



# RACHAEL T. PANIK, AICP

P H . D . S T U D E N T  
R E S E A R C H & T E A C H I N G A S S I S T A N T

## EDUCATION

PH.D.,  
TRANSPORTATION  
SYSTEMS ENGINEERING  
2020-PRESENT

### GEORGIA INSTITUTE OF TECHNOLOGY

President’s Fellowship Awardee  
Eisenhower Fellowship Awardee (2020, 2021)  
Graduate Student Advisory Council, Professional Development Chair  
**Focus Areas:** Vulnerable road user safety, safe systems, safety in engineering education  
**Dissertation Topic:** New methodologies for measuring exposure in vulnerable road user risk estimation  
**Expected Graduation:** 2024

MASTER’S,  
CITY &  
REGIONAL PLANNING  
2016-2018

### CLEMSON UNIVERSITY

Magna Cum Laude  
Edward McCallum Scholar  
**Focus Area:** Transportation Planning  
**Thesis Topic:** “Safety in Numbers” and Bicycle Safety: A Detailed Analysis of the Denver Metropolitan Area

BACHELOR’S  
CIVIL ENGINEERING  
2012-2016

### UNIVERSITY OF ALABAMA AT BIRMINGHAM

Magna Cum Laude  
Civil Engineering Honors  
Experiential Learning Scholar  
Japanese Language Minor  
**Focus Area:** Structural Engineering

## PROFESSIONAL EXPERIENCE

GEORGIA INSTITUTE OF  
TECHNOLOGY  
2020 - PRESENT  
ATLANTA, GA

### GRADUATE RESEARCH & TEACHING ASSISTANT

Conducts research for Dr. Kari Watkins on bicycle and pedestrian safety. Assists teaching the department’s Multimodal Transportation course, and will become the instructor of record in Fall 2022.

TOOLE DESIGN GROUP  
2017-2020  
SPARTANBURG, SC

### PLANNER & ENGINEER | INTERN

Filled interdisciplinary role as planner, engineer, and researcher after completing part-time internship during master’s degree. Managed tasks within projects. Supervised and trained intern team.

CLEMSON UNIVERSITY  
2016  
CLEMSON, SC

### GRADUATE RESEARCH ASSISTANT

Supported faculty member Dr. Eric Morris with projects and papers while pursuing master’s in City and Regional Planning. Work included travel time use substitutions, travel behavior and attitudes, and transit planning for local agencies.

## CONTACT

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# RACHAEL T. PANIK

GEORGIA  
INSTITUTE OF  
TECHNOLOGY

## RESEARCH, PUBLICATIONS, & PRESENTATIONS

- 2022 ● **Probing elements of safety culture in engineering students: Exploratory analysis and preliminary results**  
CONFERENCE PRESENTATION  
DUBLIN, IRELAND  
**EUROPEAN SAFETY AND RELIABILITY CONFERENCE**  
RACHAEL T. PANIK, HAMIDREZA NAZEMI, JOSEPH H. SALEH, BRIAN FITZPATRICK, PATRICIA L. MOKHTARIAN  
We assess attitudes towards safety in engineering practice and experiences with safety education among engineering students. We find disparities among engineering disciplines, where some majors have more negative views toward safety than others. This may point to the need for more [effective] safety education to prevent negative attitudes toward safety in the workplace.
- 2022 ● **Identification of Potential Warning Signals for a Smartphone-based Bicyclist Assistant System**  
CONFERENCE PROCEEDING  
NEW YORK, NY  
**INTERNATIONAL CONFERENCE ON APPLIED HUMAN FACTORS AND ERGONOMICS**  
ANIKA RIMU, RACHAEL T. PANIK, MURALI SRINIVASAN, KARI E. WATKINS, MING LI, SHUCHISNIGDHA DEB  
This paper is a preliminary study to identify effective warning signals for a smartphone-based application designed to mitigate bicycle crashes. We analyze discussions from experts and stakeholders on the design and efficacy of warning signals and application.
- 2022 ● **Metrics of Mobility: Assessing the Impact of COVID-19 on Travel**  
CONFERENCE PROCEEDING  
WASHINGTON, D.C.  
**TRANSPORTATION RESEARCH BOARD MEETING**  
RACHAEL T. PANIK, DAVID EDERER, KARI E. WATKINS  
In this work, we present methodologies used to assess changes in travel behavior during the COVID-19 pandemic across the United States. We highlight the usefulness of our metrics for measuring changes in mobility in disruptive scenarios, showcasing the value of using changepoint analysis in travel research.
- 2022 ● **Metrics of Mobility: Assessing the Impact of COVID-19 on Travel**  
JOURNAL PAPER  
IN REVIEW  
**TRANSPORTATION RESEARCH RECORD, SPECIAL ISSUE ON COVID-19**  
RACHAEL T. PANIK, DAVID EDERER, KARI E. WATKINS  
The COVID-19 pandemic disrupted typical travel patterns across the United States. This paper creates and applies metrics for measuring changes in mobility in U.S. counties using a sample of data from counties in 5 states. We find that the most meaningful correlates of travel behavior are employment concentrations, indicating that travel behavior during the early stages of the pandemic was largely influenced by work characteristics.
- 2021 ● **CycleGuard: A Smartphone-based Assistive Tool for Cyclist Safety Using Acoustic Ranging**  
JOURNAL PAPER  
**PROCEEDINGS OF THE ACM ON INTERACTIVE, MOBILE, WEARABLE AND UBIQUITOUS TECHNOLOGIES**  
WENQIANG JIN, SRINIVASAN MURALI, YOUNGTAK CHO, HUADI ZHU, TIANHAO LI, RACHAEL T. PANIK, ANIKA RIMU, SHUCHISNIGDHA DEB, KARI WATKINS, XU YUAN, MING LI  
Given the thousands of bicyclists who are involved in right-hook vehicle collisions, this paper presents a bicycle assistant system designed to detect and mitigate right-hook crashes.
- 2020 ● **COVID-19 and Mobility in Practice**  
CONFERENCE PRESENTATION  
ONLINE  
RACHAEL T. PANIK  
I discuss the impacts of COVID-19 on mobility in Alabama and Mississippi to planning practitioners as a part of the states' joint APA conference. Using findings from my research, I equipped practitioners with tools to harness mobility data for their communities.

