EXHIBIT A

SCOPE OF WORK

Contract Grant

Does this project include Research (as defined in the UTC)? Yes No

PI Name: **Giovanni Circella**

Project Title: **Validating Vehicle Choice Surveys**

Project Summary/Abstract

CARB leverages surveys to guide program decisions, particularly those related to vehicle incentive programs targeting disadvantaged communities (DACs). SB 150 mandates that at least 25% of California Climate Investment funds be directed toward DACs, as identified by CalEnviroScreen. Surveys have engaged thousands of Californians to gauge their vehicle preferences. This project aims to enhance the quality of these surveys through two key pathways. First, the project will improve the interpretation of past and future survey questions regarding vehicle choice. This will be accomplished by comparing survey responses with DMV registration data, and other sources to determine how responses align with actual purchases. Second, the project will assess how survey participants compare to the broader population and explore the representation of racial groups and communities. This comparison will help to determine if survey samples reasonably represent the populations they are used to model. This project will improve the interpretation of survey results to allow CARB's air quality planning and incentive funding programs to make more informed decisions to meet program goals. The project will also guide surveyors in refining future survey designs, both survey questions and sampling methods, to ensure they are more inclusive and representative.

If Third-Party Confidential Information is to be provided by the State:

Performance of the Scope of Work is anticipated to involve use of third-party Confidential Information and is subject to the terms of this Agreement; ***OR***

A separate CNDA between the University and third-party is required by the third-party and is incorporated in this Agreement as Exhibit A7.

Scope of Work

Background

CARB has funded public surveys to investigate consumer vehicle choices. These surveys aim to answer questions such as: What vehicles or technologies will participants choose in the future? The answers to these questions are important to multiple CARB programs. CARB's Emission Factor model (EMFAC) estimates air pollutant emissions from California's on-road vehicles. EMFAC uses survey data to predict future emissions from the transportation sector. Air quality planning programs at CARB rely on tools like EMFAC to create State Implementation Plans that meet Federal Ambient Air Quality Standards. Correct estimates of air pollutant emission reductions from the transportation sector are essential to meeting the state's air quality goals. Survey results are also used by light-duty incentive programs that aim to increase the adoption of zero-emission electric vehicles (ZEV). Surveys help identify the policies and incentives that encourage the adoption of ZEVs. This is especially important in areas with low ZEV adoption, such as priority communities.

Applying survey results to policies and programs can be challenging due to potential gaps between survey responses and consumer behavior. Factors influencing the discrepancy between hypothetical purchases and actual consumer behavior include a participant's vehicle preferences changing when they are ready to purchase. Survey responses may also be interpreted differently by participants and researchers. Responses like "somewhat likely to consider purchasing a ZEV" could indicate a 30%, 50%, or other arbitrarily chosen chance of purchase. The term "consider purchasing an electric vehicle" is also difficult to define and quantify, making the results highly dependent on untestable assumptions by the researchers.
Surveys typically aim to collect samples of survey participants that reflect the demographics of the state or priority populations. While CARB surveys typically collect demographic data to compare the sample to the population, no study has examined how well Californians are represented across multiple CARB-funded surveys on consumer vehicle choices. Vehicle choice surveys often do not examine other characteristics of their sample, such as vehicle ownership rates and ZEV ownership rates. Surveys will provide biased results if the samples systematically differ from the intended population.

Objective

This project will compare past CARB-funded survey results on consumer vehicle purchasing preferences with real-world data on vehicle purchases. Results will provide guidance to improve the design, interpretation, and utility of future surveys. The project will also analyze how survey participants compare to the broader population and explore the representation of racial groups and communities. This comparison will help to determine if survey samples reasonably represent the populations they are used to model. This project will allow CARB to better incorporate survey responses into air quality planning and incentive funding programs while advancing environmental justice goals.

Project Tasks

Task 1: Literature Review

The Contractor will conduct a literature review and present a summary of the findings to CARB. The Contractor will focus on how vehicle choice surveys have been conducted both when funded by CARB and in the literature more broadly, as well as a review of recruiting representative samples for surveys. The review will discuss how researchers have interpreted responses to vehicle choice questions and how government bodies, including CARB, use surveys to inform programs. In addition to published literature, the Contractor should include input from the researchers who conducted surveys for CARB to address how their vehicle choice questions were interpreted.

Interim Deliverable

Literature review: A literature review, which is a comprehensive report summarizing relevant literature, will be required as an interim deliverable. The review should explicitly inform the research questions and the pre-analysis plan. The literature review should also discuss participation and representation in surveys.

Task 2: Pre-Analysis Plan

The pre-analysis plan (PAP) will identify the specific research questions for the analysis, compare DMV data to survey responses, and characterize the representativeness of the survey sample. When feasible, the PAP will include specifications, subgroups, and the tests that will be analyzed, in addition to power analyses that account for multiple hypothesis testing when applicable. The PAP should build on the literature review's discussion of the survey data and how responses have been interpreted.

Interim Deliverable

Pre-Analysis Plan: The Contractor and CARB must complete and approve a draft of the PAP. While the PAP may change once data is collected and cleaned, the PAP should provide a clear strategy for the analysis that will be performed on the data. The final draft of the PAP must be completed and posted before the analysis begins. The PAP should include the interpretation of survey responses included in the project (e.g., converting categorical responses to numerical ones) and the primary characteristics of participants that will

be evaluated as measures of representation. Statistical power should be considered when choosing how many subgroups are evaluated.

Task 3: Data, Code, and Data Dictionaries

The Contractor will collect data from past surveys. The Contractor will write code to compile data from different studies and create a data dictionary that describes each variable. CARB will acquire registration data from the DMV and provide a data dictionary for each variable. These data will be combined with other data sources, such as CalEnviroScreen or census data, to create the datasets used in the analysis. The Contractor will determine the appropriate level of granularity for the analysis, such as the census tracks or blocks. All data cleaning, combining, and analysis will be performed with scripts to create a replication package, allowing others with access to the data to reproduce all findings fully and those without data access to see each step. Data, code, and data dictionaries will be provided. If there are limitations on data sharing, the Contractor will provide aggregated datasets that reproduce similar analyses. During the Institutional Review Board process, steps should be taken to address data sharing.

Interim Deliverable

Interim data, code, and data dictionaries should be shared between CARB and the Contractor and regularly updated.

Task 4: Final Report

Task 4a: Draft Final Report

The Contractor will provide a draft final report that includes the literature review/background, PAP, data, code, data dictionaries, methods, results, discussion/interpretation, conclusions, and guidance for how CARB and the Contractor can improve the formation and interpretation of vehicle choice survey questions and make surveys more inclusive and representative. Data and code should be delivered along with the draft final report, allowing researchers unfamiliar with the project to understand the analysis and reproduce the findings. The draft final report should be submitted six months before the end of the contract and include all data and code used for the draft.

Task 4b: Final Report

The final report will be responsive to CARB staff comments from the draft, ADA-compliant, and sufficient for public consumption on State websites.

Project Deliverables

The project proposal shall include but not be limited to the following deliverables:
At the Beginning of the Contract

- All researchers must undergo cultural competency training (e.g., implicit bias training and racial equity training). Training should be completed or scheduled within 30 days of contract execution.

During the Active Contract Period

- The Contractor must submit Quarterly Progress Reports. These reports shall include plain-language summaries that can be posted publicly. CARB will provide the progress report template.

- The Contractor shall engage in monthly consultation calls with CARB and key stakeholders. The Contractor shall engage in quarterly update meetings with CARB and key stakeholders.
- The contractor shall submit Interim reports to keep CARB staff informed. Upon CARB staff's request, these reports are expected at the end of each task to ensure that progress is being made.

