

A

LITERATURE SEARCHES

Introduction

A review of the literature is an essential component of any research study. This appendix summarizes the sources of information and the strategies for identifying and obtaining relevant materials. Details on how to report a literature review, and the format for citations, are given in Chapter Six.

Any research study must build on what is already known. A literature review enables a person to gain an understanding of the topic and become familiar with the existing state of knowledge. It will identify related research and data so that proposed research can be placed in perspective. A review of the literature might even provide the answers to the problem at hand, such that further investigation is unnecessary. There is so much information available that a critical analysis of the state-of-the-art can be a very cost-effective method of solving problems. Where the review is a prelude to experimental work, the review might identify unanticipated problems, and sometimes, the solutions. Above all, a thorough review of the literature ensures that the proposed study will meet accepted standards and not waste resources.

The vast body of information now available is both a blessing and a curse. On the one hand, there is a greater chance of finding the desired information; on the other hand, the sheer volume of the literature can be intimidating. Fortunately, the development of modern computers and electronic databases has made searching the literature a much simpler task than in the days of color-coded index cards and mechanical systems which relied upon the use of cards with holes punched according to coding system.

There are two types of electronic databases: bibliographic and full text. Bibliographic databases provide complete reference information on an article, including title, author, publication, and date. Some bibliographic databases, such as TRIS (see section later in this appendix) also include an abstract of the article. Full text databases provide access to the full text of an article, but are usually much narrower in scope than bibliographic databases.

Searching the literature involves two essential steps:

1. Identifying relevant articles
2. Obtaining a copy of the articles.

While the creation of numerous databases, and the existence of the Internet, has opened up many new sources of information to the researcher, it has also increased the importance of the professional librarian. Access to many of the commercial databases is expensive, and time on-line must be kept to a minimum. Furthermore, most libraries lend materials only to patrons and to

other libraries, and consequently the assistance of a librarian is needed to borrow any materials from collections outside one's home library.

Sources of Information

Although the technology for searching the literature has changed dramatically in recent years, the principles have not. The basic rule is to progress from the general to the specific as illustrated in Figure B-1. The point at which one begins the search depends upon one's level of knowledge on the subject at hand.

Encyclopaedias are the most general sources of information and, for situations where the researcher is new to the field, a surprisingly useful way of gaining an introduction and some understanding of a subject. Books constitute the next level of specialization and provide a more detailed treatment than is possible in an encyclopaedia. Books are valuable in that they usually provide a balanced treatment of a subject, though their relevance depends on the date of publication and the particular subject matter. If one is fortunate to find a recent monograph, this can be very helpful. The inherent disadvantage of any textbook is that a long time is required for writing, editing and publication. This inevitably means that the text will not be up-to-date, even on the day of publication. In fields that are changing rapidly, such as instrumentation, computer hardware and computer applications, textbooks can provide only an introduction to the subject and most of the required information must be obtained from recent journals, papers, and periodicals.

Hierarchy of Sources

Encyclopaedias
Textbooks
Abstracts
Journals
Conference Proceedings
Periodicals
Reports
Trade Literature
Personal Contacts

Hierarchy of Searching

Titles
Key Words
Abstracts
Documents

Figure A -1: Hierarchies of Sources and Searching

In most fields of science and engineering, abstracts of recent publications are available from commercial sources. Subscriptions are expensive, and commercial abstracts are therefore usually found only in libraries. The simplest compilations publish the titles, abstracts and keywords (as provided by the author) of articles published in a specified number of journals and periodicals. More sophisticated abstracts provide keywords assigned by professional indexers, translations of abstracts published in foreign languages, and, sometimes, annotated summaries. Commercial abstracts are often the best method of searching foreign language publications if one does not know the language.

Journals are one of the most important sources of information. They are normally peer-reviewed, which assures the quality of the publication, and each article contains a list of references for which

there are full citations. A review article, especially one that is recent, is particularly useful, not only for the review, but also for the list of references. For most subject areas, the researcher will find that a substantial proportion of the most relevant articles are published in a relatively small number of journals. Having identified these journals, concentrating one's efforts on recent issues can be an effective way of locating the most useful articles.

Papers published in conference proceedings can also be useful in providing details of recent research or work-in-progress, but they tend to be more difficult to identify and obtain than journal articles. Because conference proceedings are often not subject to peer review, the quality of the papers may be uneven. Papers contained in conference proceedings do not always appear in electronic databases. Where the proceedings are published by a commercial publisher or technical society, they can be purchased or obtained through an interlibrary loan without difficulty. Where the proceedings are published by the conference organizers, and distributed only to the delegates, copies may not be available.

Articles published in periodicals differ from papers in journals in that they are usually chosen to be of general interest, and consequently are written in a more journalistic style and provide fewer technical details. The articles usually describe recent events and are an excellent way of finding out what is happening in the field of interest.

Reports are similar to conference proceedings in that they are not always catalogued, the quality is uneven, and they may be difficult to obtain. The situation improved considerably in the transportation field with the requirement that all reports be catalogued in the TRIS database, and can usually be obtained from either the sponsor or the National Technical Information Service (NTIS), Springfield, VA 22161. The advantage of reports is that they provide the most complete record of a research study. Theses also provide complete documentation of studies, and are available from the University of Michigan at Ann Arbor.

