

**PRINCIPLES FOR THE ORGANIZATION OF THE TRANSPORTATION**  
**RESEARCH THESAURUS**

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## **1 INTRODUCTION**

The Transportation Research Thesaurus (TRT) is a standard for the indexing of transportation concepts and topics. It was developed under the National Cooperative Highway Research Program (NCHRP), Projects 20-32 and 20-32(2), administered by the Transportation Research Board (TRB). This Principles document is intended as a policy statement for specific practices within the organization and development of the TRT. It is intended to provide scope and structure to those involved in the development of the thesaurus.

## **2 FOUNDATION**

The TRT was originally developed to serve as an indexing tool for the Transportation Research Information Service (TRIS) database. As such, it was created as a multimodal thesaurus with an emphasis on highways.

The TRT conforms to the National Information Standards Organization's American National Standard (ANSI/NISO) Z39.19-2005, entitled *Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies*.

The TRT has already been defined in detail in the *Transportation Research Thesaurus and User's Guide* (NCHRP 450). The Principles document reviews some of the information contained in the NCHRP report, and in ANSI/NISO Z39.19-2005, but it is focused primarily on establishing policies and procedures for the review and maintenance of the TRT. For additional information on the structure, history, and philosophy behind the creation of the TRT, please refer to the documents listed above.

## **3 SCOPE**

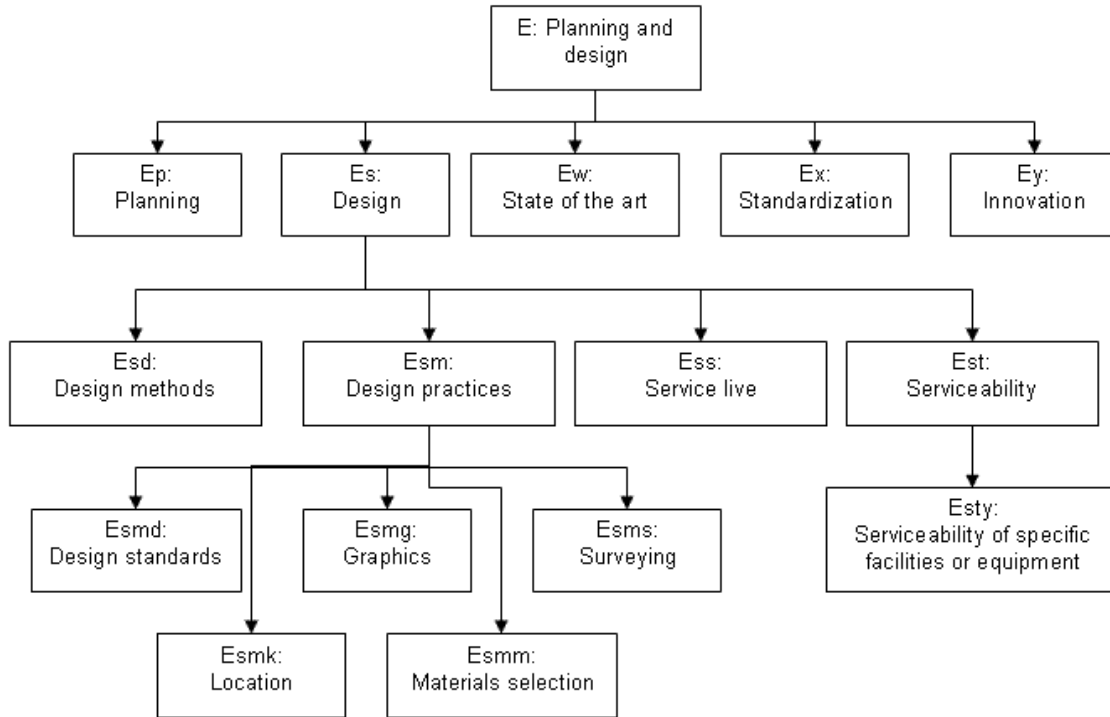
The original purpose of the TRT was for TRIS indexing, and thus the scope reflected the coverage of TRIS (multimodal but with an emphasis on highways). The current scope of the TRT is to contain subjects relating to the general field of transportation, including air, land, sea, and space modes.

The TRT does not generally include proper names. This includes formal names of government agencies, organizations, persons, or places. The one exception to this is instances in which the proper name has entered into common usage (e.g., Terzaghi's rule). It is strongly recommended that a standard authority list be used for all proper names. Two possible lists are the Library of Congress Authority File and the United States Board of Geographic Names.

## 4 STRUCTURE

The TRT is organized into a set of 21 hierarchies, called facets. Each facet consists of one Top Term that represents a principle concept within the TRT. Below each Top Term are terms that are both closely related and subordinate to it.

