University of Alabama at Birmingham
vsisiopi@uab.edu
0000-0003-4262-8990

Dimitra Michalaka, Ph.D.
The Citadel
dmichala@citadel.edu
0000-0001-7001-0579

Additional Researchers:

William J. Davis, Ph.D.
The Citadel
jeff.davis@citadel.edu

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1.0 INTRODUCTION

Transportation equity is an integral part of the urban and regional development conversation as it relates to basic rights for citizens, including access to resources and opportunities. In response to this need, there has been an increased interest by the public sector in transportation equity education for present and future engineers, planners, and policymakers. Such education moves beyond conventional engineering and planning education and incorporates a broader range of perspectives, concepts, and ideas, including the social and environmental implications of transportation interventions.

However, many universities and professional development centers in the U.S. do not currently offer courses and training materials related to equity implications of transportation planning. This report narrates the findings of a study addressing transportation equity education in the Southeast and outlines the development and implementation of a transportation equity program for planning and engineering schools. In light of our findings, we determined three key subject areas that need to be thoroughly considered in curriculum development for graduate schools, specifically in engineering fields: *impact analysis*, *multi-criteria decision-making modeling*, and *social divide in new technologies*.

1.1 Scope

The lack of knowledge about equity in decision-making processes has made it challenging for transportation agencies to build long-term plans to uplift equity through transportation planning processes. The skillset required for these plans must start at the beginning of professional development. The goal of this project is to examine the current status of transportation equity education and propose curriculum changes for graduate transportation engineering and planning programs using the following areas: 1) types of equity; 2) potential impacts; 3) tools to measure commitment to equity throughout the processes; 4) strategies to combat inequities; 5) understanding of social context; 6) value of partnership building; and 7) accessibility- vs. mobility-based approaches. This project will build on previous research and current national, state, and regional activities, and our conversations with stakeholders.

2.0 BACKGROUND KNOWLEDGE

Transportation systems, instrumental in connecting individuals to essential services and opportunities, inadvertently propagate societal disparities, disproportionately impacting marginalized communities. Thus, prioritizing equity and inclusivity in transportation engineering education is paramount (Mohebbi et al., 2022). Despite its significance, a notable dearth exists in literature and education programs centered on equity integration in this field, signifying a

substantial research gap. In light of evolving educational standards, it's worth noting that the Accreditation Board for Engineering and Technology (ABET) has recently expanded its criteria to include more equity-focused areas. Although ABET's revisions primarily target undergraduate engineering education, this shift towards a greater emphasis on social issues such as equity and inclusion has broader implications for graduate-level studies and the engineering profession as a whole. The transition echoes the growing recognition that engineers must be prepared to address complex societal challenges that require an understanding of diversity, equity, and inclusion principles.

Several initiatives and resources embody this equity-centric approach. For instance, the Transit Cooperative Research Program's Report 214 (Twaddell & Zgoda, 2020) provides effective guidelines, and the Center for Transportation, Equity, Decisions, and Dollars (CTEDD) is advancing a dedicated Transportation Equity Curriculum (Williams et al., 2021). Moreover, the University of Florida's (UFTI) Transportation Equity Certification Program is an exemplary scheme aimed at equipping professionals with an in-depth understanding of transportation equity, illustrating the type of targeted, comprehensive training that can instigate industry-wide change. An understanding of the current state of equity integration serves as a cornerstone for future improvements, ensuring the development of professionals capable of creating inclusive and equitable transportation systems (University of Florida Transportation Institute, 2023).

Equity and diversity considerations extend beyond the transportation sector, permeating other engineering fields. Dr. Walter C. Lee's research group, GUIDE, exemplifies this broader recognition by advancing diversity, equity, and inclusion across engineering disciplines (Lee, 2023). In conclusion, while there is a growing recognition of the importance of equity in engineering education, concerted efforts are necessary to embed these considerations as a standard part of all engineering curricula. Educational institutions, by addressing these gaps, can serve as catalysts for positive social change through the lens of engineering education.