Prior to Contract Close

- The contractor shall submit all data, analyses, and analytical tools generated during this project. These should be sufficient to understand and reproduce results.
- The contractor shall produce plain-language fact sheets, including recommendations for future research and interpretation of survey results. The fact sheets will be translated into Spanish.
- The Contractor shall satisfy the following requirements of the Draft Final Report (DFR):

  - DFR will be copy-edited, reviewed, and approved by the Principal Investigator.
  - Include a plain language summary in DFR
  - Include an equity implications section in DFR

- The Contractor must work with CARB to create plain-language outreach deliverables for the public that summarize the project's results and impact.
- The Final Report submitted to CARB must be ADA-compliant.
- The Contractor will participate in a virtual or in-person seminar to present the project findings.
- Peer-reviewed publications should be publicly available if possible (please budget for this expense; submission-ready publications shall be reviewed by CARB staff).
- Additional deliverables are a literature review (Task 1), a pre-analysis plan (Task 2), and regular updates of data and code (Task 3).

Timeline

This project is anticipated to be completed in 24 months from the start date. Cost shall not exceed $50,000.

Project month	1	2	3	4	5	6	7	8	9	10	11	12
Calendar year	2025		2026									
Calendar month	N	D	J	F	M	A	M	J	J	A	S	O
Task 1 Literature review												
Task 2 Pre-Analysis Plan												
Task 3 Data analysis												
Task 4a Draft Final Report												
Task 4b Final Report												
Quarterly meetings	*			*			*			*		
Project month	13	14	15	16	17	18	19	20	21	22	23	24

Calendar year	2026		2027									
Calendar month	N	D	J	F	M	A	M	J	J	A	S	O
Task 1 Literature review												
Task 2 Pre-Analysis Plan												
Task 3 Data analysis												
Task 4a Draft Final Report												
Task 4b Final Report												
Quarterly meetings	*			*			*			*		

Meetings

A. Initial meeting. Before work on the contract begins, the Principal Investigator and key personnel will meet with the CARB Contract Project Manager and other staff to discuss the overall plan, details of performing the tasks, the project schedule, items related to personnel or changes in personnel, and any issues that may need to be resolved before work can begin.

B. Progress review meetings. The Principal Investigator and appropriate members of his or her staff will meet with CARB's Contract Project Manager at quarterly intervals to discuss the progress of the project. This meeting may be conducted by phone.

C. Community Engagement and/or Technical Advisory Committee Meetings (If Applicable). For community engagement efforts, including meetings with a Technical Advisory Committee (TAC), the Contractor must co-create meeting materials, including presentation slides, flyers, and speaking notes with CARB staff. The Contractor will work with CARB to understand policies and agree to accurately represent those policies or defer for follow-up. CARB will participate in community meetings and TAC meetings, unless mutually agreed upon with CARB and the PI, in cases where it could impact community engagement efforts negatively.

D. Technical Seminar. The Contractor will present the results of the project to CARB staff and a possible webcast at a seminar at CARB facilities in Sacramento or El Monte.

CONFIDENTIAL HEALTH DATA AND PERSONAL INFORMATION (OPTIONAL – For projects with Health Data and/or Personal Information)

CARB will not be provided access to and will not receive any confidential health data or other confidential personal information under this contract. Further, CARB will have no ownership of confidential health data or other confidential personal information used in connection with this contract. The entities conducting the research in this contract will follow all applicable rules and regulations regarding access to and the use of confidential health data and personal information, including the Health Insurance Portability and Accountability Act (HIPAA) and requirements related to the Institutional Review Board (IRB) process. CARB will not be a listed entity with authorized access to confidential information pursuant to the IRB process for this contract.

EXHIBIT A1

DELIVERABLES

List all items that will be delivered to the State under the proposed Scope of Work. Include all reports, including draft reports for State review, and any other Deliverables, if requested by the State and agreed to by the Parties.

If use of any Deliverable is restricted or is anticipated to contain preexisting Intellectual Property with any restricted use, it will be clearly identified in Exhibit A4, Use of Preexisting Intellectual Property & Data.

Unless otherwise directed by the State, the University Principal Investigator shall submit all deliverables to State Contract Project Manager, identified in Exhibit A3, Authorized Representatives.

Deliverable	Description	Due Date
Racial equity/implicit bias training	The Principal Investigator and key personnel must demonstrate that they have taken, or will take, cultural competency training, implicit bias training, or racial equity training, whichever is administered at their institution. Training certificates or certificates of completion completed within one (1) year prior to the agreement start date will be accepted. If the training has not been completed within one (1) year prior to the agreement start date, then the Principal Investigator and key personnel must demonstrate that they have scheduled the training within 30 days of the agreement start date and shall complete the training within 90 days of the agreement start date.	Within 90 days of the agreement start date.
Initial Meeting	Principal Investigator and key personnel will meet with CARB Contract Project Manager and other staff to discuss the overall plan, details of performing the tasks, project schedule, items related to personnel or changes in personnel, and any issues that may need to be resolved before work can begin.	Month 1
Progress Reports & Meetings	Quarterly progress reports and meetings throughout the agreement term, to coincide with work completed in quarterly invoices.	Quarterly
Draft Final Report	Draft version of the Final Report detailing the purpose and scope of the work undertaken, the work performed, the results obtained and conclusions, and a Public Outreach Document and an Equity Implications Section. The Draft Final Report shall be copy-edited before being sent to CARB for review and the Principal Investigator shall attest that the Final Report has been reviewed and approved. The Draft Final Report must be submitted in accordance with the requirements outlined in Exhibit A1, Section 2 – Research Final Report Format.	Three (3) months prior to the agreement end date.
Data	Data compilations first produced in the performance of this Agreement by the Principal investigator or the University's project personnel.	Two (2) weeks prior to agreement end date.

Technical Seminar	Presentation of the results of the project to CARB staff and a possible webcast at a seminar at CARB facilities in Sacramento or El Monte. The Technical Seminar slides shall be submitted in an ADA compliant format. CARB's standard for ADA compliance requires that the submitted document adhere to WCAG 2.1 AA (https://www.w3.org/TR/WCAG21/) and Federal Section 508 (https://www.section508.gov/).	On or before agreement end date.
The following Deliverables are subject to paragraph 19. Copyrights, paragraph B of Exhibit C		
Final Report	Written record of the project and its results. The Final Report must be submitted in accordance with the requirements outlined in Exhibit A1, Section 2 – Research Final Report Format.	Two (2) weeks prior to agreement end date.

1. **Reports and Data Compilations**

A. With respect to each invoice period University shall submit, to the CARB Contract Project Manager, one (1) electronic copy of the progress report. When emailing the progress report, the "subject line" should state the contract number and the billing period. Each progress report must accompany a related invoice covering the same billing period. Each progress report will begin with the following disclaimer:

> *The statements and conclusions in this report are those of the University and not necessarily those of the California Air Resources Board. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products*.

B. Each progress report will also include:

1. A brief summary of the status of the project, including whether the project is on schedule. If the project is behind schedule, the progress report must contain an explanation of reasons and how the University plans to resume the schedule.

2. A brief narrative account of project tasks completed or partially completed since the last progress report.

3. A brief discussion of problems encountered during the reporting period and how they were or are proposed to be resolved.

4. A brief discussion of work planned, by project task, before the next progress report. and

5. A graph or table showing percent of work completion for each task.

C. Nine (9) months prior to Agreement expiration date, University will deliver to CARB an electronic copy of the draft final report in both PDF and Microsoft Word formats. The draft final report will conform to Exhibit A1, Section 2 – Research Final Report Format.

D. Within forty-five (45) days of receipt of CARB's comments, University will deliver to CARB's Contract Project Manager an electronic copy of the final report incorporating all reasonable alterations and additions. Within two (2) weeks of receipt of the revised report, CARB will verify that all CARB comments have been addressed. Upon acceptance of the amended final report approved by CARB in accordance to Exhibit A1, Section 2 – Research Final Report Format, University will within two (2) weeks, deliver to CARB an electronic copy of the final report in both PDF and Microsoft Word formats.

E. As specified in Exhibit A1, Section 2, Final Report will be submitted in an Americans with Disabilities Act compliant Format.