Terms within the TRT are labeled using a notation system. The system identifies the Top Term using a capital letter, and uses lower case letters to indicate subordinate levels in the hierarchy, resulting in a unique notation for each term in the thesaurus.

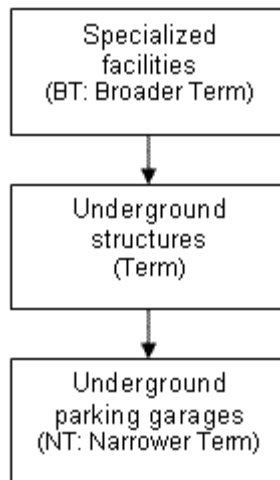


**Figure 1 : Example of the TRT Structure**

Terms within the TRT are linked through their semantic relationships to one another. The semantic connection between terms can generally be defined as one of three relationship types: hierarchical, equivalent, or associative.

### 4.1 Hierarchical relationships

Hierarchical relationships are based on levels of superordination and subordination, where subordinate terms represent members or parts of the superordinate term. Hierarchical relationships are expressed as broader terms (BT) and narrower terms (NT).



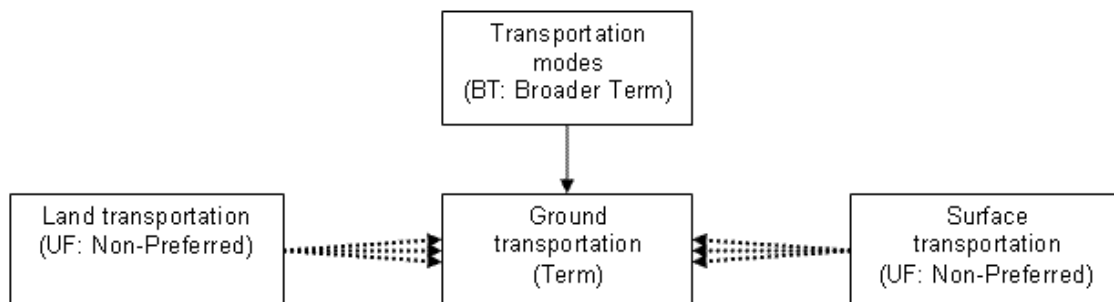
**Figure 2 : Example of the TRT hierarchical relationship**

*Underground structures are a type of Specialized facility, while Underground parking garages in turn are a type of Underground structure.*

## 4.2 Equivalence relationships

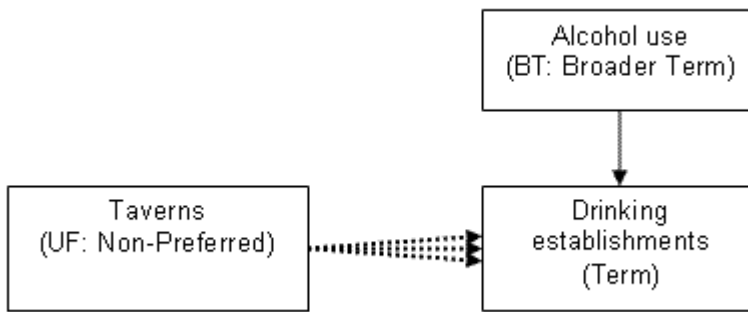
It is not uncommon for one concept to be represented by several different terms. Because of this, within the TRT, one preferred term is selected for each concept. Terms that are synonyms or near-synonyms to the preferred term, those that have variant spellings, or those that represent a focus that is too narrow for the scope of the TRT are linked to the preferred term.

In the full display of the preferred term, these non-preferred terms are referred to as Use For terms (UF).



**Figure 3 : Example of the TRT non-preferred relationship**

*Ground transportation is the preferred term, and both Land transportation and Surface transportation are non-preferred terms for this concept. Any searches that are performed on either of these terms will refer the searcher to Ground transportation.*



**Figure 4 : Another example of the TRT non-preferred relationship**

Given the TRT's focus as a transportation resource, the addition of *Taverns* as a preferred term, would be a far too specific term. However, it is possible that indexers or researchers might search for the term. Therefore, it is added as a non-preferred term within the broader topic of *Drinking establishments*, which is an established term within the TRT.