3.0 PRACTICE REVIEW

Understanding the current dynamics of mobility and accessibility issues requires a multifaceted understanding of communities and their needs. In order to accomplish this objective, it is crucial to ensure that transportation practitioners and policymakers have a comprehensive understanding of transportation equity issues. It is essential to provide transportation decision-makers with education on transportation equity. Transportation equity education refers to educational opportunities that increase awareness and provide required knowledge on equity subjects such as implications of equity in transportation and inclusive decision-making. This knowledge provides crucial information on types of equity, potential impacts, and strategies to overcome existing barriers and mitigate future adverse impacts (Reardon, 1998).

Graduate programs across the country rarely include courses related to transportation equity and justice, with only a handful of notable examples in planning schools that can be explored

and replicated in engineering fields. This gap can be attributed in part to disparate definitions of equity and a lack of understanding of the significance of such training. Bringing changes to the education system and integrating topic areas related to transportation equity in existing programs requires several steps: 1) defining transportation equity; 2) clarifying the importance of such training for the program and the whole university; 3) setting milestones; and 4) defining strategies to achieve educational goals. By examining the training and courses that do exist, it is possible to build on lessons learned from these experiences and create effective course material more quickly.

To gain insight into what is and is not working regarding current practices, the research team designed an online survey and distributed it to graduate program directors across the U.S. to gather notable practices. The following sections explore the design of and findings from the survey study.

3.1 Survey Design

To begin designing the survey questions, the research team identified four main areas to address: 1) existing training; 2) long-term educational plans; 3) institution-wide efforts; and 4) self-assessment regarding the integration of equity into the educational system. In addition, the survey also included questions about partnership opportunities with private and public sectors outside of academia.

The research team obtained IRB approval from the UF Institutional Review Board for an exempt study with limited or no risk prior to distributing the survey via Qualtrics (IRB202201828). The recruitment process took longer than initially anticipated, primarily because some programs exhibited reservations about joining the survey. A significant number of prospective participants who contacted the research team reported inadequate knowledge regarding transportation equity.

In the course of engaging with survey respondents, the principal investigator (PI) of the research explicated the research aims in meticulous detail. Specifically, the PI underscored the significance of identifying lacunae in knowledge and experience related to transportation equity, as the study seeks to delineate gaps in this area. To obtain informative insights into noteworthy approaches, the research team utilized purposive sampling, concentrating on graduate programs with a demonstrated commitment to prioritizing equity in their curricula. During the selection process, the team ensured the inclusion of institutions with varying geographical locations and sizes, as well as historically Black universities and minority institutions.

3.1.1 Target Population

This survey's target population consisted of directors or managers of graduate programs in engineering or planning schools across the United States. The research team utilized purposive sampling to collect varied examples, considering geographical location, size, types of programs,

and Historically Black College or University (HBCU) affiliation as the primary criteria for participation. The survey announcement was distributed to graduate program directors/managers in engineering and planning schools across the country, with distribution assistance from two transportation research centers in California and Georgia. The survey participants were spread across various geographical locations, with California, Arizona, Nevada, Oregon, and Pennsylvania having the highest representation.

Of the survey participants (38 participants), 35% were affiliated with civil/transportation engineering programs while 40% were members of urban planning departments. About 22% of the participants did not mention their affiliation, and the remaining participants were affiliated with other programs, including technology and science departments. Only 9% of participants were affiliated with HBCUs. These findings indicate a favorable distribution of responses from engineering and planning programs, providing examples from planning schools that can be replicated in engineering programs, including multidisciplinary degree programs. Detailed information regarding the distribution of survey participants is presented in Table 1, considering that 45% of participants did not mention their location. Table 2 summarizes the key findings related to the participants' affiliations (Tables 1 & 2).

