

DOCUMENTATION CENTER

Final Report

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Prepared by
James O'Day
Joseph C. Marsh IV
Rameshwar N. Paul

U.S. DEPARTMENT OF TRANSPORTATION
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The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the National Highway Safety Bureau.

FOREWORD

This report was prepared by the Highway Safety Research Institute (HSRI) at The University of Michigan on Federal Highway Administration contract FH-11-6689 under project NHSB-4 for the National Highway Safety Bureau (NHSB). In the highway safety field the contractor studied the needs of a Documentation Center and recommended alternative operational formats. The contractor determined the existing situation, defined the ideal situation, determined the existing capability for fulfilling the ideal and recommended alternative operational formats.

The studies discussed in this report began in July 1967 and were concluded on April 30, 1968. The project director was Mr. James O'Day, head of Information and Systems Analysis. Joseph C. Marsh IV, head of Highway Safety Research Information Center, and Rameshwar N. Paul, now Assistant Director of the ERIC center on Library and Information Science Education, also shared technical responsibility for the research activities.

This is final report summarizes the work of seven tasks in the study. The results of the first two tasks were published as an interim report. The complete contents of the interim report have been updated and included in this final report.

The authors wish to acknowledge the assistance and cooperation so generously provided by those interviewed during the users' study and those who have contributed to the preparation of this report: Mildred Denecke, Infrared Information and Analysis Center (IRIA), The University of Michigan, for assisting in the users' study; Nancy Huang, Library Acquisition, HSRI, for discussion of acquisitions; Gilbert Staffend and Layman E. Allen, of The University of Michigan, for discussion of legal information analysis; Charles W. Wixom, Public Information, HSRI, and David W. Hessler, Education and Audiovisual, Western Michigan University, for their discussions of public information and audiovisuals, respectively; and Pat Fincher, editor, HSRI, and the publications staff for assembling this report.

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SUMMARY REPORT

The Highway Safety Research Institute has conducted a study of the needs of a National Traffic Safety Documentation Center and of the methods for implementing such a center. This was performed in seven tasks:

Task A--Determination of users and their information needs (Section 2).

Task B--Determination of existing procedures for obtaining information (Section 3).

Task C--Analysis and Recommendation for NTSDC acquisition, processing, storage, retrieval and dissemination functions (Section 5).

Task D--Projection of (audiovisual, information analysis, and public information) material preparation activities (Section 6).

Task E--Service recommendations (Section 7).

Task F--Survey of existing information facilities and determination of the extent they meet information needs and requirements (Section 8).

Task G--Integration of NTSDC elements developed in previous tasks into a comprehensive systems framework (Section 10).

Highway safety per se is a mission-oriented field characterized by the interaction of numerous separate closed and/or open professional groups representing the majority of the hard and soft sciences.

Information pertinent to the mission comes from numerous subject areas. New areas are constantly being explored for information. Thus, while the highway safety mission is specific, the information base continues to widen. This multidisciplinary dispersion of information poses difficult acquisition, indexing, and retrieving problems.

As a result of the increased level of activity and concern, a wide variety of new people have been and will become involved in the highway safety mission, and all present unique information requirements. What has evolved is an urgent need for discussion across disciplines and professions, an urgent need for ready access to information and an urgent need for information packaged in new ways: The need for a vigorous National Highway Safety Documentation Center is clear.

The recommended NHSDC systems framework (Section 10) calls for central NHSB coordination and dissemination functions in a network of specialized information centers that provide acquisition, processing and user services. The development of this network assures (1) a timely and evolutionary national capability, (2) greater user participation, and hence better understanding, and (3) broader acquisition resources. The specific recommendations and study results leading to them are summarized below and detailed in the body of this report.

USERS

The central theme of Task A (Section 2) has been to determine the answers to three questions through a user study.

- (1) Who are the potential users?
- (2) What are their information and documentation requirements?
- (3) Which of these needs should be fulfilled?

Two general comments can be made about previous user studies. First, user studies have many limitations and cannot serve as the basis for design; their value lies in providing guidelines for planning. Second, user study methodology is poorly developed, but even the poorest study will yield considerable insight.

Recognizing the attributes and limitations of such efforts, we proceeded to conduct both a direct survey (using flexible interviews) and an indirect survey (Highway Safety Research Information Center user requests). Having considered an exhaustive list of users and their functions, we classified users into five broad categories according to the kinds of information they require: Researchers, administrators, practitioners, mass media representatives, and the occasional users. Survey results are discussed in Section 2 and Appendix A.

After defining the users of highway safety information by type and number, characterizing their information requests, and commenting on their knowledge and use of present information resources, Section 2 considers which of the user's needs might be met by the National Highway Safety Documentation Center.

EXISTING PROCEDURES

The central theme of Task B (Section 3) was concerned with procedures used or available for the acquisition, storage, retrieval, and dissemination of highway safety information and their strengths and deficiencies. Procedures for selection, acquisition, cataloging,

subject analysis and indexing, machine indexing and retrieval, and document storage and retrieval are discussed.

Journal articles represent a very high proportion of the literature, about 75 to 80 percent. Only a small fraction of the nonjournal literature is represented by commercial books; the rest consists of technical reports, proceedings, etc.

A significant feature of the highway safety field is its interdisciplinary nature and that the information pertinent to highway safety comes from numerous subject areas. New areas are constantly being explored for information. The information base of the highway safety field may be described as reflecting an "APUPA" (Alien, Penumbra, Umbra, Penumbra, Alien) pattern (Fig. 14). Thus, if the core literature of highway safety may be described as represented by an Umbra region, then on either side of this region are the vast areas of Penumbra region containing the literature which, though not highway safety literature by itself, may provide information contributing to the better understanding of highway safety. Finally, outside this Penumbra region, there is the huge volume of Alien literature which has no direct relevance to highway safety. While the core literature of highway safety represented by the Umbra region is relatively small compared to the other fields in science and engineering, it draws very heavily on the vast literature in the Penumbra region. Also, the line separating the Penumbra region from the Alien region is not very clear. This makes self sufficiency by a single library practically impossible.

A voluntary network of information centers is emerging (Section 3). A more effective method of resource sharing and coordinated communication is needed.

Full text copies of "fugitive" and limited distribution material are not available. Many bibliographies and information services are provided without recourse to full text (Section 3).

Eleven classification/indexing schemes were discovered (plus two unpublished thesauruses). Three of these came out only this year. Only two are specialized to the highway safety mission (Section 3).

In discussing the active transfer of information from the originator to the user, one can consider the system in two parts: (1) acquisition and evaluation: the processes of building and maintaining the information bank, and (2) retrieval, analysis, and dissemination: the techniques by which the stored information is made available to the user. The status of these operations at present has been discussed under Task B for those collections primarily concerned with the highway safety field. For the primary centers of activity, there presently exists a disparity in methods of cataloging and indexing which are resistant to change because of local needs. Some standardization has begun to occur by informal agreement in the area of corporate source lists and citation format, but little or nothing has been done about the coordination of indexing schemes.

Inasmuch as highway safety is a multi-faceted field, it seems necessary to depend upon a number of sources or centers to acquire the universe of highway safety literature; thus, a need exists for either

coordination of the indexing technique or a translation capability to permit communication among the various activities.

The results of Tasks A and B were published as an interim report and have been repeated as part of the final report. Section 4 presents a summary of A and B and brings the results up to date.

INTERNAL OPERATIONS

The consideration of internal operations (acquisitions, cataloging, indexing, abstracting, storage, and retrieval) of the NHSDC was considered as part of Task C (Section 5).

Herner has compared the library operation to an iceberg, where the visible part represents retrieval and dissemination operations and the invisible part represents the many operations necessary to smooth output:

The spot lighting of search capability of information storage and retrieval systems has tended to put into the background the other useful (and quantitatively greater) tasks performed by these systems in publication, announcement, and list production.

Thus, the use of the computer for literature searches alone is not enough to justify the high costs. Rather, the computer must be used by the NHSDC to manipulate bibliographic materials and generate documents and records necessary to the smooth operation of the center.

The design, implementation, and maintenance of an NHSDC computer-based union bibliography is strongly recommended.

While initial acquisitions have been considered, emphasis was placed on developing an aggressive program of continuing acquisition (e.g., automatic distribution of research reports, formal exchange agreements), as this aspect is a key to successful continuation of the Center.

The interim NHSDC will have already acquired some 2,000 documents by the publication date of this report, so initial acquisitions have already begun and experience has already been gained. An increase in the NHSDC acquisition rate to build a comprehensive collection will be almost entirely dependent on the acquisition of good bibliographic citations, as there is no simple method of mass short-term document procurement. Thus, it is recommended that a comprehensive set of citations be compiled and developed into a union bibliography as a base for NHSDC document procurements.

Besides internal use of a union bibliography for administrative and processing purposes, it should be produced in multiple copies for distribution. This has the effect of discouraging dependence on computer retrieval, permitting users to do their own searching. A union bibliography is a service of the NHSDC to others wishing to acquire a similar collection. Consequently, the system becomes easier to justify because it is being fully exploited.

All users of the Center and especially research staff should be encouraged to recommend new materials to be added to the library. As experts in their field, they can be extremely helpful in making selections

for new acquisitions. This is done primarily through requests for materials for their own use. Although this is a service to the user, it is also a service to the acquisition process of building a collection. The acquisition, cataloging, and indexing of material in response to individual requests should receive top priority in order to provide a responsive user service. Every effort should be made to entice the staff to request and obtain all of their personal documents through the Center.

Because of the multidisciplinary dispersion of information and ever-increasing new subject areas involved in highway safety, it is physically impossible and unadvisable for any special library to possess all materials pertinent to the field or to subscribe to all important journals, especially those in related subjects. It is thus necessary for the special library to rely on a bigger library of more general nature or with a more comprehensive collection in a specific subject area.

Thus, the only way that the NHSDC will be able to acquire many of these articles will be through interlibrary loan. As an added help, materials within the NHSDC network should flow freely and xerox copying should be readily available at each node. The user can assume bibliographic self-sufficiency in a free-flowing network of specialized centers each having access to a comprehensive collection.

It is recommended that the collection be maintained with a strong culling policy to weed out unnecessary materials on the basis of usage and/or age. Culling has a direct bearing on document storage costs and space, yet it often is hard to surrender the symbols of privilege and status. In the planning stage of a highway safety library, it seems useful only to suggest that perhaps five years from the present some culling may be indicated. In this regard, a useful by-product of any automation in the collection will be the record of usage rate for particular sets of documents. It is recommended that materials trimmed from the collection be placed in a very compact dead storage warehouse or on microfilm.

Part of this task has been to determine the efforts needed to catalog, index, and abstract publications, reports, and other materials for the NHSDC and evaluate alternative procedures. Vocabulary control techniques were also examined.

It is recommended that the cataloging guidelines presented in the Standard for Descriptive Cataloguing of Government Scientific and Technical Reports, Revision No. 1, October 1966, by the Committee on Scientific and Technical Information (COSATI) be adapted wherever possible. The COSATI standard should be used as a basis for expansion, as the NHSDC cataloging scheme must provide comprehensive citations, for example, to the legal and medical fields, and to books, journal articles, hearings, and public laws.

It is our recommendation that brief (100 words average, 250 words maximum) annotations be prepared for each document being processed. This is the present policy of the interim documentation center, and it should be continued. The preparation of short annotations (as versus the author's original abstract) that reflect the document in the light of the highway safety mission is extremely useful if not necessary.

The type of indexing may range from controlled (i.e., use of a rigid authority list) to uncontrolled (i.e., free indexing with text-derived catch words or key words). Some control is needed to insure effectiveness and efficiency. The maintenance and updating of subject authorities is a complex but vital function. The most widely used control tool is the thesaurus.

The thesaurus is a logical language control tool providing a list of words (and concepts) to be used in indexing and searching documents. It presents synonyms and antonyms. The technical thesaurus also displays terms or concepts hierarchically as a guide to indexing/searching at more general or specific levels. The thesaurus is a tool to correlate the language of the author with that of the requester and, as such, is a key to subject retrieval. Finally, an alphabetical index to all words should be constructed to permit searches to begin in this manner when desired.

We recommend that the NHSDC use a (post-) coordinate indexing scheme utilizing the concepts of facet analysis as a vocabulary-control mechanism in the construction and maintenance of an NHSDC structured thesaurus.

Facet analysis builds from existing vocabulary. First, terms with similar characteristics (material, processes, properties, etc.) are grouped into categories, then the terms in each group are arranged hierarchically to display their generic-specific relationships. The technique leads to a mutually exclusive arrangement of concept terms, and not a classified arrangement of documents; it is based on words (concepts) and not knowledge (documents).

ADVANTAGES OF FACET ANALYSIS

(1) Vocabulary control:

Whether a classified or structured index is used or not, an essential tool in constructing any retrieval index is a classification or structure. The purpose of this structure is to provide organization in which the most useful generic relations of each term can be displayed and omissions can be detected.

(2) A basis in the language of highway safety:

Being based upon language, a faceted vocabulary is more stable than the volatile knowledge natural language is used to describe. New ideas and knowledge can be readily indexed without alteration of a "tree of knowledge".

(3) Aid to indexer/user:

The resulting generic structuring acts as a comprehensive guide to the indexer or user.

(4) Framework provides for the addition of terms or integration of other thesauruses.

(5) Usefulness as a tool in NHSB management:

Facet analysis is frequently used (without

realizing it) as a management technique to organize information, to gain an overview, and to identify information gaps. It has been actively used by the NHSB since its inception and is an active concern of NHSB research management staff. It is felt that a faceted NHSDC subject index would complement this trend--and might itself be of direct value to NHSB management.

It should be the policy of the NHSDC to actively see that as much of the noncopyrighted literature of highway safety as feasible be provided in microfiche and hard copy for secondary distribution through the Clearinghouse for Federal Scientific and Technical Information (CFSTI). Present NHSB policy places all NHSB contractors' reports in the CFSTI. This policy should be continued and expanded to other report literature. Usage of the CFSTI services should meet the needs of highway safety users, and provide access to an even larger population of potential users. A comprehensive union bibliography with adequate citations should turn the key so that any librarian can access the copyrighted material from local resources.

The NHSDC operation design should provide for the implementation of a remote-access, real-time retrieval scheme at some future date as determined by the economics, demand, and acceptance of such a service. It is further recommended that a very limited pilot system be implemented now to assist in determining economics, demand, and acceptance. (See Appendix F, for example)

MATERIAL PREPARATION

Beyond the union bibliography and its byproducts, the NHSDC should be active in preparing state-of-the-art, public information, and training materials.

State-of-the-art reports, technical summaries, and directories should be prepared to serve a useful function for both administrators and technical people concerned with highway safety. Additionally, the preparation of such reports on a continuing basis adds measurably to the interest of personnel in a documentation center--keeps them technically alive.

State compliance with the Federal Highway Safety Standards will soon become a concern of the National Highway Safety Bureau. Disputes over legal obscurities can be anticipated and forestalled if an information-center function is devoted solely to the analysis of present statutes and new highway safety legislation from the states as related to Highway Safety Standards 4.4.6 (Codes and Laws) and 4.4.7 (Traffic Courts) and the Uniform Vehicle Code and Model Traffic ordinances. The unique structure of the proposed system will readily yield the exception statistics required to let NHSB administrators know the patterns of state compliance on a provision-by-provision or even clause-by-clause basis.

The primary function of a public information office in highway safety is to get informative substantive material to the public. Key objectives include providing information, the ultimate purpose of which is to: enable the recipient to make decisions better within the full range of individual discretion, or to influence his approach in decision-making such that a desired attitude is more like to result, or behavior occur. The distinguishing characteristic here (for public information) is that mass media channels are used to get the information to the recipients. The channels may range from such mass distributors as television networks or large newspapers to meetings of small groups.

The approach of this aspect of this study was to look at the mass media channels in use, the audiences that exist, and to examine what has and what is being done, how well it has been done, what it is possible to do, and to define a reasonable set of goals for the NHSB Documentation Center.

There are several examples of such activities, campaigns and programs, most notably those of such organizations as the National Safety Council, The American Automobile Association, and similar industrial and professional groups. These activities have been--and continue to be--most successful in using the mass media to present their information units (messages) to large groups. Yet results in terms of changes in opinion, attitudes and behavior deriving directly from such activities cannot be quantitatively ascertained; in many instances, qualitative measurements are not possible either.

The volume of material available is somewhat staggering. Mendelsohn's measurement of material in print indicated some 400,000 separate "messages" (paragraphs expressing a single idea promoting safety) are produced yearly for the American public.

The wealth of opportunity for future research is indicated in one of the stronger statements concerning the present state of the traffic safety public information activities. It was made by Mendelsohn in a recent study of the content of safety messages: "In essence, the contemporary literature of traffic safety today is strangely medieval in both content and approach." (Section 6.3)

Mendelsohn begins his study with two quotations that sum up the state of public information regarding traffic safety. He quotes Arch McKinley, (then) Public Information Director of the National Safety Council, as stating, "nothing in America is more publicized than traffic safety." This is probably true. His other quotation is from the 1966 report The State of the Art of Traffic Safety, by Arthur D. Little, Inc.; "We have found no substantive data on the effectiveness of general safety propaganda; the limited information available suggests it is not particularly effective."

Interest has declined since the passage of the national highway and traffic safety acts; passage of the acts represented a climax following which their interest would tend to dissipate.

To provide a test of this hypothesis, news clippings from a clipping service were classified by general subject and counted for the year. The number of such clippings declined over this period. This rather unsurprising result was substantiated by comments solicited from

newsmen for the user study. They are typified in this paraphrased comment from nationally known writer: "Give us a new angle. The safety story's getting old. The editors want fresh slants or they won't use it."

The "new angles" can be provided by information garnered from inputs to the Documentation Center.

We need more research into all aspect of the training media field. To learn more about the role of media in the learning process, research dealing with behavioral patterns and attitudes must continue. Education is sorely needed to develop literacy in other media in the same manner that it has been developed in print and the spoken word. Training materials are only as effective as the person using them; teachers still need practical learning situations which will help them establish behavioral goals for their students.

There should be a clearinghouse of highway safety information that would attempt to evaluate existing materials as well as ensuring that pertinent research reaches the proper channels quickly. There is a need for some type of comprehensive listing of highway safety audiovisual materials, coupled with an effort to make it available to those who could benefit.

EXISTING FACILITIES

Task F is concerned with a survey of existing highway safety information facilities to determine the extent to which they meet the varied needs of highway safety personnel (Section 8). Some highlights of this survey:

A review of libraries/information centers revealed over 100 related to highway safety.

Although there are only a few libraries devoted exclusively to highway safety literature, a number of other libraries, including those attached to universities, industrial concerns, societies and foundations, and governmental units, as well as some large public libraries, contain significant volumes of literature likely to be useful to highway safety personnel. In general, the university libraries, because of their immediate access to the total resources of the university and the presence of an active body of users, are better provided. Libraries attached to industrial concerns, although some of them have excellent collections, are in general not open to the public. Another important group of libraries are those attached to societies and foundations which constitute an important source of literature, particularly relating to the activities and publications of their sponsoring societies.

Because of an increased level of activity and concern, a wide variety of people have become involved in the highway safety mission. This has resulted in an urgent need for information packaged in new ways requiring subject specialists for analysis and synthesis. More services are required by workers than they can obtain under traditional conditions. This has led to the emergence of a number of specialized information centers. Some of the more important centers are: Highway Research Information Service (HRIS) of the Highway Research Board, Safety Research Information Service (SRIS) of the National Safety Council, and Highway Safety Research Information Center (HSRIC) of The

University of Michigan. Only HSRIC provides a full range of bibliographic and library services as well as information analysis, while the other two chiefly collect, store, and publish abstracts. They do not store, nor do they provide nor lend documents as SRIS does through the NSC Library. Moreover, highway safety is only one of the interests and covers only a small part of the total highway safety information.

There is also beginning to emerge a kind of informal network of these information centers based primarily on informal and voluntary agreements. This arrangement, however, is far from satisfactory because of the lack of coordination of their activities, lack of common cataloging and indexing procedure, or some kind of translation mechanism for the various indexing systems and, finally, the lack of an adequate bibliographic organization and a union catalog of highway safety.

The need for coordination has led to some efforts in this direction but these activities need to be enhanced and broadened in scope.*

Although the efforts to develop a comprehensive bibliography of highway safety go far back--at least four decades--in time, the present situation leaves much to be desired. Most of the recent efforts have been either inadequate or a part of a more general effort for a much wider audience rather than to meet the specialized needs of highway safety personnel. What is needed is a well planned and determined effort not only to identify and list comprehensively the core literature of highway safety, but also to locate at least one copy of each item in a library which is willing to make it available to any user either on loan or, preferably, by copying it.

At the international level, the cooperative efforts of IRF and OECD resulted in the establishment in January 1965 of an International Road Research Documentation program which covers a number of west European countries, Canada, and Australia, and has a separate coordinating center for each of three languages--English, French and German.

SYSTEM FRAMEWORK

The problem addressed as Task G was to integrate the elements of an NHSDC developed in previous tasks into a comprehensive system framework (Section 9). Organization is considered primarily from two user-oriented activities--the "push" mechanism (the automatic distribution of materials to predetermined users) and the "pull" mechanism (dissemination methods that provide information to users when they see a need for it and ask for it).

A hybrid organization of certain centralized functions (e.g., coordination, dissemination) and augmented functions in a network of primary (satellite or sub-) centers (e.g., state-of-the-art reports, literature searches)--is recommended over (1) a single central store servicing all users or (2) the loosely coordinated system in existence today.

A hybrid system involving direct communication of users with local centers, augmented by the existence of a union bibliography and by development of strong ties among the various facilities, will lead to much improved pull services.

* The NSC's SRIS and HSRIC are presently working towards compatible cataloging and the sources. A joint corporate authority list is being completed by HSRIC and HRIS.

The equation below, analogous to the radar equation, represents the functional form of a number of factors involved in the communication of information from a library to a user. This can be considered analogous to the radar process, where a radar transmitter sends out a request (signal) and receives a reply (the response), the power of the returned signal being inversely proportional to the distance between the radar and the reflector. In short form, the radar equation is usually given as:

$$P_r = \frac{P_t \times G_t \times G_r \times \sigma}{d^4}$$

The information-retrieval counterparts are shown at the right where:

| | |
|---|--|
| P_r = power received | (value of the information received) |
| P_t = power transmitted | (inquirer's understanding of how to use the system) |
| G_t = gain of the transmitting antenna | (bandwidth of the communications channel from the user to the Library) |
| σ = radar cross section of the reflecting object | (quality of the library) |
| d = distance between radar and reflecting object | (time required to get a response) |

P_t can be considered as analogous to the user's understanding of the system. Educating the user and fostering his participation in the activities and development of the information system should be encouraged.

Antenna gains G_t and G_r are related to ease of use, e.g., the form or formats used in a dialog with the system--the query and response. For example, this factor is dependent on the level or levels of surrogation made available to the patron, and the browsability of the information system.

With present knowledge it is not possible to assign values to the exponents, or for that matter to define the parameters in precise terms. We postulate that the indicated relationships do exist. Consider the small isolated library serving a user. His communication with the librarian may be excellent--he can carry on a conversation, explain his problem and fill in needed details easily. The librarian's communication with him similarly will be good. His understanding of the way to enter a request may be good, and the distance and time factors (d) are small. The only factor in the equation which is weak is σ , the library capability, and this may be overriding in the sense that the library just does not have the information and does not know how to get it.

If, on the other hand, the library is a large central store, it may have an excellent relevance/recall ratio, and is by definition adequate in size. However, the distance and time factors may be large, the communication channels may be restrictive, and the user's knowledge of how to enter the system may be quite limited.

From the user study it is apparent that the majority of users will continue to ask questions of their local information source. Further, the general user's knowledge of the existence, let alone the capabilities, of national information centers seems to be very limited. It is suggested that information transfer can best be maximized by some combination of centralized and decentralized facilities which make it appear to the user that his local source is indeed capable. Presently local libraries have an inadequate knowledge of the existence of highway safety information and the methods for obtaining it. If a catalog or bibliography of the universe of highway safety literature existed, was periodically updated, and contained an indication of where such literature could be obtained, the local facility would then be capable of providing a more useful service.

Some functions, of course, must be accomplished centrally--and some locally, in order to effect the maximum information transfer at minimum cost. We will now outline, in elementary form, a recommended structure for accomplishing this.

Three alternative approaches have been suggested by the above discussion. The first would be to leave things much as they are, requiring the local information centers and libraries largely to shift for themselves in acquiring documents, making abstracts, etc. The opposite approach would be to centralize the entire system by having a single lending library and a complete and workable indexing scheme. The intermediate or hybrid solution--which starts with the present system and augments it--is recommended.

RECOMMENDED NHSDC SYSTEM

Figure 17 displays the system recommended as a result of this study. It is a network making use of several existing facilities and capabilities, augmented by a control and communications function to be provided by the National Highway Safety Bureau.

Several levels of activity are indicated: First, the NHSB will serve to coordinate all pertinent activities within the network. For discussion purposes, the NHSB activity is described in two parts--the central control and the local NHSB information center. The latter is one of several primary centers--the others being the Highway Research Information Service, the Safety Research Information Service, and the Highway Safety Research Information Center. Libraries associated with these satellite centers are indicated in the square boxes. Provision is made (dotted lines) for expansion to include several additional primary centers to cover either regional or specialist activities. Secondary centers can be considered as a large number of local library activities serving a unique set of users. Such secondary centers may be closely allied to a primary center or may be rather loosely tied to the national center.

Acquisition of material leading to a union bibliography would be accomplished by the various primary centers, the workload to be divided according to individual capabilities. Specific assignments should be discussed in a steering committee, with the final decision resting with the chairman. A suggested preliminary distribution of assignments

would include government reports (except highway engineering) through NHSB, highway engineering through HRIS, behavioral psychology and education through SRIS, automotive engineering and medical through HSRIC. The steering committee indicated on the diagram would consist of one representative from each primary center with a chairman from the NHSB center. Both journal and report literature would be acquired and indexed in this manner.

A tentative organization diagram of the NHSB activity is shown as Figure 13. The functions of the local information center (in the NHSB) and of coordination of the network are shown separately. Satellites (including the NHSB collection) are indicated as being monitored by the coordination section within the bureau.

IMPLEMENTATION

Recommendations for actions to be undertaken by the Department of Transportation in connection with the development of a documentation center activity in highway safety are summarized in Section 10. An outline of the contents of the section are given here:

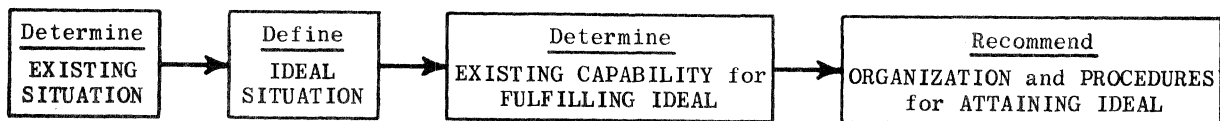
- (1) Establish a coordination and control activity within the Department of Transportation to effect a highway safety information network.
 - (a) Establish a steering committee to be chaired by the documentation center chief of the National Traffic Safety Institute.
 - (b) Continue a user-needs study.

An early output of the user-needs studies would be recommendations for the establishment of new primary centers.
 - (c) Develop a thesaurus.
 - (d) Give formal recognition to the existence of a highway safety information network; and, by appropriate public relations activities, promote the knowledge and use of the network.
 - (e) Expect to conduct a purge at the end of approximately five years.
 - (f) Develop agreements among the various primary centers, and assign sources as necessary for effective coverage of the field.
- (2) Develop the information network to create a centralized bibliographic base and a decentralized but extensive acquisition and storage of documents.
 - (a) For the documents themselves, each primary center should be encouraged to acquire and hold documents as are useful-- Secondary distribution through the Clearinghouse for Federal Scientific and Technical Information.
 - (b) With regard to document surrogates, there should be an initial exchange of card files (or other hard copy) among the participating entities. Preliminary to the development of a union bibliography, a study of library characteristics for the existing major collections should be conducted. Publication of a union bibliography to cover the core or "umbra" material of traffic safety should be begun within the next six months.
- (3) Continue and enhance the research-in-progress information collection systems currently in existence.
- (4) Initiate several nationally sponsored publications programs to disseminate information.

- (a) Start an announcement journal initially containing both news and selected publications announcements: a somewhat broadened version of the present Highway Safety Literature publication.
 - (b) Begin publication of an abstract journal eventually to include all documents in the network.
 - (c) Publish an annual union bibliography, which will be a compilation of the abstract journals.
 - (d) Sponsor the development and publication of several state-of-the-art reports, directories, bibliographies, and/or handbooks.
 - (e) Publish a research-in-progress report annually.
- (5) Make the system responsible to individual user requests.
- (a) Through a switching network (for referral) and by providing each center with adequate reference material, handle individual requests for specific information.
 - (b) Create, within the network, a capability for extensive literature searches. It is further suggested that a pilot terminal system be set up to demonstrate on-line retrieval and to evaluate its effectiveness, acceptability, and efficiency (implying cost).
 - (c) Although secondary distribution of reports through the Clearinghouse (CFSTI) is encouraged, the documentation network should maintain a liberal lending policy. A rapid inter-library loan system should be available among the primary centers. Copying machinery should be readily available.
 - (d) There is a clear need for an in-depth study which would result in a catalog of audiovisual materials in the highway safety field. A byproduct of such a study would be the identification of areas in which further training materials are needed.

1. INTRODUCTION

The Highway Safety Research Institute (HSRI) at The University of Michigan has conducted a study of the needs of a National Highway Safety Documentation Center (NHSDC) and of the methods for implementing such a center. The basic approach to the study of this problem is outlined in Figure 1. The functions performed are summarized within the boxes. After a brief look at the highway safety information system, we will attempt, in this introduction, to characterize pertinent features of the highway safety field and put forward a definition of "highway safety information." We will also consider the need for development of a Nation Highway Safety Documentation Center. The body of the report, Sections 2-10, contains the results of Tasks A-G as outlined below. The final section, 10, is a compilation of all the primary recommendations made in this report with an implementation and operation time schedule.



Tasks A and B

FIGURE 1. SCHEMATIC REPRESENTATION OF STUDY APPROACH

The interim report was concerned with the determination of the existing situation. This was performed in two tasks: A and B. The contents of the interim report have been included here and brought up to date to reflect the current situation.

The ideal NHSDC was defined as part of Tasks C, D, and E in Sections 5, 6, and 7, respectively. Task C dealt with the internal organization and operations (e.g., acquisitioning, indexing) of an NHSDC. Tasks D and E covered material preparation and services.

A survey of existing centers was conducted in Task F (Section 8) to determine the extent to which present facilities are meeting the varied needs of different types of users. The results of all the previous tasks were integrated into a recommended organization and procedures for attaining the ideal situation in Section 9 (Task G).

1.1. HIGHWAY SAFETY INFORMATION SYSTEM

The highway safety information system (Fig. 2) can be visualized by considering the user groups and their interactions. Research information users are frequently producers of research information. Administrators include primary standards and policy makers who produce information affecting all components. The practitioner is the man who directly affects the traffic system itself. He is the highway engineer, the police official, or the driver education instructor. While the communication between researchers is relatively strong, the linking of research results to practice is weak.

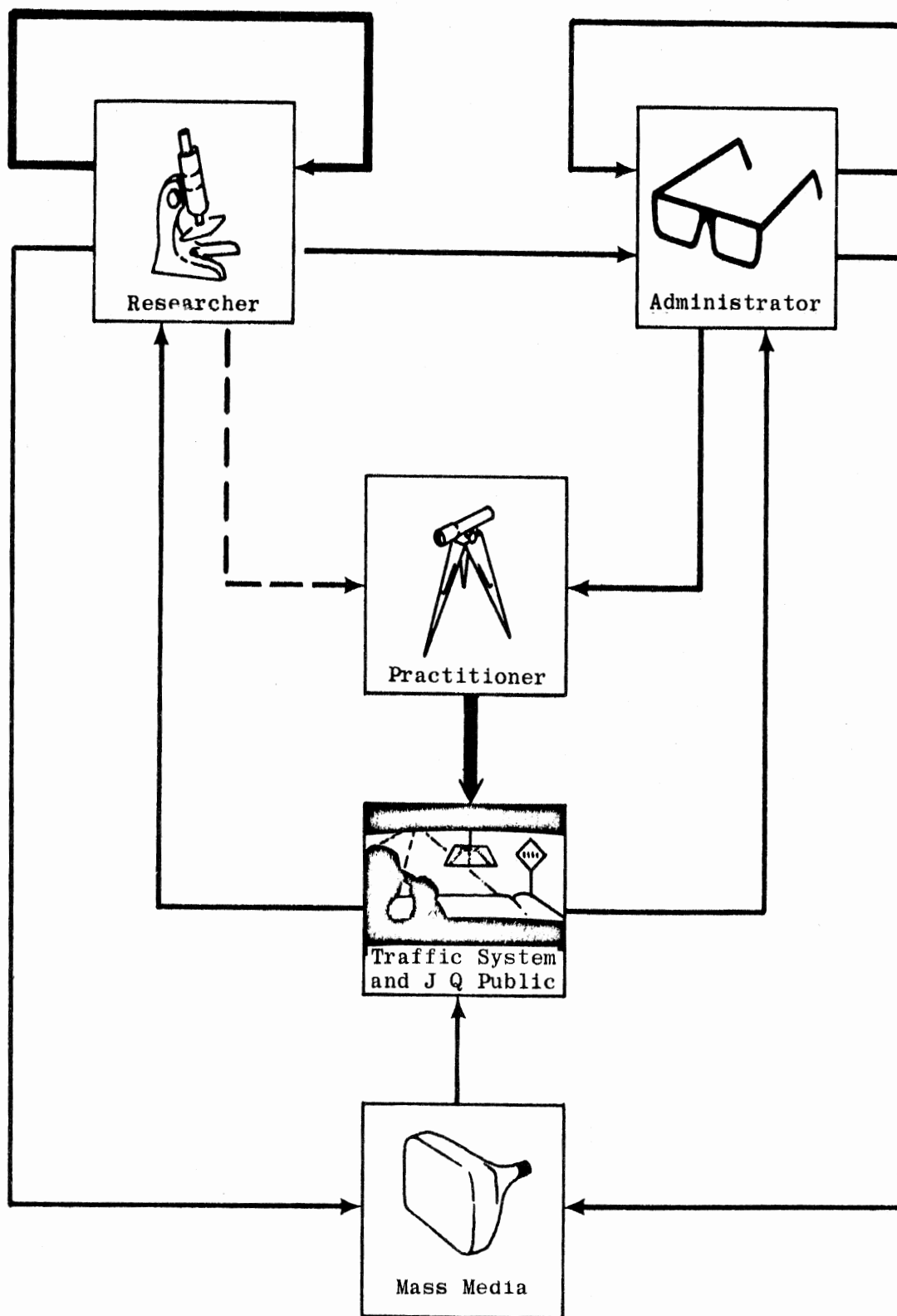


FIGURE 2. HIGHWAY SAFETY INFORMATION SYSTEM

John Q. Public interacts with the traffic system and its safety features (or lack of). Beyond his direct participation, his major information source is the mass media, e.g., news articles and TV film clips. The role of the National Highway Safety Documentation Center is to enhance and/or emphasize certain of the channels of information flow to produce the best overall improvement in traffic safety. Recommending an organizational format and procedures for attaining this ideal is the objective of the present study contract.

The determination of each user group and its interface requirements as users and producers of information in the system is covered in Section 2, and the existing documentation procedure used in the flow of information between users is covered in Section 3. Each information flow line in Figure 2 is actually an intricate system in itself. The research and engineering information flow indicated in Figure 3 exemplifies the multiplicity of information user interfaces.

1.2. COMPARISON OF HIGHWAY SAFETY WITH OTHER FIELDS OF ACTIVITY

The highway safety field can be characterized as being open, soft, and mission-oriented as compared to the closed, hard, discipline-oriented field of, say, liquid metals. Many areas of concern have a closed group of people, or invisible college, directly associated with the area. Each of these groups develops its own channels of communications, e.g., professional journals and conference circuits. This theme is reflected in the increased specialization in our society, even in the organization of industry itself. This is not the case in the highway safety field, which is an open group of people made up of many separate closed and/or open subgroups, all of which must interact. The scattering effect is frightening: each researcher publishes his highway safety article in the journals of his own profession. Thus, we find, for example, a series of articles on periodic motor vehicle inspection in the Journal of the American Medical Association.

Most of the sophisticated study and development of information systems has been in the hard sciences and technology areas, such as aerospace. We need only reflect on the efforts of the Committee on Scientific and Technical Information (COSATI) and the Engineers Joint Council (EJC). Indexing and retrieving are relatively easily structured and well developed in the hard sciences, but not in the highway safety field. The soft sciences must also be considered. Although highway safety is fairly concise or specific, the information base is extremely broad, covering practically all subject areas-- physical, biomedical, psychological, education, legal, financial, and social. Present schemes, such as the COSATI Standard for Descriptive Cataloging (1), break down, and the new specialized and comprehensive approaches are required.

The specialized information center may be oriented toward either a discipline or a mission. The discipline-oriented information center processes subject matter pertinent to part of a recognized discipline which has its own literature and professional traditions. The mission-oriented information center covers an activity area of

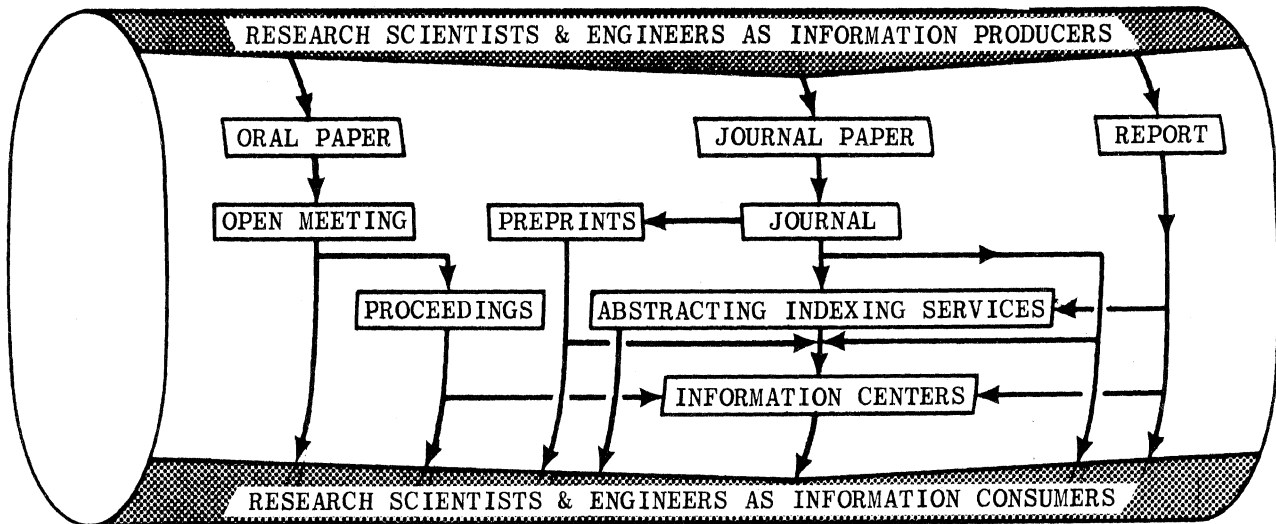


FIGURE 3. RESEARCH AND ENGINEERING INFORMATION FLOW

special interest and, therefore, one which requires an interdisciplinary approach. Highway safety per se is a mission-oriented field characterized by the interaction of numerous closed groups representing the majority of the hard and soft sciences. This setting should be kept in mind since it is a template for all considerations of highway safety information.

1.3. DEFINITION OF HIGHWAY SAFETY INFORMATION

What is "highway safety information"? "Highway" really refers to the total highway transportation system. Thus, we are dealing with system components--the vehicle, the roadway, the driver--and their interactions, a complex subject in itself. The question "What is safety?" leads deep into the game of semantics. The following is C. O. Miller's attempt to place within a single definition safety and accident prevention in the aerospace field today (2):

The objective conservation of men and equipment based on timely communications and decisions within the operational and economic requirements necessary in a progressive aerospace community.

Safety information is the communicable knowledge of data of value to the workers in the safety field. This information takes the following forms:

(1) Information about people and organizations. The who, what, and where of related activities in the field can be found in newspaper clippings, journals, extracts, attendance lists, membership lists, trip reports, telephone conversations, and conference discussions.

(2) Accident incident information. Field data on accidents, vehicle, driver, traffic, and so on, form a basis for analysis of the accident/incident environment.

(3) Procedures/standards information. Established procedures and standards reflect the results of past work in accident prevention. This information is of direct value to the practitioner. It takes the form of handbooks, manuals, regulations, codes, standards, patents, hearings, technical orders, and specifications.

(4) Science/technology information. Published material (e.g., books, documents, research reports, journal articles) pertinent to the mission of highway safety can be found in all subject areas.

1.4. NEED FOR A NATIONAL HIGHWAY SAFETY DOCUMENTATION CENTER

We all recognize the need to learn, to accumulate knowledge, and to have it readily available. We note the 53,000 highway deaths per year and the 10 billion dollar economic loss per year, and we recognize the importance of highway safety information:

...a raging epidemic of highway deaths which has killed more of our youth than all other diseases combined... (President Johnson)

One of the major opportunities for enhancing the effectiveness of our national scientific and technical effort and the efficiency of government management of research and development lies in the improvement of our ability to communicate information about current research efforts and the results of past efforts. (President Kennedy)

Collections of literature related to highway safety dot the map (Fig. 4). Information pertinent to the mission comes from every discipline and subject area. With the increased level of concern, new areas are constantly being explored for information of possible value. While the highway safety mission is specific, the information base continues to widen. This multidisciplinary dispersion of information poses difficult acquisition and indexing problems.

There has been an increase in the level of research activity and action programs as a result of growing public concern and congressional response to the highway safety problem. A similar growth in highway safety literature is shown in Figure 5. As a result of this increased activity, a wide variety of new people have (and will continue to) become involved in the highway safety mission, and all present unique information requirements. These people include, for example, each of the new governor's representatives, who will be concerned with the implementation of the 13 state standards.

What has evolved is an urgent need for discussion across disciplines and professions, an urgent need for ready access to information, and an urgent need for information packaged in new ways: The need for a National Highway Safety Documentation Center is clear. The exploration of this need and of the methods for implementing such a center is the objective of this study.

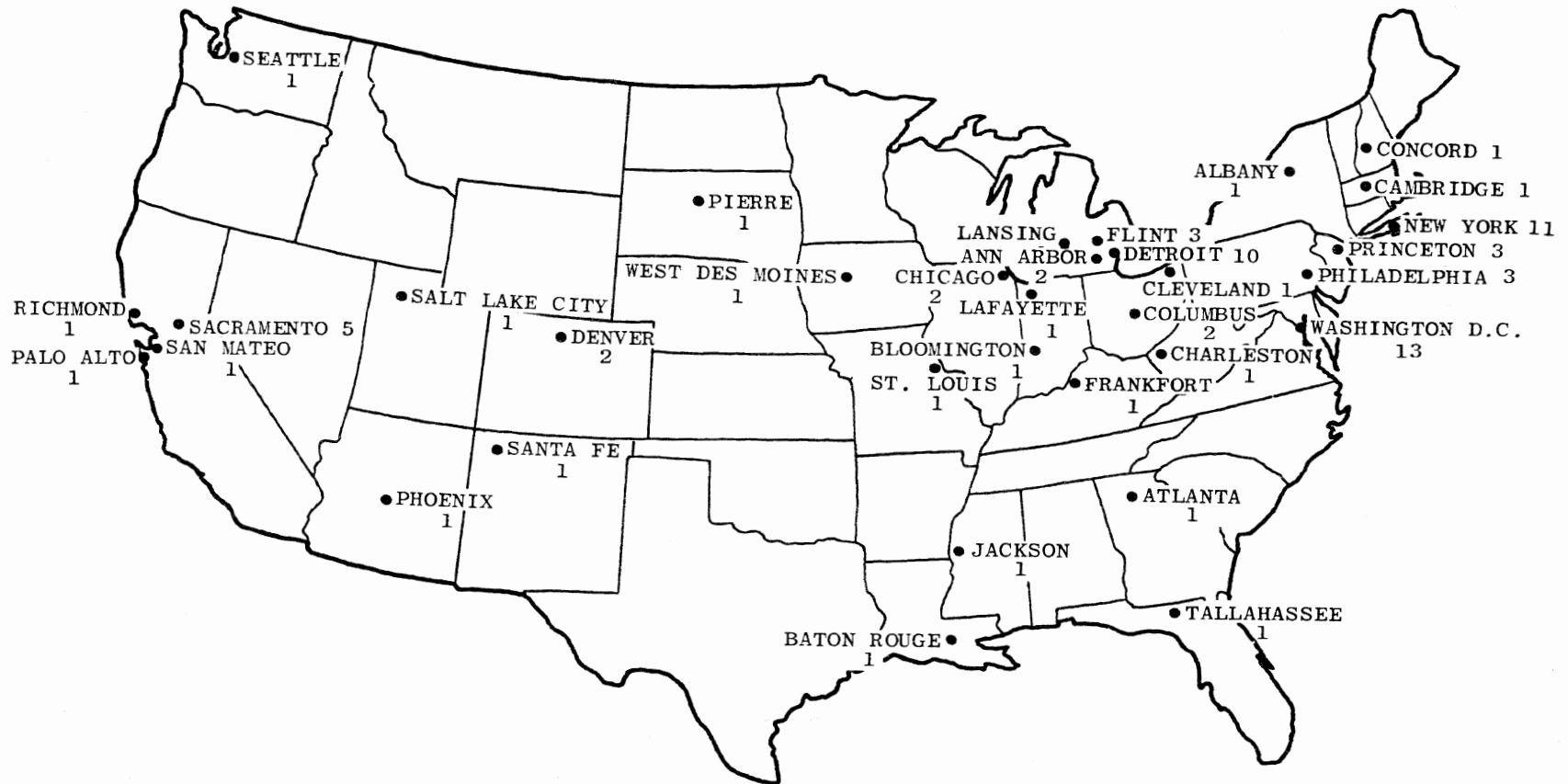


FIGURE 4. GEOGRAPHIC DISTRIBUTION OF HIGHWAY SAFETY RELATED LITERATURE COLLECTIONS, 1967

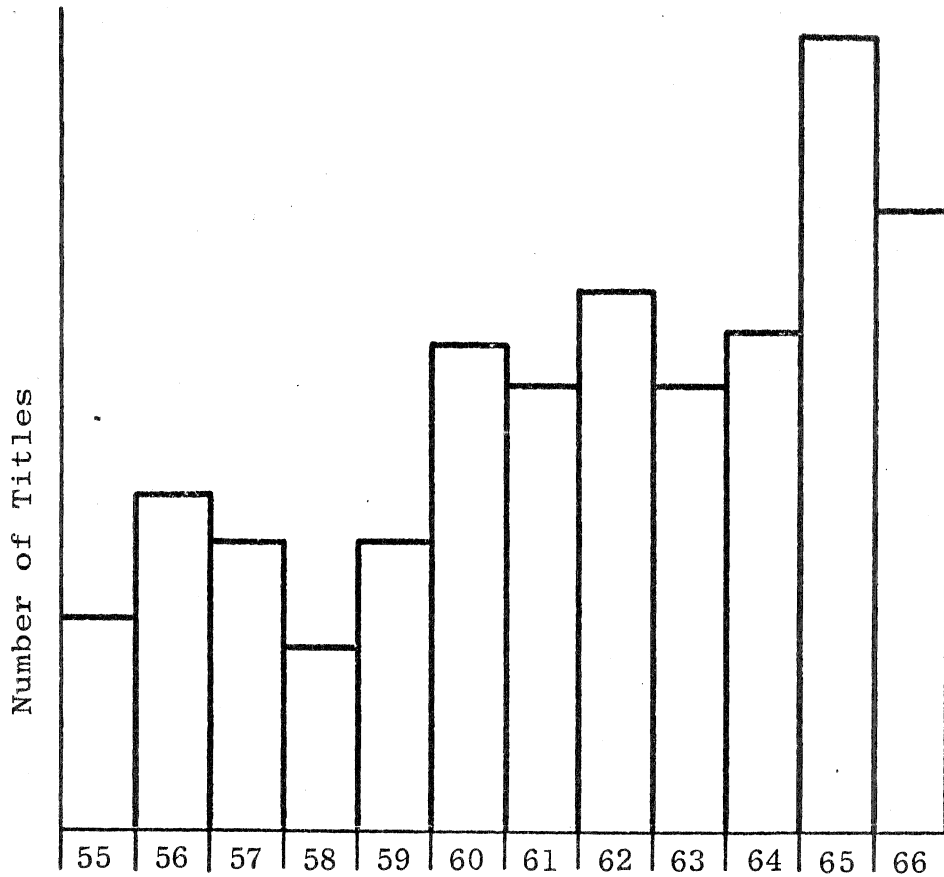


FIGURE 5. LITERATURE GROWTH IN HIGHWAY SAFETY. (Derived from NSC's Guide to Traffic Safety Literature). The number of 1966 publications is necessarily short due to the natural lag in processing.

2. TASK A: USERS AND THEIR INFORMATION NEEDS

2.1. INTRODUCTION

Alan Rees (14) sets the stage:

The information retrieval field has been plagued for many years by busy people spending large sums of money, designing or attempting to design phantom systems for non-existent people in hypothetical situations with unknown needs. It is not surprising that large numbers of theorists, hardware peddlers and promoters have ignored the user, with the result that the needs of users are conspicuously absent in many discussions on system design and operation.

The ideal information system would serve all the people, all the time, in a pleasant, timely, effective, and efficient manner. The first step toward attaining this goal is to determine who the user is and what his information needs are. Under the present contract, the central theme of Task A has been the determination of the answers to three questions:

- (1) Who are the potential users of a highway safety documentation center?
- (2) What are their information and documentation requirements?
- (3) Which of these needs should be fulfilled by the Center?

2.2. METHODOLOGY

Our initial effort at defining the spectrum of highway safety information users consisted of making an exhaustive list of traffic safety functions and organizations, as indicated in Table 1. With this as a guide, we then made a determination of the number of users in each category in order to get some idea of the magnitude of the dissemination problem. Next we attempted to define the needs of users.

In the latter endeavor there have been two classically defined approaches, the direct and the indirect methods. The advantages and disadvantages of each have been discussed by Herner (9). We used semistructured, in-depth interviews rather than mailed questionnaires as a direct method of determining users' needs. The conversational technique has the advantage of permitting the investigator to discuss in detail the potential use of information. It is possible to inquire what the respondent does with information, what the consequences of late information arrival are, and what kinds of services he might require. The interviews were conducted sequentially so that ideas and themes gained from one series of discussions could be followed up in subsequent interviews.

The direct method is limited in that the respondent cannot easily define a need which he has never experienced (such as a computer-access abstract source), but such a limitation can often be overcome by the opportunity to discuss the problem in some detail.

| ORGANIZATIONS | FUNCTIONS | | | | | | | | | | OPERATIONAL | | | | | INFORMATION STORAGE & RETRIEVAL | EDUCATIONAL | PUBLIC INFORMATION TRANSMITTAL | USER |
|-----------------------------------|-------------|----------------|---------------------|----------|--------|-------------|---------------|------|-------------------|------------|-------------|----------------|-------------|---|---|---------------------------------|-------------|--------------------------------|------|
| | LEGISLATIVE | ADMINISTRATIVE | LONG-RANGE PLANNING | RESEARCH | DESIGN | DEVELOPMENT | MANUFACTURING | TEST | EMERGENCY MEDICAL | REGULATORY | | | MAINTENANCE | | | | | | |
| | | | | | | | | | | BEHAVIORAL | VEHICULAR | CONTROL SYSTEM | | | | | | | |
| FEDERAL GOVERNMENT | | | | | | | | | | | | | | | | | | | |
| Congress | ● | | | | | | | | | | | | | | | | | | |
| NTSB NHSB | | ● | ● | ● | | | | ● | | | | | | ● | ● | ● | | | |
| B. P. R. | | ● | ● | ● | ● | | | ● | | | | | | ● | ● | ● | | | |
| H. E. W. | | ● | ● | ● | | | | ● | | | | | | ● | ● | ● | | | |
| Military | | | | ● | | | | | | | | | ● | | | | ● | | |
| STATE GOVERNMENTS | | | | | | | | | | | | | | | | | | | |
| Legislatures | ● | | | | | | | | | | | | | | | | | | |
| Highway Depts. | | ● | ● | ● | ● | | | ● | | | | | | ● | | | | | |
| Motor Veh. Depts. | | ● | | | | | | | | ● | | | | ● | | ● | | | |
| Driver Licensing | | ● | | | | | | ● | | ● | | | | ● | ● | ● | | | |
| Educational Depts. | | ● | | | | | | | | | | | | ● | ● | ● | | | |
| Police | | ● | | | | | | ● | ● | ● | | | | ● | | ● | | | |
| LOCAL GOVERNMENTS | | | | | | | | | | | | | | | | | | | |
| Road Commissions | | ● | ● | | ● | | | | | | | | | ● | ● | | | | |
| Traffic Engrng. | | ● | | | | | | | | | | | | ● | ● | | | | |
| Police | | | | | | | | ● | ● | ● | | | | ● | ● | ● | | | |
| Courts | | | | | | | | | ● | | | | | ● | | | | | |
| INDUSTRIAL FIRMS | | | | | | | | | | | | | | | | | | | |
| Automotive | | | ● | ● | ● | ● | ● | | | | | | | ● | | | | | |
| Insurance | | | | | | | | | | | | | | ● | | | | | |
| Trucking | | | | | | | | | | | | | | ● | | | ● | | |
| Construction | | | | ● | ● | | | ● | | | | | | ● | | | | | |
| Fuel | | | ● | | | | | ● | | | | | | | | | | | |
| Component | | | | ● | | | | ● | | | | | | | | | | | |
| Bus | | | | | | | | | | | | | | ● | | | ● | | |
| SERVICE FIRMS | | | | | | | | | | | | | | | | | | | |
| HOSPITALS | | | | | | | | | | | | | | | | | | | |
| CLINICS, PHYSICIANS | | | ● | | | | | ● | ● | | | | | | | | | | |
| EDUCATIONAL | | | | | | | | | | | | | | | | | | | |
| Universities | | | ● | | | | | | | | | | | | | | | | |
| High Schools | | | | | | | | | | | | | | | | | | | |
| CONSULTING ENG. & RES. | | | | | | | | | | | | | | | | | | | |
| SAFETY ORGANIZATIONS | | | | | | | | | | | | | | | | | | | |
| PROFESSIONAL SOCIETIES | | | | | | | | | | | | | | | | | | | |
| MASS MEDIA | | | | | | | | | | | | | | | | | | | |
| PRIVATE CITIZEN | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | ● | | | ● | | |

TABLE 1. SAFETY-RELATED TRAFFIC SYSTEM FUNCTIONS AND ORGANIZATIONS

The indirect method consists of observing actual request and citation activity and tabulating these data. This has the advantage of providing factual information, but users often make requests for something other than what they really need, which results in what is sometimes called "the librarian's dilemma." A user asks the librarian for a book about steam engines and another on gasoline engines. The librarian can produce these. But what the user really wants is information about the efficiency of both kinds of engines, and if the request had been made in this form, the librarian might have provided a table with the required information from an engineering handbook.

Previous user and use studies have been compiled and reviewed by Columbia University (4), Davis (6), Fishenden (7), Herner (9), Johoda (10), Menzel (11), Thornudd (21), and Voigt (22). We have acquired several recently completed user studies (3,5,12-15,17-19, and 23) and reviewed them for methodology and findings. For the most part, such surveys considered technical users (often the scientist-researcher) within a discipline, or at best within a limited number of related disciplines. Even with this limitation of coverage, the findings from these studies provide some understanding and guidelines which are reflected in this Task and in the Conclusions and Recommendations in Section 10.

The value of user studies has often been questioned. Taube (11) states that they "have no value as direct guides to the design of information systems," but may have other forms of value, e.g., clues as to optimum size of information units and degree of consumer indoctrination. According to a study by Herner and Company (23):

They were found wanting both on an individual and on a collective basis.

In short, while the results of user studies to date do not offer much direct guidance in planning libraries and information systems, they do indicate types of needs and uses. Such information can provide a starting point to better understand the user and to plan for future activities that will ultimately help him operate more efficiently and effectively.

Fishenden (7) has noted that

User surveys are often criticized as producing few useful results, but the results represent a substantial body of knowledge which is likely to be of considerable value in assessing future proposals for development of new services. The investigations also lead to increased awareness of the problem.

Two general comments can be made about previous studies. First, user studies have many limitations and cannot really serve as the basis for design; their value lies in providing guidelines for planning. Second, user study methodology is poorly developed, but even the poorest study will yield considerable insight as to how to proceed in an information center design program.

Recognizing the attributes and limitations of such efforts, we proceeded to conduct both a direct survey (of a wide variety of potential users, as defined by the chart in Table 1) and an indirect survey (by tabulating the requests of users of the Highway Safety Research Information Center). The latter yielded information primarily about technical and scientific users, although occasional requests came from a broader population.

2.3. USERS

Having considered the exhaustive list of users and their functions, we then proceeded to classify them according to the kinds of information they require. We found five broad groupings: the researchers (with a need for detailed and in-depth information), the administrators (with a need for summary information), the practitioners (with a need for manuals or "cookbooks" in their field), mass media representatives (with a variety of needs based on their communications function), and a large group of occasional users.

TABLE 2. NUMBERS OF USERS

| | |
|--------------------------|---------------|
| Research | 1,000 |
| Private | (100) |
| Auto Industry | (400) |
| Federal/State | (500) |
| Administrators | 4,000 |
| Practitioners | 31,000 |
| Construction/Maintenance | (4,000) |
| Licensing | (1,000) |
| Inspection/Investigation | (3,000) |
| Enforcement | (5,000) |
| Rescue/Medical | (5,000) |
| Teaching | (13,000) |
| Mass Media | 300 |
| Drivers | 100 million |
| Driving Students | (1.5 million) |

Numbers in each user group (Table 2) were derived from a variety of sources. The number of researchers was determined by estimating the current research budget in traffic safety and dividing by the estimated cost per researcher. The numbers of administrators and practitioners were derived from directories and educated guesses based on our previous exposure to the field. There is a fine dividing line in many cases between the administrator and the practitioner. Administrators include such people as the Secretary of State, the Highway Commissioner, legislators, and standards officials. Under the practitioner category, we counted driver education instructors, highway engineers, traffic engineers, many police officials, ambulance operators, and other people professionally engaged in activities related to traffic safety. The number of mass media representatives who are concerned with traffic safety on a nearly fulltime basis is quite small. There are a hundred or so automotive writers associated with the country's newspapers and

magazines, including a large press corps in Detroit representing national media. TV and radio networks have a few people on their staffs who specialize in this field. The Society of Magazine Writers is a small group of about 250 professional writers of whom perhaps 10 are directly concerned with traffic safety writing. Thus, we have estimated this group at only 300--realizing, of course, that many more writers are occasionally interested in traffic safety and placing these under the category of occasional users. Potentially, the occasional user category could include any lawyer in the "free world" who is involved in trying a traffic case (we have received queries from an Australian lawyer seeking advice about sleepy drivers), any of a number of graduate students, any of a large number of newspaper reporters, doctors, high school principals, college professors, and so on. The total number of such individuals is not so important because we are certain that not all of them will make use of a center.

The number of people who would use the center cannot be read directly from Table 2. The numbers in that table can serve only as initial guidelines for, say, determining the distribution of a particular newsletter. The estimates used in deriving the numbers of users were not intended to be exhaustive, since there are clearly more than 5,000 policemen and judges concerned with enforcement. The actual number who do use the center would be controlled by publicity and/or service charges, so that their demands would be balanced against usefulness in the promotion of traffic safety.

2.3.1. THE DIRECT SURVEY

Over the course of three months, we interviewed approximately 40 people to discuss their information needs in traffic safety. Table 3 shows the categories; 30 complete interviews were conducted. These people represented an across-the-board sample but, in general, represented not so much the scientific and technical or research groups as the practitioners, administrators, mass media men, and occasional users. A discussion of results for each group of users is given in Appendix A. We asked each interviewee for questions which he would like to have answered by an information service, or for questions which he had himself asked recently of some information source. Summaries of the actual questions are given in Table 4.

TABLE 3. CATEGORIES AND NUMBERS OF USERS INTERVIEWED

| | |
|--|---|
| Lawyers | 2 |
| Safety Organization Representatives | 3 |
| Traffic and Highway Engineers | 2 |
| Insurance Agents | 2 |
| Automobile Dealers | 2 |
| Researchers | 4 |
| Legislators (and legislative assistants) | 2 |
| Mass Media Representatives | 6 |
| Educators | 3 |
| Police and State Agency Officials | 4 |

30

TABLE 4. RESPONDENTS' QUESTIONS/REQUESTS

1. Copy of article about motorcycle accidents.
2. What is the University of Michigan doing in safety research?
3. Causes of accidents, kinds of injuries, attitudes toward safety, relationship of research labs to industry, pressures on federal government from industry.
4. What are the safety features of the Volvo?
5. Performance data on Kelsey-Hayes disc brakes.
6. Effectiveness of tire studs.
7. Effectiveness of collapsible front ends.
8. Copies of 1969 proposed standards.
9. Copy of Stapp Conference Proceedings.
10. Comments from insurance industry on compulsory disclosure legislation.
11. Baltimore accident data for several years.
12. County and local accident statistics.
13. Dollar loss from automobile accidents.
14. Is Periodic Motor Vehicle Inspection good or bad?
15. Number of overtaking and passing accidents in U.S. per year.
16. Projection of gross national product.
17. Number of injuries by type associated with vehicle accidents.
18. Newspaper clippings on drunk driving in Australia.
19. Design of research laboratory buildings.
20. Copy of 7th Stapp Conference Proceedings.
21. Literature search on vehicle handling.
22. Copy of SAE lighting standards.
23. Figures on recent drunk driving convictions.
24. Statistics on effectiveness of implied consent laws.
25. Information on "sleepy driver" accidents--cause of sleepiness, etc.
26. Number of drunk driver arrests last year.
27. Reason for arrest in connection with fatal accidents in 28 states last year.
28. UCLA report on Liberty Mutual safety seat.
29. List of Allstate policy holders in state.
30. City and local accident and violation statistics.
31. Copies of state legislation on traffic safety.
32. Information on fatality rates in states with and without vehicle inspection as a function of time.
33. Specification of steering adjustment on various cars.
34. Committee report on DOT appropriations.
35. What is maximum traffic load of a two-lane highway in a residential area?
36. Traffic survey manuals published by federal government.
37. Raw data on local accidents.
38. Bibliography of publications and research in progress regarding emotions, motivation, scare tactics, propaganda mechanisms.
39. Accidents per capita 10 years ago compared to those today.
40. What is the most important feasible undertaking to be supported toward reducing highway deaths and injuries?
41. Will crushable front ends work?

(Table 4, Continued)

42. All statistics on enforcement of traffic laws--from apprehension to disposition.
43. A brief but incisive pamphlet for young drivers to impress them with the need for safe driving.
44. Everyone talks about highway safety; why doesn't someone do something about it?
45. Material with which to fight the local city sign ordinance.
46. Material with which to fight the local city traffic engineer's ideas.
47. Nationwide listing of facilities available for emergency care.
48. Percent of people who wear seat belts in the U.S.
49. Good statistical data relating accidents to other factors.
50. What are accident frequencies in my county, and where are they occurring?
51. How well is the NHSB meeting its goals? What areas important to highway safety are left untouched by the present legislation?
52. How should we (the public) expend our traffic safety dollars?
53. What is the best existing piece of literature on the drunk driving problem?
54. Statistical breakdown to show whether the driver or the vehicle is more at fault in an accident.
55. Data from accident records to show which make and type of car is safest and which is most dangerous.
56. Data on crashworthiness of various vehicles.
57. Does the public really care about safety?

TABLE 5. CATEGORIES OF USERS' QUESTIONS

| | |
|------------------|----|
| Data (facts) | 32 |
| Advice | 23 |
| Documents | 11 |
| Surveys | 4 |
| Activity Reports | 2 |

From Table 5 we see that people most commonly ask for some sort of numerical or specific reference information (such as the number of people injured in Grand Rapids last month, or the wheel alignment specifications for the '66 Mustang). Next most frequent were those which we would classify as requests for advice. It is not suggested that a documentation center be prepared to answer directly such queries as, "How well is the NHSB meeting its goals?" or "Does the public really care about safety?" Such queries, however, provide important clues as to the kinds of material needed within the documentation center. Requests for specific documents were not too frequent. These would include such items as a request for a copy of the 9th Stapp Conference Report or a Traffic Survey Manual. At the bottom of the frequency tabulation were survey questions (e.g., a nationwide listing of facilities available for emergency care) and activity reports (e.g., what is your present organizational program in traffic safety?).

Except for occasional informal discussions, personnel of the National Highway Safety Bureau were not included in the group of interviewed users. This came about primarily because, at the time of the study, the bureau was in its formative stages, and it was not possible to discuss detailed information requirements with people who were new to their jobs. Informal discussions, however, indicate that bureau personnel fall generally into two categories--researchers and administrators--and that their information needs correspond closely to those of their counterparts in other activities.

2.3.2. THE INDIRECT SURVEY

The indirect survey consisted of analyzing the requests of the users of the Highway Safety Research Information Center during September 1967. These users were primarily from the research community. The bulk of the requests, about 78% (as shown in Table 6) were for specific publications, and only about 10.4% were for information on or about a subject. Most of the subject requests were for information on standards or specifications and accident data. An important area of inquiry appears to be information about people and organizations active in the field, following very closely the proportion of subject requests.

TABLE 6. HSRIC REQUESTS FOR SEPTEMBER 1967

| <u>Requests for Specific Publications</u> | <u>Number</u> | <u>Percent</u> |
|---|---------------|----------------|
| Journal articles | 257 | 78 |
| Reports, proceedings | | |
| Books | | |
| | | |
| <u>Search Requests</u> | | |
| By subject | 34 | 10.4 |
| About people | 14 | 4.6 |
| About organizations | 13 | 4.2 |
| All items by author | 2 | 1.4 |
| Broad literature searches | 2 | 1.4 |
| | <u>330</u> | <u>100.0</u> |

It may be noted here that, although there were only two requests for a broad literature search, these involved a considerable amount of staff time because of the exhaustive nature of the searches. Another observation that may be made is that research workers, in general, appear to use journal literature far more heavily (about 86%) than nonjournal literature (about 14%). Also, technical reports and conference proceedings appear to be at least as important as books and monographs. The articles used by research workers are widely scattered among the journals, and there is a wide variety of subject matter covered in these journals. Although 257 requests for journal articles referred to only 115 journals, for the most part, HSRIC's own collection of 175 journals was inadequate to meet these requests. It is apparent from Table 7 that the field of highway safety is strongly interdisciplinary, and that almost any subject can provide information contributing

TABLE 7. SUBJECT AREAS

For HSRI Technical Staff and for Journals Borrowed
by the HSRI Library from Other Libraries, Sept. 1967

| <u>Subject Field</u> | <u>Number of Journals Borrowed</u> | <u>Total Number of Requests for These Journals</u> | <u>HSRI Technical Staff</u> |
|--|--|--|-------------------------------------|
| General | 4 | 4 | 7 |
| Science - General | 4 | 6 | 1 |
| Math and Statistics | 6 | 11 | 2 |
| Physics | 5 | 6 | 3 |
| Earth Sciences | 1 | 1 | - |
| Psychology | 2 | 7 | 5 |
| Child Development | 1 | 1 | - |
| Ergonomics | 2 | 12 | 1 |
| Physiology | 2 | 3 | 2 |
| Public Health | 2 | 4 | 1 |
| Medicine | 16 | 29 | 5 |
| Engineering - General | 6 | 12 | 9 |
| Trade Journals | 2 | 4 | 4 |
| Mechanical Engineering | 11 | 42 | 14 |
| Automotive Engineering | 10 | 32 | 5 |
| Civil Engineering | 2 | 2 | 5 |
| Highways | 6 | 18 | 8 |
| Traffic Engineering | 9 | 17 | 2 |
| Chemical Engineering | 2 | 2 | - |
| Aviation | 1 | 1 | - |
| Law | 13 | 17 | 2 |
| Operation Research/Systems/ Control/Documentation | 8 | 26 | 7 |
| | <u>115</u> | <u>257</u> | <u>75</u> |

to the better understanding and advancement of highway safety. A direct survey of the primary research interests of the HSRI staff again (see Table 7) demonstrates the broad subject spread of the field.

2.3.3. NATIONAL SAFETY COUNCIL SURVEY. One additional useful description of the spectrum of users comes from a recent survey conducted by the National Safety Council among the readership of the Traffic Safety Research Review, a publication separate from Traffic Safety but included in its 17,500 subscriptions. Approximately 80% of the readers were sent questionnaires, and 40% of those surveyed responded. The readership is obviously a group with an express professional interest in traffic safety, and while the sample in the survey is limited, it indicates the breadth of interests in the field. Applicable results of the survey are given in Table 8*. The percent column does not total 100, since respondents often checked more than one choice in a multiple choice question.

2.4. KNOWLEDGE OF CURRENT INFORMATION ACTIVITIES

Further information was obtained from the interviews listed in Table 3. In these interviews, we showed the respondent a list of active knowledge centers (libraries, services, information centers) and asked whether he knew of their existence (Table 9) and whether he had ever used them (Table 10). A general lack of knowledge of present services was revealed. Interviews were conducted primarily in Michigan (many in Lansing), and the respondents demonstrated familiarity with the Michigan State University Library (most knew of their local library) and a lack of familiarity with the University of North Carolina facilities. The advantages of news coverage and publication are evident in that a large percentage of respondents knew of the Cornell Aeronautical Laboratory's Automotive Crash Injury Research (ACIR) program, the University of California's ITTE work, and the National Safety Council's library and information services. Northwestern University's Traffic Institute led the list of used organizations, evidently because of its program of publishing manuals useful to the practitioners in fields related to traffic safety.

The ranking (or numbers) displayed in Tables 9 and 10 should not be taken quantitatively, for two reasons. First, the sample of respondents was not broad and certainly did not give each user group a fair representation. Second, the form of the question biased the results; few users knew of the Safety Research Information Service, at the National Safety Council, yet there is a wide knowledge of the existence of the National Safety Council, and it was this that was reflected in the results.