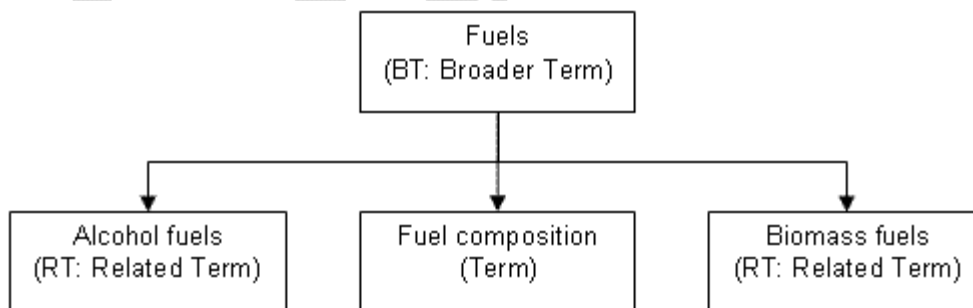
### 4.3 Associative relationships

Associative relationships exist between terms that are neither hierarchical nor equivalent, but are nevertheless semantically related to one another.

Within the TRT, there are two types of associative relationships: related terms, and cross-references.

#### 4.3.1 Related terms

Related terms (RT) are terms that are siblings within the same branch of the hierarchy, and which therefore, possess the same superordinate term.

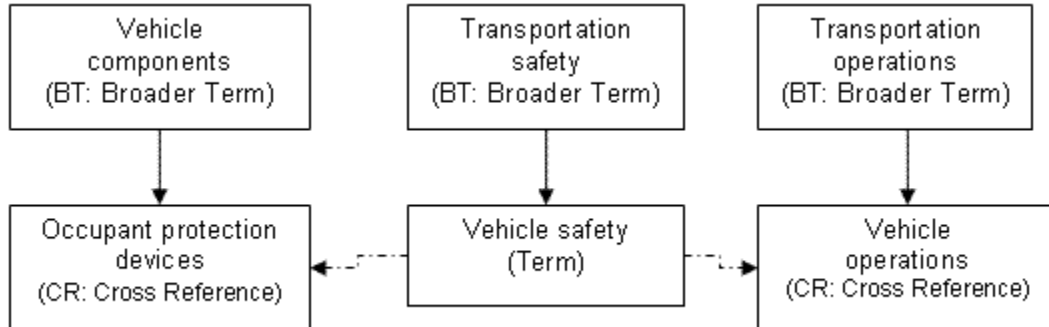


**Figure 5 : Example of the TRT associative relationship of related terms**

*Fuel composition* has two siblings or related terms, *Alcohol fuels* and *Biomass fuels*. All three terms are the children of *Fuels*.

### 4.3.2 Cross-references

Cross-references point toward terms with associative relationships that exist in separate branches of the hierarchy. In the TRT these have sometimes also been known as RT2 terms



**Figure 6 : Example of the TRT associative relationship of cross reference**

Although they have different parent terms, the topics of *Vehicle operations*, and *Occupant protection devices* relate to the concept of *Vehicle safety*, and are therefore added to that term as cross-references. Note that although they may be of interest in the topic of *Vehicle safety*, *Vehicle operations* and *Occupant protection devices* are not related to one another. Therefore, there are no cross-references between these two terms.

## 5 TERM COLLECTION

[Committee guidelines for term submission – need approval of submission form and any other submission methods]

## 6 TERM SELECTION

### 6.1 Warrants

Concepts considered for inclusion into the TRT are selected using a wide variety of sources. Broadly, the terms are selected based on literary warrant, user warrant, and organizational warrant.

#### 6.1.1 Literary warrant

Literary warrant involves examining the vocabulary of the literature, documents, and other source material of the thesaurus' subject area to determine terms to be added to the thesaurus. In the case of the TRT, this need is met in part through: the regular *Transportation Research Information Service (TRIS)* and *National Transportation Library (NTL) Digital Repository* and library catalog reports of uncontrolled terms and keywords used in records of those databases; state departments of transportation websites; transportation industry websites; and transportation industry publications. Given the rapid growth of the transportation field, it is expected that the sources of literary warrant will grow as the field of transportation does.

### **6.1.2 User warrant**

User warrant is determined by examining the search terms and phrases frequently used in requests from users to an information storage and retrieval system. Both TRIS and the NTL provide periodic reports to the TRT selection team to track such searches.

### **6.1.3 Organizational warrant**

Usually organizational warrant involves identifying the terms preferred by the organization or organizations that will use the vocabulary. As the TRT is an international standard, identifying term preference for all organizations connected to transportation would be impractical. Instead, the TRT selection team and the Transportation Research Board's TRT Subcommittee have chosen to view the transportation community as a whole as a de facto organization. As such, suggested terms are being actively solicited from that group.

## **6.2 Precoordinated and postcoordinated terms**

A precoordinated term is one that combines multiple concepts into a compound term in order to indicate a specific concept more accurately. Postcoordinated terms are those that are combined at searching by the vocabulary's user, usually involving a combination of Boolean operators.