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## RESEARCH, PUBLICATIONS, & PRESENTATIONS CONTINUED

- 2019** ● **Does walking and bicycling more mean exercising less? Evidence from the US and the Netherlands**  
JOURNAL PAPER  
CONFERENCE PRESENTATION  
WASHINGTON, D.C.  
**JOURNAL OF TRANSPORT AND HEALTH**  
**TRANSPORTATION RESEARCH BOARD MEETING**  
RACHAEL T. PANIK, ERIC MORRIS  
We investigate the relationship between active travel and other physical activities using American Time Use Survey (ATUS) data and comparable Dutch data. Our findings indicate that those who engage in active travel are not less likely to engage in other forms of physical activity. We present this research in a poster session at the TRB 2019 meeting.
- 2018** ● **Safety in Numbers and Bicycle Safety: A Detailed Analysis of the Denver Metropolitan Area**  
MASTER'S THESIS  
**TIGERPRINTS**  
RACHAEL T. PANIK, ADVISED BY ERIC MORRIS  
In my master's thesis, I investigated the crash/safety phenomenon "safety in numbers" as it applies to bicycle crashes in the Denver, CO, region. Using hundreds of thousands of roadway segments, I modeled the relationship between the number of crashes and the number of bicyclists using street segment level ridership data. My findings showed that increases in the number of bicyclist decreased the predicted risk of crash per person.
- 2016** ● **UAB Commuter Survey: Final Report**  
TECHNICAL REPORT  
**ASSOCIATION FOR THE ADVANCEMENT OF SUSTAINABILITY IN HIGHER EDUCATION**  
VIRGINIA P. SISIOPIKU, OSSAMA E. RAMADAN, RACHAEL T. PANIK (LISTED AS RACHAEL C. THOMPSON)  
We describe travel patterns among UAB faculty, staff, and students. Our results were used to create recommendations for administration regarding further transportation investments. The data created in this technical report are referenced in Athens Journal of Technology and Engineering article, "Travel Patterns and Preferences of Urban University Students."

## ACTIVE RESEARCH PROJECTS

- 2022** ● **VULNERABLE ROAD USER ACTIVITY AND SAFETY**  
**NON-MOTORIZED ACTIVITY ESTIMATION AND RISK FACTORS ASSESSMENT**  
In partnership with the Georgia Department of Transportation, this research will leverage existing datasets to create activity estimates of non-motorized travel. We investigate new methods for creating exposure estimates. These estimates of activity will be used to assess the risk factors associated with bicycle and pedestrian crashes with the intent to give GDOT more tools for assessing safe design practices.  
**Working Paper:** Systematic Literature Review of Bicycle Volume Estimation Methods
- 2021-PRESENT** ● **SAFETY EDUCATION IN ENGINEERING**  
**ASSESSING ELEMENTS OF SAFETY CULTURE AND ENGINEERING SAFETY EDUCATION**  
This works serves as the starting point for a long-term research program to investigate how individuals entering the workforce acquire and partake in safety culture over time. This work will inform ways that students may be primed to partake in the positive elements of safety culture.  
**Working Papers:** Factor Analysis of Safety Culture Elements Survey; Multinomial Logit Assessment of Safety Perceptions

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## PAST RESEARCH PROJECTS

2020-2021

### COVID-19 AND MOBILITY METRICS

#### IMPACTS OF THE PANDEMIC ON GEORGIA ECONOMY AND MOBILITY

Supported by the Speedwell Foundation, this research sought to quantify the ways that COVID-19 has impacted Georgia's economy, travel, and mobility. Products of this research presently include working papers and a website, curating metrics of the economic response to the pandemic during 2020.