U.S. Regions				
West	Midwest	Northeast	Southeast	Southwest
21%	5.5%	13%	5.5%	10.5%

Table 1: Percentage of the survey participants considering their locations (Source: Self-elaboration)

Affiliation		
Urban Planning	Engineering Programs	No Mention
40%	35%	22%

Table 2: Percentage of the survey participants considering their affiliations (Source: Self-elaboration)

3.2 Lessons Learned

As discussed earlier, the principal investigator (PI) of this study was contacted by several educational institutions that expressed reluctance to participate in the survey due to a lack of knowledge or experience in the area of transportation equity. Based on the PI's continuous communication with survey respondents, it was predicted that merely 22% of participating programs would have any student training pertaining to transportation equity and all such programs would be affiliated with planning schools. Further, the overwhelming majority of participants — roughly 87% — responded that their program had no institutional-wide initiatives or training in place. The subsequent sections elaborate on the current training and initiatives offered by planning programs, as well as subject areas that were uncovered as prospective training directions for engineering schools.

3.2.1 Existing Programs

The survey results indicated that planning schools have an extensive history of integrating equity discourse into curricula, including several participating programs discussing transportation equity specifically. However, the study found that no participating engineering school had educational materials, initiatives, or institution-wide programs emphasizing transportation equity. There could be several reasons behind this disparity, including:

- *Historical context:* Historically, urban planning has demonstrated a proclivity towards integrating social justice and equity considerations within its curriculum while engineering education has traditionally emphasized the acquisition of technical skills and knowledge. This historical context has subsequently impacted the course development within each field.
- *Different priorities:* Urban planning is centered on designing and managing cities and communities, while engineering education is more focused on developing and constructing infrastructure and technologies. Despite the potential of both fields to impact equity and inclusion, urban planning is more likely to prioritize these concerns due to its overarching objective of generating livable and sustainable communities.
- *Different disciplinary approaches:* Urban planning draws upon a diverse array of disciplines, encompassing social sciences, humanities, and design, which are inherently more conducive to incorporating equity and inclusion concepts. Conversely, engineering education places a stronger emphasis on hard sciences, which may be perceived as having less direct relevance to equity and inclusion issues.
- *Lack of awareness:* Engineering faculty and administrators may exhibit a lack of awareness regarding the significance of transportation equity or have limited familiarity with the relevant literature. This may contribute to the failure to prioritize transportation equity within their curriculum.
- *Resource constraints:* Engineering schools may encounter resource constraints pertaining to curriculum development or faculty training, creating obstacles to the integration of novel topics such as transportation equity.

It is important to note that both educators and practitioners in various fields are recognizing equity and inclusion as issues that must be integrated into all facets of education and practice to build comprehensive solutions. Until now, these topics have been isolated to certain fields, if discussed at all. The following table shows the summary of survey findings regarding existing courses or programs (Table 3). Only 22% of participating individuals reported that their department offers transportation equity training to students. Notably, these respondents were all affiliated with planning programs. Additionally, only 9% of the survey participants reported

that their institution has any institution-wide initiatives or training programs that provide faculty members with knowledge on transportation equity issues.

Program Concentration / Courses	Open to Other Fields	Host Department/School	Requirement	State
JEDI Leadership Academy	Open	University Leadership	Current or incoming Student	AZ
CEILS Equity & Justice Training	University-wide	University Leadership	NA	CA
Mobility & Transportation Planning Graduate Program	Open	Planning School	Undergraduate Degree	CA
Transportation Equity Training	Open	Engineering Department	NA	FL
Sociology of Social Justice and Policy	University-wide	Social Science Department	Not available to Sociology majors.	FL
To be Offered Transportation Equity Course	University-wide	Planning School	NA	NJ
Social Justice Education Initiative	University-wide	University Leadership	NA	OR

Table 3: Examples of Transportation Equity Training and Initiatives in Surveyed Departments

3.2.2 Gaps in Academic Education

Utilizing a survey-based approach, the research team discovered a lack of education around equity concepts for both students and faculty within engineering schools. Focusing on prominent institutions within the Southeast, the investigators selected a cohort of planning school directors or program managers for an exploratory interview study to gain insight into transportation equity education practices. The research team meticulously devised an in-depth interview protocol with seven open-ended questions, encompassing the subsequent areas:

- Interpretations of equity from the participants' perspectives
- Presence of a transportation equity curriculum
- Prospective initiatives concerning transportation equity education
- Multidisciplinary collaboration prospects to elevate equity

A total of 28 individuals from graduate planning programs in the Southeast were invited to partake in the interviews. Due to temporal restrictions stemming from the interview scheduling, the research team was able to conduct ten in-depth interviews, comprised of participants from Alabama, Florida, North Carolina, and South Carolina. The following section

delineates the insights from planning schools and their comprehensive endeavors to assimilate equity into the existing curricula.

