<Project Title>

<Project Title>

<Month and Year Submitted>

<Authors as First M. Last>

Insert project photo to replace this placeholder.

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**TECHNICAL REPORT DOCUMENTATION PAGE**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1. Report No. | 2. Government Accession No. | | | 3. Recipient’s Catalog No. | | |
| 4. Title and Subtitle  <Project Title> [select the field, hit F9, and delete this text] | | | | 5. Report Date  <Month and Year Submitted> [select the field, hit F9, and delete this text] | | |
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| 11. Contract or Grant No. 69A3551747128 | | |
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| 16. Abstract  <Abstract highlighting the major findings of the project. TRDP should not go over one page.> | | | | | | |
| 17. Key Words  <Key words separated by commas> | | | 18. Distribution Statement  No restrictions. This document is available to the public through the CARTEEH UTC website.  http://carteeh.org | | | |
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Executive Summary

The executive summary should serve as a high-level, standalone project brief (up to two pages) that succinctly describes the problem, the work conducted, and outputs, outcomes, and impacts resulting from the study. Please include the following sections:

1. Problem statement—describe the motivation and need for the project, including a statement of the problem to be solved or the research needed.
2. Technical objectives—describe the technical objectives of the study, including the approach and methodology used to achieve the research goals.
3. Key findings—highlight the key study findings, including relevant outputs and outcomes.
4. Project impacts—describe the impacts of the study on:

* The effectiveness of the transportation system.
* The adoption of new practices.
* The body of scientific knowledge.
* Transportation workforce development.

Acknowledgments

(Optional) Acknowledge any other contributors and sources of project funding other than CARTEEH.

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# Report Guidelines (FOR REFERENCE—Delete This Section)

## Formatting and Content

Follow these guidelines in preparing your report:

* Use only the styles provided in this template if possible:
* Heading 1, Heading 2, Heading 3, and Heading 4.
* Body Text, List Bullet, List Bullet 2, and List Number.
* Figure and Figure Caption.
* Table Caption, Table Header, and Table Text.
* Organize the report into sections or chapters to give a complete description of the project, including data gathered, analyses performed, and results achieved. Use appendices as needed for supplementary materials.
* Heading names (Methods, Results, etc.) in this document are solely for demonstration purposes. Rename or rerrange section headings as necessary, but make sure to include a description of the following required elements:
* The research problem.
* Current literature and the state of the practice.
* The approach and methodology.
* Data collection, analysis, and results.
* Findings, conclusions, and recommendations.
* Research outputs, outcomes, and impacts.
* Technology transfer outputs, outcomes, and impacts.
* Education outputs, outcomes, and impacts.
* Cite your sources using a consistent format.

If you would like information on how to use templates, please visit <http://tti.tamu.edu/group/communications/word-template-instructions/>.

## Review and Publication Process

The principal investigator (PI) should submit the Project Closeout Checklist and draft Final Research Report within **60 days** after the project completion date. CARTEEH leadership will then review the report and determine whether additional edits are necessary prior to its approval. If edits are required, the report will be returned to the PI with comments on requested revisions.

Once revisions are completed, the final documents should be returned to CARTEEH for final approval. After notifying the PI of the final approval, CARTEEH administration will upload the research report to the CARTEEH website and various repositories, per the grant’s requirements.

## Figures

High-resolution images are preferred if possible. Use automatic cross references to mention each figure in the text (Figure 1).



Figure 1. Sample image with caption. (Use sentence case; end with a period.)

## Tables

Use automatic cross references to mention each table in the text (Table 1). Tables should be created using Word’s formatting if possible.

Table 1. Sample Table Caption (Capitalize Each Word, and Do Not End with a Period)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Title 1 | Title 2 | Title 3 | Title 4 | Title 5 |
| The table should be centered on the page. | Headers for the columns should be in Table Header style and shaded 20 percent gray. | Units should be given in the header and not repeated in cells. | All table text should use the Table Text style and be centered. | Tables should not split across the page unless absolutely necessary. |
| Info 1 | Info 2 | Info 3 | Info 4 | Info 5 |

# Sample Level 1 Heading

## Sample Level 2 Heading

In order to use a subheading, you need to divide chunks of information. Therefore, you should have at least two subheadings.

Use **Body Text** style for paragraphs. Use a sentence to introduce bullets:

* Bullet. Use **List Bullet** style.
* Bullet.
* Bullet.
* Sub-bullet. **Use List Bullet 2** style.
* Sub-bullet.
* Sub-bullet.

### Sample Level 3 Heading

Use **Body Text** style. Use a sentence to introduce numbered lists:

1. List element. Use **List Number** style.
2. List element.
3. List element.

#### Sample Level 4 Heading

Use **Body Text** style. Try not to go beyond level 4 headings.