2.5. WHICH NEEDS SHOULD BE FULFILLED?

Up to this point, we have defined the users of highway safety information by type and number, characterized their information requests, and commented on their knowledge and use of information sources. The final item in the user survey was the determination of the needs to be met by a highway safety documentation center.

* The National Safety Council plans to publish the results of this survey, which were more extensive than those in Table 8.

TABLE 8. READERSHIP SURVEY: TRAFFIC SAFETY RESEARCH REVIEW

| | | |
|--|-------|------|
| Readership | 2,700 | |
| Questionnaires Sent | 2,100 | 100 |
| Returned | 850 | 40 |
| <u>Field of Career Interest</u> | | |
| Education | | 23.6 |
| Engineering | | 18.1 |
| Psychology | | 15.0 |
| Government | | 13.5 |
| Miscellaneous (research, administration) | | 10.0 |
| Medicine | | 7.8 |
| Industrial Fleet Safety | | 5.7 |
| Insurance | | 4.0 |
| Social Science | | 2.0 |
| <u>Research Interests</u> | | |
| Driver Behavior | | 49.3 |
| Driver Education | | 31.2 |
| Accident Investigation | | 29.4 |
| Vehicle Design | | 19.8 |
| Drugs and Alcohol | | 18.1 |
| Highway Design | | 18.1 |
| Transportation Systems | | 16.0 |
| Other | | 2.2 |
| <u>Activity</u> | | |
| Teaching or Training | | 32.1 |
| Conducting Research | | 21.3 |
| Administration: General | | 20.9 |
| Safety | | 20.5 |
| Research | | 13.8 |
| Other | | 1.6 |
| <u>Use of Information</u> | | |
| For General Information | | 67.4 |
| In Teaching | | 32.4 |
| In Research | | 24.5 |
| In Program Decisions | | 14.9 |
| Don't Use | | 1.0 |

TABLE 9. RESPONDENTS INDICATING FAMILIARITY WITH CENTERS

| <u>Center</u> | <u>Number</u> |
|--|---------------|
| Safety Research Information Service National Safety Council | 26 |
| Automotive Crash Injury Research Cornell Aeronautical Laboratory | 24 |
| Institute of Transportation and Traffic Engineering, University of California | 23 |
| Library of Congress | 22 |
| Highway Traffic Safety Center Michigan State University | 19 |
| Highway Safety Research Information Center Highway Safety Research Institute | 18 |
| Highway Research Information Service Highway Research Board | 17 |
| Northwestern University Transportation Library | 17 |
| Bureau of Public Roads Library | 16 |
| AAA, ASF Libraries | 14 |
| Highway Traffic Safety Center University of Illinois | 11 |
| Bureau of Highway Traffic Library Yale University | 11 |
| NASA Information Facility | 11 |
| University of Michigan Transportation Library | 8 |
| Federal Clearinghouse for Federal Scientific and Technical Information | 8 |
| Highway Safety Research Center University of North Carolina | 7 |
| Systems on Automotive Safety Information | 6 |
| Defense Documentation Center | 6 |
| University of Michigan Transportation Library | 0 |

TABLE 10. RESPONDENTS INDICATING USE OF CENTERS

| <u>Center</u> | <u>Number</u> |
|--|---------------|
| Northwestern University Transportation Library | 11 |
| Safety Research Information Service National Safety Council | 10 |
| Automotive Crash Injury Research Cornell Aeronautical Laboratory | 10 |
| Highway Traffic Safety Center Michigan State University | 10 |
| Library of Congress | 8 |
| Highway Research Information Service Highway Research Board | 7 |
| Bureau of Public Roads Library | 7 |
| AAA, ASF Libraries | 6 |
| Institute of Transportation and Traffic Engineering, University of California | 6 |
| Bureau of Highway Traffic Library Yale University | 6 |
| Defense Documentation Center | 5 |
| Highway Safety Research Information Center Highway Safety Research Institute | 4 |
| Federal Clearinghouse for Federal Scientific and Technical Information | 3 |
| Highway Traffic Safety Center University of Illinois | 2 |
| Highway Safety Research Center University of North Carolina | 2 |
| NASA Information Facility | 1 |
| System on Automotive Safety Information | 0 |

Ideally, we should at this point be able to compute the value (in terms of enhanced safety or better transportation) of furnishing information to any of the potential users. Obviously, this cannot be done. We can, however, discuss the uses to which information will be put, and speculate about the effects of such uses. In a similar manner, we can make judgments about the timeliness requirements for information which will lead us to conclusions about the needs for automation.

From both the direct and indirect surveys conducted under this program, we have tabulated those materials and services most often needed or asked for by the five groups of users discussed above (Table 11). From discussions with the interviewees and with their peers, we have judged some of the indicated needs to be more critical than others. These priority items are indicated by (X) on the chart. We cannot conclude at this point that any of the services should not be provided, but simply that those indicated as most important should receive priority in the development of a center. The following comments pertain to each of the materials or services listed in Table 11.

Current awareness bulletins are generally considered vital by researchers. Early notification of the output of colleagues in related fields is important in guiding one's own research effort as well as minimizing unnecessary duplication. Current awareness services for administrators and practitioners are of somewhat less value, although several people requested them. Practitioners request information when they need it, rather than making a continuous effort to stay up to date in a field. Consequently, there is some question as to whether a current awareness service directed at them would have a significant effect.

Annotated bibliographies are essentially research works in themselves. Typically, they result from a researcher's long efforts in a field and represent his attempt to consolidate knowledge in something a little less sophisticated than a state-of-the-art report. While such documents are not generally useful to a large segment of even the research population, it appears that their preparation should be encouraged.

The union catalog is, in theory, a complete list of literature related to traffic safety. As indicated above, there will always be literature relevant to traffic safety which will lie in hiding (fugitive); but an aggressive acquisition program by the several principal agencies involved can build up a rather extensive joint catalog of the primary literature. Its need to researchers is obvious, and its availability almost certainly would assure its use by administrators and writers.

The need for research in progress reports has been specifically noted by researchers, administrators, and writers. All of these people want to know what is going on in the world, albeit for different purposes. Researchers indicate that, given the normal publication delays of professional journals (and the propensity of some of their colleagues not to publish when they should), they must attend many conferences and meet their peers to find out what research is underway. But conference activity is not enough to keep everyone informed. Administrators need similar information to help guide their programs, and

TABLE 11. INFORMATION MATERIALS AND SERVICES
REQUIRED BY VARIOUS TYPES OF USERS

| Materials and Services | Researchers | Administrators | Practitioners | Mass Media | Occasional Users |
|----------------------------------|-------------|----------------|---------------|------------|------------------|
| Current Awareness Bulletins | (X) | X | X | | |
| Annotated bibliographies | X | | | | |
| Union Catalog | (X) | X | | X | |
| Research in Progress Reports | (X) | (X) | | (X) | |
| People/Organizations Directories | X | (X) | | X | X |
| Newsletters | (X) | X | (X) | (X) | |
| Literature Searches | X | | | | |
| Request Bibliographies | (X) | (X) | | X | |
| Reviews/Summaries | X | (X) | | X | |
| State-of-the-Art Reports | X | X | | | |
| Field Manuals | | | (X) | | |
| Accident Statistics | X | X | X | X | X |
| Reference Information | X | X | X | X | X |
| Audiovisual Material | | X | X | X | |
| Selective Dissemination | (X) | X | | | |
| Referral Services | X | X | | (X) | |
| Documents/Lending Services | X | X | X | X | X |
| Copies | (X) | | X | X | |

writers need it because they must anticipate readers' desires. All things considered, this is probably the most important need we have found, and while there is some work being done to meet it, much more could be done.

Directories of organizations and people already exist in many of the subfields of traffic safety, e.g., lists of expert witnesses and members of the Society of Automotive Engineers. They seem to be of particular value to administrators, with peripheral value to others. It is likely that certain new directories specializing in traffic safety could be useful byproducts of any documentation center activity.

Newsletters are desired by and no doubt are useful to all but the occasional users. While some newsletters already exist, the field is not completely covered, and short, concise reports of current activities in the field are welcomed by most users. Biased reports are better than none, and it is likely that the users would prefer to hear their side of the stories. Consequently, there is some doubt as to whether a federal agency should undertake the publication of a newsletter; it might be better to make sure that relevant material is available to the writers for subsequent dissemination.

Request bibliographies are compiled in response to a specific request. Our judgment is that they are likely to be most useful to the administrator (say the state official in charge of licensing drivers) but also of considerable value to the researcher and writer.

Literature searches, reviews and summaries, and state-of-the-art reports are useful summaries of particular subjects listed in order of increasing depth and sophistication. There is a mixed feeling among researchers about state-of-the-art reports--many would prefer to do their own. It seems obvious, however, that serious summarization within a field is useful from time to time.

Field manuals (also called cookbooks) are most important to the practitioner. Perhaps the most notable publisher of such manuals in the traffic safety field is the Northwestern University Traffic Institute. Over 3,000 manuals covering such subjects as the improvement of the present system of traffic accident records and police traffic supervision as an aid to drivers have been published under the aegis of Northwestern, and several major compilations of these manuals have appeared. There seems to be no question that one of the major problems in the traffic safety field (as in others) is getting research results into usable form for the practitioner, and good handbooks are a likely answer. Whether such efforts should be performed by the documentation center or merely endorsed is not clear at this writing.

Accident statistics seem to be of some value to everyone. Researchers need them to prove a point; administrators need them to sell a program, etc. They are often requested as material for a speech, a magazine article, or other public utterance. How much effort should go into making them available for the general public is undetermined, but many users will ask for them. Summary statistics produced by a data center are an obvious input to an information center.

Audiovisual materials--film strips, training movies, etc.--are currently available from numerous sources. Timely availability is

often a problem because of waiting lists, and there seems to be no unified directory for this material.

Selective dissemination of material is the distribution of documents and/or abstracts to users on the basis of their indicated needs or interest profiles. It has been requested by a number of researchers and administrators for essentially the same reason: reading everything to find a few useful items is too time-consuming, and some preselection is often desired. A congressional assistant's in-basket on a certain day may contain 100 separate documents, letters, folders, etc.; he cannot read it all, yet the same amount of material may come in again the next day.

Referral service (a switching system) is of primary value to the researcher and writer. Referrals are made to experts, sources of information, or documents, and are a normal function of an information center.

Documents/lending services suggests that there are reference libraries containing copies of documents. All kinds of users require this service occasionally, though generally from a local source. Copies of documents are of most value to researchers, who seem to prefer having their own copies for as long as needed. If a copying service is set up for researchers, it will undoubtedly serve the less demanding needs of practitioners and writers as well.

Taking only the priority items into consideration, Table 12 shows their present status and projects a desired frequency for each service. The list of current activities is selective. These priority items have been given full consideration in the latter phase of the contract, so the contents of Table 12 are in no way exhaustive or comprehensive.

TABLE 12. STATUS OF PRIORITY ITEMS

| <u>Materials and Services</u> | <u>Estimated Desired Frequency</u> | <u>Selected Current Activities</u> |
|----------------------------------|------------------------------------|--|
| Current Awareness | Monthly | HRB, NSC |
| Union Catalog | | |
| Research in Progress | Semiannually | HRIS, SRIS |
| People/Organizations Directories | Annually | HSRIC (Professional) |
| Newsletters | Biweekly | Insurance Institute for Highway Safety, Automotive News |
| Request Bibliography | As Needed | HRIS, Others |
| Field Manuals | As Needed | Northwestern, IIHS, Publishers |
| Selective Dissemination | Monthly | HRIS |
| Referral Services | As Needed | Informal |
| Document Copies | As Needed | Federal Clearinghouse for Scientific and Technical Information |

3. TASK B: EXISTING PROCEDURES FOR OBTAINING INFORMATION

Task B is concerned with procedures used or available for the acquisition, storage, retrieval, and dissemination of highway safety information and the strengths and deficiencies of these procedures. The major operations involved are locating relevant documents, acquiring them, recording them, analyzing their subject contents, storing them for future use, and retrieving them from store to fulfill the needs of users. There are a number of other related activities and routines, such as checking against library catalogs and order files to avoid duplication, accessioning, labeling, etc., which must be carried out for the successful execution of these operations; however, we have confined our attention only to the major operations noted above.

A review of directories (5-9) revealed over 100 libraries/information centers (see Appendix B) which appeared to be concerned with highway safety or some aspect of it. There were two procedures available for discovering the current practices followed in these libraries in regard to acquisition, storage, and retrieval. One was to mail a questionnaire to all, or to a large sample of these libraries; this had been done previously (2), with rather limited success. The other, which we chose, involved the following steps:

- (1) A review of the literature.
- (2) Visits to a few selected libraries (see Appendix B) to study their operations and gain a deeper knowledge of the problems involved, to talk with their personnel, and to evaluate the effectiveness of their operations.
- (3) A visit to Case-Western Reserve University Bibliographic Systems Center to examine their collection of library classification schemes.
- (4) Correspondence with a few libraries that we couldn't visit.

It may be noted that the main objective of all acquisition, storage, and retrieval activities is to ensure that a user can get all the relevant information he needs without delay, no matter where and when it originated. In the field of highway safety, this presents a complex problem, for a number of reasons. The first, and most important reason, is the interdisciplinary nature of highway safety--almost any subject may provide information that contributes to the better understanding and advancement of highway safety. Second, until recently, most of the work done in this field has been scattered throughout the literatures of various disciplines. Third, there is a wide variety of users of highway safety information, with heterogeneous backgrounds and educational achievements, who often require the same information in different forms and often in subject fields other than their own specialization. Fourth, the pace of research activity in this field, and consequently the demand for information, has increased rapidly. Finally, the nature and origin of highway safety literature also presents a problem. As is obvious from Table 13, journal articles represent a very high proportion of this literature, about 75 to 80 percent. Also, as shown in Table 14, only a small fraction of the nonjournal literature is represented by books published by commercial presses; the rest consists of reports

sponsored by universities, research institutions, state and federal government agencies, conferences, societies, and foundations. Such publications, though relatively inexpensive or free, are seldom announced in book-trade journals and tend quickly to go out of print. Most of them, particularly the scientific and technical reports, are distributed automatically to a predetermined list of recipients, and a library that does not appear on that mailing list may find it often difficult to learn about the existence of a report, let alone obtain it.

TABLE 13. USE OF JOURNAL VS. NONJOURNAL PUBLICATIONS

A. Nonjournal Requests

Proportion of Requests for Journal and Nonjournal Publications Received by HSRI Library During September 1967.

| | |
|----------------------------|-----|
| Journal Articles | 86% |
| Reports, Proceedings, etc. | 7% |
| Books | 7% |

B. Announced Publications

Proportion of Journal and Nonjournal Publications on Highways and Highway Safety Announced in Certain Journals.

| <u>Journal</u> | <u>Journal Publications</u> | <u>Nonjournal Publications</u> | <u>Total</u> | <u>Percent Journals</u> |
|---|-----------------------------|--------------------------------|--------------|-------------------------|
| <u>Traffic Safety</u> | | | | |
| September 1967 | 73 | 24 | 97 | 75 |
| October 1967 | 58 | 13 | 71 | 82 |
| November 1967 | 104 | 11 | 115 | 90 |
| <u>Highways: Current Literature</u> | | | | |
| March 15, 1967 | 88 | 38 | 126 | 70 |
| September 27, 1967 | 99 | 38 | 137 | 72 |
| <u>Current Literature in Traffic & Transportation</u> | | | | |
| September 1967 | 191 | 67 | 258 | 74 |

TABLE 14. ORIGIN OF NONJOURNAL PUBLICATIONS

| Journal | Regular Books | Federal Govt. | State | Local/Regional | Univ./Res. Institute | Society Foundation | Trade Assn. | Industry | Service Society | Management Firms |
|----------------------------|---------------|---------------|-------|----------------|----------------------|--------------------|-------------|----------|-----------------|------------------|
| <u>Traffic Safety</u> | | | | | | | | | | |
| Sept 1967 | - | - | 1 | - | - | 11 | - | - | - | - |
| Oct 1967 | 2 | 5 | 2 | - | 4 | 14 | - | 1 | - | - |
| Nov 1967 | - | 3 | 2 | 1 | - | 4 | - | - | 1 | - |
| <u>Highways: Curr Lit</u> | | | | | | | | | | |
| 15 Mar 67 | | 6 | 9 | 3 | 7 | 5 | 6 | 2 | - | - |
| 27 Sep 67 | | 16 | 7 | - | 6 | 6 | - | 2 | - | 1 |
| <u>Curr Lit Traf Trans</u> | | | | | | | | | | |
| Sept 1967 | 8 | 27 | 1 | 3 | 15 | 8 | 2 | 2 | - | 1 |
| Total | 10 | 57 | 22 | 7 | 32 | 48 | 8 | 7 | 1 | 2 |

3.1. SELECTION

For these reasons, the librarian's traditional book selection tools, such as publishers' announcements, book-trade journals, general review media, are proving rather ineffectual and need to be supplemented by more effective methods. Two methods which appear to be the most fruitful are regular scanning of professional journals, and direct contact with as many of the producers of literature of interest as possible in order to facilitate automatic receipt of such literature upon publication. The National Bureau of Standards has compiled a list of 314 organizations active in motor vehicle and traffic safety research. The list is obviously selective since there are a number of other organizations which produce information of interest to workers in highway safety. The System on Automotive Safety Information of General Motors (SASI) maintains a list of about 1,000 safety oriented organizations; the Highway Safety Research Information Center (HSRIC) of The University of Michigan maintains a list of about 1,500 agencies; and the Highway Research Information Service (HRIS) of the Highway Research Board maintains a list of over 2,200 sources, including journals. HRIS and the Safety Research Information Service of the National Safety Council (SRIS), besides maintaining quite extensive source lists, also try to contact research workers whenever they learn of a new research project.

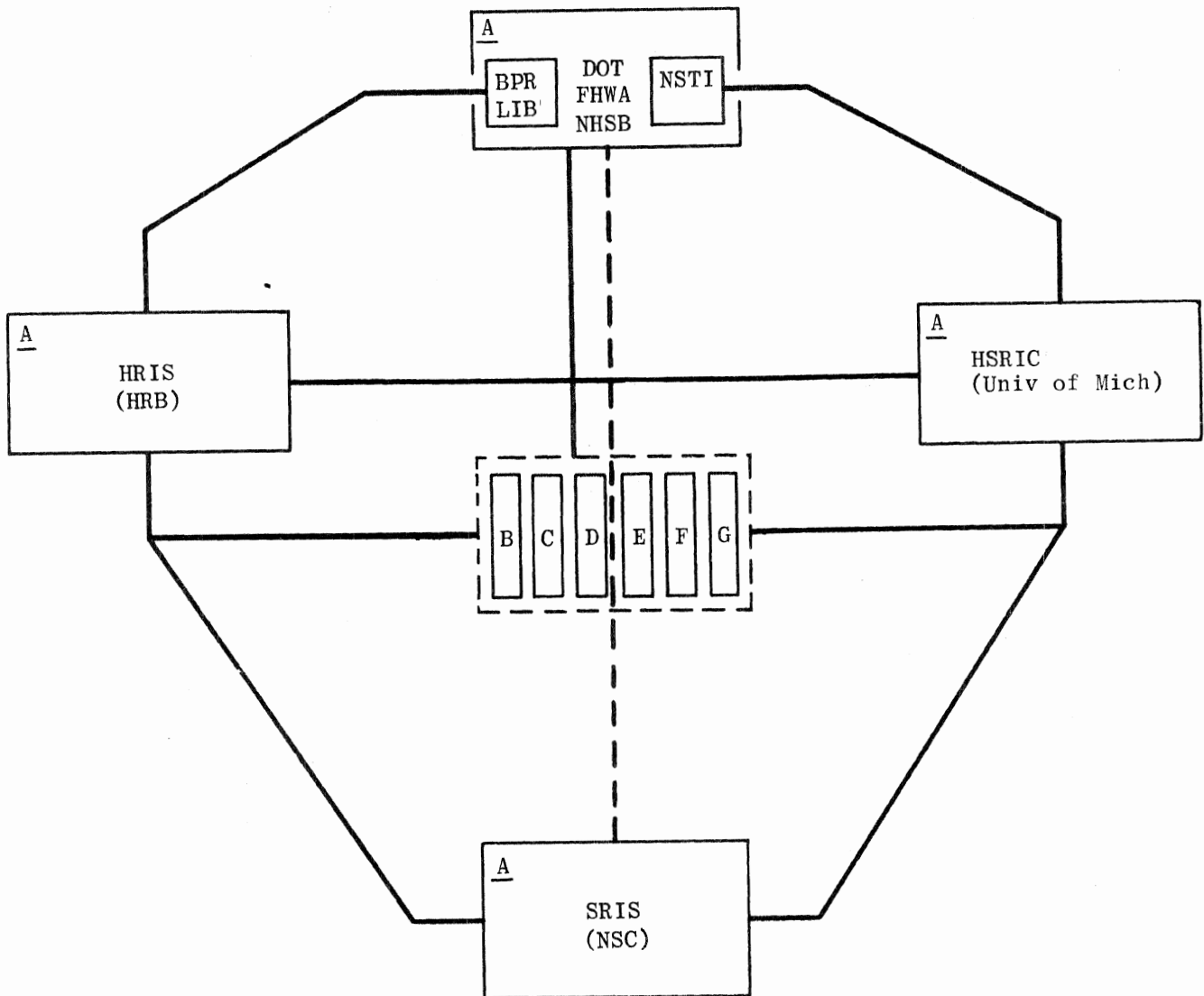
Another problem area is presented by "fugitive" materials such as reports, speeches, and proceedings of conferences and symposia. Only a few libraries make any determined effort to obtain such materials. HSRIC maintains a list of forthcoming meetings* of interest to highway safety personnel, subscribes to a clipping service, and encourages its professional and research staff to file reports on their own trips.

It may also be noted here that, in some cases, these methods are being supplemented by formal or informal exchange agreements with other libraries/information centers to share information about their acquisitions and other operations. Thus, there is emerging a kind of informal network of information centers in highway safety (Fig. 6). This network, as we see it, has seven parts, as follows:

- (A) Four primary information centers:
 - (1) National Traffic Safety Institute (NTSI)
 - (2) Highway Research Information Service (HRIS)
of the Highway Research Board
 - (3) Safety Research Information Service (SRIS)
of the National Safety Council
 - (4) Highway Safety Research Information Center (HSRIC)
of The University of Michigan

Each of these four major information centers maintains a large document collection and, in general, has access to a relatively large and professional staff in its field of interest. These centers use other specialized centers and/or collections (the six other parts of the information network listed below), to obtain information and act as sources of information for them.

* Forthcoming meetings are issued monthly as part of HSRI Research.



Legend

- | | |
|--|---|
| <p>A. Primary information centers, such as HRIS, HSRIC, SRIS.</p> <p>B. Specialized centers, such as HTSC, SASI (GM), CAST (Wayne State Univ), etc.</p> <p>C. Other highway safety/transportation collections, such as Yale, Northwestern, ITTE, etc. Also state highway departmental collections.</p> | <p>D. Related federal agencies, such as NBS, NIH, NLM, DDC, ERIC, SIE, NASA, NRCST (LC), etc.</p> <p>E. Societies and foundations.</p> <p>F. Other people/organizations active in the field of highway safety.</p> <p>G. Foreign information centers, such as IRRD, RRL, CGR, MIRA, Excerpta Medica, etc.</p> |
|--|---|

FIGURE 6. MODEL OF EXISTING HIGHWAY SAFETY RESEARCH INFORMATION NETWORK

(B) Specialized information centers, such as the Highway Traffic Safety Center (HTSC) at Michigan State University, the System of Automotive Safety Information (SASI), and information centers set up and supported by NASA, such as CAST (Wayne State University).

(C) Other highway safety/transportation collections, such as those at Yale, Northwestern, and ITTE; state highway departmental collections, large public libraries, etc.

(D) Related federal agencies, such as the National Bureau of Standards, National Institute of Health, National Library of Medicine, Educational Information Research Center (ERIC), and the Library of Congress.

(E) Societies and foundations.

(F) Other people and organizations active in the field of highway safety.

(G) Foreign information centers, such as International Road Research Documentation, Road Research Laboratory, Canadian Good Roads Association, Motor Industry Research Association (MIRA), and Excerpta Medica.

Although there is obvious duplication and overlapping in their activities, each of these centers also has an area or areas of special interest. Thus, HRIS is obviously interested in highway engineering and design, and SRIS in traffic safety and its psychological aspects.

The resources of the various parts of this network, their collections and their services, have been examined more closely in the second phase of this contract. However, it must be stressed that this network has come into existence primarily on a voluntary basis, with the resultant uncertainty in service and failure to exploit fully the best available collections for a given purpose.

3.2. ACQUISITION

After a document has been located and selected, its acquisition is relatively simple, except that often, by the time an order for it is placed or a request made, it may already be out of print and no longer available. During our visits to libraries and our contacts with research workers, we often heard complaints about the lack of full texts of documents which they had identified as pertinent to their needs. Some information centers collect or retain only abstracts and refer to their users other collections, such as Bureau of Public Roads (BPR) library, for the actual documents. This problem is particularly serious with respect to foreign documents. Thus there is a need for an adequate system of secondary distribution of research publications.

It may be observed here that, although the total volume of highway safety literature is relatively small compared to that for other sciences and engineering fields, it is difficult for a single library or information center to be self-sufficient because the subject matter is dispersed among various disciplines. There is, therefore, a great need among highway safety libraries to share resources and develop tools, such as a union catalog of highway safety literature. The feasibility of compiling a union catalog was explored in the second phase of this contract.

3.3. CATALOGING

Once documents are acquired, they must be recorded in catalogs and their subject contents analyzed and indexed if they are to be used. The first part of this activity is concerned with what is known as descriptive cataloging. Although the task of descriptive cataloging is rather mechanical and, to some extent, routine, problems arise, particularly in handling report literature and in determining the correct term of entry for corporate bodies. Most of the libraries we visited used either the Library of Congress Rules for Descriptive Cataloging or the American Library Association (ALA) Cataloging Rules for Author and Titles entries. They also used Library of Congress catalog cards; however, these cards were available only for a very small fraction of their acquisitions. Some of the information centers (such as SASI and SRIS) are using, or planning to use, the Standard for Descriptive Cataloging of Government Scientific and Technical Reports, published by the Committee on Scientific and Technical Information (COSATI). SRIS has developed its own cataloging procedures, which are similar to the COSATI Standard of the Federal Council for Science and Technology.

There are some basic differences between the COSATI Standard (followed by the HSRIC rules) and the LC or ALA rules, particularly in their handling of entries of corporate bodies. The general COSATI rule is "catalog from the report in hand, using only those organizational elements that appear on the report." The LC rules require the cataloger to search and provide additional information if not available from the report in hand. The COSATI Standard omits "U.S." before headings, i.e., Bureau of Public Roads and not U.S. Bureau of Public Roads. City or state names which repeat part of the name of the main element are omitted. If the subelement includes a geographic name, this is repeated as part of subelement, as

Massachusetts Institute of Tech. Cambridge
Rochester University, N.Y.

When more than two organizational elements are displayed in imprint, the corporate author heading includes only two, the largest and smallest. If a corporate author changes its name, the COSATI Standard recommends that both old and new forms of names be retained, with cross references made between them. The COSATI Standard also permits rearranging the title to put less significant parts last, such as "quarterly progress report," or "6th annual." Some of these differences are shown in Figure 7.

ERIC has found the COSATI Standard somewhat lacking in the handling of educational publications and, using it as a basis, has set up its own Guidelines for Descriptive Cataloging. For any specific factors not covered by these guidelines, the cataloger is advised to consult the COSATI Standard, and for items not covered by the COSATI Standard, the cataloger may refer to the ALA Anglo-American Cataloging Rules.

An important development with respect to descriptive cataloging has been the publication of the new edition of Anglo-American Cataloging Rules this year by ALA. The new AA Code makes a number of important

46

HSRI-01195

Alcohol and road traffic. Proceedings of the Third International Conference on Alcohol and Road Traffic.

British Medical Assoc., London.

1963. 362 p. tables. figs.

Conference: Third International Conference on Alcohol and Road Traffic,
3-7 Sept 1962, London, Eng.

Source: B.M.A. House, London, Eng.

G Traffic

OBCBC Physiological Effects, Alcohol, Toxicology, Problems, Biomedical Aspect

PCCB Alcoholism, Typologies/Clinical Diagnosis, Personality, Psychological Aspect

RCFBB Drinking, Moving Violations, Criminal, Laws, Legal Aspect

YEB Proceedings, Contents

OBCBB Blood level, Alcohol, Toxicology, Problems, Biomedical Aspect

J Accident

HSRI-01195

HE 5606 .I62 **International Conference on Alcohol and Traffic.**
Proceedings. 1st-
1950-
(Stockholm,
v. diagrs. 21 cm. For complete record see Shelf List
Cover title, 1950- : Alcohol and road traffic.

1. Drinking and traffic accidents—Congresses. I. Title: Alcohol and road traffic.

HE5614.I 55 **614.862** **53-39354**
(3) **M i U**
Transmitted on
Library

FIGURE 7. LC vs HSRIC CATALOG CARDS

changes in the handling of corporate entries and is in remarkable harmony with the COSATI Standard. However, the need here is not only to adopt or formulate an ideal set of cataloging rules, but also to encourage and develop a standard and uniform practice among all libraries and information centers in the field of highway safety. The number of such libraries/information centers is increasing, and if they have to cooperate with one another in interlibrary loan and resource sharing, as they must, it is desirable that they speak a common language by recording their document citations in a uniform way. A beginning in this direction can perhaps be made by developing jointly a common corporate authority list.

A related question is the physical form of catalog entry. Although most libraries use the standard 3 x 5 inch card, a few, namely SASI and HSRIC, have begun to use a 5 x 8 card. BPR Library uses a 4 x 6 card for its periodicals index. However, we believe that more important than the size of the catalog card is the form of the catalog. Since users of highway safety information are scattered all over the country, a catalog should be in a form which is more or less equally accessible to all of them. This seems to be possible only with a periodically updated computer-based book catalog. This question will be further explored in Section 5.

3.4. SUBJECT ANALYSIS AND INDEXING

Fundamental to the problem of information retrieval in libraries is the process of analyzing the text containing information and describing it in an indexing language. This is usually done by adopting--very often, adapting--a standard classification system or a thesaurus, or it may require the devising, and subsequent development and control, of a new indexing language especially designed for the specific field or mission.

There are several reasons why existing general systems are unsatisfactory for particular libraries/information centers. First, most of them do not give adequate details for accurate specification of the highly complex subjects in papers and reports that such libraries/information centers must handle. Second, despite the comprehensiveness and variety of certain general schemes, they do not fully cater to the viewpoints of each particular library. Third, even if they are varied in viewpoints, they do not sufficiently provide for the flexible combination of terms which highly specific subjects demand. Fourth, they achieve flexibility only by unnecessarily lengthy or complicated notational means. Finally, they fail to provide optimum helpful filing order.

The continued proliferation of new special classification schemes and thesauruses is evidence enough that such criticisms are felt to be valid. Through visits to various transportation/highway safety libraries and to the Bibliographic Systems Center of the Case-Western Reserve University, we discovered 15 such systems (plus two unpublished thesauruses), which are listed below:

- (1) American Automobile Association, Library Subject Heading List, Washington, D.C.
- (2) Automobile Manufacturers Association, Patent Department, Classification Used by the Library, Detroit.

- (3) - - -Subject Headings Related to Patent Library, October 1965.
- (4) Bureau of Public Roads, A Classification Scheme for Highway Engineering; Adapted from Library of Congress Scheme, Addenda and Revisions, August 1965.
- (5) Kathryn Childs Cassidy, and Joy Redfield, Library Classification and Related Bibliography of Traffic Engineering Literature. Bureau of Highway Traffic, Yale University, New Haven, 1948.
- (6) LIBRARY OF CONGRESS, A Classification Scheme for Highway Engineering, Federal Works Agency, May 1949.
- (7) Colorado, Department of Highways Library, List of Subject Headings, March 1955.
- (8) Highway Research Board, Highway Research Information Service, HRIS Thesaurus, Washington, D.C., March 1967.
- (9) Institute of Transportation and Traffic Engineering, Highway Transportation Subject Headings Used by the Institute of Transportation and Traffic Engineering Library, Number 21. California, University of: Institute of Transportation and Traffic Engineering. May 1960.
- (10) Joseph C. Marsh IV, Rameshwar N. Paul, and Michael L. Thall, Highway Safety Research Information Center Subject Index Facets, Ann Arbor, September 1967, Highway Safety.
- (11) National Safety Council Library, Filing System for Safety Publications, Chicago.
- (12) National Safety Council, Safety Research Information Service, Developmental Thesaurus of Approved Terms in Safety Research, compiled by Rosemary A. Buckley, Jean L. Hoffman, and Gerald Driessen, Chicago, August 1967.
- (13) NATIONAL SAFETY COUNCIL, Subject Heading List, NSC, Chicago, Illinois, 1959.
- (14) National Safety Council, Classified Subject List for Traffic Safety, Chicago, 1939, 19p.
- (15) Pennsylvania University, Wharton School of Finance and Commerce, Lippincot Library, Classification (An Adaptation of Dewey Decimal Classes 310, 330, 368, and 380), Philadelphia, 1963.

Five of the 15 systems are classification schemes, and the rest are subject heading lists or thesauruses for subject indexing. In conventional libraries, classification is used to arrange documents on shelves, and subject heading lists are used to provide an alphabetical approach to the subject contents of these documents in catalogs. The classification scheme most commonly found in libraries seems to be the Library of Congress scheme or some adaptation of it. In newly developing information centers such as HRIS and HSRIC, for which the users are likely to be scattered geographically and the bulk of the collection consists of materials not published in book form, the documents are usually shelved in simple accession order or some variation of it; the subject approach to the contents of documents is provided through subject indexes or catalogs. Thus, the subject heading lists and thesauruses assume an added significance. Three of the seven thesauruses listed above, namely items 8, 10, and 12 came out only last year, which is incidentally another indication of increased activity in this field. Let us examine these thesauruses more closely.

3.4.1. HRIS THESAURUS. The HRIS Thesaurus lists about 15,000 terms. It contains uniterm-type single terms such as Inflow, Informal, Infrared, Intact, Integers. There are phrases, such as Initial Tangent Modulus, Followup Investigation, Driving under the Influence, Distance Measuring Equipment, 85-Percentile Speed. There are also precoordinated subject headings or descriptors, such as Distillation/Refining Process, and Regional Planning/Transportation. There are 32 terms beginning with the word pile or piles, which explains, to some extent, the size of this thesaurus.

Despite its size, there are some serious omissions in this thesaurus in certain areas of highway safety, particularly in biomechanics, injury/trauma, and vehicles. A few of these are noted below:

(1) Although INJURY is an authorized term, there seems to be no provision for injuries to various parts of the body. Thus, while NECKING is an authorized term, Neck Injury or Neck is not. Nor is Whiplash. HEAD and FOOT appear as authorized terms and can probably be coordinated with INJURIES, but there is no mention of Abdomen, Ear, Nose or other parts of the human body. There is BACKLASH, but no Back.

(2) ANTHROPOLOGY is an authorized term, but Anthropometry is not.

(3) There is no mention of Prosthesis.

(4) There is no provision for Pregnancy, Pregnant Women, Woman Driver, or, for that matter, women at all. Incidentally, there are 35 terms beginning with the word "Driver"

(5) Child and Children are unauthorized terms and they must be entered under the authorized term MINOR. There is no mention of Infants nor Adolescents.

(6) There seems to be no provision for Dashboard nor Instrument Panel.

(7) There is no provision for Probation. Although there are six terms beginning with SUSPENDED, SUSPENSION, or SUSPENSIONS, there is no provision for simple Suspension or Suspension of Driver's License.

(8) While there are five authorized terms beginning with GLASS, there is no mention of Glasses, Spectacles, or Corrective Lens.

(9) BLOOD is an authorized term, but there is no mention of Blood Level.

This list of omissions or inconsistencies in the HRIS Thesaurus could be expanded further. This is not to indict the HRIS Thesaurus, but merely to point out that the size of a thesaurus alone, or the addition of terms without adequate vocabulary control, does not solve the problem of information retrieval. The limitations of such a thesaurus become obvious with a comprehensive and exhaustive search on a subject. For example, to make a comprehensive search on accidents would require 58 or perhaps more of the following descriptors:

HRIS Authorized "Accident" Terms

| | |
|------------------------|-----------------------------------|
| Accident Causes | Head-On Collisions |
| Accident Investigation | Investigation (Traffic Accidents) |
| Accident Prevention | Motor Vehicle Accidents |
| Accident Rates | Pedestrian Vehicle Conflicts |
| Accident Severity | Single Vehicle Accidents |
| Accident Severity Rate | Traffic Accident Analysis |

| | |
|-----------------------------|-----------------------------------|
| Accident Type | Traffic Accident Causes |
| Accidents | Traffic Accident Economic Effects |
| Collisions | Traffic Accident Reporting |
| Construction Area Accidents | Traffic Accidents |
| Fatal Accidents | |

There is no clear distinction among the terms accidents, collisions, motor vehicle accidents, and traffic accidents. There also does not appear to be a simple way of determining all the relevant descriptors on a given subject except by making an exhaustive search through the whole thesaurus, which, in view of its size, can be quite a time consuming operation. A generic-specific capability would be convenient.

The large size of the thesaurus does not necessarily increase its usefulness; in fact, it seems to hinder indexing and retrieval efficiency. It may also be noted here that the HRIS, besides using authorized terms, also uses a list of "identifiers" almost as long as the authorized list itself, thereby increasing the size of the thesaurus and its complexities. The identifiers also include trade names, proper names, and candidate terms for the authorized list.

HRIS "Accident" Identifiers

| | |
|-----------------------------------|---|
| Accident Avoiding Behavior | No Accident Record |
| Accident Costs | Non-Fatal Accidents |
| Accident Free | Non-Ejection |
| Accident Inducing Characteristics | Non-Fatal |
| Accident Liable | Non-Intersection Collisions |
| Accident Proneness | Principles of Accident Effect Reporting |
| Accident Victims | |
| Anti-Collision | Random Traffic Incidents |
| | Secondary Collisions |
| | Side Impact Collisions |

3.4.2. SRIS DEVELOPMENTAL THESAURUS. The SRIS Thesaurus is the second thesaurus to appear this year. The introduction states that it represents a shift from the narrower Yale Traffic Engineering Classification to a broader, more efficient coordinate indexing system using uniterms. The system has been applied to 800 documents added between April and July 1967. Another 5,000 remain to be indexed. This thesaurus is rather short, with less than 600 terms in all, and, despite the introduction, the terms are anything but uniterms. There are a number of precoordinated subject-heading terms or descriptors. Thus, there are 32 terms beginning with ACCIDENT or ACCIDENTS and 13 terms beginning with SAFETY.

Because of the size of the thesaurus, details are often lacking, and most documents on specific or specialized subjects have to be indexed under broader terms. Thus, Merging Traffic goes under TRAFFIC CONTROL AND OPERATIONS and/or TRAFFIC FLOW; Door Latches goes under SAFETY DEVICES and/or SAFETY FEATURES. Except for HEAD INJURIES, all other injuries seem to go under INJURIES. Thus, Chest and Knee Injuries go under INJURIES, as do Blasting Injuries. There is no separate provision for Neck Injuries or Back Injuries or, for that matter, injuries to other parts of the body. There is no heading for child or

children. Children's Accidents is under ACCIDENT-CHILDREN; Children's Emergency Services is under EMERGENCY SERVICES; Children's Injuries is under INJURY; Children's Safety Devices is under SAFETY DEVICES and/or SEAT BELTS; and Children's Seat Belts go under SEAT BELTS, and/or SAFETY DEVICES, and/or PASSENGER SAFETY.

3.4.3. HSRIC SUBJECT INDEX FACETS. The third and the latest of these thesauruses is the HSRIC Subject Index Facets. Its faceted approach to subject indexing seems to provide the most effective means for vocabulary control as well as for coordinate indexing with specific and generic searching capability and has been adopted by a number of thesauruses which have appeared recently (1).

As in descriptor indexing, a composite document is broken down into simpler concepts or ideas that jointly depict the document's subject contents, what questions the document is likely to answer, and how it is likely to be asked for. The second step is the coding of the document according to the concepts it presents by selecting as many codes from the HSRIC subject index facets as required to adequately describe the document's contents. Here the faceted approach is better than a straight alphabetic listing of descriptors. The emphasis is on indexing (and retrieval) by concepts and generic structure, so that one does not become entangled in the semantic conflicts resulting from the fact that some words are used in a variety of disciplines.

The indexer selects terms (subject codes) by a "table-of-contents" approach (see below) rather than a dictionary and cross-reference approach. The indexer can look at a document, see an idea or concept (in his mind's eye), turn to the code page, refine the idea, and select a code, without worrying about word usage or semantic links to authorized term usage across disciplines.

| <u>Table of Contents to Highway Safety Subject Index</u> | |
|--|-----------------------------------|
| COMPONENTS (Objects, Physical Entities of the System) | |
| | Materials |
| | Ways (Roads) |
| | Vehicles |
| | People |
| | Society (Organizations of People) |
| OPERATIONS (Verbs, Actions of the System) | |
| | Traffic |
| | Regulation and Control |
| | Services |
| | Accidents (includes Injury) |
| ENVIRONMENT (Natural Environment) | |
| | Space (Geography) |
| | Time |
| | Weather |
| ASPECTS (Perspectives, Points of View of the System) | |
| | Physical |
| | Biomedical |
| | Psychological |
| | Educational |
| | Legal |
| | Socioeconomic |

TOOLS

Disciplines
Methods
Equipment
Report Type

The index, then, is a set of structured term groups. Figure 8 is an informal depiction of the relationship of facets, i.e., a "stick-figure" table of contents. Figure 9 shows a method of picturing motor vehicle inspection from the legal and physical standpoints; subject terms are not precoordinated during indexing but are joined (coordinated) for retrieval.

The HSRIC Thesaurus has been applied to over 5,000 documents at HSRIC. Among the advantages claimed are the following:

- (1) It is especially designed for indexing and retrieving information on highway safety.
- (2) Emphasis is on retrieval by concepts and generic structure, bypassing the semantic problems in a multi-discipline mission.
- (3) A generic-specific capability is provided; thus, deep indexing still permits general browsing.
- (4) It provides an effective mechanism for vocabulary control.
- (5) Since only the basic concepts are listed, the system is relatively stable and can easily accommodate new subjects. However, this does not prevent precoordinating heavily used subjects.
- (6) The system can be easily adapted for computer use.

The Thesaurus is under continuing development and contains an alphabetic index to all the terms.

3.5. MACHINE INDEXING AND RETRIEVAL

At present, the only computer-based operational information retrieval system in the field of highway safety seems to be the Highway Research Information Service. The system is an off-line operation and is used to store and retrieve index and abstract files of documents and research-in-progress notices. HSRIC is engaged in developing a prototype of an on-line computer system of index retrieval.

Outside the field of highway safety, a number of computer-based on-line information retrieval systems, such as COLEX at the Systems Development Corporation and TIP at the Massachusetts Institute of Technology, are now in operation. These systems and the feasibility of a similar system for use by the National Highway Safety Documentation Center (NHSDC) were explored in Section 5. It should be noted that most of these mechanized information systems deal only with the storage and retrieval of document citations and, sometimes, abstract files, and that the processing of information into storage and the contents analysis of documents are still done manually. Also, a common feature of most mechanized information systems is the consistent under-utilization of the search capabilities originally advanced as the major rationale for system implementation. NASA and MEDLARS (Medical Literature Analysis

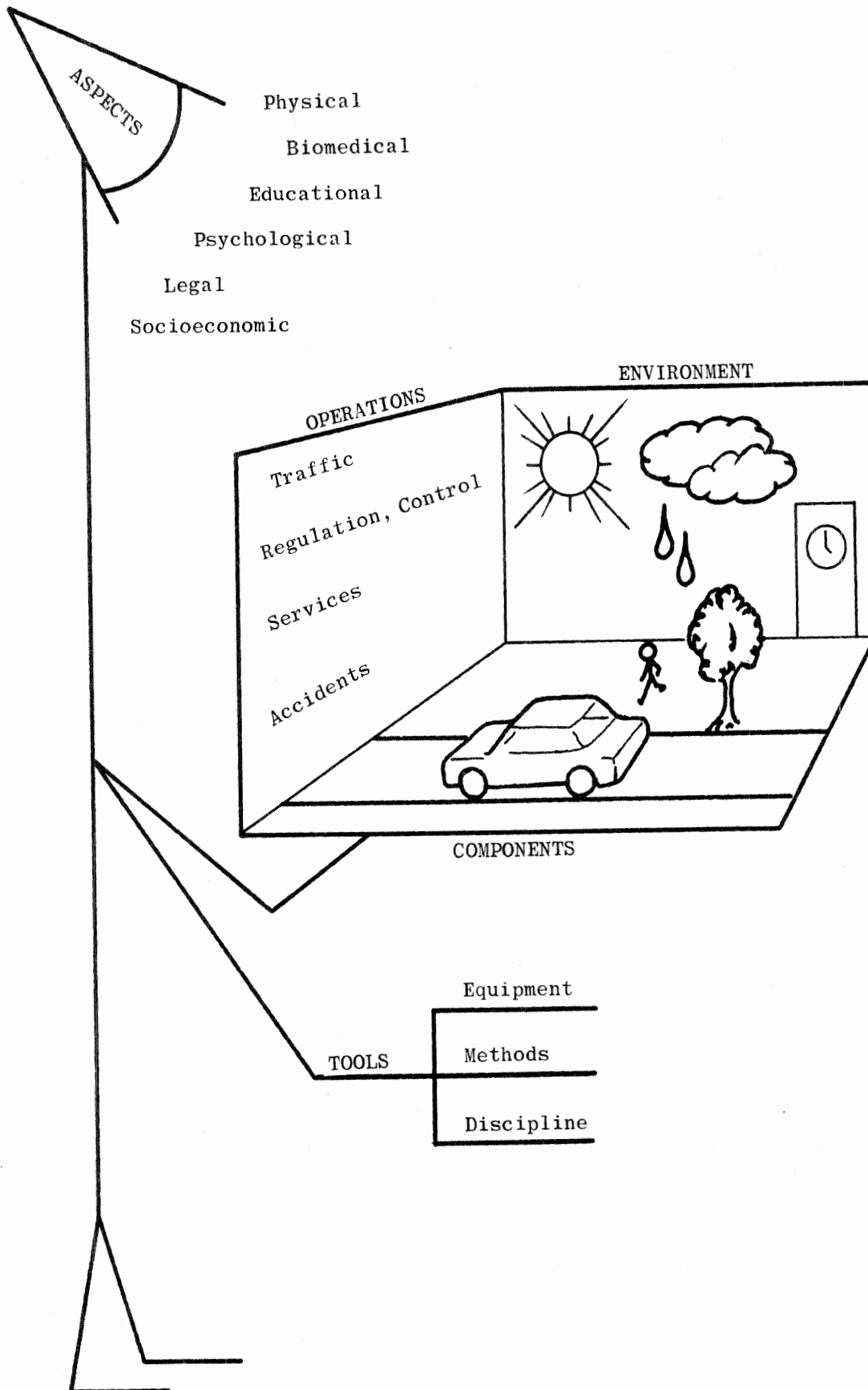
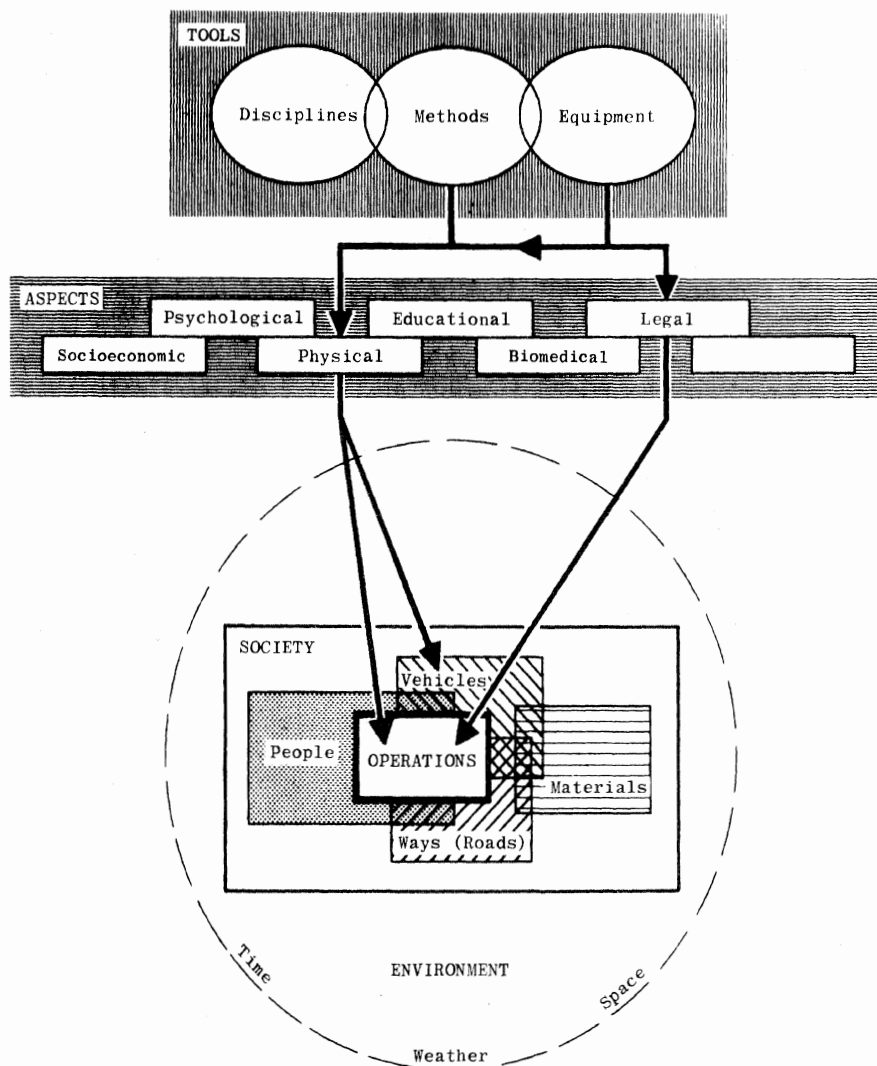


FIGURE 8. HIGHWAY SAFETY COORDINATE INDEXING FACETS



COMPONENTS are the tangible items, things, or entities that make up a highway transport system. The three key components are People, Vehicles, and Ways (or Roads). Vehicles and Roads are made of Materials, and People manifest themselves in the form of Society (communities, corporate bodies, and governments) which provide an organizational background for highway transportation operations.

OPERATIONS are the "verbs," that is, the actions and interactions of the components. Here we find traffic jams and accidents.

ENVIRONMENT refers to natural environment of Space, Time, and Weather, that affects all components and all operations.

ASPECTS are points of view or perspectives from which one can look at highway safety.

TOOLS are for problem solving. Disciplines are the traditional academic areas of study such as mathematics, medicine, highway engineering. Methods consist of theoretical procedural techniques, such as statistical analysis, that may be used to study the problems of highway safety. Equipment consists of hardware necessary to conduct a program, experiment, or study.

FIGURE 9. HSRIC FACETS

and Retrieval Systems), two of the most publicized systems, are reported to be devoting only a small portion of their total capability to performing searches (10). Surveys have shown that only a small fraction of all inquiries are suitable for machine searching (4). Thus mechanized service can only supplement a conventional service. Relatively more useful and quantitatively greater tasks performed by these systems appear to be in publications announcements and lists.

3.6. STORAGE AND RETRIEVAL

The problem of storage is essentially that of providing access to documents. A library may provide the needed document from its own collections, or, as it happens sometimes, it may have to depend on outside sources. Traditionally, libraries have tried to solve this problem through interlibrary loans, which is, and will probably remain, the most effective way to meet demands for certain types of documents, such as those out of print, relatively old, or needed only infrequently. Reliance on interlibrary loan by itself, however, is unsatisfactory for a number of reasons. The system is dependent on the generosity of a few large libraries that appear to be doing most of the lending. Thus, the Bureau of Railway Economics Library reported lending over 900 items and borrowing only about 20 items in 1966; a similar report was made by the Bureau of Public Roads Library. Another difficulty is the lack of duplicating facilities in libraries, e.g., the Bureau of Public Roads Library, which often have the desired documents; this presents a problem when a document is needed simultaneously by a number of libraries. It is desirable, therefore, to supplement interlibrary loan with a system of secondary distribution of publications, such as the Clearinghouse for Federal Scientific and Technical Information or the Educational Research Information Center (ERIC).

This also brings up the problem of copyright. It is the practice of many libraries at the present time to make single copies of journal articles to meet individual requests. The National Medical Library, which makes available single photo copies of articles through interlibrary loan, also has plans to develop a graphic image, storage, and retrieval system to be operated parallel with MEDLARS. This system would store micro-images of the texts of individual articles, and would be the basis for providing users with hard copies of articles whose citations have been retrieved by computers. This is far from being a uniform or universal practice at present, and the legal status of such services, which is not clear under existing law, depends upon the definition of "fair use." An ad hoc Task Group on Legal Aspects involved in information systems, set up by COSATI, recommended in July 1967 "that further study of this problem be made" and "that a commission be established to study the problems of the copyright law as applied to computers and to information systems" (3).

Another aspect of the problem of storage is the regular removal of rarely used documents, or "dead weight," from the shelves and catalogs to improve collections and service. These documents, however, should be available to users if and when needed. The need could be met by setting up an archive or storage collection at one of the participating

libraries, thereby expediting interlibrary loan and bibliographic work and ensuring that researchers will have the necessary information. Because of the nature of highway safety literature, such a storage collection would be established in a library which already has a comprehensive collection and also has adequate copying and reproduction facilities.

3.7. SUMMARY

Although the literature of highway safety is relatively small compared to that of other fields in science and engineering, it is scattered among the literatures of various other subject fields. Books published by commercial publishing houses form only a small fraction of the total literature of the field. Journal articles constitute about 75 to 80 percent of the titles requested by research workers as announced by libraries in their accession lists. A major portion of the literature not published in journals consists of reports published by societies, foundations, universities and research institutions, and state and federal government agencies.

It is obvious that traditional acquisition procedures are not adequate to meet the challenge of this kind of literature. The most effective procedures seem to be regular scanning of journals and direct contact with the producer of highway safety information. In the second phase of this contract we took a closer look at agencies that generate information likely to be useful to workers in highway safety.

It is also obvious that, because of the subject spread of highway safety literature, no single library can acquire all the materials needed by workers in the field of highway safety. There is a need, then, for a system of resource sharing among various libraries/information centers to be facilitated by the compilation of a union catalog. Such cooperation should lead to a system or network of information centers. Such a network is already beginning to emerge. However, at present, it exists primarily on a voluntary basis, which results in less than maximum efficiency in service and in failure to exploit the best available collection for a given purpose. The following factors contribute to the problem:

- (1) Absence of a union catalog of literature on highway safety
- (2) Communication difficulties
- (3) Lack of adequate facilities for secondary distribution of full text copies
- (4) User restrictions

To increase cooperation and communication among the various constituents of this network, there is a need for coordination of certain library procedures, particularly regarding rules for descriptive cataloging and, if possible, indexing. The COSATI Standard, supplemented by the new Anglo-American Cataloging Rules for any specific factors not covered by it, may be adapted for descriptive cataloging. On the basis of our experience and a critical examination of the existing thesauruses, we recommend that a thesaurus based on faceted principles be considered. Cooperative cataloging and retrieval should also be explored (Section 5).

Mechanized information systems can, at present, only supplement a well-conceived system; they cannot replace it. They can perform relatively more useful and quantitatively greater tasks in the production of publication announcements and lists. The feasibility and potential extent of their use by the National Highway Safety Documentation Center will be explored as a part of Task C.

To provide users of highway safety information with all the documents they might need, a system of interlibrary lending should be encouraged; this should be supplemented by a system of secondary distribution of publications and an archive containing materials that are rarely used.

4. REVIEW AND UPDATING OF TASK A AND B RESULTS

Three interim reports on Tasks A and B have been published (1-3). It is fruitful at this point to review the highlights of each of these reports and to bring the description of existing procedures up to date.

Summaries of the three reports are presented alphabetically--GE, HSRI, SDC. Each section is quoted directly except for the underlining and footnotes provided by the present author.

I. General Electric, TEMPO

The following is the complete Section 1 (Summary) from the GE TEMPO interim report (without Figure 1-1). The GE report provides an extensive review of the user population.

PRESENT CIRCUMSTANCES

After completing the work outlined in Tasks A and B, the following observations can be made.

The User Population

The highway safety user population appears to be very large and diffuse. The study identified 36 communities comprising four distinct user groups.

The size of the user population is more apparent than real. Some of the people are involved in highway safety some of the time.

Communication exists within each user community, the most effective being informal.

A repeatedly expressed opinion was that there are very few quality researchers.

The Body of Literature

There is currently no adequate way to delimit the literature of traffic safety.

That much of the existing literature concerning traffic safety is suspect was a strongly expressed opinion of researchers.

Increasing emphasis on traffic safety research at the federal and state levels will have a marked effect on the quantity of literature during the next decade.

The amount of public information material is enormous and there is no way to measure its effectiveness.

The Existing Information System

There is no means for the existing information system to integrate research results to give every type of user within and among groups an overview of total traffic safety activities.

The single most pressing need for the system is to pass on the research results to those concerned with their application.

The primary means of information transfer is via the informal investigator-to-investigator route.

The majority of information activities which have some functional relation to traffic safety are concerned with serving the organization housing them.

The most significant growth in the literature from the research community will result from the NHSB contracting program and the establishment of the Research Center.

The present information base, as it can be deduced from statements of information people in fields related to highway safety, is in the 25,000 to 50,000 documents range.

INFORMATION NEEDS

Classification of Needs

The information needs of the 36 user communities is displayed in Figure 1-1. The need is expressed by one of three values--major, minor, or community-oriented. A major need indicates a definite expression of need by the community; a minor need indicates a desire, but not a necessity; and a community-oriented indication is assigned to the expression of a need for an information service or product tailored to a specific community, e.g., an annual review for medical practitioners.

A consistent set of identified needs was for a central source of information and an announcement service. Corollary to such a need is the development of some means of vocabulary control, such as development of a thesaurus. The need for a current awareness or SDI service was rarely expressed in the research user group but was repeatedly expressed by members of the applications user group.

Secondary information products were identified as a strong information need which the NTSDC will have to satisfy. Some of these products which are generally needed are: state-of-the-art reviews, annual reviews, and research-in-progress summaries. In the communities which are primarily concerned with the conversion of research for public use a strong expression of need is indicated for such information products as newsletters, bulletins; data compilations; fact sheets, speeches and press release service; and audio-visual materials, lists, guides, and evaluative reviews.

The need for some mechanism to present research results in a form understandable to the intelligent layman was repeatedly emphasized. This need is labeled Translation of Research in Figure 1-1.

User Community Priorities

Due to currently active programs, certain of the 36 user communities identified in Figure 1-1 will require priority by the NTSDC to satisfy their information needs. To be meaningful

these priorities should relate to the objectives of the traffic safety program established by NHSB and now underway. The communities judged to be deserving of priority consideration are:

- Policy, Planning, and Management Research
- Policy and Legislative Agencies
- State Transportation Coordinating Agencies
- Regulatory and Licensing Agencies
- Vehicle Non-Manufacturing Research
- Systems Operations Research

Special Services and Products

In addition to the general statement of needs a number of suggestions were made for miscellaneous publications that the NTSDC could prepare to assist various communities. These are identified throughout Section 5.

There is a class of user need that goes beyond the defined scope of the Documentation Center. This need is for evaluation of research information, educational materials, pamphlets, brochures, instructional materials, and audiovisual aids. It is perhaps unreasonable from a practical standpoint that the NTSDC can be expected to directly perform any of these evaluation tasks. Certainly evaluation will become a less significant need with the quality control which will result from the NHSB contracting program and establishment of the National Traffic Safety Research Center. In the interim, the Documentation Center can encourage evaluation by other organizations associated with the highway safety field.

Finally, one interviewee made the astute observation that the success of the NTSDC will depend in large part on sufficient self-publicity to make potential users aware of its existence.

One point can be clarified in the last section of the GE interim report discussing existing system evaluation. As part of retrieval evaluation, it was noted that:

In the newer and emerging system elements, the concept-thesaurus approach is the rule. The exception to this statement is the approach adopted by the HSRIC. This classification scheme is of interest and may prove to be of use.

To avoid any possible misunderstanding, it should be mentioned that:

The HSRIC structured thesaurus is not a traditional classification scheme. A concept-thesaurus is used in a (post-) coordinate retrieval scheme. A faceted analysis was used to provide vocabulary structure and control (see Appendix E).

II. The University of Michigan, Highway Safety Research Institute

Section 4 of the HSRI interim report contained the following tentative recommendations:

1. Users of the National Traffic Safety Documentation Center will be people from many locations and disciplines, with different interests, educational levels, and system demands (e.g., response time, format).

Users' needs must be satisfied by a flexible system capable of providing a variety of services while evolving new services to meet new demands. A major failure of earlier information systems design is that once the design was established, it was viewed as an unchangeable mechanism. Information systems, to be useful, must be organic, i.e., capable of change.

Availability of services must be structured. More effort should be devoted to the needs of significant users and to the preparation and review of state-of-the-art publications in areas of current concern. An explicit definition of "significant user" cannot be derived, but such a user can be characterized by his value to the mission or company and the likelihood that his increased knowledge will be passed on to his co-workers and to practitioners in the field. The publication of services available and fees can be used to structure services.

2. There is a very low usage rate for almost all present library and information services. When faced with extensive literature search requirements, the user does not know where to turn or what procedures to follow.

The training and education of primary users as well as wide publication and announcement of available services must be included in plans for documentation center activities.

The system must be simple and not burdened with procedural details if the user is to understand and employ it with a minimum of difficulty. According to Mooers' Law, "...an information retrieval system will tend not to be used whenever it is more painful and troublesome for a customer to have information than for him not to have it."*

3. User studies can provide a starting point in the planning of information center activities, but an operative system must remain continuously responsive to the needs of its users.

Appropriate feedback mechanisms should be established so that the user is able to influence the system. Further development and extension of direct and indirect study techniques and continued user analysis will be required for the healthy growth and establishment of any information activity. The staff of the system should constantly view

*C. N. Mooers, "Mooers' Law, or Why Some Retrieval Systems Are Used and Others Are Not," Technical Bulletin No. 136, Zator Co., December 1959.

the users as constituting a group of customers, the satisfaction of whose needs is the basis for the establishment and continued existence of the system and for the creation and maintenance of any particular service.

4. Current Awareness. The reading of journals and news bulletins is the primary mode of keeping abreast (probably through habit). Each user reads the journals of his own profession or discipline.

A variety of current journals should be provided at each local information activity based upon local users' requests and backgrounds. Multiple subscriptions to popular titles and notices of current articles and meetings of interest should be considered. The growth of directories (e.g., of people, organizations, audio-visual materials) and news bulletins should be encouraged in areas of concern. Mechanisms for comprehensive notification of research in progress should be provided. While the user should be led to explore new material and sources, he should not be swamped; techniques of selective dissemination will be considered during the second phase of the contract.

5. Reference. The availability of readily obtainable, up-to-date, factual information is important. This category subsumes the bulk of the requests (in terms of numbers) the center will have to answer. (See conclusion and recommendation 2, on structuring the availability of services.) Such detailed information takes many forms and has a variety of sources.

Mechanized document retrieval systems are not as important as systems that can provide pertinent details. This problem is considered in Task B (existing procedures) and will be expanded in Task C (center organization and functions). The screening of journals, newspapers, newsletters, and readily available handbooks and reference works should be considered. Summary accident statistics compiled regularly by the National Traffic Safety Data Center should satisfy many requests.

6. Literature searches have played a major role in highway safety research in the last year as new projects and users come into this mission-oriented field from a variety of disciplines, and a high degree of cross-pollination of information has been required. There are two problems here: (1) weak indexing and coverage of the field by present bibliographic services (see Task B) and (2) weak utilization of present services (see conclusion 3).

Communication among highway safety centers should be improved. There are several techniques for strengthening indexing and coverage, and these will be explored as part of Task C. They include, for example, development of authority lists, a union catalog, an exchange network,

scanning of professional journals, and direct contact with sources for automatic distribution of material to the center.

7. Copies of "fugitive" material and limited-distribution reports are not generally available as required. There is a corresponding concern about bibliographies and information services being simple compilations of references without much regard for the existence of at least file copies of documents.

A secondary distribution or document clearinghouse function should be established now in conjunction with an effort to stock the clearinghouse with material for which copies are not readily available. Copyright restrictions remain unresolved. Skepticism should be expressed about any information scheme that cannot provide the user with a full text. Notification of publishing sources and availability could be integrated with bibliographic citations. On the other hand, the system should have a purging mechanism to remove "dead weight" to archive storage where it could still be retrieved but would not burden the system.

8. Recently, there has been a proliferation of new information center activities. (This in itself is an indication of urgency.) An informal exchange network of centers is evolving. There appears to be a need for a variety of types of information centers in highway safety.

Any anticipated system should provide for inclusion of specialized information centers based on three main criteria: subject need, the existence of an ongoing research program at a school or research institution in the subject area, and the presence of a large library. The developing network of existing centers should be enhanced through direct participation and formal recognition. Techniques for the enhancement of resource sharing will be considered in the contract's second phase. A meeting of all personnel concerned with the handling of highway safety information has been suggested by several people.

9. Field manuals and handbooks are needed for the application of research results and procedures/standards information. While information storage and retrieval within the researcher-to-researcher cycle is relatively well developed, the flow of information from researcher to practitioner is weak (though this is not so in the highway engineering field).

The preparation of application handbooks (cookbooks) should be provided for. Whether these should be sponsored by or prepared by the documentation center is not clear and will probably have to be decided on an individual basis.

10. Foreign materials usage is limited by lack of accessibility and familiarity, and by reluctance to read foreign languages.

Use and availability of foreign material should be improved. The documentation center should consider limited translation services, review papers of foreign materials, and selective acquisition from a wide variety of foreign sources.

III. System Development Corporation, Washington Operations Center

Section III, Design Considerations, of the SDC interim report, identified "several salient needs" which have been reproduced below. Two comments:

- (1) It is our recommendation that a "single point of access" to a "comprehensive collection" be provided on a timely basis by the development of a union bibliography (or catalog) and a solid network of existing collections.
- (2) The large majority of users interviewed by SRI did not use microforms. Few had ever seen a microfiche (Section 2).

From SDC Interim Report, Section III, Design Considerations:

There were several salient needs or desires identified in the foregoing discussion:

There will be almost universal support for a National Traffic Safety Documentation Center provided that it will be in fact a comprehensive collection of the world's significant traffic safety literature.

All of the interviewees want the documentation center to be a single point of access to the traffic safety literature.

The interviewees want the center to provide access to the original text and not to function only as a referral center.

There is nearly unanimous acceptance on the part of the users and sources to receipt of the original text in microform.

Those members of the traffic safety community interviewed placed high importance on the development of a thesaurus of concepts, subjects, terms, and nomenclature in traffic safety.

Several alternative modes of inquiry to the proposed National Traffic Safety Documentation Center were discussed with the interviewees and a good deal of enthusiasm was evidenced for the provision of remote access stations at the principal sites, for instance, the state agencies and the various associations including those that we have called special mission sources.

There is a strong need for a Bureau newsletter.

There is an expressed need for a file of legislation and legislative history inclusive of federal legislation and legislation of the states in the area of traffic safety that is indexed with thesaurus terms to assure ease of access.

A set of definitive and authoritative Bureau-sponsored and approved state-of-the-art reports and critical reviews in the several areas of traffic, highway, and motor vehicle safety are needed.

There is a need for a personality-organization-facility file that could be queried by any of those access channels or by thesaurus terms.

5. TASK C: ANALYSIS AND RECOMMENDATIONS FOR DOCUMENTATION CENTER ORGANIZATION AND FUNCTIONS

Task C was to conduct analyses to serve as the basis for decisions regarding the organization and functions of the Documentation Center; and to prepare recommendations on acquisitions and their processing, storage, and retrieval and dissemination. Clearly these recommendations are closely related with the analysis and recommendations of Task G on Documentation Center organization and operating procedures. This section will discuss the internal operations of the center, while Section 9 (Task G) will deal primarily with the organization (centralization/decentralization) of a network of information centers and the satisfaction of a series of information system requirements consistent with the objectives of the National Highway Safety Documentation Center. Task G develops a recommendation for central coordination and dissemination in a network of information centers providing acquisition, processing, and user services. The development of this network assures (1) a timely and evolutionary national capability, (2) user participation and, hence, better user understanding and broader acquisition resources, (3) readily available user services.

The National Highway Safety Documentation Center is responsible for facilitating the transfer of information from originator to user. The information processing system can be thought of as two subsystems:

- (1) Acquisition and evaluation (the processes of building and maintaining the information bank), and
- (2) Retrieval, analysis, and dissemination (techniques by which the stored information is made available to the user).