4.0 DISCUSSION

Transportation equity is a critical concept in ensuring that all individuals have equitable access to transportation services irrespective of their diverse backgrounds or abilities. This encompasses ensuring fair access to transportation services, addressing transit disadvantages, and enhancing accessibility issues for various marginalized groups such as children, the elderly, and individuals with disabilities. Through our conversation with planning programs in the Southeast, it is evident that transportation equity is a subject area that emphasizes inclusive decision-making, affordability, and accessibility for all individuals.

Some planning programs have placed extensive focus on diversity, equity, and inclusion in the transportation planning process, while others have mainly focused on transit planning as a key element in ensuring a fair distribution of transportation resources and services. Our interview participants identified several main equity issues in their areas of impact, including the affordability of transportation services for underserved populations such as students, low-income workers, and individuals with special needs. Moreover, interviewees identified the lack of attention given to qualitative data on how transportation services are received by communities, as well as the extreme resource shortage in rural areas, as major equity issues.

To ensure equitable transportation, it is vital to understand the disconnect between quantitative approaches and qualitative issues with transportation systems. This disconnect can perpetuate economic disparities and limit opportunities for individuals living in rural areas, where lack of proper infrastructure and limited accessibility of transportation options make it challenging for people to reach essential services such as healthcare facilities or employment. As such, addressing equity issues in rural transportation is of paramount importance to support inclusive and equitable economic growth. In terms of interdisciplinary education, all planning programs we interviewed stated that they encourage graduate students to take courses from other departments but do not mandate it. Students can choose to take classes in related fields such as public health, public administration, sustainable technology, civil engineering, and geography to complement their planning education. Moreover, some planning studios have students from different disciplines such as civil engineering, community planning, public administration, geography, environmental engineering, and adult education, working together on community-based projects. The integration of different perspectives and fields is essential for addressing complex planning issues and developing innovative solutions.

Planning schools have a strong culture of embracing a multidisciplinary approach, inviting students from diverse disciplines to take courses in planning and sending their planning students to other departments to take courses. The overarching goal of this approach is to expose students to a broader understanding of transportation and community issues and to foster collective efforts to address them through various group projects. While some planning

schools have specific courses dedicated to community engagement, others integrate them throughout their entire curriculum. This approach is aimed at developing a deep understanding of community needs and concerns and engaging with community members throughout the planning process to ensure their needs are being met. One planning school offered a compulsory course on community engagement, titled "participatory methods." Students interested in diversity, equity, and inclusion (DEI) in planning could choose from various courses offered by planning programs (Elefteriadou et al. 2021; see also Corburn, 2003).

Another school had a neighborhood planning and community design specialization with significant DEI elements. Another program planned to introduce a course on qualitative methods in planning that would focus on effective and meaningful community engagement tools and techniques. Although planning schools varied in their level of equity sensitivity in their curriculum, they all highlighted equity issues and inclusion techniques through theoretical materials and student projects. The following sections present a training matrix and collaborative model developed based on the findings from planning schools through interviews studies and surveys.

4.1 Learning Matrix

Empirical evidence from in-depth interviews and surveys has demonstrated the pivotal role of learning methods in encouraging students to consider transportation problems a social responsibility and motivating them to tackle those problems in their communities. Through an extensive evaluation of existing research and discussions with planning schools, the research team identified four primary methods to convey the significance of equity in transportation planning, policy-making, and implementation.