F. Together with the final report, University will deliver a set of all data compilations as specified in Exhibit A1 – Schedule of Deliverables.

G. University's obligation under this Agreement shall be deemed discharged only upon submittal to CARB of an acceptable final report in accordance to Exhibit A1, Section 2 – Research Final Report Format, all required data compilations, and any other project deliverables.

2. Research Final Report Format

The research contract Final Report (Report) is as important to the contract as the research itself. The Report is a record of the project and its results and is used in several ways. Therefore, the Report must be well organized and contain certain specific information. The CARB's Research Screening Committee (RSC) reviews all draft final reports, paying special attention to the Abstract and Executive Summary. If the RSC finds that the Report does not fulfill the requirements stated in this Exhibit, the RSC may not recommend release, and final payment for the work completed may be withheld. This Exhibit outlines the requirements that must be met when producing the Report.

Note: In partial fulfillment of the Final Report requirements, the Contractor shall submit a copy of the Report in PDF format and in a word-processing format, preferably in Word – Version 6.0 or later. The electronic copy file name shall contain the CARB contract number, the words "Final Report", and the date the report was submitted.

Accessibility. Contractor must ensure that the Final Report complies with Web Content Accessibility Guidelines 2.0, levels A and AA, and otherwise meets the accessibility requirements set forth in California Government Code Sections 7405 and 11135, Section 202 of the federal Americans with Disabilities Act (42 U.S.C. § 12132), and Section 508 of the federal Rehabilitation Act (29 U.S.C. § 794d) and the regulations promulgated thereunder (36 C.F.R. Parts 1193 and 1194) (collectively, the "Accessibility Requirements"). For any report provided in PDF format, Contractor shall also provide an electronic version in the original electronic format (for example, Microsoft Word or Adobe InDesign). CARB may request documentation from the Contractor of compliance with the Accessibility Requirements and may perform testing to verify compliance. Contractor must bring into compliance, at no cost to CARB, any report by Contractor or its subcontractors not meeting the Accessibility Requirements. If Contractor fails to bring its or its subcontractors' report into compliance with the Accessibility Requirements within five (5) business days of written notice from CARB, or within the time frame specified by CARB in its notice, Contractor will be responsible for all costs incurred by CARB in bringing Contractor's or its subcontractors' report into compliance with the Accessibility Requirements. Contractor agrees to respond to and resolve any complaint brought to its attention regarding accessibility of deliverables provided under this Contract for a period of one year following delivery of the final deliverable under this Contract.

Deviations from the Accessibility Requirements are permitted only by written consent by CARB.

Watermark. Each page of the draft Report must include a watermark stating "DRAFT." The revised report should not include any watermarks.

Title. The title of the Report should exactly duplicate the title of the contract. However, minor changes to the title may be approved provided the new title does not deviate from the old title. These minor changes must be approved in writing by the contract manager. Significant changes to the title would require a formal amendment.

Page size. All pages should be of standard size (8 ½" x 11") to allow for photo-reproduction.

Corporate identification. Do not include corporate identification on any page of the Final Report, except the title page.

Unit notation. Measurements in the Reports should be expressed in metric units. However, for the convenience of engineers and other scientists accustomed to using the British system, values may be given in British units as well in parentheses after the value in metric units. The expression of measurements in both systems is especially encouraged for engineering reports.

Section order. The Report should contain the following sections, in the order listed below:

Title page
Disclaimer
Acknowledgment (1)
Acknowledgment (2)
Table of Contents
List of Figures
List of Tables
Abstract
Public Outreach Document
Executive Summary
Equity Implications Section
Body of Report
References
List of inventions reported and copyrighted materials produced
Glossary of Terms, Abbreviations, and Symbols
Appendices

Page numbering. Beginning with the body of the Report, pages shall be numbered consecutively beginning with “1”, including all appendices and attachments. Pages preceding the body of the Report shall be numbered consecutively, in ascending order, with small Roman numerals.

Title page. The title page should include, at a minimum, the contract number, contract title, name of the principal investigator, contractor organization, date, and this statement:
"Prepared for the California Air Resources Board and the California Environmental Protection Agency"

Disclaimer. A page dedicated to this statement must follow the Title Page:

> The statements and conclusions in this Report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

Acknowledgment (1). Only this section should contain acknowledgments of key personnel and organizations who were associated with the project. The last paragraph of the acknowledgments must read as follows:

> This Report was submitted in fulfillment of [CARB contract number and project title] by [contractor organization] under the [partial] sponsorship of the California Air Resources Board. Work was completed as of [date].

Acknowledgment (2). Health reports should include an acknowledgment to the late Dr. Friedman. Reports should include the following paragraph:

> This project is funded under the CARB’s Dr. William F. Friedman Health Research Program. During Dr. Friedman’s tenure on the Board, he played a major role in guiding

CARB's health research program. His commitment to the citizens of California was evident through his personal and professional interest in the Board's health research, especially in studies related to children's health. The Board is sincerely grateful for all of Dr. Friedman's personal and professional contributions to the State of California.

Attestation. A page dedicated to this attestation statement must follow the Acknowledgement(s). The Principal Investigator (PI) must digitally sign below the following statement:

> The Final Report for CARB Agreement No. [contract number] titled "[Enter project title]" has been copy-edited for grammar, style, and format and is reviewed and approved by the Principal Investigator (PI), [title and name of PI] of [Contractor Name]. The signature below attests that the PI has completed a thorough review of this Final Report and approves it for submission to the California Air Resources Board.
>
> PI Signature
> Date

Table of Contents. This should list all the sections, chapters, and appendices, together with their page numbers. Check for completeness and correct reference to pages in the Report.

List of Figures. This list is optional if there are fewer than five illustrations.

List of Tables. This list is optional if there are fewer than five tables.

Abstract. The abstract should tell the reader, in nontechnical terms, the purpose and scope of the work undertaken, describe the work performed, and present the results obtained and conclusions. The purpose of the abstract is to provide the reader with useful information and a means of determining whether the complete document should be obtained for study. The length of the abstract should be no more than about 200 words. Only those concepts that are addressed in the executive summary should be included in the abstract.

Example of an abstract:

A recently developed ground-based instrument, employing light detecting and ranging (lidar) technology, was evaluated, and found to accurately measure ozone concentrations at altitudes of up to 3,000 meters. The novel approach used in this study provides true vertical distributions of ozone concentrations aloft and better temporal coverage of these distributions than other, more common methods, such as those using aircraft and ozonesonde (balloon) techniques. The ozone and aerosol measurements from this study, in conjunction with temperature and wind measurements, will provide a better characterization of atmospheric conditions aloft and the processes involved in the formation of unhealthful ozone concentrations than can be achieved with traditional ground-based monitors.

Public Outreach Document. The public outreach document is a one-page document that will be widely used to communicate, in clear and direct terms, the key research findings from the study to the public. CARB will be translating the document into other languages. This document must adhere to the following guidelines:

- Single space, limited to one-page or about 500 words.
- Use narrative form and active voice.
- Incorporate a graphic that it is easy to interpret and captures the results' central message.
- Avoid jargon and technical terms. Use a style and vocabulary level comparable to that of sixth grade reading level.
- The document should contain a title and the following five sections: Issue/s, Main Question, Key Research Findings, Conclusion/s, and More Information. Guidance on

how to write these sections is described below.

TITLE: Adopt a short, non-technical title to make the topic clear and concise. The title will likely differ from the original title of the contract.

ISSUE/S: In one to two paragraphs, describe why the project was needed. In this section, identify the problem leading to this study and what the study was set to accomplish to help address the problem. Reference any history that is relevant such as a regulation, legislation, program, law, or other. Without going into detail and disclosing the research findings, mention the methods used in the study and how it informed the results.

MAIN QUESTION: Present a concise central research question driving this project.

KEY RESEARCH FINDING/S: This section covers the key research findings. List key points and or findings.