Eugene Wall (1) noted that:

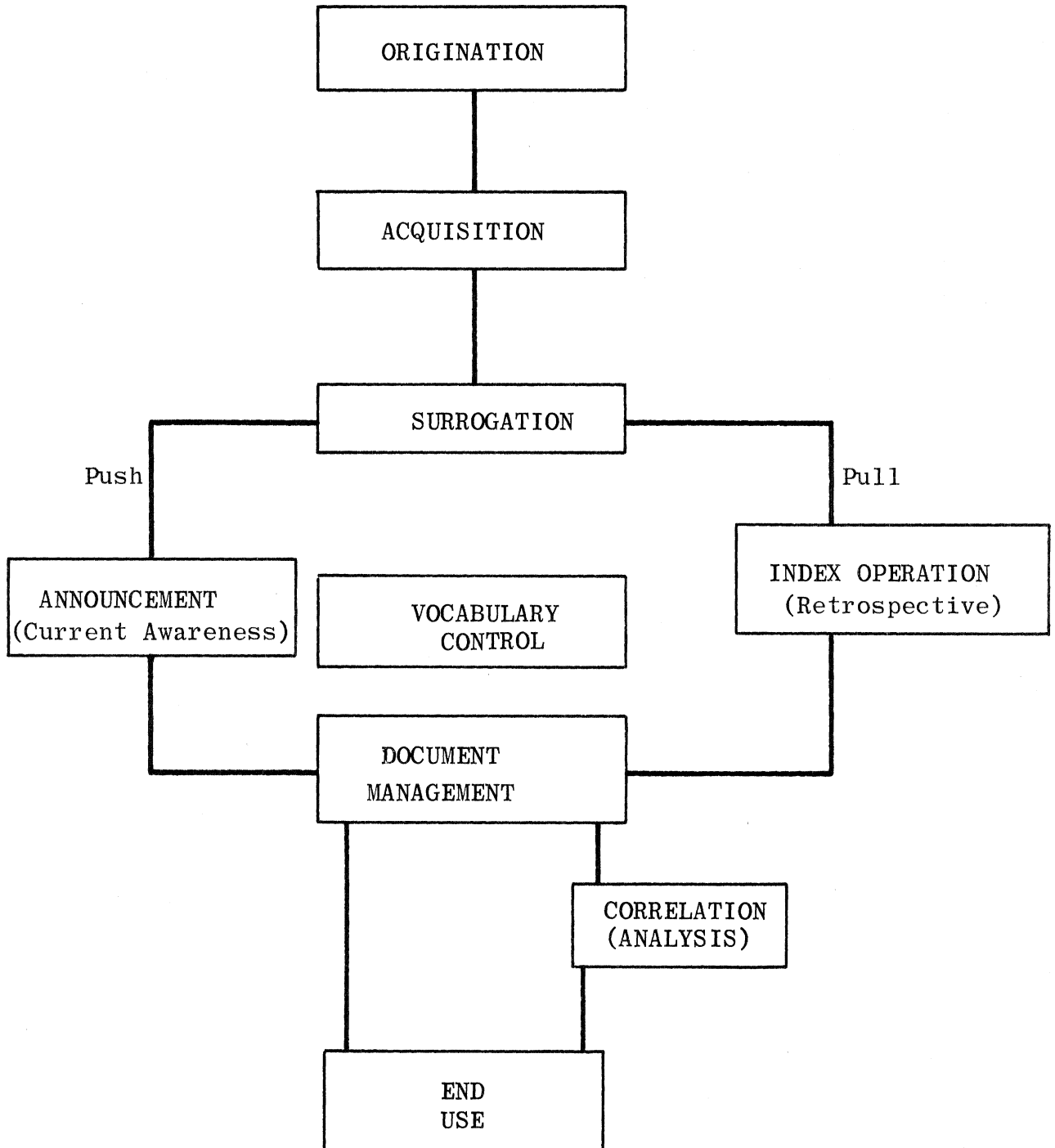
Within the processing area, we can detect seven distinct "unit processes", each of which may be widely varied in detail and scope. These are the processes that we shall tag with the general terms of acquisition, surrogation, announcement, index operation, document management, correlation, and vocabulary control. From one or more of these seven processes can be constructed every information or data system excluding those consisting of direct communication between the originator and user of information.

These seven unit processes essentially depict the internal operations of any one information center when arranged as in Figure 10. Each of these processes will be considered in turn.

M. J. Weinstock and associates (2) have discussed mechanization for retrieval vs. mechanization of other library functions. They note:

A common feature of most information storage and retrieval systems (and not one often discussed by system advocates and managers) is the consistent underutilization of the search capabilities originally advanced as the major rationale for system implementation.

FIGURE 10. INFORMATION CENTER INTERNAL OPERATIONS



In addition:

Computer search is neither as economical nor as rapid as its strongest advocates claim.

This underutilization was exemplified in the MEDLARS system, which was designed to perform 90-100 searches per day and is reported performing between 7 and 10.

Beyond the characteristic underutilization (or overdesigning) of automatic retrieval schemes, there is a question of how many requests are even appropriate to ask a computer. Again, the Herner report uses a National Library of Medicine example. Of 175 reference questions checked, only 12 were found suitable for MEDLARS searching, and these were generally concerned with new research projects or the publication of complete bibliographies. Many reference questions directed at a library are for a figure, a simple fact, a bibliographic citation, a definition, etc. These questions must be answered immediately (not batched every two weeks) and can be easily and quickly answered from card or book catalogs, reference works, or precompiled statistics from the National Highway Safety Data Center.

This is not to say that computer operations are not of value. Herner has compared the library operation to an iceberg, where the visible part represents retrieval and dissemination operations and the invisible part represents the many operations necessary to smooth output:

The spot lighting of search capability of information storage and retrieval systems has tended to put into the background the other useful (and quantitatively greater) tasks performed by these systems in publication, announcement, and list production.

Operations typically amenable to computer aid include annual lists of serial holdings, weekly lists of current periodicals, processing information list, a monthly printed author-title-subject catalog, a shelf list, a printed permuted index based on catalog subject headings, a daily circulation list, and such byproducts as a journal expiration list, item usage reports by year and times used (a prerequisite to culling), item usage reports by department and employee, printed book catalogs and catalog cards (with copies for branch libraries), reports of expenditures and balances of publications procurement budgets, cumulative printed call number and accession number indexes, periodic KWIC indexes, and indexes to proposals received or generated.

Thus, the use of the computer for literature searches alone is not enough to justify the high costs. Rather, the computer must be used by the NHSDC to manipulate bibliographic materials and generate documents and records necessary to the smooth operation of the center.

The design, implementation, and maintenance of an NHSDC computer-based union bibliography is strongly recommended. The production of a union bibliography is discussed in this section, and the administration is covered as part of Task G (Section 9).

Besides internal use for administrative and processing purposes, a union bibliography should be produced in multiple copies for distribution. This discourages dependence on computer retrieval, permitting users to do their own searching. Being fully exploited, the system becomes easier to justify.

It is projected that the NHSDC will use computer to assist in:

(1) Preparation and maintenance of subscription, circulation and fiscal records.

(2) Manipulation and printing of subject and corporate authority lists.

(3) Preparation of accession announcement lists and cumulative union bibliography.

(4) Cataloging of documents by using authority codes for subject and corporate entries for which the computer automatically inserts the full English entry and prepares the appropriate headings for any required catalog cards.

(5) Conducting retrospective searches for the publication of special bibliographies with computer-generated permuted indexes as required.

(6) Provision of real-time reaction and dialogue between the user and computer which will permit a number of simultaneous users to "browse" by modifying search strategy according to the type of information being retrieved. This service contrasts with the once-through "shotgun" approach of batched searches. The NHSDC operational design should provide for the implementation of a remote-access, real-time retrieval scheme at some future date as determined by the economics, demand, and acceptance of such a service. It is further recommended that a very limited pilot system be implemented now to assist in determining economics, demand, and acceptance. Appendix C is an example of such a pilot.

The application of computers within the NHSDC will be considered throughout the remaining sections of the report as appropriate, with an eye towards a union bibliography and byproducts.

5.1. ACQUISITION

Determination of the effort needed to locate and acquire publications, research reports, manuals, and other documents for the NHSDC has been based on sources, availability of documents, amount of existing and future materials, time and cost of acquiring. While initial acquisitions have been considered, emphasis was placed on developing an aggressive program of continuing acquisition (e.g., automatic distribution of research reports, formal exchange agreements), as this aspect is a key to successful continuation of the Center. Acquisition shall for our purposes here be defined as including the processes of selection, ordering, and screening input.

The interim NHSDC will have already acquired some 2,000 documents by the publication date of this report, so initial acquisitions have already begun and experience has already been gained. Because of the nature of highway safety literature (journal articles, items out of print or hard to identify), an increase in the NHSDC acquisition rate

to build a comprehensive collection will be almost entirely dependent on the acquisition of good bibliographic citations, as there is no simple method of mass short-term document procurement.

Thus, it is recommended that a comprehensive set of citations be compiled and developed into a union bibliography as a base for NHSDC document procurements. Obviously, a union bibliography is also a service of the NHSDC to others wishing to acquire a similar collection.

5.1.1. SELECTION. A very aggressive selection program is required to keep abreast of the field; the user can never find the pertinent information if it was never selected for inclusion in the collection. A collection stands on its contents as well as the ability to retrieve from them. To the user, recall is as dependent on a comprehensive collection as it is on good indexing techniques. The following is a suggested list of approaches which should be implemented and exploited.

(1) Journal Subscriptions: As indicated in Task B, journal articles represent about 75 to 80 percent of the literature. It is in these journals that one can find the most up-to-date facts and research programs concerning various aspects of highway safety. Journals will not only keep the NHSDC well informed as to what is going on in the field, but also contain many valuable articles to be processed into the collection. A base of at least 200 journal subscriptions will be required.

(2) Scanning: Abstract bulletins, journals, accession lists, standard library acquisition tools should be scanned regularly for new publications to be ordered. Examples of some items scanned by HSRIC:

U.S. Government Research and Development Reports,
Clearinghouse for Federal Scientific and Technical
Information

Guide to Traffic Safety Literature, National Safety
Council

Highway Safety Literature: An Announcement of
Recent Acquisitions, National Highway Safety
Bureau

Highways Current Literature, Bureau of Public Roads
SAE Master List of Publications

Monthly Catalog, Superintendent of Documents

Monthly Checklist of State Publications, Clearinghouse
for Federal Scientific and Technical Information

Highway Research Abstracts, Highway Research Board

Road Abstracts, Road Research Laboratory

Dissertation Abstracts, University Microfilm

Psychological Abstracts

(3) Distribution Lists: Again, as indicated in Task B of the report, many of the reports sponsored by research institutions, laboratories, or documentation centers are seldom announced in book trade journals and are only distributed to a predetermined list of recipients. A library which is not on a report's mailing list may never learn of its existence or may not be able to get a copy, since these publications tend to go out of print quickly. Thus it is important that the library attempt to contact different sponsoring or research agencies, or even individuals in many cases, to be placed on their report distribution lists. This can be done on an automatic-distribution basis or by exchange agreement, depending on the nature of the library and each individual or agency contacted.

(4) Meetings, Conferences: Another important type of literature in the field consists of papers presented in meetings and conferences. While most papers may be published in proceedings much later, some may never appear again after the meeting. However, these papers are often available for distribution before or during the meeting. In order to keep its collection up to date, it is essential that a library should be aware of all kinds of meetings taking place in the near future and write to the appropriate ones for papers. Even if no papers are available right then, it is thus possible to learn the date and source of availability, since the sponsoring agencies for certain proceedings vary. This is an area where participation of a large number of technical users can be particularly helpful, if they are encouraged to bring back papers distributed at meetings they attend.

(5) Requests and Suggestions: This is a prime area in which to encourage user participation across many subject and geographical areas.

All users of the library, especially research staff, should be encouraged to recommend new materials to be added to the library. (This would mean primarily requests for materials for their own use.) As experts in their field, they can be extremely helpful in making selections for new acquisitions. Although this is a service to the user, it is also a service to the acquisition process of building a collection. The acquisition, cataloging, and indexing of material in response to individual requests should receive top priority in order to provide a responsive user service. Every effort should be made to entice the staff to request and obtain all of their personal documents through the center--knowing they will get prompt service and that the library will keep a permanent bibliographic record (and provide a personal copy) for them as an added service.

5.1.2. ORDERING. Once selection is made through scanning lists, requests, etc., the selected titles* should be thoroughly searched against the library catalog (and outstanding order file, if any) in order to avoid unnecessary duplication of titles already in the collection or on order. The duplicate checking can be done in any number of ways, e.g., corporate author, personal author (main entry), or title. The corporate author (source) file is often used in DOD information centers but is not useful for the broader literature of highway safety.

*"Title" is used interchangeably with "document" and "item" and includes all forms of published materials.

The use of personal-author (or, in the traditional library, main-entry) files is complicated by (1) authors of several articles for whom a further check is needed (by title or date, for example), and (2) many cases of no personal author. The most unique and regularly available identifier of a document is its title. Although other approaches work, too, we have found the title to be the "cleanest" single-level look-up for duplicate checking. This is the interim NHSDC approach and should be continued.

Before typing an order for any document, an effort should be made to verify all bibliographical citations as completely as possible. This cannot always be done easily, since most of these publications are never announced in professional library trade journals or acquisition tools such as Publisher's Weekly, Books in Print, and CBI. Difficulties are imposed especially by some requests from staff, who will seldom give all the bibliographic information needed for ordering or purchasing. There will be cases where they have simply heard of the report from someone and can only suggest the approximate publication date and possible source. Sometimes, after a great deal of effort, it is discovered that the requested report was never published or is not yet in existence.

As already indicated, many publications for the highway safety collection cannot be purchased through publishers or regular trade channels. Even after bibliographical citations are verified, locating the sources in some cases creates a problem that the regular academic or public library does not encounter. The addresses of some less well known organizations and laboratories cannot readily be found in most directories. This is where a corporate-author (source) authority list developed during the compilation of a union bibliography is particularly useful.

Because of its utility, the Highway Safety Research Information Center (HSRI) has joined with the Highway Research Information Service (HRB) to develop a joint list of over 5,000 sources with complete addresses (wherever possible). This alphabetically arranged authority file will cover most sources which might issue publications concerning any aspect of highway safety. The sources regularly covered by SRIS have also been included. The actual procurement of material can be done as follows:

(1) Books, dictionaries, or any publications which can be ordered through regular trade channels can be ordered by sending out a purchasing-order form made for the purpose.

(2) As many of the publications in the field are often simply distributed on a limited basis without any charge, a letter or request form can be sent to the proper agency for a copy of the desired item. To avoid complicating the billing system, it is advisable to state on the letter or the form that, in case there is a charge for the document, the agency should advise the cost but not send the material until a regular purchase order is received.

(3) Often a deposit account can be made with some agencies such as the Government Printing Office and the Clearinghouse for Federal Scientific and Technical Information. A deposit account can also be

made for photoduplication service in some libraries which have large collections in areas which may be useful, such as the New York Public Library, Engineering Society Library, etc.

(4) Because of the multidisciplinary dispersion of information and ever-increasing subject areas involved in highway safety, it is physically impossible and unadvisable for any special library to possess all materials pertinent to the field or to subscribe to all important journals, especially those in related subjects. It is thus necessary for the special library to rely on a bigger library of more general nature or with a more comprehensive collection in a specific subject area, such as the National Library of Medicine, which would have many medical journals that a specialized library would not receive, but which might contain some pertinent articles. Thus, the only way that the NHSDC will be able to acquire these articles is through interlibrary loan. As an added help, materials within the NHSDC network should flow freely and xerox copying should be readily available at each node.

(5) Gifts of individual documents or whole collections should be encouraged.

5.1.3. SCREENING. Whenever the documents are received, they should be checked against the purchase or request file to clear out the record. Since most publications are simply selected by title without knowledge of the exact content, it is essential that each document be technically screened before it is permanently cataloged. During this procedure, documents which would appeal to certain staff members can be noted and routed to these people after cataloging. (This screening of incoming items is required to sift out the dirt, and also provides feedback needed in setting the center's acquisition policy.) Finally, before the document is cataloged, it will be rechecked against the title file to see whether it is a new title or an added copy.

5.1.4. CULLING. Early in the development of a highway safety documentation activity, there is quite properly more emphasis on acquisition than on culling. Five years from now, however, it is likely that decreasing storage space will dictate the removal of some portion of the collections to microform or less costly storage facilities.

Obsolescence has been generally defined in terms of rate of use, and for particular collections has been determined experimentally. Herner reported that biomedical books at Yale older than 12 years were seldom used, that government research reports were almost never used more than 4 years after publication, and that demand for journals more than 13 years old was so low that it was more economical to borrow them from another library than to store them.

In the planning stage of a highway safety library, it seems useful only to suggest that perhaps five years from the present some culling may be indicated. In this regard, a useful byproduct of any automation in the collection will be the record of rate of use for particular sets of documents--journals, books, research reports, bibliographies, summaries and reviews, and audiovisual materials. Operations research techniques should be applied to compute the optimal storage arrangements for documents as a function of use.

5. 2. PROCESSING

A part of this task has been to determine the efforts needed to catalog index, and abstract publications, reports, and other materials for the NHSDC and evaluate alternative procedures. Vocabulary control techniques were also examined.

The processing of a document into the collection is a two-step identification procedure that will ultimately permit one to later find that document. Identification involves (1) recording the bibliographical information for document identification purposes, and (2) reviewing for document content identification. A document is identified by descriptive cataloging, i.e., recording author, title, corporate origin, date, pagination, etc.

Although cataloging was not a specific function covered in the Task C statement of work, a discussion of descriptive cataloging recommendations has been included here because of its relative importance in the operation of a center. A document's contents are identified by technical review. This process includes abstracting/annotating and subject indexing. An emphasis has been placed on vocabulary control techniques in the management of corporate origin (corporate author), names, personal names, and subject indexing terminology.

5.2.1. FORMS. A first step in any (mechanized) system is to record the necessary information from each document into a form suitable for (machine) processing (3-9). Detailed consideration must be given to the specific type and formats of information entered into the (mechanized) system. Two forms are used for processing: an analysis/processing work sheet and the final permanently recorded bibliographic citation (e.g., catalog cards, magnetic tape). The worksheet precedes and leads to the final recorded form. There are obviously many variations in the implementation. Form "L" (Fig. 11) is an example of the interim NHSDC "Highway Safety Document Analysis Worksheet."

It is our recommendation that the NHSDC use a form that meets the following criteria:

- (1) As far as possible, all forms should be the same size to permit interfiling, for example, of on-order request forms, copies of interim work sheets, and permanent catalog cards. A common size also reduces the number of file-drawer sizes and therefore makes the allocation of storage areas more flexible.
- (2) The forms should be of a size convenient to handle and use, i.e., a compromise between full-size (hard to interfile) 8 1/2 x 11-inch sheets and small cards (often cramped and hard to read).
- (3) The forms should be easily and directly compatible with a computer printout without having to reformat or photoreduce to fit a limited space. Most computer-produced citations use a format width of 55 to 60 characters and are printed at 10 characters per inch; thus, a 6-inch-wide citation should fit directly on the form with margins.
- (4) The forms should be as directly compatible as possible with other information activities in the highway safety area. The Safety Research Information Service (NSC), the Highway Safety Research

Information Center (HSRI), and the System on Automotive Safety Information (GM) all use the same form. The form used by these centers meets the third criterion (i.e., directly compatible with a computer printout format); thus, the pertinent entries on Highway Research Information Service (HRIS-HRB) magnetic tapes can be printed out directly on the same form. It is strongly recommended that NHSDC forms be directly compatible with related information activities so that a union card file can be started immediately.

In order to meet the above criteria it is recommended that the NHSDC use 8 x 5-inch forms as far as possible (either card stock or multiple carbon/NCR forms as needed). HSRIC experience with the 8 x 5-inch form has been very favorable. It is easy for the staff to handle, can display bibliographic and short annotations without undue crowding, is a convenient size for a standard mail request form, and can be filed sidewise in a standard desk drawer using a movable partition, thus eliminating large file boxes on the desks of research staff who maintain personal files. We have also reduced the title and contents pages of incoming documents by 50% and reproduced them on 8 x 5-inch cards as a quick announcement service to our staff who can also use them for personal files. The 8 x 5 cards are conveniently printed two at a time on 8 x 10-inch card stock, and then cut. The 8 x 5 cards can be photoreduced to 5 x 3-inch cards if required. An example of this reduction and a sample of the forms presently used by HSRIC are included in Appendix D.

5.2.2. CONVERSION INTO MACHINE-READABLE FORM. The document surrogate will also be processed into a machine-readable form (e.g., tape, disk, cards). When we first studied the ERIC (Office of Education) system, the surrogate was converted into machine-readable form at the individual centers. That approach was burdened with (1) low usage rate of expensive equipment, (2) extensive training of multiple operators to perform a task in a similar manner, (3) a resultant high error rate during conversion that required frequent rekeying at a central location. This problem has since been resolved--the worksheets are sent to the central computer operation for keying and checking. It is recommended that conversion of NHSDC surrogates to machine-readable form be done centrally unless there is justification to do otherwise (e.g., material might already be available in machine-readable, directly usable form).

It is suggested that the bibliographic and subject information be punched on IBM cards in a format consistent with an established NHSDC format. This helps alleviate the problem of field identification and usage of field delimiters. The data should not be packed field after field, so that an error of data omission does not require complete repunching of the entire record. Rapid visual verification of data is also facilitated when using IBM cards. Either machine or visual verification of punched data is an absolute necessity.

A decision on filing must also be made before conversion to machine-readable form because it may be necessary to add a special filing field to each record. A choice must be made between acceptance of the computer's collation sequence, computer programming of filing rules, and the inclusion of special fields such as a special fixed-field filing title.

Hines and Harris (10) have helped pave the way through the morass of computer and ALA file rules. In some fields, special sort keys should be used; although costs go up during initial conversion, computer programs then become less complicated. Computer programs to convert entries to file "as if spelled----" are more expensive than the kind where input is fitted to machine sequence.

The problem of the use of upper-and lower-case characters needs to be resolved. At present, the use of the universal print chain means decreased print speed, therefore increased costs. On the other hand, at some time in the future, technology will have advanced to the point where unlimited character capability will be in standard use. If full character capability is not included in the bibliographical system at original design time, the omission will require rectification later.

Two examples demonstrate that this later rectification may not be too serious a handicap. Cariou (5) has noted that "the pattern of capitalization is related to sentence order" in the content of Library of Congress catalog cards. The CFSTI is also producing in one instance an upper-lower case output using the patterns and types of information as capitalization indicators. While not perfect, the approach has been fruitfully used.

Maintaining bibliographic consistency in the compilation and integration of core literature should not present too great a problem in format. The key to consistency in the union bibliography lies in the effective use of authority lists for corporate and subject control (discussed in the next two sections). Incorporation of 5 x 3 catalog cards from the more traditional library presents stiffer problems (12-14) in determining the end of the title field and the beginning and ending of the subtitle and author statements. This information is often ambiguous and run on. Foreign-language catalog cards also present a problem and should probably be excluded during the initial compilation. Several trials have been conducted which show that the conversion hurdle is not impossible to overcome, although some thought should be given to the adequacy or depth of bibliographic detail on LC cards as against an established NHSDC cataloging policy. Finally, there is the problem of the librarian/cataloger, watching the work flow, wanting to check and correct possibly erroneous material spotted on the catalog cards being processed. A certain amount of personal restraint must be exercised, or the whole collection might be recataloged.

5.2.3. DOCUMENT IDENTIFICATION (CATALOGING). It is recommended that the cataloging guidelines presented in the Standard for Descriptive Cataloging of Government Scientific and Technical Reports, Revision No. 1, October 1966, by the Committee on Scientific and Technical Information (COSATI) be adopted wherever possible. Copies of this standard are obtainable from the Clearinghouse for Federal Scientific and Technical Information (CFSTI) by ordering document AD 641 092. The COSATI standard should be used as a basis for expansion, as many documents are not "government reports" in the sense of the restricted physical sciences. The NHSDC cataloging

scheme must provide comprehensive citations, for example, to the legal and medical fields, and to books, journal articles, hearings, and public laws.

In the following discussion we have taken the COSATI cataloging standard as a basis and have expanded certain sections to provide for a broader class of literature. These suggestions are based on our own, HSRIC, experience in attempting to catalog the diverse materials in highway safety. (See Appendix D for a sample HSRIC catalog card.) An attempt should be made to provide as comprehensive a situation as possible so that others can obtain copies and so documents can be reordered. It is not to be implied that all of the information recorded be used as entry points in a book or card-catalog index, but it should be an aid in acquisition. The interim NHSDC practice is represented by the Highway Safety Document Analysis Worksheet, Form "L", shown in Figure 11. The bibliographic catalog entries are listed below by the section numbers used in the COSATI standard. (The discussion assumes a familiarity with the COSATI standard which will not be repeated here except to note extensions and exceptions.)

(1) Accession Number: The use of six unique digits preceded by "HS," e.g., "HS-031754," is the current practice of the interim NHSDC and should be continued.

(2) Corporate Author (source): The source of a document should be recorded in a standard form according to an authority list. Although recording sponsorship in the defense and aerospace information arenas is not a general practice, we have found it to be a fruitful one, as reports are closely linked with research in progress. Sponsors often turn out to have a clearer identity than the corporate author, i.e., requesters often refer to an IIHS or Public Health Service or NHSB report but don't know who conducted the research. In fact the identity of the sponsor is so strong that at times the sponsor and not the corporate author (source) is recorded in NHSB's Highway Safety Literature. It is thus recommended that all corporate authors and sponsors be recorded using a single authority list for each document when they are readily available with the document. Sponsorship need not be recorded when it is the same as the corporate author or when contract numbers are recorded.

Because of the importance of a corporate-authority list, HSRIC has joined its list with that of the HRIS and plans have been developed to maintain it on a mutually consistent and agreeable basis. The sources regularly covered by SRIS are also included in this list. The corporate authority list plays two roles in an information system (in acquisition and cataloging) and is designed to meet both needs. With few exceptions, it is formatted and alphabetized according to COSATI. A coding scheme is also used to maintain the alphabetical sequence; thus, the specific entries can be abbreviated. The specific entry or heading is followed by the full address in a normal (noninverted) format.

Example:

Heidelberg University/Germany/
University of Heidelberg
Grabengasse 1
69 Heidelberg, Germany

Thus, the list is structured and formatted a la COSATI and has the full mailing address, too, as a reference for acquisitions. A provision is also made for cross-references. The combined list of over 5,000 entries covers most sources of highway safety information and will continue to grow as new areas are uncovered. It is recommended that this list be used as a tool by the NHSDC in developing a union bibliography.

(3,4) Title, Descriptive Note or Subtitle: It is suggested that the all-capital format in use be continued. Sections 3 and 4 should be considered together so that "Proceedings of the 2nd Annual International Conference" becomes "International Conference, 2nd Annual, Proceedings."

It is suggested that titles starting with dates (e.g., "1966 Manual") be inverted (e.g., "Manual, 1966"), so that reports of succeeding years will fall together in title sequence. For congressional hearings, the title can be written using the subject and the descriptive note "hearing," e.g., "Federal-Aid Highway Financing, Hearings."

(5) Personal Author: The interim NHSDC practice of last name followed by initials should be continued. This approach simplifies later computer production of author indexes.

(6,7) Date, Pagination: These two are easily recorded on the same line, as is the current practice of the center. It is also useful to include collation or descriptive remarks on the same line, where convenient, e.g., tables, figs., illus., maps, microfiche, microfilm. This should not be done exhaustively, but only when a particular feature is outstanding.

(8) Contract Number: Contract numbers are taken to include contract, grant, order and project number. Project numbers should be included only if there is no contract or grant number. While contract numbers should conform to the way they are cited in reports, previously recorded numbers should be referred to, to provide the consistency required for machine-produced indexes. HSRIC has had little call for documents by contract number and so records them but does not maintain a contract-number index at this time.

(9) Report Number (reference): While the COSATI standard refers to this section as "Report Number," it should be expanded to consider a broader class of references, e.g., such things as the journal (book) from which the article (chapter) was taken, the report number, public law number, bill number, or, in the case of a book, the publisher's series name, if one exists. For congressional publications, Calendar, Statute, House Document, and Report numbers can be disregarded.

(10) Availability: Notice of availability should include order number or publisher (e.g., John Wiley and Sons). If the availability is the same as the corporate author or journal, the name should not be repeated (this is NHSDC current practice). At least four types of order numbers should be recognized, usually from the Clearinghouse for Federal Scientific and Technical Information (CFSTI), from Defense Documentation Center (DDC), from National Aeronautics and Space Administration (NASA), or from the Society of Automotive Engineers (SAE). Cost of items should be recorded when known.

AD 635 050 (from DDC)
PB 170 275 (from CFSTI)
N66-12345 (from NASA)
*SAE 650001

(11) Supplementary Note: Besides the COSATI standard usage, this is a convenient place to record a more detailed note on conferences: "International Study Week in Traffic Engineering, 6th Annual, 10-14 Sept. 1963, Denver, Colorado."

5.2.4. DOCUMENT CONTENT IDENTIFICATION (INDEXING, ABSTRACTING). Effective and efficient subject-indexing technique is fundamental to the success of the NHSDC. A brief look at the history of subject retrieval (17-37) and the need for vocabulary control leads to recommendation of a (post-) coordinate indexing scheme utilizing the concepts of facet analysis in the construction and maintenance of an NHSDC structured thesaurus. The advantages of this approach that served as a basis for the recommendation are given. A discussion of notation, links, roles, scope notes, and evaluation is also included.

Abstracts provide a screening or selection aid. It is our recommendation that the interim documentation center's present policy of brief annotations be continued.

History of Subject Retrieval. Early philosophical concepts of an inherent order in knowledge were the basis of first attempts at organizing knowledge. Traditional enumerative hierarchical classification attempted to group like subjects, separate unlike subjects, and provide an equal degree of similarity at each grade of separation. The Dewey Decimal Classification (DDC) is probably the most widely used example of hierarchical classification.

Hierarchical classification is burdened with the equally traditional problem of "one-place" or "pigeonhole" assignment of documents dealing with several topics from more than one point of view. This problem was recognized by Dewey and later by Cutter and resulted in the development of the Universal Decimal Classification (UDC) (38,39) and Raganathan's Colon Classification (CC) (40). Although permitted to assign several different "places" to one document, the schemes were still burdened with a rigidly ordered precoordination of notation.

It is also significant to note that alphabetical indexes to classification schedules are usually prepared to aid the classifier, with some degree of cross-reference provided.

The rigidity of classifications led to the development of alphabetically arranged subject headings. Some hierarchy is often used in order to group similar items. Cross-referencing between headings became essential (whether or not hierarchy was used) to provide adequate access to the catalog. The network of cross-references generated in such a file is not generally controlled in any logical or exhaustive fashion. Often no record of subject headings and interrelationships is maintained other than the subject file itself.

With the advent of new mechanical devices, the current concept of coordinate indexing evolved (41,42). In this system, individually selected terms, descriptors, or unit concepts are combined (often using

*It is recommended that the six-digit SAE order number be used as an order number under "availability" in the NHTSB Highway Safety Literature.
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Boolean algebra--AND, OR, NOT) to retrieve all those items satisfying the criteria. Thus, concepts are post-coordinated (joined after indexing) rather than precoordinated (as in classification schemes). This procedure allows deeper indexing (more concepts) while using less complex terms. As coordinate indexing has matured, single-word (uniterm) systems have evolved into multiword terms (phrases, descriptors) and free indexing systems have evolved into controlled vocabularies.

It is not hard to picture a scheme that discards hierarchical ordering of the universe of knowledge but maintains the other aspects of orderly structure as a mechanism for vocabulary control of alphabetical term lists. This is the "best of both" approach.

Automatic Indexing. There are already comprehensive reviews of automatic indexing techniques, so we will not review them here (43-57). Upon considering these techniques at some length, we recommend that the NHSDC not use an automatic indexing scheme at this time, although an eye should be kept on developments in this field. The reasons for this recommendation are outlined briefly below.

(1) Indexing by machine is possible, but it has not reached wide acceptance and generally is not yet economically feasible, partly because of the lack of availability of machine-readable text. Also, pilot tests to date have had a severe limitation on the total number of descriptors, subject headings, or classifications that can be assigned.

(2) Results are based on the author's word usage, hence do not reflect various points of view. Since much highway safety information is drawn from allied material of different original intent, automatic derivative indexing would be at a handicap.

(3) Automatic assignment indexing in attempting to delimit, normalize, and standardize terminology is burdened with human problems equivalent to those found in manual indexing techniques.

The use of KWIC* (58-60) indexes is widespread because of its timeliness and because a KWIC index is better than none at all. This is the one technique of automatic indexing appropriate for use by the NHSDC. The weaknesses of the KWIC approach, however, are well documented, and the use of a KWIC index should never replace a conscientious indexing scheme except as a timely interim measure.

An example of an application of the KWIC technique to gain an alphabetical entry to individual words in multiterm descriptors and to display several levels of generic-specific structure in a subject authority list is given in Appendix E. Citation indexing (61), while powerful, is not useful in the diverse highway safety field.

Need for Vocabulary Control. The type of indexing may range from controlled (i.e., use of a rigid authority list) to uncontrolled (i.e., free indexing with text-derived catch words or key words) (62). Some control is needed to insure effectiveness and efficiency. The maintenance and updating of subject authorities is a complex but vital function. The most widely used control tool is the thesaurus, which we will consider here in the most general sense (63-73).

The process of subject indexing involves two basic steps (74):

(1) The indexer chooses clues that will serve to identify the item later for purposes of retrieval.

*KWIC = Key Word in Context

(2) The indexer either marks on the item itself or records as a separate item the tags, labels, or codes representing these clues.

What is needed is a vocabulary-control tool that will:

(1) Normalize the language of documents to the language of questions. As such, it should lead the indexer or searcher from text words or search words to key words.

(2) Permit the indexer to describe more fully, at different levels of generality, from different technical points of view. It should act as a device for display of synonyms, hierarchical structure, etc.

(3) Provide a tool for the searcher in analyzing and defining questions. It should permit searchers to phrase inquiries according to the scope and degree of their immediate interests.

(4) Act as an authority list against which candidate terms must be justified.

The thesaurus (as considered here) is a logical language control tool providing a list of words (and concepts) to be used in indexing and searching documents. It presents synonyms and antonyms (as does Roget's Thesaurus). The technical thesaurus also displays terms or concepts hierarchically as a guide to indexing/searching at more general or specific levels. The thesaurus, as a tool to correlate the language of the author with that of the regulator, is a key to subject retrieval. Finally, an alphabetical index to all words should be constructed to permit searches to begin in this manner when desired.

Recommendation for a Faceted Thesaurus. We recommended that the NHSDC use a (post-) coordinate indexing scheme utilizing the concepts of facet analysis as a vocabulary-control mechanism in the construction and maintenance of an NHSDC structured thesaurus. There are several recent "testimonials" to this approach:

John R. Sharp concludes that "the best possible system may consist of a vocabulary based on facet analysis and used as a coordinate system (75)".

D. J. Campbell used facet analysis to tighten up an existing coordinate indexing vocabulary and found that faceting clarified term distinctions and brought related terms together (76).

Mulvehill and Brenner (77) concluded that "faceting is a natural method for thesaurus formation and its control."

The Classification Research Group went so far as to claim the need for a faceted classification as the basis of all methods of information retrieval (78). Vickery provides a more rational assessment: "I would modify that claim today. I believe that all retrieval systems using a file of index words can be improved by the use of a structured vocabulary. Facet analysis offers a technique of vocabulary construction, and I believe it to be a good one. At the very least, it has the virtue of being an explicit technique that can be described, communicated, taught, analyzed,

criticized, amended, and improved. It is not left to incommunicable and inconsistent intuition. This is the chief reason why the technique merits attention."

The question "how good is a post-coordinate faceted indexing scheme?" has no quantitative answer, as the methodology of indexing-system evaluation is relatively weak. One example (79) does exist in the Aslib Cranfield Research Project (80) test of the faceted scheme for aeronautics, in which a multiple-entry (post-coordination) approach had the highest success rate:

The system as originally tested consisted of (a) a classified file in which only one entry was made for each topic, (b) an alphabetic file compiled by chain indexing each classified topic. Performance was poorer than that of the other systems tested. The percentage success figures were:

| | |
|--------------|--------------------|
| Facet | 73.8 + 2.5 percent |
| UDC | 75.6 + 2.5 percent |
| Alphabetical | 81.5 + 2.5 percent |
| Uniterm | 82.0 + 2.5 percent |

A supplementary test, in which multiple entries were made in the classified file for each topic, improved the success rate of Facet to 83 percent.

Before considering the potential advantages of facet analysis which were the basis for recommending it as a vocabulary control mechanism in an NHSDC coordinate indexing scheme, we will look briefly at it as a technique. The subject is often veiled in mystic verbiage inaccessible to common documentarists.

Faceted classification as originally set forth by Ranganathan and later modified in England (81-86) resembles coordinate indexing systems in that terms are synthesized, but differs in that the coordination occurs in the indexing process (precoordination). Moreover, terms are combined in a fixed order, unlike coordinate systems. The technique of facet analysis used in developing a faceted classification can be fruitfully applied to structuring a coordinate indexing thesaurus.

There are some signs of recognition of the need for such cross-fertilization, e.g., the discovery of Mulvehill & Brenner that they had been using facet analysis for thesaurus building without conscious knowledge of its principles, and the explicit and very profitable use of the method thereafter (22).

Traditional enumerative systems of classification assume that generic relations can be adequately displayed by the construction of one vast tree of knowledge--starting with the universe, dividing into the main classes, and repeatedly subdividing each subclass. But:

a simple tree of knowledge cannot satisfactorily represent the generic relations between terms. A type of schedule

is needed which allows a given genus to be subdivided in more than one way, to give several sets of subclasses, each of which is a homogeneous group of collateral species. Such a schedule is in fact a faceted classification (83).

Facet analysis builds from the existing vocabulary. First, terms with similar characteristics (material, processes, properties, etc.) are grouped into categories, then the terms in each group are arranged hierarchically to display their generic-specific relationships. That is facet analysis in one sentence. The technique leads to a mutually exclusive arrangement of concept terms, not documents; it is based on words (concepts) and not knowledge (documents).

For example, in the HSRIC structured thesaurus all the component terms relating to vehicles (e.g., motorcycles, bicycles, brakes, carburetors) were placed in one group and then structured within that group. Several existing schemes have been based on facet analysis. Two of these schemes are of peripheral interest to highway safety; namely, the American Petroleum Institute (API) Subject Authority List (87) and D. J. Foskett's Occupational Safety and Health Documents Classification Scheme (88).

Facet analysis offers many advantages to the NHSDC:

(1) It affords vocabulary control:

(a) Whether a classified index is used or not, an essential tool in constructing any retrieval index is a classification or structure. The purpose of this structure is to provide organization in which the most useful generic relations of each term can be displayed.

(b) Compound concepts are factored into basic units to reveal new links.

(c) In the structuring of each group of terms (or facet), discrepancies become clear and omissions are discovered.

(d) The roles of terms and definition or usage of homographs are often made clear by context within the structure, or hierarchical definition (89).

(e) "Related term" cross-references when required are as easily provided for as in other schemes.

(2) Faceting has a basis in the language of highway safety:

(a) Being based upon language, a faceted vocabulary is more stable than the volatile knowledge natural language is used to describe. New ideas and knowledge can be readily indexed without alteration of a "tree of knowledge."

(b) The technique is particularly adept and responsive to specialized mission-oriented fields. Alan Rees (79) notes that:

In very brief summary, we might say that faceted schemes are . . . in American parlance, mission-oriented rather than discipline-oriented. What we mean by that is they are designed for user groups whose interests cut across the traditional fields.

(3) It provides an aid to the indexer/user:

The resulting generic structuring acts as a comprehensive guide to the indexer or user. This is a basic function of any thesaurus, but a

faceted analysis assures completeness and consistency of structuring. The merits of a structured vocabulary as an aid to indexer or user are discussed elsewhere.

(4) It serves as a framework for the addition of terms or integration of other thesauruses (90-92):

It is recommended that the NHSDC develop a well-structured thesaurus to serve as a basis for the integration of the various existing vocabularies in the highway safety field. Sound structure is an apparent key to building a joint thesaurus. "Hyslop (93) considers that greater attention ought to be paid to structure than to actual terminology, for she considers that the establishment of sound structural rules will make for easier thesaurus building and a high degree of flexibility in the extraction of microthesauri (94)" (or, conversely, the infusion of existing specialized thesauri). Hyslop mentions the "hierarchical superstructure to be superimposed over the individual vocabularies of the cooperating agencies (i.e., AEC, NASA, DDC, and OTS) in the development of the COSATI Subject Category List."

(5) It is useful as a tool in NHSB management:

Fairthorne stated (79): "Few realize that a good classification system, used by competent people, can provide a telescope through which technological cultural developments can be observed before they can become explicit."

Facet analysis is frequently used unconsciously as a management technique to organize information, to gain an overview, and to identify information gaps. It has been actively used by the NHSB since its inception and is an active concern of NHSB research management staff. Figures A-E, Appendix F, were presented by the NHSB as part of an orientation to NHSB contractors. The "decision oriented structures" and "classifications" are in fact a preliminary faceted analysis of the highway safety field. It is felt that a faceted NHSDC subject index would complement this trend--and might itself be of direct value to NHSB management.

With regard to notation, it is further recommended that the NHSDC thesaurus use codes to represent terms/concepts for the following reasons:

(1) This avoids arbitrary selection of one term among all of its synonyms. When one word is selected as an authority word, the use of other words is suppressed. In a field of varied user backgrounds (hence vocabularies) the selection of one authority word will confuse the uninitiated user who may complain of arbitrary thought control. The use of a subject code permits equal standing of all synonyms for a concept.

(2) Natural language, although easier for the indexer/user, frequently requires the equivalent of a code look-up to determine accepted word forms, resolve spelling problems, and the like. It also requires more keystrokes and larger computer storage areas. Subject codes require less keypunching and, more significantly, are much shorter for entry into a remote terminal. The problems of correctly entering long authorized terms that often have to be looked up for proper form were discussed with John Scroggins of SDC during a demonstration of

COLEX, and it was suggested that another time a coded scheme might be used. It is recommended that the NHSDC use subject codes to communicate with the computer data base and let the computer perform dictionary look-up to communicate with us in natural-language printouts.

(3) Storage is saved and flexibility increased by the use of structured subject codes that incorporate the hierarchical ordering of the thesaurus. Such an approach is precisely analogous to the numbering of sections in this report, i.e., subject codes are generated in a "table of contents" fashion that provides for unlimited expansion of lists (e.g., 4.1, 4.2, 4.3, . . . , 4.11, 4.12, etc.) and specificity (e.g., 4.2, 4.2.1, 4.2.1.1, etc.). This technique is exemplified in the HSRIC structured thesaurus (Appendix E). Structured subject codes are recommended to facilitate computer generation of structured thesaurus displays and to permit the user to broaden his search criteria automatically by dropping terminal digits from subject codes selected. Storage is saved, as broader terms need not be autoposted (i.e., the requestor can broaden his query at search time), while permitting a great deal of specificity or detail in indexing.

Several vocabulary management problems (and solutions) still remain to be considered: namely, mechanism of term relationships, usage of links and roles, term definition, and evaluation and updating.

Two basic relationships exist among terms: synonymy and hierarchy. Although these relationships can be displayed and mechanically manipulated in a straightforward manner, two problems arise in developing them: (1) Two terms may be related synonymously from one point of view and not from another, to the point of being near antonyms. (2) The same conflict arises in hierarchical relationships, e.g., father-son, whole-part, general-specific.

Subjects can be related to each other by positions in a process, mechanistic associations, composition, function, discipline, or methodology. Vickery's method of faceted vocabulary construction provides a logical constituent technique for deriving these relationships.

It is recommended that the common library practice of using the "see also" reference for unspecified relationships and (often) "down" hierarchical relationships be discarded in favor of (1) "broader term" or "narrower term" for hierarchy, and "related term" for all other relationships. It is also suggested that, where there are more than two levels of hierarchy, all levels be displayed. The alphabetically arranged rotated index in Appendix E displays a compromise between a structured "table-of-contents" display and the "two level" (BT-NT) display used in the main body of the EJC and LEX thesauruses.

It is felt that enough evidence exists (98-100) to suggest the NHSDC avoid the tanglewood of links and roles. Their definition and usage will not be discussed here. The "link" problem of two main themes in one document can often be resolved (although this is seldom necessary) by a quick perusal of the title or abstract. The "role" problem can be alleviated through the use of a well-controlled and structured thesaurus and the use of limited scope notes. There is a very direct analogy between a role applied to a term and the quality that is given to that term by its inclusion in a facet.

Generally, the definition of homographs is clear from the context of hierarchical relationships. Although "suspension" has meanings relative to all three elements of the highway traffic system (driver, road, and vehicle), its usage is clear in a structured thesaurus:

Suspension - Legal, Enforcement

Suspension - Roadway, Bridge

Suspension - Vehicle

The definition of most vocabulary terms is clear from the display of synonymous and hierarchical relationships. Where definition is not clear, brief parenthetical modifiers will usually distinguish between terms. Rarely, where definition (hence intended usage) is still not clear, more extensive and definitive scope notes may be required.

Finally, the NHSDC should establish and periodically review measures of indexing effectiveness. While a considerable body of literature exists on the subject (80, 101-112), there is presently no convenient methodology or assurance of results. This situation should not prevent the use of some rough measures (e.g., relevance and recall ratios) in the NHSDC system.

Thesaurus maintenance should also be enhanced with statistics of frequency of term usage and co-occurrences (the number of items described by particular combinations of terms). Terms with an extremely high degree of co-occurrence are candidates for permanent precoordination. For example, the terms "driver" and "education" are separate or independent concepts in the HSRIC thesaurus. Because of their frequent usage together as a compound concept in "driver education" they have been permanently precoordinated to form a new concept.

Abstracting. It is our recommendation that brief (100 words average, 250 words maximum) annotations be prepared for each document being processed. This is the present policy of the interim documentation center, and it should be continued.

The degree of abstracting is a choice between the ideal and what the system can afford. There is a growing feeling that abstracts are not necessary for the browsing and selection of document citations. Often the title (or first or last paragraph) is equally effective and avoids the effort of writing abstracts. Long abstracts are also expensive to store digitally and take an exorbitant time to display or print out in a remote terminal environment.

On the other hand, the diffuseness of the literature of highway safety often makes the preparation of short annotations (as vs. the author's original abstract) that reflect the document in the light of the highway safety mission extremely useful if not necessary.

The technical reviewer should provide annotations which tend to qualify the glowing accounts of work performed often given by the authors' abstracts and broad titles. Particular attention should be given the actual scope of the document relative to the mission, since this is rarely evident from a title. Segments of the article, summary, or abstract provided by the author, publisher, or abstracting agency should be copied and integrated (where useful) to reduce the amount of original writing.

The technique of automatic abstracting is better described as automatic extracting of highly ranked sentences (or phrases). According to the Auerbach state-of-the-art report (18), automatic extracting techniques have been generally unsuccessful although occasionally they result in an extract which is sufficiently informative, concise, and coherent. Most extracts produced by these various techniques lack one or more of these important characteristics.

5.3. STORAGE

The effort and resources needed to store physical documents and document surrogates have been determined on the basis of operational experience gained from parallel tasks in HSRIC and the literature.

5.3.1. DOCUMENTS. Documents can be stored in original full-size form or in microform. Full-size documents are useable without enlargement or reproduction, although frequent reproduction from hard copy can become costly. While full-size documents require more storage space, this can be minimized. Because of the large percentage of journal literature, document storage density has averaged about 70 documents per shelving foot in the HSRIC collection. Thus a comprehensive collection of 20,000 documents could be stored on 12 library shelving units with three-foot shelves. A very small specialized collection can group documents by broad subject classes, but it is recommended as more practical that the NHSDC file documents in accession-number order.

It is recommended that the NHSDC use microform documents for document archival storage or for the storage of large files that show a low activity rate--based on the economics of storage and the availability of materials already in microform.

In the section on culling, it was recommended that the collection be maintained with a strong culling policy on the basis of usage and/or age. Culling has a direct bearing on document storage costs and space, yet it often is hard to surrender the symbols of privilege and status. The criterion of size of collection has been for too long a symbol of a superior or "strong" library. It is recommended that materials trimmed from the collection be placed in a very compact storage warehouse or on microfilm. Also, as suggested, it should be the policy of the NHSDC to ensure that a major portion of the uncopyrighted highway safety literature is placed in the CFSTI. This policy will make microfiche copies available to the largest number of users.

While microform storage of documents can save storage space, the real economies of using microform are derived from quantity reproductions and distribution. One obvious recommendation: where microforms are used, provision should be made for an adequate number of readers. It is easy to rely on one large reader-printer which in time will be used solely for reproducing hard copies, not for reading purposes. Microform documents require relatively expensive equipment for their reading or full-size reproduction. This equipment is not readily available to most users, and many users still have reservations about convenience.

5.3.2. DOCUMENT SURROGATES. The storage of document surrogates (e.g., bibliographic, subject, and annotation information) will be

in two forms, machine-readable and human-readable. The storage of surrogates in digital form can be on magnetic tape, disk, or card (e.g., IBM Data Cell). Surrogate information can be recorded in hand copy on card or book form printout.

It is recommended that the full NHSDC surrogates be stored on magnetic tape, and that (potentially) abbreviated indexes to the surrogates be stored on magnetic disk to serve an on-line retrieval scheme. It is prohibitively expensive to store full citations and annotations on magnetic disks with the hardware presently available. The advent of magnetic card storage devices (e.g., NCR CRAM, RCA RACE, IBM Data Cell Drive) should be closely watched. These devices provide more storage capacity and less access speed, and since the "cards" are interchangeable costs can be shared with other problems. Magnetic cards should ultimately provide a flexible and economic storage medium.

Hard copy versions of document surrogates can be in card or book form (113). Card files are a browsable, random-access, multiple entering retrieval mechanism that is not provided by any other mechanism. They possess a random and instantaneous updating capability with a minimum access time. On the other hand they are time-consuming to maintain, subject to human errors, and are hard to reproduce and disseminate. The book form is easily reproducible and portable and, once printed, maintains its own file integrity.

It is recommended that the NHSDC use card files in the acquisition process where flexibility is required and in other areas where browsability is required. Cards can be produced by the computer in filing sequence to help alleviate the time-consuming (and error-ridden) process of card file maintenance. Since the computer can print cards as easily as paper, the potential exists for completely reproducing a card file on a periodic basis rather than manually attempting to correct for all of the misfiled and lost cards.

Second, it is recommended that the NHSDC print out (and distribute) a comprehensive annual union bibliography. It is suggested that the main entries be in access number order with full citations and annotations and that extensive cross indexes be provided. Although specific format is a matter for later discussion, it is suggested that the indexes include more than an access number under each entry point. Although a full citation is prohibitive, the inclusion of titles is a helpful screening mechanism. Section 14 of the COSATI standard for descriptive cataloging provides some guidance in this area.

It is suggested that initially the union bibliography be distributed in quarterly supplements as an abstract journal with an annual cumulation of four quarters. The annual union bibliography may contain selected indexes that cumulate over all years. The frequency and format of policy should be reviewed annually.

5.4. RETRIEVAL AND DISSEMINATION

Retrieval and dissemination are the product ends of the NHSDC. To delve into all their aspects and ramifications would produce a thorough understanding of and insight into the mission and functioning of all information centers. Our scope here is more limited. Current awareness

services (PUSH) and retrospective searches (PULL) provide a convenient division of information products. The workload and cost of promoting service was derived from the results of the user study of information needs (Section 2, Task A) and is discussed in Section 9. This section deals with the operations of index manipulation, communication, and document reproduction.

5.4.1. INDEX MANIPULATION. The requester approaching the NHSDC will most likely enter the retrieval system through a human intermediary, who will help the requester to shape his search, whether for a specific reference question or extensive literature search. The participation of the indexing and acquisition staff in retrieval clearly provides a positive feedback mechanism on user viewpoint and interest areas.

Still, the indexing scheme provides the key to retrospective searches. The thesaurus (discussed in Section 5.2) provides such a key in shaping requests, as well as aiding the indexers. Now we see how the indexing scheme does indeed promote communication between document and requester.

The user often starts with one clue-word such as "alcohol," and with this one clue attempts to decipher the secrets of a subject index. He rarely uses a full compound subject, and the term is very likely broader than the specific information sought. Thus the thesaurus must act as a guide to the user--as a tool to the compound subject sought, or to direct the user to more specific (or general) concepts. The rotated index example in Appendix E provides an alphabetic approach to individual terms used in multiword (compound) descriptors and also acts as a guide to several levels of hierarchy.

Besides the associations suggested to the requester by the thesaurus, common subject-term assignment to the documents retrieved on a first pass may provide fruitful means of interactive association. For example, as a guide to future trials, the requester could be supplied with, say, the twenty terms most frequently used to describe the documents retrieved during any one pass through the system.

Beyond the thesaurus, the actual language used to enter an automated system needs to be considered (114-121). "Boolean functions are, in general, not applicable in information retrieval systems (122)." Several intellectual or theoretical arguments back this conclusion. From a practical point of view the author has found few uninitiated users who understood the significance of the logical AND or OR, or who could use them effectively even after an explanation.

The user usually does understand that two subject terms will retrieve more documents combined with an OR than with an AND. The use of a threshold selection language (123) looks like a natural and logical approach to "encoding" a search. Unlike the more awkward Boolean statement, this technique allows the search criteria to be specified in an intuitive manner.

In its simplest form the requester enters selected terms along with a number indicating the relative importance of each term in the search. At the end the requester states the minimum score a document must have to be retrieved. For example, if the requester required information on "ejection" and might like to see items on "drinking," "injury," or

"overturning," he might request:

| | |
|-------------|---|
| ejection | 4 |
| drinking | 2 |
| injury | 2 |
| overturning | 2 |

with a minimum score of 4.

Such an approach is flexible, can perform all the equivalent Boolean functions, and provides the potential to display results to the user in degrees of importance. It is conceivable that, in the example, documents satisfying all the criteria (a score of 10) could be displayed first, followed by items with a score of 9, etc. It is suggested that the NHSDC consider the approach in more detail.

5.4.2. COMMUNICATION. Two communications media are considered here that deal directly with the requester: telefacsimile services and on-time remote terminals.

The Council on Library Resources sponsored a 30-day test of the Xerox Magnavox Telecopier between the Reno and Las Vegas campuses of The University of Nevada and the Davis campus of the University of California (124). Transceiving time for an average 10-page request was about an hour. At a volume of 1000 pages per month, transceiving costs \$4.60 per 10-page transmission, excluding any telephone line costs. Full details of costs, transmission times, and quality are given in the report.

The use of telefacsimile between the primary NHSDC network centers for the transmission of text is prohibitively expensive, although such a scheme might be used to communicate detailed requests and retrieved citations. Providing such a linkage with secondary users is again prohibitive. In one example (125), use of telefacsimile service by users in one local telephone area was low enough to drop the system.

The application of on-line remote terminals by the NHSDC was discussed at the beginning of Section 5. As a communication medium, the remote terminal again can provide the requester a chance to interact or browse--an ability he lost when his card catalog went onto magnetic tape and his searches were batched together. He then had to use a "shotgun" approach and often could not consume all the "hits." At a terminal he can consider items piecemeal and change his mind along the way.

Many experimental on-line retrieval schemes are operational and in regular use in several military applications (126-132). Several trials have been made to establish national networks. These schemes did operate but could not be economically justified (witness the three NASA trials in this application area).

Because of rapidly advancing technology, it is recommended that the NHSDC establish a pilot on-line terminal system to test efficiency, effectiveness, and user acceptability. It is felt that these factors can best be measured in a trial run. An example of the current HSRIC pilot system has been included in Appendix C.

Reproduction

It is strongly recommended that as much of the non-copyrighted literature of highway safety as feasible be provided in microfiche and

hard copy (133) for secondary distribution through the CFSTI. Present NHSB policy places all NHSB contractors reports in the CFSTI. This policy should be continued and expanded to other report literature. Usage of the CFSTI services should meet the needs of highway safety users, and provide access to an even larger population of potential users.

Large portions of the highway safety literature are restricted by copyrights. Because copyright laws are presently under review, considerable literature on the subject has recently been published. We will not review this material here (134-137). It was noted in Section 3 (Task B) that about 80 percent of the relevant literature is from journals. A comprehensive bibliography with adequate citations should allow any librarian to assess the material from local resources.

6. TASK D: CURRENT AWARENESS, ANALYSIS

Cost and workload projections for the basic services to be provided by the documentation center are presented in Section 8. In this section we consider in detail the specific activities concerned with summary and state-of-the-art reports, with audiovisual (training) aids, and with the dissemination of safety/technical material to the media and thence to the public.

In the field of audiovisual aids there is a great need for a central catalog of materials both listing availability and commenting critically on the quality and utility of each item. Although such materials are generally prepared for use in the schools, they often can be used in other applications such as radio, television, and small group meetings. A master index available through the documentation center would facilitate usage in all of these activities.

The primary function of a public information office in highway safety is to get informative substantive material to the public. Broadly this involves two facets--the retrieval and the distribution functions. While it is clear that retrieval must start within the documentation center's area of responsibility and that ultimate dissemination is a likely function of the public affairs office, it is not so clear where the dividing line between these two should be. Consequently, we have discussed the problems of preparing public information material up to the point of mass distribution without regard for the placement of an organizational dividing line. Estimates of manpower and costs in this section are independent of those derived in Section 9 of this report and covering the other technical services of a documentation center.

6.1. ANALYSIS REPORTS, DIRECTORIES: LEGAL INFORMATION

State-of-the-art reports, technical summaries, and directories serve a useful function for both administrators and technical people concerned with highway safety. Additionally, the continuing preparation of such reports adds measurably to the interests of personnel in a documentation center--keeps them technically alive. Specific reports may range from technical handbooks or cookbooks that translate research results into practice to a compilation of divergent viewpoints and summary of a newly evolving and controversial subject. The spectrum can be broadened to range from a technical summary of tire materials to a directory of seat-belt manufacturers.

Analysis may result in a single report (e.g., handbook) or may consist of continuous analysis of a specific topic. We have not discussed the details of specific reports, but have included a brief discussion of one technical documentation function which might well be a continuing effort. This is a comprehensive critical analysis of the laws concerned with the highway safety field.

State compliance with the Federal Highway Safety Standards will soon become a major concern of the National Highway Safety Bureau. Major disputes over legal obscurities can be anticipated and forestalled if an information-center function is devoted solely to the analysis of present statutes and new highway safety legislation from the states.

Desired responsiveness will be possible only in a highly structured, automated system.

The obvious benefits of even loosely structured but highly responsive legal information systems have been demonstrated by the Internal Revenue Service's Reports and Information Retrieval Activity (David Link; see Supplementary Bibliography, Appendix G), the University of Pittsburgh's Health Law Center, and the United States Air Force LITE system. Even these first steps encourage uniformity and discourage duplication of effort. However, the need for precision in distinguishing compliance from noncompliance with federal law and the directives of the National Highway Safety Bureau suggests that a more refined structure would yield greater benefits to the administrators of highway safety programs.

The Uniform Vehicle Law Commission has provided model statutes for the drafting of state legislation. Further improvements in design and organization are a byproduct of the statutory normalization proposed by Layman E. Allen (1-3). This structure has been implemented experimentally on mental-health statutes, the Internal Revenue Code, and the Uniform Commercial Code with great success. It provides models which render normalized legislation unambiguously and reveals gaps and contradictions without difficulty.

Because the system illustrated would contribute most to the administration of legal changes throughout the states, we recommend that the National Highway Safety Bureau provide in the Documentation Center a Law Analysis Section. This section would monitor state laws and enforcement practices related to Highway Safety Standards 4.4.6 (Codes and Laws) and 4.4.7 (Traffic Courts) and the Uniform Vehicle Code and Model Traffic ordinances. The unique structure of the proposed system (see example following) will readily yield the exception statistics required to let NHSB administrators know the patterns of state compliance and resistance on a provision-by-provision or even clause-by-clause basis.

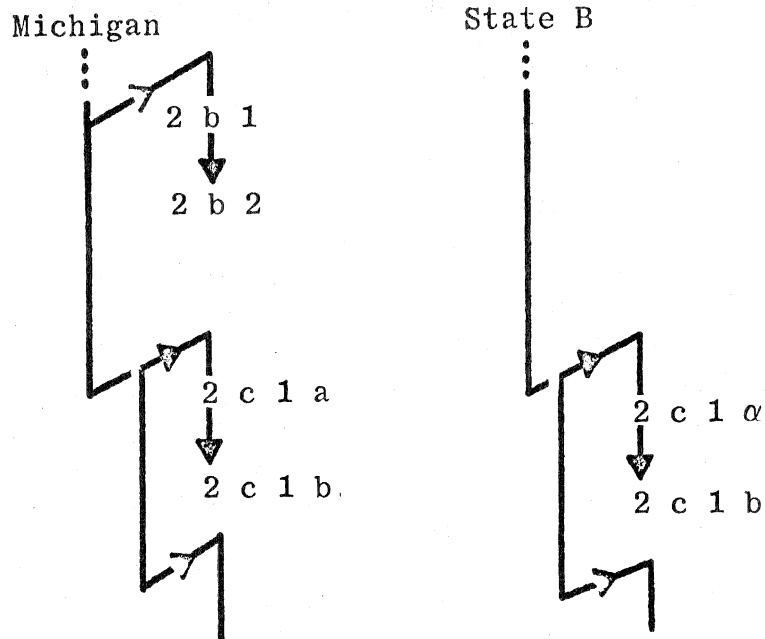
Example of a Normalized Statute

Beginning with the legislation of a state, whatever its form, an unskilled clerk who knows the basic normalization rules may prepare raw text for the system (Appendix G, Exhibit A). The form stored in the computer may be schematized as in Figure 12. (Appendix G, Exhibit B, shows these structures as applied to Section 257.625 of the Michigan Vehicle Code.) The important thing to note is the structure which is determined by the implications of each provision. If (\rightarrow), then (\rightarrow), and logical operators define relationships within a statute. Content and structural patterns define similarities as we move from state to state.

State B is different from Michigan both in structure and in the content of a clause. State B makes no provision for release of test results (\rightarrow 2b1+2b2 does not appear). State B sets different levels (2c1~~a~~) on the presumption that the defendant was not intoxicated (2 c 1 b, in both states).

Though these examples can only hint at the power implicit in intensive analysis, it is evident that such analysis has always been

FIGURE 12. A SCHEMATIC REPRESENTATION OF NORMALIZED STATUTE LINKS



at the heart of incisive legislative growth and correction. When the subject at issue is a large body of statutes to be monitored across fifty states, the proposed system may offer the only hope of the requisite management precision.

6.2. AUDIOVISUAL MATERIALS

It is the purpose of this study to provide some data and insight regarding the availability and use of audiovisual materials in the area of traffic safety and driver education. A fully comprehensive study in this field would require more time and more research, especially for those decisions which require more specific value judgments, as in rating the effectiveness of a particular piece or title of audiovisual material. This author did enlist the assistance of several teachers and future teachers concerned with the subject under study. Monitoring several opinions made it apparent that the listings these people possessed were very incomplete and their value judgments were based upon personal preference rather than any concrete proof of effectiveness. Projected media, primarily motion pictures and filmstrips (35mm single frame, with sound or silent), form the bulk of the materials considered most effective by users surveyed in the field. But agreement is far from unanimous as to specific titles. It is fortunate that the projected media listed above are the most important presently, since materials of this format can be found in the more comprehensive listings available. The major sources are listed herein. Exclusive of this brief introduction and summary, the study shall be divided into twelve sections:

- (1) Materials available
- (2) Where used plus outlets
- (3) Frequency of use (including anticipated or known life of material types)
- (4) Audience exposure
- (5) Determining the worth of the materials
- (6) What users consider effective and why
- (7) Who are the producers
- (8) Typical production costs
- (9) How materials are distributed
- (10) Projected use, outlets, and audience potential
- (11) New techniques which look promising
- (12) Unanswered questions and the need for research

The last section is the weakest, in the author's opinion. This section could be expanded greatly to deal with the vast gap which exists between research in learning and application in teaching. A vast amount of research is certainly needed with regard to the answers to such questions as how we learn, why we learn, and what makes changes in people possible. Paragraph 10 below, dealing with audience projections for the next ten years, could best be handled at the state or national level by those agencies collecting and formulating such data, e.g., state departments of education (Michigan has two consultants in driver education associated with the Department of Education) and the United States Office of Education. Statistical abstracts from the Bureau of the Census of the U.S. Department of Commerce also will be helpful in determining potential audience.

(1) A rather complete search was made of recent audiovisual materials by surveying and recording the numbers and titles of motion pictures, filmstrips (silent and sound with disc or tape), and tape recordings produced over the past seven years. This period of time covers major titles produced so far during the sixties. These materials have been made available to educators and others through normal outlets or distribution channels. Unfortunately, many materials produced for driver education which would come under the label of audiovisual media have no comprehensive listings or evaluative sources similar to those now becoming available for the more common projected media. This author did send out over 50 inquiries to all of the major distributors of projectuals for the overhead projector. Those audiovisual media requiring a similar search include models, mockups, multimedia kits, slide sets (silent and sound), 8mm cartridge films, charts, and manipulative materials which can be used on feltboards, magnetic boards, or magnetic chalkboards. There are also a limited number of simulators of different manufacture utilizing a wide range of materials which fail to appear in any one place. Some of these devices are listed in the safety literature, the NAVA Equipment Directory, AVI Guide to New Products, Business Screen, and other journals in the media field. Although the survey was able to turn up many of the films and filmstrips and recordings made available to driver education during the past seven years, we must certainly keep in mind that no one medium is always the most effective way to communicate and that the skilled teacher may select from a number of different media

to fulfill the objectives stated with a particular terminal behavior in mind for the student. Thus, this survey must continue in order to pull together all of the significant media now available. The chances to achieve a positive behavioral change in our student will be enhanced when we know where we are going, how we plan to get there, and what tools are at our disposal to do the job which must be done on a national scale. Everything mentioned above is used to teach driver education, but the emphasis implied by the users interviewed at university and public-school levels rests solidly with 16mm sound motion pictures, filmstrips, printed materials, and actual experience in an auto. We will not attempt to list all the film and filmstrip titles located, but the following references are most useful: the Library of Congress Catalogs for Motion Pictures and Filmstrips (also the volumes for recordings on discs--all these listings are published quarterly and combined into a single volume at the end of the calendar year), the NICEM Index to 16mm Educational Films (similar to the Library of Congress listings which are nonevaluative by nature; released by McGraw-Hill through the National Informational Center for Educational Media), the NICEM Index to 35mm Educational Filmstrips (just released at the time of writing), the Educators Progress Guides to Free and Inexpensive Films (also the 1967 issues for filmstrips and recordings), the National Audio Tape Catalog (a 1967 DAVI publication through the NEA), Curriculum Materials (1966 edition, Association for Supervision and Curriculum Development), Free Learning Materials for Classroom Use (State College of Iowa, 1967), Education Media Index (McGraw-Hill--17 volumes listing all types of media, but not too helpful in the area under study), the major film-rental libraries (including Michigan-MSU, Indiana, Syracuse, Wisconsin, Illinois, NYU, Western Michigan, Mountain States, UCLA, Wayne State, Minnesota, Films Incorporated, Association Films, Modern Talking Picture Service), and the major educational film producers (McGH, EBEC, National Film Board, Coronet, Cenco, Cahill, Churchill, Journal, and many smaller firms). More time would have permitted even more depth. Nearly all the motion pictures are obtained on a free loan or rental basis, and this is probably good, since the very design and techniques of many of the productions make them obsolete in few years. When the material and the teacher's approach are too dated, more harm than good can result.

(2) Traffic safety and driver education are taught through the military, adult classes, clinics, agencies of the states, institutes, and others, but the lion's share of this responsibility falls upon the public schools of the nation. State departments of education can provide exact data as to the numbers enrolled in such courses; other similarly concerned state agencies could furnish their respective data. Teachers gain their initial experience through courses offered by schools of education. At this level and the secondary-education level, driver education has been a separate part of the total curriculum, lacking the prestige and administrative backing of other so-called academic fields. Too many courses were pushed on coaches and physical-education instructors because of their ability to teach or develop psychomotor skills, and few driver education teachers even now have had much preparation for this serious task.

A brief survey indicated that projected media seemed to be the most important of all the media, yet national surveys and visits to secondary schools reveal that a minority of these institutions have enough classrooms with light control. There are other difficulties to be considered regarding the selection and use of media. The pattern for instruction may be large group (presentation), small group (interaction), or independent study. Assuming that the instructor follows the patterns established with sound pedagogy in mind, he will probably select the specific approach which will help the learner achieve the desired terminal behavior as originally set forth in stated objectives for the students. But the teacher of driver education is faced with the very complex problem of knowing the sources of audiovisual materials which are extremely scattered in this field. Selection patterns are different, and some factors should be noted.

- (a) There is no central or comprehensive listing of a-v materials, even when they are the same type.
- (b) Professional journals in the field are often missing from the collections of periodicals in schools of education. This would prevent a future teacher in this area from gaining experience with which might lead him to a-v instructional materials, such as Traffic Digest, Traffic Quarterly, and Traffic Safety. These publications are not even easily located in Ulrich's International Guide to Periodicals, because they lack any tie with such headings as highway safety, driver education, etc.
- (c) Many of the motion pictures available must be ordered through state police, highway departments, government agencies, commercial firms, auto clubs, highway bureaus or institutes, and university film-rental libraries. Often only the latter can insure that the materials are inspected after every use and retire materials when better ones become available. Schools usually have blanket accounts with distribution centers.

(3) The survey seems to indicate that, once instructors settle on some favorite material, they tend to schedule its use for every class each semester. Good material like "Broken Glass", "The National Drivers' Test", "Freeway Phobia", and others must often be scheduled far in advance. University rental libraries allow more shipping and use time within their respective states; consequently, a given film may have a maximum of 15 to 20 bookings during the fiscal year. Other sources lacking automatic cleaning and inspection machines may get close to 40 bookings per year on a given print. Most other agencies rarely order and replace damaged footage with new stock from the producer. But universities have a rental fee or a small service charge; e.g., AAA deposited a number of titles with the University of Michigan's Audiovisual Education Center which have a one-dollar service charge. The university libraries do not rent other a-v materials. Tape recordings

are usually duplicated from a master for a small charge per quarter- or half-hour, so frequency of use is difficult to determine. Other a-v items are handled by so many agencies that frequency of use becomes a monumental task. One might establish 25 to 30 bookings per year as a realistic maximum for kits, filmstrips, charts, etc., from sources other than a-v or instructional-materials centers. Schools will prefer good materials which they can afford, usually under 50 dollars per item. (A filmstrip is approximately 6 to 12 dollars.)

(4) The average exposure of any given item is presently an impossible figure to obtain, as accurate data are rarely returned to lending agencies from the user. The number of bookings for an item can be accurately determined, but the number of showings per booking and the total size of the group(s) attending are pure guesswork. Diversity of users and reordering are the best indicators of the worth of the material in question. We do know, however, that secondary users tend to use a given item for each of their classes in a given field. Three showings per booking to a total audience of one hundred would not be unrealistic. If the material is shown on television (closed circuit, vtr, or broadcast), refiguring is necessary.