The first method encompasses a range of pedagogical tools: dedicated transportation planning classes; integration of transportation themes into other courses; field exercises; planning studio classes; and independent studies. By leveraging these educational resources, students can acquire a thorough understanding of transportation equity issues and develop practical skills to address them. This approach equips students with knowledge and ability required to identify, analyze, and resolve transportation challenges while promoting equitable access to and social justice in transportation systems (Goodspeed et al. 2023; see also Khatami et al. 2022).

The second method prioritizes a methodological and systematic approach to comprehending transportation equity issues, empowering students to identify and analyze challenges from a pragmatic standpoint. This approach teaches students to break down complex problems into manageable components, formulate comprehensive solutions, and identify the most effective means of implementation. This method also enables students to consider diverse perspectives and incorporate multiple stakeholders in transportation planning processes. The emphasis on methodological and systematic strategies provides students with a robust framework to

approach transportation equity issues, promoting evidence-based solutions and informed decision-making.

The third method focuses on community-based projects with governmental and non-profit organizations. These projects offer students the opportunity to collaborate directly with individuals from diverse social and cultural backgrounds to develop practical solutions to transportation challenges. Students engage with community members, understand their perspectives and needs, and develop solutions that are tailored to the citizens of that area. This direct collaboration provides a deeper understanding of the social and cultural dynamics that influence mobility, giving students the space to develop nuanced, effective solutions to transit equity issues (Krumholz & Wetheim, 2018; see also Linovski & Marshall Baker, 2023; Nesshover et al. 2017). This approach both develops practical skills and cultivates empathy and cultural competency, ultimately training inclusive transportation planning professionals.

Finally, the fourth method involves discussing transportation equity issues in a variety of courses in a general capacity, without any specific tools. This wider integration acknowledges that building equity discussions into technical courses can be challenging. Still, it exposes students to the significance of these issues at multiple touchpoints throughout their education. Even if just one class session is dedicated to the topic, it allows students to develop an awareness of the role equity plays in transportation planning, policy-making, and implementation. This approach encourages students to think critically about the interconnectedness of transit issues and broader socioeconomic contexts. While this method is more generalized than the other three, it nevertheless offers valuable exposure to the issues and reinforces equity as a critical component of transportation planning.

The following matrix provides a summary of the research outcomes pertaining to the learning methods used to foster transportation equity (Figure 1).