CONCLUSION/S: In one to two paragraphs, discuss how the results could be used. Mention its relevance to policies, rules, regulations, legislations, or CARB programs. Include suggestions for next steps, additional research, or other actions.

MORE INFORMATION: In two to three short sentences provide specifics about the study. This section should include the full title of the study, sponsor, authors, and where the full report can be found (the final report will be posted on the CARB website). In addition to a direct contact to gain more information (author and CARB contract manager).

Executive Summary. The function of the executive summary is to inform the reader about the important aspects of the work that was done, permitting the reader to understand the research without reading the entire Report. It should state the objectives of the research and briefly describe the experimental methodology[ies] used, results, conclusions, and recommendations for further study. All of the concepts brought out in the abstract should be expanded upon in the Executive Summary. Conversely, the Executive Summary should not contain concepts that are not expanded upon in the body of the Report.

The Executive Summary will be used in several applications as written; therefore, please observe the style considerations discussed below.

Limit the Executive Summary to two pages, single spaced.

Use narrative form. Use a style and vocabulary level accessible to the general audience. Assume the audience is being exposed the subject for the first time.

Do not list contract tasks in lieu of discussing the methodology. Discuss the results rather than listing them.

Avoid jargon.

Define technical terms.

Use passive voice if active voice is awkward.

Avoid the temptation to lump separate topics together in one sentence to cut down on length.

The Executive Summary should contain four sections: Background, Objectives and Methods, Results, and Conclusions, described below.

THE BACKGROUND SECTION. For the Background, provide a one-paragraph discussion of the reasons the research was needed. Relate the research to the Board's regulatory functions, such as establishing ambient air quality standards for the protection of human health, crops, and ecosystems; the improvement and updating of emissions inventories; and the development of air pollution control strategies.

THE OBJECTIVES AND METHODS SECTION. At the beginning of the Objectives and Methods section, state the research objectives as described in the contract. Include a short, one or two sentences, overview of what was done in general for this research.

The methodology should be described in general, nontechnical terms, unless the purpose of the research was to develop a new methodology or demonstrate a new apparatus or technique. Even in those cases, technical aspects of the methodology should be kept to the minimum necessary for understanding the project. Use terminology with which the reader is likely to be familiar. If it is necessary to use technical terms, define them. Details, such as names of manufacturers and statistical analysis techniques, should be omitted.

Specify when and where the study was performed if it is important in interpreting the results. The findings should not be mentioned in the Objectives and Methods section.

THE RESULTS SECTION. The Results section should be a single paragraph in which the main findings are cited, and their significance briefly discussed. The results should be presented as a narrative, not a list. This section must include a discussion of the implications of the work for the Board's relevant regulatory programs.

THE CONCLUSIONS SECTION. The Conclusions section should be a single short paragraph in which the results are related to the background, objectives, and methods. Again, this should be presented as a narrative rather than a list. Include a short discussion of recommendations for further study, adhering to the guidelines for the Recommendations section in the body of the Report.

Equity Implication Section. The equity implications section should summarize how the research results inform disparate impacts of policies, regulations, or programs on priority communities.[5] This section should summarize how sociodemographic factors were examined in this research. Given the data used or collected, which populations are excluded or overrepresented? How were relevant communities engaged in the research effort and/or how were existing data gaps identified and ground-truthed during the research project? If ground-truthed data were found to not accurately reflect the lived experiences of community members, what future research projects could address this disconnect. The research results should inform existing or future CARB programs and the equity implications section should discuss how the research results may inform programs to close disparities in health outcomes, pollutant exposure or climate adaptation, etc., for priority communities. This section should be limited to a maximum of two (2) pages, single spaced and shall include the following sections.

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[5] Priority communities here encompasses various terms CARB uses such as priority populations[2], communities of concern[3], protected classes[4], or disadvantaged communities[5].
[2] Priority Populations — California Climate Investments
[3] Referenced from the California Public Utilities Commission Environmental and Social Justice Plan an effort resulting from California's Capitol Collaborative on Race & Equity.
[4] Protected Classes | California State Senate
[5] SB 535 Disadvantaged Communities ; California Climate Investments to Benefit Disadvantaged Communities | CalEPA; CalEnviroScreen 4.0 | OEHHA

HISTORICAL ANALYSIS. Provide an overview of the inequities and disparities observed in the existing data or data gathered during the research and how it ties to historic policies. For example, what is the root-cause of the disparity being experienced by the community or population central to this research?

MATERIALS AND METHODS. Describe how this research project examines racial equity. Some methods can include but are not limited to: examining the potential for existing data to address racial inequalities, ground-truthing existing data, engaging priority communities, assessments for racial and ethnic subgroups in the development of data and approaches, identifying data gaps and filling those gaps.

RESULTS AND DISCUSSION. Describe how the results improve our understanding of the equity issues identified or interventions to address those inequalities.

Body of Report. The body of the Report should contain the details of the research, divided into the following sections:[6]

INTRODUCTION. Clearly identify the scope and purpose of the project. Provide a general background of the project. Explicitly state the assumptions of the study.

Clearly describe the hypothesis or problem the research was designed to address. Discuss previous related work and provide a brief review of the relevant literature on the topic.

MATERIALS AND METHODS. Describe the various phases of the project, the theoretical approach to the solution of the problem being addressed, and limitations to the work. Describe the design and construction phases of the project, materials, equipment, instrumentation, and methodology.

Describe quality assurance and quality control procedures used. Describe the experimental or evaluation phase of the project.

RESULTS. Present the results in an orderly and coherent sequence. Describe statistical procedures used and their assumptions. Discuss information presented in tables, figures, and graphs. The titles and heading of tables, graphs, and figures, should be understandable without reference to the text. Include all necessary explanatory footnotes. Clearly indicate the measurement units used.

DISCUSSION. Interpret the data in the context of the original hypothesis or problem. Does the data support the hypothesis or provide solutions to the research problem? If appropriate, discuss how the results compare to data from similar or related studies. What are the implications of the findings?

Identify innovations or development of new techniques or processes. If appropriate, discuss cost projections and economic analyses.

SUMMARY AND CONCLUSIONS. This is the most important part of the Report because it is the section that will probably be read most frequently. This section should begin with a clear, concise statement of what, why, and how the project was done. Major results and conclusions of the study should then be presented, using clear, concise statements. Make sure the conclusions reached are fully supported by the results of the study. Do not overstate or overinterpret the results. It may be useful to itemize primary results and conclusions. A simple table or graph may be used to illustrate.

[6] Note that if the research employs multiple distinct methods, analyses, etc., the final report can include separate materials/methods, results, and discussion sections to allow for coherent discussion of each set of analyses and findings. However, the executive summary and conclusions sections should synthesize the collective findings of the entire study.

RECOMMENDATIONS. Use clear, concise statements to recommend (if appropriate) future research that is a reasonable progression of the study and can be supported by the results and discussion.

References. Use a consistent style to fully cite work referenced throughout the Report and references to closely related work, background material, and publications that offer additional information on aspects of the work. Please list these together in a separate section, following the body of the Report. If the Report is lengthy, you may list the references at the end of each chapter.

List of inventions reported and publications produced. If any inventions have been reported, or publications or pending publications have been produced as a result of the project, the titles, authors, journals or magazines, and identifying numbers that will assist in locating such information should be included in this section.

Glossary of terms, abbreviations, and symbols. When more than five of these items are used in the text of the Report, prepare a complete listing with explanations and definitions. It is expected that every abbreviation and symbol will be written out at its first appearance in the Report, with the abbreviation or symbol following in parentheses [i.e., carbon dioxide (CO2)]. Symbols listed in table and figure legends need not be listed in the Glossary.

Appendices. Related or additional material that is too bulky or detailed to include within the discussion portion of the Report shall be placed in appendices. If a Report has only one appendix, it should be entitled "APPENDIX". If a Report has more than one appendix, each should be designated with a capital letter (APPENDIX A, APPENDIX B). If the appendices are too large for inclusion in the Report, they should be collated, following the binding requirements for the Report, as a separate document.