# Background and Introduction

Use **Body Text** style.

### Asthma

Asthma is a complex chronic air way disease characterized by episodes of shortness of breath, coughing, wheezing and sputum production, caused by a reversible or partially reversible airway obstruction and hyperresponsiveness with varying degrees of severity ranging from mild self-resolving to sever episodes resulting in mortality (National Heart Lung and Blood Institute, 2007). In 2015, a global burden of disease study estimated that more than 358 million individuals had asthma around the world making it the most prevalent chronic respiratory disease worldwide (Soriano et al., 2017). In the United States (U.S.) the National health Interview Survey in 2017 showed that 19 million adults and 6.2 million children currently had asthma.

### Causation of asthma

Text here ….

### New evidence of traffic related air pollution induced asthma

Text here ….

#### Biological plausibility

Text here ….

#### Significance of association

Text here ….

### State of evidence of similar burden studies

Text here ….

# Problem

Use **Body Text** style.

# Approach

Use **Body Text** style.

# Methodology

Use **Body Text** style.

### Study area and time period

We analyzed census, air pollution and asthma incidence rates data for the contiguous U.S. (48 states and the District of Columbia) for the years 2000 and 2010. The analysis was done using the finest level of the standard hierarchy of census geographic entities in the U.S. when available [Figure]. Data available at the census block level (the finest geographical unit for census data) included population counts, urban or rural living location and air pollution data. The median household income data was only available at the census group level (one level higher than the census block) while asthma incidence rate was only available at the state level. States not within the contiguous U.S., namely Alaska, Hawaii and Puerto Rico, were excluded from the analysis due to the unavailability of air pollution data.

### Census data

Text here ….

### Air pollution exposure data

Text here ….

#### NO2 exposure

#### PM2.5 exposure

#### PM10 exposure

### Asthma incidence rate data

Text here ….

#### National asthma incidence rate

Text here ….

#### State-specific asthma incidence rate

Text here ….

### Concentration response function

Text here ….

### Burden of disease methodology

Text here ….

### Counterfactual scenarios

Text here ….

### Sensitivity analysis

Text here ….

### Running the analysis

Text here ….

#### Software used

Text here ….

#### Spatial maps production

Text here ….

#### 500 cities lookup table

Text here ….

# Results

Use **Body Text** style.

# Conclusions and Recommendations

Use **Body Text** style.

# Outputs, Outcomes, and Impacts

**[Delete these section instructions]**

**Outputs**: new or improved processes, practices, technologies, software, training aids, or other tangible products resulting from this activity.

**Outcomes**: changes made to the transportation system, or its regulatory, legislative, or policy framework, resulting from research outputs.

**Impacts:** the effects of an outcome on the transportation system, or society in general, such as reduced fatalities, decreased operating costs, etc.

## Research Outputs, Outcomes, and Impacts

**[Delete these section instructions]**

Please provide a detailed description of all **research** outputs, outcomes, and impacts resulting from this study.

Examples include:

* Peer-reviewed publications.
* Presentations at conferences and technical meetings.
* Changes to policy or regulations, or decisions that were informed by research findings.

## Technology Transfer Outputs, Outcomes, and Impacts

**[Delete these section instructions]**

Please provide a detailed description of all technology transfer outputs, outcomes, and impacts resulting from this study.

Examples include:

* Data sets produced, including digital object identifier (doi).
* Code developed, including links to a repository.
* Software developed, including doi.
* Intellectual property generated, including subject inventions, patent applications, and issued patents.
* Strategic partnerships formed to inform decision-making or drive technology adoption, including public and private sectors.

## Education and Workforce Development Outputs, Outcomes, and Impacts

**[Delete these section instructions]**

Please provide a detailed description of all education and workforce development outputs, outcomes, and impacts resulting from this study.

Examples include:

* Students involved in the project.
* Outreach to students conducted at the K-12 and university level as part of the project.
* Training and educational materials developed, including curricula, lectures, and classroom exercises.
* Innovative educational and outreach methods deployed as a result of the project.

National Heart Lung and Blood Institute. (2007). National Asthma Education and Prevention Program. Expert panel report 3: guidelines for the diagnosis and management of asthma: full report 2007.

Soriano, J. B., Abajobir, A. A., Abate, K. H., Abera, S. F., Agrawal, A., Ahmed, M. B., Aichour, A. N., Aichour, I., Aichour, M. T. E., & Alam, K. (2017). Global, regional, and national deaths, prevalence, disability-adjusted life years, and years lived with disability for chronic obstructive pulmonary disease and asthma, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet Respiratory Medicine, 5*(9), 691-706.