Trade literature should not be discounted as a useful source of information, particularly for details of new materials, products, and equipment. Providing the reader is alert for bias and lack of objectivity, trade literature has the advantages of describing practical applications, and being up-to-date.

The most direct method of obtaining information is to write or speak to the author of an article or a researcher who is currently working in the area of interest. While most researchers are willing to discuss work that has been published, and often provide details of work-in-progress, contact should not be made until you have prepared adequately. Direct personal contact is usually not appropriate until you understand the subject and are familiar with the previous work of the researcher. Questions should be direct and specific. Vague, general questions are unlikely to lead to fruitful discussion because no one has the time to explain what you should be capable of finding out for yourself.

The literature is so vast that it is never possible to locate all the relevant articles on a topic. The objectives of the literature search should be to gain an understanding of the subject matter, and to read the most relevant articles that are obtainable. The "obtainable" criterion should not be interpreted as an excuse not to be persistent in locating copies of relevant articles from obscure sources!

Search Hierarchy

As with sources of information, the hierarchy of searching progresses from the general to the specific, in a logical series of steps. Each step is followed by a selection process. While the steps have become blurred with the advent of electronic searching, the principles remain.

In the past, catalogues would be searched for the titles of articles that appeared relevant, by searching for key words. Abstracts of the most relevant articles would be obtained, and a decision made whether to obtain a copy of the document, depending upon the relevance of the abstract, and the location of the document. This is a very important activity because a lot of time and money can be wasted obtaining documents that ultimately prove not to be very useful. Electronic searches typically search for key words in titles, key word indexes and abstracts simultaneously. In a situation where a very large number of “hits” occurs, it is usually worthwhile to scan the titles manually, before printing the abstracts, because it may be obvious that many of the titles are not relevant. A similar review should be made of the abstracts before documents are ordered.

If you have access to a good technical library, the time-honored pastime of browsing the collection is often time well spent. It is surprising how often very relevant articles are discovered which have not been identified by searching databases. Most library information is catalogued according to one of two major systems: the Library of Congress System or the Dewey Decimal System. The main categories of these two systems are given in Tables A-1 and A-2. The main categories are subdivided several times into areas and subjects such that each publication has a unique call number, which determines its location in the stacks. This means that related material appears in the same location, so that if browsing locates one useful article, others may be close-by.

Journals are not often catalogued, but are shelved alphabetically by title. As noted in the previous section, articles relevant to a particular field of study tend to be published in a small number of journals. Once the journals have been identified, browsing through recent issues can be the beginning of a very rewarding trail. Checking the list of references in recent articles, and subsequently checking the reference lists in those articles, often leads to the identification of a significant portion of the literature.

Table A-1: The Dewey Decimal System

000	General Works	500	Natural Science
100	Philosophy	600	Useful Arts
200	Religion	700	Fine Arts
300	Sociology	800	Literature
400	Philology	900	History

Table A-2: The Library of Congress System

A	General Works	M	Music
B	Philosophy, Religion	N	Fine Art
C	History	P	Language and Literature
D	Foreign History	Q	Science
E, F	American History	R	Medicine
G	Geography, Anthropology	S	Agriculture
H	Social Science	T	Technology
J	Political Science	U	Military Science
K	Law	V	Naval Science
L	Education	Z	Library Science

Search Strategies

Most online searches rely on the use of the Boolean operators AND, OR, NOT, often in conjunction with parentheses. The Boolean operators are not intuitive. For example AND does not add terms to create a greater sum (as in "I will have bacon and eggs"). The OR connector does not reduce the sum (as in "I will have bacon or eggs"). In Boolean Logic the opposite happens, AND reduces, OR expands. The operators are illustrated pictorially in Figure A-2, and examples are given later in this section.