(5) In attempting to identify those materials considered good or effective by the users, only motion pictures could be evaluated in any significant manner. Even films present certain difficulties in identifying the specific attributes which make them effective. The few 16mm film titles listed here are singled out because some experienced users have mentioned them as being good in their opinion or film libraries have indicated a high rate of traffic in their scheduling records. Some of the titles considered effective follow:

BEFORE IT'S TOO LATE
BOTTLE AND THE THROTTLE
BROKEN GLASS
CASE OF THE MISGUIDED KILLER
CITY DRIVING TACTICS
CRASH AND LIVE
A DAY IN THE LIFE OF A CALIFORNIA PATROLMAN
DEATH ON THE HIGHWAY
DEFENSIVE DRIVING TACTICS
FATAL MEETING
FREEWAY PHOBIA, PARTS 1 & 2
HOW DO YOU DRIVE
LIVE AND LET LIVE
MOTOR MANIA
NATIONAL DRIVER'S TEST
NONE FOR THE ROAD (Cahill version)
A PROFESSIONAL PORTRAIT
REACTION, BRAKES, TIME AND SPACE
SAFE ON IMPACT
SAFETY BELT FOR SUSIE
SMITH SYSTEM OF SAFE DRIVING
THE SMITH SYSTEM

TICKET TO SAFETY
WHEELS OF TRAGEDY
WHY WE KILL

The above listing of 16mm motion-picture titles does not take into consideration the objectives of the individuals using the materials. Some of the titles above are reasonably old, yet users or libraries place them in the active category. One producer, Cahill, has a large number of titles in the list. It must be remembered that these titles and others omitted are not located as readily as those in some other subject fields. There may be many outstanding films missing from the list, but the above titles are readily available through many channels. Audiovisual materials other than motion pictures come from so many different sources that an extensive survey would be needed to identify the more significant items or titles. In addition to the producers and/or distributors of audiovisual materials listed in part seven of this report, two agencies which could shed some light on the issue are the Highway Traffic and Safety Center of Michigan State University and the Traffic Institute of Northwestern University.

(6) Accurate and definitive measuring standards are generally lacking in the field of driver education. Little testing has been devised that is directly related to the effectiveness of given material, especially regarding entry and exit behavioral patterns. As in all fields, too few teachers evaluate the effectiveness of their teaching and application of a particular medium to a specific task. Unfortunately, the average teacher has little time to preview materials, finds limited school funds available to purchase new materials, must use the media under less than ideal conditions, and lacks familiarity with the few selective and evaluative instruments that may be used. One of the keys that will promote more effective utilization of audiovisual materials is a comprehensive selection tool that will attempt to evaluate the material in a manner similar to the Bertha Landers Reviews or the Educational Film Library Association Guide to 16mm Films (card sets, special subject reviews, and the EFLA Guide). If teachers know what is available, have some idea of its content value, and know the procedures for obtaining it, more concentration can be focused on the design and implementation of communication techniques to solve particular types of learning tasks which might include the development of a concept or skill, the improvement of recognition, recall, or associative abilities, or a host of other desired exit objectives for the student. The materials themselves are only as effective as the person using them.

(7) It is often difficult to determine the difference between producer and distributor for the materials found in the various listings. If we were to remove the few professional producers of educational materials from the listing of producers of a-v materials for highway safety and driver education, the group would be mainly composed of industrial and commercial producers. Geographically the distribution of these producers is nationwide, but with greater concentration in the populous areas of the Pacific Coast, the Middle West, and the

East Coast. A partial list of significant producers of more than one title in the subject under examination follows:

| | |
|---------------------------------------|-----------------------------------|
| National Safety Council | Automobile Association of America |
| Wayne State University | Consulate General of Canada |
| Ford Motor Company | General Motors Corporation |
| Cahill and Associates | Walt Disney Productions |
| National Film Board of Canada | Association Films (distributor) |
| National Education Association | Chicago Motor Club |
| MSU Highway Traffic Safety Center | Bell Telephone |
| American Dairy Association | Shell Oil Company |
| Department of the Air Force | Indiana University |
| McGraw-Hill | Farm Film Foundation |
| International Film Bureau | EBEC Films |
| Bosch Corporation | Modern Talking Picture Service |
| National Educational Television (NET) | (distributor) |
| Duart Productions | State Police (several states) |
| Cornell University | University of Southern California |
| National Commission for Safety | Coronet Films |
| Education | Allstate Insurance Company |
| B.F. Goodrich Company | U.S. Rubber Company |
| Chrysler Corporation | Union Carbide Corporation |
| Automobile Manufacturers Association | Firestone Tire and Rubber Company |
| Wolf's Head Oil Refining Company | Nationwide Insurance |
| Raytheon Learning Systems Company | Fass-Levy Films |
| New York University Center for | Aetna Life Insurance |
| Safety Education | Society for Visual Education |
| National Association of Automotive | AAA Foundation for Traffic |
| Mutual Insurance Companies | Safety |
| CBS | National Broadcasting Company |
| University of California | Edcom Productions |
| Safe Car Educational Institute | U.S. Public Health Service |
| American Oil Company | Texaco |
| AV-ED Films | Sid Davis Productions |
| Henk Newenhouse, Inc. (dist.) | Chevrolet Motor Division, GM |
| Liberty Mutual Insurance Company | |

Note: Nearly all agencies and industries associated with the automobile or highway safety make some material available to schools.

(8) Production costs for audiovisual materials have so many variables that producers themselves have difficulty estimating costs. A few rules of thumb can be applied.

SOUND MOTION PICTURES: This is the most expensive of all the media. This is especially true when the 16mm sound film is produced double-system (sync sound) and uses A and B roll editing to create optical effects and eliminate splices visible on the screen. Color adds 15% to 20% to the production cost. Pure animation is the most costly, followed by films incorporating professional actors. The general guide for a quality educational film in color with lip-sync would be approximately \$1500 per minute (print running time).

CARTRIDGE MOTION PICTURES (8MM): Quality 8mm films destined for a cartridge (usually five minutes in length) must be designed with this format in mind at the beginning production stages. The original footage must be shot in 16mm and A and B roll editing is used. Again pure animation is the most costly. Typical costs without animation but with some graphics might run about \$300 to \$500 per minute of running time.

FILMSTRIPS (SILENT AND SOUND): This very common medium has the advantage of extremely low unit costs. Silent filmstrips often are more costly than filmstrips with an accompanying soundtrack on disc or tape. This may be due to expensive graphics, if used, or registration and shooting charges for internal captions, if used. Again there are many variables, but \$6000 script-to-screen could be a realistic estimate.

SLIDE SETS (35MM--FULL FRAME FORMAT): The costs and problems in producing this type of material are close to those of filmstrips, except that initial laboratory costs are lower. However, unit costs for slide sets are far greater than those for silent or sound filmstrips. Sound recordings on discs have high initial costs but lower unit costs than sound made on tape and duplicated from a master.

TRANSPARENCIES FOR THE OVERHEAD PROJECTOR: Costs with this medium vary greatly as to the costs of the original master artwork and the method of transparency production used. Some companies sell duplicate masters for making copies, e.g., 3M and K & E.

(9) We have already seen that the audiovisual materials presently available come from many sources, with universities the largest single source for films, and other software coming from countless sources. Driver education instructors usually have a couple of major sources, but few know the total offering available. Too many distribution points sent out materials in poor condition (especially motion pictures). Better distribution and improved information gathering seem warranted.

(10) About 25% of our total population is now in school. National Education Association Research Report 1968-R1 tells us that public-school enrollment in the fall of 1967 was 47,788,324 in the 50 states. We know our nation's population to be slightly in excess of 200,000,000. We also have fairly accurate estimates for the increase in population over the next ten years. Information lacking includes state and national enrollment figures for driver education courses in the public schools. Enrollments in courses sponsored by other agencies and adult education classes are often even more difficult to obtain and project into the future.

(11) Perhaps old material will be of more benefit to the student, when teachers learn to use it well, than that to come. The gap between new technology and intelligent application in the classroom is narrowing, but it is still about five years, as witness the present state of use of instructional television, regular and super 8mm cartridges, programmed instruction, information retrieval, optical sound filmstrips, helical-scan video tape recorders (low cost), simulators, and the like. We are doing little in these areas and need to do much more. The older media have improved greatly, but their creative use has not progressed very rapidly. Slow-scan television transmission of still pictures over the FM bands and the exciting possibilities of electronic video

recording used with conventional receivers are soon to come, but it would be well to learn to use what we have now.

(12) The task ahead is not easy; we need more research into all aspects of the media field. To learn more about the role of media in the learning process, research dealing with behavioral patterns and attitudes must continue. Education is sorely needed to develop literacy in other media in the same manner that it has been developed in print and the spoken word; institutes could be held to train teachers in the proper use of media. As we have already said, materials are only as effective as the person using them; teachers still need practical learning situations which will help them establish behavioral goals for their students.

It is also necessary to create new and better materials to meet the newly stated objectives, but more can be done to help teachers locate and use the materials now available. There should be a clearinghouse of highway safety information that would attempt to evaluate existing materials as well as ensuring that pertinent research reaches the proper channels quickly. There is a need for some type of comprehensive listing of highway safety audiovisual materials, coupled with an effort to make it available to those who could benefit.

Studies are needed in testing, materials need to be brought together, mass communication must continue to reach the public. Attitudes must be established long before taking a course in driver education. A closer relationship must exist between the content of these courses and the rest of the curriculum.

--David W. Hessler

6.3. PUBLIC INFORMATION

6.3.1. INTRODUCTION. Public information activities are carried out for several purposes. Their objectives strongly determine their nature and approach. Key objectives usually include providing information the ultimate purpose of which is to: (1) enable the recipient to make decisions better within the full range of individual discretion, or (2) to influence his approach to decision-making so that some desired attitude or behavior is more likely to result. Or the activities may be undertaken to make result (2) possibly through some parallel effort. It is assumed that in either case, the ultimate objective of the National Highway Safety Bureau Documentation Center public information activity is to provide information to make highway transportation safer in some way. This may result through providing specific information units (messages) either to individuals within groups, which they may (or may not) use to modify their own behavior, or to groups, to modify opinions and attitudes in such a way as to enhance prospects for increased highway safety. (4) These objectives obtain as well for other channels of communication; the distinguishing characteristic here (for public information) is that mass media channels are used to get the information to the recipients. The channels may range from such mass distributors as television networks or large newspapers to meetings of small groups (e.g., Parent-Teacher Association meetings). (5-7)

The approach of this aspect of this study is to look at the mass media channels in use, the audiences that exist, and to examine what has been and what is being done, how well it has been done, what it is possible to do, and a reasonable set of goals for the NHSB Documentation Center. From this, we then recommend activities consonant with these goals, with anticipated levels of activity of the center, and with the national need.

6.3.2. WHAT HAS BEEN DONE. Information activities to induce "safer" attitudes and behavior on the part of individuals in large audiences have been carried out for some time. Yet, in spite of strikingly large (and expensive) efforts, no measurably significant results have accrued. (8,9,10,11,12)

There are several examples of such activities, "campaigns" and programs, most notably those of such organizations as the National Safety Council, The American Automobile Association, and similar industrial and professional groups. As will be seen in more detail below, these activities have been--and continue to be--most successful in using the mass media to present their information units (messages) to large groups (13-15). Yet results in terms of changes in opinion, attitudes, and behavior deriving directly from such activities cannot be quantitatively ascertained; in many instances, qualitative measurements are not possible either. In large part, this deficiency results from a lack of appropriate mechanisms with which to make such measurements (also explored more fully below), or lack of foundations of knowledge of attitudinal and behavioral mechanisms from which to measure change, and the effectiveness with which media can be employed to induce such changes.

In addition, there is such a variety of models of perception, cognition, motivation, and behavior that the prospect for the short-term development of quantitative measurement devices is not bright (9, 16-26). All of these present opportunities--if not demands--for future research. The wealth of opportunity is indicated in one of the stronger statements concerning the present state of the traffic safety public information activities. It was made by Mendelsohn in a recent study of the content of safety messages: (11) "In essence, the contemporary literature of traffic safety today is strangely medieval in both content and approach."

Noting that the distribution of such "literature" is self-separating into two "almost completely separated curves--one marked 'education,' the other 'propagandistic,'" Mendelsohn observes:

Further, as the evidence that has been adduced has shown, the so-called facts and authoritativeness that appear in the literature, when converted into rationales for drawing subjective inferences about the causes (and control) of traffic accidents, are simplistic, naive and frighteningly misleading. Thus, what appears on the surface as a strong 'informational-educational' component of the literature is something else altogether in actuality. It is a 'pseudo-information' that serves

primarily as backing for propaganda. To characterize the 'education' end of the bimodal distribution as being truly educational is stretching the concept of education to the limits of credibility. In other words, the educational component of the literature that was studied is not purely such, but rather it represents a mix of information-giving (the validity of much of which is open to serious question) plus propagandizing. Being composed of the two elements--education and propaganda--the 'education' curve in the bi-modal distribution is in fact neither.

Now to the 'propaganda' curve. If we measure the propagandistic character of the literature against the criteria that were outlined in Section I of this report, we note immediately that what we have is not 'good' propaganda at all. The interpretive literature of traffic safety that was subjected to content analysis makes no effort to establish source credibility in any systematic fashion. Action recommendations and demands appear relatively infrequently--and when they do, they are garnished with heavy helpings of imperatives for people to do what they already do, as well as with meaningless slogans and calls for absurd actions. Many areas in which readers can be expected to take meaningful actions toward the ultimate control of accidents on the roadways are either totally or almost totally neglected.

Implications of this for the NHSB Documentation Center seem to be that it, perhaps uniquely as a repository of accurate safety knowledge, can rectify the requirement for authoritativeness, and it can provide the means to develop required knowledge through research for more effective uses of the mass media. The research should seek new message structures of high utility and authority in terms of accuracy, new ways to present such messages, and new means (i.e., quantitative means) to measure effectiveness.

Mendelsohn begins his study with two quotations that sum up the state of public information regarding traffic safety. He quotes Arch McKinley, then Public Information Director of the National Safety Council, as stating, "nothing in America is more publicized than traffic safety." This is probably true. His other quotation is from the 1966 report The State of the Art of Traffic Safety, by Arthur D. Little, Inc.: "We have found no substantive data on the effectiveness of general safety propaganda; the limited information available suggests it is not particularly effective." (11) (The fact is, aside from one other brief reference, the A. D. Little study doesn't mention public information at all.) (8)

Both of the quotations above contain large elements of truth, although this need not imply hopelessness. That the current effort is substantial indicates that significant importance is attached to making the effort, but is in itself a kind of positive forecast for future

efforts. That the benefit of the effort is unclear at best may also be an attribute; it leaves the field wide open to the development of new approaches, of original and creative use of authoritative information, to new formulations of goals and approaches to measure effectiveness. (13)

In the following paragraphs, we examine the level of current effort in terms of media employed (newspapers, magazines, radio, television, audiovisual devices) and the audience (or publics) reached, and some of the current costs of doing so.

McKinley's statement about the level of effort seems well founded. Several groups are active in the dissemination of safety information. The volume of material available is somewhat staggering. Mendelsohn's measurement of material in print indicated some 400,000 separate "messages" (paragraphs expressing a single idea promoting safety) are produced yearly for the American public.

Material for all media is produced variously by many organizations concerned with safety, including government, industry, and special interest or professional groups. The two which have done the most seem to be the National Safety Council and The American Automobile Association. Both the AAA and NSC distribute advertising and feature material for use in newspapers and magazines, in the form of mats and copy. Subject matter ranges from driving tips to interpretive and propagandistic material. AAA distribution is through state and local units. Indications from two states (Wisconsin, Ohio) are that response from media has been good, with weekly newspapers perhaps more responsive than dailies.

In newspapers, virtually every community in the country is exposed to news stories about crashes, especially the more severe and dramatic kinds. These usually are straightforward accounts of what happened, with little or no interpretation or propaganda. They were not included in Mendelsohn's sample, nor has there been any serious effort to determine their effect on audiences in the cause of safety.

In magazines, a more interpretive approach is the rule, rather than straight reporting. We attempted to determine simply what kinds of articles are most used by major magazines by seeking out titles in The Reader's Guide to Periodical Literature for the period March 1963 to March 1968. Results of this are summarized in Appendix G. It will be noted that these publications reach large numbers of homes, that the most frequent articles concerned safety devices and standards (reflecting current events--i.e., the congressional hearings on standards), and that articles on drivers and driving appeared most frequently in such publications as family, women's and lay "science" magazines.

In examining these magazine articles on subjects relating to highway safety, an attempt was made to break down the topic into the number of representative, major articles that have appeared in general circulation magazines and the circulation of these articles among the American public. The vast majority of the articles appearing during the five year period come under the heading, "Automobiles--Safety Devices and Measures." It is interesting to note that during 1963-65, 28 articles appeared on this subject, 1965-66, 45, and between 1966-67, 125, with such titles as: "Auto Safety: Nader vs. General Motors" and "Congress gets ready to legislate safety; writing safety standard bill"

Another simple examination was made to determine what was happening to the frequency of use of safety information in the print media (all magazines and the few largest newspapers) over the year ending in March 1968. It was felt that frequency of usage would be an indication of the interest of "gatekeepers" (editors and publishers) in the subject of safety. Obviously it is essential to have strong interest on the gatekeepers' part if safety news is to continue or increase in frequency of use, in getting to the public through these media.

The hypothesis of this simple examination was that the gatekeepers' interest might have declined since the passage of the national highway and traffic safety acts; passage of the acts represented a climax following which their interest would tend to dissipate. To provide a test of this hypothesis, news clippings from a clipping service were classified by general subject and counted for the year mentioned. Because of the nonrigorous nature of this test, the only valid conclusion is the empirical: The number of such clippings declined over this period, with a negative slope on the order of 0.30 (Fig. 13).

This rather unsurprising result was substantiated by comments solicited from newsmen for the interim report for this study. They are typified in this paraphrased comment from one nationally known writer: "Give us a new angle. The safety story's getting old. The editors want fresh slants or they won't use it."

The "new angles" can be provided by information garnered from inputs to the Documentation Center. Use of them by editors can then be reinforced, if necessary, by techniques that have been tried to persuade gatekeepers to use more news about similar fields, that is, about public issues based on technological development. (27) There is no indication such techniques would not work with new and technologically sound safety information. But the information must be new, at least to the editor's readers.

However, newspaper coverage in general was difficult to evaluate due to the lack of indexes for any major newspaper but the New York Times. The following observations, then, were taken from the Times. It may be worthy of note that the caliber and national coverage of this newspaper are likely to make its relevance greater than that of most major dailies in the U.S. and certainly above that of most city papers.

In the New York Times index, under Traffic--NY were these sub-headings (and illustrative titles): Express and Park-Ways (e.g., "HWY. Dept. Surveys Cross-Bronx Expressways to determine what railings on overpasses are dangerous"); Accidents (e.g., "11 killed as their car enters dead-end st."); Drunken Driving ("statistics on arrests"); One-Way Streets ("announcements of"); Parking; Safety ("police bid parents stress safety to children"); Signals, Signs and Traffic Circles (e.g., "misleading road signs cause confusion"). Articles of this type may be expected to make up the main flow of traffic safety news of any city newspaper, excepting, of course, "accident" stories.

Under U.S. Safety, coverage was given to such articles as: "Gov. Brown offers safety program;" "Comment on various campaigns to cut accidents;" "hold 'horror' films intended to scare drivers of little value."

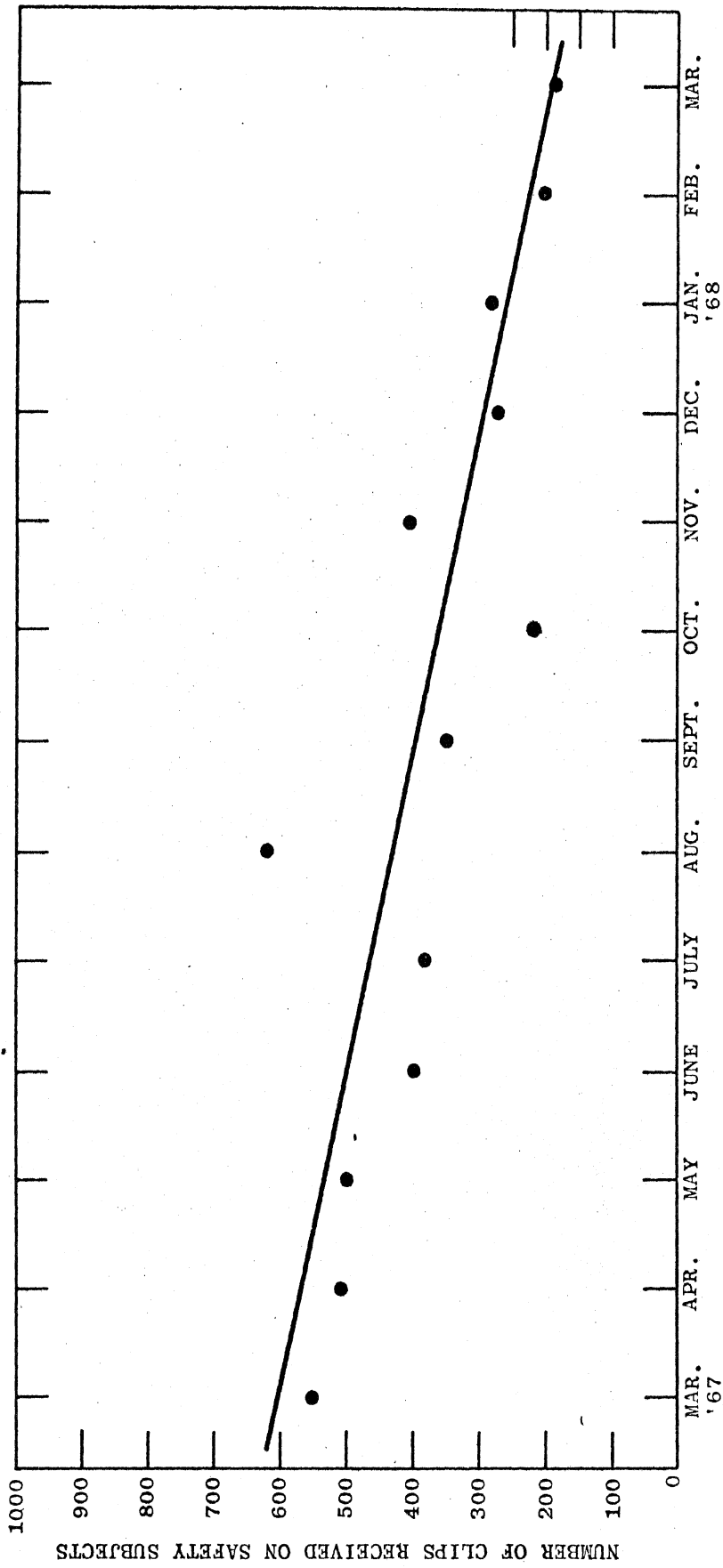


FIGURE 13. FREQUENCY OF APPEARANCE OF SAFETY NEWS ITEMS

The same swell earlier noted under Safety Devices & Measures for periodicals (Appendix H) is seen under the topic Safety in the New York Times for the year 1966-67. Subjects responsible for the major increase from the 33 articles in 1963, 13 in 1964, 84 in 1965 and back down to 96 in 1967, were such as: "Pres. Johnson proposes \$725-million, 6-yr. safety program as part of plan to set up transportation dept.," "G.M. admits routing investigation of Nader;" "Senate 76-0, approves safety standard bill;" etc.

The above indicates the nature and extent of safety information appearing in public print media up to the present. The volume, considering news articles (but not crash stories), advertising spots, agency and organizational handouts (and pamphlets, stickers, and posters), is staggering. The most noticed and accepted channels, the newspapers and magazines, may be becoming saturated. It seems reasonable to hope that new, authoritative information provided by the Documentation Center, for distribution to the print media, will help to clear these channels so that important, substantive information may again reach the public through the print media. Much the same holds for special publications such as pamphlets containing, for example, driver information. Pamphlets, however, unless integrated with some other communication function (e.g., driver training), do not command the attention or authority which derives from impartiality, as do news articles.

In television and radio, as in the print media, the National Safety Council again has made the largest single contribution to date. In addition to the NSC campaigns undertaken in cooperation with the Advertising Council, the NSC is also a parent organization for local safety councils and helps to finance and provides promotional material for some local campaigns. Because of the scope of their campaign and the need to use media effectively, NSC makes extensive use of radio and television.

There are, however, other groups which are also involved in attempts to make the public aware of traffic safety and use radio and television in this attempt. One of these has been the Injury Control Office of the U.S. Public Health Service. While this group expects eventually to handle less and less of the traffic safety material as National Highway Safety Bureau activity increases, it has worked with another group active in promoting traffic safety information--the Safety Belt Council (formerly "Seat Belt"). One example of this is a film showing the simulated crash with a dummy family. It was based on information gathered from the UCLA research project which Injury Control helps support. Safety Belt Council has also distributed 10, 30 and 60 second radio tapes promoting the use of seat belts. Several state affiliates of the AAA are using radio campaigns as well, some based on the noted "Bring 'em Back Alive" campaign in Michigan.

In addition to the AAA, Safety Belt Council, etc., the Insurance Institute for Highway Safety also has its own campaign. And local radio and television stations and their sponsors broadcast their own material to the public, much of which is based on information furnished by such agencies and organizations as cited above, as well as by local law enforcement agencies.

The results in the television-radio area, as elsewhere, are difficult to assess. The general consensus of those undertaking them is that primarily the traffic safety campaigns are valuable and effective. But the only measure of this effectiveness seems to be relationships arbitrarily associated with accident, injury and death rates; most of those consulted felt advertising had had a "significant" effect on these rates.

As reference materials, or for continual media usage, the availability of materials which have been used in part years seems negligible. The Advertising Council's Chicago office may have something of an historical file of what NSC-AC have done in previous campaigns. However, USPHS does maintain a film library in Atlanta, Georgia. The films include those done by Injury Control and also films done by other groups, and they are available for rental either from a list or through regional offices of USPHS. But the fact that the approach changes over the years, and the material which has been prepared becomes obsolete, makes every effort a new and necessarily original one.

In all cases, new material is distributed from the source. For example, if USPHS' Injury Control produces a film, they may have 100 copies printed and distribute these to their regional offices. In this case the films may be obtained from the regional offices. As far as radio and television are concerned, there seems to be little in the way of catalogs or directories. (See also the preceding section on audiovisual materials.)

Some figures on the number of television and radio stations are notable in pointing out the scope of the present campaigns. As of February 29 the FCC listed 5,984 commercial on-the-air radio stations and 652 commercial on-the-air television stations (VHF and UHF). The March 13 issue of Broadcasting magazine lists 5,988 radio and 652 TV. A recent Traffic Safety magazine article indicates that the Advertising Council distributed radio and television kits to all stations in the U.S.

The USPHS has distributed radio spots in their various campaigns to 3500 stations using the NAB mailing lists. Also they have just recently sent one-minute spots to 500 radio stations picked arbitrarily as representative large city stations.

Though limited, these figures point out that the NSC annual traffic safety messages apparently are reaching great numbers of people. For example, 4.4 billion "home impressions" (messages received through "home" receivers) were reported for television in 1966. Also, the Advertising Council later in the year sent radio kits to 407 college stations and received 195 reply cards which could also be used for comments. Many of the stations did comment, all favorably.

A striking factor of this effort, as with the print media, is its voluntary, nonrecompensed nature. Extent of the voluntary contribution is emphasized in the fact that the stations are not required to contribute public service time. Public service announcements are recommended by the NAB Code but not required for their Seal of Good Practice. Nor is there a federal regulation requiring their support. NAB does encourage public service announcements by stations from their non-programming time limitations in their TV code. An NAB Code Authority

Department spokesman suggested that stations are usually very generous in their public service time but that they probably give most to the National Safety Council campaign (in the area of traffic safety).

When it started, 20 years ago, the National Safety Council's campaign was geared to prevent accidents. This was the time of the memorable "The Life You Save May Be Your Own" slogan. More recently the purpose was the promotion of the purchase and installation of seat belts. Last year's campaign was geared toward defensive driving and the use of seat belts.

The procedure followed by the Advertising Council in their choice of theme follows this outline. First, the AC is a voluntary organization made up of advertising agencies to prepare such campaigns as a public service. And the Advertising Council is the agent for the National Safety Council. Time and effort are contributed by the individual agencies with the NSC paying for the mechanical costs only (and these are also special rates). It was estimated that on an average campaign the contribution is about the same as the time and effort that would be spent on a regular account for which they are paid.

The creative work is entirely contributory by the agency, as in the case of Needham, Harper and Steers, work for the NSC and AC campaign. Last year actor Barry Sullivan contributed the narration through special arrangement with the Screen Actors Guild. Comedians "Bob and Ray" contributed their radio transcriptions.

Injury Control is paying a Hollywood firm, Anderson, Morgan, DeSantis and Ball, about \$5000 to make three films. Most of this work is done for special prices. In its various campaigns, USPHS farmed out the work for its television spots. They put it out for bid and chose from at least three bids made by package firms in New York, Chicago, Hollywood, etc.

A notable, special TV contribution has been the CBS Driving Tests. These programs, which ran two years, earned both CBS and Shell Oil, the sponsor, Sloan awards. This was unusual, but CBS invested thousands of dollars in the project, in cooperation with the National Safety Council. Nothing else has been done like it; no other full network, national program.

As with print media, large volumes of messages are being sent to the public through the electronic media. The essential lesson from this is that the media are responsive: Good material (which implies professional preparation) will be used. The Documentation Center can serve as an authoritative original source for much of the information for such material.

Audiovisual. While dealt with in the preceding section of this report, audiovisual materials are also mentioned in this section on public information for two key reasons: Not only do such materials provide information for special, select audiences in the educational area (students), but the materials often are used additionally on electronic media and for presentation to small groups (such as women's clubs, service clubs, youth organizations). In one state (Minnesota) over a 10-year period, one-fifth of the use of films alone

was for such non-educational groups. In both ways such materials reach wide audiences, and in a notably effective format (in terms of receiving attention), especially so when the audience is actively involved. (28-30) The preceding report on audiovisual materials was prepared by a well-known authority, Prof. David W. Hessler, Western Michigan University. In this section we shall include a summary of those elements of the Hessler report relevant to mass media.

It is of substantial significance that no central catalog or source listing of materials seems to exist, making it difficult for public media (including small meetings) to locate and obtain materials. The few materials rated good by their users are noticed, apparently, by word-of-mouth, and because of insufficient supply are difficult to obtain.

Finally, this medium--audiovisual materials for education--is of central importance to any public information effort because (1) a substantial proportion of the public is in school now; (2) these constitute captive audiences who are relatively easy to reach; and (3) many are at a state of psychological development when a judicious and well-conceived effort to inform will result in optimum return (30-32).

Effectiveness. Measurements or assessments of "effectiveness" of public information activities must be based on the intended purposes of the activities, which may be to inform, to "educate," to shape opinion, or to modify behavior. Whatever the purpose, techniques to measure such results or effectiveness leave much to be desired. The absence of adequate theories of mass communications, of knowledge of their effects on attitude change, and of research on effects of opinion change on behavior, have been noted previously. In addition, studies of opinion, attitudes and behavior are limited by deficiencies of motivational theory, which itself is characterized by the existence of several schools of thought of varying acceptance. (5, 18, 20, 22, 24, 33-35) Trends in such research and theory are in the direction of integrated approaches to individual behavior and attitude change. (24)

Still, some work has been done, the results of which suggest what may be anticipated in highway safety information programs. Most studies of effects of attempts to influence opinion and behavior have been in the areas of political or economic behavior. Some of these have concerned areas based on the use of scientific or technical knowledge (e.g., water fluoridation, polio shots, etc.), (36) and some emerging studies appear to fall in areas more closely comparable or parallel with likely behavior structures in the driving and safety arena (e.g., smoking and health) and bear watching. (33, 37-39) The health area in particular should be watched as public health authorities become increasingly sophisticated in persuasive techniques. (33, 38)

On the other hand, very few studies of the attitudes or affects associated with behavior in the safety area have been done (14, 40-42), and those mostly have results of limited transferability.

One of the more notable examples in the safety effort of an attempt to induce a behavioral change through mass-media persuasive techniques is the campaign to get people to use available passenger restraint systems. Although their effectiveness has been established, their usage remains relatively low--only 38 per cent of the passenger-drivers of the 65 per cent of vehicles equipped with the devices reported "always" using them, in a survey by the Auto Industries Highway Safety Committee. Studies which have examined attitudinal factors associated with seat belt usage indicate that a fairly complex set of such factors operates. (42-44) While experimental variables left some questions to be resolved regarding the transferability of results (e.g., sample size, captive subjects, etc.), (19) the findings generally support the view that the basic motivational affects for or against restraint system usage remain to be discovered. Further, they suggest a positive approach to be more effective than one using fear arousal, a consideration supported by other studies of fear arousal. (40, 45-47) (There is, however, some ambiguity in the findings of the studies of the utility of the fear-arousal technique. If fear arousal is used, however, it must not overwhelm, the act to remove the fear must be explicit, and the benefit not distantly removed in time. (48) In any case, safety belts are now required on all new automobiles, and the National Safety Council this year is launching a major campaign (with a degree of fear arousal) to induce people to use restraints. The point is that, unless these factors are understood, the campaign is likely to fail. An increased flow of communication alone is unlikely to change attitudes whose bases are unknown. For example, intensive information campaigns to prevent forest fires have failed for these reasons (33, 38, 49, 50).

But not much has been done to study basic safety attitudes and behavior, especially regarding the involvement of mass communication. Only a single study on this subject was included in a bibliography of 2,200 articles on mass communication research done between 1944 and 1964 (51), in spite of the volume of safety information material previously noted. This was a need Mendelsohn attempted to fill with his 1964 work on structuring a model for determining the use and effects of public information on safety behavior. Available theory and techniques, however, simply were not adequate for the task. (21)

Other studies have similarly pointed up these shortcomings while offering hints at approaches which are hoped would be more effective. Most deal more with principles of persuasive communication than with the science of measurement. These principles include knowing the audience(s) and its (their) characteristics (base attitudes, capability of handling information, etc.), the art of message structure to fit the audience's requirements, and the characteristics of potentially useful media. Studies of effectiveness of many of these fill the literature, but these are mainly qualitative; as noted above, so far they have contributed little to the development of a generally applicable theoretical model of communication. (5, 11, 13, 34)

Two aspects of the nature of safety information and its intended use bear particular examination, however. These aspects are the fundamental technological nature of the information and the parallels of experience which may be assumed to exist in other "health-type" campaigns, in which broad attitude or behavioral modification has been sought.

Studies of the presentation of technological information by mass media show such information must be presented not only on a level that the audience can accept (i.e., simply and clearly), but also must be attractively presented (i.e., somewhat entertaining). However, such information is received by (or selected by) mainly those who need it least--those who are already somewhat informed on the effects, or who tend more to follow the behavior sought or hold the attitudes desired. It can be assumed these factors would hold true for safety information. (45, 52-55)

That many influences work on the individual and affect his receptivity and propensity to be changed (in either attitude or behavior) is evident from many health-related case studies. And, of the previous studies of mass communication effectiveness with respect to health issues, the area that may have the closest parallel to the safety issue is that concerned with smoking and health. (43) Therefore, some appropriate cases which may parallel the safety area may be illuminating. For example, Cannell and MacDonald (56) found (1956) that the higher the education of nonsmokers, the more likely they were to accept as proved the relationship between smoking and lung cancer. But for smokers, they found greater education correlated with a lesser likelihood to believe the report. Later, after the Surgeon General's Report on Smoking and Health (1964), Swinehart and Kirscht found among college students that smokers accepted the Report less and became less accurate in recall of its findings. The researchers conclude "The pattern of reactions shown by smokers suggests that although they were able to accept the Report's findings on a cognitive level, they were unable to do so affectively. They clearly avoided a conscious denial of the threat but may have been quite unaware that other responses, such as selective forgetting, were mobilized. This implies that anti-smoking campaigns of a strictly informational nature will continue to be ineffective so long as they fail to block such defenses." (39) Similar cognitive structures and affects may operate with respect to safety attitudes and behavior, (12) but if understood may be overcome. (57)

It is suggested here, in fact, that both smoking and driving involve motives, attitudes and beliefs with certain basic and significant similarities. That these are perceived to be similar and strong is evidenced by observations about marketing and motivating sales of both cigarettes and automobiles. Further, behavior patterns in driving appear to reflect a complex set of fundamental attitudes. (43, 58, 59)

In the smoking studies in particular (and the seat belt usage studies), the mechanism of dissonance has been observed. (7, 43) Receivers of dissonant information block it out. It has been suggested that the use of accident statistics, as in holiday campaigns, produces

a similar if broader effect--to immunize people to any safety message. (61) People feel "it can't happen to me" in spite of statistical evidence to the contrary. (12) Thus no matter what the appeal used, the remoteness would tend to dissipate audience receptiveness to the message. (48)

From these studies there does appear to emerge one useful model for inducing specific behavioral changes. Cartwright notes that a chain of processes must be initiated within a person to produce the desired changes. Within the individual there must be created: (1) a particular cognitive structure, (2) a particular motivational structure, (3) a particular behavioral (action) structure. That is, the individual must have the information to know he should do something, he must want to do it, and thirdly, a trigger mechanism to actually get him to do it must be provided. (37) Again, however, to use steps (1) and (2), an understanding of basic cognitive, motivational, and attitudinal structures seems essential. (50) Opinion, attitudes, and behavior can be changed, sometimes substantially, but persuasive communication of the type the safety effort requires is not advertising, and similar results should not be expected (until, at least, the basic groundwork has been done). (17, 33, 38, 50, 61)

In general, then, the prospect of significantly affecting the majority of "needers" of safety information through mass media may seem dismal--except, possibly, as those "needers" find information an absolute requisite to their use of transportation (i.e., learning some responses from a film clip, slide presentation, or closed circuit TV in order to pass licensing examinations). (17, 38) The best place for information to be imparted is in schools during the school years; the younger the better.

Where does this leave "public information" and the uses of the mass media? These can still serve important functions of information transfer and utility, but--as can be seen from the above--one should not expect great or sudden changes in transportation safety to be brought about from their use. Rather, changes will be made slowly--as behavior of the receiver and user groups is imitated by others who use mass media less for instructional purposes. Behavioral changes become widespread in a system only when they acquire the strength and dispersion of mores (62).

Implications of this for the Documentation Center seem obvious. Efforts should be made to disseminate information through existing media channels in the most effective format possible--i.e., in an attention-getting manner consistent with the requirements and opportunities presented by the medium employed. For the long run, however, if the activity is to achieve optimum results, every effort should be made to understand and obtain new knowledge about audience characteristics--knowledge sadly lacking today.

6.3.3. RECOMMENDATIONS. In recommending an organizational structure to handle public information, and even more, to project ten years into the future, several basic determinations must be made. First, the mission must be established--is it to be responsive (pull: answering demands for information), initiative (push: releasing information as

it comes in), or both (usually the case)? And is it to be socially passive (distributing information without regard to effect), or active (using information to achieve specified attitudinal and behavioral change)? Workload would increase progressively through this list of possible activities.

Workload and structure are also functions of at least two other variables: the level of information input (information resources), and the demands placed upon the organization to serve external information transfer facilities (media). The latter, in turn, is a function of the (media's) knowledge of the resource's availability, (the more widely it's known, the more it will be used), its responsiveness (the quicker it is, the more used), cost (the cheaper the more used), quality (better; more), and authoritativeness (the more accurate, the more widely used).

For these recommendations, we shall assume that the Documentation Center will be largely passive and both initiative and responsive. (This is not to denigrate the case for active, persuasive efforts; however, it is assumed here that active efforts will be carried out by those directly charged with such missions--either the public affairs offices of the parent organization, or private, professional groups. One reason for this is the necessity for thoroughly professional efforts in the tight competition not only for audience attention but also for media space/time, which have been authoritatively noted (63). The importance of this cannot be underestimated. As the report on Communications of the President's Commission on Heart, Cancer and Stroke points out, few government agencies can compete in terms of salary with those paid to private professional creative people. And such talent is essential if the material is to be used in such highly competitive media as television and magazines.)

Information input is at this point a relatively unknown factor. Thus, projections must be estimated on the basis of experience. (We shall use 15,000 acquisitions per year.) The only available estimate of the ratio of technical information which is translatable to the general public fixes it at about one percent (64) (such information being defined as new concepts, rather than refinements in data). We shall assume, however, that since the bureau will be serving several specific audiences, and because manpower efficiency ratios decrease as subject matter increases, the need will be about three times this rather arbitrary ratio. Finally, because of the nature and mission of this organization, we shall assume that it is desired that knowledge of availability of the resource, responsiveness, cost, quality, and authoritativeness all operate at optimum levels, and that these in fact will be optimum.

In addition, our interim report presented some indications of the present nature of demands by mass media representatives: there are about 300 or so persons who would use such facilities on some regular basis (with a frequency ranging perhaps from a high of once or twice a day for a wire service personnel who are assigned safety as a "beat" to magazine or TV personnel who may use such services once a year). A reasonable mean would appear to be some five to seven calls per person per year--resulting in calls for service ranging from 1500 to

2100 times per year. As safety knowledge is generated and as audience barriers (such as the immunization to safety information) are overcome, this conceivably could rise by as much as an order of magnitude over ten years, judging by the volume of the present total effort. However, something like a doubling or quadrupling is much more likely. In addition, as inquiries rise, duplication increases so the need for additional personnel is not directly proportional.

Finally, workload projection is a function of the number of media to be served, as the requirements of each are sufficiently various so that different talents are required. The media to be served include newspapers, magazines, books and other prints, radio, television, and audiovisual (filmstrips, tape and film cartridges, movies, charts, slow-scan TV clips, etc.). This will also require acquisition and handling capability for such nonprint materials.

It is assumed further that initial acquisition will be 18,000 documents, that acquisition rate then will be about 15,000 per year, resulting in a fairly constant workload ratio based on input. Output requirements, however, will probably continue to rise as more media call on the Center's services.

This will result in a need, then, for the operational structure shown in Tables 15 and 16 to serve the public information function:

TABLE 15. PUBLIC INFORMATION BUDGET
(In Thousands of Dollars)

| | Now | 1973* | 1978* |
|-----------|----------|-----------|-----------|
| Salary | \$60-100 | \$120-300 | \$165-340 |
| Operation | \$40-80 | \$100-300 | \$150-600 |

* based on 1968 dollars

NOTES: Projections will vary according to:

(1) The amount of such activity undertaken by parent agency; the above estimate assumes the Documentation Center operation will carry out virtually all retrieval, creation, all single-copy preparation, and some reproduction. Division of effort between agencies will have to be decided by the parent agency.

(2) Amount of large-scale reproduction and distribution, except for distribution to special audiences (schools, clubs, safety organizations, etc.) handled by other organizations. Needs of mass media will be largely on a single-copy (master) basis. Thus, preparation of material is primarily to meet responsive needs and does not require large-scale reproduction capability. The low estimates include needs based on an initiative effort reasonably anticipated, including reproduction; high estimates assume more extensive initiative and reproduction efforts.

(3) Degree of change in the technology of mass communication. For a look at some possible (as well as some relatively unlikely) changes, see the succeeding section.

TABLE 16. PERSONNEL REQUIRED: PUBLIC INFORMATION

(Low & High Estimates Given--see notes below)

| | Now | 1973 | 1978 |
|--|------------|-------------|--------------|
| Manager | 1-1 | 1-1 | 1-1 |
| Information Specialists and Handlers: | | | |
| Newspapers, Magazines | 1-1 | 1-3 | 2-3 |
| Books, Pamphlets, etc. | 1-1 | 1-2 | 0-2 |
| Film, TV and Radio: | | | |
| Responders-Handlers | 1-1 | 1-2 | 1-2 |
| Producers-Editors | 1-1 | 0-2 | 1-2 |
| Reproducers | 0-1 | 1-3 | 1-3 |
| A-V Aids: | | | |
| Responders-Handlers | 0-1 | 1-3 | 1-3 |
| Producers-Editors | 0-1 | 0-1 | 1-2 |
| Other: | | | |
| Designers, Artists | 0-1 | 1-2 | 1-3 |
| Reproduction Staff | 1-2 | 1-3 | 2-4 |
| Secretarial | 1-1 | 1-3 | 1-3 |
| | <u>5-9</u> | <u>9-25</u> | <u>11-28</u> |

6.3.4. CONSIDERATION OF FUTURE DEVELOPMENTS. To anticipate future needs for information and format, it is appropriate to take a look at the nature of developments of the various media, for they will change the requirements for using the media. While some of these developments will be in wide use within ten years (offset, printing, or color TV, for example), others may not be. As many knowledgeable scientists point out (65), the pace of technological development is often, if not usually, underestimated. With this in mind we shall examine a few such possible developments which have varying potentials to change the information dissemination picture.

An obvious development will be the growth of color television. This offers increased flexibility of the medium and implies that material collected for use by the medium must be in color (experience now shows that if it is not, it will not be used). In addition it should be noted that a trend seems to be developing toward increased use of magnetic (as opposed to optical) sound tracks. This should be followed for further developments.

The advent of three-dimensional television is near, but the rate of its progress toward economic feasibility is uncertain. It is said now to be technologically feasible. 3D TV would provide still greater flexibility for the presentation of highway safety information; the introduction of parallax into the image literally will add a new dimension to information transfer possibilities.

Also now developed and expected to be of increasing utility are electronic video recorder (EVR) techniques which, with their unique storage and retrieval characteristics, offer increased potential for use of the medium, either through such facilities as national educational television networks or for classroom or home use.

Print formats also are changing. For example, offset printing is now becoming much more common in news publishing, especially on the smaller newspapers which are growing in number in suburbia, in contrast to the continuing decline in number of large metropolitan dailies. Considerable attention, therefore, should be given to storage and retrievability appropriate to the offset format. Typesetting by computer is also presently widespread and expanding, tending to increase the rate of information transfer relative to news publishing contains implications of special significance for the future. It implies a future of increased flexibility in and expansion of news handling techniques. Recently, at least one large newspaper (Los Angeles Times) was experimenting with digital handling and electronic display of news. Eventually (but at some unknown date--primarily because of the economics involved, not because of limitations of technology) this may result in the replacement of the newspaper as we know it by the use of display screens in the home. This will produce a great flexibility of choice for the viewer-reader in selecting the news or information to perceive, for this device would offer several levels of depth of detailed information for each headline displayed on the home screen. Information could be recalled in successive levels of detail from a central digital storage medium. The screen display

will provide serial access; random access may be provided by automatic print-out devices attached to home receivers, as well as an index recall device.

The advent of such devices will place greater responsibilities and new burdens on news gatekeepers and writers--not fewer. With such devices available and a wider selection from which to choose, the viewer-reader will be "turned off" a subject much more easily; hence greater efforts must be made to retain his attention through clear, interesting and entertaining presentation of the story. (CATV, which increases the number of channels available to a TV viewer, may be exerting such an influence on broadcasters now.)

Interesting material presented with clarity and authority will be more in demand than ever. Just what forms these will take cannot entirely be known now, but age-old principles of clear exposition for holding attention and interest undoubtedly will apply with even greater priority than today.

As McLuhan has noted, (66) greater involvement of the perceiver tends to increase the effectiveness of the message. New media certainly will tend to increase the involvement of the perceiver. It appears evident, therefore, that the opportunity to inform, educate and influence will be greater than ever before. However, it also appears likely that the probability of influencing a given group with a given message will be lower because of the much greater options available to each group "member" to select among messages. (McLuhan may be correct in his observation that "the medium is the message", but the degree to which it is will decline as the number of media increase and as the range of possible selection increases within a given medium.) (20, 28, 32, 36)

The advent and influence of transistors, microcircuitry, and FM radio in recent years underscores the importance of continuous observation of the development of the radio medium as well as of television. Technological developments in circuitry and miniaturizing have lessened the cost and made personal radios more widely available, thereby increasing the potential audience. FM radio, because of its higher cost and greater fidelity in reproduced sound, has influenced the nature of its audience in a manner unanticipated by the broadcast industry. Because of these effects, it seems to have a greater influence than anticipated (60) with its tendency to reach the audience of "opinion leaders" created by its original higher cost and quality.

The increased traffic and limitations of available bandwidth of the radio broadcast medium appear at present to be growing in severity, but it seems rather doubtful that these would have a significant effect on possible broadcast capacity within this decade. Optical communications systems using lasers have been widely mentioned as an alternative, but again it seems unlikely for both economic and technological reasons that these will influence the medium within 10 years. Rather, it appears much more likely that development and advances in the technology and economics of microcircuitry will have a much greater significance during this period, as these tend to make

more widely available almost personal audio and video receivers. For example, the flexibility of usage of audio receivers in vehicles may be vastly increased. And the potential for use of two-way communications, although less a mass medium, also is enhanced by these developments. In addition, provided the circuitry and bandwidth are available, the potential use of mass media for direct educational purposes in the home and vehicle may be enhanced and could be particularly effective if technology and economics provide for direct, real-time feedback. (32) Audiences will tend to become less massive, and more individualistic.

The critical factor in each of these trends seems to be the possible rate of their advent and distribution.

In any case, it appears that tools are developing with which to forecast technological development (67). These should be examined. While they contain deficiencies for specific forecasts within industries, it is suggested here that those devices will be most rapidly developed from new technology which imply the quickest or greatest return on the risk capital available for their development. In communications, the projection of three-dimensional imagery is certainly a development of great potential profit, for example, and therefore can be expected to receive concerted attention toward development of economic feasibility.

As such devices appear, they will change requirements for servicing the media. This is the element of importance for the Documentation Center.

--Charles W. Wixom

7. TASK E: SERVICES

Task E of this program was to consider the advisability of providing certain functions in connection with the documentation center. Specifically, these functions were: (1) A lending library service, (2) selective dissemination, and (3) an information search facility. All of these subjects are discussed in more detail elsewhere in this report; here we would like to present the philosophy of service appropriate to an information center.

The technical library, information center, or information analysis center (or whatever other name seems appropriate) has been contrasted with the conventional public library:

Whereas the public library has a long-term objective to satisfy cultural needs, the technical library's objective is to dispense a more tangible product; answers to problems of interest on a day-to-day basis. Public-type libraries operating traditional library systems may legitimately classify as unreasonable an urgent request for specific information in a conveniently wrapped package, and can save a considerable amount of money by refusing to service such a request.

On the other hand, a technical library, which is able to respond rapidly to such a request, can save considerable amounts of money in researchers' time and thereby make it reasonable in relation to the value of services rendered. Accepting this premise, it appears to follow that technical libraries should not be operated on the same principles as public libraries.*

In the pages that follow, we indicate that the cost associated with placing the core of highway safety technical material into a central storage facility will be of the order of \$200,000 per year. And while the acquisition, indexing, and storage are vital functions of the documentation center, the service function is realized only when a user reads a report. We have thus recommended (Task G) incorporation of an information search capability within the Documentation Center, selective dissemination by the publication of an announcement service and an abstract journal, and a lending library supplement this for local qualified users and for library interchange of hard-to-find materials.

The Documentation Center must serve not only as a local service unit for the National Highway Safety Bureau, but also as a national source for information, reference, and occasionally for documents. While it may be difficult to justify a large staff and fast reaction capability to handle the casual questions of the man on the street, reasonable indication that the user is a qualified administrator, practitioner, researcher, or writer should lead to prompt and effective servicing of requests.

*86th Congress, 2nd session, Document no. 113, Documentation, Indexing, and Retrieval of Scientific Information: A Study of Federal and Non-Federal Science Information Processing and Retrieval Programs, Washington, D.C., 1961.

Secondary distribution is best handled through the clearinghouse, but adequate primary distribution to highway safety-oriented libraries throughout the country should forestall many clearinghouse requests and result in quicker service to the ultimate user. An extra 100 hard copies of contract reports distributed in this manner might provide wide enough distribution.

The concept of an NHSB documentation center should be broadened to include informal communications: a network of information exchange centers.

During the users' study, an urgent need was expressed for informal communications. The researcher/administrator needs to discuss his problem with someone knowledgeable about the highway safety field and its literature. This opportunity is not provided by a restricted document retrieval system. A library staffed by a non-subject-oriented librarian does not provide the user with someone he trusts in his subject area. The requester should feel that he is talking to an information exchange center rather than a document center--an alma mater for an invisible college.

A study of the highway safety field reveals many separate subject specialty groups each with its own channels of communications, e.g., professional journals and conference circuits. As a result, informal communication is scattered (as is the literature). There is no highway safety profession. The need for a professional focus in the area was pointed out in the A.D. Little State of the Art of Traffic Safety. It is felt that the NHSB can play a key role in providing exchange centers.

Men who run the centers should be subject-oriented, knowledgeable, evaluative, and adept in information science--they must be gossips who enjoy telling of others' work. This activity can include conducting semistructured meetings where current research and results are presented before publication. These small meetings would permit uninhibited discussions. The exchange center staff should also visit colleagues and tour the invisible college to maintain current awareness.

Activity of this informal nature was not covered in the original NHSB documentation center directives but should be considered a central goal. This style or philosophy can be seen in both the Highway Research Board and ERIC system activities. Enhancement of informal information exchange will require an aggressive NHSDC.

8. TASK F: SURVEY OF EXISTING FACILITIES*

Task F is concerned with determining the extent to which existing information facilities meet the varying needs of highway safety personnel. A number of agencies have been active in providing services and materials to some workers. We will examine some of these agencies (libraries and information centers in a university, industrial, society or foundation, government, and public setting) in the first part of this section.

Task A identified some of the materials and services needed by various types of workers in highway safety. The second half of this section will deal with the relevant activities of existing information facilities and the present accessibility of bibliographies, abstracts, current-awareness services, research-in-progress notices and a union bibliography.

8.1. INFORMATION AGENCIES

As pointed out earlier, a number of agencies are active in the field of highway safety, and because of increased activity and concern in recent years, new agencies are being formed. In the first part of this chapter, we will look at some of these agencies and their activities relative to highway safety information.

8.1.1. LIBRARIES. There are only a few libraries devoted exclusively to highway safety. The second edition of Directory of Special Libraries and Information Centers (DSLIC) lists only the following under Traffic Safety:

- (1) American Automobile Association Library
- (2) Automotive Safety Foundation Library
- (3) Highway Safety Research Institute Library,
The University of Michigan
- (4) Virginia (State) Governor's Highway Safety
Committee Public Film Library

However, as noted in Task B, most of the literature on highway safety may be found in many types of libraries, particularly those with a specialized collection on highway transportation.

A review of directories (1-4) and our own investigations revealed some 104 libraries/information centers concerned with highway safety or some aspect of it. These libraries range from those with only a few hundred volumes under the supervision of a part-time secretary to those containing several thousand volumes maintained by professional librarians and performing a whole range of sophisticated tasks such as indexing and abstracting. They include libraries attached to museums which contain materials primarily of historical interest, and university and research libraries where emphasis is on original and research materials; they also include industrial libraries which, in general, are not open to the public, and the public libraries. Table 17 gives the distribution of these libraries by the type of organization which maintains and services them.

*This section should be read in conjunction with Section 3 on Existing Procedures.

TABLE 17
HIGHWAY SAFETY TRANSPORTATION LIBRARIES
By Organizational Type

| Type | Number of Libraries | |
|----------------------------------|---------------------|----------|
| University/Research Institutions | | 15 |
| Government | | |
| Federal | 6 | |
| State | 26 | |
| Local/Regional | 3 | 35 |
| Public | | 9 |
| Museum | | 4 |
| Industry | | 18 |
| Trade Association | | 13 |
| Service Organization | | 3 |
| Societies & Foundations | | <u>8</u> |
| Total | | 104 |

University Libraries. In general, universities with some program in highway safety have relatively good and large collections. Although only 15 university libraries are included in these directories as having a special transportation collection, many more, particularly the large ones, are likely to have significant volumes of interest to highway safety personnel. One reason for the exclusion of many of these libraries may be that, while several universities have some program in highway safety (1), these programs are not always located in engineering or transportation departments; they may be found in education, psychology, medicine, public health, or other departments. It should also be noted here that the organization of the 15 libraries included in this list is far from uniform. Some, such as the Commerce Library of Ohio State University or the Baker Library of Harvard University, collect highway safety/transportation literature as a special area of interest; others, such as the Transportation Library of The University of Michigan, are departmental libraries with centralized processing of technical operations; while others, such as the Transportation Center Library of Northwestern University, are more or less self-contained libraries sponsored and supported by highway safety/transportation institutes, and are responsible for all of their technical operations. The libraries in the last category usually appear to be more responsive to the needs of users and have been actively engaged in numerous bibliographic activities.

The university highway safety/transportation libraries also have the advantage of immediate access to the resources of the other sections of the university library, which, in view of the interdisciplinary

nature of highway safety fields, can be very important. Also, in their faculties and students, they have an active body of users. Besides providing books, pamphlets, periodicals, and other documents for loan or reference, and limited reference service, these libraries often provide a number of other services. Most of them have some arrangement for photocopying service, usually at cost. Some have been quite active in compiling bibliographies and issuing accession lists. We will examine these and other services later in this chapter.

In general, university libraries are open to outside research workers, either directly for reference or through interlibrary loan, though sometimes such service is limited because of the pressure on staff time and other resources.

One of the largest, and perhaps the oldest, of these in the Transportation Library of The University of Michigan, which contains about 175,000 publications covering all phases of transportation. The collection is particularly rich in highway engineering and economics and motor transportation, excluding automotive engineering, with a notable collection of historical transportation materials. Principal emphasis is on United States material, although publications from other English-speaking countries are well represented. The library, begun in 1923 and developed by members of the Civil Engineering Department during its early years, is now a part of the University Library.

The Bureau of Highway Traffic Library of the Yale University began in 1926 when the Bureau was founded at Harvard University and moved to its present location in 1937 along with the Bureau. Special subject areas of this library are Highway Transportation, Traffic Engineering and Urban Planning. In the past, the library has been active in designed new classification systems for traffic engineering literature and compiling its bibliography. It first issued a selected bibliography of traffic engineering in 1948. In 1954, it published a more comprehensive (though still selective), annotated and indexed bibliography of traffic engineering literature containing 686 items (5,6). It is open to the public and issues annually a selected, annotated and indexed bibliography of highway traffic engineering and city planning.

Another important library is that of the Institute of Transportation and Traffic Engineering (ITTE) of the University of California. Founded in 1948 to support the research and teaching functions of the Institute, the library specializes in airport engineering, highway economics, traffic engineering, bituminous materials, and mass transit. It publishes bimonthly a Selected List of Recent Acquisitions and annually a List of Magazines Currently Received, both available free on request, and occasionally, issues bibliographies under the title Library References.

One other library which should be mentioned here is the Transportation Center Library of Northwestern University, which was established in 1956 to cover all nonengineering aspects of transportation and traffic police administration. Containing about 40,000 volumes (including the nonlegal holdings of the former Traffic Institute Library), it

serves faculty and students at Northwestern and other universities, the transportation industry, the government, and transportation-research agencies. Its monthly publication Current Literature in Traffic and Transportation lists current acquisitions, including periodical articles, and is available by subscription.

Industrial Libraries. There are a number of good libraries attached to the research laboratories of major automobile manufacturers and other companies in the transportation field. Their interest in automotive/highway safety is evident from the recent establishment of such specialized information centers as the System on Automotive Safety Information (SASI) at the General Motors Research Library in Warren, Michigan, and the Automotive Safety Center of the Ford Motor Company in Dearborn, Michigan. Unfortunately, most of these libraries are not open to the public; the GMR library does not even exchange its accession list with outside libraries.

The most active of these libraries appears to be the GMR Library, which has existed since 1917, has maintained an interloan service for other company divisions since 1927, and has prepared a current-awareness bulletin since 1933. Despite its own rich collection and extensive resources, it depends very heavily on outside libraries. It borrows about 1,100 items a year on interlibrary loan, about 80 percent from the Detroit Public Library's Technology and Science Department. The library itself is particularly rich in automotive engineering, physical sciences, and mechanical engineering, and maintains special collections of automotive catalogs and shop manuals. Its collection consists of about 20,000 books, 22,500 bound periodicals, and an extensive collection of translations, GMR publications, automobile catalogs, internal reports, and government research reports. The library also publishes a weekly announcement bulletin, Current Engineering Literature, which is distributed to GM personnel only. The library is open to outside users in very special circumstances only.

Many other company libraries are not so big. As a matter of fact, it is not unusual for many companies to have only a very small collection and to depend heavily on nearby university or public libraries for most of their needs.

Society or Foundation Libraries. Another group of active libraries are those attached to societies, foundations, and service organizations. As a matter of fact, the largest transportation library in this country and possibly in the world, the Bureau of Railway Economics Library, falls into this category. Although primarily concerned with railroads, its collection of about 400,000 items includes material on every phase of transportation. Special strengths of the collection are annual reports, congressional documents, bills, laws, statistics, legislative debates, etc., and long runs of periodicals, etc. The library has no photocopying facilities but is open to the public and lends material through interlibrary loan. Its weekly Recent Accessions of Interest is distributed worldwide.

Of special interest to highway safety personnel is the library of the National Safety Council, founded in 1913. This 1968 edition of DSLIC

describes its holdings as 3,500 books, 500 bound periodicals, 240,000 documents, pamphlets, and clippings, 15,000 items of trade literature, 50,000 photographs, and 170 reels of microfilm. The library also acts as a repository for research reports collected by the Safety Research Information Service (SRIS) of the National Safety Council, maintains branches in the New York and San Francisco offices of the Council, and services 70 community Safety Council libraries in the United States and Canada. Its most important service, perhaps, is its annual publication Guide to Traffic Safety Literature, kept up to date by monthly additions in Traffic Safety. A 10-year cumulation covering the period 1956-1965 appeared in 1966. The library is open to anyone interested in safety and accident prevention and provides, but does not seem to encourage, inter-library loans and photocopying services.

The library of the Highway Research Board is rather small, with a collection of about 5,000 documents, mainly HRB publications. It does not publish an accession list but has been quite active in compiling bibliographies. By January 1967, it had compiled over 500 bibliographies on various aspects of highway engineering, including highway safety. Some of them are published as a part of the HRB series of bibliographies; others are available only in manuscript form on request from the library.

Other collections that should be noted here are those of the Automotive Safety Foundation, American Automobile Association, Greater New York Safety Council, International Association of Chiefs of Police, Institute of Traffic Engineers, National Highway Users' Conference, and the Society of Automotive Engineers. Most of these libraries are open to the public, at least for reference, and will release their materials through interlibrary loan. They are also the ideal source for locating publications issued by societies sponsoring them.

Government Library Facilities. By far the most important of these collections is that of the Bureau of Public Roads Library. It specializes in highway engineering, bridges and tunnels, soil mechanics, hydraulics, and traffic engineering and safety. Its holdings as reported in the 1968 edition of the DSLIC include 170,547 books, 11,071 bound periodical volumes, and 92,094 pamphlets. The entire collection is in hard-copy format; no microforms are kept. The library subscribes to about 700 journals and other serials. It has indexed periodical articles since 1919 and, as of August 1967, it had over 750,000 entries in this index. The entries are recorded on 4 x 6 cards and filed chronologically by subject matter. New entries are also announced in the library's two-part accession list:

- (1) Highways: Current Literature
- (2) Urban Transportation Research and Planning

No cumulation of the index or the accession list has been issued, nor is any planned.

The library has also issued some bibliographies on highway safety. In 1928, it issued a bibliography of street and highway safety (7) under the auspices of the Committee on Causes and Prevention of Highway

Accidents of the Highway Research Board. This is perhaps the first significant bibliography on highway safety and contains annotated references to over 2,300 periodical articles published during 1923-1927. In 1938, the library issued another bibliography on highway safety which listed 1,376 annotated references to books, periodical articles, and society publications issued between 1928 and 1938 (8). The library is open to the public for reference only; it lends material through interlibrary loan but has no facilities for photocopying service.

There are a number of other important federal-government libraries and other library services such as the National Medical Library and the MEDLAR, the libraries of the National Bureau of Standards and its Office of Vehicle Systems Research, the FAA Library, and, of course, the Library of Congress, which have significant volumes of literature of interest to highway safety workers.

Another large group of government libraries are the libraries of state highway departments and related state and local agencies. The 1968 edition of DSLIC reported 26 such libraries. It is likely that other states have small office collections, perhaps under the supervision of an office secretary. Although a few states such as California, Colorado, and New York have fairly large libraries (in some cases more than one), most of the 26 reported in the DSLIC are rather small, with a collection size between 3,000 and 5,000. A number of them, for example, those of Michigan and Minnesota, were established rather recently by merging various office collections. In most cases, besides the publications of their own states, their collections consist of publications of the Bureau of Public Roads and the Highway Research Board. Often their interest in highway safety is limited to publications of the National Safety Council. Their information needs in this area seem to be satisfied by the NSC's Guide to Traffic Safety Literature. Outside the resources of their own collections, these libraries appear to depend heavily on the state university library, a large public library, if located in the same city, and the state library, often in this order. It is not uncommon for most of the specialized divisions of state highway departments, including the highway safety department, to retain their own office collections.

Public Libraries. Only a few public libraries hold any substantial collection of literature on highway safety. The most notable such collection is the Technology and Science Department of the Detroit Public Library. Reference has already been made to the extensive use of this collection by the auto industry. Only a few other public libraries have special science and technology collections. A survey (9) reported only 18 with science collections exceeding 50,000 and only 6 having collections of 200,000 or more volumes. The largest of these, the Science and Technology Division of the New York Public Library, reported 450,000 reference volumes in 1960, excluding patents, which are in a separate division, and certain subjects in the biological sciences which are outside the scope of the Department's collections (10). Pittsburgh has approximately 460,000 bound volumes, including 60,000 circulating books and patents (11).

In some large public libraries such as those of New York and Pittsburgh, collections are of an archival nature and the material is most useful for historical research. A few large public libraries also have fairly extensive collections of patents and report literature. It should be noted that 15 of the 22 U.S. patent depository collections are in public libraries and that 19 public libraries are depositories for Atomic Energy Commission (AEC) reports and many have collections of NASA reports.

Most public libraries provide traditional reference and bibliographic services, often handled by phone. Some of the larger libraries even have separate telephone-information desks to relieve the reference load upon the rest of the library. Reference service beyond answers to specific factual questions was reported by many of the libraries. A few prepare brief lists of references on demand; some will perform literature searching--usually for a fee. Some libraries which do not provide such services, or do so only on a limited scale, nevertheless help users to obtain them locally. The Los Angeles Public Library, for example, maintains a file of retired staff members available for literature search. A few other libraries permit staff members to do such work on their own time.

The public libraries have also another important role in any information program: to provide highway safety information to the general public. Such information, if it is to reach the public effectively, should be readily available at or through the local public library.

8.1.2. INFORMATION CENTERS. A recent development in highway safety has been the emergence of specialized information centers. A number of factors are responsible for this: (1) As a result of increased activity and concern, a wide variety of people have become involved in highway safety missions. (2) Information pertinent to highway safety comes from numerous subject fields. (3) This has resulted in an urgent need for discussion across disciplines and professions and for information packaged in new ways requiring subject specialists for analysis and synthesis. (4) Finally, more individualized bibliographic services are required by workers than they can obtain under traditional libraries by themselves cannot adequately meet all these demands.

Some of these centers which have emerged during the past couple of years are the Highway Research Information Service (HRIS) of the Highway Research Board, the Safety Research Information Service (SRIS) of the National Safety Council, the Highway Safety Research Information Center (HSRIC) of the University of Michigan, the National Traffic Safety Institute Documentation Center, the System on Automotive Safety Information (SASI) of the General Motors Research Laboratories. There are also a number of information centers in related fields, such as MEDLAR of the National Library of Medicine, and the Center of Alcohol Studies of Rutgers State University.

Highway Research Information Service (HRIS). HRIS, a part of the technical activities of the Highway Research Board, is supported by funds from the Bureau of Public Roads and state highway departments. It is based on a computerized information storage and retrieval system. Two types of information are selected for storage: research-in-progress reports, and publications abstracts. Research-in-progress reports are acquired directly on HRB Research Project Report forms from U.S. research agencies and sponsor agencies. The Bureau of Public Roads transmits data to HRIS on all its research-and-development projects. Through exchange agreements, research-in-progress reports are also obtained from the Science Information Exchange (SIE), the National Safety Council (NSC), the International Road Federation (IRF), and the Canadian Good Roads Association (CGRA). Publications abstracts are prepared for all HRB publications, including NCHRP reports. The BPR transmits abstracts for all interim or final reports on research-and-development studies. Through exchange agreements, publications abstracts are also received from IRRD (through the British Road Research Laboratory), the NSC, the NSRIC, and the ASCE. As of August 1967, the collection of publications abstracts included about 7,000 selections, mainly from 1965-1967 publications. Plans call for closing significant gaps in publications storage for these and preceding years.

Two things should be noted about the HRIS collection. First, full texts of publications represented by HRIS abstracts are not generally stored in the HRIS system. These publications may be obtained, if still available, from the issuing agencies or, when a PB accession number is noted at the end of the abstract, from the Federal Clearinghouse for Scientific and Technical Information at Springfield, Virginia. Second, only 9 percent of all the abstracts stored in the HRIS system are on highway safety; the rest of the collection deals with other aspects of highway design and engineering. It is estimated by HRIS that 2,500 document abstracts currently on file have some direct relation to highway safety.

For retrieval purposes, HRIS storage includes an index-term file consisting of authorized terms from the HRIS Thesaurus List, other subject-matter terms called "identifiers", sources, and authors or project investigators. Under each index term are listed the accession numbers for all document records to which the index terms have been applied. Printout books of the index-term file are prepared three or four times per year and used for manual retrieval of document records. Document records are also grouped into 34 broad subject areas.

Retrieval of document records may be accomplished by computer or manually. The computer output for any file-search request will include the request specification and may include an accession match list, document-record printouts, and indexes. Manual retrieval is usually employed when only one or two index terms are sufficient to locate a relatively small number of relevant document records. It may also be used for urgent requests that cannot wait for the scheduled computer run.

The major services of HRIS are its two publications, Highway Research in Progress and HRIS Abstracts. Two issues of Highway Research in Progress were produced in September 1965, and April 1967. Beginning

in 1968, it is to be issued annually in January. The first and experimental issue of HRIS Abstracts appeared in October 1967, containing about 700 publications abstracts which were entered into the system during July or August 1967. Some 65 of these abstracts are on highway safety, the rest on other aspects of highway design and engineering. Another issue covering September and October input to the system was issued in December 1967. Both of these publications are provided with author, subject and source indexes; both will be further examined later in this section.

HRIS also provides a current-awareness service to those users who wish to receive document-record printouts of newly stored material on a regular schedule and according to a fixed request. This service is provided monthly on the basis of current-awareness requests or user-interest profile. This user-interest profile may be one of the 8 categories into which 34 HRIS subject areas are grouped, or it may be more closely tailored to individual requirements.

Other special services offered by HRIS include magnetic tapes containing specified document records with or without the corresponding printouts.

Safety Research Information Service (SRIS). The Safety Research Information Service of the National Safety Council was established to advance the cause of safety research through the collection, dissemination and exchange of information. It provides abstracts and bibliographic assistance to researchers interested in the safety field and to others with similar interests within the safety field.