The contract manager will determine whether appendices are to be included in the Report or treated separately. Page numbers of appendices included in the Report should continue the page numbering of the Report body. Pages of separated appendices should be numbered consecutively, beginning at “1”.

3. Other Deliverables

A. Contractor must ensure that all products and services submitted, uploaded, or otherwise provided by the Contractor and/or its subcontractors under this Agreement, including but not limited to data, software, plans, drawings, specifications, reports, operating manuals, notes, and other written or graphic work prepared in the course of performance of this Contract (collectively, the “Work”), comply with Web Content Accessibility Guidelines 2.0, levels A and AA, and otherwise meet the accessibility requirements set forth in California Government Code Sections 7405 and 11135, Section 202 of the federal Americans with Disabilities Act (42 U.S.C. § 12132), and Section 508 of the federal Rehabilitation Act (29 U.S.C. § 794d) and the regulations promulgated thereunder (36 C.F.R. Parts 1193 and 1194) (collectively, the “Accessibility Requirements”). For any Work provided in PDF format, Contractor shall also provide an electronic version in the original electronic format (for example, Microsoft Word or Adobe InDesign). CARB may request documentation from the Contractor of compliance with the Accessibility Requirements and may perform testing to verify compliance. Contractor must bring into compliance, at no cost to CARB, any Work by Contractor or its subcontractors not meeting the Accessibility Requirements. If Contractor fails to bring its or its subcontractors’ Work into compliance with the Accessibility Requirements within five (5) business days of written notice from CARB, or within the time frame specified by CARB in its notice, Contractor will be responsible for all costs incurred by CARB in bringing Contractor’s or its subcontractors’ Work into compliance with the Accessibility Requirements. Contractor agrees to respond to and resolve any complaint brought to its attention regarding accessibility of deliverables provided under this Contract for a period of one year following delivery of the final deliverable under this Contract.

Deviations from the Accessibility Requirements are permitted only by written consent by CARB.

EXHIBIT A2

KEY PERSONNEL

List Key Personnel as defined in the Agreement starting with the PI, by last name, first name followed by Co-PIs. Then list all other Key Personnel in alphabetical order by last name. For each individual listed include his/her name, institutional affiliation, and role on the proposed project. Use additional consecutively numbered pages as necessary.

Last Name, First Name	**Institutional Affiliation**	**Role on Project**
Principal Investigator (PI):		
Giovanni Circella, Ph.D.	University of California, Davis	Oversee the progress of tasks, coordinate with CARB, and lead dissemination efforts, including stakeholder engagement, conferences, and publications
Co-PI(s) – if applicable:		
Yongsung Lee, Ph.D.	University of California, Davis	Manage the progress of tasks, take the lead on specific tasks, support a postdoctoral researcher, and contribute to reporting materials and the preliminary/final report
Other Key Personnel:		
Siddhartha Gulhare, Ph.D.	University of California, Davis	Make progress on all tasks in coordination with PI and Co-PI, support preparing reporting materials and preliminary/final reports, contribute to academic publications

EXHIBIT A3

AUTHORIZED REPRESENTATIVES

The following individuals are the authorized representatives for the State and the University under this Agreement. Any official Notices issued under the terms of this Agreement shall be addressed to the Authorized Official identified below, unless otherwise identified in the Agreement.

State Agency Contacts	**University Contacts**
Agency Name: **CARB**	University Name:
Contract Project Manager (Technical) Name: Collin Weigel Address: Research Division 1001 I Street, 5th Floor Sacramento, CA 95814 Telephone: (279) 208-7359 Email: collin.weigel@arb.ca.gov	***Principal Investigator (PI)*** Name: Giovanni Circella Director, 3 Revolutions Future Mobility Program Address: Institute of Transportation Studies 1715 Tila Street Davis, CA 95616 Telephone: 530-752-1072 Email: gcircella@ucdavis.edu Designees to certify invoices under Section 14 of Exhibit C on behalf of PI: 1. Sharon Holgerson, Research Administrator, skholgerson@ucdavis.edu 2. <Name>, <Title>, <EmailAddress> 3. <Name>, <Title>, <EmailAddress>
Authorized Official (contract officer) Name: Alice Kindarara, Branch Chief Address: Acquisitions Branch Fiscal Services Division 1001 I Street, 20th Floor Sacramento, CA 95814 alice.kindarara@arb.ca.gov ***Send notices to (if different):*** Name: Renee Carnes Address: Research Division 1001 I Street, 7th Floor Sacramento, CA 95814 Telephone: (279) 208-7754 Email: renee.carnes@arb.ca.gov	***Authorized Official*** Name: Patrick J. Woods Director, Sponsored Programs Address: One Shields Avenue, Mrak Hall 4th Floor Davis, CA 95616-5270 530-754-5818 awards@ucdavis.edu ***Send notices to (if different):*** Name: SPO Awards Analyst, Contracts & Grants Analyst Address: Sponsored Programs One Shields Avenue, Mrak Hall 4th Floor Davis, CA 95616-5270 Telephone: 530-754-7700 Fax: N/A Email: awards@ucdavis.edu

Administrative Contact Name: Renee Carnes Address: Research Division 1001 I Street, 7th Floor Sacramento, CA 95814 Telephone: (279) 208-7754 Email: renee.carnes@arb.ca.gov	***Administrative Contact*** Name: Sharon Holgerson Research Administrator Address: Institute of Transportation Studies 1715 Tila Street Davis, CA 95616 Telephone: 530-752-9276 Email: skholgerson@ucdavis.edu
Financial Contact/Accounting Name: Accounts Payable Address: P.O. Box 1436 Sacramento, CA 95814 Email: AccountsPayable@arb.ca.gov **Send courtesy copy to:** rd.invoices@arb.ca.gov	***Authorized Financial Contact/Invoicing*** Name: Nicole Tardiff Director, Contracts & Grants Accounting Address: 1441 Research Park Drive Davis, CA 95618 Telephone: 530-757-8525 Email: ndtardiff@ucdavis.edu Designees for invoice certification in accordance with Exhibit C – University Terms and Conditions, Section 14 on behalf of the Financial Contact: 1. Tammy Castelli, Fund Mgr. Supervisor, tacastelli@ucdavis.edu 2. Lenora Bruce, Fund Mgr. Supervisor, labruce@ucdavis.edu 3.

EXHIBIT A4

USE OF INTELLECTUAL PROPERTY & DATA

If either Party will be using any third-party or pre-existing intellectual property (including, but not limited to copyrighted works, known patents, trademarks, service marks and trade secrets) "IP" and/or Data with restrictions on use, then list all such IP/Data and the nature of the restriction below. If no third-party or pre-existing IP/Data will be used, check "none" in this section.

A. State: Preexisting Intellectual Property (IP)/Data to be provided to the University from the State or a third party for use in the performance in the Scope of Work.

None or List:

Owner (State Agency or 3rd Party)	Description	Nature of restriction:

B. University: Restrictions in Preexisting IP/Data included in Deliverables identified in Exhibit A1, Deliverables.

None or List:

Owner (University or 3rd Party)	Description	Nature of restriction:

C. Anticipated restrictions on use of Project Data.
If the University PI anticipates that any of the Project Data generated during the performance of the Scope of Work will have a restriction on use (such as subject identifying information in a data set), then list all such anticipated restrictions below. If there are no restrictions anticipated in the Project Data, then check "none" in this section.

None or List:

Owner (State Agency or 3rd Party)	Description	Nature of restriction:

EXHIBIT A5

RÉSUMÉ / BIOSKETCH

Attach 2-3 page Résumé/Biosketch for Key Personnel listed in Exhibit A2.