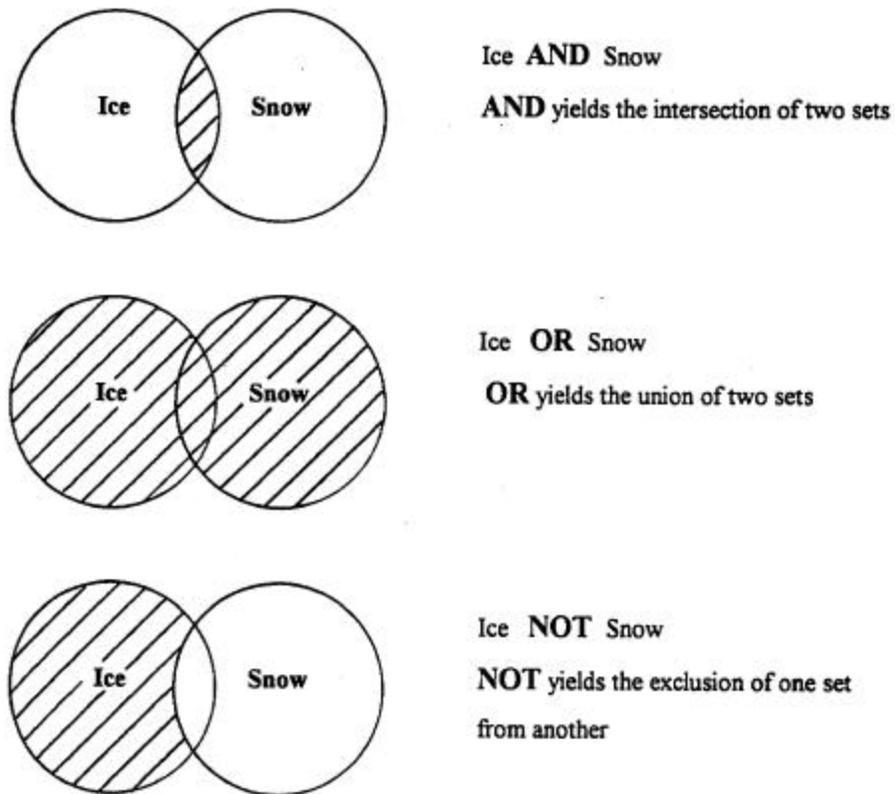


Figure A-2: Illustration of Boolean Operators

There are a number of simple rules for improving the effectiveness of searches, and minimizing the amount of time online.

a) Be specific

The more specific the topic, the lower the probability of identifying articles which are not relevant. For example, a topic such as 'Waterproofing Membranes for Concrete Bridges' provides four words that define a precise area of search. Conversely, a search to identify the literature relevant to the writing of this manual is difficult because the topic is so broad and key words such as science, research, transportation, and methodology can be used in several contexts. In such a case, it is advisable to conduct a series of searches on narrower topics, such as the subject of each chapter.

b) Simplify

Use only key words, and eliminate prepositions, articles and connecting words such as the, and, for, at, by, to, with. Most databases prohibit the use of common prepositions and the Boolean operators as search terms. TRANSPORT (explained in the next section) prohibits the use of a, an, and, in, not, near, of, on, or, the, with.

c) Retrieve only the most recent articles

Most databases allow for the retrieval of articles published after a specified date. The most difficult part of any literature search is obtaining the first few “hits”. As noted in the section ‘Sources of Information’, a recent article is often a gateway to the most relevant literature. Concentrating on the most recent literature also enables the searcher to try different approaches and keywords without the expense of identifying a large body of literature that is not relevant.

d) Truncate

Truncate words to retrieve all words that begin with the same letters. For example: *scien** (the wild card or truncation symbol * is used in TRANSPORT) will retrieve articles containing the words science, scientific and scientist.

e) Ignore Uppercase Letters

Most databases are not case sensitive and all keywords can be entered in lowercase letters, including proper nouns.

f) Use AND to narrow a search

For example *waterproof* AND membrane** will retrieve only items which include waterproof (and waterproofing) and membrane (and membranes), i.e. it will exclude waterproof sealers and admixed waterproofers (because they are not membranes). A search of *waterproof* AND membrane* AND bridge* will exclude applications to structures such as parking garages and tunnels from the previous search. By narrowing the search to *waterproof AND membranes AND bridge AND concrete*, applications to steel and timber bridges will be excluded. However, there is a danger in making the search too narrow, because applications to concrete bridges will also be excluded, unless the author included the word “concrete” in the keywords or abstract (depending on the database).

g) Use OR to broaden a search

This technique is particularly useful when different terms are used for the same thing. For example, in a search for articles on elastomeric bearings, the keywords would probably be *bearing AND elastomer OR rubber*.

h) Use NOT to exclude a concept

For example, if one is interested in bearings used in static applications such as bridges and machinery bases, but not dynamic applications such as automobile engine mounts or helicopter rotors, the search might be *bearing AND (bridge OR machine) NOT (engine OR rotor)*. The use of the parentheses is significant. The above will retrieve every article that includes “bridge” or “machine”, in combination with “bearing”, provided it does not also contain the word “engine” or “rotor”.

TRANSPORT also recognizes the search operators NEAR, WITH and IN. NEAR finds records that contain two terms within the same sentence, e.g. “speed” and “bump”. The addition of a numeral, e.g. *NEAR4* finds terms within the specified number of words of each other. NEAR can be used very effectively to locate terms which usually appear together, e.g. *speed NEAR2 (bump OR hump) OR rumble strip* will produce a search that locates all articles which contain speed bump, speed

hump OR rumble strip (or the plurals of these terms).

The operator WITH is used to find records that contain two (or more) terms in the same field. The fields in TRANSPORT are given in Table A-3.

IN is used to limit a search to words in a particular field. For example Smith IN AU would identify all the articles written by anyone called Smith.

Table A-3: Fields in TRANSPORT

AB	Abstract
AU	Author
CA	Corporate Author(s)
CN	Internal Control Number
DE	Descriptors
IS	ISSN Number
LA	Language of Document
LS	Language of Summary
NT	Source Notes
PA	Publication Availability
PB	Publishers
PY	Publication Year
RN	Report Number
RS	Record Source
SB	Subfile
SC	Subject Classification
SO	Source (Publication Title)
TI	Title
UD	Update Code

Transportation Research Information Services (TRIS)

TRIS is the Transportation Research Information Services database, a computerized information file maintained by the Transportation Research Board, and available on-line at the TRB web site. The database contains more than 350 000 abstracts of completed research, and summaries of research projects in progress. The AASHTO Research Advisory Committee Research-in-Progress database is incorporated into TRIS quarterly.