SRIS is concerned with all phases of safety research and extends its searching, collecting, and abstracting functions to many areas. According to a descriptive brochure, SRIS specializes in law, economics, humanities, sociology, political science, man-machine relations, human-factors engineering, and psychology (individual and group behavior). According to the same brochure, other scientific areas of interest to SRIS are biology, hygiene, physiology, toxicology, pharmacology, bio-engineering, clinical medicine, environmental biology, occupational medicine, statistics, mathematics, operations research, civil engineering, industrial engineering, mechanical engineering, marketing, and mass communications.

Apparently, this is more an ideal than a reality. The SRIS has over 5,000 abstracts of completed and current research related to highway safety. These abstracts and notices of current research are published in the National Safety Council's quarterly research journal, Traffic Safety Research Review. A typical issue contains about 15 abstracts and 30 to 40 notices of current research projects. Listings under "Current Research" are not always very current, as shown in Table 18 below.

TABLE 18. CURRENT RESEARCH PROJECTS

Starting Dates announced in Traffic Safety Research Review, December 1967.

| Starting Date | Projects Reported |
|--------------------------|-------------------|
| 1960 or before | 1 |
| 1963 | 2 |
| 1964 | 4 |
| 1965 | 3 |
| 1966 | 9 |
| 1967 | 14 |
| Completed (?) or no date | <u>1</u> |
| Total: | 34 |

SRIS invites inquiries of "broadest latitude" concerning safety research. Replies are sent in the form of abstracts, bibliographies, and references to other possible sources of information. In return, the researcher is asked to report news of his study to the Information Service so that others may benefit from his knowledge.

The complete texts of reports, etc., are housed in the National Safety Council's Library. Abstracts are filed under authorized terms or identifiers assigned to the documents by indexers using a special thesaurus developed by SRIS (see Task B). Retrieval is manual, but a computerized system is promised later.

The SRIS also has exchange agreements with HRIS and HSRIC.

Highway Safety Research Information Center (HSRIC). HSRIC is an integral part of the Highway Safety Research Institute of The University of Michigan. Since its inception, the Institute has laid heavy emphasis on "an information program operating from a library and editorial office with modern equipment including computers."

The initial effort of the Center has been towards serving the internal needs of HSRI and its staff. Thus, it had the advantage of the presence of an active body of immediate users. The Center in essence is being built by the Institute staff using its services, which also serves as a source of expertise. Unlike HRIS and SRIS which provide only a few set services to their users, the HSRIC attempts to satisfy all of its users' information needs, including those for a full library service. To this end, the Center has actively sought mutually beneficial exchange and coordination agreements with other centers. This policy is aimed at developing a system or network of highway safety information centers.

The Center's library has about 7,000 documents and is adding at an average rate of about 6,000 documents per year. It subscribes to about 180 journals and is acquiring microfilms of back volumes of

pertinent journals. The Center's library is also a part of The University of Michigan Library System and thus has immediate access to one of the largest transportation collections and other resources of The University of Michigan libraries. The Center is also building up a large file of information on people, organizations, and subjects of active interest in highway safety. The principal inputs to the files are newspaper clippings, journal notes, trip reports, telephone conversations, and conference discussions.

The Center has also established HIT-LAB, a convenient store of accident, violation, and injury data from Ann Arbor and surrounding Washtenaw County. This computer-based data bank serves many researchers both with statistical data and with specific information for accident follow-ups.

The Highway Safety Research Institute is staffed with approximately 200 research scientists, engineers, clerks, and part-time students. The researchers and engineers are responsible for theoretical and evaluation studies, determining pertinent information sources through surveys of current research documents, technical writing and presentations, state-of-the-art reports and special studies, and the technical design, implementation, and supervising of the Center's activities.

To process all this information, the Center has developed its own set of cataloging rules (which follows very closely the COSATI Standard) and its own system of faceted indexing (Appendix E). The Center has developed a pilot on-line computer system of index retrieval (Appendix C).

HSRIC has the ability to call up data, information, or knowledge required by users. Following are some of the services that HSRIC may provide:

- (1) Special subject bibliographies on request
- (2) Special data and literature surveys
- (3) Publication of annotated bibliographies
- (4) Publication of reviews and surveys of selected problems
- (5) Publication of state-of-the-art reports
- (6) Technical consultation and referral service
- (7) Limited advisory service
- (8) Document reproduction on demand
- (9) Translation on request

The Center also issues periodically its acquisition list and a monthly bulletin listing forthcoming meetings of interest to highway safety personnel, has been active in conducting literature searches on many aspects of highway safety, and has issued some bibliographies and surveys of literature, including one on restraint systems.

System on Automotive Safety Information (SASI). The System on Automotive Safety Information, established by the General Motors Research Library to provide a company-wide information analysis center for automotive-safety information, has been active in building up a specialized collection on the subject and has conducted literature

searches on (1) Energy Absorbing Systems, 30 January 1967, listing 117 items, and (2) Steering Column, Steering Shaft and Impact Studies, 23 March 1967, listing 390 items. It has also issued a review of selected literature on friction brakes.

The SASI collection of 20,000 items is expected to grow to 200,000. This large projection is due in part to the inclusion of newspaper clippings, individual speeches from hearings, and other short items. Unfortunately, the services of SASI, in general, are not available to highway safety personnel outside the General Motors Company.

8.1.3. INTERNATIONAL ROAD RESEARCH DOCUMENTATION. No account of the bibliographic organization of highway safety information would be complete without a reference to the International Road Federation (IRF), the Organization for European Economic Cooperation and Development (OECD), and the International Road Research Documentation (IRRD). This is particularly important because of the great and growing amount of research being done in other countries. For the first time in history, highway expenditures are greater outside than within the United States. The Fourth World Meeting of IRF in 1962, attended by hundreds of specialists from many countries, showed clearly in the 222 papers presented and the discussions that followed the magnitude and importance of highway safety-related research that was going on everywhere, emphasizing the need for international exchange of such research and information.

In 1964, the Federation under a contract with the Bureau of Public Roads, made a pilot survey of highway research and development projects in Sweden, Denmark, West Germany, and Italy, and reported some 278 projects. This was followed in 1965 with a more comprehensive survey of 17 countries reporting some 2270 research projects.

Meanwhile, the Organization for European Economic Cooperation and Development (OECD) in Paris had been developing its own plans for international coordination and exchange of road-research documentation. It had already organized an international conference on road safety research at the Road Research Laboratory in Great Britain. The conference pinpointed the importance of road safety and directly hastened the establishment of new national centers for road safety research. In several countries, national coordinating agencies were established to help integrate and guide the work going on and to prepare the way for possible future international cooperation. In accordance with a recommendation by the conference, the OECD also undertook the compilation of an International Directory on Road Safety Research of which the first edition appeared in 1965, and a revised and enlarged second edition in 1967.

These activities of IRF and OECD heightened interest in highway safety in many countries and led in January 1965 to the establishment of International Road Research Documentation (IRRD) by Canada, Denmark, France, the Federal Republic of Germany, Norway, Portugal, Spain, Sweden, and the United Kingdom. (Australia joined later.) The objective of the program, to make information from member countries

available to all to assist research, covers all aspects of road research, including highway safety.

The IRRD has already started work on road-research documentation. Each participating center prepares bibliographical information sheets of the literature it analyzes, based on a standard model. A coordinating center collects and circulates information sheets for each of three languages--for English, the Road Research Laboratory in England; for French, the Laboratoire Central des Ponts et Chaussées in Paris; and for German, the Forschungsgesellschaft für das Strassenwesen, Cologne. A fourth center for Spanish is planned later. Each IRRD member receives from each centralizing laboratory a batch of information sheets produced by each of the three linguistic groups. The Road Research Laboratory in England also publishes these abstracts in its monthly Road Abstracts, which it has published since 1934. Although RRL does not furnish copies of documents abstracted in Road Abstracts, anyone within Great Britain may borrow them through interlibrary loan. It also has an exchange agreement with the Highway Research Information Service.

8.1.4. SOCIETIES AND FOUNDATIONS. Societies play an important role in the dissemination and transfer of information. One of the recommendations of the Arthur D. Little study on traffic safety was the immediate establishment of a professional society for the discussion of research needs, the solution of research problems, and criticism of research findings in the traditional manner.

Although perhaps there is no single society exclusively and comprehensively devoted to highway safety, a number of societies have taken a very active interest in some aspect of highway safety as one of their major concerns. A selected list of these societies and foundations with some indication of activities relative to highway safety is given in Appendix B.

We have already discussed the libraries, information services, and other related activities of some of these societies such as the National Safety Council, the Highway Research Board, and the International Road Federation. Most of the other societies and foundations maintain libraries, organize conferences, symposia, and seminars, and publish journals and newsletters. One of the most useful newsletters, Status Report, is published by the Insurance Institute for Highway Safety.

The National Committee on Uniform Traffic Laws and Ordinances publishes and distributes Uniform Vehicle Code and Model Traffic Ordinance. One of the major functions of the National Highway Users' Conference is to act as a clearinghouse and disseminate information relative to development, safety, taxation, finance, administration, and use of highways. The National Safety Council, besides its activities already discussed, also collects and publishes data on highway accidents (Accident Facts).

8.1.5. UNIVERSITIES AND RESEARCH INSTITUTIONS. We have already discussed the extensive facilities maintained by universities. Besides these, they have a great variety of educational and research programs

on various aspects of highway safety. A study conducted in 1962 by the Traffic Safety Research and Education Committee of the Association of State Universities and Land Grant Colleges in collaboration with the National Commission on Safety Education reported some 1,000 course offerings in highway traffic safety at 233 colleges (12). During the last decade or so, a number of universities have established special programs or institutions to coordinate existing programs in various departments within the same universities and initiate additional interdisciplinary programs. The above study discusses 14 such programs, including those at the universities of California, Cornell, Illinois, Northwestern and Michigan State. Since 1962, more new programs, such as the Highway Safety Research Institute of The University of Michigan and the new program at the University of North Carolina, have been set up.

Most of these programs also carry on some kind of information-dissemination activities about highway safety in general and about their research findings in particular. The Highway Safety Research Institute of The University of Michigan and the new program at the University of North Carolina, have been set up.

Most of these programs also carry on some kind of information-dissemination activities about highway safety in general and about their research findings in particular. The Highway Safety Research Institute of The University of Michigan, established in 1965, has laid a heavy emphasis on "an information program operating from a library and editorial office with modern equipment including computers." The program and activities of its Highway Safety Research Information Center (HSRIC) have already been examined in detail. The Cornell Aeronautical Laboratory regularly publishes the results of its research in a series of monographs and reports which are available, generally free, to those interested. It also publishes a newsletter describing its new research projects and listing new publications. The ITTE at the University of California, besides maintaining a large library, producing bibliographies, and publishing a quarterly journal, Transportation Science, has also produced a number of films on the subject.

8.2. INFORMATION SERVICES

We will now examine the present availability to highway safety personnel of the information services and materials identified in Task A. An obvious prerequisite for providing these services is an adequate bibliography of highway safety and related literature, both current and retrospective.

8.2.1. BIBLIOGRAPHIES. As previously noted, a number of agencies--libraries and societies--have from time to time compiled bibliographies on highway safety or some aspect of it. As early as 1927, the Committee on Causes and Prevention of Highway Accidents of the Highway Research Board felt the need of an index of literature pertinent to its subject. Its efforts resulted in one of the first significant bibliographies on highway safety (7). Prepared by the staff of the Bureau of Public Roads Library, the bibliography contains annotated

references to 2,389 periodical articles on highway safety and related subjects, most of which were published from 1923 through 1927. A list of 177 American and foreign periodicals, from which the references are drawn, is given. This is followed by Mildren A. Wilson's (8) selective bibliography, which includes 1,376 annotated references to books, periodical articles and publications of societies issued from 1928 through May 1937. To appreciate the scope of these bibliographies, a partial list of their contents is given below:

- (1) Accidents and Accident Prevention
- (2) Analysis of Highway Accidents
- (3) Accident Prevention
- (4) Accident Records and Reporting
- (5) Safety Factors in Highway Design
- (6) Traffic Control and Regulation
- (7) Commercial Vehicles
- (8) Motor Vehicle Insurance

During this period, a number of selective and sometimes more specialized bibliographies also appeared. In 1928, the United Railways and Electric Company of Baltimore published a mimeographed Bibliography of Publications Relating to Vehicular Traffic and Traffic Control (13). The American Electric Railway Association published a Bibliography on Street and Highway Traffic in 1930, a revised edition of which appeared in 1931, and a supplement in 1932 (14). In 1937, a Bibliography on Driving Safety, prepared under the direction of Dr. Harry R. De Silva as a part of a research project on driving skill, was issued by the Albert Russel Erskine Bureau for Street Traffic Research of Harvard University (15). A revised version listing 295 items appears as an appendix to Why We Have Automobile Accidents, by Harry De Silva (16).

One other work to appear in this period that should be mentioned here is Safety and Safety Education: An Annotated Bibliography, which appeared in 1939. Prepared by the Research Division of the National Education Association, it consisted of two main parts: (a) books, pamphlets, and bulletins, and (b) periodical articles, published during 1936-1938. Although the 1,400 annotated entries covered nearly all phases of safety, several hundred of these were related to highway and traffic safety. It should be noted that much of the material cited in these bibliographies is not of chiefly historical interest.

After the Second World War, there was a sharp increase in highway accidents and death, resulting in renewed interest in highway safety. In 1947 the Highway Research Board, which previously had sponsored bibliographies compiled by the Bureau of Public Roads Library, began the publication of a series of bibliographies on various phases of highway design, engineering, and materials. These bibliographies, issued on an irregular basis, usually 2 or 3 per year, vary in style. Some are just listings of citations, some give brief annotations, some give key words, and others give abstracts.

The second publication to appear in this series was a Selected Bibliography on Highway Safety (7). Prepared at the request of the

National Committee for Traffic Safety, its object was to provide an annotated list of about 250 selected references which might be used to set up a basic library on highway safety. As such, it included only those items which were still in print and available at the time of compilation. The term "highway safety" was defined liberally to include matters of design, construction, and traffic facilities. Classification of material followed the subjects of the President's Highway Safety Conference Committee reports and included headings such as:

- Laws and Ordinance
- Accident Records
- Education
- Enforcement
- Engineering
- Motor Vehicle Administration
- Public Information
- Organized Public Support
- Periodicals and Bibliographies

In 1948, the Bureau of Highway Traffic at Yale University published its Library Classification Scheme and Selected Bibliography of Traffic Engineering Literature. Part II of this publication consists of a selected and annotated bibliography of about 250 publications (5), a number of which were on highway safety. This work was brought up to date in 1954 by Cassidy and Kagan (6). Their bibliography contains 686 selected, annotated entries arranged alphabetically with subject indexes. It includes books and reports and indexes the series of publications, "all articles on administration, highway finance, and traffic operations from the Proceedings of the Annual Meetings of the Highway Research Board for the past five years; all articles from the Proceedings of the Institute of Traffic Engineers for the last five years, and most of the Bulletins of the Highway Research Board for recent years, except those dealing exclusively with highway construction". This is kept up to date by annual selected bibliography of highway traffic-engineering and city-planning literature issued by the Bureau's Library, with an emphasis on traffic engineering.

During the last few years, a number of bibliographies on highway safety have appeared. Chronologically, the first of these is Haight's Annotated Bibliography of Scientific Research in Road Traffic and Safety, a preliminary edition of which appeared in 1963 (18) and a revised edition in 1967 (19). It lists only about 750 items, including a number of those published in other countries and other languages. The emphasis is on research and theoretical studies. Annotations are in the form of a 3-column code to indicate (1) the approximate "mathematical texture" of the work, (2) author's method, and (3) general subject of the publication.

The next comprehensive bibliography came from the National Safety Council which, beginning in 1955, had started the publication of an annual Guide to Traffic Safety Literature. In 1966, it issued a ten-year cumulative edition covering the period 1955-1965 (20). This volume contains about 15,000 alphabetical entries under broad subject

headings, including articles from over 350 periodicals, pamphlets, and books received by the library of the National Safety Council which "contribute either to the technical aspects or to the development of programming in traffic safety." Research reports are listed separately at the end. There are an author index, a directory of publishers and organizations, and addresses of periodicals indexed. The bibliography is kept up to date by the "Safety Library" pages in Traffic Safety, published monthly by the council, and their cumulation in the Annual Guide to Traffic Safety Literature. As noted earlier, emphasis is on popular and semipopular literature. Coverage in areas such as vehicular and biomedical factors is also far from adequate. Nevertheless, the work constitutes an important source of bibliographic information on highway safety, is widely used, and comes very close to being a kind of Readers' Guide to traffic safety literature. Also, as the Guide is based on the records of the documents received in the Council's library, documents listed should be available there.

The third comprehensive study to appear was State of the Art of Traffic Safety, published by Arthur D. Little Company (21). The purpose of this study was to assess current understanding of traffic safety with regard both to the manner and degree in which various factors contribute to traffic accidents and their resulting loss, and to methods for reducing this loss. The study entailed a review of domestic and foreign literature on the subject and discussions with persons active in traffic safety research. However, no attempt was made to cover all information on the broad subject of traffic safety, quantity not being the objective. The bibliographical part of the work lists over 1,800 documents ranging from individual papers to monographs, with emphasis on original reports of findings from quality research performed within the past 10 years. Thus, despite the great merits of the work as a state-of-the-art review, its value as a basic comprehensive bibliography on highway safety is somewhat limited. HSRIC is currently updating portions of the A.D. Little study as part of an HSRI program definition study with the Insurance Institute for Highway Safety (IIHS).

Another recent publication that should be noted is the Bibliography on Motor Vehicle and Traffic Safety issued by the Office of Vehicle Systems Research of the National Bureau of Standards (22). It lists about 800 documents received in the Office's library under the following headings:

- Tire Systems
- Occupant Restraint Systems
- Braking Systems
- Human Factors, Behavior and Engineering
- Vehicles, Systems and Components
- Traffic and Transportation--General

Later revisions of this work are promised. Some specialized bibliographies dealing with a particular problem or aspect of highway safety have also been issued. In 1962, the Highway Research Board issued a review study by Goldstein on human variables in traffic accidents listing 54 items and giving a digest of their findings (23). Very recently, the Board has published a bibliography on visibility and night driving (24).

Several shorter bibliographies have been published in the last six years.

J. L. Whitelaw compiled A Selected Bibliography of Highway Traffic Safety with Annotations in 1961 at the Highway Traffic Safety Center, Michigan State University, East Lansing, Michigan. The bibliography of 476 reports with a subject and author index was sponsored by the U.S. Public Health Service.

A review by Bragaw of the Literature on the injury potential of automotive safety glass was issued by the Research and Development Division of E. I. Dupont de Nemours Company in 1962 (25).

A summary of research on Traffic Control and Roadway Elements; Their Relationship to Highway Safety was prepared in 1963 by the Automotive Safety Foundation in cooperation with the U.S. Bureau of Public Roads and contains over 700 related citations. Efforts are under way at HSRIC to bring sections of the report up to date in cooperation with ASF.

G. M. Mackay published over 600 citations in A Selected Bibliography on Road Accident Research in June 1965, "as part of a research project into traffic accidents in the City of Birmingham, England." The project was conducted in the Department of Transportation and Environmental Planning at the University of Birmingham and was Departmental Publication Number 9.

The New York State Safety Car Project Bibliography published by the State of New York, Department of Motor Vehicles, Research Library in May 1966, contains 550 items with a special emphasis on aviation safety literature. SASI has issued bibliographies on (1) energy-absorbing systems (1962) (26) and (2) steering-column, steering shaft, and impact studies (1967) (27), as well as a review of selected literature on friction brakes (28).

There are also a number of bibliographies, particularly in the areas of human factors and impact, which, though not compiled for highway safety personnel, are of great interest to them. The Human Engineering Information and Analysis Service of the Institute for Psychological Research of Tufts University has published a comprehensive bibliography on human engineering (29). Clark issued a chronological bibliography on the biological effects of impact in 1961; revised and expanded edition appeared in 1962 (30). A far more comprehensive bibliography edited by R. G. Snyder, John Ice, and others, containing abstracts of biomedical research studies in acceleration, impact weightlessness, vibration, and energy-escape and restraint systems, appeared in 1963, with a supplement in 1966 (31).

A number of contracts awarded by the Federal Highway Administration and the National Highway Safety Bureau during 1967-1968 also call for literature searches and state-of-the-art reports. The results, when published, should also make useful contributions to the bibliography of highway safety. Plans have also been initiated to publish a bibliography of 2,500 highway safety-related HRIS publications abstracts as a joint effort of HRB and HSRI.

8.2.2. ABSTRACTS. There is no single abstracting publication devoted exclusively to highway safety. However, there are a number of journals which publish some abstracts of interest to highway safety personnel. The oldest of these is Highway Research Abstracts, published monthly by the Highway Research Board since 1931. It began as an irregular publication, and volume numbering began with Volume 17, No. 7, July 1947. A highly selective publication, it publishes about 70-80 abstracts per issue, only a fraction of which are on highway safety. Since 1937, the December issue has been a synopsis, containing abstracts of the papers and reports scheduled for publication at the annual meeting of the Highway Research Board. A cumulative index covering 1931-1961 appeared in 1963.

The second abstracting journal is Road Abstracts, published monthly by the Road Research Laboratory in England. It publishes about 1,200-1,500 brief, nonevaluative summaries per year, only a small fraction of which are on highway safety. Full texts of documents abstracted are available on loan to interested users within the country. It should be noted here that the Road Research Laboratory acts as the English Language Documentation Center for the International Road Research Documentation (IRRD).

The Research Review of the National Safety Council, a quarterly supplement to Traffic Safety, also publishes a small number of abstracts--about 15 per issue. The December 1967 issue, for example, contained only 13 abstracts--9 reports and 4 journal articles. The March 1968 issue contains 19 abstracts of which 9 are stated to be journal abstracts, 3 are reproduced from Psychological Abstracts, 1 is an author abstract, and 6 are from the Proceedings of the 11th Stapp Car Crash Conference. Except for the last mentioned, no bibliographical citations are given, making it almost impossible to locate the original papers.

A recent abstracting publication of interest is HRIS Abstracts, an experimental issue of which appeared in late 1967. The publication, to be issued bimonthly by the Highway Research Information Service of the Highway Research Board, is intended to complement and augment the Board's Highway Research Abstracts, which is directed toward broader reader interest. Future issues may also contain material published in HRA. The experimental issue includes abstracts of research reports, papers published in technical journals, and articles selected from the open literature and contributed by BPR, CGRA, ASCE, NCHRP, NSC, universities, and state highway departments. In general the abstracts are informative, with author, subject, and source indexes. Of about 780 abstracts included in this issue, only 65 are on highway safety. Even by conservative estimates, this leaves much of the highway safety literature uncovered. Bibliographical citations in many cases leave much to be desired, as they do not give the date of publication or the pagination. In some cases, it is difficult to ascertain whether the paper reported is a self-contained monograph or is taken from a journal, and if the latter, which journal.

Another recent publication that should be noted here is Traffic Systems Reviews and Abstracts, prepared by the Research Triangle Institute of North Carolina for the Bureau of Public Roads. The main

objective of this in-depth technical-review service is to furnish to Bureau of Public Roads staff, and to others concerned with major highway research-and-development programs, critical reviews and abstracts of current literature on the following topics:

Traffic Flow Theory
Communication and Control Systems
Cost Effectiveness Methodology

The first issue, dated September 1967, contains 30 reports and papers. For each item, it gives an abstract, usually the author abstract, followed by a brief evaluative review. For highway safety personnel the publications reported do not appear to be directly concerned with highway safety. There is no indication whether the publication will be continued on a periodical basis.

Other journals which publish some abstracts of interest to highway safety personnel are Psychological Abstracts, Journal of the American Medical Association, and Excerpta Medica (Section IXB: Orthopaedics and Traumatology). There are also journals like Transportation Science which publish abstracts of significant papers from other journals. However, these efforts are too small and uncoordinated.

8.2.3. CURRENT-AWARENESS SERVICES. Here the situation appears to be more promising, as a number of libraries and information centers publish lists of their recent acquisitions. Major current literature announcing services and their features are indicated in Table 19. A reference has already been made to the "Safety Library" section of Traffic Safety, which announces new publications received in the library of the National Safety Council. Each issue lists about 100-125 items of which 75 to 80 percent are journal articles. Although some federal and state government publications are listed, there appears to be a heavy emphasis on the publications of other societies and foundations.

Highways: Current Literature is published fortnightly by the Bureau of Public Roads Library and announces about 125-140 publications per issue. Although there appears to be heavy emphasis on federal and state government publications, about 70 to 75 percent of the items listed are journal articles, with coverage oriented toward highway design and engineering. Current Literature in Traffic and Transportation, published monthly by the Transportation Center Library of Northwestern University, contains about 250 entries per issue. Again, almost 75 percent of the entries are journal articles; the rest include monographs and publications of the universities and other research institutions. The list is rather weak in coverage of state publications. Finally, there is Highway Safety Literature: Announcement of Recent Acquisitions, published semimonthly by the National Traffic Safety Institute Documentation Center of the National Highway Safety Bureau. The first issue of Highway Safety Literature appeared 8 December 1967 and contained about 100 entries, most of which are research reports, conference proceedings, and speeches. Subject areas covered include all phases of highway and traffic safety, particularly those encompassed by the National Highway Safety Act of 1966 and the National Traffic and

TABLE 19
 MAJOR CURRENT LITERATURE ANNOUNCING SERVICES
 IN THE HIGHWAY SAFETY FIELD

| Title | Publisher | Frequency | Average Number & Type of Activities | Subject Coverage |
|--|---|--------------|--|--|
| Traffic Safety Library | National Safety Council | Monthly | 100-125 Journal Articles 75-80% Rest State & Federal Government Society publications | Highway Safety |
| Current Literature in Traffic & Transportation | Northwestern University Transportation Center | Monthly | 250 Journal Articles 70% Rest Books Monographs | Transportation including Highway Safety |
| Highways: Current Literature | Bureau of Public Roads Library | Fort-nightly | 125-140 Journal Articles 70-75% Rest Federal & State Governments Publications, etc. | Highway Engineering & Design Some Highway Safety |
| Highway Safety Literature | NTSI Documentation Center | Fort-nightly | 90-100 Reports Conference Proceedings, etc. | Highway Safety |

Motor Vehicle Safety Act of 1966. Brief annotations are given. Copies of publications listed are available to personnel of the U.S. Department of Transportation; others must direct their request to the source indicated in the announcement. Entries are arranged under the broad subject headings of Motor Vehicle Safety, Highway Safety, and Related Program Areas. Not all items announced are recent publications, at least one dated back to 1943 (32).

8.2.4. RESEARCH IN PROGRESS. Complete and prompt registry of research-in-progress reports is an essential part of an adequate bibliography of a subject. Researchers, administrators, and writers want to know what is going on in their field of interest, though for different reasons. Given the normal publication delays of professional journals, research workers must attend many conferences and depend on their personal contacts with their professional colleagues. Some journals, particularly of the newsletter type, often announce new projects. The National Safety Council's Traffic Safety Research Review carries a regular feature, "Current Research," containing brief notices of current research projects. A typical issue contains about 30-40 announcements, not always very current. Thus, the 34 projects announced in the December issue included projects started as far back as 1960.

The most ambitious project for bibliographic control of research-in-progress reports is the Highway Research Information Service (HRIS), set up by the Highway Research Board in 1964. In the first volume of Highway Research in Progress, issued in 1965, it announced over 3,000 projects, including some in other countries. A second, much expanded volume appeared in April 1967, and the publication is intended to continue on an annual basis. It should be noted that highway safety is only a part of total coverage; only 9 percent of projects reported in the second volume are directly related to highway safety. Also, it does not cover the field exhaustively; for example, only about a third of the projects listed under the heading "Accident Prevention" in Research Grant Index, 1966 (U.S. Public Health Service) appear in Highway Research in Progress. Nevertheless, the project is an important step forward in adequate listing and disseminating of research in progress, and it has arrangements with the Bureau of Public Roads, Science Information Exchange, National Safety Council, International Road Federation, Canadian Good Roads Association, Highway Safety Research Information Center, and a number of organizations to receive reports of new projects.

It is clear that efforts to compile a bibliography of highway safety have been going on for at least four decades. As a result of the increased level of activity and concern, a number of new agencies and new projects, services and publications have been started. The situation, though encouraging, is far from satisfactory. There is lack of coordination of the activities of various agencies, of common cataloging and indexing procedures or any kind of translating mechanism for the different indexing systems, and, finally, of an adequate bibliographic organization and a union catalog of highway safety.

This lack of coordination was reflected in an informal meeting* of those people primarily concerned with operating information activities

*The meeting, sponsored by the Highway Safety Research Institute of The University of Michigan, was held in Ann Arbor on 12 February 1968.

related to highway safety. Six centers were represented: HRIS (HRB), HSRIC (HSRI), HTSC (MSU), NBS, SASI (GMR), and SRIS (NSC). A seventh, the NHSB interim documentation center, was unable to attend. While the main objective of the meeting was to get acquainted and hence increase intercommunication, the lack of coordination was revealed in the fact that each of the seven centers used a different subject authority list.

This situation is also complicated by the very nature of the field, the most remarkable feature of which is its interdisciplinary nature. Information pertinent to highway safety comes from numerous subject areas, and new areas are constantly being explored for information. The information base of highway safety field may be described as reflecting an "APUPA" (Alien, Penumbra, Umbra, Penumbra, Alien) pattern (Fig. 14). Thus, if the core literature of highway safety is described as representing the Umbra region, on either side are vast areas of Penumbra containing literature which, though not highway safety literature, may provide information contributing to better understanding of highway safety. Finally, outside this Penumbra is the huge volume of Alien literature with no direct relevance to highway safety. While the core literature of highway safety represented by the Umbra region is relatively small compared to other fields in science and engineering, it draws heavily on the Penumbra region. Also, the line separating the Penumbra from the Alien region is not very clear. This makes self-sufficiency by a single library and adequate bibliographic control by a single documentation center almost impossible.

Another factor adding to this complexity is the nature of needs of highway safety personnel which often present conflicting requirements for a bibliographic organization. Their need for current-awareness service demands fast coverage and reporting of the most significant current literature. Their need for comprehensive literature surveys, annotated bibliographies, abstracts, information analysis, and related services requires time and the existence of a comprehensive bibliography and personalized service. Thus, the nature of the highway safety field and the needs of highway safety personnel require that documentation service in the field be organized at the following levels, preferably through a coordinated network of specialized information centers:

- (1) Fast access to significant current information.
- (2) Comprehensive record of core literature of highway safety for its identification, location and ultimate search.
- (3) Special bibliography (including related information in other subject fields) and information analysis to meet the more complex needs of individual research workers or special-interest groups.

The plan for a comprehensive bibliography of the core literature of highway safety, represented by the Umbra region, should aim not only at identifying and listing literature, but also at locating each item in at least one library in the system which is willing either to lend to any user or to provide a copy. This can be done by coordinating the

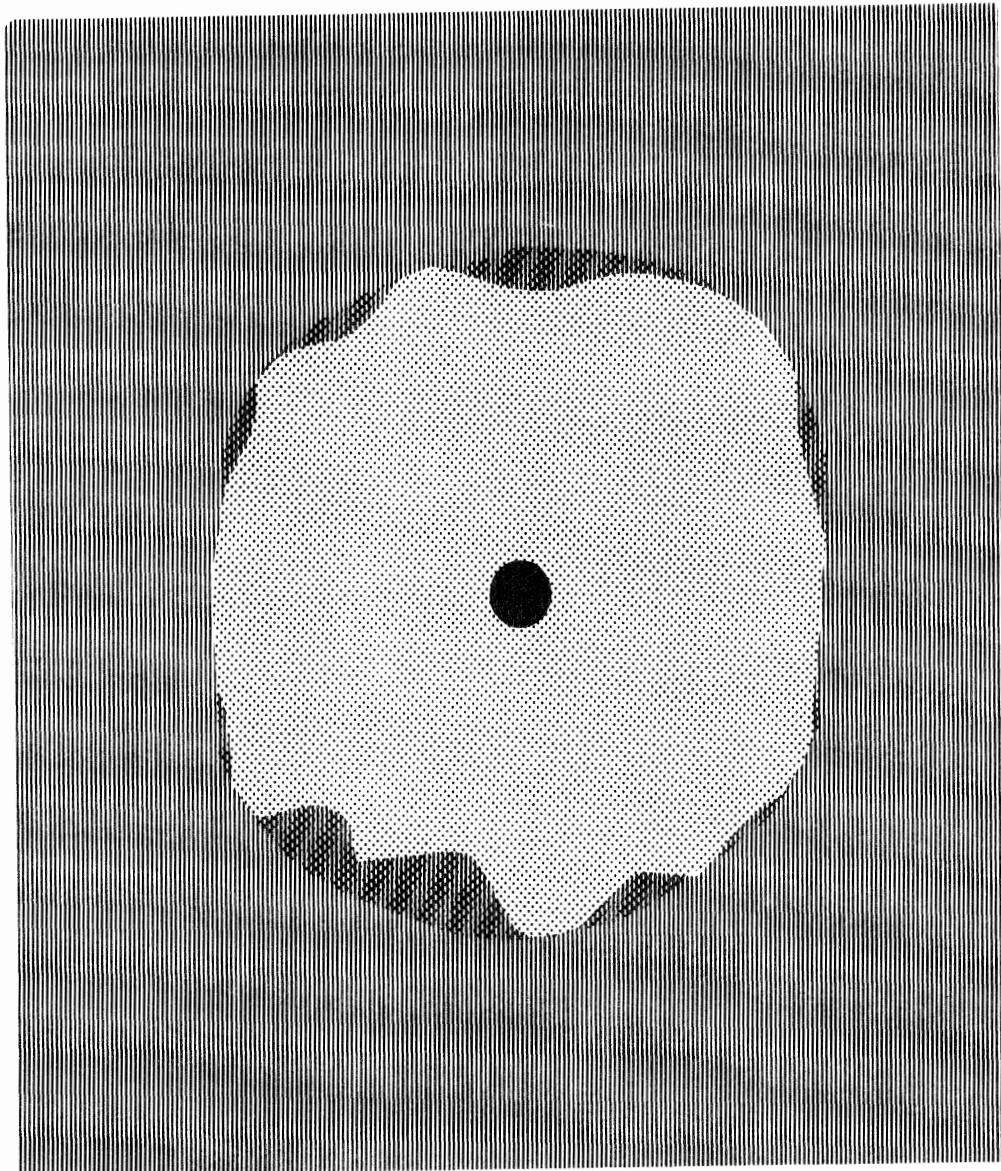


FIGURE 14. THE APUPA PATTERN

acquisition programs and accession lists of major libraries and information centers in the system. Safety literature should be accompanied by more specialized information-analysis activities and programs, such as abstracting, translation, coverage of related and elusive literature in other subject fields, packaging information in different forms and for different audiences, etc. Because of the specialized nature of this level of bibliographic control, such activities can be best carried on by subject specialists working in close association with research workers (whose findings they must analyze and interpret and to whose needs they must respond) and research centers where they would have access to other resources. Naturally, such a program must be properly coordinated and its results and products made widely known and disseminated. In addition, there should be a fast announcement service to bring to the attention of highway safety personnel the most significant recent literature in the field with the least possible delay. The emphasis here should be on speed and selectiveness rather than on comprehensive coverage. This service should be performed by one central agency such as the National Highway Safety Institute Documentation Center. It is already publishing a fortnightly bulletin of recent acquisitions, Highway Safety Literature. With greater speed in coverage (to reduce the time lag between publication and announcement) and wider scope to include more journal literature, this should be developed into a fast current-awareness service.

9. TASK G: ORGANIZATION AND OPERATING PROCEDURES

The problem addressed as Task G is to integrate the elements of the center developed in previous tasks into a comprehensive systems framework. The question to be answered is what combination of potential services and potential means of providing them best meets the objectives of the center and the needs of the users. The information required to answer this question has been discussed in the previous tasks and has been distilled into a thesaurus of system requirements outlined in Table 20 below. Since the user is the primary target of the information system, we will consider alternative system organizations in terms of the end use of information. Section 10 will detail the recommended organization and implementation plan.

In considering organization, it is appropriate to discuss two distinct user-oriented activities of the documentation center--the "push" mechanism (i.e., the automatic distribution of materials to predetermined users) and the "pull" mechanism (dissemination methods that provide information to users when they see a need for it and ask for it). In Tasks A and B of this program, an attempt was made to define for each of these mechanisms the number and type of users, as well as (for pull) the likely number of requests per unit time and (for push) their need for information.

Needs for information or service should be easily determinable by assigning a value to the services--perhaps in terms of future accident reduction. While predictive games have been developed and played to investigate such problems, time and funds did not permit such an approach in the present contract. Rather, a reasonable amount of service was defined by a combination of stated needs (of interviewed users) and of the exhibited needs (of current users of HSRIC). A summary of this information is presented in Tables 21 and 22.

With this background, three information-system arrangements focused on the pull mechanisms are shown in Figure 15. (1) follows a centralized and automatic scheme, and has direct connection from users to the central store. (3) is not far from the system in existence today, with many library activities loosely coordinated through personal knowledge, library-association directories, the telephone, and the interlibrary loan system. (2) is a hybrid arrangement, arrived at by beginning certain central functions (coordination and dissemination) and augmenting certain functions at primary (satellite or sub-) centers (e.g., state-of-the-art reports, literature searches). Both primary and secondary subcenters may communicate with the NHSB center, as indeed may the ultimate users. Primary centers, however, would be distinguished by more direct participation in the design and development of the system, and in their assistance in surrogation operations (abstracting and/or indexing in certain specialized fields) or in providing a regional repository and local retrieval services. In time, they would be likely to have a more direct (say teletype) connection to a central bibliographic store, whereas the secondary centers would be more likely to continue to operate by mail or telephone.

TABLE 20
SYSTEM REQUIREMENTS

User-Oriented

- Provide services responsive to users' needs and requirements
- Easy to use
- Timely response
- Local access points
- Meet needs of an increasing number of users
- Flexibility and responsive to a wide range of requesters' requirements for specificity, recall, and relevance
- User influence via feedback mechanisms

Administrative

- Coordination and implementation of overall policy
- Budget and legislative policies

Internal System Operations

- Complete coverage
- Screening acquisitions by critical review
- One locatable copy
- Purging from active files based on usage, age, etc.
- Archival function--permanent retention of at least one accessible copy
- Minimum redundant surrogation
- Minimum redundant keyboarding
- Capability and standardization
- Timely processing
- Document distribution--efficient, economic, timely
--minimum constraints on dissemination
- Efficient acquisition and dissemination of foreign source materials
- Enhancement of oral and other informal communications media
- Information analysis--capability for integration, correlation, summaries, states of the art, and identification of information gaps

System Evolution

- Timely
- Minimum disruption
- User-oriented quality-assurance program
- Continual review of operations
- System design for efficient and timely modification
- Responsive to changes from users needs and new technology

Education and Training

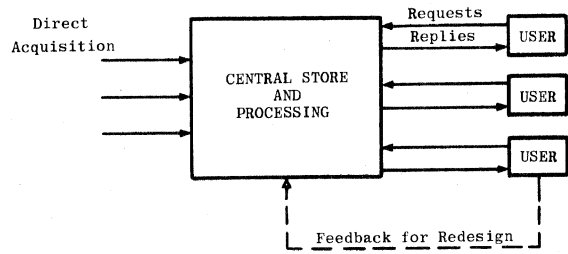
- User should be made aware of services
- System design for minimum of operator training

TABLE 21
THE NEED FOR PULL-TYPE MECHANISMS

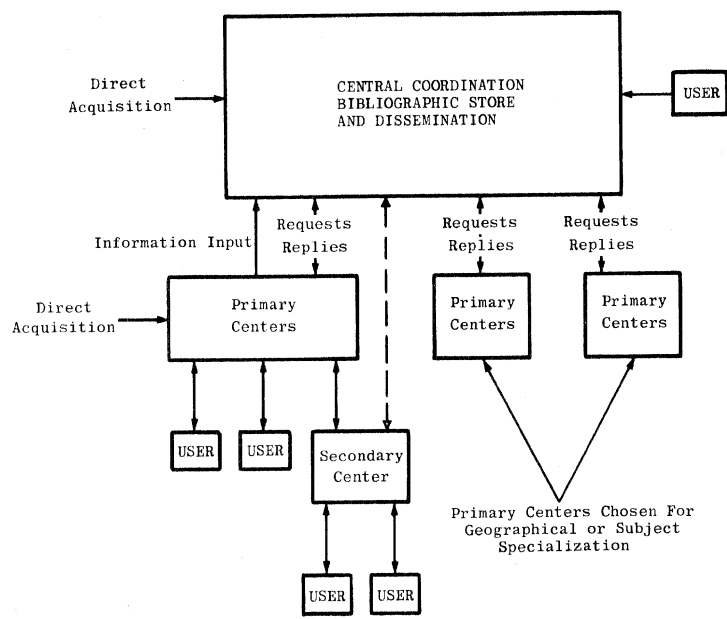
| User | Type of need | Need in less than: |
|----------------------------|--|--------------------|
| 1,000 | | |
| Researchers | Documentation lending service | 1 day to 2 weeks |
| | Doc copies | 1 day to 2 weeks |
| | Lit. searchers (inc. RIP) | 2 wks. to 1 month |
| | Referrals | 1 day |
| | Accident statistics | 1 day to 1 week |
| | Request bibliographies | 1 to 4 weeks |
| | Reference information | 1 day |
| 4,000 | | |
| Administrators | Research-in-progress reports | 1 month |
| | Request bibliographies | 1 month |
| | Accident statistics | 1 day to 1 week |
| | Audiovisual material (for presentations) | 1 day to 2 weeks |
| | Documents/lending service | 1 day to 2 weeks |
| | Reference information | 1 day |
| | Referral services | 1 day |
| 31,000 | | |
| Practitioners | Accident statistics | 1 day to 1 month |
| | Audiovisual materials | 1 day to 2 weeks |
| | Documents/lending service | 1 day to 2 weeks |
| | Copies | 1 day to 2 weeks |
| | Reference information | 1 day |
| 300 | | |
| Mass Media Representatives | Research-in-progress reports | 1 day to 1 week |
| | Request bibliographies | 1 week to 4 weeks |
| | Accident statistics | 1 day to 1 week |
| | Audiovisual material | 1 day to 2 weeks |
| | Referral services | 1 day |
| | Documents/lending service | 1 day to 1 week |
| | Copies of documents | 1 day to 1 week |
| | Reference information | 1 day |
| Many (?) | | |
| Occasional Users | Accident statistics | 1 to 2 weeks |
| | Reference information | 1 to 2 weeks |
| | Documents/lending services | 1 week to 2 weeks |

TABLE 22.
THE NEED FOR PUSH-TYPE MECHANISMS

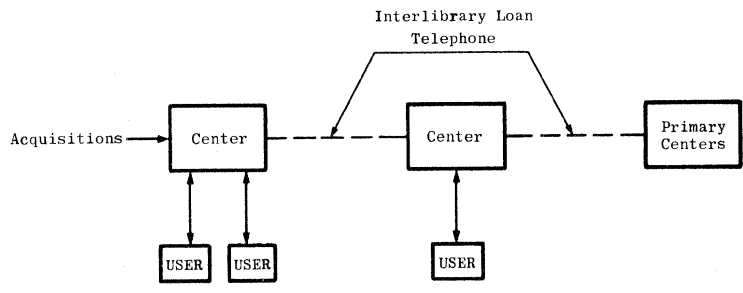
| | Type of Need | Frequency |
|-----------------------------------|---|--|
| 1,000 Researchers | Current-awareness bulletins Annotated bibliographies Union Catalog | Monthly or better As prepared/year Published annually/continually updated |
| | People/organization directories Newsletters Reviews/summaries State-of-the-art reports Selective dissemination Research-in-progress reports | Annually Weekly or biweekly As prepared As prepared Monthly to selected users Published annually |
| 4,000 Administrators | Current-awareness bulletins Union Catalog People/organization directories Reviews/summaries State-of-the-art reports Selective dissemination Research-in-progress reports | Monthly or better Published annually Annually As prepared As prepared Monthly to selected users Published annually |
| 31,000 Practitioners | Current-awareness bulletins Newsletters | Monthly or better Weekly or biweekly |
| 300 Mass Media Representatives | Union Catalog People/organization directories Newsletters Reviews/summaries | Annually Annually Weekly or biweekly As prepared |
| Many Occasional Users | Push mechanisms to occasional users go essentially through the media | |



(1) CENTRALIZED/AUTOMATIC SYSTEM



(2) HYBRID SYSTEM



(3) ISOLATED SYSTEM

FIGURE 15. PULL SYSTEMS

Kochen (1) has postulated a fully automatic remote-access information-retrieval system. This hypothetical system stores 400 bits of information about each of 1,000,000 documents in a central digital store; it is accessed through either a teletypewriter or a data-phone. In the latter case, responses are postulated to emanate from a spoken word-storage unit so that individual users can communicate with the system by pushing buttons and listening to the response. Hypothesizing 1,000 users sharing 200 terminals, Kochen calculates a cost of \$178 for a half-hour retrospective-search conversation--access to the system being more or less immediate (i.e., less than a working day). This computation neglects the cost of developing and up-dating the central store. A recent search performed by this institution actually took place over a period of several weeks. The reader might consider the additional effort required to perform these services in one day. The request was for literature pertaining to "concrete alloys" containing fiberglass, particularly that type of concrete modified with latex and glass fibers. Costs of this search can be broken down as follows:

| | |
|--|----------|
| (1) Discussion between the user and the librarian | \$ 6.00 |
| (2) Librarian's search of existing literature including CAST, the American Concrete Institute's index, the Applied Science and Technology Index, the British Technology Index, Chemical Abstracts, Government Research and Development Reports | \$ 90.00 |
| (3) Telephone calls to American Concrete Institute, Portland Cement Association, Owens-Illinois, Owens-Corning-Fiberglass Co., and Wayne State University. | \$ 40.00 |
| (4) Search activities at each of the called sources | \$ 90.00 |
| (5) Return telephone calls | \$ 15.00 |
| (6) Collation of the information | \$ 24.00 |
| (7) Report to the user | \$ 3.00 |
| Total | \$278.00 |

It is conceivable that the same information could be obtained from an automated store at approximately the same cost, although it is perhaps obvious how extensive such a store would have to be.

Kochen continues to compute the same service in the case where 1,000 users share only a small number of terminals, accepting a delay of a week or so in obtaining this information, and postulates that the cost might come down to something like \$22 per request. This is at least comparable to the present cost of a request from the Engineering Societies Library (\$7/hr.), where a retrospective search by manual techniques can result in an annotated bibliography in about two weeks. Typical searches of this sort average \$50 total cost.

The "shared-terminal" system of Kochen could be thought of as a sort of hybrid between the dispersed and centralized systems, where each

terminal was in fact a library with a well trained intermediary between the user and the central system. Many requests could be filled without access to the central store if a reasonably up-to-date union bibliography existed, but a central control could insure that routing of requests out of the user's local facility would be efficient.

Efficient usage of an information-retrieval system depends strongly on the user's knowledge of the system. The key to usage is to get people involved in the information-system activities directly--i.e., both in the input and the output functions. At a local technical library, for example, those who get the most use out of the system are those who put the most into it--contributing documents, suggesting sources, aiding in the development of an indexing system, and the like. At a higher level, it seems that this same sort of relationship would be fruitful between a national center and the various possible satellite activities. Individuals, at least in the foreseeable future, will seldom have the inclination or knowledge to enter the system at the national level but will continue to query their local facility. Under Task A of this report, we asked a number of users about their knowledge or use of national facilities and found, for example, that while many people knew of the Highway Research Board or the National Safety Council by name or reputation, they did not know of and had not used their information activities. Conversely, many librarians in the transportation field do know of such activities.

9.1. SYSTEM ALTERNATIVES

9.1.1. ALTERNATIVES FOR THE PULL MECHANISM. The pull mechanism is an information-retrieval process. It can be considered analogous to the radar process, where a radar transmitter sends out a request (signal) and receives a reply (the response), the power of the returned signal being inversely proportional to the distance between the radar and the reflector. In short form, the radar equation is usually given as:

$$P_r = \frac{P_t \times G_t \times G_r \times \sigma}{d^4}$$

The information-retrieval counterparts are shown at the right, where

| | | |
|----------|--|--|
| P_r | = the power received | (the value of the information received) |
| P_t | = the power transmitted | (the inquirer's understanding of how to use the system) |
| G_t | = the gain of the transmitting antenna | (the bandwidth of the communications channel from the user to the library) |
| G_r | = the gain of the receiving antenna | (the bandwidth of the communications channel from the library to the user) |
| σ | = the radar cross-section of the reflecting object | (the quality of the library) |
| d | = distance between radar and reflecting object | (the distance and delay in getting a response) |

P_t can be considered as analogous to the user's understanding of the system. Educating the user and fostering his participation in the activities and development of the information system should be encouraged.

Antenna gains G_t and G_r are related to ease of use, e.g., the form or formats used in a dialog with the system--the query and response. For example, this factor is dependent on the level or levels of surrogation made available to the patron, and the browsability of the information system.

The quality of the library, σ , can be defined by three parameters: specificity, recall, and relevance. Users require information with different degrees of specificity--from the boiling point of water at 200 psi to a general discussion of vaporization. Users require different degrees of recall or completeness of the information applied to them, i.e., of exhaustiveness of retrieval. Users also require different degrees of relevance of the information supplied to them, i.e., of precision of retrieval. Thus, the quality of the library depends on its ability to reflect the requirements of different users.

Distance and delay incorporated in the d^4 term have a strong inverse relationship to the value of the information system to the user. Although the radar equation's exponent of four may be too large, it illustrates the point that the value of information to the user falls off sharply with time.

Using this equation as a basis for discussion, we might consider alternative approaches to the organization of a documentation effort in highway safety. It is clear that the greatest user understanding (P_t) and the best communications (G_t and G_r) exist at the local library where distance and delay (d) are relatively small. A high degree of response is developed to more frequent communications. The difficulty is that few if any local libraries can currently be self-sufficient in the sense of containing the universe of highway safety literature.

Conversely, it is not difficult to picture a single center with tremendous storage capability; but the ability of users to understand it, the chance for filtering (impedance) in the communications channels, and the increased distance and delay factors introduce many problems.

We can hypothesize that either the "pure" systems above (i.e., many self-sufficient facilities or a single one) could be designed to yield the same performance. In the former case, each library would have to process redundantly a rather complete set of the literature, whereas a central facility would have to have extensive communications capability, a continuing education program to train the many possible users in the best methods of interrogating the system, and an aggressive acquisition program to assure broad coverage.

We conclude, however, that a hybrid system involving direct communication with the local library, augmentation of the local library's capabilities by the existence of a union catalog, and the development of strong ties among the various facilities will lead to a much improved pull service.

9.1.2. ALTERNATIVES FOR THE PUSH MECHANISM. Clearly, the push mechanism of dissemination to all users dictates a centrally organized and coordinated operation. Three alternative arrangements paralleling those of Figure 15 are shown in Figure 16. The fully centralized system does all of its own acquisition and processing, and distributes its output directly to individual users. The isolated system, not much different from what currently exists, acquires an amount of information limited by its own budget and interests and distributes its output to a select group of users. Only weak communication exists between primary centers (e.g., NSC library receives the BPR acquisition list). This situation presents a confusing and disorderly array of sources to the user.

The hybrid system (2) centralizes the direction of publishing functions of several primary centers. It may distribute material directly to many users (e.g., bureau contractors), secondary library facilities (such as the IACP library), certain key individuals, and indirectly to many other users through the primary centers.

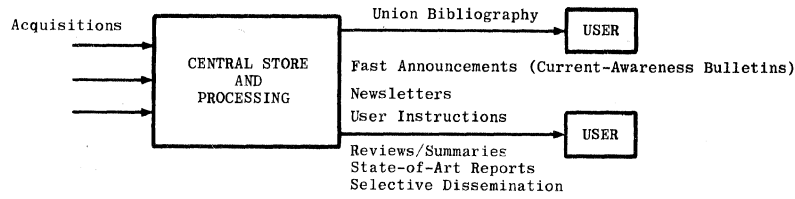
Acquisition of material for the hybrid system may be direct or through selected primary centers specializing in particular fields. Primary centers (and others) may prepare state-of-the-art reports, may abstract and index documents, and should feed back design information continually to the central facility so as to maintain a pertinent and useful operation.

We thus recommend the development of a hybrid system incorporating strong central control of dissemination as a part of the national highway safety documentation effort. Other system requirements must be met in the areas of administration, internal system operations, systems evolution, and education and training. Each of these points will be considered in turn to arrive at a comprehensive set of recommendations.

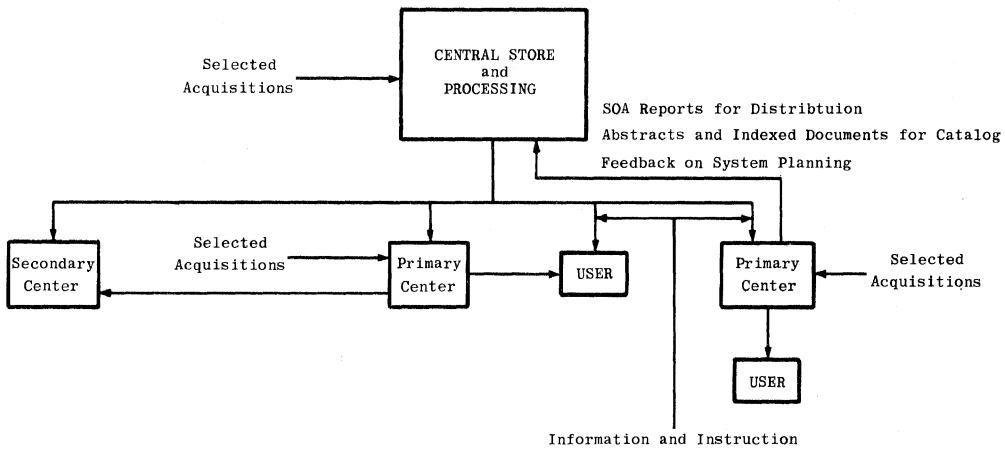
9.2. A RECOMMENDED NHSDC SYSTEM

Figure 17 displays the system recommended as a result of this study. It is a network making use of several existing facilities and capabilities, augmented by a coordination and communications function to be provided by the National Highway Safety Bureau.

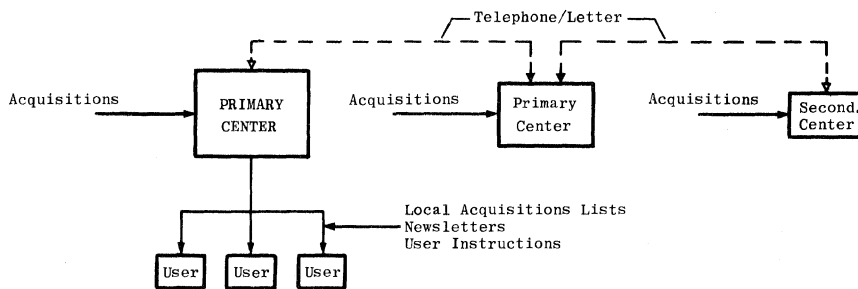
Several levels of activity are indicated: First, the NHSB will serve to coordinate all pertinent activities within the network. For discussion purposes, the NHSB activity is described in two parts--the central control and its own internal information center. The latter is one of several primary centers--the others being the Highway Research Information Service, the Safety Research Information Service, and the Highway Safety Research Information Center. Libraries associated with these satellite centers are indicated in the boxes. Provision is made (dotted lines) for expansion to include several additional primary centers to cover either regional or specialist activities. Although a firm recommendation is not made, it seems likely that one of these should be on the West Coast (for example, at the NHSB offices, at ITTE, at GE TEMPO) and one on the East Coast (for example, at NYU for safety education, at The Travelers Research Center, or elsewhere). Secondary



(1) THE CENTRAL SYSTEM



(2) THE HYBRID SYSTEM



(3) THE ISOLATED SYSTEM

FIGURE 16. PUSH SYSTEMS

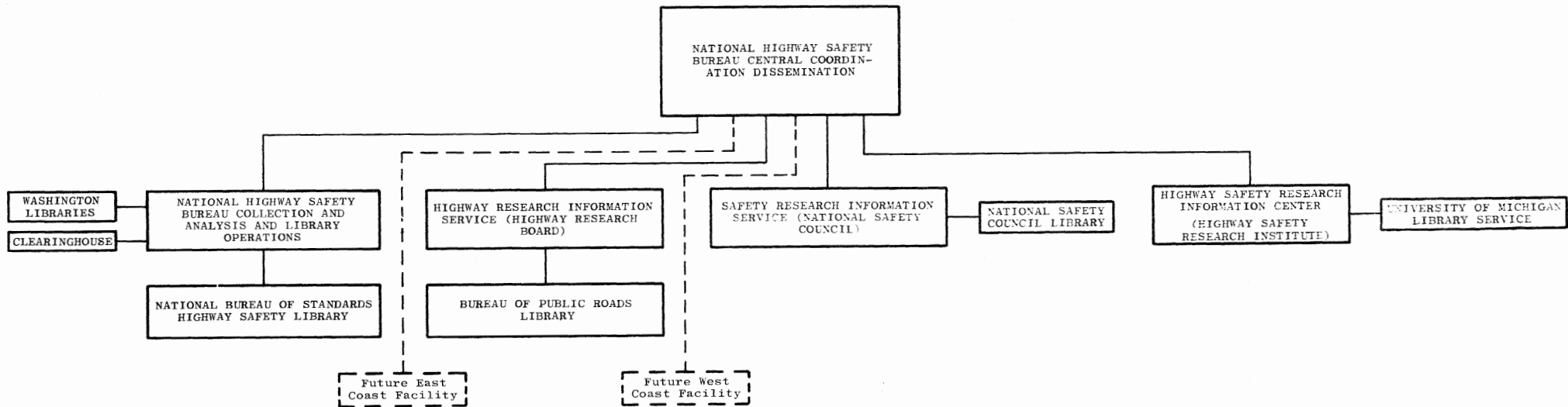


FIGURE 17. RECOMMENDED NHSB DOCUMENTATION CENTER SYSTEM

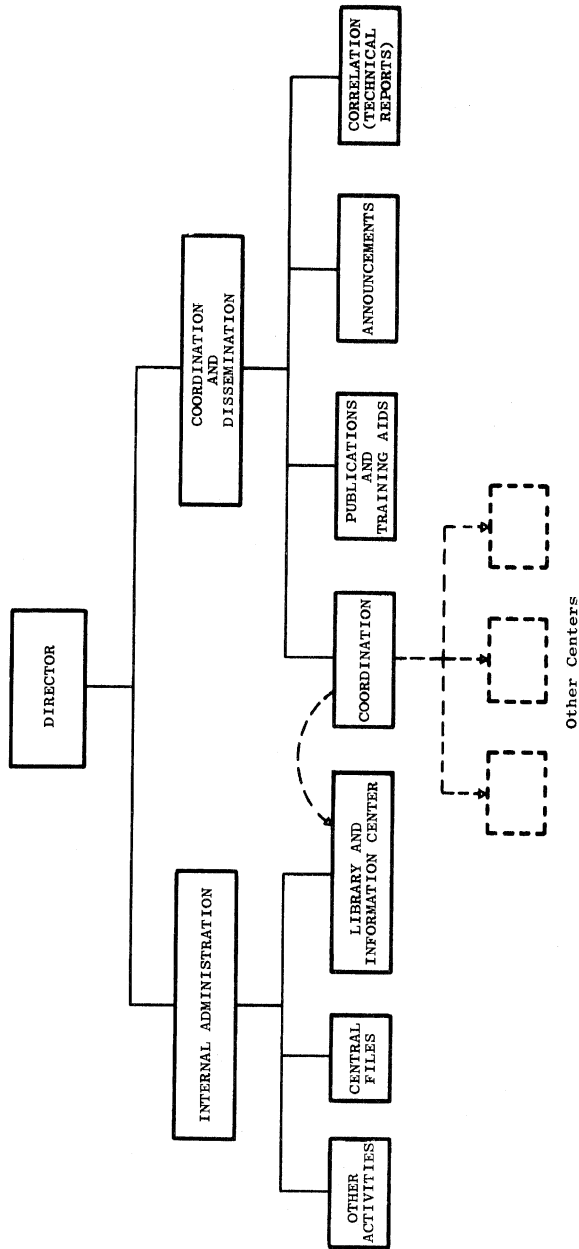


FIGURE 18. NHSB DOCUMENTATION CENTER ORGANIZATION

centers can be considered as a large number of local library activities serving a unique set of users. Such secondary centers may be closely allied to a primary center (such as the NBS activity and the NHSB) or may be rather loosely tied to either the national or a satellite center.

Acquisition of material leading to a union catalog would be accomplished by the various primary centers, the workload to be divided according to individual capabilities. Specific assignments should be discussed in committee, with the final decision resting, of course, with the chairman. A suggested preliminary distribution of assignments would include government reports (except highway engineering) through NHSB, highway engineering through HRIS, behavioral psychology and education through SRIS, automotive engineering and medical through HSRIC. The committee indicated on the diagram would consist of one representative from each primary center with a chairman from the NHSB center. Both journal and report literature would be acquired and indexed in this manner.

A tentative organization diagram of the NHSB activity is shown as Figure 18. The functions of the local information center and of coordination of the network are shown separately. The functions of internal administration include the local information center as well as other activities, e.g., handling of proposals and audiovisuals. Remote satellites are indicated as being monitored by the coordination section within the bureau.

9.3. COST-EFFECTIVENESS ANALYSIS

9.3.1. INTRODUCTION. Cost-effectiveness analyses seem to be the order of the day, and it would be a coup to develop a meaningful analysis in connection with this information-center program (2-6). Past investigators have limited their conclusions to the appropriate percentage of a total R&D budget which shall be spent on information handling-- basing their decision on even more remote decisions of the same sort.

Belfour (Albert J. Belfour, "Financing Information Analysis Centers", Proceedings of the First Ad-Hoc Forum of Scientific and Technical Information Analysis Center Managers, Directors, and Professional Analysts, held at Battelle Memorial Institute, Nov. 9-11, 1965) indicates that a chief value of his Mechanical Properties Data Center is to eliminate needless duplication or research. Cost of obtaining from the files for the first time data worth \$15,000 in research savings is approximately \$150 (or 1%). The value is realized, however, only if people make use of the information center.

Walter Carlson, formerly director of technical information for DOD, has indicated that the information activity in many organizations has continued to exist when only 3 to 5 percent of the organization are users and are responsible for initiating the flow of information to a much larger number of users. The point made here is that a total count of usage of an information facility is not indicative of the ultimate destination of the information, and that even a lightly used center may be performing a very useful function.

Evaluation for cost-effectiveness analysis might better be considered as a management-control technique. Every effort should be made to measure the services provided in terms of number of users and repeat usage, and by keeping track of incidence of critical user of information. Internal information rate (document-processing rate), recall precision, etc., should also be accounted for periodically. The potential for mathematical modeling should be considered (7-11).

9.3.2. BUDGET PLANNING. The network system suggested in this report is, to a great extent, an augmentation of existing facilities. For the most part, development costs of present activities have been borne by the individual facilities or their sponsors, and it is evident that many of these units will continue to receive a portion of their support from other sources.

We contrast this situation with that existing in the ERIC system, in which all clearinghouses are fully supported by federal funds, although they in turn are generally associated with centers of excellence in various parts of the country. The ERIC budget allows approximately \$150,000 per year for each of the 18 clearinghouses, although a few operate at substantially higher budgets than this (up to \$500,000). The central office budget for ERIC has not been determined in the course of this study, but there are approximately 6 professional people associated with the headquarters operation.

With this background we present a cost schedule for operations necessary to accomplish the above tasks:

(1) Acquisition and Processing Costs: Cost information here is based primarily on operating experience at HSRIC. Table 23 presents the man-hours per document presently used in the acquisition, cataloging, key-punching, indexing, abstracting, printing, and filing, and the supervision of these functions. At current wage rates, including overhead, this costs approximately \$9 per document (see Table 24). In addition, computer time, document purchasing, and printing supplies and material costs currently average \$3.65 per document.

TABLE 23
HSRIC ACQUISITION AND PROCESSING EFFORT

| <u>Function</u> | <u>Man-hours per Document</u> |
|-----------------|-------------------------------|
| Acquisition | .4 |
| Cataloging | .33 |
| Keypunching | .05 |
| Indexing | .25 |
| Abstracting | .13 |
| Printing | .11 |
| Filing | .5 |
| Supervision | <u>.33</u> |
| Total | 2.0 |

TABLE 24
ACQUISITION COSTS FOR 6000 DOCUMENTS PER YEAR

| | | |
|--|----------|-------------|
| 250 Magazine subscriptions @ 20=\$5000 | | |
| 600 Books @ \$14 = \$8400 | \$19,400 | \$3.20 |
| Xerox copies \$6000 | | |
| Printing supplies | | .25 |
| Computer time (to tape form) | | <u>.20</u> |
| | Subtotal | \$3.65 |
| Wages (see Table 23) (2 man hours per document @ \$4.50) | | <u>9.00</u> |
| | Total | \$12.65 |

We have assumed for this computation the following conditions. Input to the system will be through one of several satellite information centers and will consist of an initial entry and a subsequent annual input as described in Table 25. Rules for entry require at least one copy of each document somewhere in the system. Except for journal articles and documents older than, say five years, a copy should be available at the NHSB library, although duplicate copies may exist at any of the satellites.

TABLE 25
ACQUISITION AND PROCESSING COSTS
(18,000 Initial Documents plus 15,000 per Year)

| | Initial # | Initial Cost | Annual # | Annual \$ |
|----------------|-----------|--------------|----------|-----------|
| HSRI | 2,500 | | 1,000 | |
| SRIS | 3,500 | | 1,000 | |
| HSRIC | 8,000 | | 8,000 | |
| NHSB | 3,000 | | 5,000 | |
| Other (Future) | 5,000 | | -- | |
| <hr/> | | | | |
| Total | 18,000 | \$162,000 | 15,000 | \$190,000 |

Effectively, the bureau library would contain the sum of all documents in the system, except for certain journal articles and the older literature. A cutoff at five years for older literature is suggested but is obviously subject to reconsideration.

Initial costs of acquiring the total collection of the several libraries would likely be spread over more than a year and might be preceded by an exchange of card files among the principal libraries as a preliminary union catalog.

(2) Acquisition of Research-In-Progress Information and Its Cost:
We have recommended that the current research-in-progress activities of the National Safety Council and the Highway Research Information Service

be tapped to the fullest possible extent in creating a highway safety research-in-progress file. One suggested method for accomplishing this would be for the annual index to be published by HRIS (see next section) with contributions from the various participating libraries and information activities.

Under present circumstances, the Highway Research Board has accepted such information from many activities without charge, although as noted below a charge is made at output. No attempt is made to cost-analyze the acquisition, processing, and storage here, as negotiation seems likely.

(3) Push Operations and Their Costs: Although the details of push services are subject to modification, for cost-analysis purposes we assume the following:

- (a) A fast-announcement service every two weeks (6 pages, 5,000 copies) covering the most important reports and research activities.
- (b) Annual research-in-progress report (600 pages, 1,000 copies).
- (c) An abstract journal--quarterly at first, later monthly (up to 600 pages/quarter, 1,000 copies).
- (d) An annual union bibliography (2,400 pages, 1,000 copies) consisting of republication of the year's abstract journals with a cumulative index including former years.

Costs* of acquisition of the material for these publications, including preparation in digital form, have been accounted for above. In Table 26, we compute the cost of (1) printing out (2) sorting the indexes, and (3) publication and distribution.

State-of-the-art reports are considered as a part of the push system. We estimate four reports per year at \$50,000 per report, but it is obviously dependent on many factors and could range widely from this value.

(4) Pull Operations and Their Costs (see Table 27): The principal pull operations are requests for documents, for referrals, for research-in-progress searches, or for special bibliographies. While it is difficult to predict the number of such calls which will appear in a year's time, it is possible to limit the number of requests by structuring the system. Detailed records can be kept of the nature and number of requests, and the charges for service can be varied as appropriate.

For example, it is expected that bureau requests would receive first priority, followed by contractor requests. In the latter case, we presume that short queries would be handled without charge, but that longer searches (say, those resulting in a special bibliography) might be charged to the contract. The dividing line between these two services could be adjusted to the desired level.

*Costs based on use of commercial printing, IBM 1401 computer, from experience at HSRIC.

TABLE 26

ANNUAL COSTS OF PUSH SERVICES

| | | |
|---|------------|---|
| a. Fast Announcement, 5000 copies, 6 pages, biweekly publication | | |
| | Printing | \$465 |
| | Addressing | 10 |
| | Postage | <u>100</u> |
| | | \$575 x 26 weeks = \$14,950 |
| b. Research In Progress Report, Annual | | |
| | Printing | \$6000 |
| | Mailing | <u>750</u> |
| | | \$6750 |
| c. Abstract Journal, Quarterly, 1000 copies, 600 pages | | |
| | Printing | \$1500 |
| | Mailing | <u>300</u> |
| | | \$1800 x 4 quarters = \$7200 |
| d. Union Bibliography, Annual, 1000 copies, 2400 pages | | |
| | Printing | \$6000 |
| | Mailing | <u>750</u> |
| | | \$6750 |
| e. Computer Services, Printout and Index Preparation (a-d) = \$2000 | | |
| Total (a-e): | | \$14,950 + \$6750 + \$7200 + \$6750 + \$2000 = \$37,650 |

TABLE 27. ANNUAL COSTS OF PULL SERVICES

| Item | |
|---|----------|
| Bibliographic Searches for Contractor | \$ 5,000 |
| Extensive manual searches for Contractors | \$ 3,600 |
| Simple requests | \$ 4,160 |
| NHSB Local Copying Costs (Unreimbursed) | \$ 3,000 |
| Lending Losses, Postage, Misc. | \$ 1,200 |
| | <hr/> |
| TOTAL: | \$16,960 |

Services to noncontractors fall into two categories. The first is the release and distribution of the bureau's own publications--copies of standards, or other material descriptive of the bureau's activities. We assume that simple requests of the sort will be filled from stock without charge. Secondly, computer searches should be handled at cost--much as is currently done by HRIS. Similarly, extensive literature searches should probably be billed at cost. The exception to this rule is that there may be specific areas which the bureau wishes to favor--perhaps generally to support (with literature) someone's efforts in alcoholic vehicle-operator research. In such instances, the bureau might absorb the costs of related searches.

A special group of noncontracting users is found in media. Policies for furnishing pull information to news services, magazine writers, etc., must be set by the bureau, although it is likely that they will be somewhat more liberal than services to the general public. It is beyond the scope of the present contract to do more than suggest that a policy must exist.

