IDAHO TRANSPORTATION DEPARTMENT

RESEARCH REPORT

[Report Title]

RP [###] Number to be supplied by ITD

By

[First M.I. Last, First M.I. Last, etc.]

[Authoring Organization]

Prepared for

Idaho Transportation Department

[ITD Research Program, Planning and Development Services](https://itd.idaho.gov/alt-programs/?target=research-program)

Highways Division

[Month Year] E.g., February 2023

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Leave this page unchanged except for the deletion of this text.

Throughout this file, **delete all instructions** (text in yellow highlighting).

Items in [square brackets] should be replaced with report-specific content.

Pay special attention to guidance noted “**ACCESSIBILITY**” to meet federal accessibility requirements.

Technical Report Documentation Page

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. Report No.  FHWA-ID-(will be filled in by ITD) | 2. Government Accession No. | | 3. Recipient’s Catalog No. | | |
| 4. Title and Subtitle  [Report Title] | | | 5. Report Date  [Month Year] | | |
| 6. Performing Organization Code | | |
| 7. Author(s) List all authors. Include ORCID numbers with hyperlinks if known; if so, separate each author with a line break  [First M.I. Last, First M.I. Last, etc.] or  [First M.I. Last, [https://orcid.org/####-####-####-####](https://orcid.org/)]  [First M.I. Last, [https://orcid.org/####-####-####-####](https://orcid.org/)] | | | 8. Performing Organization Report No.  [Billing code] | | |
| 9. Performing Organization Name and Address  [Organization name]  [Organization address] | | | 10. Work Unit No. (trais) | | |
| 11. Contract or Grant No. | | |
| 12. Sponsoring Agency Name and Address  Idaho Transportation Department (SPR)  Highways Division, Planning and Development Services, Research Program  PO Box 7129 Boise, ID 83707-7129 | | | 13. Type of Report and Period Covered  [Final or Interim] Report  [mm/dd/yyyy - mm/dd/yyyy] | | |
| 14. Sponsoring Agency Code  RP-[###] | | |
| 15. Supplementary Notes  Project performed in cooperation with the Idaho Transportation Department and Federal Highway Administration. | | | | | |
| 16. Abstract  Provide an approximately 200-word description of the project. | | | | | |
| 17. Key Words  [Keywords] | | 18. Distribution Statement  Copies available from the [ITD Research Program](https://itd.idaho.gov/alt-programs/?target=research-program) | | | |
| 19. Security Classification (of this report)  Unclassified | 20. Security Classification (of this page)  Unclassified | | | 21. No. of Pages  [Add the total # of pages] | 22. Price  None |

Note the table above is exempt from certain federal Section 508 regulations; it is the only table in the report where merged cells are allowed. Blank cells in the table above should be left blank.

Acknowledgments

[Text]

Technical Advisory Committee

Each research project is overseen by a Technical Advisory Committee (TAC), which is led by an ITD project sponsor and project manager. The TAC is responsible for monitoring project progress, reviewing deliverables, ensuring that study objectives are met, and facilitating implementation of research recommendations, as appropriate. ITD’s Research Program Manager appreciates the work of the following TAC members in guiding this research study.

* Project Sponsor: [Name]
* Project Manager: [Name]
* TAC Members: [List]
* FHWA-Idaho Advisor: [Name]

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The Table of Contents, List of Tables, and List of Figures automatically populate with data when Word heading styles and captions (table and figure labels) are used correctly.

Before completing the report, Update the Table of Contents (this page) by right-clicking within the table and selecting “Update Field > Update Entire Table.” Similarly update the List of Tables and List of Figures (following pages) before completing the report.

Separate the Table of Contents, List of Tables, List of Figures and List of Abbreviations and Acronyms with page breaks.

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List of Abbreviations and Acronyms

23 CFR 420 Code of Federal Regulations, Title 23, Part 420

FHWA Federal Highway Administration

ITD Idaho Transportation Department

RD&T Research, development, and technology transfer

SP&R State Planning & Research (FHWA)

TAC Technical Advisory Committee

Replace the examples above with relevant abbreviations and acronyms used in this report.

# Executive Summary

The executive summary is the only chapter that is not numbered. An executive summary typically ranges in length from one page for a shorter report to three pages for a longer report.

# [Chapter Title] Use Style “Heading 1” for Chapter Titles; Use Title Case for styles “Heading 1” and “Heading 2.”

[Text] Use style “Normal” for regular text.

Start each chapter on a new page.

## [Second-Level Header]

[Text]

### [Third-level header] Use sentence case for styles “Heading 3” and “Heading 4”.

[Text]

#### [Fourth-level header]

[Text]

# Sample Content

Content in this chapter is provided as examples and guidance. **The most common content elements are provided here. See the** [**ITD Style Manual for Research Reports**](https://apps.itd.idaho.gov/Apps/research/forms/ResearchReportStyleManual.pdf) **for further details.** Delete this entire chapter from the report.

## Tables

A sample table follows.