TRIS is available on-line at the TRB web site to perform searches free of charge. The use of TRIS is required by the Federal Highway Administration SP&R, Research, Development, and Technology Transfer Program Management Process. State research units must use the TRIS database for program development, reporting of current RD&T activities, and input of final report information.

TRIS is the major database for articles related to transportation. A fact sheet on TRIS is given in Figure A-3. TRIS is available in the United States, and many other countries, through Knight-Ridder Information's DIALOG service (a commercial online database service) as File 63. DIALOG also contains the Transportation Library Subfile (TLIB), which is comprised of bibliographic citations of new acquisitions to the University of California, Berkeley, Institute of Transportation Studies Library, and the Northwestern University Transportation Library at Evanston. TLIB covers all modes of

transportation, and more than 9500 citations are added annually.

FACTS ABOUT TRIS

What is TRIS?

TRIS is the Transportation Research Information Services data base, a computerized information file maintained and operated by the Transportation Research Board (TRB) of the National Research Council. It is sponsored by the U.S. Department of Transportation's Federal Highway Administration, Federal Transit Administration, and National Highway Traffic Safety Administration; the highway and transportation departments of the fifty states, the District of Columbia and Puerto Rico; the U.S. Army Corps of Engineers; the American Automobile Manufacturers Association; the National Asphalt Pavement Association; and the Association of American Railroads.

TRIS is available through Knight-Ridder Information's DIALOG service as File 63.

What information is in TRIS?

TRIS contains information on transportation modes and practices, including planning, design, finance, construction, maintenance, equipment, traffic, operations, management, and marketing. TRIS contains more than 350,000 abstracts of completed research and summaries of research projects in progress.

Where does the information come from?

More than 1,000 journals are scanned for TRIS. Primary domestic information sources include the U.S. Department of Transportation's Federal Highway Administration and Federal Transit Administration; the U.S. Congress; the U.S. General Accounting Office; trade and professional associations; universities; research institutes; and other regional and state organizations. International information sources include the International Union of Public Transport, the European Conference of Ministers of Transport, and the Organisation for Economic Cooperation and Development (OECD).

What is TLIB?

The Transportation Library Subfile (TLIB) is a valuable addition to TRIS. The University of California,

Berkeley, Institute of Transportation Studies Library and the Northwestern University Transportation Library at Evanston provide bibliographic citations of new acquisitions, which are added to the TRIS Online file at DIALOG and become part of the TLIB subfile. TLIB covers all modes of transportation and provides more than 9,500 records for TRIS input annually.

What is the format of TRIS?

For records of completed research, the TRIS data base provides abstracts; index terms; and bibliographic citations, including availability. For records of ongoing research projects, the TRIS data base provides project summaries; index terms; names, telephone numbers, and agencies of the responsible individuals and principal investigators; and pertinent published reports. TLIB records contain bibliographic citations and modified Library of Congress subject headings as index terms, but no abstracts.

What is TRANSPORT?

TRANSPORT is a CD-ROM based product combining the complete information resources of the world's three leading transportation research data bases. TRANSPORT provides a single, easy-to-search source for TRIS, OECD's International Road Research Documentation (IRRD) data base, and the European Conference of Ministers of Transport's (ECMT) TRANSDOC data base. TRANSPORT records are easy to access using the SilverPlatter Information Search and Retrieval System (SPIRS) software. Call SilverPlatter Information at 1-800-343-0064 for more information on TRANSPORT.

For additional information about TRIS contact

Jerome T. Maddock
Manager
Information Services
Transportation Research Board
GR 302H
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Washington, DC 20418
Tel: 202-334-2995 Fax: 202-334-3495
Internet: jmaddock@nas.edu

Figure A-3: Fact Sheet on Transportation Research Information Services (TRIS)

TRIS is also available on CD-ROM as part of a commercial package known as TRANSPORT, which also includes the Organization for Economic Cooperation and Development's (OECD) International Road Research Documentation (IRRD) database, and the European Conference of Ministers of Transportation (ECMT) TRANSDOC database. TRANSPORT records can be accessed by using the SilverPlatter Information Search and Retrieval System (SPIRS) software. A two-page fact sheet on TRANSPORT, which includes details of how to subscribe, is given in Figure A-4.

Details about DIALOG can be obtained from DIALOG Information Services, 3460 Hillview Ave., Palo Alto, CA 94304, Tel (800) 334-2564 or (415) 858-3785, Fax (415) 858-7069. Information on connecting to DIALOG with a personal computer is given in Figure A-5 and details of accessing TRIS on DIALOG are given in Figure A-6. DIALOG has international representatives in many countries and these can be contacted through the worldwide headquarters in Palo Alto. DIALOG Information Services Inc. has a home page (<http://www.dialog.com>) on the World Wide Web, which contains information on products and services. A search of the DIALOG data is only available through the Internet to DIALOG customers. DIALOG is also available through "gateway" services, some of which provide search menus and alternative pricing structures.

TRIS maintains a home page on the Internet's World Wide Web at the address: <http://www.nas.edu/trb/index.html>. Users can view a description of TRIS, and, with the correct software, gain access to the catalogs of the two libraries that participate in TLIB: the University of California Institute of Transportation Studies Library (MELVYL), and the Northwestern University Transportation Library (NWUTL). Links to other transportation-related Internet sites are provided, including those of TRB sponsors and government, academic, and other organizations.