For a trial cost estimate, let us assume that each of 100 contractors requests one bibliographic search and one research-in-progress search per year. As a guide we present the current HRIS search charges for similar activities. First, financial supporters of HRB are given a quota for free service. After this quota is succeeded they are charged at the same rate as favored users, which is the actual retrieval cost. Fees at this level are \$35 per request (computer) plus 25¢ per printout page. Unfavored users are charged at a rate which is supposed to pay for some of the storage and handling of information--this is four times the "favored user" charge. Guessing at a moderately large report, 100 requests from contractors might total \$5,000 at the favored-user rates.

A much more frequent service is likely to involve a manual search. An extensive search has been described above, and the cost of \$300 is typical. At the other end of the spectrum is a simple request, e.g., what other things has G. W. Jones published? (1/2 hour of professional time @ \$8 per hour.) Let us assume that there will be one per month of the former, and four per day of the latter (for a 260-day year). This totals \$7,760.

The final cost to be computed in the pull system is the cost of copies of documents, or actual costs involved in lending. We assume that copyrighted materials can be obtained locally by most users. For NHSB users we estimate \$3,000 per year in copying costs. Clearinghouse copies will be obtained without cost to this documentation-center system. As a last resort, document copies can be made available at cost, which varies from 10¢ to 25¢ per page depending on the organization's overhead problems. In any case, this should not be considered an operating cost if it is reimbursed.

Lending costs, where this practice is permitted, will consist of labor in servicing the request, the postage, and the value of the lost documents. It is suggested that bureau personnel be generally authorized to keep a document permanently, as long as the system knows its whereabouts; lending to external personnel or organizations should be

limited--preferably through interlibrary loans and for limited periods. In practice the bureau should provide a useful documentation service, so that people who would benefit by reading available literature can in fact get it. In trading off the cost of lost documents against the value of the communication, we lean slightly in favor of losing documents. We estimate \$100 per month as a reasonable lending loss and handling cost.

Total costs to the bureau for the four categories discussed are shown in Table 28. Internal operating cost of the bureau and costs for research in progress (acquisition) are not included in this compilation.

TABLE 28. COSTS OF DOCUMENTATION CENTER ACTIVITIES

(15,000 Documents per Year)

| | Initial Costs | Annual Costs |
|-------------------------|---------------|--------------|
| <u>Acq. & Proc.</u> | \$162,000 | \$190,000 |
| <u>RIP</u> | * | * |
| <u>Push</u> | | 237,650# |
| <u>Pull</u> | | 16,960 |

* To be negotiated, estimate not available at present time.

Includes \$200,000 for four state-of-the-art reports.

10. RECOMMENDATIONS AND CONCLUSIONS

Recommendations for actions to be undertaken by the Department of Transportation in connection with the development of a documentation center activity in highway safety are summarized on the accompanying chart (Fig. 19). Comments and amplification of the contents of the chart are given here:

(1) Establish a coordination and control activity within the Department of Transportation to effect a highway safety information network. Specific activities under this heading are:

(a) Establish a steering committee to be chaired by the documentation center chief of the National Traffic Safety Institute. Members of the committee will be the directors of the various participating primary centers and one representative each from the user population, the government library or information system, and information center specialists.

(b) During the first year, continue a user-needs study aimed at developing a specific list of addressees for services to be provided by the center. In the four following years, user needs should be considered at the periodic steering-committee meetings, and after five years a review study should be conducted.

An early output of the user-needs studies would be recommendations for the establishment of new primary centers (to cover specific geographical regions or specific subjects), new services to be provided, and identification of new users.

(c) Develop a thesaurus of highway safety information which will permit maximum use of existing literature collections, as well as effective recall and relevance in searches.

(d) Give formal recognition to the existence of a highway safety information network; and, by appropriate public relations activities, promote the knowledge and use of the network.

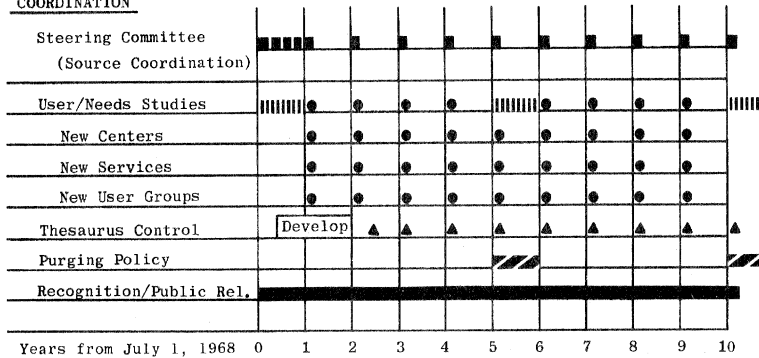
(e) Expect to conduct a purge of the documentation system at the end of approximately five years. This should be anticipated so that certain records of document usage and age will be available at that time.

(f) Develop agreements among the various primary centers, and assign sources as necessary for effective coverage of the field.

(2) Develop the information network to create a centralized bibliographic base and a decentralized but extensive acquisition and storage of documents.

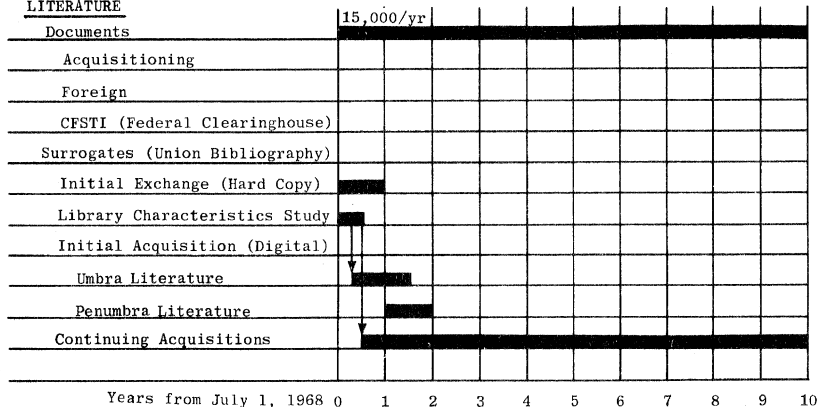
(a) As to the documents themselves, primary centers should be encouraged to acquire and hold as many documents as are useful--with the provision that duplicate copies of almost all documents should exist in the national center. Provision

COORDINATION

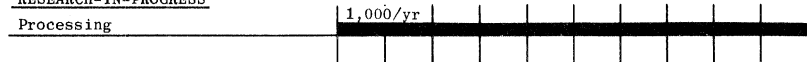


- To be considered at steering committee meeting for possible action.
- ▲ Update thesaurus by sub-committee action.
- Meetings
- ▤ Study Contract
- ▨ Purge

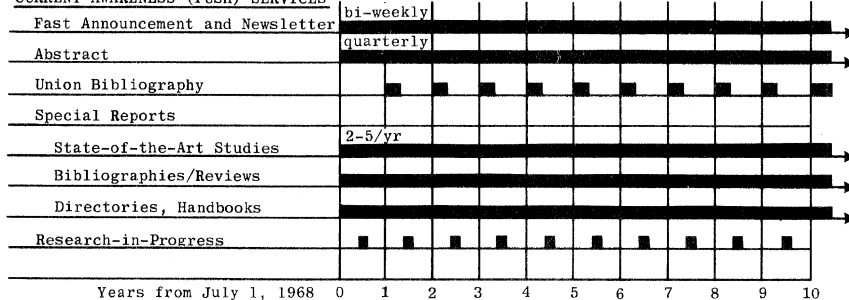
LITERATURE



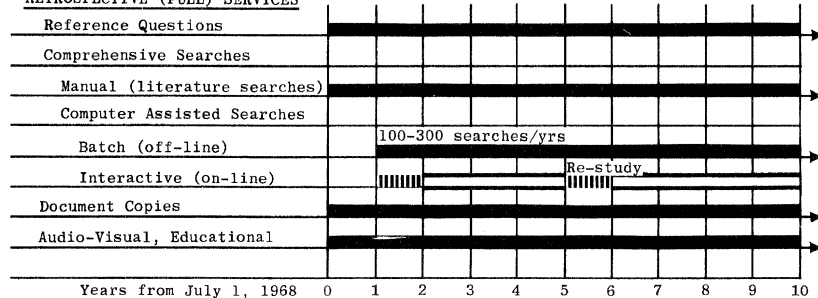
RESEARCH-IN-PROGRESS



CURRENT AWARENESS (PUSH) SERVICES



RETROSPECTIVE (PULL) SERVICES



- ▤ Pilot Study
- ▭ Implement if Warranted

FIGURE 19. SUMMARY OF RECOMMENDATIONS

should be made to incorporate both relevant government-sponsored reports and privately sponsored reports into the U.S. Department of Commerce Clearinghouse system for secondary distribution.

(b) With regard to document surrogates, there should be an initial exchange of card files (or other hard copy) among the various participating entities so that each will know the holdings of the others. Preliminary to the development of a union bibliography, a study of library characteristics for the existing major collections should be conducted. Initial acquisition in the form suitable for publication of a union bibliography to cover the core or "umbra" material of traffic safety should be begun within the next six months. Acquisition of less relevant material (the pen-umbra) is of less immediate importance and can be delayed. Following the deliberations of the steering committee, a continuing program of acquisition (from assigned sources) should exist.

(3) Continue and enhance the research-in-progress information collection systems currently in existence. Specifically, by action of the steering committee, incorporate into the research-in-progress reporting system information from centers of special knowledge to supplement the existing activities of the Highway Research Board and the National Safety Council.

(4) Initiate several nationally sponsored publications programs to disseminate information.

(a) Start an announcement journal initially containing both news and selected publications announcements. This should be a somewhat broadened version of the present Highway Safety Literature publication to be issued bimonthly.

(b) Begin publication of an abstract journal eventually to include all documents in the network. This should be a quarterly to begin with and might be published monthly the second year, if volume warrants.

(c) Publish an annual union bibliography, which will be essentially a compilation of the quarterly or monthly abstract journals with appropriate indexes.

(d) Sponsor the development and publication of several state-of-the-art reports, directories, bibliographies, and/or handbooks.

(e) Publish a research-in-progress report annually.

(5) Make the system responsible to individual user requests.

(a) Through a switching network (for referral), providing each center with adequate reference material, handle individual requests for specific information.

(b) Create, within the network, a capability for extensive literature searches. Initially this can be done only manually, and it is likely that the manual search will continue to provide coverage of peripheral areas. After the first year

it should be possible to search the core highway safety literature with automated techniques based on union bibliography data. It is further suggested that a pilot terminal system be set up to demonstrate on-line retrieval and to evaluate its effectiveness, acceptability, and efficiency (implying cost).

(c) Although secondary distribution of reports through the clearinghouse is encouraged, the documentation network should maintain a liberal lending policy to local qualified users of each center. A rapid interlibrary loan system should be available among the primary centers. Copying machinery should be readily available.

(d) There is a clear need for an in-depth study which would result in a directory of audiovisual education materials in the highway safety field. A byproduct of such a study would be the identification of areas in which further training materials are needed.

REFERENCES

Section 1:

1. Committee on Scientific and Technical Information, Federal Council for Science and Technology, Standard for Descriptive Cataloging of Government Scientific and Technical Reports, Washington, D.C., October 1966, AD 641 092.
2. C. O. Miller, "The Safety Information Challenge", ASSE Journal (Technical Section), Vol. 11, September 1966, pp. 9-16.
3. National Safety Council, A Guide to Traffic Safety Literature, Volume 10, 1955-1965, Chicago, 1966.

REFERENCES

Section 2:

1. American Association of Motor Vehicle Administrators, Personnel Directory of Memla Jurisdiction, Washington, D.C., July 1965.
2. American Road Builders Association, Highway Officials and Engineers, Washington, D.C., June 1966.
3. Auerbach Corporation, DOD User Needs Study; Phase I, Volume 1, May 14, 1965. (AD 615 501)
4. Columbia University Bureau of Applied Social Research, Review of Studies in the Flow of Information Among Scientists, Volumes 1 and 2, Office of Science Information Service, National Science Foundation, 1960. (AD 400 688)
5. CONSAD Research Corporation, A Proposed Library and Documentation Program for Transportation, Pittsburgh, March 1967.
6. R. A. Davis and C. A. Bailey, Bibliography of Use Studies, Drexel Institute of Technology, Graduate School of Library Science, Philadelphia, March 1964.
7. R. M. Fishenden, "Information Use Studies, Part I: Past Results and Future Needs", Journal of Documentation, Vol. 21, September 1965, pp. 163-168.
8. Gale Research Co., Encyclopedia of Associations, 4th edition, Vols. I, II, III; Detroit, 1964.
9. S. Herner, "The Information Gathering Habits of American Medical Scientists", Current and Past Studies and their Implications, Paper, Second Institute on Current Problems of Science Literature Service, Columbia University (Aug. 16-20) 1954b.
10. G. Jahoda, "Information Gathering and Use Habits of Chemists", J. Chem. Doc., Vol. 4, July 1964, pp. 154-156.
11. H. Menzel, "The Information Needs of Current Scientific Research", Library Quarterly, Vol. 34, January 1964, pp. 4-19.
12. J. Mersel, J. C. Donahue, and W. A. Morris, Information Transfer in Educational Research, Informatics Inc., TR-66-15-7, April 8, 1966.
13. North American Aviation, Inc., DOD User Needs Study, Phase II, Flow of Scientific and Technical Information Within the Defense Industry, Final Report, Vol. 1, Overview, November 30, 1966. (AD 647 111)
14. Alan M. Rees, "Information Needs and Patterns of Usage", Information Retrieval in Action, Western Reserve University, Cleveland, 1963, pp. 17-23.

15. M. Rosenfeld and C. W. Hoffman, A Survey of Information Transfer Requirements of Scientists and Engineers at Aberdeen Proving Ground, Md., Ballistic Research Laboratories, February 1965. (AD 046 541)
16. "Safety Education, Leadership Directory 1966-67", SAFETY: Journal of Administration, Instruction, Protection, November-December 1966, National Commission on Safety Education, Washington, D.C.
17. H. F. Sieber, Jr., Interview Guide Handbook, DOD Contract SD219, 8 May 1964. (AD 601 259)
18. C. Smith, User Requirements for Chemical Information and Data System (CIDS), Frankford Arsenal, Philadelphia, April 1965. (AD 616 889)
19. Systems Development Corporation, "Recommendations for National Document Handling Systems in Science and Technology," Appendix A, A Background Study, Volumes I and II, November 1965. (CPB 168 267, AD 624 560)
20. M. Taube, "An Evaluation of Use Studies of Scientific Information", Emerging Solutions for Mechanizing the Storage and Retrieval of Information (Studies in Coordinate Indexing, Vol. V), compiled by Mortimer Taube, Documentation, Inc., Washington, D.C., 1959, pp. 46-71.
21. E. Tornudd, "Study on the Use of Scientific Literature and Reference Service of Scandinavian Scientists and Engineers Engaged in Research and Development," Proceedings of the International Conference on Scientific Information, Vol. 1, National Academy of Sciences-National Research Council, Washington, D.C., 1959, pp. 19-75.
22. M. J. Voigt, Scientists' Approaches to Information, American Library Association, 1961.
23. M. J. Weinstock, A Recommended Design for the United States Medical Library and Information System; Vol. II, Background Studies, Herner, Washington, D.C., January 1966. (CPB 172 924)

REFERENCES

Section 3:

1. American Petroleum Institute, Information Retrieval Project Subject Authority List, 3rd ed., January 1966.
2. Consad Research Corporation, A Proposed Library and Documentation Program for Transportation, prepared for the U.S. Department of Commerce, Office of the Undersecretary for Transportation, Pittsburgh, March 1967.
3. Federal Council for Science and Technology, The Copyright Law as it Relates to National Information Systems and National Programs (A study by the Ad Hoc Task Group on Legal Aspects Involved in National Information Systems), Washington, D.C., July 1967.
4. R. M. Fishenden, "Information Use Studies," Journal of Documentation, Vol. XXI, September 1965, pp. 163-176.
5. Anthony T. Kruzas, Directory of Special Libraries and Information Centers, Gale Research Company, Detroit, 1963.
6. Kenneth N. Metcalf, Transportation Information Sources, Gale Research Company, Detroit, 1965.
7. National Referral Center for Science and Technology, A Directory of Information Sources in the United States: Physical Sciences, Biological Sciences, Engineering, Washington, D.C., 1965.
8. National Science Foundation, Specialized Science Information Services in the United States, Washington, D.C., 1961.
9. Organization for Economic Cooperation and Development, International Road Safety Research Directory, 2nd ed., Paris, 1966.
10. Melvin J. Weistock, et al., A Recommended Design for the United States Medical Library and Information System, Herner, Washington, D.C., 1966.

REFERENCES

Section 5:

1. Eugene Wall, "A Rationale for Attacking Information Problems," American Documentation, April 1967, pp. 97-103.
2. M. J. Weinstock, et al., A Recommended Design for the United States Medical Library and Information System, Herner, 1966.
3. Kay Martin, et al., The Catalog Input/Output System, RAND, Santa Monica, 1966. (AD 629 606)
4. Philippe J. Gabrini, Automatic Introduction of Information into a Remote-Access System: A Physics Library Catalog, University of Pennsylvania, Philadelphia, 1966. (AD 641 564)
5. Frederick G. Kilgour, Library Catalogue Production on Small Computers, American Documentation, 1966.
6. International Business Machines, Mechanized Library Procedures, White Plains.
7. International Business Machines, Library Catalog Production 1401 and 870, White Plains.
8. International Business Machines, Library Catalog Production with the 1050 System, White Plains, 1966.
9. International Business Machines, General Information Manual Aerospace Information and Control Systems Technical Information Dissemination and Retrieval, White Plains.
10. Theodore C. Hines and Jessica L. Harris, Computer Filing of Index, Bibliographic, and Catalog Entries, Bro-Dart Foundation, Newark, 1966.
11. Mavis Carlov, A Computerized Method of Preparing Catalog Cards Using a Simplified Form of Data Input, Proceedings, American Documentation Institute, Volume 4, Thompson, 1967.
12. Donald P. Hammer, Problems in the Conversion of Bibliographical Data--A Key punching Experiment, American Documentation, 1968.
13. Informations Systems Office, Project Marc, Washington, 1967.
14. Alexander M. Cain, Steps Towards a Computer-Based Library Network: A Survey of Three Medical Libraries, State University of New York, Syracuse.
15. Bernice F. Field, "The New Catalog Code: The General Principles and the Major Changes," Library Resources & Technical Services, Vol. 10, Fall 1966, pp. 421-436.
16. Stanley J. Swihart and Elizabeth Bodie, An Input System for Automated Library Indexing and Information Retrieval, Including Preparation of Catalog Cards, Sandia, 1963.

17. Joseph Becker and R. M. Hayes, Information Storage and Retrieval: Tools, Elements, Theories, Wiley, 1966.
18. Lawrence Berul, Information Storage and Retrieval, A State-of-the-Art Report, Auerbach, Philadelphia, 1964. (AD 630 089)
19. Charles P. Bourne, The Historical Development and Present State-of-the-Art of Mechanized Information Retrieval Systems, American Documentation, 1961.
20. Winifred F. Desmond and Lester A. Barrer, Indexing and Classification: A Selected and Annotated Bibliography, Nuclear Science Division, Special Libraries Association, New York, 1966. (NP 015 937)
21. Carlos A. Cuadra, Annual Review of Information Science and Technology, American Documentation, 1966.
22. C. A. Cuadra (Editor), Annual Review of Information Science and Technology, Volume 2, Wiley, 1967.
23. Study of Mechanization in DOD Libraries and Information Centers, Boox, Allen Applied Research, Bethesda, Maryland, 1966.
24. Office of Naval Research, Information Systems Summaries, Department of the Navy, Washington, D.C., 1965. (AD 634 526)
25. Frederick Jonker, Indexing Theory, Indexing Methods and Search Devices, Scarecrow Press, New York, 1964.
26. Harold Borko, The Conceptual Foundations of Information Systems, System Development, Santa Monica, 1965. (AD 615 718)
27. B. C. Vickery, On Retrieval System Theory, (2nd Edition), Butterworth, 1967.
28. Broadfield, The Philosophy of Classification, Grafton, London, 1946.
29. Data Processor, Vol. 10, Number 4, (Special Report: Information Retrieval), November 1967.
30. International Business Machines, Aerospace Information and Control Systems: Technical Information Dissemination and Retrieval, General Information Manual, White Plains.
31. International Business Machines, Mechanized Library Procedures, Data Processing Application, White Plains.
32. International Business Machines, Selected Papers on an Integrated System for Disseminating, Storing, and Retrieving Information, Data Systems Division, Poughkeepsie, New York, 1964 (TR 00. 1103)
33. International Business Machines, Storage, Retrieval, and Dissemination of Information, White Plains.

34. International Business Machines, Index Organization for Information Retrieval, Data Processing Techniques (Form C20-8062), 1961.
35. Allen Kent, Library Planning for Automation, Spartan Books, Macmillan, Washington, D.C., 1964.
36. Manfred Kochen, Techniques for Document Retrieval Research: State-of-the-Art, International Business Machines, Yorktown Heights, New York, 1963.
37. Arthur L. Korotkin, et al., Indexing Aids, Procedures and Devices, General Electric, Maryland, 1965. (AD 616 342)
38. Summary of the Status of the Universal Decimal Classification in English Including Progress by the AIP/UDC Project through September 1, 1966.
39. Robert L Lormand, "Classification and Deep-Searching with UDC," Technical Memo, Willow Run Laboratories, University of Michigan, Ann Arbor, 1966.
40. S. R. Ranganathan, Colon Classification, (7th ed. rev.), Asia Publishing House, 1961.
41. Josephine J. Jaster, Barbara R. Murray, and Mortimer Tauber, The State-of-the-Art of Coordinate Indexing, Documentation Incorporated, Washington, D.C., 1962. (AD 275 393)
42. Mortimer Taube, et al., Studies in Coordinate Indexing, Volume III, Documentation, 1956.
43. M. E. Stevens, Automatic Indexing: A State-of-the-Art Report, MBS Monograph 91, U.S. Dept. of Commerce, 1965.
44. Lauren B. Doyle, "Is Automatic Classification a Reasonable Application of Statistical Analysis of Text?", J. Assoc. Computing Machinery, Vol. 12, October 1965, pp. 473-489.
45. Lockheed Missiles & Space Co., Annual Report: Automatic Indexing and Abstracting, Part 1, Sunnyvale, Calif., 1966.
46. International Business Machines, Normal Text Search for Information Retrieval, IBM, White Plains.
47. P. B. Baxendale, "Machine-Made Index for Technical Literature-- An Experiment," IBM Journal, October 1958.
48. Harold Borko, The Construction of an Empirically Based Mathematically Derived Classification System, System Development, Santa Monica, Calif., 1961.
49. Myrna D. Bernick and Harold Borko, Toward the Establishment of a Computer Based Classification System for Scientific Documentation, System Development, Santa Monica, Calif., 1964.

50. A. G. Dale, N. Dale, and E. D. Pendergraft, A Programming System for Automatic Classification with Applications in Linguistic and Information Retrieval Research, Defense Documentation Center, Linguistics Research Center, Austin, 1964. (AD 609 180)
51. J. L. Dolby, L. L. Earl, and H. L. Resnikorf, The Application of English-Word Morphology to Automatic Indexing and Extracting, Lockheed Missiles and Space Co., Palo Alto, 1965. (AD 615 424)
52. Jane J. Robinson, Automatic Parsing and Fact Retrieval: A Comment on Grammar, Paraphrase, and Meaning, USAF Project Rand, 432036, Rand Corporation, Santa Monica, Calif., 1964.
53. John H. Williams, Jr., Discriminant Analysis for Content Classification, International Business Machines, 1966. (AD 630 127)
54. Peter G. Assorio, Classification Space Analysis, University of Colorado, Boulder, 1964. (AD 608 034)
55. Berthold Altmann, A Multiple Testing of the ABC Method and the Development of a Second-Generation Model. Part 1: Preliminary Discussions of Methodology, Harry Diamond, Washington, D.C., 1964. (AD 617 118)
56. Richard Jernigan and Alfred G. Dale, Set Theoretic Models for Classification and Retrieval, Linguistics Research Center, University of Texas, Austin. (AD 609 179)
57. J. H. Williams, Results of Classifying Documents with Multiple Discriminant Functions, International Business Machines, Rockyville, Md., 1965. (AD 612 272)
58. International Business Machines, General Information Manual: Keyword-In-Context (KWIC) Indexing, White Plains, 1962.
59. Charles M. Blocher and Kenyon C. Rosenberg, "A Comparison of the Relevance of Key-Word-In-Context versus Descriptor Indexing Terms," American Documentation, January 1968.
60. Richard Lee Binford, A Comparison of Keyword-In-Context (KWIC) Indexing to Manual Indexing, University of Pittsburgh, 1965. (AD 620 420)
61. Eugene Garfield, "Science Citation Index: A New Dimension in Indexing," Science, Vol. 144, May 8, 1964, pp. 649-654.
62. Frederick Jonker, Outline of a General Theory of Index Terminology and Indexing Methods, Jonker Business Machines, Md., 1961
63. B. C. Vickery, "Thesaurus: A New Word in Documentation," J. Documentation, Vol. 16, Dec. 1960, pp. 181-189.

64. B. C. Vickery, "Vocabularies for Coordinate Systems," Aslib Proceedings, Vol. 15, June 1963, pp. 170-176.
65. S. Backer, "The Thesaurus as a First Step in an Information-Retrieval System," Textile Institute and Industry, April 1967, pp. 91-96.
66. E. A. Janning, Operations of a Document Retrieval System Using a Controlled Vocabulary, Technical Report AFML-TR-66-36, Wright-Patterson Air Force Base, 1966.
67. Robert R. Freeman, Modern Approaches to the Management of a Classification, American Institute of Physics, New York, 1966.
68. Office of Naval Research, Manual for Building a Technical Thesaurus, Dept. of the Navy, 1966. (AD 633 279)
69. Engineers Joint Council, Thesaurus Rules and Conventions, approved Nov. 9, 1966.
70. Everett H. Brenner and Theodore C. Hines, Thesaurus Construction: Historical Background and Use Consideration, American Petroleum Institute, Columbia University, New York.
71. B. E. Holm and L. E. Rasmussen, "Development of a Technical Thesaurus," American Documentation, July 1961, pp. 184-190.
72. Eleanor D. Dym, "A New Approach to the Development of a Technical Thesaurus," Proceedings, American Documentation Institute Annual Meeting, Oct. 22-27, 1967, Vol.4, pp. 126-131, Thompson.
73. Office of Technical Services, Guidelines for Using Astia Descriptors, Dept. of Defense, Washington, D.C., 1961.
74. Lawrence H. Oliver et al., An Investigation of the Basic Processes Involved in the Manual Indexing of Scientific Documents, General Electric, Bethesda, 1966. (PB 169 415)
75. J. R. Sharp, Some Fundamentals of Information Retrieval, London House and Maxwell, New York, 1965, p. 97.
76. D. J. Campbell, "Analytical Techniques for the Radical Revision of Thesauri," Abstracts, International Federation for Documentation (FID), 1965 Congress, Washington, D.C.
77. J. G. Mulvehill and E. H. Brenner, "Faceted Organization of a Thesaurus Vocabulary," Progress in Information Science and Technology, Proceedings, American Documentation Institute, Annual Meeting, October, 1966, Adrienne Press, p. 175.
78. Classification Research Group, "The Need for a Faceted Classification as the Basis of All Methods of Information Retrieval," Proceedings of the International Study Conference on Classification for Information Retrieval, Pergamon, 1957.

79. B. C. Vickery, Faceted Classification Schemes, Rutgers Series on Systems for the Intellectual Organization of Information, Vol. 5, Rutgers, 1966, pp. 26, 87.
80. Cyril W. Cleverdon, Report on the Testing and Analysis of an Investigation into the Comparative Efficiency of Indexing Systems, Aslib Cranfield Research Project, National Science Foundation, Washington, D.C., 1962.
81. B. C. Vickery, Faceted Classification: A Guide to Construction and Use of Special Schemes, Aslib, London, 1960.
82. B. C. Vickery, Classification and Indexing in Science, Butterworths, 1958.
83. Classification Research Group on Facets, Bulletin No. 6, J. Documentation, pp. 156-172.
84. International Study Conference on Classifications for Information Retrieval, Proceedings, Pergamon, 1957.
85. D. J. Foskett, The Construction of a Faceted Classification for a Special Subject, Institute of Education, University of London.
86. D. J. Campbell, "Making Your Own Indexing System in Science and Technology," Aslib Proceedings, Vol. 15, Oct. 1963, pp. 282-303.
87. American Petroleum Institute, Information Retrieval Project Subject Authority List, 3rd ed., 1966.
88. D. J. Fiskett, Occupational Safety and Health Documents Classification Scheme, Pergamon, 1957.
89. Phyllis A. Richmond, Hierarchical Definition, Volume 11, 1960.
90. Charles H. David, "Integrating Vocabularies with a Classification Scheme," American Documentation, January 1968.
91. Simon M. Newman, Information Systems Compatibility, American University Technology of Management Series, Vol. 1, Macmillan, London, 1965.
92. Walter Hohnacker and Mark Newmark, "Automated Maintenance of a Highly Structured Thesaurus at Engineering Index," Proceedings, American Documentation Institute Annual Meeting, Oct. 22-27, 1967, Thompson, pp. 132-136.
93. Marjorie R. Hyslop, "Sharing Vocabulary Control," Special Libraries, December 1967, pp. 708-714.
94. Owen D. Nichols and Samuel A. Tancredi, "Air Pollution Technical Information Processing: The Microthesaurus Approach," American Documentation, January 1968.

95. O. E. Taulbee, "Ways of Classifying Information That Can Help Get Projects Started and Keep Them on Course," Machine Design, December 9, 1965.
96. B. W. Adkinson, Information: Its Organization and Use for Technological Advance, SAE Paper 619D, 1963.
97. F. W. Lancaster, "Engineering Information Storage: Indexing vs. Classification," Machine Design, January 7, 1965.
98. E. A. Janning, Modification of an Information Retrieval System by Improving Vocabulary Control, Indexing Consistency and Search Capabilities, AFML-TR-65-20, Wright-Patterson AFB, 1965.
99. Jefferson D. Sinnett, An Evaluation of Links and Roles Used in Information Retrieval, ML-TDR-64-152, Wright-Patterson AFB, 1964.
100. Mortimer Taube, "Notes on the Use of Roles and Links in Coordinate Indexing," American Documentation, April 1961.
101. Madeline M. Henderson, Evaluation of Information Systems: A Selected Bibliography with Informative Abstracts, NBS Technical Note 297, 1967.
102. Alan M. Rees and Tefko Saracevic, The Measurability of Relevance, Comparative Systems Laboratory Technical Report No. 7, Center for Documentation and Communication Research, Western Reserve University, Cleveland, 1966.
103. Alan M. Rees, Evaluation of Retrieval Systems, Center for Documentation and Communication Research, Western Reserve University, Cleveland, 1965.
104. F. W. Lancaster and J. Mills, "Testing Indexes and Index Language Devices: The Aslib Cranfield Project," American Documentation, January 1964.
105. A. J. Goldwyn, The Place of Indexing in the Design of Information Systems Tests, Technical Report No. 3, Comparative Systems Laboratory, Western Reserve University, Cleveland, 1964.
106. Department of the Navy, Information Storage and Retrieval System: Evaluation of Indexing Procedures and Retrieval Effectiveness, Department of the Navy, Washington, D.C., 1964.
107. William Goffman, "On Relevance as a Measure," Information Storage Retrieval, Vol. 2, Pergamon, 1964, pp. 201-203.
108. Saul Herner, F. W. Lancaster, and Walter F. Johanningsmeier, A Case Study in the Application of Cranfield System Evaluation Techniques, Herner, Washington, D.C., 1964. (AD 608 743)
109. A. Resnick and C. B. Nensley, "The Use of Diary and Interview Techniques in Evaluating a System for Disseminating Technical Information," American Documentation, Vol. 14, April 1963, pp. 109-116.

110. Jean Aitchison and Cyril Cleverdon, A Report on a Test of the Index of Metallurgical Literature of Western Reserve University, College of Aeronautics, Cranfield, 1963.
111. Alan M. Rees, Review of a Report of the ASLIB-CRANFIELD Test of the Index of Metallurgical Literature of Western Reserve University, Western Reserve University, Cleveland, 1963.
112. Cyril W. Cleverdon and J. Mills, "The Testing of Index Language Devices," Aslib Proceedings, Vol. 15, April 1963.
113. F. R. Smith and S. O. Jones, "Card versus Book-Form Printout in a Mechanized Library System," Special Libraries, Vol. 58, Nov. 1967, pp. 639-643.
114. Theory of Documentation and Searching Strategy, Final Report under Contract No. AF 49(638)-357, Center for Documentation and Communication Research, Western Reserve University, Cleveland. (AD 278 551)
115. William Goffman, "On the Logic of Information Retrieval," Information Storage Retrieval, Vol. 2, Pergamon, 1965, pp. 217-220.
116. Manfred Kochen, Some Problems in Information Science with Emphasis on Adaptation to Use through Man-Machine Interaction, International Business Machines, Yorktown Heights, New York, 1964. (AD 600 113)
117. M. Kochen et al., High Speed Document Perusal, AF 49(638)-1062, International Business Machines, Yorktown, New York, 1962.
118. H. Marron and W. R. Foster, Subject Searches on Current Research Information of Parallel Computer and Manual Files, Science Information Exchange.
119. Bertram Raphael, A Computer Program for Semantic Information Retrieval, Massachusetts Institute of Technology, 1964. (AD 608 499)
120. Lawrence A. Bennigson, David A. Thompson, and David Whitman, "A Proposed Structure for Displayed Information to Minimize Search Time through a Data Base," American Documentation, January 1968.
121. William Goffman, "A Searching Procedure for Information Retrieval," Information Storage Retrieval, Vol. 2, Pergamon, 1964, pp. 73-78.
122. J. Verhoeff, W. Goffman, and J. Belzer, "Inefficiency of the Use of Boolean Functions for Information Retrieval Systems," Communications of the Association for Computing Machinery, Vol. 4, Dec. 1961.

123. A. Wittman Berry and Peter Z. Ingerman, "A Threshold Selection Language," Proceedings, Association for Computing Machinery 22nd National Conference, Thompson, 1967, pp. 311-316.
124. H. G. Morehouse, Telefacsimile Services between Libraries with the Xerox Magnavox Telecopier, University of Nevada Library, Reno, 1966.
125. "Library System Found Little Used by Hospital Staff," Medical Tribune, Vol. 9, April 1968, p. 3.
126. R. C. Sheldon, R. A. Roach, and S. Backer, "Design of an On-Line Computer Based Text le Information Retrieval System," Presented at the 37th Annual Meeting of the Textile Research Institute, Princeton, 1967. (TD-166-67)
127. J. F. Nolan et al., An Experimental On-Line Data Storage and Retrieval System, Massachusetts Institute of Technology, Lexington, Mass., 1965. (AD 623 796)
128. D. L. Drew et al., "An On-Line Technical Library Reference Retrieval System," American Documentation, Vol. 17, January 1966.
129. Howard P. Burnaugh, The BOLD (Bibliographic On-Line Display) System, System Development Santa Monica, Calif., 1966. (AD 632 473)
130. L. J. van der Wolk, "Teletype and the Telecode for Libraries," UNESCO Bulletin for Libraries, Vol. 20, July-Aug. 1966, pp. 170-176.
131. William D. Mathews, Tip Program Description, Massachusetts Institute of Technology, Cambridge, Mass., 1966. (AD 635 134)
132. G. E. Bryan, Joss: Introduction to the System Implementation, RAND, Santa Monica, Calif., 1966. (AD 644 339)
133. Jessica L. Harris, "Offset Printing from Typescript as a Substitute for Microfilming of Dissertations," American Documentation, January 1968.
134. Laurence B. Heilprin, "Technology and the Future of the Copyright Principle," American Documentation, January 1968.
135. Gerald J. Sophar and Laurence B. Heilprin, The Determination of Legal Facts and Economic Guideposts with Respect to the Dissemination of Scientific and Educational Information as it is Affected by Copyright: A Status Report, BR-7-0793, (ED-014-621)
136. The Copyright Law as It Relates to National Information Systems and National Programs: A Study by the Ad Hoc Task Group on Legal Aspects Involved in National Information Systems, Federal Council for Science and Technology, Washington, D.C., July 1967. (PB 175 618)
137. Edward S. Lazowska, "Photocopying, Copyright, and the Librarian," American Documentation, Vol. 19, April 1968, p. 123.

REFERENCES

Section 6:

1. Layman E. Allen, "Sketch of a Proposed Semi-Automatic, Hierarchical, Open-Ended Storage and Retrieval System for Statute Oriented Legal Literature," Proceedings of the 1965 Congress, Vol II, International Federation for Documentation, 31st Meeting and Congress, Washington D.C., October 7-16, 1965, pp. 189-198.
2. Layman E. Allen, "A Language-Normalization Approach to Information Retrieval in Law," presented at the 1966 Annual Meeting of the American Political Science Association, New York, September 6-10, 1966.
3. Layman E. Allen, "Beyond Document Retrieval Toward Information Retrieval," Minnesota Law Review, Vol. 47, 1963, pp. 713-767.
4. John W. Gibbons, "What to Tell the Public About Traffic Safety," Traffic Digest and Review, January, 1968.
5. R. A. Bauer and A. Bauer, "America: Mass Society and Mass Media," Journal of Social Issues, Vol. 16, 1960, pp. 3-67.
6. B. Berelson, "Communications and Public Opinion," in Schramm, W. (ed.), Communications in Modern Society, University of Illinois Press, Urbana, 1960.
7. Murray Blumenthal, "Dimensions of the Traffic Safety Problem," Traffic Safety. Paper presented at 1967 Automotive Engineering Congress, March, 1968.
8. A. D. Little, Inc., The State-of-the-Art of Traffic Safety, Automobile Manufacturers Association, New York, 1966.
9. B. W. Marsh, Motivated Public Understanding for Traffic Safety, American Automobile Association, 1962.
10. Harold Mendelsohn, "Are Traffic Safety Messages Really on Target?," Traffic Digest and Review, December, 1967.
11. ____, "The Dogmas of Traffic Safety," Research Report, University of Denver, 1967.
12. J. Naisbitt, "The Great Holiday Massacre, A Study of Impact: Public Relations to Television Documentary Throws New Light on Safety Propaganda," Traffic Safety, March, 1961, pp. 12-15, 36, 48-49.
13. "A Section of the Action Program for Highway Safety," Public Information, 1966. Report of the President's Committee for Traffic Safety, G.P.O., Washington, D.C., 1961.
14. "What Motorists Really Think About Traffic Safety!," Report on a Study Conducted by Opinion Research Corporation published by the Pure Oil Company and the ATA Foundation, Inc. Washington, D.C.,: ATA Foundation, Inc., Washington, D.C., n.d.

15. "1966 Traffic Safety Campaign," Advertising Council-National Safety Council, n.d.
16. Colin Cherry, On Human Communication, Wiley, New York, 1957.
17. W. P. Davison, "On the Effects of Communication," Public Opinion Quarterly, Vol. 23, 1959, pp. 343-360.
18. C. I. Hovland and I. Janis, Communication and Persuasion, Yale University Press, New Haven, 1953.
19. C. I. Hovland, "Reconciling Conflicting Results Derived from Experimental and Survey Studies of Attitude Change," American Psychologist, Vol. 14, 1959, pp. 8-17.
20. H. C. Kelman, "Processes of Opinion Change," Public Opinion Quarterly, Vol. 25, 1961, pp. 57-79.
21. Harold Mendelsohn, "The Denver Symposium on Mass Communications Research for Safety" (edited by Murray Blumenthal), National Safety Council, 1964.
22. S. Moscovici, "Attitudes and Opinions," Annual Review of Psychology, Vol. 14, 1963.
23. M. W. Riley, and J. W. Riley, "A Sociological Approach to Communications Research," Public Opinion Quarterly, Vol. 15, 1951, pp. 445-460.
24. Milton Rokeach, "Attitude Change and Behavioral Change," Public Opinion Quarterly, Vol. 39, 1966-67.
25. W. Schramm, "Information Theory and Mass Communication," Journalism Quarterly, Vol. 32, 1955, pp. 131-136.
26. C. E. Shannon, and W. Weaver, The Mathematical Theory of Communication, University of Illinois Press, Urbana, 1949.
27. Charles W. Wixom, "Tapping News Executive's Interest to Enhance the Flow of Science News," presented at American College Public Relations Association Great Lakes District Conference, Milwaukee, March, 1968.
28. Harold L. Henderson and Theodore Kole, "A Study of the Effectiveness of Small Group Discussions of Safety Films and Driver Problems in Changing the Attitudes and Behavior of Accident-Involved Driving," Drivers Safety Service, Inc., New York, 1963.
29. I. L. Janis, and B. T. King, "The Influence of Role Playing in Opinion Change," Journal of Abnormal/Social Psychology, Vol. 49, 1954, pp. 211-218.
30. Robert Henry Schwarz, "A Study of the Effectiveness of Role Playing as a Means of Modifying an Existing Attitudinal Structure," Dissertation Abstracts, 1966.

31. Horace C. Hartsell, "Using Multimedia in Safety Education," Safety, March-April, 1967.
32. B. F. Skinner, "Teaching Science in High School--What is Wrong?," Science, Vol. 159, Feb. 16, 1968, pp. 704-710.
33. I. M. Rosenstock, "What Research in Motivation Suggests for Public Health," American Journal of Public Health, Vol. 50, 1960, pp. 295-302.
34. Albert E. Schefflen, "Human Communication: Behavioral Programs and Their Integration in Interaction," Behavioral Science, Vol. 13 (44), 1968.
35. H. Toch and M. S. MacLean, Jr., "Perception, Communication, and Education Research: A Transactional View," Audio-Visual Communication Review, Vol. 10, 1962, pp. 55-77.
36. Hillier Kriegbaum, Science and the Mass Media, New York University Press, New York, 1967.
37. Dorwin Cartwright, "Some Principles of Mass Persuasion," Human Relations, Vol. 2, 1949, p. 253.
38. W. Griffiths and A. L. Knutson, "The Role of Mass Media in Public Health," American Journal of Public Health, Vol. 50, 1960.
39. James W. Swinehart, and John P. Kirscht, "Smoking: A Panel of Beliefs and Behavior Following the PHS Report," Psychological Reports, 18, 519-528; 1966.
40. Ruth I. Beach, "The Effect of a 'Fear-Arousing' Safety Film on Physiological, Attitudinal and Behavioral Measures: A Pilot Study," Traffic Safety Research Review, June, 1966.
41. Verling C. Troidahl and R. Vincent Farace, "Traffic Accidents and Public Opinion," Michigan State Economic Record, July-August, 1966.
42. "Dupont Seat Belt Survey," 1967.
43. G. W. Blomgren, Jr., and T. W. Scheuneman, Psychological Resistance to Seat Belts, The Traffic Institute, Northwestern University, 1961.
44. Dorrian A. Sweetser, "Attitudinal and Social Factors Associated With Use of Seat Belts," Journal of Health & Social Behavior, pp. 116-125, 1967.
45. I. L. Janis and S. Feshback, "Effects of Fear-Arousing Communications," Journal of Abnormal and Social Psychology, Vol. 48, 1953, pp. 78-92.
46. Howard Leventhal, Jean C. Watts, and Francia Pagano, "Effects of Fear and Instructions on How to Cope with Danger," Journal of Personality and Social Psychology, Vol. 6, 1967, pp. 313-321.

47. Gerald R. Miller and Murray A. Hewgill, "Some Recent Research on Fear-Arousing Message Appeals," Speech Monographs, Vol. XXXIII, November, 1966.
48. Nathan Maccoby, interview, Stanford University.
49. Benjamin E. Griessman, "The Perception-Retention of Fire Prevention Messages: An Aspect of Communication Research," Ph.D. Dissertation [Dissertation Abstracts, 1967 27 (9-A), 3130].
50. H. Hyman and P. B. Sheatsley, "Some Reasons Why Information Campaigns Fail," Public Opinion Quarterly, Vol. 21, 1947, pp. 412-423.
51. Wayne A. Danielson and G. C. Wilhoit, Jr., A Computerized Bibliography of Mass Communication Research, 1944-1964, Magazine Publishers Association, New York, 1967.
52. G. Ray Funkhouser, "Some Correlates of Information Seeking," Paper presented at Pacific Chapter of American Association for Public Opinion Research Corporation, Feb., 1967.
53. ____, "Communicating Science to Non-Scientists," presented at Conference of American Association for Public Opinion Research, Feb., 1967.
54. James N. Morgan, "Who Uses Seat Belts?," Behavioral Science, Vol. 12, November, 1967.
55. John P. Robinson, and James W. Swinehart, "The Role of Television in Communicating World Affairs," presented at Conference on Television and World Affairs, January, 1968.
56. C. F. Cannell, and J. C. MacDonald, "The Impact of Health News on Attitudes and Behavior," Journalism Quarterly, 33, 1954, p pp. 315-323.
57. Sue B. Seitz and Charles C. Cleland, "Changing Existing Attitudes-- A Dissonance Approach," Psychological Reports, Southern Universities Press, 1967.
58. Vance Packard, The Hidden Persuaders, Pocket Books, New York, 1957.
59. Stanley H. Schuman, et al., "Young Male Drivers," Journal of the American Medical Association, Vol. 12, June, 1967, p. 200.
60. Ronald G. Havelock, "Social Roadblocks in Utilization of Highway Safety Research," presented at Second Annual Auto Insurance Industry Traffic Safety Research Symposium, March, 1968.
61. C. I. Hovland and H. A. Pritzker, "Extent of Opinion Change as a Function of Amount of Change Advocated," Journal of Abnormal/Social Psychology, Vol. 54, 1957, pp. 257-261.
62. Bernard Berelson and Gary A. Steiner, Human Behavior: An Inventory of Scientific Findings, Harcourt, Brace & World, New York, 1964.

63. "A National Program to Conquer Heart Disease, Cancer and Stroke," report of the Subcommittee on Communications, U.S.G.P.O., Washington, 1964.
64. M. W. Thistle, "Popularizing Science," Science, Vol. 127, 1958, pp. 951-955.
65. Charles H. Townes, "Quantum Electronics, And Surprise in Development of Technology," Science, Vol. 159, February, 1968.
66. Marshall McLuhan, Understanding Media: The Extensions of Man, McGraw-Hill, 1965.
67. Prof. James R. Bright, "Can We Forecast Technology?," Industrial Research, March, 1968.

OTHER SOURCES

Other interviewed for this report include representatives of the following organizations:

Automobile Manufacturers Association;

Injury Control Office of the U.S. Department
of Public Health Service,
Cincinnati, Ohio;

Public Health Publications,
USPHS,
Washington, D.C.;

Advertising Council,
Washington, D.C.;

Advertising Council,
Chicago, Illinois;

Sloan Foundation,
Automotive Safety Division,
Washington, D.C.;

Needham, Harper & Steers, Inc.,
Chicago, Illinois;

National Highway Safety Bureau,
Department of Transportation,
Washington, D.C.;

Code Authority Department
National Association of Broadcasters,
Washington, D.C.;

National Safety Council,
Chicago, Illinois

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REFERENCES

Section 8:

1. Anthony T. Kruzas, Directory of Special Libraries and Information Centers, Gale Research, Detroit, 1963; 2nd ed., 1968.
2. Kenneth N. Metcalf, Transportation Information Sources, Gale Research, Detroit, 1965.
3. National Science Foundation, Specialized Science Information Services in the United States, Washington, D.C., 1961.
4. Organization for European Economic Cooperation and Development, International Road Safety Research Directory, 2nd ed., Paris, 1966.
5. Kathryn Childs Cassidy and Joy Redfield, Library Classification Scheme and Selected Bibliography of Traffic Engineering Literature, Bureau of Highway Traffic, Yale University, New Haven, 1948, pp. 71-118.
6. Kathryn Childs Cassidy and Cele Kagan, Bibliography of Traffic Engineering Literature: Selected, Annotated and Indexed, Bureau of Highway Traffic, Yale University, New Haven, 1954.
7. Library of the Bureau of Public Roads, Bibliography: Street and Highway Safety (mimeographed), Highway Research Board, Committee on Causes and Prevention of Highway Accidents, Washington, D.C., 1928.
8. Mildred A. Wilson, Bibliography on Highway Safety, Misc. Publ. #296, Department of Agriculture, Washington, D.C., 1938.
9. Daniel R. Pfoutz and Jackson B. Cohen, "Service to Industry by Public Library," Library Trends, Vol. 14, Jan. 1966, pp. 236-261.
10. G. S. Bonn, "Science-Technology Periodicals," Library Journal, Vol. 88, March 1963, p. 954.
11. D. R. Pfoutz, "Science and Technology Department of the Carnegie Library of Pittsburgh," Crucible, Vol. 49, June 1964, p. 153.
12. Association of State Universities and Land Grant Colleges and National Commission on Safety Education, University Transportation and Accident Prevention Centers. . . , National Education Association, Washington, D.C., 1962.
See also: Office of Education & National Commission on Safety Education, Courses on Highway Safety and Highway Traffic: A Directory of College and University Offerings, National Education Association, Washington, D.C., 1958.
13. United Railway and Electric Company, Bibliography of Publications Relating to Vehicular Traffic and Traffic Control (mimeographed), Baltimore, 1928.

14. American Electric Railway Association, Bibliography on Street and Highway Traffic, AERA Bulletin #305, New York, 1930; rev. ed., AERA Bulletin #355, 1931; Annual Supplement, 1932.
15. Albert Russel Erskine Bureau for Street Traffic Research, A Bibliography on Driving Safety (mimeographed), WPA Project #12259, Harvard University, Cambridge, Mass., 1937.
16. Harry R. De Silva, "Bibliography," Why We Have Automobile Accidents, John Wiley, New York, 1942, pp. 375-387.
17. Highway Research Board, A Selected Bibliography on Highway Safety, HRB Bibliography #2, Washington, D.C., 1947.
18. Frank A. Haight, Annotated Bibliography of Scientific Research in Road Traffic and Safety, Information Circular #33, Institute of Transportation and Traffic Engineering, Los Angeles, 1 April 1963.
19. ____, "Annotated Bibliography on Road Traffic and Safety," Operations Research, Vol. 12, Nov.-Dec. 1964, pp. 976-1039.
20. Guide to Traffic Safety Literature: Articles, Pamphlets, and Books, National Safety Council, Chicago, 1966.
21. State-of-the-Art of Traffic Safety: A Critical Review and Analysis of the Technical Information on Factors Affecting Traffic Safety, Arthur D. Little, 1966.
22. Office of Vehicle Systems Research, National Bureau of Standards, Bibliography on Motor Vehicle and Traffic Safety, Washington, D.C., 1968.
23. Leon G. Goldstein, Human Variables in Traffic Accidents: A Digest of Research and Selected Bibliography, HRB Bibliography #31, Highway Research Board, Washington, D.C., 1962.
24. Highway Research Board, Night Visibility: Selected References, HRB I Bibliography #45, Washington, D.C., 1967.
25. Chester G. Bragaw, A Review of the Literature on the Injury Potential of Automotive Safety Glass, E. I DuPont de Nemours, Wilmington, 1962.
26. General Motors Research Laboratories, System on Automotive Safety Information, Literature Search on Energy Absorbing Systems, Warren, Mich., 1967.
27. General Motors Research Laboratories, System on Automotive Safety Information, Literature Search on Steering Column, Steering Shaft, and Impact Studies, Warren, Mich., 1967.
28. General Motors Research Laboratories, System on Automotive Safety Information, Friction Brakes: A Review of Selected Literature, Warren, Mich., 1966.

29. Paul G. Ronco, Human Factors Engineering Bibliographic Series, Vol. 2: 1960-1964 Literature, Dept. of Defense/Tufts University Institute for Psychological Research, Human Engineering Information and Analysis Center, 1966.
30. Carl C. Clark, A Chronological Bibliography on the Biological Effects of Impact, Martin, Baltimore, 1961; revised and expanded edition, Carl C. Clark, et al, 1962.
31. R. G. Snyder, et al., Biomedical Research Studies in Acceleration, Impact, Weightlessness, Vibration, and Emergency Escape and Restraint Systems: A Comprehensive Bibliography, Vols. 1-7, Civil Aeromedical Research Institute, 1963; Supplement I, J. Ice and R. G. Snyder, 1966.
32. Highway Safety Literature, No. 5, 12 Jan. 1968, p. 12.

REFERENCES

Section 9:

1. M. Kochen, "Systems Technology for Information Retrieval," unpublished memorandum, Mental Health Research Institute, The University of Michigan, Ann Arbor, 1962.
2. Carlos O. Segarra, An Approach to Cost Effectiveness of A Selective Mechanized Document Processing System, AD 651 486, March, 1967.
3. Charles P. Bourne and Donald F. Ford, "Cost Analysis and Simulation Procedures for the Evaluation of Large Information Systems," American Documentation, Vol. 15, No. 2, p. 142-149, April 1964.
4. Charles P. Bourne, Requirements, Criteria, and Measures of Performance of Information Storage and Retrieval Systems, AD 270 942, December 1961.
5. B. L. Mathers, System Performance Specification for a National Chemical Information System, AD 650 901, April 1967.
6. W. E. Chapin, G. L. McCann, and W. H. Veazie, A Study of Requirements for Establishment and Operation of a Transducer Information Center, Battelle Memorial Institute, FDL-TDR-64-34, March, 1964.
7. James W. Perry, and William Goffman, Mathematical Formulation of Basic Procedures in Documentation: Theory of Documentation and Strategy of Searching, Cleveland, Ohio, Contract No. AF (49)638 357.
8. Charles R. Blunt, An Information Retrieval System Model HRB-Singer, October 1965. (AD 623 590)
9. C. Richard Conger, The Simulation and Evaluation of Information Retrieval Systems, HRB-Singer, April 1965. (AD 464 619)
10. U. O. Gagliardi, C. G. Ying, and L. G. Holt, Mathematical Programming Techniques for Information System Design, Dunlap and Associates, July 1964. (AD 605 826)
11. Gus J. Caras, "Computer Simulation of a Small Information System," American Documentation, Vol. 19, April 1968, p. 120.

A P P E N D I X A

SUMMARY OF INTERVIEW RESPONSES

The respondents have been grouped according to their professional functions, and the responses summarized to present a general picture of the needs expressed by each group.

1. Mass Media Representatives
2. Legislators and Legislative Assistants
3. Automobile Dealers
4. Insurance Agents
5. Traffic and Highway Engineers
6. Safety Organizations Representatives
7. Researchers
8. State Officials
9. Police Officials
10. Driver Education Instructors

1. MASS MEDIA REPRESENTATIVES

This group of five people represents some 50 years of writing experience related to highway safety. None of them receives any form of government support. All get considerable information by direct personal contact; most have had no experience with microforms, and those who have did not find them convenient.

Only one of the five saw Traffic Safety regularly; their normal operation most often involved "calling the original source." Several had used the National Safety Council for data or referral to other sources. A major television network has its own information center, but of course, its coverage must be broad and has only a limited capability in traffic safety.

Most members of the press are avid readers of news magazines and newspapers as well as of general-background reading material.

With regard to timeliness of information it is necessary to consider that there are two kinds of reporting: the first is "responsive reporting," the timely reporting of events as they happen. This is ordinarily done without any in-depth searching, and lack of information does not seem to be a handicap. Efforts are often made to provide some back-up for a story, but the need does not seem to be critical. The other type of reporting is investigative--explanations of causes rather than descriptions of events. In this work it is difficult and often impossible to get needed information, but the reporter usually has some weeks to do the research and write the material.

These media representatives look forward to a single good source of highway safety information. They would like information available in a convenient, cross-indexed form so that intelligent answers could be obtained in a one-day turnaround time. Television workers would appreciate a film clip file from which they could borrow material as necessary. Magazine writers (and others who do investigative pieces) would like information about research in progress in time to produce articles on the results in a timely fashion.

Typical queries from media people are: What are the Volvo safety features? How effective are tire studs? How effective are collapsible front ends? What are the safety features of all the new cars [for preparation of a table]? What is the best [most authoritative/comprehensive] existing piece of literature on drunk driving? Do accident record data show which car is the safest/most dangerous?

2. LEGISLATORS AND LEGISLATIVE ASSISTANTS

Two people were interviewed, one with a ten-year interest in traffic safety, the other with a two-year interest. Neither was fully involved in this field, but both estimated that 10 to 15 percent of their time during a given year would be devoted to this subject. Neither had used microforms much, but given the notorious volume of paper work at the federal level it seemed an attractive format.

As in other fields, these potential users subscribe to and read professional journals related to their occupations--the Congressional Quarterly and State Government, and law and accounting journals.

Newsletters in areas of current interest are found useful regardless of their point of view or bias. Personal contact is a major means of acquiring information, often obtained directly because of a wide circle of acquaintances, but also occasionally obtained by referral from a friend or organization. These people are fairly avid readers of periodic news reports--Time, Newsweek, several daily papers. They receive a fair amount of both solicited and unsolicited information from lobbyists, who are considered valuable sources.

Their principal outputs are speeches, bills, and amendments, with only occasional articles written for magazines or newspapers.

Their information problem is one of handling too large a volume of unfiltered information. Congressional journals, books, magazines, pamphlets, etc., add up to thousands of pages per day which cannot be read but must be at least scanned. Some selection process to indicate required reading is certainly needed here.

Typical queries from legislators: What is the accident frequency in my county [for a Kiwanis Club speech]? Is periodic motor vehicle inspection good or bad? How well is NHSB meeting its goals? What areas important to highway safety legislation are left untouched by the present legislation?

3. AUTOMOBILE DEALERS

One foreign and one American-make dealer were interviewed. Both are self-supporting. One stated that he had been interested in highway safety for 20 years, the other for 30 years. When asked what percentage of their time was devoted to highway safety activities, one said 0% and the other said less than 1%. Neither had requested any information lately from anyone regarding highway safety problems, and both felt reasonably happy with what the company brochures provided.

Regular reading material includes the local and National Auto Dealers Association publications, service magazines (free magazines with tips to mechanics, etc.), and Automotive News (which is read regularly in detail).

Timeliness of safety-related information did not seem to be a problem. Dealers are happy to pass along the company's safety brochures to prospective customers. One dealer had a short film strip indicating the safety features of his new model. Neither was much impressed by the safety furor...one stated that "Safety features are not going over very strong...style is most important."

When asked what question he would like to direct to an information center, one respondent wanted material with which to fight the local city sign ordinance (which was currently requiring him to tear down an expensive sign and replace it with another), and material with which to fight the local city traffic engineer's policies (because a recent change in one-way street assignments had affected his business potential negatively). Automobile dealers seem to be most interested in the business effects of auto safety--e.g., they would favor a PMVI program that permitted only new car dealers to perform inspections, and they strongly support the establishment of standards for junking old cars.

One dealer is currently conducting his own "safety" program, which consists of catching "unsafe" items on a normal service check of a car, recommending repair to the owner, and then noting the defects on the bill if the owner declines to have the work performed.

4. INSURANCE AGENTS

We talked with two local insurance agents--one an agent for a single national company, the other an independent agent. Both were interested in auto safety primarily because of their jobs. Neither had used microforms of any kind. Neither had requested any highway safety information from anyone recently.

Their normal information sources include professional journals, e.g., The National Underwriter's Weekly, and the Journal of Insurance Information. They occasionally hear a highway safety speaker at an insurance association meeting. Company pamphlets supply some safety information, and association publications keep them up to date on legislation which affects their business.

Timeliness of information seems to be no problem as they have essentially no requests. Their output, in safety-related fields, is primarily the dissemination of company-provided information. They are active in local safety council work at times, and are occasionally called upon to speak.

Response to queries about how they might use an information center devoted to highway safety indicated that they would not be likely to make many requests. They might, on the other hand, receive and transmit literature provided to them.

5. TRAFFIC AND HIGHWAY ENGINEERS

Two traffic engineers, one at the city level and one at the county level, were interviewed. Length of time interested in highway safety was stated as 7 and 17 years respectively, indicating essentially the length of their professional careers to date. They were supported by local government funds. Both had made use of microforms, and in general liked them.

Their recent requests for information included requests for traffic survey manuals published by the federal government, material on 1969 vehicle standards, appropriation reports, and data on maximum traffic capabilities of certain highway types. In general, their needs were for a mixture of administrative and engineering information, the city engineer being more concerned with administrative matters.

Regular reading material for these people include Traffic Quarterly, Public Works, Rural Roads, and AASHO publications. They also see the IIHS Newsletter, the HRB Publications list, several trade magazines, and both had several personal contacts in the Federal Highway Administration and the State Department of Highways. With regard to timeliness of information, one stated that items are usually received on time, but that since there is often no notice that some particular information or material exists, it is hard to miss having it.

A principal problem for local traffic engineers is that accident records are not prepared in a form that is useful to them. In addition, they desire good summaries of new information available in the field of traffic engineering. One respondent noted that employee time loss from accidents is a serious problem [these are off-the-job traffic accidents]. He proposes to present the National Safety Council's Defensive Driving Course to employees as a countermeasure.

6. SAFETY ORGANIZATION REPRESENTATIVES

We interviewed four representatives of safety organizations. One had been concerned with traffic safety for 12 years, the others for only a few years each. All were supported by nonprofit foundations, and devoted 80% to 90% of their time to highway safety problems. One of the four had used microforms and found them convenient; the others had never used them.

Professional journals read by this group included the Institute of Traffic Engineers Journal, the IACP publications, the SAE Journal, and Automotive Review. This group read several newsletters avidly, but used library services very little. Personal contact seems to account for most of their information input, much of this occurring at conferences, some by telephone and letter.

With regard to timeliness of information, it was noted that there is often a serious delay in getting documents through regular government channels. Legislative news is often received later than desired, although newsletter services tend to keep them informed here. Obtaining knowledge of the existence of reports is often a problem.

Output of this group includes articles and pamphlets for legislative support in the traffic safety field, periodic "traffic facts" documents, talks to various safety groups, news releases, and considerable personal and telephone contact.

They would like to see rather complete bibliographies of material in the field of human communications--including reports of progress in research on emotions, the use of scare tactics, propaganda mechanisms, etc. A summary of their suggestions for improved information service includes:

- (1) An inventory of traffic programs [for my state]
- (2) Quarterly index and bibliography of literature in traffic safety
- (3) Weekly abstracts [with sources indicated]
- (4) Weekly newsletters
- (5) One good centralized library to which I can make requests
- (6) Availability of materials for demonstrations, talks, and presentations
- (7) Current reports of research in progress

7. RESEARCHERS

Although we interviewed only a few researchers completely, we had direct contact with a large number; the responses of both groups are summarized here.

Among those fully interviewed, interest in traffic safety had spanned anything from two weeks (for an economist recently assigned to a federal project) to 30 years (for a senior research administrator). Most of these people were supported by federal funds, at least in part. All got a fair amount of information by direct personal contact--from meetings and from discussions with their colleagues. Half of them had used microforms, and all considered them inconvenient for their use.

Each of these people regularly reads two or three professional journals relevant to his field of interest (psychology, economics, etc.). In addition, most were familiar with and read Traffic Safety (including the research review) regularly. Most of these people are regular readers of newspapers--particularly the New York Times--and of a scattering of news magazines (U.S. News and World Report, Time, and others).

Regarding timeliness of information, the biggest problem seems to be keeping informed on current research. While many researchers feel that duplication of efforts is not necessarily a bad thing in the research phase, they would like to know what kinds of things their peers are up to, and to be able to communicate with them to discuss methodology and early results. Normal journal publishing delays in most fields of research are from six months to two years. Between the author's research time, writing time, and administrative delays, it is not surprising that two parallel research programs (which might well have gained from intercommunication) frequently do not learn of each other's existence until the program is completed. Technical society meetings help to keep researchers informed about current research, but since these are usually intradisciplinary they do not do the whole job.

Timeliness of response of library systems (for reprints, distribution copies of privately printed reports, etc.) is usually acceptable. Several researchers felt that there were unnecessary and harmful delays here too. Many times the requested material is just not available (e.g., limited distribution, out of print).

Researchers' principal outputs are reports to sponsors, journal articles addressed to professional colleagues, and occasional informal talks to civic or professional groups. Results of research are often reported to the general public through public information offices, although the researchers themselves seldom exploit this medium.

Typical questions from researchers are dominated by requests for factual data. For example, what is the number of passing accidents in the U.S. per year, what is the projection of the gross national product, how many illnesses and injuries (by type) are associated with vehicular accidents? Such requests often take the form of a request for a particular paper--usually a journal article, and usually from a journal not likely to be stocked by a small library. One researcher was concerned with measuring the efficacy of certain injury countermeasures, and wanted to determine the percentage of seat-belt use in the United States. In order to determine this, however, he had to request numerous articles whose titles suggested they might lead to the information.

Specific suggestions from researchers include the requirement for a broad capable library nearby (at least in the same city if not in the same building). In general, the researcher desires hard copy which he can peruse at his desk, and he wants the full text of articles rather than a brief abstract. Abstracts are useful in leading him to the right document, but before drawing conclusions he will probably want the article itself. Additionally, an augmented research-in-progress reporting system such as now exists in the Traffic Safety Research Review and the Highway Research Information Service's Research In Progress, is much desired.

8. STATE AGENCY OFFICIALS

In this category we have grouped together representatives of a number of state agencies vitally concerned with the traffic safety problem. This includes the governor's traffic safety representative, the chairman of the state safety commission, the driver education administrator, and representatives from the highway department, the health department, the public service commission, and the department of state (which in this state is responsible for vehicle and driver licensing). All but two of the people estimate that 100% of their time is spent in activities related to highway safety, and their average experience in this work is 16 years. Most are supported by state funds, although a few receive a part of their support from federal sources. Most had seen microforms of some kind, but did not like to use them because they could not take the material home easily. One had used it extensively for record storage, but not for ordinary printed material. He found it useful in that service.

Recent queries made by these people were often for (1) advice (e.g., what is the effectiveness of a given state advisory committee, are air pollutants from cars a serious health hazard in this state); (2) data (where are mobile hospital sites in the U.S., what are the Washington State motorcycle injury statistics); and (3) documents reporting other states' activities (report of Wisconsin driver education curriculum, vehicle codes of all the states, copies of implied consent forms from other jurisdictions).

Most keep up to date in their special field of interest by reading a few professional journals: AAMVA Bulletin, Journal of American Insurance, JAMA, Journal of Trauma, Medical Economics, Traffic Safety Digest. Most see and use Traffic Safety (and the research review). They seem to use personal contacts less for information than some of the other users, although this is still an important source.

Information is often not timely enough to help in making necessary decisions. At the level at which these gentlemen operate, decisions are likely to be important ones, and they often require good supporting evidence regarding other states' experience in the same area. Such reports are often not received in time (e.g., for this year's legislative session), but the lateness is more often caused by lack of knowledge about research projects or reports than it is by the mechanical delays of procuring the reports. In general, the higher the station of the

individual the more concerned he is about "on-line" retrieval. Conversely, this individual usually wants summarized results and conclusions, rather than little pieces of data, or raw research reports.

These individuals generally produce summary reports concerning activities for which they have been responsible. In addition, they frequently help prepare legislation and serve as staff to the elected officials at the state level in getting together support material for legislative action. Technical reports, administrative memorandums, financial plans, and program planning documents are often actually produced by other people in their employ at slightly lower levels, although they may be signed by the officials.

When asked what single question they might address to an information service, most wanted advice, or relatively deep evaluative answers to difficult questions. For example, one official would like to see a report on the status of scientific evidence supporting the standards promulgated by the secretary of transportation; one wanted all information which shows that driver education makes a difference; and one would like to know by what percent highway mortality could be reduced by an improved highway medical care program.

Specific suggestions for improvements include a national and regional clearinghouse for highway safety information; a more sophisticated indexing system; improved methods for dissemination; translations of foreign material (including some selective dissemination of same); better summaries of studies and better abstracts; newsletters restricted to the bare essentials to facilitate rapid assimilation of relevant information on current work in the field; directories of individuals engaged in highway safety work; compilations of laws relevant to the field; accessibility of documents in interdisciplinary areas; and better and speedier retrieval service.

9. POLICE OFFICIALS

Two police officials, with an average of 19 years experience, were interviewed. One was a department head at the state level, the other performed a similar function in a city of 80,000 residents; both are entirely supported by tax moneys. They both considered that nearly all their time was spent in traffic safety activities; neither had made use of microforms except for record-keeping.

Recent requests for information in the field of highway safety included (1) how serious is the motorcycle problem, locally and comparatively; (2) how can we get the most for the money in street lighting; (3) what kind of driver education programs are available for school bus drivers; (4) what are the federal and state standards regarding motorcycle helmets; and (5) can something be done to control the rent-a-car?

Professional journals read include the Journal of the International Association of Chiefs of Police, the International City Manager's Association series, and Traffic Quarterly. Regularly read are the IIHS Newsletter and the state traffic safety legislative newsletter. Traffic Safety is scanned regularly. Some use is made of the local

library, and occasional requests have been directed to the Traffic Institute at Northwestern and the Institute of Traffic Engineers. Travelers Insurance Company literature and National Safety Council books and posters are welcomed. Information needed or requested is usually received in a timely fashion.

Output of senior police officials such as these is often in the form of radio and TV spot announcements, speeches to civic clubs, participation in safety conferences, and newspaper releases. Their recent important requests include the following: (1) Provide us with information showing that the driver (or other factor) is the greatest factor contributing to accidents; (2) Is the social drinker or the alcoholic the greater problem?

Items of particular interest--the city policeman wanted to see national accident data in a form that would permit him to compare his town's performance with other towns of similar population and structure. Both wished for a catalog of papers and films in highway safety.

10. DRIVER EDUCATION, INSTRUCTORS

Interviews were conducted with both commercial and high-school driver education instructors, and also with the organizers of a truck driver training school taught in conjunction with junior college programs. Each of the people interviewed had been in the driver instruction field for more than five years and considered his work to be directly related to the traffic safety problem. The commercial school was supported by fees, the high school teacher by local school taxes (plus a state subsidy for driver education), and the truck driving program was supported initially by a federal grant and later by a combination of state and student support. None of these people had used microforms enough to form an opinion as to their usefulness.

Sources of information for driver education teachers include journals--Safety Magazine, Traffic Safety, and newsletters from local driver education associations or the national association (ADTSEA division of NEA). There is often a mixture in the journals of material in driver safety and school safety. The teachers interviewed seldom used library services for printed material, but did draw upon film libraries for 16-mm sound films. Printed material for distribution to the class is more often obtained from the AAA, from various automobile and oil companies, and from other special groups (alcohol associations, etc.). AAA and NEA publish source lists indicating where school teachers can obtain free material simply by writing for it. Abstract services in this field do not seem to exist except incidentally in connection with magazines or newsletters.