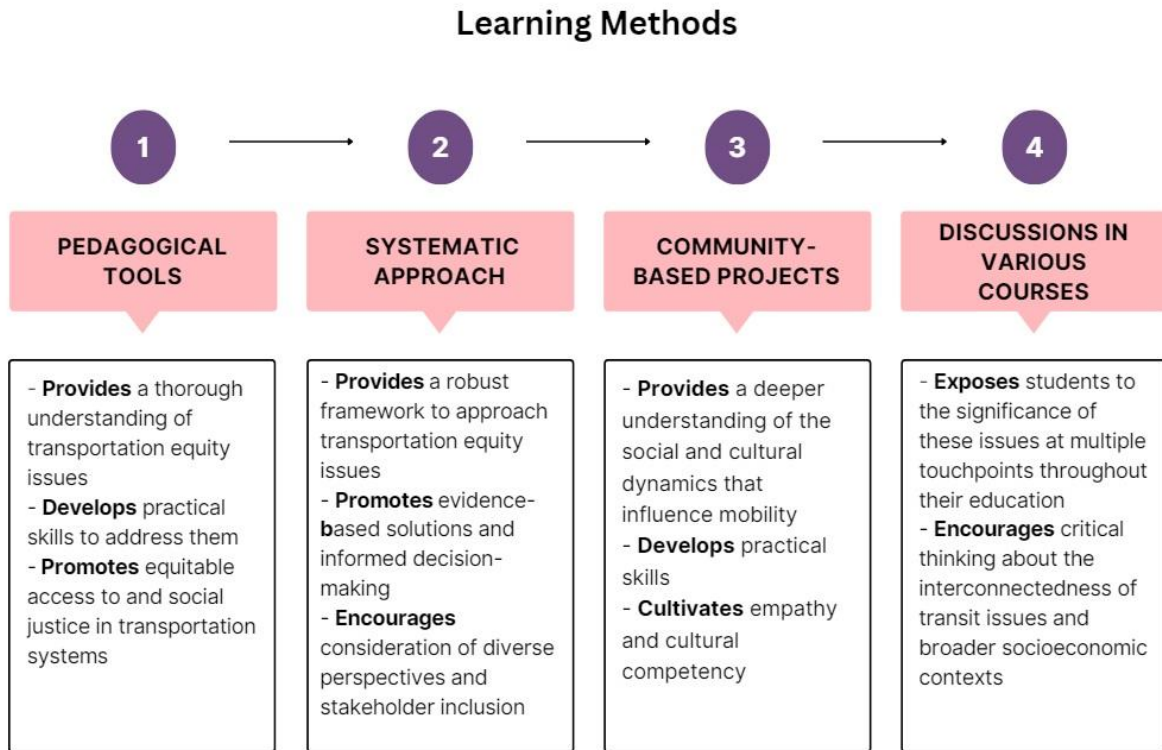


Figure 1: Primary Methods of Learning Matrix

4.2 Proposed Collaborative Model

In addition to the learning matrix, the study dug into types of collaboration offered to students. The findings from our surveys and interviews reveal that planning schools — although not engineering programs — are deeply engaged with their surrounding social environment and commonly utilize workspaces to address community needs via academic projects led by faculty and students. Community Design Centers (CDCs) are a common organizational model that directly engage with communities during transportation planning and policy creation. For example, some universities use design labs to focus on community-led projects while others receive funding from community-based projects. Additionally, several participating departments undertake projects comparable to those of CDCs although they do not meet the formal CDC definition. The broad application of community-based approaches in transportation planning programs reflects the growing recognition of how vital equitable and inclusive practices are to the future of the industry. The trend indicates that planning schools are striving to bridge the gap between academic research and community solutions.

This bridge requires building rapport with public and private sectors, including non-profits, which is vital to advancing equity in transit planning. Some interviewed departments offer internships at non-profit agencies, regional transit agencies, or community pillars such as health

departments. Programs must establish these connections to set students — and the industry — up for future success. Such engagement with external stakeholders reflects broader industry trends emphasizing community-based planning approaches. This trend empowers planning agencies to design practical solutions that solve local needs while promoting inclusive and equitable transit practices (Caggiano et al. 2022; see also Lee et al. 2023).

Beyond providing internship placement for individuals, these partnerships promote equity-focused projects by listening to what the community desires and opening the planning table to concerns and ideas. Many programs work closely with community partners and local government. This approach is prevalent in smaller cities that lack dedicated planning departments, and it provides students with professional experience to develop solutions working with communities. The popularity of these partnerships underscores the growing support for inclusive, collaborative approaches to transportation problems. To aid programs in building these relationships and, ultimately, a more inclusive workforce, we propose the collaborative model depicted in Figure 2.

Based on the findings from planning programs, this model fosters community-based projects that prioritize transportation equity. While based on data from planning programs, it can be adopted by engineering schools to design practical solutions tailored to the needs of local communities and provide students with hands-on experience in addressing real-world challenges. This model crafts partnerships that result in solutions tailored to individual community problems, thereby making meaningful contributions to the development of equitable and sustainable transportation systems.