Documents that are cited in the TRIS database may be obtained from the publication source listed in the "Availability" field in the record. Sample records are given in the two-page fact sheet shown in Figure A-7. Additional information on obtaining documents is given in Figure A-8.

Further information about TRIS and service providers is available from: Manager, Information Services, Transportation Research Board, 2101 Constitution Avenue, Washington D.C. 20418, Tel (202) 334-2995, Fax (202) 334-3495.

TRANSPORT on SilverPlatter

Based on information from the Organization for Economic Cooperation and Development (OECD), The European Conference of Ministers of Transport (ECMT) and the Transportation Research Board (TRB), TRANSPORT on SilverPlatter provides unparalleled coverage, incorporating the work of the world's top transportation researchers, practitioners and administrators.

A Product of International Cooperation.

TRANSPORT on SilverPlatter combines the databases and knowledge of three leading research organizations: OECD's International Road Research Documentation (IRRD), the European Ministers of Transport TRANSDOC database, and the TRB Transportation Research Information Services database (TRIS). Combined, these databases cover more than 490,000 records. TRANSPORT contains all these with approximately 25,000 new records added annually. The multilingual nature of TRANSPORT (predominantly English, with other articles in French, German and Spanish) makes it a useful tool for any organization already working in, or seeking access to worldwide information.

An Essential Tool for Researchers and Decision Makers in the Transport Field.

The breadth of topics covered by TRANSPORT makes it a useful addition to any information center or library and a requirement for those working within the transport field. The availability of the product as a single or double disc enables users to subscribe at the level they require in order to meet their needs.

An Unparalleled Resource.

TRANSPORT on SilverPlatter contains many records not available as a set anywhere else. It covers all aspects of the transport industry worldwide, particularly in North America and Europe. Available for DOS and Windows platforms in English (French, German and Spanish versions of SilverPlatter's WinSPIRS are currently in development), TRANSPORT is a unique resource providing benefits worldwide.

- more -

Title	TRANSPORT
Source	Organisation for Economic Cooperation and Development, the European Conference of Ministers for Transport, the Transportation Research Board
Coverage	1968-Present
No of Discs	2 (Single Disc Option)
Print Equivalent	None
Update Frequency	Quarterly
Number of Records in Database	490,000
Approximate Number Added Annually	20,000 - 25,000
Number of Journals Indexed	1,000+
Format	Bibliographic
Abstracts Included	Yes
Purchase or Lease	Lease
Searchable Fields	Title, Author, Source, Language, Report/Patent Number, Year of Publication and many more.
Complementary Databases	Applied Science and Technology Index; Business Periodicals Index; CHEM-BANK; COMLINE on SilverPlatter; ISMEC, Market Studies Library on CD

XC045-11

Figure A-4: Fact Sheet on TRANSPORT on SilverPlatter, Part I

TRANSPORT on SilverPlatter

TRANSPORT covers all modes of transportation issues, with emphasis on modes of land transport (road, rail, urban systems), as well as inland and coastal shipping, ports, airports, pipelines, and others.

Subject fields available include:

- Transport: Economics, Administration, Policy
- Environment and Safety in Transport
- Traffic and Transport
- Materials
- Traffic Control, Information Technology and Communications;
- Advanced Transport Telematics (TVHS/RTI)
- Design, Construction and Maintenance of Transport Infrastructures
- Vehicles

Quick Access to the Right Information.

Specific descriptors and broad classification categories guide users to exactly the information they need. Powerful database features and SPIRS, SilverPlatter Information Retrieval System software, provide fast access to important material for expert and novice users alike. Searchers can:

- Search for a single word or phrase or define a range for searching
- Combine search concepts with Boolean operators
- Specify the proximity of words
- Browse and search from the Index of terms
- Search directly from a record
- Review results immediately on screen or in print
- Get help about the search software or the database in use at any point during a search.

What an Annual Subscription Includes.

An annual subscription to TRANSPORT includes the CD-ROM database on two compact discs, quarterly updates, SilverPlatter Information Retrieval System (SPIRS) software for the IBM or compatible, on-disc Help screens and database Guides, comprehensive printed documentation, toll-free technical support and a subscription to the *SilverPlatter Exchange* newsletter.

For more information or to become a SilverPlatter CD-ROM subscriber, call or write:

In the United Kingdom
10 Barley Mow Passage
Chiswick, London W4 4PH
U.K.
0800 262 096
(elsewhere +44 0 181 995 6242)
FAX: +44 0 181 995 5159

In North America
100 River Ridge Drive
Norwood, MA 02062-5043
U.S.A.
800 343 0064
(elsewhere 1 617 769 2599)
FAX: 1 617 769 8763

Or, contact your local distributor:

Figure A-4: Fact Sheet on TRANSPORT on SilverPlatter, Part II

Connecting to DIALOG with a Personal Computer

In order to communicate with DIALOG using a personal computer, you need three basic components. The first component is the computer itself, e.g., an IBM PC or compatible, an Apple computer, or any of a number of other types. The second component is a modem, and the third is some kind of communications software. You can use any type of personal computer for which a compatible modem and communications software are available.