GIOVANNI CIRCELLA, Ph.D.
Director, 3 Revolutions Future Mobility Program, and Professional Researcher, Institute of Transportation Studies, University of California, Davis, *and*
Assistant Professor of Mobility, Department of Geography, Ghent University
+1-530-554-0838, gcircella@ucdavis.edu
Website: https://3rev.ucdavis.edu/giovanni-circella/ LinkedIn: giovannicircella

EDUCATION

Politecnico di Bari (Technical Univ. of Bari, Italy), Ph.D. in Transportation Planning (2008)
Specializations: land use transportation modeling, transportation planning, environmental economics, policies for sustainable transportation
Dissertation: *Integrated Land Use and Transportation Planning for Sustainable Transport Solutions*
University of California, Davis, M.S. in Agricultural and Resource Economics (2009)
Politecnico di Bari (Technical Univ. of Bari, Italy), Italian Laurea (B.A.+M.S.) Degree (summa cum laude) in Civil Engineering (2004)

SELECTED PROFESSIONAL SERVICE AND AWARDS

Assistant Professor, Department of Geography, Ghent University, 2022 – present.
Head of Master School in Urban Mobility, European Institute of Technology, 2022 – present.
Director, 3 Revolutions Future Mobility Program, Institute of Transportation Studies, University of California, Davis, 2017 – present.
Honda Distinguished Scholar on New Mobility Studies: Endowment from American Honda Co., University of California, Davis, 2018 - present.
Professional Researcher, Institute of Transportation Studies, University of California, Davis, 2023 – present (Associate Prof. Res., 2021 - 2023, Assistant Prof. Res., 2015 – 2021).
Senior Research Engineer, School of Civil and Environmental Engineering, Georgia Institute of Technology, 2016 – 2022 (Research Engineer, 2013 - 2016).
Elected Secretary of the Executive Board, International Association of Travel Behaviour Research (IATBR)*, 2024 – present (Elected Board Member, 2020 – 2024).*
Co-Secretary General, World Conference on Transport Research Society (WCTRS)*, 2023 – present.*
Chair, Standing Committee on Transportation and Information and Communication Technologies (AEP35), Transportation Research Board, 2018 - 2024.
Member, Standing Committee on Travel Behavior and Values (AEP30) and International Coordination Council (A0020C), Transportation Research Board.
Fulbright Program Scholarship: Research Scholar at UC Davis (2006 –2007).
Research Faculty Senate, Georgia Institute of Technology*:* Representative of Research Faculty of the School of Civil and Environmental Engineering, 2014 - 2017.
Post-Doc Researcher, Institute of Transportation Studies, UC Davis, 2009 - 2015.
Licensed Professional Engineer (P.E.): Italy, #7374 – Bari.
Keynote Speaker: Trailways Annual Conference, Fort Myers, FL, February 2016.
Visiting Researcher Scholarships: University of Leeds (UK), 2016, TU Wien (Austria), 2008.
Award for the Best Research Thesis, City of Bari, Italy, 2006.

Socrates-Erasmus Program Fellowship: Universidad Politécnica de Valencia, Spain, 2003.

PROFESSIONAL EXPERIENCE

Giovanni Circella is the Director of the 3 Revolutions Future Mobility Program at the University of California, Davis, and a BOF Tenure-track Assistant Professor in the Department of Geography of Ghent University. He is also the Head of the Master School in Urban Mobility of the European Institute of Technology, and has been the Honda Distinguished Scholar for New Mobility Studies at UC Davis since 2018. Prof. Circella's interests include travel behavior and emerging transportation services, sustainable transportation, travel demand modeling, travel survey methods, and policy analysis. His recent research has focused on the impacts of information and communication technology (ICT), telecommuting, e-shopping, new mobility (including shared mobility, micromobility and ridehailing) and vehicle automation on travel behavior and auto ownership, the evolving lifestyles and mobility patterns of specific population segments (e.g. "millennials") and in various regions of the U.S., Europe, South America and the Middle East. Dr. Circella has led a major research effort on the impacts of the COVID-19 pandemic on activity organization and travel choices. He is a member of the Travel Behavior and Values (AEP30) Committee and the International Coordination Council (A0020C) of the Transportation Research Board. Dr. Circella is the elected secretary of the International Association for Travel Behaviour Research, and the co-secretary general of the World Conference on Transport Research Society. He has served in the NCHRP 20-102, 20-102(01), 20-102(09) and 20-102(19) and TCRP B-47 project panels on the impacts of connected and automated vehicles and other emerging transportation technologies. Dr. Circella regularly cooperates with planning organizations and other agencies in Europe, the U.S. and South America.

SELECTED RECENT PUBLICATIONS

"Not all ride-hailing trips are created equal: an examination of additional trips enabled by ride-hailing and the users who made them." (*forthcoming*), by P. Loa, X. Iogansen, Y. Lee, and G. Circella. *Transportation*, https://doi.org/10.1007/s11116-024-10566-6

"Ridehailing use, travel patterns and multimodality: A latent-class cluster analysis of one-week GPS-based travel diaries in California." (2025), by X. Iogansen, Y. Lee, M. Young, J. Compostella, G. Circella, and A. Jenn. *Travel Behaviour and Society*, 38, 100855.

"Examining Complex Impacts of E-shopping and Built Environment Factors on Shopping VMT." (2025), by M. Sohi, P. Loa, B. Ozbilen, X. Iogansen, Y. Lee, and G. Circella, *Transportation Research Part D: Transport and Environment*, 139, 104567.

"Future of Passenger Mobility in the USA: Scenarios for 2030." (2025), by A. Kothawala, M. Ahmad, R. Dominguez-Faus, L. Fulton, and G. Circella. *Transportation Research Record*, 03611981241302330.

"Change in work arrangement during the COVID-19 pandemic: A large shift to remote and hybrid work." (2024), by X. Iogansen, J.K. Malik, Y. Lee and G. Circella. *Transp. Res. Interdiscip. Perspectives*, 25, 100969.

"Deciphering the factors associated with adoption of alternative fuel vehicles in California: An investigation of latent attitudes, socio-demographics, and neighborhood effects." (2023), by X. Iogansen, K. Wang, D. Bunch, G. Matson, and G. Circella. *Transportation Research Part A: Policy and Practice*, 168, 103535.

"Transportation and neighborhood priorities of Californians with disabilities: Focus group findings." (2023), by J. Flynn, G. Circella, and P. S. Venkataram. *Transportation Research Record*, 03611981231180203.

"What travel modes do shared e-scooters displace? A review of recent research findings" (2023), by K. Wang, X. Qian, D. Fitch, Y. Lee, J. Malik and G. Circella, *Transport Reviews*, 43 (1), 5-31.

"Exploring heterogeneous structural relationships between e-shopping, local accessibility, and car-based travel: an application of enriched National Household Travel Survey add-on data" (2023), by S.H. Kim, P.L. Mokhtarian, S. Choo, and G. Circella, *Transportation Research Record*, 2677 (5), 463-480.

"Longitudinal analysis of COVID-19 impacts on mobility: an early snapshot of the emerging changes in travel behavior." (2022), by G. Matson, S. McElroy, Y. Lee, and G. Circella, *Transp. Res. Record*, 2677(4), 298-312.

"Estimating short-term travel demand models that incorporate personally owned autonomous vehicles" (2022), by M. Harb, J. L. Walker, J. Malik, and G. Circella, *Travel Behaviour and Society*, 26, 279-289.

