

**A L<sup>A</sup>T<sub>E</sub>X TEMPLATE FOR PAPERS SUBMITTED TO THE TRANSPORTATION  
RESEARCH BOARD**

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Word Count: 1089 words + 1 table(s)  $\times$  250 = 1339 words

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**1 ABSTRACT**

2 The Transportation Research Board (TRB) has unique and seemingly arbitrary requirements for  
3 manuscripts submitted for review. These requirements make it difficult to write the manuscripts  
4 quickly, and no existing  $\text{\LaTeX}$  style comes close to fooling the guidelines. This represents an initial  
5 effort at creating a template to meet the requirements of TRB authors using  $\text{\LaTeX}$ , R, Sweave,  
6 and/or other literate programming software.

7  
8 *Keywords:* Keyword1, Keyword2

## 1 INTRODUCTION

2 The Transportation Research Board (*I*) has unique and somewhat arbitrary requirements for papers  
3 submitted for review and publication. While the initial submission is required to be in PDF for-  
4 mat, submissions for publication in Transportation Research Record must be in Microsoft Office  
5 format. On top of this, the manuscripts must be line-numbered, captions are bolded and employ  
6 atypical punctuation, and the references must be numbered when cited and then printed in order.  
7 More details about the manuscript details can be found online at [http://onlinepubs.trb.org/](http://onlinepubs.trb.org/onlinepubs/AM/InfoForAuthors.pdf)  
8 [onlinepubs/AM/InfoForAuthors.pdf](http://onlinepubs.trb.org/onlinepubs/AM/InfoForAuthors.pdf).

9 It is assumed that the readers of this document have some significant level of experience in  
10  $\text{\LaTeX}$  and `bibtex`. As use of literate programming becomes more widespread in engineering and  
11 planning, it is possible that this template may need to be made more robust.

## 12 History

13 David Pritchard posted the original versions of this template in 2009 and updated it in 2011, soon  
14 after TRB began allowing PDF submissions. Gregory Macfarlane made significant adaptations to it  
15 in March 2012, allowing for Sweave integration and automatic word and table counts. Ross Wang  
16 automated the total word count and made some formatting modifications in July 2015. Version  
17 2.1.1 has been made available on GitHub in January, 2016. Version 3.1 has been made available on  
18 Github ([https://github.com/chiehrosswang/TRB\\_LaTeX\\_rnw](https://github.com/chiehrosswang/TRB_LaTeX_rnw)) in June, 2017. Versions 2.1.1  
19 Lite and 3.1 Lite were made available on GitHub ([https://github.com/chiehrosswang/TRB\\_](https://github.com/chiehrosswang/TRB_LaTeX_tex)  
20 [LaTeX\\_tex](https://github.com/chiehrosswang/TRB_LaTeX_tex)) in June, 2017 for users who do not need R and Sweave functions provided in the  
21 original versions.

## 22 FEATURES

23 The template has a number of features that enable quick and painless manuscript authoring.

### 24 Title Page

25 The standard  $\text{\LaTeX}$  `\maketitle` command is not very versatile, so we have replaced it with a  
26 `titlepage` environment. This means that the writers will be required to manually enter spacings  
27 based on the number of contributors, but the current settings (12pt between authors, 36pt before,  
28 and 60pt after them) seems to work well.

29 Near the bottom of the title page, TRB requires a count of the manuscript's words, figures,  
30 and tables. This template generates these counts automatically. The figure and table counts are  
31 simply pulled from the  $\text{\LaTeX}$  counters using the `totcount` package. The word count feature is  
32 not as straight-forward, as it utilizes a call to the system command `texcount`. Thus to compile the  
33 document writers must enable `\write18` in their `pdflatex` call.

34 In the newest version of this template, we added the total count automatically. The total  
35 count basically adds not only the word count, but also the equivalent count (250 words) for each  
36 figure and table. This is implemented using a customized command `\totalwordcount`. Please  
37 see the original code for more information.

### 38 Page Layout

39 The document has 1 inch margins as required, with the author's names in the left heading and the  
40 page number in the right. The authors heading will need to be edited by the writers; automating this  
41 from the title page command is not currently possible. Paragraphs leading sections and subsections

1 are not indented, while all subsequent paragraphs in that section are. Section types are defined as  
 2 outlined by the Transportation Research Board (*I*)

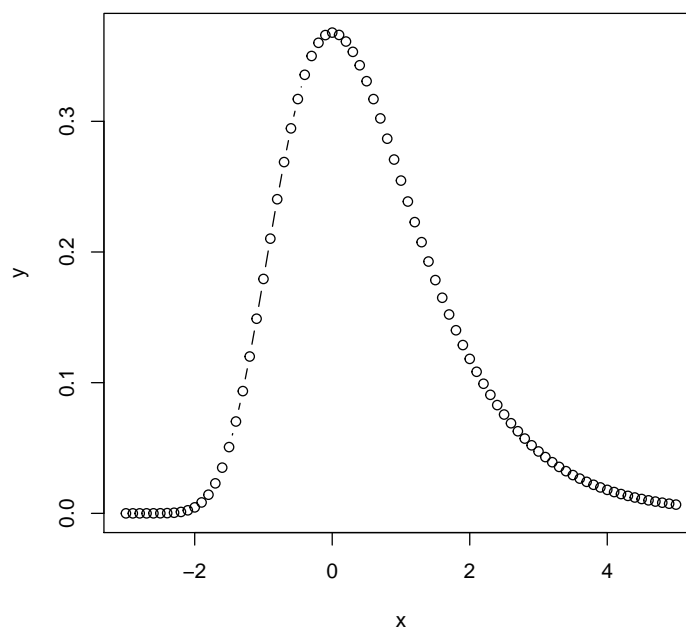
3 The document is single-spaced in 12 point Times font. Times New Roman is a proprietary  
 4 font and is therefore not available by installation in open-source software. While the differences  
 5 between Times variants are negligible, Times New Roman itself can be used in Mac OSX by  
 6 compiling under xelatex.