Note that an ordinary telephone line will work with DIALOG; however, avoid using telephone lines with a "call-waiting" feature as they interfere with communications to DIALOG.

Modem. You can use an internal or external modem. An internal modem sits inside the main housing of your personal computer; an external modem is enclosed in a small box that sits outside the computer. The "box" that encases an external modem generally includes a row of lights that indicate when the modem is transmitting or receiving data.

Both internal and external modems connect to a telephone line with a plug-in phone jack. Internal modems have the advantage of being less expensive, and they take up less space since they are internal to your computer. External modems, while more expensive, allow you to monitor data transmission and reception more closely. If you access DIALOG from outside the United States, make sure that your modem is CCITT compatible.

Communications Software. If you plan to start using a personal computer for online searching, you need to acquire communications software to establish the connection between your computer, your modem, and DIALOG. The software must be compatible with both your modem type and your computer; it must be asynchronous, and it should communicate in ASCII code.

When evaluating communications software, you should consider which features are most important to you as an online searcher. If you want to be able to save your searches and/or search results to a disk file, or to create your search strategies before you go online, check with the software vendor to make sure that the software has these capabilities. Other features that you should check for are a "Break" or "Interrupt" function that allows you to interrupt DIALOG

output and return to the question mark prompt and a print function that allows you to print the information that you retrieve from DIALOG. Some communication software also allows you to store the steps required for logon to DIALOG so that you can logon with a single keystroke.

If you are setting up your communications software to communicate with DIALOG, you may need to specify these parameters:

Terminal Emulation:	TTY compatible
Duplex:	Full
Band Rate:	300, 1200, or 2400
Data Bits:	7
Start Bits:	1 (automatically included in most software)
Stop Bits:	1
Parity:	Even

Other specifications that you may need to set are:

XON/OFF option:	on
Auto linefeed:	off
ABM/Answerback:	off
BlockMode:	off
Auto Disconnect:	off

If you are using an IBM PC, PC/XT, PC/AT, Compaq, AT&T 6300, or other IBM-compatible computer, consider using DIALOGLINK,SM a customized communications software package produced by Dialog Information Services especially for DIALOG customers. The DIALOGLINK Communications Manager offers:

- Automatic logon to all DIALOG services
- The ability to create and edit search strategies before going online
- The ability to save, redisplay, and print information already received from DIALOG
- Preset logon protocols for DIALNET®, TYMNET, and TELENET telecommunications networks
- The ability to recall/modify the last command you entered
- Storage and masking of passwords
- A companion Account Manager program that tracks online costs

For more information about DIALOGLINK, contact DIALOG Marketing at 800-3-DIALOG (800-334-2564) or 415-858-3785.

Figure A-5: Connecting to DIALOG with a Personal Computer

Searching TRIS Using DIALOG Menus



DIALOG Information Services, Inc. is the primary carrier of the Transportation Research Information Services (TRIS) database. Users unfamiliar with DIALOG searching can use the Menu feature to search TRIS in these easy steps:

1. Dial the local DIALOG number and enter your password

If you do not already have a DIALOG password, you may obtain one in the United States by calling 800-3-DIALOG (800-334-2564). DIALOG will also supply a list of telephone numbers for U.S. cities.

2. At the DIALOG prompt, type: BEGIN MENU

DIALOG will respond with the following screen:

DIALOG MENU (sm) Main Menu

Choose a subject CATEGORY by entering an option NUMBER. Select a DATABASE by entering its acronym (e.g. PROMT), or file number (*16).

1 Agriculture, Food & Nutrition	12 Law
2 Biosciences & Biotechnology	13 Medicine & Drug Information
3 DIALOG Business Connection (DB)	14 News & Full Text Publications
4 Business Information	15 OAG: Official Airline Guide
5 Chemistry	16 Patents, Trademarks, Copyrights
6 Company Information	17 People, Books, & Consumer News
7 Computers & Software	18 Physical Science & Technology
8 Energy & Environment	19 Social Science & Humanities
9 Engineering	20 DIALMAIL
10 Government & Public Affairs	21 Help in Database Selection
11 Industry Analysis	22 DIALOG News, Help & Practice

Output Review/Cancel Options
Copyright 1991 DIALOG Information Services, Inc. All rights reserved.
/H = Help /L = Logoff /B <Dialog File no.> = Command mode

3. Type: TRIS

The menu screen provides three options: (1) selection of a category by typing a number from 1 to 22, (2) selection of a database by typing its acronym (e.g. PROMT), or (3) selection of a database by entering its file number. Simply type the acronym TRIS to begin searching the TRIS database (option 2).

4. Follow the Menus to perform the search

DIALOG provides appropriate menu screens as the search progresses. Help is always an option on these menus.