Yongsung Lee

1605 Tilia Street, Davis, CA 95616

email yshlee@ucdavis.edu | ORCID 0000-0002-1980-1225 | Google Scholar

Present academic position:

Assistant professional researcher, Institute of Transportation Studies, University of California, Davis (07/2023-)

Previous academic position:

Assistant professor, Department of Geography, University of Hong Kong (8/2020-8/2023)

Postdoctoral fellow, School of Civil and Environmental Engineering, Georgia Institute of Technology (9/2018–6/2020)

Academic qualifications:

Ph.D., School of City and Regional Planning, Georgia Institute of Technology (12/2018)

M.U.P., Urban and Regional Planning, University of Illinois at Urbana-Champaign (08/2012)

M.E., Architecture, Seoul National University, South Korea (02/2008)

B.E., Architecture, Seoul National University, South Korea (02/2003)

Research interest:

Travel Behavior, Transportation Planning, Information and Communication Technology, Shared Mobility, Autonomous Vehicle, Value/Attitude/Lifestyle

Previous relevant research work:

1. Impacts of the COVID-19 Pandemic on Mobility, Telecommuting, and E-shopping Patterns in the United States, 3 Revolution Future Mobility Program, Institute of Transportation Studies, University of California at Davis, PI: Dr. Giovanni Circella, 2020-2024.
2. Attitudes and Preferences on Emerging Transportation Modes and Autonomous Vehicles, Center for Teaching Old Models NEw Tricks, or TOMNET (The U.S. DOT Tier-1 UTC), PIs: Drs. Ram Pendyala & Patricia L. Mokhtarian, 20172020.
3. Exploring the Relationships among Travel Multimodality, Driving Behavior, Ridehailing and Energy Consumption, National Center for Sustainable Transportation, PI: Dr. Giovanni Circella, 2017-2019.
4. The Impacts of Emerging Technologies and Trends on Travel Demand in Georgia, School of Civil and Environmental Engineering, Georgia Institute of Technology, PI: Dr. Patricia L. Mokhtarian, 2016-2019.
5. What Affects Millennials mobility? The Impacts of Residential Location, Individual Preferences, and Lifestyles on Young Adults Travel Behavior in California, Institute of Transportation Studies, University of California, Davis, PI: Dr. Giovanni Circella, 2015-2017.

Research grant:

1. Proposal submitted to the University of California Institute of Transportation Studies (UC ITS) as PI for project titled, “Towards Sustainable Urban Logistics" (1/1/2025-12/31/2025, received budget USD 40,000)
2. Proposal submitted to the National Center for Sustainable Transportation as Co-PI for project titled, “Lessons Learned on Mobility as a Service (MaaS): Exploring Opportunities and Barriers for the US Context” (4/1/2025-3/31/2026, received budget USD 38,703)
3. Proposal submitted to the National Center for Sustainable Transportation as Co-PI for project titled, “Investigating the Evolution of Residential Self-Selection in the Post-COVID Era: The Transition to Digital Lifestyles and Changing Travel Behaviors” (1/1/2025-12/31/2025, received budget USD 140,000)
4. Proposal submitted to the Swedish Governmental Agency for Innovation Systems (i.e., Vinnova) as Co-I for project titled, “Transatlantic Cooperation for Leveling Up MaaS” (4/1/2024-3/31/2025, received SEK 995,640 or USD 96,107)
5. National Center for Sustainable Transportation (funded by the U.S. Department of Transportation) as Co-PI for project titled, “Impacts of Remote/Hybrid Work and Remote Services on Activity and Transportation Patterns” (USD 231,607: 04/2024-03/2026)
6. Proposal submitted to the Hui Oi-Chow Trust Fund at the University of Hong Kong as PI for project titled, “Social and built-environment factors affecting physical activities during the COVID-19 pandemic” (received budget, HKD 69,269 or USD 8,918)
7. Proposal submitted to the Seed Fund for Basic Research for New Staff at the University of Hong Kong as PI for project titled, “Travel Behaviours During and After the COVID-19 Pandemic” (received budget, HKD 150,000 or USD 19,323)
8. Proposal submitted to the National Center for Sustainable Transportation as PI for project titled, “If Pooling with a Discount were Available for the Last Solo-Ridehailing Trip, How Much Additional Travel Time Would Users Have Accepted and for Which Types of Trips?” (received budget, USD 30,000)

Representative publications:

1. Kim, I., **Lee, Y.**, Mokhtarian, P. L., & Circella, G. (*accepted*). How Will People Spend Travel Time in Autonomous Vehicles? A Four-Region Study Focusing on Heterogeneous Preferences. *Transportation*.
2. Loa, P., Iogansen, X., **Lee, Y.**, & Circella, G. (2025). Are All Ride-hailing Trips Created Equal? An Examination of Additional Trips Enabled by Ride-hailing and the Users Who Make Them. *Transportation*.
3. Iogansen, X., **Lee, Y.**, Young, M., Compostella, J., Circella, G., & Jenn, A. (2024). Ridehailing Use, Travel Patterns and Multimodal Lifestyle: A Latent-class Cluster Analysis of One-week GPS-based Travel Diaries in California. *Travel Behaviour & Society*.
4. **Lee, Y.**, & De Vos, J. (2023). Who Would Continue Working Remotely in Hong Kong As the Pandemic Progresses? *Transportation Research Part D: Transport and Environment*. 120(103753), 1-23.
5. **Lee, Y.**, & Lee, B. (2022). What's Eating the Public Transit in the United States?: Reasons for Declining Transit Ridership in the 2010s. *Transportation Research Part A: Policy and Practice*. 157, 126-143.
6. **Lee, Y.**, Chen, Y. H., Circella, G., & Mokhtarian, P. L. (2022). Substitution or Complementarity? A Latent-Class Cluster Analysis of Ridehailing Impacts on the Use of Travel Modes in Southern U.S. Cities. *Transportation Research Part D: Transport and Environment*. 104(130167), 1-15.
7. Wang, K., Qian, X., Circella, G., **Lee, Y.**, Malik, J., & Fitch, D. T. (2022). What Mobility Modes Do Shared E-Scooters Displace? A Review of Recent Research Findings. *Transport Review*.
8. **Lee, Y.**, Circella, G., Mokhtarian, P. L., & Guhathakurta, S. (2019). Heterogeneous Residential Preferences Among Millennials and Members of Generation X in California: A Latent-Class Approach. *Transportation Research Part D: Transport and Environment.*
9. **Lee, Y.**, Circella, G., Mokhtarian, P. L., & Guhathakurta, S. (2019). Are Millennials More Multimodal? A Latent-Class Cluster Analysis with Attitudes and Preferences among Millennial and Generation X Commuters in California. *Transportation*.
10. **Lee, Y.**, Lee, B., & Shubho, M. T. H. (2019). Urban Revival by Millennials? Intra-Urban Net Migration Patterns of Young Adults, 1980-2010. *Journal of Regional Science*.

Editorships of academic journals:

1. Guest editor for Travel Behaviour and Society on a special issue on post-pandemic mobility (08/2021-04/2024)

Membership of professional organisations:

1. Standing committee on Effects of Information and Communication Technologies (ICT) on Travel Choices (AEP35), Transportation Research Board (4/15/2022-4/14/2025)
2. International Association of Travel Behavior Research (IATBR, 2018-)
3. Association of Collegiate Schools of Planning (ACSP, 2014-)

EXHIBIT A6

CURRENT & PENDING SUPPORT

University will provide current & pending support information for Key Personnel identified in Exhibit A2 at time of proposal and upon request from State agency. The "Proposed Project" is this application that is submitted to the State. Add pages as needed.

PI: Giovanni Circella					
Status	**Award #**	**Source**	**Project Title**	**Start Date**	**End Date**
Proposed Project		CARB	Validating Vehicle Choice Surveys	TBD	TBD
Active	74A1413	Caltrans	Future of Mobility Whitepaper	10/1/2023	12/31/2025

PI: Yongsung Lee					
Status	**Award #**	**Source**	**Project Title**	**Start Date**	**End Date**
Proposed Project		CARB	Validating Vehicle Choice Surveys	TBD	TBD
Active	74A1413	Caltrans	Future of Mobility Whitepaper	10/1/2023	12/31/2025
Active		Caltrans	Towards Sustainable Urban Logistics	1/1/2025	12/31/2025

EXHIBIT A7

THIRD PARTY CONFIDENTIAL INFORMATION

CONFIDENTIAL NONDISCLOSURE AGREEMENT

(Identified in Exhibit A, Scope of Work – will be incorporated, if applicable)

If the Scope of Work requires the provision of third party confidential information to either the State or the Universities, then any requirement of the third party in the use and disposition of the confidential information will be listed below. The third party may require a separate Confidential Nondisclosure Agreement (CNDA) as a requirement to use the confidential information. Any CNDA will be identified in this Exhibit A7.