Terms selected and arranged so as to allow easy postcoordination are preferred where possible as precoordinated terms can increase the size and complexity of a vocabulary. There are, however, some instances in which precoordinated terms should be retained:

- a) When a phrase occurs frequently within the literature/vocabulary

Example:

Per se laws  
Kiss and ride  
Eminent domain

- b) When creating a compound phrase will help eliminate false hits in the search process

Example:

Block signal systems  
Life cycle analysis  
Critical path method

## **6.3 Ambiguity and qualifiers**

As aiding searching and retrieval is one of the primary goals of the TRT, reducing the problems caused by ambiguity is also considered one of the primary goals of the maintainers of the TRT.

Ambiguity occurs when a word or a phrase describes more than one concept. In such cases, qualifiers are added to assign context to the terms.

Example:

Equilibrium (Economics)  
Equilibrium (Mechanics)  
Equilibrium (Systems)

It is possible for some concepts to belong to more than one category. This is known as polyhierarchy. The TRT's notational organization does not allow for polyhierarchy. Therefore, when a term may reasonably be considered a member of more than one branch of the thesaurus, it should be placed under the branch in which it most frequently appears in literary, user, and organizational warrant. Cross-references should be added pointing from the other possible branches towards the preferred term.

## **6.4 Form of term**

The form of the term should be decided by literary, user, and organizational warrant. The most common spelling of the word, including use of hyphens and apostrophes, should be selected. When variant spellings and punctuation occur, non-preferred heading should be created for them.

### **6.4.1 Natural language order**

Use natural language order, also known as direct order, for the entry of terms. If it is considered necessary for alphabetical listings, non-preferred headings may be included for the indirect form of the term.

### **6.4.2 Plural vs. singular form of term**

Below are explanations and examples to describe when a term should take a plural form and when it should take a singular form. Please note, however, that there may be instances in which both the singular and plural form of the name are needed in the TRT (for example, if they represent different concepts, or are used to distinguish process from product). In those cases, the terms should be assigned either qualifiers or scope notes, as appropriate.

#### **6.4.2.1 Plural form**

Terms in the TRT should be made plural in the following case:

- a) Count nouns – terms about which the question “How many?” can be asked, but about which the question “How much?” cannot be asked.

Example:

Pipeline companies  
Composite pavements

#### **6.4.2.2 Singular form**

Terms in the TRT should be made singular in the following cases:

- a) Noncount nouns – terms about which the question “How much?” can be asked, but about which the question “How many?” cannot be asked.

Example:

Electric power supply  
Econocrete

- b) Abstract concepts – these include activities or processes, properties or states, and disciplines.

Example:

Activities or processes: Production  
Emotions: Anger  
Properties or states: Width  
Disciplines: Zoology

### **6.4.3 Acronyms and abbreviations**

Most terms should be entered in their full form. However, any acronyms or abbreviations that widely appear in common use may be chosen as the preferred terms with their full forms included as non-preferred terms. When an acronym or abbreviation is entered, it should be done so without periods (e.g., DUI rather than D.U.I.)

### **6.4.4 Capitalization**

The first letter of the first word of every term should be capitalized, as should all proper names. Further capitalization may be added if a term includes capitalization in common use, e.g., pH value

### **6.4.5 American form**

The American spelling and usage of a term should be used. If it is considered useful for search purposes, non-preferred terms may be included for the non-American form of a term (e.g., Armored vehicles rather than Armoured vehicles).

## **7 NOTES**

### **7.1 Scope notes**

Scope notes are intended to explain the scope and meaning of a term, as well as to refer the searcher to other sections of the TRT when necessary. Scope notes are to be used for ambiguous terms only, and are not to provide standard definitions (see section 7.2 for explanation of definitions).

Example:

Admixtures

Scope note: Material other than water, aggregates or cement added to concrete during mixing

When a scope note refers to another term in the TRT, a reciprocal scope note should be included in that term.

Example:

Wastes

Scope note: Refer to Rbmd: WASTE PRODUCTS for waste products of potential economic value

Waste products

Scope note: Waste products of potential value in building; Refer to Jfk: WASTES for waste pollutants

## **7.2 Definitions**

Definitions are intended to provide the searcher with the standard definition of the term. It is also expected that thesaurus users will examine the placement of the term within the hierarchy to further illustrate its intended use and meaning.

## **7.3 Editorial notes**

Editorial notes contain any documentation, research, or comments from those involved in maintaining the TRT. The notes are visible only to those with access to the TRT editing software.

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