Figure A-6: Accessing TRIS on DIALOG

SAMPLE RECORDS

Research in Progress

RECORD TYPE	→	
TRIS ACCESSION NUMBER	→	488510 ¹ PR ¹
TITLE	→	IDENTIFICATION OF SPECIAL USE TRUCK TRAFFIC
INVESTIGATORS	→	INVESTIGATORS: Mason, JM; Middleton, D
SPONSORING ORGANIZATION	→	SPONSORING ORG: Texas State Department of Highways & Public Transp; Federal Highway Administration
PERFORMING ORGANIZATION	→	PERFORMING ORG: Texas Transportation Institute Texas A&M University College Station Texas 77843
CONTRACT NUMBER	→	CONTRACT NO: 2-18-84-420; HP&R
PROJECT START DATE	→	PROJECT START DATE: 8509
PROJECT TERMINATION DATE	→	PROJECT TERMINATION DATE: 8608
		SUBFILE: IRIS
ABSTRACT	→	The objectives of this project include locating and describing regions within the state of Texas impacted by trucks and other traffic generated by the timber, agricultural, and surface mining industries. In addition to these three industries, still others are being investigated. The type of vehicles used in these industries, modal split, radius of influence, and trip generation factors will be determined on a site-specific
DESCRIPTORS	→	DESCRIPTORS: AGRICULTURE; MINING; MODAL SPLIT; OPERATIONS AND TRAFFIC FLOW; RESEARCH PROJECT; TIMBERS; TRAFFIC; TRAFFIC FLOW, CAPACITY, AND MEASUREMENTS; TRIP GENERATION; TRUCKS

TLIB Record

RECORD TYPE	→	
TRIS ACCESSION NUMBER	→	440184 ¹ DA ¹
TITLE	→	ARTERIAL SIGNAL TIMING OPTIMIZATION USING PASSER II-47: MICROCOMPUTER USER'S GUIDE
AUTHORS	→	Chang, EC; Lei, JC; Messer, CJ
CORPORATE SOURCE	→	Texas Transportation Institute Texas A & M
JOURNAL NAME	→	RESEARCH REPORT: No 467-1 -UNTRACED SERIES N467- Jul1988/Final Repo 96pp
PUBLICATION YEAR	→	English
REPORT NUMBER	→	REPORT NO: FHWA/TX-88/467/1 SUBFILE: UCITS: TLIB
ABSTRACT (INCLUDES AVAILABILITY)	→	By Edmond Chin-Ping Chang and James Chiang-Kuo Lei and Carroll J. Messer ADDL Place of Publication: Springfield, VA ADDL Publisher: available through National Technical Information Service Other Phys. Description: VIII Illustrated Spine Title: PASSER II-47- MICROCOMPUTER USER'S GUIDE July 1988 Research Study Number 2-18-86-47 Bibliography: p. 78-79 ADDL Corp. Author INFO: Texas Transportation Institute Texas Transportation Institute Texas A & M University System
DESCRIPTORS	→	DESCRIPTORS: ELECTRONIC TRAFFIC CONTROLS; PASSER II 87 COMPUTER PROGRAM; TRAFFIC SIGNALS, TIMING; TRAFFIC SIGNS AND SIGNALS

Figure A-7: Sample Records Contained in TRIS, Part I

SAMPLE RECORDS

Journal Article

RECORD TYPE _____
TRIS ACCESSION NUMBER → 469591 'DA'
TITLE → **FIELD ANALYSIS OF RUTTING ON OVERLAYS OF CONCRETE INTERSTATE PAVEMENTS IN ILLINOIS**
AUTHORS → Carpenter, SH; Enockson, L
CORPORATE SOURCE → Transportation Research Board
JOURNAL NAME → Transportation Research Record N1136 #987, pp 46-56 10 Fig. 9 Tab. 6 Ref.
PUBLICATION YEAR → SUBFILE: HRIS
AVAILABILITY → AVAILABLE FROM: Transportation Research Board Publications Office 2101 Constitution Avenue, NW Washington D.C. 20418

ABSTRACT → Thirty-two overlay projects placed over portland cement concrete pavements were surveyed for the initial development of a comprehensive statewide pavement data base of which these overlay projects would be part. Ninety-two different uniform sections were visually surveyed to obtain performance data on the overlay projects. Design and construction data were collected for inclusion in the data base. The data were analyzed to develop regression relations between rutting and mixture properties of the asphalt concrete overlays. The analysis clearly shows the importance of material properties to the development of rutting, particularly the gradation parameters. Eleven of the projects were core for structural testing in the laboratory. The structural tests clearly show that the resilient modulus and indirect tensile strength bear a strong relationship to the rutting that develops in the overlay during its life. The analysis in this paper clearly shows how a statistically sound examination of pavement performance can furnish data for an analysis that provides information that can be used to alter mix design and construction practices to address a specific problem. In this paper it is shown that permanent deformation can be controlled through proper material control; further, if the allowable limits on variability of the mixture coming out of the plant can be altered, performance can be altered. A judicious selection of median values and tighter plant control can reduce rutting potential. This paper appeared in Transportation Research Record No. 1136, Pavement Design.
DESCRIPTORS → **DESCRIPTORS: ASPHALTIC CONCRETE; CONCRETE PAVEMENTS; CONSTRUCTION METHODS; CORE ANALYSIS; DATA ACQUISITION; DATA ANALYSIS; DEFORMATION; FIELD STUDIES; INDIRECT TENSILE TEST; LABORATORY TESTS; MIX DESIGN; MODULUS OF RESILIENCE; OVERLAY COURSE; PAVEMENT DESIGN AND PERFORMANCE; PAVEMENT PERFORMANCE; RUTS; VISUAL SURVEYS**