Or

Exhibit A7 is not applicable for this Agreement.

EXHIBIT B3

INVOICE ELEMENTS

In accordance with Section 14 of Exhibit C – Payment and Invoicing, the invoice, summary report and/or transaction/payroll ledger shall be certified by the University's Financial Contact and the PI (or their respective designees).

Invoicing frequency

☒ Quarterly ☐ Monthly

Invoicing signature format

☐ Ink ☒ Facsimile/Electronic Approval

Summary Invoice – includes either on the invoice or in a separate summary document – by approved budget category (Exhibit B) – expenditures for the invoice period, approved budget, cumulative expenditures and budget balance available[7]

- Personnel
- Equipment
- Travel
- Subawardee – Consultants
- Subawardee – Subcontract/Subrecipients
- Materials & Supplies
- Other Direct Costs
    - TOTAL DIRECT COSTS (if available from system)
- Indirect Costs
    - TOTAL

Detailed transaction ledger and/or payroll ledger for the invoice period [8]

- University Fund OR Agency Award # (to connect to invoice summary)
- Invoice/Report Period (matching invoice summary)
- GL Account/Object Code
- Doc Type (or subledger reference)
- Transaction Reference#
- Transaction Description, Vendor and/or Employee Name
- Transaction Posting Date
- Time Worked
- Transaction Amount

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[7] If this information is not on the invoice or summary attachment, it may be included in a detailed transaction ledger.

[8] For salaries and wages, these elements are anticipated to be included in the detailed transaction ledger. If all elements are not contained in the transaction ledger, then a separate payroll ledger may be provided with the required elements.

EXHIBIT D

ADDITIONAL REQUIREMENTS ASSOCIATED WITH FUNDING SOURCES

Exhibit D is not applicable for this Agreement.

EXHIBIT E

SPECIAL CONDITIONS FOR SECURITY OF CONFIDENTIAL INFORMATION

If the Scope of Work or project results in additional legal and regulatory requirements regarding security of Confidential Information, those requirements regarding the use and disposition of the information, will be provided by the funding State agency in Exhibit E. (Please see section 8.E of Exhibit C.)

OR

Exhibit E is not applicable for this Agreement.

EXHIBIT F

ACCESS TO STATE FACILITIES OR COMPUTING RESOURCES

Exhibit F is not applicable for this Agreement.

EXHIBIT G

NEGOTIATED ALTERNATE UTC TERMS

I. Exhibit C, UTC – 220 Section 14 – Payment & Invoicing is hereby amended to incorporate the following:

Add Item 6 to Section 14. A. to read as follows:

6) CARB shall withhold payment equal to 10 percent after the Contractor has been compensated for 90 percent of the total agreement amount. The 10 percent shall be withheld until completion of all work and submission to CARB by the University of a final report approved by CARB in accordance with Exhibit A1, Schedule of Deliverables, Section 2. It is the University's responsibility to submit one (1) original and one (1) copy of the final invoice.

Amend Section 14. C.2 – Invoicing to read as follows:

2) Invoices shall be submitted in arrears not more frequently ~~than monthly and not less frequently~~ than quarterly to the State Financial Contact, identified in Exhibit A3. Invoices may be submitted electronically by email. If submitted electronically, invoice must include the following certification for State certification to the State Controller's Office, in compliance with SAM 8422.1

This bill has been checked against our records and found to be the original one presented for payment and has not been paid. We have recorded this payment so as to prevent later duplicate payment.

Signed: _____
State Agency Accounting Officer

Add Item E: to Section 14, to read as follows:

E. Advance Payment

1) Nothing herein contained shall preclude advance payments pursuant to Title 2, Division 3, Part 1, Chapter 3, Article 1 of the Government Code of the State of California.

2) Upon termination or completion of this Agreement, Contractor shall refund any excess funds to the CARB. Contractor will reconcile total Agreement costs to total payments received in advance and any remaining advance will be refunded to the CARB's Accounting Office. In the event the Agreement is terminated, total project costs incurred prior to the effective date of termination (including close-out costs) will be reconciled to total project payments received in advance and any remaining advance will be refunded to the CARB. In either event Contractor shall return any balance due to CARB within sixty (60) days, of expiration or earlier termination.

Amend Section 14.B –Budget Flexibility to read as follows:

B. Budget revisions between identified budget categories in cost reimbursement agreements that are within the total Agreement amount, comply with the Prior Approval Requirements, above and do not change the Scope of Work or substitute Key Personnel, as defined in this Agreement, are allowed as described below:

1) Up to 10% ~~of each annual budget amount or $10,000, whichever is less,~~ is allowed with approval of the State's Contract Project Manager, or as otherwise agreed to by the Parties and documented on Exhibit B.

2) Exceeding 10% ~~or $10,000, whichever is less,~~ of the last approved budget require the State's Contract Project Manager's prior approval and may require a formal amendment to this Agreement. The University will submit a revised budget to the State for approval. Budget transfers that would cause any portion of the funds to be used for purposes other than those consistent with the original intent of this Agreement are not allowed.

II. Add the following sections to the UTC-220 to incorporate additional required provisions:

Add Section 31 to read as follows:

31. GenAI Disclosure Obligations:

A. The following terms are in addition to the defined terms and shall apply to the Contract:

1) "Generative AI (GenAI)" means an artificial intelligence system that can generate derived synthetic content, including text, images, video, and audio that emulates the structure and characteristics of the system's training data. (Gov. Code § 11549.64.)

B. Contractor shall immediately notify the State in writing if it: (1) intends to provide GenAI as a deliverable to the State; or (2), intends to utilize GenAI, including GenAI from third parties, to complete all or a portion of any deliverable that materially impacts: (i) functionality of a State system, (ii) risk to the State, or (iii) Contract performance. For avoidance of doubt, the term "materially impacts" shall have the meaning set forth in State Administrative Manual (SAM) § 4986.2 Definitions for GenAI.

C. Notification shall be provided to the State designee identified in this Contract.

D. At the direction of the State, Contractor shall discontinue the provision to the State of any previously unreported GenAI that results in a material impact to the functionality of the System, risk to the State, or Contract performance, as determined by the State.

E. If the use of previously undisclosed GenAI is approved by the State, then Contractor will update the Deliverable description, and the Parties will amend the Contract accordingly, which may include incorporating the GenAI Special Provisions into the Contract, at no additional cost to the State.

F. The State, at its sole discretion, may consider Contractor's failure to disclose or discontinue the provision or use of GenAI as described above, to constitute a material breach of Contract when such failure results in a material impact to the functionality of the System, risk to the State, or Contract performance. The State is entitled to seek any and all remedies available to it under law

as a result of such breach, including but not limited to termination of the contract.

Add Section 32 to read as follows:

32. Health and Safety

Contractors are required to, at their own expense, comply with all applicable health and safety laws and regulations. Upon notice, Contractors are also required to comply with the state agency's specific health and safety requirements and policies.
Contractors agree to include in any subcontract related to performance of this Agreement, a requirement that the subcontractor comply with all applicable health and safety laws and regulations, and upon notice, the state agency's specific health and safety requirements and policies.

Add Section 33 to read as follows:

33. Executive Order N-6-22 – Russia Sanctions

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. The EO directs state agencies to terminate contracts with, and to refrain from entering any new contracts with, individuals or entities that are determined to be a target of Economic Sanctions. Accordingly, should the State determine Contractor is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for termination of this agreement. The State shall provide Contractor advance written notice of such termination, allowing Contractor at least 30 calendar days to provide a written response. Termination shall be at the sole discretion of the State.