*Archived Project Website: [gacovid19.org](http://gacovid19.org)*

## LEADERSHIP & SERVICE

GEORGIA INSTITUTE OF  
TECHNOLOGY  
2021 - PRESENT

### UTIL JOURNAL CLUB ORGANIZER

Initiated the first academic journal club centered on multimodal transportation within the Urban Transportation Information Lab (UTIL) at Georgia Tech. Creates thematic meetings based on student interest and research needs. Coordinating presenters from the UTIL lab, alumni, and related research groups.

GEORGIA INSTITUTE OF  
TECHNOLOGY  
2021 - PRESENT

### CEE PHAM PROGRAM, CO-ORGANIZER

Serves as a mentor and co-leader for the departmental Ph.D. Applicant Mentorship program (CEE PhAM), which provides guidance to undergraduate students who are interested in advanced degrees. Leads application workshops and Q&A panels with current masters' students and prospective Ph.D. students.

PHYSICAL ACTIVITY  
POLICY, RESEARCH, AND  
EVALUATION NETWORK  
2021 - 2022

### PAPREN TRANSPORTATION POLICY AND PLANNING WORK GROUP FELLOW

Served as research and administrative fellow for the Physical Activity Policy, Research, and Evaluation Network, which produces thematic research and products for the Center of Disease Control's Division of Nutrition, Physical Activity, and Obesity (DNPAO). Supported meeting organization and project development.

AMERICAN PLANNING  
ASSOCIATION  
2018 - PRESENT

### STUDENT REPRESENTATIVES COUNCIL CHAIR, PAST CHAIR, BOARD DIRECTOR, EDUCATION COMMITTEE MEMBER, NATIONAL PLANNING CONFERENCE COMMITTEE MEMBER

Served in a variety of leadership positions within the APA:

- *SRC Chair, Past Chair:* Set the strategic direction of student activities as a Board Director from 2018-2020. Represented the student and young professional voice in the APA's decision-making processes. From 2019 - 2021, served in an advisory capacity as past chair.
- *Education Committee:* Member of the 2021 committee charged by the APA Board of Directors to ensure that educational needs of members are addressed through programs and partnerships.
- *National Planning Conference Committee:* Member of the 2021 committee tasked with organizing the largest conference for urban planners in the U.S.

UNIVERSITY OF ALABAMA  
AT BIRMINGHAM  
2016

### UNIVERSITY AMBASSADOR

Selected as 1 of 20 representatives to serve as the official hosts of the university of Alabama at Birmingham. Responsible for encouraging the distinguished reputation of the University to patrons and visitors.

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GEORGIA  
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TECHNOLOGY

## TEACHING EXPERIENCE

GEORGIA INSTITUTE OF  
TECHNOLOGY

### TEACHING ASSISTANT: DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

- *Multimodal Transportation Engineering (Fall 2021)*: Grader and rubric designer. Lecturer on risk analysis for bicyclists and pedestrians. Will serve as the instructor of record in Fall 2022.
- *Sustainable Transportation and Transit Abroad (Spring 2021)*: Helped professor prepare a new course that combined material from two courses. Gave a lecture on transit stations in Tokyo. Facilitated multiple discussions of course material.
- *Urban Transportation Planning (Fall 2020)*: Helped faculty transition material to online format. Designed lecture on parking in urban areas.

UNIVERSITY OF ALABAMA  
AT BIRMINGHAM

### TEACHING ASSISTANT: MECHANICS OF SOLIDS

Graded homework, conducted study sessions, and facilitated an exam as an undergraduate student.

## SCHOLARSHIPS, GRANTS, & AWARDS

2021

### CENTER FOR TRANSPORTATION EQUITY, DECISIONS, AND DOLLARS STUDENT OF THE YEAR

Selected for recognition award and scholarship for the CTEDD program based on human factors and safety research.

2021

### GEORGIA DEPARTMENT OF TRANSPORTATION RESEARCH GRANT AWARDEE

Co-authored a successful grant application to study bicycle and pedestrian activity, exposure, and safety. Awarded \$250,000 over a 36-month study period.

2020

### DWIGHT D. EISENHOWER TRANSPORTATION FELLOWSHIP (2020, 2021)

Twice awarded a nationally-competitive scholarship given to students in transportation-related disciplines to attract the nation's brightest minds to the field.

2020

### GEORGIA INSTITUTE OF TECHNOLOGY PRESIDENT'S FELLOWSHIP

Fellowships offered annually to a select number of Ph.D. students who bring exemplary scholarship and innovation to the academic departments.

2018

### FULBRIGHT SCHOLAR AWARD RECIPIENT

Awarded scholarship to study autonomous vehicle interactions with vulnerable road user at Leeds University's Institute for Transport Studies.

2017

### EDWARD L. FALK CITATION FOR MERIT

Award given to one first-year student in Clemson University's City & Regional Planning program based on professional promise and service to the program.

2016

### ED McCALLUM SCHOLARSHIP

Endowment presented to the highest ranked incoming graduate student in Clemson University's City & Regional Planning Program.

2015

### STATE DEPARTMENT CRITICAL LANGUAGES SCHOLAR

Selected as a top 10 percentile applicant for a nationally competitive foreign language award. Studied Japanese in Hikone, Japan, in an immersive environment during the summer of 2015.