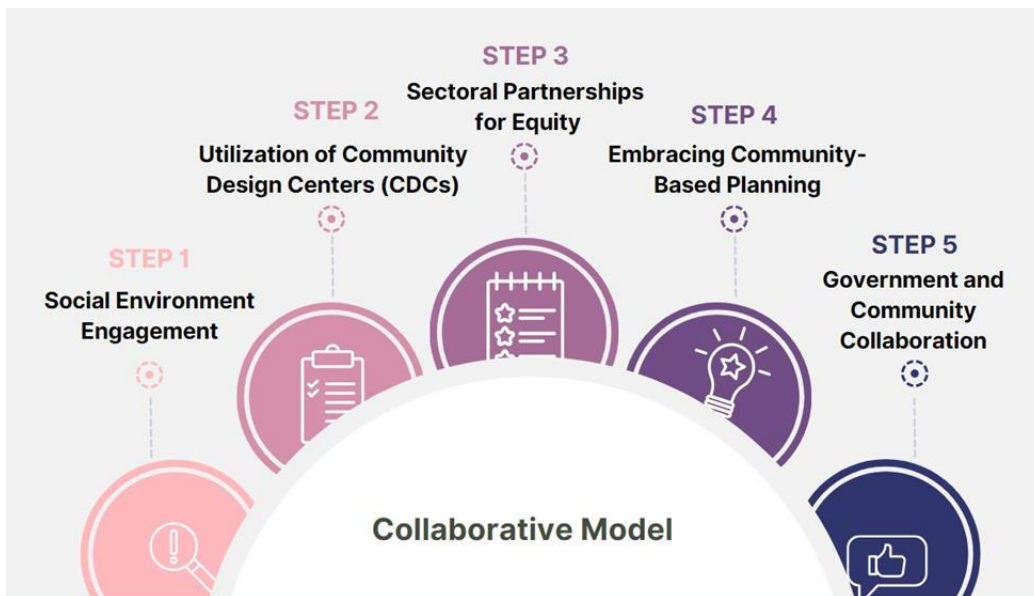


Figure 2: 5 Steps of the Collaborative Model (self-elaboration)

5.0 CONCLUSIONS

The importance of transportation equity in urban and regional development cannot be overstated. However, this study uncovers substantial gaps in the current educational curriculum related to this subject, particularly in engineering programs. These curricular omissions result in graduates who may be technically competent but ill-prepared to address the multi-dimensional challenges of transportation equity, including equitable access to resources and opportunities. Based on empirical evidence from interviews and surveys with planning schools, we have identified four principal methods that are effective in instilling a sense of social responsibility among students and encouraging them to tackle transportation challenges in their communities. These methods range from dedicated transportation planning classes and field exercises to community-based projects. The findings have been synthesized into a learning matrix, which serves as a practical guide for integrating equity-focused education in graduate schools.

Simultaneously, the study uncovers meaningful collaborations between planning schools and public and private sectors, including non-profits. These partnerships aim to not only provide practical training for students but also contribute toward community-focused solutions for transportation equity. In response, we propose a collaborative model that enhances these partnerships and brings a community-based approach to engineering education.

Yet, despite these promising practices, the study finds that there is still significant work to be done. Specifically, the results reveal that many universities and professional development centers currently lack courses and training material focused on the equity implications of transportation planning. Moreover, there appears to be a lack of awareness among faculty and administrators concerning the importance of such education.

In closing, this study serves as a call to action for a broader shift in educational approaches towards transportation equity. By advocating for a more inclusive curriculum that encompasses key subject areas such as impact analysis, multi-criteria decision-making modeling, and understanding the social divide in new technologies, we can better prepare future engineers, planners, and policymakers. The learning matrix and collaborative model proposed here offer a structured path for achieving these changes and advancing toward more equitable and sustainable transportation systems.

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7.0 APPENDICES

7.1 Survey Instrument

Dear Sir/Madam,

We are reaching out to request your participation in a brief survey regarding **Transportation Equity Education** in urban planning and engineering programs across the U.S. The goal of the survey is to understand and document notable practices of curriculum development and interdisciplinary training related to transportation equity in engineering and planning schools/programs across the U.S.

There are no risks or discomforts anticipated and all of your answers will remain confidential. The survey will take 3 to 5 minutes to complete and your participation is voluntary. You are free to withdraw your consent and to stop participating in this study at any time. If you do withdraw your consent, you will not be penalized in any way and you will not lose any benefits to which you are entitled. If you have any questions regarding your rights as a research participant, please contact **Dr. Mehri M. Mohebbi at mmohebbi@ufl.edu** (Principle investigator) or the UF IRB-02 office at 352-392-0433.

By clicking the next button below, you give your consent to participate in the survey. It also means that you have been informed about this study's purpose, procedures, possible benefits, and risks; the alternatives to being in the study; and how your privacy will be protected.