Table 2.1 Intersection Crash History (1/1/2002 to 12/31/2004)

| **Intersection** | **Number of Crashes** | **Collision: Rear-End** | **Collision: Turning** | **Collision: Angle** | **Collision: Other** | **Severity: PDO** | **Severity: Injury** | **MEV** | **Crashes per MEV** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SW ABC Blvd./ SW XYZ Ave. | 32 | 13 | 13 | 4 | 2 | 21 | 11 | 14.6 | 0.44 |
| SW ABC Blvd./ SW LMNOP Ave. | 6 | 2 | 3 | 1 | 0 | 4 | 2 | 5.1 | 0.23 |

PDO—Property Damage Only

MEV—Million Entering Vehicles

Additional guidance:

* Create tables in Word (“Insert > Table” menu options). Do *not* paste or insert a table as an image. Do *not* insert an Excel table.
* Use tables only to display data. Do *not* use tables to format a page.
* **ACCESSIBILITY:** Make tables as simple as possible.
  + Do *not* merge any cells in a table.
  + Do *not* add extra spaces or blank lines.
  + Do *not* insert screenshots of tables.
  + Do *not* group tables with figures.
  + In the menu “Table Layout > Properties > Row,” uncheck “Allow row to break across pages.”
* **ACCESSIBILITY:** Use “Table Tools > Layout > Repeat Header Rows” to indicate the table header row.
* **ACCESSIBILITY:** Bold lines, shading or color may be used for emphasis or clarity, but they may *not* be used as the sole method of communicating information, even if color-coding is explained.
  + Permissible options:

| **Growth Rate, May 2020** | **Growth Rate, June 2020** |
| --- | --- |
| 8.20% | -6.04% |

| **Growth Rate, May 2020** | **Growth Rate, June 2020** |
| --- | --- |
| 8.20% | -6.04% |

* + *Not* permissible option:

| **Growth Rate, May 2020** | **Growth Rate, June 2020** |
| --- | --- |
| 8.20% | 6.04% |

*Note: Green shading indicates positive growth,  
pink shading indicates negative growth.*

* **ACCESSIBILITY:** Use of alternative text (or “alt text”) with tables is optional.
  + Following the accessibility guidelines for tables should make alt next unnecessary, but it may be provided as additional guidance for readers.
  + See **Chapter 3. Accessibility** in the [ITD Style Manual for Research Reports](https://apps.itd.idaho.gov/Apps/research/forms/ResearchReportStyleManual.pdf) for information about alt text.
* To properly insert the label above the table so that the List of Tables populates correctly:
  + Use “References > Insert Caption.”
  + Center label after placing.
* If you change chapter numbering after creating a label:
  1. Select the caption text.
  2. Right-click and select “Update field” to fix numbering.

## Figures

Common types of figures are **charts** (or graphs—graphic representations of data), **images** (photos and illustrations), and **maps**. Guidance and instructions here apply to all types of figures.

A sample figure follows.

The horizontal axis lists 31 dates in 2020 from January 1 to January 31.

The primary (left) vertical axis indicates the daily low temperature in degrees Fahrenheit for each date. Plotted data in red from January 1 to January 31 range between 15 °F and 40 °F. 

The secondary (right) vertical axis indicates the daily high wind speed in miles per hour for each date. Plotted data in blue from January 1 to January 31 range between 5 mph and 25 mph. 


Figure 2.1 Daily low temperatures and high wind speeds recorded in Boise, Idaho, in January 2020

Additional guidance:

* **ACCESSIBILITY:** Use alt text to describe in detail what is being communicated in the graphic.
  + See **Chapter 3. Accessibility** in the [ITD Style Manual for Research Reports](https://apps.itd.idaho.gov/Apps/research/forms/ResearchReportStyleManual.pdf) for information about alt text.
  + Right-click the image and use the “Format Image > Layout and Properties > Alt Text” menus to set the alt text.
  + See the example alt text provided for the figure above.
* **ACCESSIBILITY:** Color may be used to emphasize different data sets, but it cannot be the only means to distinguish between them.
  + In the above example, square and triangular data markers distinguish the two data sets.
  + On a map, do not only rely solely on coloring of regions to convey data.
* **ACCESSIBILITY:** To support users with limited vision, consider labeling individual data points with numerical values or including a numerical data table to supplement the chart.
  + Do *not* add text or number labels to charts using “Insert >Text Box” tool in Word.
* Clearly label all axes and data sets.
* To properly insert the label below the figure so that the List of Figures populates correctly:
  + Use “References > Insert Caption.”
  + Center label after placing.
* If you change chapter numbering after creating a label:

1. Select the caption text.
2. Right-click and select “Update field” to fix numbering.

* Find additional discussion on inserting, formatting, and labeling figures in the [ITD Style Manual for Research Reports](https://apps.itd.idaho.gov/Apps/research/forms/ResearchReportStyleManual.pdf).

## Equations

Sample use of an equation with defined terms follows.

*(begin example)*

Global positioning systems involve calculating speeds and distances to such precision where special relativity must be considered. For this, Lorentz factor, γ, is used:

Formula defining the Lorentz factor

Formula reads:

gamma equals begin fraction 1 divided by begin square root 1 minus begin fraction v squared divided by c squared end fraction end square root end fraction

Terms are defined in the report narrative.