Technical Report

RECORD TYPE _____
TRIS ACCESSION NUMBER → 475192 'DA'
TITLE → **ROAD PROFILE STUDY. FINAL REPORT**
AUTHORS → Cumbee, SL
CORPORATE SOURCE → Louisiana Dept of Transportation & Development P.O. Box 34245, Capitol Station Baton Rouge Louisiana 70804; Federal Highway Administration 400 7th Street, SW Washington D.C. 20590

PUBLICATION YEAR → Feb 1986 n.p.
REPORT NUMBER → REPORT NO: FHWA/LA-86/185; Rept No 185
CONTRACT NUMBER → CONTRACT NO: Study No 83-IP(B); IIP&R
AVAILABILITY → SUBFILE: IDRIS
 AVAILABLE FROM: National Technical Information Service 5285 Port Royal Road Springfield Virginia 22161

ABSTRACT → This study was undertaken to evaluate the overall usefulness of the Raabert profilograph as a roughness measuring device, and to determine its ability to profile the roadway surface. Comparison testing was conducted utilizing the profilograph along with the 10-ft rolling straightedge and the Mays Ride Meter on both portland cement concrete and hot mix asphaltic concrete surfaces. The profiling ability of the profilograph was studied by testing it over a surface with known (induced) areas of roughness. It was found that the digital counters of the profilograph are un-repeatable, and therefore not useable. The profilograph's graphical trace was found to be very repeatable, and when evaluated using a 0.1-in. blanching band, to correlate well with both the 10-ft. rolling straightedge and the Mays Ride Meter. It was determined that in most cases the profilograph produces a graphical trace which closely resembles the actual surface profile of the roadway. Recommendations for the development of profilograph "roughness" specifications and for profilograph utilization are included in this report.
DESCRIPTORS → **DESCRIPTORS: MEASURING INSTRUMENTS; PAVEMENT DESIGN AND PERFORMANCE; PROFILOGRAPHS; ROAD PROFILE; ROUGHNESS; TESTING**

Figure A-7: Sample Records Contained in TRIS, Part II

Obtaining Documents Cited in TRIS



Reports, papers and articles referenced in the TRIS database, its printed equivalents (*Highway Research Abstracts*, *Transit Research Abstracts*) or in the TRANSPORT CD-ROM may be obtained from the publication source listed in the "Availability" field in the record.

Transportation Research Board Publications

Publications of the Transportation Research Board may be ordered from:

Transportation Research Board
Business Office
GR 346
2101 Constitution Avenue, N.W.
Washington, DC 20418
Tel. (202) 334-3213/3214

Transportation Libraries

When no availability is specified, consult an established transportation library. One of the following libraries can either assist with a request or refer the user to another transportation library. A fee may be charged for photocopying, copyright clearance and/or mailing of the article; contact the libraries for further information. Library sources for loan or photocopy of these documents are:

UCB ITS
Institute of Transportation Studies
Library
University of California, Berkeley
412 McLaughlin Hall
Berkeley, California 94720
Tel. (415) 642-3604

NWUTL
Transportation Library
Northwestern University
1935 Sheridan Road
Evanston, Illinois 60208
Tel. (708) 491-5273

USDOT Library
US Department of Transportation
Library (M-45)
400 Seventh St., S.W.
Washington, DC 20590
Tel. (202) 366-0746

Commercial Services

Services which can provide documents and photocopies for a fee include:

Article Express International, Inc.
469 Union Avenue
Westbury, NY 11590
Tel. (800) 238-3458
or (516) 997-0699

Documents, Inc.
4 Professional Drive
Suite 132
Gaithersburg, MD 20879
Tel. (301) 212-9003

Canada Institute for Scientific
and Technical Information
Building M-55
National Research Council Canada
Ottawa, Ontario K1A 0S2
Tel. (613) 993-1585

Transportation Research Information Services (TRIS)



Figure A-8: Obtaining Documents Cited in TRIS

The Internet

The Internet is accessible to anyone with a computer, modem, communications program, and a subscription to a consumer online service. The communications program is often available as part of the subscription package and service providers may require the use of a specific program. There are several texts available (e.g. 17) which explain how to connect to the Internet, and describe the features available from the service providers. While there is a wealth of information available on the Internet, there are limitations in trying to use the Internet to search the transportation literature.

A major difficulty in describing the Internet is that it is undergoing rapid change and expansion. In simple terms, the Internet is a network of networks of computers. It comprises thousands of separate systems, each with its own protocols. Addresses, which can change frequently, are known as URLs, or Uniform Resource Locators. Searching and retrieving information demands making decisions before one knows what might be available. The Internet lacks the consistency of commercial systems and there is no common command language. Directories, search engines, and graphic interfaces are becoming much easier to use, but it takes time to learn them and gain expertise. Even mastery of the navigation tools does not guarantee success. Finding the required information is problematic at best, and often a matter of hit and miss. Users are encouraged to record the URL of sites where useful information is found, a process known as "bookmarking". There is not a controlled bibliography and sources are of varying and unpredictable quality. While the Internet is useful for finding factual information, statistical data, details of current events and work in progress (especially by government agencies), or even scanning library catalogs, it is less useful for conducting a formal literature search. Given the access of state highway agency staff to TRIS, and to the assistance of professional librarians, these avenues are likely to be more productive than using the Internet at its present stage of development.