Thank you very much for sharing your valuable insights.

Mehri M. Mohebbi, Ph.D. (Transportation Equity Program Director, University of Florida)

Virginia P. Sisiopiku, Ph.D., FITE (Professor & TREND Lab Director, University of Alabama at Birmingham)

Dimitra Michalaka, Ph.D., P.E. (Associate Professor, The Citadel)

1. Your Position/Title:

2. Your Educational Level:

- High School Education
- Associate Degree
- Bachelors
- Master
- Ph.D.
- Other (Please specify)

3. Your Department / Program:

- Urban and Regional Planning
- Community Planning
- Civil Engineering
- Environmental Engineering
- Transportation Engineering
- Other (Please specify)

3. Your Department / Program:

- Urban and Regional Planning
- Community Planning
- Civil Engineering
- Environmental Engineering
- Transportation Engineering
- Other (Please specify)

4. Your State:

5. Your City:

6. Your Email Address (Optional):

7. Does your department or program offer any training for students that provides information on issues related to transportation equity?

- Yes
- No
- I do not know

8. If you answered 'yes' to Question7, please provide us with the information about the training (link to the training webpage, the contact information for the training, training material, etc.). Please use the upload button to provide us with files related to the training including syllabi.

Drop files or click here to upload

9. Does your institution have any institutional-wide initiatives or training to provide faculty members with knowledge related to transportation equity?

- Yes
- No
- I do not know

10. If you answered 'yes' to Question 9, please provide us with the related information (initiatives, link to the training webpage, contact information for the training, training material, etc.). Please use the upload button to provide us with files related to the training including syllabi.

Drop files or click here to upload

11. Are there any initiatives or interdisciplinary programs in your department or institution that emphasize the importance of equity training for urban planning or engineering students?

- Yes
- No
- I do not know

12. If you answered 'yes' to Question 11, please provide us with the related information (link to the initiative, related contact information, etc.). Please use the upload button to provide us with files related to the training including syllabi.

Drop files or click here to upload

13. From your perspective, what is your institution's level of success in providing opportunities for interdisciplinary training (e.g., civil engineering and urban & regional planning) for students in your department or program?

- Poor
- Below Average
- Average
- Above Average
- Excellent

14. From your perspective, how prepared are students to address equity issues within transportation-related projects throughout their professional careers?

- Not Prepared
- Somewhat Prepared
- Prepared
- Well Prepared
- I Don't Know

15. What outside agencies or entities is your program or school collaborating with to provide industry access opportunities for students including internships and leadership programs? (Select all that apply)

- Federal agencies (USDOT, FTA, etc.)
- Public agencies (DOTs, Cities, MPOs, Counties, etc.)

15. What outside agencies or entities is your program or school collaborating with to provide industry access opportunities for students including internships and leadership programs? (Select all that apply)

- Federal agencies (USDOT, FTA, etc.)
- Public agencies (DOTs, Cities, MPOs, Counties, etc.)
- Private firms
- Non-profit organizations (APTA, etc.)
- Other (Please specify)

16. Is your university/school considered a minority-serving institution or Historically Black College or University (HBCU)?

- Yes
- No
- I do not know

Thank you for sharing your valuable insights. If you are interested in finding out more about this study, please contact **Dr. Mehri M. Mohebbi** (Principal Investigator) at mmohebbi@ufl.edu.

7.2 Interview Questions

In-depth Interviews with engineering/planning Graduate Program Directors/Managers:

1. What comes to your mind when we talk about transportation equity?
2. What aspects of equity need urgent attention in your region? Which tools do you use to introduce those to graduate students?
3. How do you see your program/department in regard to integrating equity subjects into the graduate curriculum?
4. Is there any plan/program in consideration or review in this regard?
5. Which courses/trainings are available for graduate students to take centering transportation equity?
6. Are there any academic requirements OR possibility for engineering students to take courses from other disciplines? If yes, which fields?
7. Is there an established relationship between your school/department and private and non-profit organizations in your region? If yes, please name partners and let us know how those relationships benefit graduate and undergraduate students.