### 7 *Line Numbers*

8 Manuscript line numbering is implemented using the `lineno` package. There are options to change  
 9 the font style and type, but the current settings work well. Note that the line numbers refresh each  
 10 page, and that blank lines do not receive a number. Currently, line numbers and headers are not  
 11 shown on the title page, but can be easily added by adding `\pagewiselinenumbers` command  
 12 right before the beginning of the title page.

### 13 CAPTIONS

14 Figure 1 shows a Gumbel distribution as an example of captioning. As demonstrated, figure cap-  
 15 tions ought to be sentence capitalized, balded, and can be somewhat longer than in other journals.



**FIGURE 1** This is a random figure to test the counting functionality on the title page. It shows a Gumbel distribution with mode 0 and scale 1. The multinomial logit model assumes that the error terms are distributed identically and independently following this pattern.

16 Table captions are somewhat different, requiring initial capitals and are more of a title. An  
 17 example of this is given in Table 1, showing the history of this template.

**TABLE 1 A History of this Template**

Version	Date	Author	Contributions
1.0	Sep 2009	Pritchard	Initial work
1.1	Mar 2011	Pritchard	Captions
2.0	Mar 2012	Macfarlane	Automation, documentation
2.1	Jul 2015	Wang	More automation and formatting
2.1.1	Jan 2016	Wang	Minor modifications and uploaded to Github
2.1.1 Lite	Jun 2017	Wang	TeX-only template
3.1	Jun 2017	Wang	Addition of <code>trbunofficial.cls</code>
3.1 Lite	Jun 2017	Wang	Addition of <code>trbunofficial.cls</code>

## 1 Bibliography

2 The TRB bibliography style is defined in the `trb.bst` file which should be in your document  
3 folder. A new command is specified, `\trbcite{}` which will print the authors and the number  
4 of the reference in the order in which it is supplied. Note that `\trbcite{}` prints both the author  
5 names and the reference number, if you simply need the number of the reference, use command  
6 `\cite{}`. The References section will be appended to the end of the document.

7 It is very easy to add reference to papers programs written by Bierlaire (2) and Bierlaire (3)  
8 or to papers like those written by Garrow et al. (4) and Koppelman and Garrow (5). You can even  
9 go back and refer to Biogéme by Bierlaire (3) a second time. You can also cite a group of similar  
10 references without printing author names (1, 2). This template also groups multiple reference  
11 numbers together if there are three or more consecutive numbers (2–5).

## 12 Equations

13 Intelligent driver model equations from wikipedia [https://en.wikipedia.org/wiki/Intelligent\\_](https://en.wikipedia.org/wiki/Intelligent_driver_model)  
14 `driver_model` moved to the left using `amsmath` package with `fleqn` options.

$$15 \quad \dot{x}_\alpha = \frac{dx_\alpha}{dt} = v_\alpha \quad (1)$$

$$16 \quad \dot{v}_\alpha = \frac{dv_\alpha}{dt} = a \left( 1 - \left( \frac{v_\alpha}{v_0} \right)^\delta - \left( \frac{s^*(v_\alpha, \Delta v_\alpha)}{s_\alpha} \right)^2 \right) \quad (2)$$

$$17 \quad s^*(v_\alpha, \Delta v_\alpha) = s_0 + v_\alpha T + \frac{v_\alpha \Delta v_\alpha}{2\sqrt{ab}} \quad (3)$$

## 19 TO DO'S

20 Two document types, extending from the `[numbered]` option, can be defined to differentiate the  
21 initial submission (i.e., with line numbers and in-line figures and tables) and the final manuscript  
22 (i.e., without line numbers and all figures and tables are attached to the end).

## 23 CONCLUSION

24 To make the document from source in a Unix-like OS using Sweave, issue the following com-  
25 mands:

```
1 R CMD SWEAVE 'trb_template.rnw'
2 pdflatex --shell-escape document.tex
3 bibtex document
4 pdflatex --shell-escape document.tex
5 pdflatex --shell-escape document.tex
```

6       The `--shell-escape` option is required to access the command line for the word count.  
7 Normally this feature is disabled because it is a route of entry for malicious software. We promise  
8 that there is no such debilitating code in this document, and we encourage you to examine any  
9 scripts for suspicious code before permitting `pdflatex` from accessing your system.

10       For R-Studio users using Sweave and `.rnw` files, you may enable shell escape command in  
11 the Global Options > Sweave settings. Moreover, if your computer does not have a Perl interpreter  
12 you will need one, such as the ActivePerl, for the wordcount to work properly.

### 13 **ACKNOWLEDGEMENTS**

14 The authors would like to thank Aleksandar Trifunovic (<https://github.com/akstrfn>) for cre-  
15 ating the `trbunofficial` class document, which has been a very helpful improvement.

**REFERENCES**

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