Where:

γ = Lorentz factor, dimensionless

v = relative velocity between inertial frames of reference, in meters per second

c = speed of light in a vacuum, 2.998 × 10E8 meters per second

*(end example)*

Additional guidance:

* Do *not* use a figure label for equations.
* **ACCESSIBILITY**: Do *not* use equation editor directly in the Word file.
  + Insert or paste an image of the equation into the Word file.
  + Use alt text to completely describe the equation.
  + Right-click the image and use the “Format Image > Layout and Properties > Alt Text” menus to set the alt text.
  + See alt text used with the example above for a well-described equation.
  + State in the alt text that “Terms are defined in the report narrative” and then define these terms after the equation as shown in the example.

## Bullets and Numbering

Use Word’s automatic bullet and numbering features.

Bullet style is pre-set in this template:

* Bullet level 1
  + Bullet level 2
    - Bullet level 3

Numbering style is also pre-set in this template:

1. Numbering level 1
   1. Numbering level 2
      1. Numbering level 3

## In-Text Citations

Follow the Chicago Manual of Style (CMOS) for in-text citations, as noted on its [Author-Date: Sample Citations page](https://www.chicagomanualofstyle.org/tools_citationguide/citation-guide-2.html).

*(begin example)*

Standards are of high importance for intelligent transportation systems (ITS) technologies (Patel and Rowe, n.d.). One ITS research study conducted in South Korea field-tested previously designed pictograms on variable message signs (Tay and Choi 2009, 56).

*(end example)*

Additional guidance:

* See Chapter 3, Cited Works, for more guidance on how to prepare a cited works page.

# Cited Works

Content in this chapter is provided to serve as guidance with examples. Delete this guidance content from the Cited Works page. The following sample citations are provided:

* A government-sponsored research report
* A conference presentation
* An ITD manual
* A website
* A journal article
* A second citation by the same authors

*(begin example)*

Federal Highway Administration. 2020. *Alternative Designs to Alleviate Freeway Bottlenecks at Merging, Diverging, and Weaving Areas.* Hale, David K., Jiaqi Ma, Amir Ghiasi, Pascal Volet, Burak Cesme, Alexandra Kondyli, Bastian Schroeder, Sonika Sethi, Laura Torres, and Francois Belisle. FHWA-HRT-20-008. Accessed July 1, 2020. <https://www.fhwa.dot.gov/publications/research/operations/20008/index.cfm>.

Galehouse, Larry. 2019. “Regional Trends in Pavement Preservation.” Presented at Association of Modified Asphalt Producers 20th Annual Conference and Workshop, Fort Lauderdale, Florida, February 6, 2019. Accessed July 7, 2020. <https://www.modifiedasphalt.org/educational-library/presentations/>

Idaho Transportation Department. 2020. *Traffic Manual: Idaho Supplementary Guidance to the MUTCD*. Accessed July 1, 2020. <https://apps.itd.idaho.gov/apps/manuals/Traffic_Manual.pdf>.

Patel, Raman K., and Edwin Rowe. “An Overview of ITS Standards and Protocols.” Institute of Transportation Engineers. Accessed June 6, 2020. <https://www.ite.org/technical-resources/standards/its-standards-and-protocols/>.

Tay, Richard, and Jaisung Choi. 2009. “Evaluation of Pictograms in Dynamic Lane Control Systems in the Republic of Korea.” *Journal of Transportation Systems Engineering and Information Technology* 9, no. 2 (April 2009): 56-61. Accessed June 6, 2020. <https://doi.org/10.1016/S1570-6672(08)60054-9>.

———. 2017. “Differences in Rental and Nonrental Car Crashes.” *Journal of Advanced Transportation* 2017: 1-8. Accessed July 1, 2020. <https://doi.org/10.1155/2017/8757891>.

*(end example)*

Additional guidance:

* Follow the CMOS author-date citation format for cited works entries. (Do *not* use the alternative CMOS format Notes and Bibliography.) Instructions and more examples are on CMOS’s[Author-Date: Sample Citations page](https://www.chicagomanualofstyle.org/tools_citationguide/citation-guide-2.html).
* List references in alphabetical order.
* For multiple works by the same author or same combination of authors, use three em dashes (———) as shown above, and then order by ascending date. See Bibliography.com’s [How to Make and Use 3-em Dash in Chicago Style page](https://www.bibliography.com/chicago/using-3-em-dash-in-chicago-turabian/).
* If you wish, use Word’s automated citation feature for In-Text Citations and Cited Works using the “References > Insert Citation” menu options with “Chicago” style selected.
  + Authors are advised that automatically generated citations and cited works lists may need to be manually adjusted to match ITD’s requirements.
  + Authors are cautioned that their manual adjustments may be overwritten when they run updates on the Cited Works list. For this reason, manual adjustments should be made as a final step.

# Appendix A. [Title]

Use Heading 1 style for the appendix title but delete the chapter number.