Most information requested is received in a timely fashion. One notable exception to this is borrowed or rented films, which often must be scheduled 4 to 6 months in advance. Larger high schools purchase films (cost is typically \$200 for a 20-minute 16-mm film with sound), but smaller schools must depend on rental sources or helpful automotive manufacturers.

A particular problem seems to exist in the lack of a comprehensive source list for movies. Knowledge of the existence of films seems to come about in a random fashion, and the few compilations which exist go out of date quickly. One instructor felt that the films used in the Aetna and Allstate simulators were particularly good, and that they could be used without the simulator for classroom presentation if available. A few good strip films (with audio accompaniment) are available at modest cost, but these too have no central listing.

Cost appears to be a real problem in driver education programs. Most are operated with some state support, but the school cannot generally afford expensive rentals or purchases and tends to use free material whenever it can. Alcohol and drug education is often incorporated within the driver training program, and several good free sources of information in this field are available.

There are many texts available for driver education, although the most popular seems to be Sportsmanlike Driving. There is no universally acceptable curriculum guide--some states have adopted one and promulgate it for guidance of instructors in the jurisdictions, but others simply require that a course be taught without providing much guidance as to its content. Each teacher had some strong personal opinions as to what should be included in the curriculum, but none seemed to have any evidence to support his opinions.

Programmed learning materials are scarce in the driver education field, although a recent effort by the AAA has brought forth some. The U.S. Air Force has sponsored the development of a series of training films presented in a multimedia system which are well thought of, but not available to the general public or high school teacher.

A P P E N D I X B[#]

HIGHWAY SAFETY/TRANSPORTATION LIBRARIES AND INFORMATION
CENTERS IN THE UNITED STATES

(Asterisks Indicate Libraries Visited)

Agricultural and Mechanical College of Texas
Texas Engineering Library
College Station, Texas

Alabama State Highway Department
General Technical Library
Montgomery, Alabama

American Automobile Association - Library
Washington, D.C.

American Road Builders' Association - Library
Washington, D.C.

American Society of Safety Engineers - Library
Chicago, Illinois

American Trucking Associations Library
Washington, D.C.

Arizona State Highway Department Library
Phoenix, Arizona

Automobile Club of Philadelphia Library
Philadelphia, Pennsylvania

Automobile Manufacturers Association Library
Detroit, Michigan

*Automotive Safety Foundation Library
Washington, D.C.

Borg-Warner Corporation
Roy C. Ingersoll Research Center Library
Des Plaines, Illinois

*Bureau of Public Roads Library
Washington, D.C.

*Bureau of Railway Economics Library
Association of American Railroads
Washington, D.C.

California State Department of Public Works Libraries
Sacramento, California

#The literature collections noted here were taken primarily from the Directory of Special Libraries and Information Centers, Second Edition, A.T. Kruzas (Editor), published by Gale Research Co., 1968, thus many entries were not confirmed.

California (State) Division of Highways
Bridge Department Library
Sacramento, California

California (State) Division of Highways
Materials and Research Department Library
Sacramento, California

California (State) Division of Highways
Planning Library
Sacramento, California

Campbell-Ewald Company Library
Detroit, Michigan

Chrysler Corporation, Engineering Division
Engineering Library
Detroit, Michigan

Colorado Department of Highways Library
Denver, Colorado

Connecticut State Highway Department
Research and Development Division Research Library
Wethersfield, Connecticut

Dallas Public Library Science and Industry Department
Dallas, Texas

Delavan Manufacturing Company Engineering Library
West Des Moines, Iowa

Denver Public Library Sociology and Business Department
Denver, Colorado

Detroit Public Library, Automotive History Collection
Detroit, Michigan

Detroit Public Library, Science and Technology Department
Detroit, Michigan

Eaton Yale and Towne, Inc.
Research Center Library
Southfield, Michigan

Flint Public Library
Automotive Collection
Flint, Michigan

Florida State Road Department, Specification Office
Engineering Library
Tallahassee, Florida

Ford Motor Company Engineering Staff Technical Information Section
Engineering Library
Dearborn, Michigan

General Motors Corporation
Public Relations Library
New York, N. Y.

General Motors Corporation
Public Relations Staff Library
Detroit, Michigan

*General Motors Corporation
Research Laboratories Library
Warren, Michigan

General Motors Corporation, AC Spark Plug Division Research Library
Flint, Michigan

General Motors Corporation, Cadillac Motor Division Engineering Library
Cleveland, Ohio

General Motors Corporation, Chevrolet Motors Division
Engineering Center Library
Warren, Michigan

General Motors Corporation
Harrison Radiator Division Library
Lockport, N. Y.

General Motors Institute Library
Flint, Michigan

Georgia Institute of Technology
Price Gilbert Memorial Library
Atlanta, Georgia

Greater New York Safety Council Library
New York, N. Y.

Harvard University Library
Baker Library Transportation Room
Cambridge, Massachusetts

*Highway Research Board Library
Washington, D.C.

*Highway Research Information Service
Highway Research Board
Washington, D.C.

*Highway Safety Research Information Center
Highway Safety Research Institute
University of Michigan
Ann Arbor, Michigan

*Highway Traffic Safety Center
Michigan State University
East Lansing, Michigan

Illinois Division of Highways
Bureau of Research and Planning Engineering Library
Springfield, Illinois

Indiana (State) Highway Commission
Office of Highway Development
Technical Library
Indianapolis, Indiana

Indiana University Business Library
Bloomington, Indiana

Institute of Traffic Engineers Library
Washington, D.C.

*Institute of Transportation and Traffic Engineering Library
University of California
Richmond, California

*Insurance Institute for Highway Safety Library
Washington, D.C.

*International Association of Chiefs of Police Library
Washington, D.C.

Interstate Commerce Commission Library
Washington, D.C.

Jam Handy Editorial Library
Detroit, Michigan

Kansas State Highway Commission - Library
Topeka, Kansas

Kentucky (State) Department of Highways Library
Frankfort, Kentucky

Livingston Free Public Library
Livingston, N.J.

Long Island Automotive Museum
Automotive Research Service
Glen Cove, N.Y.

Louisiana (State) Department of Highways Library
Baton Rouge, Louisiana

Mack Trucks Research Department
Technical Information Service Library
Plainfield, New Jersey

*Michigan State Highway Department
 Highway Library
 Lansing, Michigan

*Minnesota - State Highway Department
 General Library
 St. Paul, Minnesota

Mississippi State Highway Department
 Testing Division Library
 Jackson, Mississippi

Mississippi State Highway Department
 Traffic & Planning Division Technical Center
 Jackson, Mississippi

National Association of Motor Bus Owners Library
 Washington, D.C.

National Auto and Truck Wreckers Association Library
 San Mateo, California

National Automobile Dealers Association
 Research and Legal Library
 Washington, D.C.

National Bureau of Standards
 Technical Information Unit
 Office of Vehicle Systems Research
 Washington, D.C.

National Highway Users Conference Library
 Washington, D.C.

National Museum of Transport Reference Library
 St. Louis, Missouri

National Professional Driver Education Association (NPDEA) Library
 Chicago, Illinois

National Safety Council - Lehigh Valley Chapter
 Safety Information Center
 Bethlehem, Pennsylvania

*National Safety Council Library
 Chicago, Illinois

New Hampshire Department of Public Works and Highways Library
 Concord, New Hampshire

New Mexico State Highway Department, Planning Division Library
 Santa Fe, New Mexico

New York Public Library Science and Technology Division
New York, New York

New York State Department of Motor Vehicles Library
Albany, N. Y.

New York-New Jersey Transportation Agency Library
New York, N. Y.

*Northwestern University
Transportation Center Library
Evanston, Illinois

Ohio State University Aeronautical-Civil Engineering Library
Columbus, Ohio

Ohio State University Commerce Library
Columbus, Ohio

Oklahoma (State) Department of Highways
Technical Library
Oklahoma City, Oklahoma

Oregon (State) Highway Commission Technical Library
Salem, Oregon

Pennsylvania (State) Department of Highways - Library
Harrisburg, Pennsylvania

Philadelphia Free Library
Philadelphia, Pennsylvania

Port of New York Authority
New York, N. Y.

Princeton University
Bureau of Urban Research Library
Princeton, New Jersey

Purdue University Library
Lafayette, Indiana

Ross Roy-B.S.F. and D. Library
Detroit, Michigan

*Safety Research Information Service
National Safety Council
Chicago, Illinois

Seattle Public Library Business and Economics Department
Seattle, Washington

South Dakota State Highway Commission
Research Division Library
Pierre, South Dakota

*Stanford University Library
Hopkins Transportation Library
Palo Alto, California

Suffolk Museum & Carriage House
Stony Brook, N. Y.

*System on Automotive Safety Information
General Motors Research Laboratories
Warren, Michigan

Texas A&M University
Texas Transportation Institute Library
College Station, Texas

Transportation Association of America Library
Washington, D.C.

Tri-State Transportation Commission
New York, N. Y.

University of California
Bureau of Public Administration Library
Berkeley, California

University of Michigan
Transportation Library
Ann Arbor, Michigan

Utah State Road Commission, Department of Highways
Technical Library
Salt Lake City, Utah

Virginia (State) Governor's Highway Safety Committee
Public Film Library
Richmond, Virginia

West Virginia State Road Commission
Reference Library
Charleston, West Virginia

Yale University
Bureau of Highway Traffic Library and Transportation Library
New Haven, Connecticut

A P P E N D I X C

HSRIC PILOT ON-LINE REMOTE-ACCESS RETRIEVAL SYSTEM

This search was run using the Hsric Pilot System. The cards appended to the search were retrieved from an accession number file that had been previously produced by computer.

UNIVERSITY OF MICHIGAN TERMINAL SYSTEM : ANN ARBOR, MICHIGAN. (LA16-040)
WHO ARE YOU?
UMHYSRI A AA

##SIG SH35 PW=
##*LAST SIGNON WAS: 13:07.15 05-03-68
USER "SH35" SIGNED ON AT 13:12.26 ON 05-03-68
##SOURCE HSRIC
#\$RUN SEARCH; 1=*MSOURCE* 2=MASTER 3=*MSINK*
#EXECUTION BEGINS

THIS IS THE HIGHWAY SAFETY

RESEARCH INFORMATION CENTER

SUBJECT RETRIEVAL SYSTEM

HAVE YOU USED IT BEFORE?

NO

THIS PILOT SYSTEM USES SUBJECT CODES TO RETRIEVE
DOCUMENT ACCESSION NUMBERS. CONTACT HSRIC FOR REFERENCES
OR COMPREHENSIVE SEARCHES AT (313) 764-2171.

WHAT IS YOUR NAME?
JIM SMITH

INPUT KEYS TO THE RETRIEVAL SYSTEM ARE SUBJECT CODES DIRECTLY
PRECEDED BY SINGLE DIGIT INTEGERS (1-9). ENTER ONE SUBJECT CODE
PER LINE. SUBJECT CODES TO BE JOINED IN A LOGICAL "AND" SHOULD BE
PRECEDED BY THE SAME INTEGER. EXAMPLE OF DEC "AND" JAN:

1DEC
1JAN

***** ENTER SUBJECT CODE INPUT KEYS *****

1J
2JN
1DEC
3TX

***** A COUNT BY KEYS OF ITEMS FOUND *****
(NON-PRINTING KEYS HAD 0 HITS)

COUNT(1)= 2
COUNT(2)= 2

SHOULD DOC NOS. BE PRINTED?

YES

H02001 H02011 H02046

***** ENTER SUBJECT CODE INPUT KEYS *****

DONE
#EXECUTION TERMINATED
#SSIG
#OFF AT 13:17.03
#ELAPSED TIME 276.983 SEC.
#CPU TIME USED 3.92 SEC.
#STORAGE USED 5570.776 PAGE-SEC.
#APPROX. COST OF THIS RUN \$1.49
#FILE STORAGE 4 PG-HR. .00

HSRIC-02001

CHARLES, S.

STATES, J.

PHYSICIANS' RESPONSIBILITY IN PREVENTION OF BODILY INJURIES
BY THE AUTOMOBILE.

AUTOMOTIVE SAFETY, SPRINGFIELD, N. J. / AMERICAN ASSOCIATION
OF AUTOMOTIVE MEDICINE, ROCHESTER, N. Y.

JULY 4, 1966. 14 P. REF.

REFERENCE. JAMA, VOL. 197, NO. 1. PP. 107-120.

DEC PASSENGER CARS, PASSENGER MOTOR VEHICLES, VEHICLES
E PEOPLE
J ACCIDENT
JN INJURY/ TRAUMA
RCCB SAFETY RESPONSIBILITY, STATUTES, LAWS, LEGAL ASPECT
VM BIOMEDICAL SCIENCES, DISCIPLINES
YCJ FUTURE/ PROJECTION, NATURE OF STUDY, REPORT TYPE

HSRIC-02011

OSBORNE, H. W.

TRANSPORTING THE SICK AND INJURED IN NIAGARA FRONTIER PLAN.

OCT 1960. 13 P. FIG.

REFERENCE. TRAFFIC QUARTERLY, PP. 528-541.

JN INJURY, ACCIDENT
JRC TRANSPORTATION, RECOVERY OF INJURED
KN BUFFALO, NEW YORK
YEM INSTRUCTIONS/ SPECIFICATIONS, CONTENTS,
STUDY-REPORTYBG PROGRAM REVIEW, PROGRESS STATUS

HSRIC-02046

WALLER, J. A.

USE AND MISUSE OF ALCOHOLIC BEVERAGES AS FACTOR IN MOTOR
VEHICLE ACCIDENTS.

CALIFORNIA STATE DEPT OF PUBLIC HEALTH, BUREAU OF
OCCUPATIONAL HEALTH, BERKELEY.

JULY 1966. 7 P. REF.

REFERENCE. PUBLIC HEALTH REPORTS, VOL. 81, NO. 7. PP.
591-597.

CONFERENCE. HEALTH, EDUCATION, AND WELFARE'S CONFERENCE
ON ALCOHOL AND ACCIDENTAL INJURY, WASH. D. C. SEPT
17, 1965.

DEC PASSENGER CARS, PASSENGER MOTOR VEHICLES, VEHICLE
J ACCIDENT
OBCH ALCOHOL, TOXICOLOGY, PROBLEMS, MEDICAL ASPECT
DE PSYCHOLOGICAL PERFORMANCE

A P P E N D I X D

HSRIC FORMS

Forms presently in use at the Highway Safety Research Information Center have been included here as examples of 8 x 5 forms.

- (1) Request Card
- (2) Inquiry Form
- (3) Acquisition Card
- (4) Process Card
- (5) Catalog Card (8 x 5)
- (6) Photoreduced Catalog Card (3 x 5)
- (7) Emergency Medical Subject Code Sheet

REQUEST CARD

HSRI LIBRARY

REQUEST

(name)

(date)

(journal title, vol, paging, date)

(author)

(title)

(corporate origin)

(report no.)

Comments:

HS-Form 7

SYSTEMS & FORMS CO.
P.O. BOX 488 - JACKSON, MICH.



Date _____

~~Order No.~~ ~~6030~~

From: Highway Safety Research Institute Library
The university of Michigan
3rd Fl. City Center Building
220 E. Huron Street
Ann Arbor, Michigan 48108

To:

We request _____ copy (ies) of the following: _____ Report _____ Reproduction
_____ Reprint Other _____

If there is a charge for this material, please indicate _____, and return this blank, but do not send the material until you receive our purchase order.

For: _____

Attention: _____

ACQUISITION CARD

HSRI
03 500

INBOUND GULF FREEWAY RAMP CONTROL STUDY I

by
Gulf Freeway Surveillance Project Staff
Charles Pinnell
Donald R. Drew
William R. McCasland
Joseph A. Wattleworth

Research Report Number 24-10

Gulf Freeway Surveillance and Control
Research Project Number 2-8-61-24

Sponsored by

The Texas Highway Department
In Cooperation with the
U. S. Department of Commerce, Bureau of Public Roads

December, 1964

TEXAS TRANSPORTATION INSTITUTE
Texas A&M University
College Station, Texas

HSRI
03 500

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HIGHWAY SAFETY SUBJECT AREAS

- A Alcohol**
- AI Accident Investigation/ Information communications, records**
- BM Biomechanics/ Biomedical human tolerance/dynamics injury-mechanism, rescue service**
- HF Human Factors psychology/behavior/attitude ergonomics education (driver) anthropometrics**
- SL Social/ Legal economics finance administration regional planning** **PMVI (Motor Vehicle Inspection) licensing enforcement legislation**
- TO Traffic/ Operations control, flow, measurement**
- VO Vehicle/ Occupant (vehicle as related to occupant) restraint, comfort, visibility seats, controls, interior components**
- VR Vehicle/ Road (vehicle as related to Road and surroundings) tires, engine, brakes, other components dynamics, crashworthiness**
- W Highway/ Road design, construction, maintenance roadside, bridge, pavement**

GR General/ Reference

HSRI Form 13

Ref _____ HSRI _____

FOR _____

Acquisition Card Y N

Cataloging

Checked _____

Indexing

Abstract _____

Shelved _____ Routed _____
(date)

Printing

To _____ From _____

Exchange File _____

Lost/Reject/Duplicate of HSRI

Notes:

Reordered

P/O

Meetings

PROCESS CARD

HSRIC-02013

BUNDORF, T.
HARDIN, M. C.

POLLOCK, D.

VEHICLE HANDLING RESPONSE TO AERODYNAMIC INPUTS.

GENERAL MOTORS CORP., RESEARCH LABORATORIES, ALLISON
DIVISION.

1964 APPROX. 17 P. FIGS. REF.

| | |
|-------|--|
| DEC | PASSENGER CARS, PASSENGER MOTOR VEHICLES, VEHICLE |
| MAK | WIND, ATMOSPHERE, WEATHER |
| NLZRD | HANDLING, VEHICLE PERFORMANCE, PHENOMENA, PHYSICAL |
| WEF | FIELD, EXPERIMENTAL, METHODS |
| WEG | LABORATORY, EXPERIMENTAL, METHODS |
| WNB | MODELS AND MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS |
| YCB | RESEARCH, NATURE OF STUDY, STUDY-REPORT TYPE |
| YEG | TABLES/ GRAPHS, CONTENTS, STUDY-REPORT TYPE |

PHOTOREduced CATALOG CARD (3 x 5)

BUNCORF, I.
HARDIN, M. C.

POLLOCK, D.

HSRIC-02013

VEHICLE HANDLING RESPONSE TO AERODYNAMIC INPUTS.

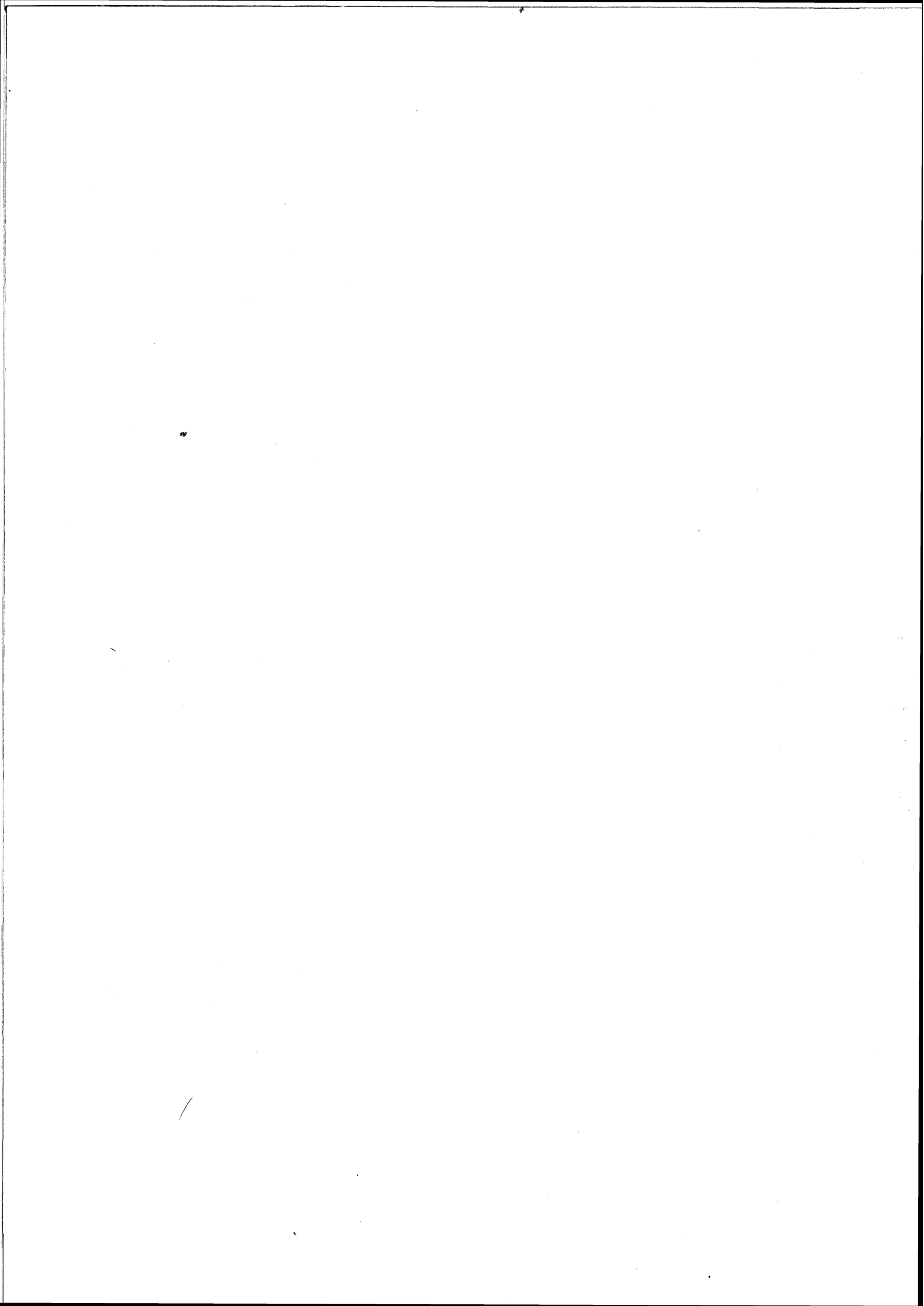
GENERAL MOTORS CORP., RESEARCH LABORATORIES, ALLISON
DIVISION.

1964 APPROX. 17 P. FIGS. REF.

| | |
|-------|--|
| DEC | PASSENGER CARS, PASSENGER MOTOR VEHICLES, VEHICLE |
| MAK | WIND, ATMOSPHERE, WEATHER |
| NLZRD | HANDLING, VEHICLE PERFORMANCE, PHENOMENA, PHYSICAL |
| WEF | FIELD, EXPERIMENTAL, METHODS |
| WEG | LABORATORY, EXPERIMENTAL, METHODS |
| WNB | MODELS AND MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS |
| YCB | RESEARCH, NATURE OF STUDY, STUDY-REPORT TYPE |
| YEG | TABLES/ GRAPHS, CONTENTS, STUDY-REPORT TYPE |

EMERGENCY MEDICAL SUBJECT CODE LIST

| COMPONENTS | ACCIDENT | BIOMEDICAL ASPECT | METHODS | EQUIPMENT | STUDY-REPORT TYPE |
|---|---|---|---|---|---|
| <p>COMPONENTS MYS (groups)</p> <p>GA Highway GB Airways GC Buses GD Buses/Off-Road GE Buses/Off-Road GF Buses/Off-Road GG Buses/Off-Road GH Buses/Off-Road GI Buses/Off-Road GJ Buses/Off-Road GK Buses/Off-Road GL Buses/Off-Road GM Buses/Off-Road GN Buses/Off-Road GO Buses/Off-Road GP Buses/Off-Road GQ Buses/Off-Road GR Buses/Off-Road GS Buses/Off-Road GT Buses/Off-Road GU Buses/Off-Road GV Buses/Off-Road GW Buses/Off-Road GX Buses/Off-Road GY Buses/Off-Road GZ Buses/Off-Road</p> | <p>ACCIDENT JA Preventive Measures JB Bumping-off-Road JC Bumping-off-Road JD Bumping-off-Road JE Bumping-off-Road JF Bumping-off-Road JG Bumping-off-Road JH Bumping-off-Road JI Bumping-off-Road JJ Bumping-off-Road JK Bumping-off-Road JL Bumping-off-Road JM Bumping-off-Road JN Bumping-off-Road JO Bumping-off-Road JP Bumping-off-Road JQ Bumping-off-Road JR Bumping-off-Road JS Bumping-off-Road JT Bumping-off-Road JU Bumping-off-Road JV Bumping-off-Road JV Bumping-off-Road JW Bumping-off-Road JX Bumping-off-Road JY Bumping-off-Road JZ Bumping-off-Road</p> | <p>BIOMEDICAL ASPECT OA Anatomy OB Anatomy OC Anatomy OD Anatomy OE Anatomy OF Anatomy OG Anatomy OH Anatomy OI Anatomy OJ Anatomy OK Anatomy OL Anatomy OM Anatomy ON Anatomy OO Anatomy OP Anatomy OQ Anatomy OR Anatomy OS Anatomy OT Anatomy OU Anatomy OV Anatomy OW Anatomy OX Anatomy OY Anatomy OZ Anatomy</p> | <p>METHODS WA Biological WB Biological WC Biological WD Biological WE Biological WF Biological WG Biological WH Biological WI Biological WJ Biological WK Biological WL Biological WM Biological WN Biological WO Biological WP Biological WQ Biological WR Biological WS Biological WT Biological WU Biological WV Biological WW Biological WX Biological WY Biological WZ Biological</p> | <p>EQUIPMENT XA Transmitters/Receivers XB Radios XC Radios XD Radios XE Radios XF Radios XG Radios XH Radios XI Radios XJ Radios XK Radios XL Radios XM Radios XN Radios XO Radios XP Radios XQ Radios XR Radios XS Radios XT Radios XU Radios XV Radios XW Radios XX Radios XY Radios XZ Radios</p> | <p>STUDY-REPORT TYPE YA Progress Status YB Progress Status YC Progress Status YD Progress Status YE Progress Status YF Progress Status YG Progress Status YH Progress Status YI Progress Status YJ Progress Status YK Progress Status YL Progress Status YM Progress Status YN Progress Status YO Progress Status YP Progress Status YQ Progress Status YR Progress Status YS Progress Status YT Progress Status YU Progress Status YV Progress Status YW Progress Status YX Progress Status YY Progress Status YZ Progress Status</p> |
| <p>OPERATIONS KA Airports KB Airports KC Airports KD Airports KE Airports KF Airports KG Airports KH Airports KI Airports KJ Airports KK Airports KL Airports KM Airports KN Airports KO Airports KP Airports KQ Airports KR Airports KS Airports KT Airports KU Airports KV Airports KW Airports KX Airports KY Airports KZ Airports</p> | <p>OPERATIONS LA Airports LB Airports LC Airports LD Airports LE Airports LF Airports LG Airports LH Airports LI Airports LJ Airports LK Airports LM Airports LN Airports LO Airports LP Airports LQ Airports LR Airports LS Airports LT Airports LU Airports LV Airports LW Airports LX Airports LY Airports LZ Airports</p> | <p>ENVIRONMENT MA Airports MB Airports MC Airports MD Airports ME Airports MF Airports MG Airports MH Airports MI Airports MJ Airports MK Airports ML Airports MN Airports MO Airports MP Airports MQ Airports MR Airports MS Airports MT Airports MU Airports MV Airports MW Airports MX Airports MY Airports MZ Airports</p> | <p>ENVIRONMENT NA Airports NB Airports NC Airports ND Airports NE Airports NF Airports NG Airports NH Airports NI Airports NJ Airports NK Airports NL Airports NM Airports NO Airports NP Airports NQ Airports NR Airports NS Airports NT Airports NU Airports NV Airports NW Airports NX Airports NY Airports NZ Airports</p> | <p>ENVIRONMENT OA Airports OB Airports OC Airports OD Airports OE Airports OF Airports OG Airports OH Airports OI Airports OJ Airports OK Airports OL Airports OM Airports ON Airports OO Airports OP Airports OQ Airports OR Airports OS Airports OT Airports OU Airports OV Airports OW Airports OX Airports OY Airports OZ Airports</p> | <p>ENVIRONMENT PA Airports PB Airports PC Airports PD Airports PE Airports PF Airports PG Airports PH Airports PI Airports PJ Airports PK Airports PL Airports PM Airports PN Airports PO Airports PP Airports PQ Airports PR Airports PS Airports PT Airports PU Airports PV Airports PW Airports PX Airports PY Airports PZ Airports</p> |



A P P E N D I X E

HIGHWAY SAFETY RESEARCH INFORMATION CENTER
STRUCTURED THESAURUS

This appendix contains a comprehensive highway safety thesaurus in use at HSRIC. The first section is an alphabetical display in a rotated format that provides access to individual terms of multiterm descriptors and provides several levels of generic-specific structure at one entry point. The second section contains the structured display in a table-of-contents or outline format.

By

Joseph C. Marsh IV

Rameshwar N. Paul

Alexa C. Sehr

FOREWORD

The Highway Safety Research Information Center (HSRIC) structured thesaurus has been developed over the last two years to meet the Center's present needs and to permit the direct application of mechanized information storage and retrieval techniques via the remote teletype terminal presently operating in the Center. The indexing scheme has been actively and successfully used for over a year. This revised index incorporates changes suggested by this experience.

This edition of the thesaurus includes rotated or permuted display that provides an alphabetical entry for each word of multiterm or compound descriptors along with several levels of generic-specific relationships, i.e., terms to the left of an entry are more specific, to the right, more general. The third section of this thesaurus contains a hierarchical display in a table-of-contents format. Future development of the HSRI indexing scheme will include its expansion to cover new concepts (terms), and coordination with other information centers in the development of a common indexing language.

There are no restrictions limiting the use of the HSRI subject indexing scheme. Comments, corrections, suggestions are encouraged by the authors, as the scheme is subjected to continuing review and development as new problems arise.

Acknowledgment should be made to the HSRI staff, Donald Munro and Michael Thall for their participation in the development of this thesaurus, and Willis C. Johnson for programming the IBM 1401 used to generate the rotated-alphabetical and hierarchical displays. Their contributions are greatly appreciated.

CONTENTS

Foreword

1. Introduction
2. Rotated Alphabetical Display
3. Structured Generic Display

COMPONENTS (Objects, Physical Entities of the System)

- B Materials
- C Ways (Roads)
- D Vehicles
- E People
- F Society (Organizations of People)

OPERATIONS (Verbs, Actions of the System)

- G Traffic
- H Regulation and Control
- I Services
- J Accidents (Includes Injury)

ENVIRONMENT (Natural Environment)

- K Space (Geography)
- L Time
- M Weather

ASPECTS (Perspectives, Points of View of the System)

- N Physical
- O Biomedical
- P Psychological
- Q Educational
- R Legal
- S Socioeconomic

TOOLS (For Problem Solving)

- V Disciplines
- W Methods
- X Equipment
- Y Report Type

INTRODUCTION

This structured thesaurus is intended to serve as a subject guide or aid for indexers and users of the literature of highway safety within the Highway Safety Research Information Center (HSRIC). This vocabulary control tool was established to normalize the language of documents to the language of questions and, as such, lead the subject indexer (or searcher) from text (or search) words to standardized terms (or codes) in a common vocabulary.

Subject indexing, the identification of a document's contents for the purpose of subsequent retrieval, involves two steps:

1. The indexer chooses clues that will serve to identify the item for purposes of retrieval by deciding what the document is about, what concepts are covered, and what questions the document is likely to answer.
2. The indexer records the tags, labels, or codes representing these clues. He codes the documents according to the concepts it presents by selecting as many codes, or clues, from the HSRIC subject index facets as required to adequately describe the document's contents.

A similar procedure is used in retrieval. The indexer expresses the original text concepts in key words or clues. The searcher expresses his query in search words. Thus, a controlled vocabulary of concepts (or thesaurus) is used to normalize the language of documents to the language of questions.

To build the HSRIC Structured Thesaurus, we grouped similar or related terms and then the terms within each separate group were structured in a hierarchical (general to specific) fashion. Thus, legal words such as laws, violations, licensing were grouped together and then structured within the group. These groups (or facets) are displayed in Section 3.

Components are the tangible items, things, or entities that make up highway transport system. The key components are People, Vehicles, and Ways (Roads). Vehicles and Roads are made of Materials, and People manifest themselves in the form of Society (Communities, corporate bodies, and governments) which provide an organizational background for highway transportation operations.

Operations are the "verbs", that is, the actions and interactions of the components. Here we find traffic jams and accidents.

Environment refers to natural environment of Space, Time, and Weather that affects all components and all operations.

Aspects are points of view or perspectives with which one can look at highway safety.

Tools comprise the problem-solving aids. Disciplines are the traditional academic areas of study such as mathematics, medicine, highway engineering. Methods consist of theoretical procedural

techniques, such as statistical analysis, that may be used to study the problems of highway safety. Equipment consists of hardware necessary to conduct a program, experiment, or study.

The second section of this thesaurus contains a rotated or permuted format that displays entries alphabetically under each word of multiterm or compound descriptors as well as several levels of general-specific relationships. Terms can be found alphabetically in the heavily printed center column. More specific terms can be found to the left, and more general, to the right. For example, "Spark Plugs" can be found under "Spark" and "Plugs". The subject codes in the right hand column can be used in the structured display (Section 3) to gain a full view of related concepts or terms. The subject codes are also used in HSRIC to retrieve complete document citations. The searcher can state his subject interest and "code" his request in a fashion parallel to the subject indexing described above or browse the index at will. When browsing, the display of more general and specific terms for each entry should act as a guide to refining or broadening a search. To search for a specific topic, the user finds a code for each of the subject elements and looks under each code in the subject file, first under the more specific or detailed codes, then working towards the general. The entries in the subject card file are arranged by subject codes, i.e., in the same order as the structured display. Each document reference is entered once for each subject code used, i.e., a document shows in the subject file as many times as there are subject codes on the entry. All the subject terms describing the document are listed at the bottom of the card. This should help the user to decide the relevancy of that document to his inquiry and act as a guide to further searching.

Notation: The subject codes used for each term were derived in the same manner in which report sections are often numbered, except that letters were used instead of numbers (to increase coding density and make the codes shorter).

Report Sections

- 1.
- 1.1
- 1.1.1
- 1.2
- 2.

Subject Facets

- B Materials
- BA Adhesives
- BAC Cement
- BB Metals
- C Ways (Roads)

Synonyms (or terms similar enough to be used as such) have been joined with a " / " to the same subject code, e.g., CDJ stands for "Junctions/Crossings". Both words show up in the alphabetic display.

ROTATED ALPHABETICAL DISPLAY

| | | |
|---|--|-------|
| | ABANDONED, STATUS, VEHICLE | ENG |
| | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAE |
| INGUINAL CANAL, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAEB |
| ILIAIC, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAEC |
| HYPOGASTRIC, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAED |
| UMBILICAL, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAEE |
| LUMBAR, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAEF |
| EPIGASTRIC, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAEG |
| HYPOCHONDRIAC, | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL | CAEH |
| | ABNORMALITY, OPERATING CONDITIONS, | NKR |
| SHOCK | ABSORBERS, CHASSIS/ FRAMES, VEHICLE | CHCE |
| | ABSORPTION, PHENOMENA, PHYSICAL | NLY |
| | ABSTRACTS, CONTENTS, STUDY-REPORT | YEC |
| | ABUTMENTS, ROADSIDE, WAYS (ROADS) | CRN |
| | ACCELERATION/ DECELERATION, | NKE |
| | ACCELEROMETERS, SENSORS/ | XCD |
| GAP | ACCEPTANCE, TRAFFIC FLOW, TRAFFIC | GHO |
| LIMITED | ACCESS, TRAFFICWAYS, WAYS (ROADS) | CCD |
| | AUXILIARIES/ ACCESSORIES, VEHICLE | CM |
| REFLECTORS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMA |
| SIGNALS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMR |
| MIRRORS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMC |
| REARVIEW, MIRRORS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMCR |
| SIDEVIEW, MIRRORS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMCS |
| RESTRAINT SYSTEMS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMC |
| SEAT BELTS, RESTRAINT SYSTEMS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMCB |
| SHOULDER HARNESSSES, RESTRAINT SYSTEMS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMCC |
| (OTHER), RESTRAINT SYSTEMS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMCD |
| WINDSHIELD WIPERS/ WASHERS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CME |
| TIRE CHAINS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMH |
| LICENSE PLATES, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMJ |
| AIR CONDITIONERS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMK |
| DEFROSTERS/ DEFOGGERS, AIR CONDITIONERS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMJB |
| HEATERS, AIR CONDITIONERS, | AUXILIARIES/ ACCESSORIES, VEHICLE | CMJC |
| PERSONAL EQUIPMENT, AUXILIARIES/ | ACCESSORIES, VEHICLE | CMK |
| HELMETS, PERSONAL EQUIPMENT, AUXILIARIES/ | ACCESSORIES, VEHICLE | CMKB |
| FACE PROTECTORS, PERSONAL EQUIPMENT, AUXILIARIES/ | ACCESSORIES, VEHICLE | CMKF |
| RADIOS/ TAPES, AUXILIARIES/ | ACCESSORIES, VEHICLE | CMJ |
| ANCHORAGES, AUXILIARIES/ | ACCESSORIES, VEHICLE | CMR |
| | ACCIDENT | J |
| | PREVENTIVE MEASURES, ACCIDENT | JA |
| SPOT IMPROVEMENTS, PREVENTIVE MEASURES, ACCIDENT | | JAF |
| | RUNNING-OFF-ROAD, ACCIDENT | JB |
| | NONCOLLISION ON ROAD, ACCIDENT | JC |
| OVERTURNING, NONCOLLISION ON ROAD, ACCIDENT | | JCB |
| FALLING FROM MOVING VEHICLE, NONCOLLISION ON ROAD, ACCIDENT | | JCC |
| (OTHER), NONCOLLISION ON ROAD, ACCIDENT | | JCF |
| | COLLISION, ACCIDENT | JD |
| EXPERIMENTAL, COLLISION, ACCIDENT | | JD*WE |
| | SINGLE VEHICLE, ACCIDENT | JE |
| | MULTIPLE VEHICLE, ACCIDENT | JF |
| | HIT AND RUN, ACCIDENT | JG |
| | FRONT, ACCIDENT | JH |
| | LEFT, FRONT, ACCIDENT | JHL |
| | RIGHT, FRONT, ACCIDENT | JHR |
| | REAR, ACCIDENT | JI |
| | LEFT, REAR, ACCIDENT | JIL |
| | RIGHT, REAR, ACCIDENT | JIR |
| | SIDE, ACCIDENT | JJ |
| | LEFT, SIDE, ACCIDENT | JJL |
| | RIGHT, SIDE, ACCIDENT | JJR |
| | ACCIDENT HAZARDS, ACCIDENT | JK |
| EJECTION, ACCIDENT HAZARDS, ACCIDENT | | JKB |
| FLYING OBJECTS, ACCIDENT HAZARDS, ACCIDENT | | JKC |
| FIRE, ACCIDENT HAZARDS, ACCIDENT | | JKD |
| SUBMERSION, ACCIDENT HAZARDS, ACCIDENT | | JKE |
| EXPLOSION, ACCIDENT HAZARDS, ACCIDENT | | JKF |
| ELECTROCUTION, ACCIDENT HAZARDS, ACCIDENT | | JKG |
| | ACCIDENT- INVESTIGATION, ACCIDENT | JL |
| ACCIDENT CAUSATION, ACCIDENT- INVESTIGATION, ACCIDENT | | JLK |
| ACCIDENT-RECORDS, ACCIDENT- INVESTIGATION, ACCIDENT | | JLR |
| | PROPERTY DAMAGE, ACCIDENT | JM |
| DEBRIS REMOVAL, PROPERTY DAMAGE, ACCIDENT | | JMD |
| REPAIRS, PROPERTY DAMAGE, ACCIDENT | | JME |
| | INJURY/ TRAUMA, ACCIDENT | JN |
| | FATAL, INJURY/ TRAUMA, ACCIDENT | JNB |
| | INTERNAL, INJURY/ TRAUMA, ACCIDENT | JNC |
| | SUPERFICIAL, INJURY/ TRAUMA, ACCIDENT | JND |
| CONTUSION/ CRUSHING/ BLUNT, INJURY/ TRAUMA, ACCIDENT | | JNE |
| CONCUSSION, INJURY/ TRAUMA, ACCIDENT | | JNF |
| LACERATION/ OPENWOUND/ PENETRATING, INJURY/ TRAUMA, ACCIDENT | | JNG |
| FRACTURE, INJURY/ TRAUMA, ACCIDENT | | JNH |
| DISLOCATION, INJURY/ TRAUMA, ACCIDENT | | JNI |
| SPRAIN/ STRAIN, INJURY/ TRAUMA, ACCIDENT | | JNJ |
| HEMORRHAGE, INJURY/ TRAUMA, ACCIDENT | | JNK |
| POISON, INJURY/ TRAUMA, ACCIDENT | | JNL |
| BURNS/ SCALDS, INJURY/ TRAUMA, ACCIDENT | | JNM |
| ASPHYXIA/ SUFFOCATION, INJURY/ TRAUMA, ACCIDENT | | JNN |
| DISMEMBERMENT/ DECAPITATION, INJURY/ TRAUMA, ACCIDENT | | JNO |
| CONSEQUENCES/ COMPLICATIONS, INJURY/ TRAUMA, ACCIDENT | | JNP |
| FATAL, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPF |
| LATE EFFECTS, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPG |
| PNEUMONIA, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPH |
| FAT EMBOLISM, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPI |
| ASPIRATION/ DEHYDRATION, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPJ |
| BLOOD LOSS/ BLEEDING, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPK |
| SHOCK, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPL |
| ANXIA/ HYPOXIA, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNPM |
| CLCT, CONSEQUENCES/ COMPLICATIONS, INJURY/ TRAUMA, ACCIDENT | | JNPO |
| COMA, CONSEQUENCES/ COMPLICATIONS, INJURY/ TRAUMA, ACCIDENT | | JNPQ |
| | WHIPLASH, INJURY/ TRAUMA, ACCIDENT | JNW |
| SEVERE INJURIES, CONSEQUENCES, INJURY/ TRAUMA, ACCIDENT | | JNX |
| | RECOVERY OF INJURED, ACCIDENT | JR |
| | DETECTION, RECOVERY OF INJURED, ACCIDENT | JRD |
| | COMMUNICATION, RECOVERY OF INJURED, ACCIDENT | JRE |
| ALERT/ ALARM, COMMUNICATION, RECOVERY OF INJURED, ACCIDENT | | JRED |
| LOCATION (SEARCH), COMMUNICATION, RECOVERY OF INJURED, ACCIDENT | | JREE |
| (INTERAGENCY), COMMUNICATION, RECOVERY OF INJURED, ACCIDENT | | JREF |
| EXTRACTION OF OCCUPANT, RECOVERY OF INJURED, ACCIDENT | | JRF |
| TREATMENT/ CARE, RECOVERY OF INJURED, ACCIDENT | | JRG |
| AID (RED CROSS), TREATMENT/ CARE, RECOVERY OF INJURED, ACCIDENT | | JRGF |
| (RED CROSS), TREATMENT/ CARE, RECOVERY OF INJURED, ACCIDENT | | JRGG |
| COMPREHENSIVE, TREATMENT/ CARE, RECOVERY OF INJURED, ACCIDENT | | JRGH |
| PHYSICIAN, TREATMENT/ CARE, RECOVERY OF INJURED, ACCIDENT | | JRGI |

| | | | |
|---|---|-------------------------------------|--------|
| | TRANSPORTATION, RECOVERY OF INJURED, | ACCIDENT | JRH |
| TRANSPORTABILITY, TRANSPORTATION, | RECOVERY OF INJURED, | ACCIDENT | JRHC |
| DEAC AT SCENE, TRANSPORTATION, | RECOVERY OF INJURED, | ACCIDENT | JRHD |
| HOSPITAL ADMISSION, RECOVERY OF INJURED, | | ACCIDENT | JRI |
| ON ARRIVAL, HOSPITAL ADMISSION, RECOVERY OF INJURED, | | ACCIDENT | JRID |
| HOSPITAL CARE, RECOVERY OF INJURED, | | ACCIDENT | JRJ |
| AFTER ARRIVAL, HOSPITAL CARE, RECOVERY OF INJURED, | | ACCIDENT | JRJD |
| EMERGENCY ROOM, HOSPITAL CARE, RECOVERY OF INJURED, | | ACCIDENT | JRJE |
| REHABILITATION, HOSPITAL CARE, RECOVERY OF INJURED, | | ACCIDENT | JRJF |
| | | ACCIDENT CAUSATION, ACCIDENT | JLK |
| | | ACCIDENT HAZARDS, ACCIDENT | JK |
| | EJECTION, ACCIDENT HAZARDS, ACCIDENT | | JKB |
| | FLYING OBJECTS, ACCIDENT HAZARDS, ACCIDENT | | JKC |
| | FIRE, ACCIDENT HAZARDS, ACCIDENT | | JKD |
| | SUBMERSTION, ACCIDENT HAZARDS, ACCIDENT | | JKE |
| | EXPLOSION, ACCIDENT HAZARDS, ACCIDENT | | JKF |
| | ELECTROCUTION, ACCIDENT HAZARDS, ACCIDENT | | JKG |
| | ACCIDENT CAUSATION, ACCIDENT INVESTIGATION, ACCIDENT | | JLK |
| | | ACCIDENT-INVESTIGATION, ACCIDENT | JL |
| | ACCIDENT-RECORDS, ACCIDENT-INVESTIGATION, ACCIDENT | | JLR |
| | | ACCIDENT-RECORDS, | JLR |
| | | ACCOUNTING, MANAGEMENT SCIENCES, | VDC |
| | | ACCURACY, OPERATING CONDITIONS, | NKG |
| | | ACHIEVEMENT TESTS, EDUCATION | QFB |
| | INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SE |
| | UNINSURED, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEB |
| | LOSS DISTRIBUTION, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEC |
| | TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SED |
| | CASUALTY, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDB |
| | MEDICAL, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDC |
| | LIABILITY, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDD |
| | DISABILITY, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDE |
| | BASIC, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDF |
| | GROUP, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDG |
| | COMPULSORY, TYPES OF INSURANCE, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEDH |
| | UNDERWRITING, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEE |
| | RISK CLASSIFICATION, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEF |
| | MUTUAL COMPANY, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEG |
| | STOCK COMPANY, INSURANCE/ | ACTUARY, SOCIOECONOMIC ASPECT | SEH |
| | | ADHESIVES, MATERIALS | BA |
| | CEMENT, ADHESIVES, MATERIALS | | BAC |
| | | ADIPOSE, CONNECTIVE TISSUES/ | CAPC |
| | | ADMINISTRATIVE, METHODS | WW |
| | HOSPITAL | ADMISSION, RECOVERY OF INJURED, | JRI |
| DEAD ON ARRIVAL, HOSPITAL | ADMISSION, RECOVERY OF INJURED, | | JRID |
| | ADOLESCENTS, PEOPLE | | ED |
| | ADULTS, PEOPLE | | EE |
| | MIDDLE AGED, ADULTS, PEOPLE | | EEB |
| | OLD AGED, ADULTS, PEOPLE | | EEC |
| | | ADVANCED (RED CROSS), TREATMENT/ | JRGG |
| | | ADVANCED (RED CROSS), MEDICAL, | CGMG |
| | | AERIAL, PHOTOGRAPHY, EQUIPMENT | XPB |
| | | AERODYNAMICS/ FLUIDICS, PHYSICAL | NH |
| | FLOW, AERODYNAMICS/ FLUIDICS, PHYSICAL | | NHF |
| | | AEROSPACE, ENGINEERING, DISCIPLINES | VLG |
| | DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BD |
| | STIMULANTS, DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BDB |
| DEPRESSANTS/ | TRANQUILIZERS, DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BDC |
| | ANESTHETICS, DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BDD |
| | DEAD | AFTER ARRIVAL, HOSPITAL CARE, | JRJD |
| | | AFTERNOON, TIME | LG |
| | DRIVING | AGE, AGE, PEOPLE | EAB |
| | | AGE, PEOPLE | EA |
| | DRIVING AGE, AGE, PEOPLE | | EAB |
| | MIDDLE AGED, ADULTS, PEOPLE | | EEB |
| | OLD AGED, ADULTS, PEOPLE | | EEC |
| | DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BD |
| | STIMULANTS, DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BDB |
| DEPRESSANTS/ | TRANQUILIZERS, DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BDC |
| | ANESTHETICS, DRUGS/ | AFFECTIVE AGENTS, MATERIALS | BDD |
| | | AGGREGATES, ROAD MATERIALS, | BEC |
| | SAND, AGGREGATES, ROAD MATERIALS, | | BECB |
| | GRAVEL, AGGREGATES, ROAD MATERIALS, | | BECC |
| | | AGING, DEGRADATION, PHENOMENA, | NLZHE |
| | FIRST | AID (RED CROSS), MEDICAL, | CGMF |
| | FIRST | AID (RED CROSS), TREATMENT/ CARE, | JRGF |
| | FIRST | AID, MEDICAL, METHODS | WSB |
| | MAINTAINING AIRWAYS, FIRST | AID, MEDICAL, METHODS | WSBC |
| MECHANICAL, RESUSCITATION, MAINTAINING AIRWAYS, FIRST | AID, MEDICAL, METHODS | | WSBCR |
| RESUSCITATION, MAINTAINING AIRWAYS, FIRST | AID, MEDICAL, METHODS | | WSBCRM |
| RESUSCITATION, MAINTAINING AIRWAYS, FIRST | AID, MEDICAL, METHODS | | WSBCRN |
| TRACHEOSTOMY, MAINTAINING AIRWAYS, FIRST | AID, MEDICAL, METHODS | | WSBCT |
| | BLEEDING, FIRST | AID, MEDICAL, METHODS | WSBD |
| | SPLINTING, FIRST | AID, MEDICAL, METHODS | WSBE |
| | HEARING | AID, PROSTHESIS, BIOMEDICAL ASPECT | CCC |
| | | AIR CONDITIONERS, AUXILIARIES/ | CMJ |
| | DEFROSTERS/ DEFOGGERS, AIR CONDITIONERS, AUXILIARIES/ | | CMJB |
| | HEATERS, AIR CONDITIONERS, AUXILIARIES/ | | CMJC |
| | | AIR FUEL RATIO, VEHICULAR, | NKVB |
| | | AIR, BRAKES, VEHICLE PARTS, VEHICLE | CHBR |
| | | AIR, COOLING SYSTEMS, POWER PLANTS, | DHGC |
| | | AIRBORNE, POWER VEHICLE, VEHICLE | DDC |
| | AIRPLANES, AIRBORNE, POWER VEHICLE, VEHICLE | | DDCB |
| | HELICOPTERS, AIRBORNE, POWER VEHICLE, VEHICLE | | DDCD |
| | | AIRCUSHION, POWER VEHICLE, VEHICLE | DDD |
| | | AIRPLANES, AIRBORNE, POWER VEHICLE, | DDCB |
| | | AIRWAY MAINTENANCE, MEDICAL, | XTL |
| | MAINTAINING | AIRWAYS, FIRST AID, MEDICAL, | WSBC |
| MECHANICAL, RESUSCITATION, MAINTAINING | AIRWAYS, FIRST AID, MEDICAL, | | WSBCR |
| RESUSCITATION, MAINTAINING | AIRWAYS, FIRST AID, MEDICAL, | | WSBCRM |
| MOUTH-TO-MOUTH, RESUSCITATION, MAINTAINING | AIRWAYS, FIRST AID, MEDICAL, | | WSBCRN |
| TRACHEOSTOMY, MAINTAINING | AIRWAYS, FIRST AID, MEDICAL, | | WSBCT |
| | ALERT/ | ALARM, COMMUNICATION, RECOVERY OF | JRED |
| | CHEMICAL TEST (BLOOD | ALCOHOL), MEDICAL, EQUIPMENT | XTC |
| | | ALCOHOL, TOXICOLOGY, PROBLEMS, | CBGB |
| | BLOOD LEVEL, ALCOHOL, TOXICOLOGY, PROBLEMS, | | CBGBB |
| | PHYSIOLOGICAL EFFECTS, ALCOHOL, TOXICOLOGY, PROBLEMS, | | CBGBC |
| | | ALCOHOLISM, TYPOLOGIES/ CLINICAL | PCCB |
| | ALERT/ | ALARM, COMMUNICATION, | JRED |
| | | ALERT, STATE OF AROUSAL, STATE OF | PEBB |
| | | ALGEBRA, MATHEMATICAL, METHODS | WMC |
| | POLYNOMIAL, ALGEBRA, MATHEMATICAL, METHODS | | WMCB |
| | LINEAR, ALGEBRA, MATHEMATICAL, METHODS | | WMCE |
| | WHEEL | ALIGNMENT, VEHICULAR, OPERATING | NKVH |

| | | |
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| CASTER/ CAMBER, WHEEL | ALIGNMENT, VEHICULAR, OPERATING | AKVHB |
| TCE-IN, WHEEL | ALIGNMENT, VEHICULAR, OPERATING | AKVHC |
| | ALIGNMENTS, GEOMETRICS, WAYS | CGC |
| | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJ |
| DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJB |
| MCOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJBB |
| LIPS, MCOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJBC |
| FLOOR, MCOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJBE |
| CHEEK, MCOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJBF |
| PALATE, MCOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJG |
| UVULA, PALATE, MOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJGB |
| JAW/ CHIN, MOUTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJCC |
| TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJCD |
| GUM, TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJCE |
| ENAMEL, TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJCF |
| ROOT, TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJCG |
| NECK, TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJD |
| CROWN, TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJE |
| KINDS OF TEETH, TOOTH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJF |
| FAUCES, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJG |
| TONGUE, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJH |
| SALIVARY GLANDS, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJI |
| TONSILS, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJJ |
| PHARYNX, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJJB |
| ESOPHAGUS, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJJC |
| STOMACH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJJK |
| GASTRIC GLANDS, STOMACH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJL |
| PYLORUS/ ORIFICE VALVE, STOMACH, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJLB |
| SMALL INTESTINE, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJMC |
| CAECUM, SMALL INTESTINE, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJMD |
| LARGE INTESTINE, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJME |
| RECTUM, LARGE INTESTINE, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJMF |
| LIVER/ BILIARY TRACT, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJMG |
| SPLEEN/ LYMPH TRACTS, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJMH |
| PERITONEUM, DIGESTIVE SYSTEM/ | ALIMENTARY TRACT, ANATOMY/ BODY, | CAJMI |
| PANCREAS, DIGESTIVE SYSTEM/ | ALLEYS, SPECIAL WAYS, WAYS (ROADS) | CAJMJ |
| | ALLOCATION, REGIONAL PLANNING, | CBH |
| RESOURCE | ALTERNATORS, ELECTRICAL SYSTEMS, | SDC |
| GENERATORS/ | ALUMINUM, METALS, MATERIALS | PHH |
| | AMBULANCE, SERVICES | PHF |
| | AMBULANCES, SPECIAL PURPOSE, MOTOR | IQ |
| | AMPLIFIERS, SENSORS/ TRANSDUCERS, | DEHL |
| | AMPUTATION, SURGERY, MEDICAL, | XCB |
| | ANALOG, COMPUTERS, EQUIPMENT | WSFG |
| | ANALYSIS/ OPERATIONS RESEARCH, | XKH |
| MODELS/ MODELING, SYSTEMS | ANALYSIS/ OPERATIONS RESEARCH, | WN |
| SIMULATION, MODELS/ MODELING, SYSTEMS | ANALYSIS/ OPERATIONS RESEARCH, | WNB |
| QUEUEING, MODELS/ MODELING, SYSTEMS | ANALYSIS/ OPERATIONS RESEARCH, | WNBH |
| INVENTORY, MODELS/ MODELING, SYSTEMS | ANALYSIS/ OPERATIONS RESEARCH, | WNBC |
| | ANALYSIS, MATHEMATICAL, METHODS | WNC |
| NUMERICAL/ CALCULATIONS, | ANALYSIS, MATHEMATICAL, METHODS | WNCB |
| GRAPHICAL, | ANALYSIS, MATHEMATICAL, METHODS | WNCG |
| DATA, | ANALYSIS, MATHEMATICAL, METHODS | WNCI |
| SCALING, DATA, | ANALYZER, IMPLIED CONSENT, | WNCJ |
| BREATH | ANALYZER, MEDICAL, EQUIPMENT | RCFE*XTB |
| BREATH | ANATOMY/ BODY, BIOMEDICAL ASPECT | XTH |
| CELL, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CA |
| TISSUE, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAB |
| ANKLE, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAC |
| FOOT, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACB |
| TOE, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACC |
| HEEL, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACD |
| LEG, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACE |
| FEMUR, LEG, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACF |
| FIBULA, LEG, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACG |
| TIBIA, LEG, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACH |
| KNEE, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACI |
| THIGH, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACJ |
| PELVIS, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACK |
| HUTTOCKS, PELVIS, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACL |
| HIPS, PELVIS, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACM |
| PERINEUM/ ANUS, PELVIS, LOWER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACN |
| ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CACO |
| INGUINAL CANAL, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAE |
| ILIAC, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAEB |
| HYPOGASTRIC, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAEC |
| UMBILICAL, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAED |
| LUMBAR, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAEE |
| EPIGASTRIC, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAEF |
| HYPOCHONDRIC, ABDOMEN, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAEG |
| THORAX, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAEH |
| BREASTS, THORAX, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAFI |
| RIBS, THORAX, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAFB |
| UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAFC |
| SHOULDER, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAG |
| AXILLA, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGB |
| ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGC |
| ELBOW, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGD |
| HUMERUS, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGE |
| FOREARM, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGF |
| RADIUS, FOREARM, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGG |
| ULNA, FOREARM, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGH |
| WRIST, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGI |
| HAND, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGJ |
| FINGER/ THUMB, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGK |
| METACARPALS, ARM, UPPER EXTREMITY, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAGL |
| NECK, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAHA |
| THROAT, NECK, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAHB |
| BRONCHIAL REGION, NECK, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAHC |
| HYOID, NECK, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAHD |
| HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAI |
| SKULL, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIA |
| FACE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIB |
| SCALP, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIC |
| MANDIBLE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAID |
| MAXILLA, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIE |
| EYE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIF |
| EYEBROW, EYE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIFB |
| EYELASHES, EYE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIFC |
| EYELID, EYE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIFD |
| CORNEA, EYE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIFE |
| SCLERA, EYE, HEAD, | ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIFF |

IRIS, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFG
 CILIARY PROCESS, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFH
 CHROID, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFI
 RETINA, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFJ
 AQUEOUS HUMOR, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFK
 CRYSTALLINE LENS, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFL
 VITREOUS HUMOR, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFP
 LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFN
 NASAL DUCT, LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIFNH
 EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIG
 PINNA, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGH
 EXTERNAL AUDITORY MEATUS, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGC
 TYMPANIC CAVITY, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGD
 TYMPANIC MEMBRANE, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGE
 EUSTACHIAN TUBES, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGF
 TYMPANIC OSSICLES, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGG
 OSSICLE, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGH
 MEMBRANECULUS LABYRINTH, EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIGI
 DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAIJ
 MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJH
 LIPS, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJHH
 FLOOR, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJBC
 CHEEK, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJBD
 PALATE, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJRE
 JAW/ CHIN, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJBF
 TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJC
 GUM, TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJCH
 ENAMEL, TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJCC
 ROOT, TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJCD
 NECK, TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJCE
 CROWN, TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJCF
 CF TEETH, TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJCG
 FAUCES, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJD
 TONGUE, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJE
 SALIVARY GLANDS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJF
 TONSILS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJG
 PHARYNX, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJH
 ESOPHAGUS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJI
 STOMACH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJJ
 GLANDS, STOMACH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJJB
 VALVE, STOMACH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJJC
 SMALL INTESTINE, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJK
 LARGE INTESTINE, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJL
 HILARY TRACT, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJM
 LYMPH TRACTS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJN
 PERITONEUM, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJP
 PANCREAS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJK
 CARDIOVASCULAR SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAK
 HEART, CARDIOVASCULAR SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAKH
 BLOOD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAKC
 ARTERIES, BLOOD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAKN
 VEINS, BLOOD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAKC
 CAPILLARIES, BLOOD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAKC
 RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAL
 RESPIRATION, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALA
 NOSE/ NASAL SINUSES, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALB
 LARYNX, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALC
 TRACHEA/ BRONCHI, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALD
 LUNGS, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALE
 PLEURA, LUNGS, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALEH
 DIAPHRAGM, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALF
 MEDIASTINUM, RESPIRATORY SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CALG
 UROGENITAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJ
 KIDNEYS, UROGENITAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAMB
 BLADDER, UROGENITAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAMC
 MALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAMD
 FEMALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAJ
 NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBN
 CENTRAL, NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBNH
 BRAIN, CENTRAL, NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBNH
 SPINAL CORD, CENTRAL, NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBNB
 PERIPHERAL, NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBNB
 AUTONOMIC, PERIPHERAL, NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBNB
 NERVE, NERVOUS SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CBNB
 MUSCULO-SKELETAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAC
 BONES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CACB
 VERTEBRAE/ SPINE, BONES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAOH
 MUSCLES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CACC
 JOINTS, MUSCULO-SKELETAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAGD
 LIGAMENTS, JOINTS, MUSCULO-SKELETAL SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CACB
 CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAP
 NAILS, CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAPB
 ACIPUSE, CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAPC
 CARTILAGE, CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAPD
 ELASTIC, CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAPE
 TENDONOUS, CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAPF
 MUCOSA, CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAPG
 ENDOCRINE SYSTEM, ANATOMY/ BODY, BIOMEDICAL ASPECT CAG
 BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CAR
 LYMPH, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARB
 BLOOD, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARC
 CEREBROSPINAL, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARD
 SALIVA, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARE
 TEARS, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARF
 GASTRIC, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARG
 URINE, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARH
 SWEAT, BODY FLUIDS, ANATOMY/ BODY, BIOMEDICAL ASPECT CARI
 ANCHORAGES, AUXILIARIES/
 ANECDOTES/ JOKES, GENERAL
 ANESTHESIA, MEDICAL, METHODS
 ANESTHETICS, DRUGS/ AFFECTIVE
 ANIMAL DRIVEN, VEHICLE
 ANIMALS (ZOOLOGICAL), PEOPLE
 ANIMALS, MODELS (PHYSICAL),
 ANKLE, LOWER EXTREMITY, ANATOMY/
 ANOXIA/ HYPOXIA, CONSEQUENCES,
 ANTHROPOMETRY, BIOMEDICAL ASPECT
 CD
 ANTIFREEZE, OILS/ LUBRICANTS/
 PERINEUM/
 ANUS, PELVIS, LOWER EXTREMITY,
 APPEALS, TRIAL/ JUDICIAL PROCESS,
 APPREHENSION/ SUMMONS, ENFORCEMENT,
 AQUEOUS HUMOR, EYE, HEAD, ANATOMY/
 AREAS/ PARKS, SERVICES
 REST
 ARM, UPPER EXTREMITY, ANATOMY/
 CAGD
 CAJG
 CAJH
 CAJHH
 CAJBC
 CAJBD
 CAJRE
 CAJBF
 CAJC
 CAJCH
 CAJCC
 CAJCD
 CAJCE
 CAJCF
 CAJCG
 CAJD
 CAJE
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 CAJJ
 CAJJB
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 CAMB
 CAMC
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 CAJ
 CBN
 CBNH
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 CBNB
 CBNB
 CAC
 CACB
 CAOH
 CACC
 CAGD
 CACB
 CAP
 CAPB
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 CAPD
 CAPE
 CAPF
 CAPG
 CAG
 CAR
 CARB
 CARC
 CARD
 CARE
 CARF
 CARG
 CARH
 CARI
 DMR
 YERC
 WSF
 BDC
 CC
 EZA
 XMD
 CACA
 JNPM
 CD
 BOB
 CACH
 RDBB
 RCC
 CAIFK
 IC
 CAGD
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| | ELBOW, ARM, UPPER EXTREMITY, ANATOMY/ | CAGOB |
| | HUMERUS, ARM, UPPER EXTREMITY, ANATOMY/ | DAGCB |
| | FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ | CAGCD |
| | RADIUS, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ | CAGDCB |
| | ULNA, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ | CAGDDC |
| | WRIST, ARM, UPPER EXTREMITY, ANATOMY/ | CAGDE |
| | HAND, ARM, UPPER EXTREMITY, ANATOMY/ | CAGDF |
| | FINGER/ THUMB, ARM, UPPER EXTREMITY, ANATOMY/ | CAGDG |
| | METACARPALS, ARM, UPPER EXTREMITY, ANATOMY/ | CAGDH |
| | STATE OF AROUSAL, STATE OF THE ORGANISM, | PEB |
| | ALERT, STATE OF AROUSAL, STATE OF THE ORGANISM, | PEBB |
| | CRCSY, STATE OF AROUSAL, STATE OF THE ORGANISM, | PEBC |
| | SLEEP, STATE OF AROUSAL, STATE OF THE ORGANISM, | PEBD |
| | DEAD ON ARRIVAL, HOSPITAL ADMISSION, | JRID |
| | DEAD AFTER ARRIVAL, HOSPITAL CARE, RECOVERY OF | JRJD |
| | ARTERIES, BLOOD VESSELS, | CAKCB |
| | BITUMINOUS/ ASPHALT, ROAD MATERIALS, MATERIALS | BEF |
| | ASPHYXIA/ SUFFOCATION, INJURY/ | JNN |
| | ASPIRATION/ DEHYDRATION, | JNPJ |
| | ASPIRATORS, MEDICAL, EQUIPMENT | XTJ |
| | ASSESSMENT, FINANCE, ECONOMICS, | SCHO |
| | ATMOSPHERE, WEATHER | PA |
| | SUNSHINE, ATMOSPHERE, WEATHER | PAC |
| | CLOUDY/ OVERCAST, ATMOSPHERE, WEATHER | PAD |
| | DUST, ATMOSPHERE, WEATHER | PAE |
| | FOG/ SMOG, ATMOSPHERE, WEATHER | PAF |
| | RAIN, ATMOSPHERE, WEATHER | PAG |
| | SNOW/ FROST, ATMOSPHERE, WEATHER | PAH |
| | SLEET, ATMOSPHERE, WEATHER | PAI |
| | STORM, ATMOSPHERE, WEATHER | PAJ |
| | WIND, ATMOSPHERE, WEATHER | PAK |
| | POSITION/ ATTITUDE/ LOCATION, OPERATING | NKA |
| | ATTITUDES, MEASURES, PERSONALITY, | PCBC |
| | SIEBRECHT SCALE, ATTITUDES, PERSONALITY, | PCBCB |
| | AUDIO-VISUAL, MATERIALS/ EQUIPMENT, | GEB |
| | EXTERNAL AUDITORY MEATUS, EAR, HEAD, | GAIGC |
| | AUDITORY/ HEARING, SENSES, | PBB |
| | AUTOMATIC/ AUTOMATED, PROCESSES, PHYSICAL | NMC |
| | AUTOMATED, SPECIAL WAYS, WAYS | CB*NMC |
| | CYBERNETICS/ AUTOMATIC CONTROL, MATHEMATICAL, | WMG |
| | AUTOMATIC/ AUTOMATED, PROCESSES, | NMC |
| | AUTONOMIC, PERIPHERAL, NERVOUS | CANCB |
| | AUTOPSY/ PATHOLOGY, MEDICAL, | WSI |
| | AUXILIARIES/ ACCESSORIES, VEHICLE | EM |
| | REFLECTORS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMA |
| | SIGNALS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMB |
| | MIRRORS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMC |
| | REARVIEW, MIRRORS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMCR |
| | SIDEVIEW, MIRRORS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMCS |
| | RESTRAINT SYSTEMS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMC |
| | SEAT BELTS, RESTRAINT SYSTEMS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMCB |
| | SHOULDER HARNESSSES, RESTRAINT SYSTEMS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMCC |
| | (OTHER), RESTRAINT SYSTEMS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMCC |
| | WINDSHIELD WIPERS/ WASHERS, AUXILIARIES/ ACCESSORIES, VEHICLE | CME |
| | TIRE CHAINS, AUXILIARIES/ ACCESSORIES, VEHICLE | DMH |
| | LICENSE PLATES, AUXILIARIES/ ACCESSORIES, VEHICLE | CMJ |
| | AIR CONDITIONERS, AUXILIARIES/ ACCESSORIES, VEHICLE | DMJ |
| | DEFROSTERS/ DEFROSTERS, AIR CONDITIONERS, AUXILIARIES/ ACCESSORIES, VEHICLE | DMJC |
| | HEATERS, AIR CONDITIONERS, AUXILIARIES/ ACCESSORIES, VEHICLE | CMK |
| | PERSONAL EQUIPMENT, AUXILIARIES/ ACCESSORIES, VEHICLE | CMK |
| | HELMETS, PERSONAL EQUIPMENT, AUXILIARIES/ ACCESSORIES, VEHICLE | CMKB |
| | FACE PROTECTORS, PERSONAL EQUIPMENT, AUXILIARIES/ ACCESSORIES, VEHICLE | CMKF |
| | BUBBLES/ SHIELDS, FACE PROTECTORS, PERSONAL EQUIPMENT, AUXILIARIES/ ACCESSORIES, VEHICLE | CMKFB |
| | GOGGLES, FACE PROTECTORS, PERSONAL EQUIPMENT, AUXILIARIES/ ACCESSORIES, VEHICLE | CMKFG |
| | RADIOS/ TAPES, AUXILIARIES/ ACCESSORIES, VEHICLE | CML |
| | ANCHORAGES, AUXILIARIES/ ACCESSORIES, VEHICLE | CMR |
| | AUXILIARY/ HAND, BRAKES, VEHICLE | CHBD |
| | AXILLA, UPPER EXTREMITY, ANATOMY/ | CAGC |
| | AXLES, CHASSIS/ FRAMES, VEHICLE | CHCC |
| | BACK-UP, LIGHTS, ELECTRICAL | DHHC |
| | BACKBOARDS, MEDICAL, EQUIPMENT | XTH |
| | BACKFIRING, ENGINE PERFORMANCE, | NLZQH |
| | VESTIBULAR/ BALANCE, SENSES, PSYCHOLOGICAL | PBG |
| | MONEY/ BANKING, FINANCE, ECONOMICS, | SCE |
| | BARRICADES, PARTS OF WAYS, WAYS | CDE |
| | GATES, BARRICADES, PARTS OF WAYS, WAYS | CDEB |
| | BASIC, TYPES OF INSURANCE, | SECF |
| | BATTERIES, ELECTRICAL SYSTEMS, | CHMD |
| | BEAMS, CONSTRUCTION, MATERIALS | RCB |
| | BEHAVIOR/ MORES, SOCIAL, | SBB |
| | RELIGION, BEHAVIOR/ MORES, SOCIAL, | SBBB |
| | ROLES, BEHAVIOR/ MORES, SOCIAL, | SBBC |
| | DEVIANCY/ CONTROL, BEHAVIOR/ MORES, SOCIAL, | SBBC |
| | CULTURE, BEHAVIOR/ MORES, SOCIAL, | SBBE |
| | ECONOMIC BEHAVIOR, ECONOMICS, SOCIOECONOMIC | SCC |
| | BUSINESS CYCLES, ECONOMIC BEHAVIOR, ECONOMICS, SOCIOECONOMIC | SCCB |
| | CONSUMER, ECONOMIC BEHAVIOR, ECONOMICS, SOCIOECONOMIC | SCCC |
| | BEHAVIORAL FACTORS, PSYCHOLOGICAL | PF |
| | STIMULUS, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFB |
| | RESPONSE, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFC |
| | REINFORCEMENT, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFD |
| | SEQUENCE/ SCHEDULE, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFE |
| | PERCEPTUAL-MOTOR COORDINATION, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFF |
| | DISTORTIONS, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFG |
| | SET, BEHAVIORAL FACTORS, PSYCHOLOGICAL | PFH |
| | UV (BELOW .4 MICRONS), OPTICAL, | NLCDH |
| | BELOW 110 IN., PASSENGER, MOTOR | CECE |
| | BELOW 90 IN., FOREIGN, PASSENGER, | CECFD |
| | SEAT BELTS, RESTRAINT SYSTEMS, | CMDB |
| | COSTS/ BENEFITS, ECONOMICS, SOCIOECONOMIC | SCE |
| | BIBLIOGRAPHY, CONTENTS, | YCC |
| | BICYCLES, NONPOWERED, VEHICLE | DBB |
| | LIVER/ BILIARY TRACT, DIGESTIVE SYSTEM/ | CAJM |
| | BILLBOARDS/ POSTERS, ROADSIDE, WAYS | CRG |
| | BIOGRAPHIES, CONTENTS, STUDY-REPORT | YEQ |
| | BIOMECHANICS, BIOMEDICAL SCIENCES, | VMB |
| | KINESIOLOGY, BIOMECHANICS, BIOMEDICAL SCIENCES, | VMBB |
| | BITUMINOUS/ ASPHALT, ROAD | BEF |
| | BLADDER, UROGENITAL SYSTEM, | DAMC |
| | BLOOD LOSS/ BLEEDING, CONSEQUENCES, INJURY/ | JNPJ |
| | BLEEDING, FIRST AID, MEDICAL, | WSBD |
| | BLINDNESS, DEFECTS, PROBLEMS, | QBDH |
| | COLOR BLINDNESS, DEFECTS, PROBLEMS, | QBDG |
| | BLOCKADE, TRAFFIC DIRECTION, | HCDF |

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| CHEMICAL TEST (| BLOOD ALCOHOL), MEDICAL, EQUIPMENT | XTC |
| | BLOOD FLOW/ CARDIAC OUTPUT, | WUPE |
| | BLOOD LEVEL, ALCOHOL, TOXICOLOGY, | OBCBB |
| | BLOOD LOSS/ BLEEDING, CONSEQUENCES, | JNPK |
| | BLOOD PRESSURE, PHYSIOLOGICAL, | WUPD |
| | BLOOD VESSELS, CARDIOVASCULAR, | DAKC |
| ARTERIES, | BLOOD VESSELS, CARDIOVASCULAR | DAKCB |
| VEINS, | BLOOD VESSELS, CARDIOVASCULAR | DAKCC |
| CAPILLARIES, | BLOOD VESSELS, CARDIOVASCULAR | DAKCD |
| | BLOOD, BODY FLUIDS, ANATOMY/ BODY, | DARC |
| CONTUSION/ CRUSHING/ | BLUNT, INJURY/ TRAUMA, ACCIDENT | JNE |
| CORPORATE | BODIES, SOCIETY | FD |
| INDUSTRIAL, CORPORATE | BODIES, SOCIETY | FDB |
| BUSINESS, CORPORATE | BODIES, SOCIETY | FDC |
| FOUNDATIONS/ SOCIETIES, CORPORATE | BODIES, SOCIETY | FDD |
| SERVICE ORGANIZATIONS, CORPORATE | BODIES, SOCIETY | FDE |
| SCHCOOLS, CORPORATE | BODIES, SOCIETY | FDF |
| SAFETY CENTERS, CORPORATE | BODIES, SOCIETY | FDG |
| | BODY (UPPER), VEHICLE PARTS, | CFD |
| | ROOFS, BODY (UPPER), VEHICLE PARTS, | DHDA |
| CONVERTIBLE, ROOFS, | BODY (UPPER), VEHICLE PARTS, | DHDAB |
| | WINDOWS, BODY (UPPER), VEHICLE PARTS, | DHDB |
| WINDSHIELDS, WINDOWS, | BODY (UPPER), VEHICLE PARTS, | D-CBB |
| | DOORS, BODY (UPPER), VEHICLE PARTS, | DHCC |
| LOCKS/ LATCHES, DOORS, | BODY (UPPER), VEHICLE PARTS, | D-DCB |
| | HINGES, DOORS, BODY (UPPER), VEHICLE PARTS, | DHCCC |
| HOODS/ DECKLIDS, | BODY (UPPER), VEHICLE PARTS, | DHCD |
| | FENDERS, BODY (UPPER), VEHICLE PARTS, | DHDE |
| | BUMPERS, BODY (UPPER), VEHICLE PARTS, | DHDF |
| INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCG |
| INSTRUMENT PANELS, INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCOB |
| CONTROLS/ HANDLES, INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCCG |
| STEERING WHEELS, INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCCD |
| SEATS, INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCEG |
| HEADRESTS, SEATS, INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCEB |
| PADDING, INTERIOR/ PASSENGER COMPARTMENT, | BODY (UPPER), VEHICLE PARTS, | DHCGF |
| | BODY FLUIDS, ANATOMY/ BODY, | CAR |
| | LYMPH, BODY FLUIDS, ANATOMY/ BODY, | CARB |
| | BLOOD, BODY FLUIDS, ANATOMY/ BODY, | CAKC |
| CEREBROSPINAL, | BODY FLUIDS, ANATOMY/ BODY, | CARC |
| | SALIVA, BODY FLUIDS, ANATOMY/ BODY, | CARE |
| | TEARS, BODY FLUIDS, ANATOMY/ BODY, | CARF |
| GASTRIC, | BODY FLUIDS, ANATOMY/ BODY, | CARG |
| URINE, | BODY FLUIDS, ANATOMY/ BODY, | CARH |
| SWEAT, | BODY FLUIDS, ANATOMY/ BODY, | CARI |
| | ANATOMY/ BODY, BIOMEDICAL ASPECT | CA |
| CELL, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAB |
| TISSUE, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAC |
| LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAD |
| ANKLE, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADA |
| FOOT, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADB |
| TOE, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CACC |
| HEEL, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CACD |
| LEG, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAOE |
| FEMUR, LEG, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAOEB |
| FIBULA, LEG, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAOEC |
| TIBIA, LEG, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAOED |
| KNEE, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADF |
| THIGH, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADG |
| PELVIS, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADH |
| BUTTOCKS, PELVIS, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADHB |
| HIPS, PELVIS, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADHC |
| PERINEUM/ ANUS, PELVIS, LOWER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CADHD |
| | ABDOMEN, ANATOMY/ BODY, BIOMEDICAL ASPECT | CAE |
| INGUINAL CANAL, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAEB |
| ILIAC, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAEC |
| HYPOGASTRIC, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAED |
| UMBILICAL, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAEE |
| LUMBAR, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAEF |
| EPIGASTRIC, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAEG |
| HYPOCHONDRIC, ABDOMEN, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAEH |
| | THORAX, ANATOMY/ BODY, BIOMEDICAL ASPECT | CAF |
| BREASTS, THORAX, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAFB |
| RIBS, THORAX, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAFQ |
| UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAG |
| SHOULDER, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGB |
| AXILLA, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGC |
| ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGD |
| ELBOW, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDB |
| HUMERUS, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDC |
| FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDD |
| RADIUS, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDEB |
| ULNA, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDEE |
| WRIST, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDEE |
| HAND, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDF |
| FINGER/ THUMB, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDG |
| METACARPALS, ARM, UPPER EXTREMITY, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAGDH |
| | NECK, ANATOMY/ BODY, BIOMEDICAL ASPECT | CAH |
| THROAT, NECK, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAHB |
| BRONCHIAL REGION, NECK, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAHC |
| HYOID, NECK, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAHD |
| HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAI |
| SKULL, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIA |
| FACE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIB |
| SCALP, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIC |
| MANDIBLE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAID |
| MAXILLA, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIE |
| EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIF |
| EYEBROW, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFB |
| EYELASHES, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFC |
| EYELID, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFD |
| CORNEA, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFE |
| SCLERA, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFG |
| IRIS, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFH |
| CILIARY PROCESS, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFI |
| CHOROIOD, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFJ |
| RETINA, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFK |
| ACQUEOUS HUMOR, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFL |
| CRYSTALLINE LENS, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFM |
| VITREOUS HUMOR, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFN |
| LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIFNB |
| NASAL DUCT, LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIG |
| | EAR, HEAD, ANATOMY/ BODY, BIOMEDICAL ASPECT | CAIGB |
| PINNA, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | |

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| EXTERNAL AUDITORY MEATUS, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | DAIGC |
| TYMPANIC CAVITY, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIGD |
| TYMPANIC MEMBRANE, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIGE |
| EUSTACHIAN TUBES, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | DAIGF |
| TYMPANIC OSSICLES, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIGG |
| OSSEUS LABYRINTH, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIGH |
| MEMBRANEOUS LABYRINTH, EAR, HEAD, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAIGI |
| DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJ |
| MCUTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJB |
| TCOTH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJC |
| FAUCES, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJD |
| TONGUE, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJE |
| GLANDS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJF |
| TONSILS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJG |
| PHARYNX, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJH |
| DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJI |
| STOMACH, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJJ |
| DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJK |
| TRACT, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJM |
| TRACTS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | DAJN |
| DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJO |
| PANCREAS, DIGESTIVE SYSTEM/ ALIMENTARY TRACT, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAJP |
| CARDIOVASCULAR SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAK |
| HEART, CARDIOVASCULAR SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAKB |
| BLCCD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAKC |
| VEINS, BLCCD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAKCC |
| BLCCD VESSELS, CARDIOVASCULAR SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAKCC |
| RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAL |
| RESPIRATION, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALA |
| NCSE/ NASAL SINUSES, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALB |
| LARYNX, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALC |
| TRACHEA/ BRONCHI, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALD |
| LUNGS, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALF |
| PLEURA, LUNGS, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALFB |
| DIAPHRAGM, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALF |
| MEDIASTINUM, RESPIRATORY SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CALG |
| UROGENITAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAH |
| KIDNEYS, UROGENITAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAMB |
| BLADDER, UROGENITAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAMC |
| MALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAMD |
| FEMALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAME |
| NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAN |
| CENTRAL, NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CANB |
| BRAIN, CENTRAL, NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CANBB |
| SPINAL CORD, CENTRAL, NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CANBC |
| PERIPHERAL, NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CANC |
| AUTCNOMIC, PERIPHERAL, NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CANCB |
| NERVE, NERVOUS SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAND |
| MUSCULO-SKELETAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAO |
| BONES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CACB |
| SPINE, BONES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAOBB |
| MUSCLES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CACC |
| JOINTS, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CACD |
| LIGAMENTS, JOINTS, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAODDB |
| CCNNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAP |
| ENDOCRINE SYSTEM, ANATOMY/ | BODY, BIOMEDICAL ASPECT | QAA |
| BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CAR |
| LYMPH, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARB |
| BLOOD, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARC |
| CEREBROSPINAL, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARD |
| SALIVA, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARE |
| TEARS, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARF |
| GASTRIC, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARG |
| URINE, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARH |
| SWEAT, BODY FLUIDS, ANATOMY/ | BODY, BIOMEDICAL ASPECT | CARI |
| BOILING POINT, THERMAL, PHYSICAL | | NEE |
| BONDS, FINANCE, ECONOMICS, | | SCHH |
| BONES, MUSCULO-SKELETAL SYSTEM, | | CAOB |
| VERTEBRAE/ SPINE, BONES, MUSCULO-SKELETAL SYSTEM, | | CAOBB |
| TEXT | BOOKS, FORM, STUDY-REPORT TYPE | YDG |
| | BOOKS, MATERIALS/ EQUIPMENT, | CEC |
| | BRACES/ CRUTCHES, PROSTHESIS, | CCE |
| | BRAIN, CENTRAL, NERVOUS SYSTEM, | CANBB |
| | BRAKE/ STOP, LIGHTS, ELECTRICAL | CHHCD |
| | BRAKES, VEHICLE PARTS, VEHICLE | DHB |
| | DRUM, BRAKES, VEHICLE PARTS, VEHICLE | DHBB |
| | DISC, BRAKES, VEHICLE PARTS, VEHICLE | DHBC |
| | AUXILIARY/ HAND, BRAKES, VEHICLE PARTS, VEHICLE | DHBD |
| | SHCES/ LININGS, BRAKES, VEHICLE PARTS, VEHICLE | DHBJ |
| | DRUMS, BRAKES, VEHICLE PARTS, VEHICLE | DHBK |
| | CYLINDERS/ CHAMBERS, BRAKES, VEHICLE PARTS, VEHICLE | DHBL |
| | HOSES, BRAKES, VEHICLE PARTS, VEHICLE | DHBM |
| | AIR, BRAKES, VEHICLE PARTS, VEHICLE | DHBR |
| | ELECTRIC, BRAKES, VEHICLE PARTS, VEHICLE | DHBS |
| | HYDRAULIC, BRAKES, VEHICLE PARTS, VEHICLE | DHBT |
| | VACUUP, BRAKES, VEHICLE PARTS, VEHICLE | DHBU |
| | BRAKING/ STOPPING, VEHICULAR | NLZRJ |
| | DISTANCE/ TIME, BRAKING/ STOPPING, VEHICULAR | NLZRJD |
| | SLACK, BRAKING/ STOPPING, VEHICULAR | NLZRJE |
| | FADE, BRAKING/ STOPPING, VEHICULAR | NLZRJF |
| | WASHOUT, BRAKING/ STOPPING, VEHICULAR | NLZRJG |
| | JUDICIARY BRANCHES/ COURTS, SOCIETY | FJ |
| | EXECUTIVE BRANCHES, SOCIETY | F1 |
| | MILITARY, EXECUTIVE BRANCHES, SOCIETY | F1B |
| | CIVIL, EXECUTIVE BRANCHES, SOCIETY | F1C |
| | POLICE, CIVIL, EXECUTIVE BRANCHES, SOCIETY | F1CB |
| | BREAKDOWN, FAILURE, PHENOMENA, | NLZLB |
| | BREASTS, THORAX, ANATOMY/ BODY, | CAFB |
| | BREATH ANALYZER, IMPLIED CONSENT, | RCFE*XTB |
| | BREATH ANALYZER, MEDICAL, EQUIPMENT | XTB |
| | BRICKS/ STONES, ROAD MATERIALS, | BED |
| | BRIDGES, PARTS OF WAYS, WAYS | CDL |
| | SUSPENSION, BRIDGES, PARTS OF WAYS, WAYS | CDLC |
| | BRIGHTNESS, OPTICAL, PHYSICAL | NCB |
| | GLARE, BRIGHTNESS, OPTICAL, PHYSICAL | NDBB |
| | FLEXIBILITY/ BRITTLENESS, MECHANICAL PROPERTIES, | ACG |
| | LEAFLETS/ BROCHURES, FORM, STUDY-REPORT TYPE | YDI |
| | TRACHEA/ BRONCHI, RESPIRATORY SYSTEM, | CALD |
| | BRONCHIAL REGION, NECK, ANATOMY/ | CAHC |
| | BUBBLES/ SHIELDS, FACE PROTECTORS, | DMKFB |
| | BUDGETS/ BUDGETING, ECONOMICS, SOCIOECONOMIC | SCG |
| | BUDGETS/ BUDGETING, ECONOMICS, | SCG |
| | BUFFETING/ BUMPING, PHENOMENA, | NLL |
| | BUILDINGS, ROADSIDE, WAYS (ROADS) | CRF |

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| | BUMPERS, BODY (UPPER), VEHICLE | CHDF |
| BUFFETING/ | BUMPING, PHENOMENA, PHYSICAL ASPECT | NLL |
| VALVE | BURNING, ENGINE PERFORMANCE, | NLZQL |
| | BURNS/ SCALDS, INJURY/ TRAUMA, | JNH |
| | BUSES, MOTOR VEHICLES, VEHICLE | DED |
| | BUSHES, VEGETATION, ROADSIDE, WAYS | CRJC |
| | BUSINESS CYCLES, ECONOMIC BEHAVIOR, | SCDB |
| | BUSINESS, CORPORATE BODIES, SOCIETY | FDC |
| | BUSINESS, PURPOSE/ TRIP, TRAFFIC | GDD |
| | BUSINESS, ZONE/ LAND USAGE, SPACE | KLF |
| | BUTTOCKS, PELVIS, LOWER EXTREMITY, | CACHB |
| | BYPASS, TRAFFICWAYS, WAYS (ROADS) | CCL |
| | CADAVERS, MODELS (PHYSICAL), | XME |
| | CAECUM, SMALL INTESTINE, DIGESTIVE | CAJKB |
| NUMERICAL/ | CALCULATIONS, ANALYSIS, | WODB |
| | CALIBRATION, INSTRUMENTATION, | WGB |
| CASTER/ | CAMBER, WHEEL ALIGNMENT, VEHICULAR, | NKVHB |
| | CAMERAS, PHOTOGRAPHY, EQUIPMENT | XPC |
| INGUINAL | CANAL, ABDOMEN, ANATOMY/ BODY, | CAEB |
| RIVER/ | CANAL, WATERS, TERRAIN/ HABITAT, | KBPC |
| | CAPABILITIES/ INTELLIGENCE, | PCBB |
| | CAPACITANCE, ELECTRIC PROPERTIES, | NGD |
| | CAPACITY/ LIMIT, OPERATING | NKJ |
| THRESHOLD, | CAPACITY/ LIMIT, OPERATING | NKJB |
| LIFE SPAN, | CAPACITY/ LIMIT, OPERATING | NKJC |
| SATURATION, | CAPACITY/ LIMIT, OPERATING | NKJD |
| PRECIPITATION, SATURATION, | CAPACITY/ LIMIT, OPERATING | NKJDB |
| | HIGHWAY CAPACITY, TRAFFIC | GB |
| | CAPILLARIES, BLOOD VESSELS, | CAKCD |
| HUB | CAPS/ DISCS, WHEELS, VEHICLE PARTS, | CHAD |
| | CARBON MONOXIDE, POISONS, | CBCGB |
| | CARBURETOR ICING, ENGINE | NLZCO |
| | CARBURETORS, FUEL SYSTEMS, POWER | CHGDC |
| PUNCHED | CARD, RECORDERS, EQUIPMENT | XHE |
| BLOOD FLOW/ | CARDIAC OUTPUT, PHYSIOLOGICAL, | WUPE |
| | CARDIOVASCULAR SYSTEM, ANATOMY/ | CAK |
| HEART, | CARDIOVASCULAR SYSTEM, ANATOMY/ | CAKB |
| BLOOD VESSELS, | CARDIOVASCULAR SYSTEM, ANATOMY/ | CAKC |
| ARTERIES, BLOOD VESSELS, | CARDIOVASCULAR SYSTEM, ANATOMY/ | CAKCB |
| VEINS, BLOOD VESSELS, | CARDIOVASCULAR SYSTEM, ANATOMY/ | CAKCC |
| CAPILLARIES, BLOOD VESSELS, | CARDIOVASCULAR SYSTEM, ANATOMY/ | CAKCD |
| TREATMENT/ | CARE, RECOVERY OF INJURED, ACCIDENT | JRG |
| FIRST AID (RED CROSS), TREATMENT/ | CARE, RECOVERY OF INJURED, ACCIDENT | JRGF |
| ADVANCED (RED CROSS), TREATMENT/ | CARE, RECOVERY OF INJURED, ACCIDENT | JRGC |
| COMPREHENSIVE, TREATMENT/ | CARE, RECOVERY OF INJURED, ACCIDENT | JRGH |
| PROFESSIONAL/ PHYSICIAN, TREATMENT/ | CARE, RECOVERY OF INJURED, ACCIDENT | JRGI |
| HOSPITAL | CARE, RECOVERY OF INJURED, ACCIDENT | JRJ |
| DEAD AFTER ARRIVAL, HOSPITAL | CARE, RECOVERY OF INJURED, ACCIDENT | JRJD |
| EMERGENCY ROOM, HOSPITAL | CARE, RECOVERY OF INJURED, ACCIDENT | JRJE |
| REHABILITATION, HOSPITAL | CARE, RECOVERY OF INJURED, ACCIDENT | JRJE |
| | CARGO, MOTOR VEHICLES, VEHICLE | DEF |
| TRUCKS, | CARGO, MOTOR VEHICLES, VEHICLE | DEFB |
| TRUCK TRAILERS, | CARGO, MOTOR VEHICLES, VEHICLE | DEFC |
| TRUCK TRACTORS, | CARGO, MOTOR VEHICLES, VEHICLE | DEFD |
| | CARTILAGE, CONNECTIVE TISSUES/ | DAPD |
| | CASE LAW, LAWS, LEGAL ASPECT | RCD |
| | CASE STUDY, NATURE OF STUDY, | YCK |
| CASTER/ | CAMBER, WHEEL ALIGNMENT, | NKVHB |
| | CASUALTY, TYPES OF INSURANCE, | SEDB |
| ACCIDENT | CATHODE-RAY TUBE, DISPLAYS/ METERS, | XGB |
| TYPANIC | CAUSATION, ACCIDENT INVESTIGATION, | JLK |
| | CAVITY, EAR, HEAD, ANATOMY/ BODY, | CAIGD |
| | CELL, ANATOMY/ BODY, BIOMEDICAL | CAB |
| | CEMENT, ADHESIVES, MATERIALS | BAC |
| | CENSUS, SURVEY, METHODS | WTB |
| | CENTER OF GRAVITY, PHYSICAL | NBC |
| SAFETY | CENTERS, CORPORATE BODIES, SOCIETY | FDG |
| | CENTRAL, NERVOUS SYSTEM, ANATOMY/ | CANB |
| BRAIN, | CENTRAL, NERVOUS SYSTEM, ANATOMY/ | CANBB |
| SPINAL CORD, | CENTRAL, NERVOUS SYSTEM, ANATOMY/ | CANBC |
| | CENTRIFUGES, DYNAMIC, MECHANICAL | XQCE |
| | CERAMICS, MATERIALS | BL |
| | CEREBROSPINAL, BODY FLUIDS, | CARD |
| TIRE | CHAINS, AUXILIARIES/ ACCESSORIES, | CMH |
| CYLINDERS/ | CHAMBERS, BRAKES, VEHICLE PARTS, | CHBL |
| SPEED | CHANGE, LANES, PARTS OF WAYS, WAYS | COCD |
| SPEED | CHANGE, TRAFFIC FLOW, TRAFFIC | GHI |
| FLCW | CHARTS, CONTENTS, STUDY-REPORT TYPE | YEP |
| SUSPENSIONS, | CHASSIS/ FRAMES, VEHICLE PARTS, | DHC |
| AXLES, | CHASSIS/ FRAMES, VEHICLE PARTS, | DHCB |
| SPRINGS, | CHASSIS/ FRAMES, VEHICLE PARTS, | DHCC |
| SHOCK ABSORBERS, | CHASSIS/ FRAMES, VEHICLE PARTS, | DHCD |
| | CHAUFFEURS, PROFESSIONAL, DRIVERS, | DHCE |
| | CHEEK, MOUTH, DIGESTIVE SYSTEM/ | EOPC |
| | CHEMICAL TEST (BLOOD ALCOHOL), | CAJBD |
| | CHEMICAL TEST, IMPLIED CONSENT, | XTC |
| | CHEMISTRY, DISCIPLINES | RCFE*XTC |
| | CHILDREN, PEOPLE | VO |
| INFANTS, | CHILDREN, PEOPLE | EC |
| PREADOLESCENTS, | CHILDREN, PEOPLE | ECB |
| JAW/ | CHIN, MOUTH, DIGESTIVE SYSTEM/ | ECC |
| | CHOROID, EYE, HEAD, ANATOMY/ BODY, | CAJBF |
| | CILIARY PROCESS, EYE, HEAD, | CAIFI |
| SHORT | CIRCUIT, FAILURE, PHENOMENA, | CAIFH |
| TOWN/ | CITY, GOVERNMENTS, SOCIETY | NLZLE |
| URBAN/ TOWN/ | CITY, TERRAIN/ HABITAT, SPACE | FCB |
| | CIVIL LIABILITY, LAWS, LEGAL ASPECT | KHM |
| NEGLIGENCE, | CIVIL LIABILITY, LAWS, LEGAL ASPECT | RCE |
| | CIVIL, CODES, LAWS, LEGAL ASPECT | RCEB |
| | CIVIL, ENGINEERING, DISCIPLINES | RCBC |
| | CIVIL, EXECUTIVE BRANCHES, SOCIETY | VLB |
| POLICE, | CIVIL, EXECUTIVE BRANCHES, SOCIETY | FIC |
| | CLASS ROOM, TEACHING/ TRAINING, | FICB |
| DISCUSSIONS/ SEMINARS, | CLASS ROOM, TEACHING/ TRAINING, | QDB |
| LECTURE/ DEMONSTRATIONS, | CLASS ROOM, TEACHING/ TRAINING, | QDBB |
| SIMULATORS, | CLASS ROOM, TEACHING/ TRAINING, | QDBC |
| RISK | CLASSIFICATION, INSURANCE/ ACTUARY, | QDBD |
| | CLAY, SOIL/ DIRT, ROAD MATERIALS, | SEB |
| MARKERS/ | CLEAR, SURFACE CONDITIONS, WEATHER | BEBB |
| | CLEARANCE, LIGHTS, ELECTRICAL | MSB |
| | CLEARANCES, GEOMETRICS, WAYS | CHNCI |
| TYPOLGIES/ | CLIMATE, WEATHER | CGF |
| | CLINICAL DIAGNOSIS, PERSONALITY, | MW |
| | | PCC |

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| ALCOHOLISM, TYPOLOGIES/ | CLINICAL DIAGNOSIS, PERSONALITY, | PCCB |
| SUICIDE/ HOMICIDE, TYPOLOGIES/ | CLINICAL DIAGNOSIS, PERSONALITY, | PCCG |
| NEUROSES, TYPOLOGIES/ | CLINICAL DIAGNOSIS, PERSONALITY, | PCCN |
| PSYCHOSES, TYPOLOGIES/ | CLINICAL DIAGNOSIS, PERSONALITY, | PCCP |
| | CLOBBING, PHENOMENA, PHYSICAL | NLZP |
| OCCLUSION/ THROMBOSIS/ | CLOT, CONSEQUENCES/ COMPLICATIONS, | JNPO |
| | CLOTHING, MATERIALS | BS |
| | CLOUDY/ OVERCAST, ATMOSPHERE, | PAD |
| | CLOVERLEAF, INTERCHANGES, | CDJEB |
| DRIVE SHAFTS/ | CLUTCHES, POWER PLANTS, VEHICLE | DNGE |
| LAW/ | CODE/ STATUTE, CONTENTS, | YEK |
| | CODES, LAWS, LEGAL ASPECT | RCB |
| CRIMINAL, | CODES, LAWS, LEGAL ASPECT | RCBB |
| CIVIL, | CODES, LAWS, LEGAL ASPECT | RCBC |
| MOTOR VEHICLE, | CODES, LAWS, LEGAL ASPECT | RCBD |
| ORDINANCES, | CODES, LAWS, LEGAL ASPECT | RCBE |
| | COGNITION/ INFORMATION PROCESSING, | PD |
| | COGNITION/ INFORMATION PROCESSING, | PDA |
| PERCEPTION, | COGNITION/ INFORMATION PROCESSING, | PDB |
| PLANNING/ DECISION MAKING, | COGNITION/ INFORMATION PROCESSING, | PDBB |
| RISK TAKING, PLANNING/ DECISION MAKING, | COGNITION/ INFORMATION PROCESSING, | PDBC |
| DEFENSE MECHANISMS, PLANNING/ DECISION MAKING, | COGNITION/ INFORMATION PROCESSING, | PDC |
| | LEARNING, COGNITION/ INFORMATION PROCESSING, | PDCB |
| CONDITIONING, LEARNING, | COGNITION/ INFORMATION PROCESSING, | PDCD |
| HABIT/ PRONENESS, LEARNING, | COGNITION/ INFORMATION PROCESSING, | PDCE |
| TRANSFER OF TRAINING, LEARNING, | COGNITION/ INFORMATION PROCESSING, | PDCF |
| | RECALL, LEARNING, COGNITION/ INFORMATION PROCESSING, | PCCG |
| INSIGHT, LEARNING, | COGNITION/ INFORMATION PROCESSING, | PBC |
| SKILLED PERFORMANCE, LEARNING, | COGNITION/ INFORMATION PROCESSING, | NLZLC |
| | COLD, TEMPERATURE, WEATHER | CHCGDC |
| | COLLAPSE, FAILURE, PHENOMENA, | YCN |
| | COLLAPSIBLE, STEERING WHEELS, | CBE |
| | COLLECTIONS, FORM, STUDY-REPORT | JD |
| | COLLEGE, EDUCATION LEVEL, | JD*WE |
| | COLLISION, ACCIDENT | CBDG |
| EXPERIMENTAL, | COLLISION, ACCIDENT | PBCB |
| | COLOR BLINDNESS, DEFECTS, PROBLEMS, | NCC |
| | COLOR SENSE, VISION, SENSES, | CHIC |
| | COLOR, OPTICAL, PHYSICAL ASPECT | JNPQ |
| | COLUMNS, STEERING SYSTEMS, VEHICLE | NLBD |
| | COMA, CONSEQUENCES/ COMPLICATIONS, | NLZN |
| | COMBUSTION, ENERGY/ POWER, | GDE |
| | COMBUSTION, PHENOMENA, PHYSICAL | GDEB |
| COMMERCIAL, PURPOSE/ TRIP, TRAFFIC | COMMERCIAL, PURPOSE/ TRIP, TRAFFIC | GDEC |
| FREIGHT, | COMMERCIAL, PURPOSE/ TRIP, TRAFFIC | BR |
| PASSENGERS, | COMMERCIAL, PURPOSE/ TRIP, TRAFFIC | BRB |
| | COMMODITIES, MATERIALS | BRC |
| EXPLOSIVES, | COMMODITIES, MATERIALS | VQ |
| INFLAMMABLE, | COMMODITIES, MATERIALS | VQB |
| INFORMATION/ | COMMUNICATION, DISCIPLINES | JRE |
| DOCUMENTATION, INFORMATION/ | COMMUNICATION, DISCIPLINES | JRED |
| | COMMUNICATION, RECOVERY OF INJURED, | JREE |
| ALERT/ ALARM, | COMMUNICATION, RECOVERY OF INJURED, | JREF |
| LOCATION (SEARCH), | COMMUNICATION, RECOVERY OF INJURED, | IE |
| DECISION (INTERAGENCY), | COMMUNICATION, RECOVERY OF INJURED, | FK |
| | COMMUNICATIONS, SERVICES | FC |
| MASS MEDIA/ | COMMUNICATIONS, SOCIETY | SFD |
| | COMMUNITIES, SOCIETY | DECD |
| | COMMUNITY SUPPORT, MEASURES, | SEG |
| | COMPACT (106-111 IN.), PASSENGER, | SEH |
| MUTUAL | COMPANY, INSURANCE/ ACTUARY, | CHDG |
| STOCK | COMPANY, INSURANCE/ ACTUARY, | CHDGB |
| INTERIOR/ PASSENGER | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGC |
| CASHBOARDS/ INSTRUMENT PANELS, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGC1 |
| CONTRCLS/ HANDLES, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGD |
| IDENTIFICATION, CONTRCLS/ HANDLES, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGD1 |
| STEERING WHEELS, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGD2 |
| COLLAPSIBLE, STEERING WHEELS, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGD3 |
| SEATS, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGE |
| HEADRESTS, SEATS, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGE1 |
| PADDING, | COMPARTMENT, BODY (UPPER), VEHICLE | CHDGE2 |
| | CONSEQUENCES/ | CHDGF |
| OCCLUSION/ THROMBOSIS/ | COMPLICATIONS, INJURY/ TRAUMA, | JNP |
| CLOT, CONSEQUENCES/ | COMPLICATIONS, INJURY/ TRAUMA, | JNPO |
| COMA, CONSEQUENCES/ | COMPLICATIONS, INJURY/ TRAUMA, | JNPQ |
| | COMPREHENSIVE, MEDICAL, EDUCATION, | GGMH |
| | COMPREHENSIVE, TREATMENT/ CARE, | JRGH |
| | COMPRESSIBILITY, MECHANICAL | NCF |
| | COMPRESSION RATIO, VEHICULAR, | NKVF |
| | COMPRESSION/ CONTRACTION, | NLZE |
| | COMPRESSION, STATIC, MECHANICAL | XQBB |
| | COMPULSORY, TYPES OF INSURANCE, | SEDH |
| | COMPUTER PROGRAMS, CONTENTS, | YES |
| | COMPUTERS, EQUIPMENT | XK |
| ANALOG, | COMPUTERS, EQUIPMENT | XKB |
| DIGITAL, | COMPUTERS, EQUIPMENT | XKC |
| HYBRID, | COMPUTERS, EQUIPMENT | XKD |
| | CONCRETE, ROAD MATERIALS, MATERIALS | BEE |
| | CONCUSSION, INJURY/ TRAUMA, | JNF |
| AIR | CONDITIONERS, AUXILIARIES/ | CMJ |
| DEFROSTERS/ DEFOGGERS, AIR | CONDITIONERS, AUXILIARIES/ | CMJB |
| HEATERS, AIR | CONDITIONERS, AUXILIARIES/ | CMJC |
| | CONDITIONING, LEARNING, COGNITION/ | PDCB |
| | CONDUCTIVITY, THERMAL, PHYSICAL | NEC |
| | CONFLICT, TRAFFIC FLOW, TRAFFIC | GHC |
| CONGESTION, | CONFLICT, TRAFFIC FLOW, TRAFFIC | GHC1 |
| | CONGESTION, CONFLICT, TRAFFIC FLOW, | GHC2 |
| TANKS/ FILLER PIPES/ | CONNECTIONS, FUEL SYSTEMS, POWER | CHGDF |
| | CONNECTIVE TISSUES/ INTEGUMENTARY | CAP |
| SKIN/ HAIR/ NAILS, | CONNECTIVE TISSUES/ INTEGUMENTARY | CAPB |
| ADIPOSE, | CONNECTIVE TISSUES/ INTEGUMENTARY | CAPC |
| CARTILAGE, | CONNECTIVE TISSUES/ INTEGUMENTARY | CAPD |
| ELASTIC, | CONNECTIVE TISSUES/ INTEGUMENTARY | CAPE |
| TENDONOUS, | CONNECTIVE TISSUES/ INTEGUMENTARY | CAPF |
| MUCOSA, | CONNECTIVE TISSUES/ INTEGUMENTARY | CAPG |
| IMPLIED | CONSENT, CRIMINAL, LAWS, LEGAL | RCFE |
| BREATH ANALYZER, IMPLIED | CONSENT, CRIMINAL, LAWS, LEGAL | RCFE*XTB |
| CHEMICAL TEST, IMPLIED | CONSENT, CRIMINAL, LAWS, LEGAL | RCFE*XTC |
| | CONSEQUENCES/ COMPLICATIONS, | JNP |
| OCCLUSION/ THROMBOSIS/ CLOT, | CONSEQUENCES/ COMPLICATIONS, | JNPO |
| COMA, | CONSEQUENCES/ COMPLICATIONS, | JNPQ |
| FATAL, | CONSEQUENCES, INJURY/ TRAUMA, | JNPF |
| LATE EFFECTS, | CONSEQUENCES, INJURY/ TRAUMA, | JNPG |
| PNEUMONIA, | CONSEQUENCES, INJURY/ TRAUMA, | JNPH |
| FAT EMBOLISM, | CONSEQUENCES, INJURY/ TRAUMA, | JNPI |
| ASPIRATION/ DEHYDRATION, | CONSEQUENCES, INJURY/ TRAUMA, | JNPJ |

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| | BLOOD LOSS/ BLEEDING, | CONSEQUENCES, INJURY/ TRAUMA, | JNPK |
| | SHOCK, | CONSEQUENCES, INJURY/ TRAUMA, | JNPL |
| | ANXIA/ HYPOXIA, | CONSEQUENCES, INJURY/ TRAUMA, | JNPM |
| | MULTIPLE SEVERE INJURIES, | CONSEQUENCES, INJURY/ TRAUMA, | JNX |
| | | CONSTRUCTION SITES, ROADSIDE, WAYS | CRH |
| | | CONSTRUCTION, ENGINEERING, METHODS | WOC |
| | EARTHWORK, | CONSTRUCTION, ENGINEERING, METHODS | WODE |
| | PREFABRICATION, | CONSTRUCTION, ENGINEERING, METHODS | WODF |
| | PRESTRESSING, PREFABRICATION, | CONSTRUCTION, ENGINEERING, METHODS | WODFH |
| | | CONSTRUCTION, MATERIALS | BC |
| | BEAMS, | CONSTRUCTION, MATERIALS | BCB |
| | SLABS, | CONSTRUCTION, MATERIALS | BCC |
| | PILLARS, | CONSTRUCTION, MATERIALS | BCC |
| | | CONSUMER, ECONOMIC BEHAVIOR, | SCDC |
| | ANECDOTES/ JOKES, GENERAL DISCUSSIONS, | CONTAMINATION, PHENOMENA, PHYSICAL | NLZJ |
| | | CONTENTS, STUDY- REPORT TYPE | YERC |
| | | CONTENTS, STUDY-REPORT TYPE | YE |
| | PROCEEDINGS, | CONTENTS, STUDY-REPORT TYPE | YEB |
| | BIBLIOGRAPHY, | CONTENTS, STUDY-REPORT TYPE | YEC |
| | ABSTRACTS, | CONTENTS, STUDY-REPORT TYPE | YED |
| | REVIEWS, | CONTENTS, STUDY-REPORT TYPE | YEE |
| | DATA STATISTICS, | CONTENTS, STUDY-REPORT TYPE | YEF |
| | TABLES/ GRAPHS, | CONTENTS, STUDY-REPORT TYPE | YEG |
| | DIAGRAMS/ PLANS, | CONTENTS, STUDY-REPORT TYPE | YEH |
| | PHOTOGRAPHS/ ILLUSTRATIONS, | CONTENTS, STUDY-REPORT TYPE | YEI |
| | HEARINGS, | CONTENTS, STUDY-REPORT TYPE | YEJ |
| | LAW/ CODE/ STATUTE, | CONTENTS, STUDY-REPORT TYPE | YEK |
| | PATENT, | CONTENTS, STUDY-REPORT TYPE | YEL |
| | INSTRUCTIONS/ SPECIFICATIONS, | CONTENTS, STUDY-REPORT TYPE | YEM |
| | STANDARDS, | CONTENTS, STUDY-REPORT TYPE | YEN |
| | MAPS, | CONTENTS, STUDY-REPORT TYPE | YEC |
| | FLOW CHARTS, | CONTENTS, STUDY-REPORT TYPE | YEP |
| | BIOGRAPHIES, | CONTENTS, STUDY-REPORT TYPE | YEQ |
| | GENERAL DISCUSSIONS, | CONTENTS, STUDY-REPORT TYPE | YER |
| | SPEECHES, GENERAL DISCUSSIONS, | CONTENTS, STUDY-REPORT TYPE | YERB |
| | COMPUTER PROGRAMS, | CONTENTS, STUDY-REPORT TYPE | YES |
| | COMPRESSION/ | CONTRACTION, PHENOMENA, PHYSICAL | NLZE |
| | REGULATION/ | CONTROL | F |
| | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ | FB |
| WARNING, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ | FB |
| | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ | FBE |
| | TRAFFIC PATROL, | REGULATION/ | FC |
| | TRAFFIC PATROL, | REGULATION/ | FCC |
| ESCORT, | TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ | FCC |
| | TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ | FCC |
| | TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ | FCC |
| | PURSUIT, TRAFFIC PATROL, | REGULATION/ | FCC |
| | | CONTROL | FCC |
| | DEVIANCY/ | CONTROL, BEHAVIOR/ MORES, SOCIAL, | SBBD |
| | REMOTE | CONTROL, CONTROLLED, SIGNS/ | CIGC |
| | QUALITY | CONTROL, ENGINEERING, METHODS | WCF |
| | | CONTROL, HANDLING, VEHICULAR | NLZRDB |
| | DIRECTIONAL/ STEERING, | CONTROL, HANDLING, VEHICULAR | NLZRDB |
| | CYBERNETICS/ AUTOMATIC | CONTROL, MATHEMATICAL, METHODS | WMC |
| | HEMORRHAGE | CONTROL, MEDICAL, EQUIPMENT | XTM |
| | CROWD | CONTROL, TRAFFIC DIRECTION, TRAFFIC | HCCD |
| | | CONTROLLED, SIGNS/ SIGNALS, WAYS | CTG |
| | TIME SEQUENCED, | CONTROLLED, SIGNS/ SIGNALS, WAYS | CTG |
| | REMOTE CONTROL, | CONTROLLED, SIGNS/ SIGNALS, WAYS | CIGC |
| | | CONTROLS/ HANDLES, INTERIOR/ | CHCGC |
| | IDENTIFICATION, | CONTROLS/ HANDLES, INTERIOR/ | CHCGC |
| | | CONTROLS, EQUIPMENT | XI |
| | RELAY, | CONTROLS, EQUIPMENT | XIH |
| | EMISSION | CONTROLS, EXHAUST SYSTEMS, POWER | CHGFE |
| | | CONTUSION/ CRUSHING/ BLUNT, INJURY/ | JNE |
| | | CONVERTIBLE, ROOFS, BODY (UPPER), | D-CAB |
| | | CONVICTION, ENFORCEMENT, LEGAL | RDE |
| | | COOLING SYSTEMS, POWER PLANTS, | DGH |
| | RADIATORS, | COOLING SYSTEMS, POWER PLANTS, | DGHG |
| | AIR, | COOLING SYSTEMS, POWER PLANTS, | CHGC |
| | PERCEPTUAL-MOTOR | COORDINATION, BEHAVIORAL FACTORS, | PFF |
| | SPINAL | CORD, CENTRAL, NERVOUS SYSTEM, | CANHC |
| | MAGNETIC | CORE, RECORDERS, EQUIPMENT | XPC |
| | | CORNEA, EYE, HEAD, ANATOMY/ BODY, | CAIFE |
| | | CORNERING, LIGHTS, ELECTRICAL | DHCH |
| | | CORNERING, VEHICULAR PERFORMANCE, | NLZRH |
| | | CORPORATE BODIES, SOCIETY | FD |
| | INDUSTRIAL, | CORPORATE BODIES, SOCIETY | FDB |
| | BUSINESS, | CORPORATE BODIES, SOCIETY | FCC |
| | FOUNDATIONS/ SOCIETIES, | CORPORATE BODIES, SOCIETY | FDD |
| | SERVICE ORGANIZATIONS, | CORPORATE BODIES, SOCIETY | FDE |
| | SCHOOLS, | CORPORATE BODIES, SOCIETY | FCF |
| | SAFETY CENTERS, | CORPORATE BODIES, SOCIETY | FDD |
| | | CORRECTIVE LENSES, PROSTHESIS, | CCB |
| | COVARIANCE/ | CORRELATION, DESIGN, STATISTICAL/ | WMEBC |
| | | CORROSION, PHENOMENA, PHYSICAL | NLZM |
| | | COST EFFECTIVENESS, ECONOMICS, | SCF |
| | | COSTS/ BENEFITS, ECONOMICS, | SCE |
| | TRAFFIC | COUNT, TRAFFIC | GC |
| | JUDICIARY BRANCHES/ | COUNTY, GOVERNMENTS, SOCIETY | FGC |
| | | COURTS, SOCIETY | FJ |
| | | COVARIANCE/ CORRELATION, DESIGN, | WMEBC |
| | | CREDIT, FINANCE, ECONOMICS, | SCHK |
| | | CREEP, DEGRADATION, PHENOMENA, | NLZHF |
| | | CRESTS/ SAGS, GEOMETRICS, WAYS | CGL |
| | | CRIMES, LEGAL ASPECT | RH |
| | | CRIMINAL, CODES, LAWS, LEGAL ASPECT | KCBB |
| | PEDESTRIAN VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCF |
| | MOVING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFA |
| | DRINKING, MOVING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFB |
| | RECKLESS, MOVING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFBB |
| | SPEEDING, MOVING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFBC |
| | HIT-AND-RUN, MOVING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFBD |
| | WRONG WAY, MOVING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFBE |
| | PARKING VIOLATIONS, | CRIMINAL, LAWS, LEGAL ASPECT | RCFBF |
| | FINANCIAL RESPONSIBILITY, | CRIMINAL, LAWS, LEGAL ASPECT | RCFC |
| | IMPLIED CONSENT, | CRIMINAL, LAWS, LEGAL ASPECT | RCFD |
| | BREATHER ANALYZER, IMPLIED CONSENT, | CRIMINAL, LAWS, LEGAL ASPECT | RCFE*XTB |
| | CHEMICAL TEST, IMPLIED CONSENT, | CRIMINAL, LAWS, LEGAL ASPECT | RCFE*XTC |
| | | CROSS SECTIONS, GEOMETRICS, WAYS | CGG |
| | FIRST AID (RED | CROSS), MEDICAL, EDUCATION, | GGMF |
| | ADVANCED (RED | CROSS), MEDICAL, EDUCATION, | CGMG |
| | FIRST AID (RED | CROSS), TREATMENT/ CARE, RECOVERY | JRGF |
| | ADVANCED (RED | CROSS), TREATMENT/ CARE, RECOVERY | JRGG |
| | | CROSSING, REGULATORY, TRAFFIC | HBED |

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| | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CDJ |
| THREE WAY, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CCJB |
| FOUR WAY, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CDJG |
| MULTIWAY, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CDJD |
| INTERCHANGES, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CCJE |
| CLOVERLEAF, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CDJEB |
| ROTARY, | INTERCHANGES, | JUNCTIONS/ | CDJEC |
| INTERSECTIONS (AT GRADE), | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CCJF |
| GRADE SEPARATION, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CDJG |
| OVERPASS, GRADE SEPARATION, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CCJGB |
| UNDERPASS, GRADE SEPARATION, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CCJGC |
| CROSSWALKS, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CCJH |
| RAILWAYS, | JUNCTIONS/ | CROSSINGS, PARTS OF WAYS, WAYS | CDJI |
| | CROSSWALKS, | JUNCTIONS/ | CDJH |
| | CROWD CONTROL, | TRAFFIC DIRECTION, | HCCD |
| | CROWN, TOOTH, DIGESTIVE SYSTEM/ | | CAJCF |
| | CROWNS, | GEOMETRICS, WAYS (ROADS) | GGI |
| CONTUSION/ | CRUSHING/ | BLUNT, INJURY/ | JNE |
| BRACES/ | CRUTCHES, | PROSTHESIS, BIOMEDICAL | CCE |
| | CRYSTALLINE LENS, | EYE, HEAD, | CAIFL |
| DEAD ENDS/ | CUL DE SAC, | SPECIAL WAYS, WAYS | CBD |
| | CULTIVATED, | TERRAIN/ | KBP |
| | CULTURE, | BEHAVIOR/ | SBBE |
| | PIPES/ | CULVERTS, | CDI |
| | CURBS, | PARTS OF WAYS, WAYS (ROADS) | CDD |
| | CURVES, | GEOMETRICS, WAYS (ROADS) | CGJ |
| | CYBERNETICS/ | AUTOMATIC CONTROL, | MMG |
| | CYCLE PATHS, | SPECIAL WAYS, WAYS | CBE |
| BUSINESS | CYCLES, | ECONOMIC BEHAVIOR, | SCDB |
| MOTOR | CYCLES, | MOTOR VEHICLES, VEHICLE | CEB |
| | CYCLIC, | PROCESSES, PHYSICAL ASPECT | NMF |
| | CYLINDERS/ | CHAMBERS, BRAKES, | CHBL |
| PROPERTY | DAMAGE, | ACCIDENT | JM |
| DEBRIS REMOVAL, | PROPERTY | DAMAGE, ACCIDENT | JMD |
| REPAIRS, | PROPERTY | DAMAGE, ACCIDENT | JME |
| | DAMPING/ | DECAY, PHENOMENA, PHYSICAL | NLZB |
| | DASHBOARDS/ | INSTRUMENT PANELS, | DHGD |
| | DATA STATISTICS, | CONTENTS, | YEF |
| | DATA, | ANALYSIS, MATHEMATICAL, | WMDH |
| SCALING, | DATA, | ANALYSIS, MATHEMATICAL, | WMDHB |
| | DAMN, | TIME | LD |
| | DAY, | TIME | LP |
| | DAYTIME, | TIME | LB |
| | DEAD AFTER ARRIVAL, | HOSPITAL CARE, | JRJD |
| | DEAD AT SCENE, | TRANSPORTATION, | JRMC |
| | DEAD ENDS/ | CUL DE SAC, SPECIAL | CBC |
| | DEAD ON ARRIVAL, | HOSPITAL | JRID |
| | DEAFNESS, | DEFECTS, PROBLEMS, | CBC |
| | DEBRIS REMOVAL, | PROPERTY DAMAGE, | JMD |
| DISMEMBERMENT/ | DECAPITATION, | INJURY/ | JNC |
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| ACCELERATION/ | DECELERATION, | OPERATING CONDITIONS, | NKE |
| | DECISION (INTERAGENCY), | | JREF |
| | DECISION MAKING/ | GAME, | WMF |
| OPTIMIZATION, | DECISION MAKING/ | GAME, | WMFB |
| PLANNING/ | DECISION MAKING, | COGNITION/ | POB |
| RISK TAKING, | PLANNING/ | DECISION MAKING, COGNITION/ | POBB |
| DEFENSE MECHANISMS, | PLANNING/ | DECISION MAKING, COGNITION/ | POBC |
| | HOODS/ | DECKLIDS, BODY (UPPER), VEHICLE | GHDD |
| | DEFECT, PHENOMENA, | PHYSICAL ASPECT | NLZK |
| | DEFECTS, | PROBLEMS, BIOMEDICAL | CBD |
| BLINDNESS, | DEFECTS, | PROBLEMS, BIOMEDICAL | CBCB |
| DEAFNESS, | DEFECTS, | PROBLEMS, BIOMEDICAL | CBC |
| PARAPLEGIA, | DEFECTS, | PROBLEMS, BIOMEDICAL | CBCD |
| ORTHOPEDIC, | DEFECTS, | PROBLEMS, BIOMEDICAL | CBC |
| EPILEPSY, | DEFECTS, | PROBLEMS, BIOMEDICAL | CBCF |
| COLOR BLINDNESS, | DEFECTS, | PROBLEMS, BIOMEDICAL | CBCG |
| | DEFENSE MECHANISMS, | PLANNING/ | PDBC |
| | DEFIBRILLATOR, | MEDICAL, EQUIPMENT | XTQ |
| DEFROSTERS/ | DEFROGGERS, | AIR CONDITIONERS, | CMJB |
| | DEFORMATION, | PHENOMENA, PHYSICAL | NLZD |
| | DEFROSTERS/ | DEFROGGERS, AIR | CMJB |
| | DEGRADATION, | PHENOMENA, PHYSICAL | NLZH |
| WEAR, | DEGRADATION, | PHENOMENA, PHYSICAL | NLZHB |
| DETERIORATION, | DEGRADATION, | PHENOMENA, PHYSICAL | NLZHC |
| FATIGUE, | DEGRADATION, | PHENOMENA, PHYSICAL | NLZHD |
| AGING, | DEGRADATION, | PHENOMENA, PHYSICAL | NLZHE |
| CREEP, | DEGRADATION, | PHENOMENA, PHYSICAL | NLZHF |
| ASPIRATION/ | DEHYDRATION, | CONSEQUENCES, INJURY/ | JNPJ |
| | DELAY, | FREQUENCY/ | NKFF |
| GUIDE/ | DELINEATION, | TRAFFIC SIGNS/ | IBC |
| POPULATION/ | DEMOGRAPHY, | SOCIAL, SOCIOECONOMIC | SBC |
| LECTURE/ | DEMONSTRATIONS, | CLASS ROOM, | GOBC |
| | DENSITY/ | SPECIFIC GRAVITY, MASS, | NBBC |
| | DENSITY/ | TRANSPARENCY, OPTICAL, | ACD |
| | DENSITY, | TRAFFIC UNITS, TRAFFIC | GGC |
| | DEPOSIT FORMATION, | PHENOMENA, | NLZO |
| | DEPRESSANTS/ | TRANQUILIZERS, DRUGS/ | BDC |
| | DESERT, | TERRAIN/ | KBF |
| | DESIGN, | ENGINEERING, METHODS | WOB |
| DRAFTING, | DESIGN, | ENGINEERING, METHODS | WOB |
| | DESIGN, | NATURE OF STUDY, | YCI |
| | DESIGN, | STATISTICAL/ | WMEB |
| FACTORIAL, | DESIGN, | STATISTICAL/ | WMEBB |
| COVARIANCE/ | CORRELATION, | DESIGN, STATISTICAL/ | WMEBC |
| REGRESSION, | DESIGN, | STATISTICAL/ | WMEBD |
| LEAST SQUARE, | DESIGN, | STATISTICAL/ | WMEBE |
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| LOOP | DETECTORS, | SENSORS/ | XCL |
| | DETERIORATION, | DEGRADATION, | NLZHC |
| RESEARCH AND | DEVELOPMENT, | ENGINEERING, METHODS | WCH |
| | DEVIANCY/ | CONTROL, BEHAVIOR/ | SBBD |
| | DIAGNOSIS, | MEDICAL, METHODS | WSC |
| TYPLOGIES/ | CLINICAL | DIAGNOSIS, PERSONALITY, | PCC |
| ALCOHOLISM, | TYPLOGIES/ | CLINICAL | PCCB |
| SUICIDE/ | HOMICIDE, | TYPLOGIES/ | PCCC |
| NEUROSES, | TYPLOGIES/ | CLINICAL | PCCN |
| PSYCHOSES, | TYPLOGIES/ | CLINICAL | PCCP |
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| | DIFFERENTIALS, | POWER PLANTS, | DHGJ |
| | DIFFUSION, | PHENOMENA, PHYSICAL | NLJ |

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| | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJ |
| MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | GAJB |
| LIPS, MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJBB |
| FLOOR, MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJBC |
| CHEEK, MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJBD |
| PALATE, MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJBE |
| UVULA, PALATE, MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJBEB |
| JAW/ CHIN, MOUTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJBF |
| TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJC |
| GUM, TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJCB |
| ENAMEL, TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJCC |
| ROOT, TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJCC |
| NECK, TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJCE |
| CROWN, TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJCF |
| KINDS OF TEETH, TOOTH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJCG |
| FAUCES, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJD |
| TONGUE, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJE |
| SALIVARY GLANDS, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJF |
| TONSILS, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJG |
| PHARYNX, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJH |
| ESOPHAGUS, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJI |
| STOMACH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJJ |
| GASTRIC GLANDS, STOMACH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJJB |
| PYLORUS/ ORIFICE VALVE, STOMACH, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJJC |
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| CAECUM, SMALL INTESTINE, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJKB |
| LARGE INTESTINE, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJL |
| RECTUM, LARGE INTESTINE, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJLB |
| LIVER/ BILIARY TRACT, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJM |
| SPLEEN/ LYMPH TRACTS, | DIGESTIVE SYSTEM/ ALIMENTARY TRACT, | CAJN |
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| | DIKES, ROADSIDE, WAYS (ROADS) | CRL |
| | SIZE/ DIMENSION, PHYSICAL PROPERTIES, | NBF |
| LANE DIRECTION, REGULATORY, TRAFFIC | | F-BEC |
| TRAFFIC DIRECTION, TRAFFIC PATROL, | | F-CC |
| INTERSECTION, TRAFFIC DIRECTION, TRAFFIC PATROL, | | F-CDB |
| ESCORT, TRAFFIC DIRECTION, TRAFFIC PATROL, | | F-CCC |
| CROWD CONTROL, TRAFFIC DIRECTION, TRAFFIC PATROL, | | F-CCD |
| PARKING, TRAFFIC DIRECTION, TRAFFIC PATROL, | | F-CDE |
| BLOCKADE, TRAFFIC DIRECTION, TRAFFIC PATROL, | | F-CDF |
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| | DIRECTIONAL/ STEERING, CONTROL, | NLZRDBB |
| | DIRECTIONAL, LANES, PARTS OF WAYS, | CDCC |
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| LEFT TURN, DIRECTIONAL, LANES, PARTS OF WAYS, | | CDCCC |
| THROUGH, DIRECTIONAL, LANES, PARTS OF WAYS, | | CDCCD |
| MAPS/ DIRECTIONS, SERVICES | | IB |
| | DIRECTORYS, FORM, STUDY-REPORT TYPE | YDD |
| SOIL/ DIRT, ROAD MATERIALS, MATERIALS | | BBB |
| CLAY, SCIL/ DIRT, ROAD MATERIALS, MATERIALS | | BBBB |
| | DISABILITY, TYPES OF INSURANCE, | SEDE |
| | DISC, BRAKES, VEHICLE PARTS, | DHBC |
| | DISCIPLINES | V |
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| STATISTICS, MATHEMATICS, DISCIPLINES | | VBS |
| PHYSICS, DISCIPLINES | | VC |
| CHEMISTRY, DISCIPLINES | | VD |
| EARTH SCIENCES, DISCIPLINES | | VF |
| PSYCHOLOGY, DISCIPLINES | | VJ |
| SOCIAL SCIENCES/ ECONOMIC SCIENCES, DISCIPLINES | | VK |
| ENGINEERING, DISCIPLINES | | VL |
| CIVIL, ENGINEERING, DISCIPLINES | | VLB |
| ELECTRICAL, ENGINEERING, DISCIPLINES | | VLC |
| INDUSTRIAL, ENGINEERING, DISCIPLINES | | VLD |
| MECHANICAL, ENGINEERING, DISCIPLINES | | VLE |
| TRAFFIC, ENGINEERING, DISCIPLINES | | VLF |
| AEROSPACE, ENGINEERING, DISCIPLINES | | VLG |
| SYSTEMS, ENGINEERING, DISCIPLINES | | VLS |
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| EPIDEMIOLOGY/ ETIOLOGY, DISCIPLINES | | VN |
| MANAGEMENT SCIENCES, DISCIPLINES | | VO |
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| DOCUMENTATION, INFORMATION/ COMMUNICATION, DISCIPLINES | | VQB |
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| GENERAL DISCUSSIONS, CONTENTS, STUDY-REPORT | | YER |
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| | DISEASES/ PATHOLOGICAL, PROBLEMS, | CBB |
| OCCUPATIONAL, DISEASES/ PATHOLOGICAL, PROBLEMS, | | CBBB |
| | DISINTEGRATION, FAILURE, PHENOMENA, | NLZLC |
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| DISLOCATION, INJURY/ TRAUMA, | | JNI |
| DISMEMBERMENT/ DECAPITATION, | | JNC |
| DYNAMIC/ DISPLACEMENT, MOTION, PHENOMENA, | | NLFB |
| DISPLAYS/ METERS, EQUIPMENT | | XG |
| CATHODE-RAY TUBE, DISPLAYS/ METERS, EQUIPMENT | | XGB |
| DISTANCE/ RANGE, PHENOMENA, | | NLG |
| MILEAGE, DISTANCE/ RANGE, PHENOMENA, | | NLGB |
| DISTANCE/ TIME, BRAKING/ STOPPING, | | NLZJD |
| DISTANCE, TRAFFIC | | GE |
| SIGHT DISTANCES, GEOMETRICS, WAYS (ROADS) | | CGD |
| DISTORTION, PHENOMENA, PHYSICAL | | NLI |
| DISTORTIONS, BEHAVIORAL FACTORS, | | PFG |
| LOSS DISTRIBUTION, INSURANCE/ ACTUARY, | | SEC |
| DISTRIBUTION, STATISTICAL/ | | WMEE |
| DISTRIBUTORS, IGNITION, ELECTRICAL | | DHBB |
| DITCHES, ROADSIDE, WAYS (ROADS) | | CRI |
| DIVIDED, TRAFFICWAYS, WAYS (ROADS) | | CGG |
| GEOGRAPHICAL DIVISION, SPACE | | KN |
| WIDOWED/ DIVORCED, PEOPLE | | ER |
| DOCUMENTATION, INFORMATION/ | | VQB |
| DOORS, BODY (UPPER), VEHICLE PARTS, | | CHDC |
| LOCKS/ LATCHES, DOORS, BODY (UPPER), VEHICLE PARTS, | | CHCCD |
| HINGES, DOORS, BODY (UPPER), VEHICLE PARTS, | | CHCCC |
| DRAFTING, DESIGN, ENGINEERING, | | WDBB |

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| | DRAINS, ROADSIDE, WAYS (ROADS) | CRM |
| | DRINKING, MOVING VIOLATIONS, | RCFBB |
| | DRIVE SHAFTS/ CLUTCHES, POWER | CMGE |
| ANIMAL | DRIVEN, VEHICLE | CC |
| | DRIVER, EDUCATION, EDUCATIONAL | CG*EO |
| | DRIVER, LICENSING, REGULATORY, | RCGC*EO |
| | DRIVERS, PEOPLE | EO |
| PROBLEM, | DRIVERS, PEOPLE | EOB |
| PROFESSIONAL, | DRIVERS, PEOPLE | EOP |
| CHAUFFEURS, PROFESSIONAL, | DRIVERS, PEOPLE | EOPC |
| | REAR DRIVES, TRANSMISSIONS, POWER | CF-CGB |
| | FRONT DRIVES, TRANSMISSIONS, POWER | CMGCC |
| 4-WHEEL | DRIVES, TRANSMISSIONS, POWER | CF-CGC |
| | DRIVENWAYS, SPECIAL WAYS, WAYS | CBA |
| | DRIVING AGE, AGE, PEOPLE | EAB |
| | DROP-OUT, EDUCATION LEVEL, | QBF |
| | DROP, DYNAMIC, MECHANICAL TEST, | XQCB |
| | DROWSY, STATE OF AROUSAL, STATE OF | PEBC |
| | DRUGS/ AFFECTIVE AGENTS, MATERIALS | BD |
| STIMULANTS, | DRUGS/ AFFECTIVE AGENTS, MATERIALS | BDH |
| DEPRESSANTS/ TRANQUILIZERS, | DRUGS/ AFFECTIVE AGENTS, MATERIALS | BDC |
| ANESTHETICS, | DRUGS/ AFFECTIVE AGENTS, MATERIALS | BDC |
| | DRUM/ DISK, RECORDERS, EQUIPMENT | XHB |
| | DRUM, BRAKES, VEHICLE PARTS, | CHBB |
| | DRUMS, BRAKES, VEHICLE PARTS, | CHBK |
| | DRY, SURFACE CONDITIONS, WEATHER | MSC |
| NASAL | DUCT, LACHRYMAL GLANDS, EYE, HEAD, | CAIFNB |
| | DUCTILITY, MECHANICAL PROPERTIES, | NCH |
| | DUMMIES, MODELS (PHYSICAL), | XMC |
| | DURATION, FREQUENCY/ TIME, | NKFC |
| | DURATION, TRAFFIC | GF |
| | DUSK/ EVENING, TIME | LE |
| | DUST, ATMOSPHERE, WEATHER | MAE |
| | DYNAMIC/ DISPLACEMENT, MOTION, | NLFB |
| | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQC |
| DROP, | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQCB |
| SLED, | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQCC |
| PENDULUM, | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQCD |
| CENTRIFUGES, | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQCE |
| VIBRATION PLATFORMS, | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQCF |
| DYNAMOMETERS, | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQCG |
| | DYNAMOMETERS, DYNAMIC, MECHANICAL | XQCC |
| | EAR, HEAD, ANATOMY/ BODY, | CAIG |
| PINNA, | EAR, HEAD, ANATOMY/ BODY, | CAIGH |
| EXTERNAL AUDITORY MEATUS, | EAR, HEAD, ANATOMY/ BODY, | CAIGC |
| TYMPANIC CAVITY, | EAR, HEAD, ANATOMY/ BODY, | CAIGD |
| TYMPANIC MEMBRANE, | EAR, HEAD, ANATOMY/ BODY, | CAIGE |
| EUSTACHIAN TUBES, | EAR, HEAD, ANATOMY/ BODY, | CAIGF |
| TYMPANIC OSSICLES, | EAR, HEAD, ANATOMY/ BODY, | CAIGG |
| OSSEUS LABYRINTH, | EAR, HEAD, ANATOMY/ BODY, | CAIGH |
| MEMBRANEUS LABYRINTH, | EAR, HEAD, ANATOMY/ BODY, | CAIGI |
| | EARTH SCIENCES, DISCIPLINES | VF |
| | EARTHWORK, CONSTRUCTION, | WCDE |
| | ECONOMIC BEHAVIOR, ECONOMICS, | SCD |
| BUSINESS CYCLES, | ECONOMIC BEHAVIOR, ECONOMICS, | SCDH |
| CONSUMER, | ECONOMIC BEHAVIOR, ECONOMICS, | SCDC |
| SOCIAL SCIENCES/ | ECONOMIC SCIENCES, DISCIPLINES | VK |
| | ECONOMICS, SOCIOECONOMIC ASPECT | SC |
| MACROECONOMICS, | ECONOMICS, SOCIOECONOMIC ASPECT | SCB |
| MICROECONOMICS/ PRICE THEORY, | ECONOMICS, SOCIOECONOMIC ASPECT | SCC |
| ECONOMIC BEHAVIOR, | ECONOMICS, SOCIOECONOMIC ASPECT | SCC |
| BUSINESS CYCLES, ECONOMIC BEHAVIOR, | ECONOMICS, SOCIOECONOMIC ASPECT | SCCB |
| CONSUMER, ECONOMIC BEHAVIOR, | ECONOMICS, SOCIOECONOMIC ASPECT | SCCC |
| COSTS/ BENEFITS, | ECONOMICS, SOCIOECONOMIC ASPECT | SCE |
| COST EFFECTIVENESS, | ECONOMICS, SOCIOECONOMIC ASPECT | SCF |
| BUDGETS/ BUDGETING, | ECONOMICS, SOCIOECONOMIC ASPECT | SCG |
| FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCH |
| TAXES, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHB |
| FEES, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHC |
| ASSESSMENT, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHD |
| MONEY/ BANKING, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHE |
| INVESTMENT, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHF |
| STOCKS, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHG |
| BONDS, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHH |
| CREDIT, FINANCE, | ECONOMICS, SOCIOECONOMIC ASPECT | SCHK |
| | EDUCATION LEVEL, EDUCATIONAL ASPECT | QH |
| ILLITERATE, | EDUCATION LEVEL, EDUCATIONAL ASPECT | QBB |
| GRADE SCHOOL, | EDUCATION LEVEL, EDUCATIONAL ASPECT | QBC |
| HIGH SCHOOL, | EDUCATION LEVEL, EDUCATIONAL ASPECT | QBD |
| COLLEGE, | EDUCATION LEVEL, EDUCATIONAL ASPECT | QBE |
| DROP-OUT, | EDUCATION LEVEL, EDUCATIONAL ASPECT | QBF |
| | EDUCATION MEASUREMENTS, EDUCATIONAL | QF |
| ACHIEVEMENT TESTS, | EDUCATION MEASUREMENTS, EDUCATIONAL | QFB |
| EXAMINATIONS, | EDUCATION MEASUREMENTS, EDUCATIONAL | QFC |
| INTELLIGENCE TESTS, | EDUCATION MEASUREMENTS, EDUCATIONAL | QFD |
| | EDUCATION, EDUCATIONAL ASPECT | QG |
| DRIVER, | EDUCATION, EDUCATIONAL ASPECT | CG*EO |
| SAFETY, | EDUCATION, EDUCATIONAL ASPECT | CGE |
| MEDICAL, | EDUCATION, EDUCATIONAL ASPECT | QGM |
| FIRST AID (RED CROSS), MEDICAL, | EDUCATION, EDUCATIONAL ASPECT | QGMF |
| ADVANCED (RED CROSS), MEDICAL, | EDUCATION, EDUCATIONAL ASPECT | QGMG |
| COMPREHENSIVE, MEDICAL, | EDUCATION, EDUCATIONAL ASPECT | QGMI |
| PROFESSIONAL/ PHYSICIAN, MEDICAL, | EDUCATION, EDUCATIONAL ASPECT | Q |
| | EDUCATIONAL ASPECT | QB |
| EDUCATION LEVEL, | EDUCATIONAL ASPECT | QBB |
| ILLITERATE, EDUCATION LEVEL, | EDUCATIONAL ASPECT | QBC |
| GRADE SCHOOL, EDUCATION LEVEL, | EDUCATIONAL ASPECT | QBD |
| HIGH SCHOOL, EDUCATION LEVEL, | EDUCATIONAL ASPECT | QBE |
| COLLEGE, EDUCATION LEVEL, | EDUCATIONAL ASPECT | QBF |
| DROP-OUT, EDUCATION LEVEL, | EDUCATIONAL ASPECT | QC |
| PRINCIPLES, | EDUCATIONAL ASPECT | CD |
| TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCB |
| CLASS ROOM, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCB |
| DISCUSSIONS/ SEMINARS, CLASS ROOM, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCBH |
| DEMONSTRATIONS, CLASS ROOM, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCBG |
| SIMULATORS, CLASS ROOM, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCBH |
| FIELD, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCD |
| FORMAL, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCD |
| INFORMAL, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QCE |
| PROGRAMMED, TEACHING/ TRAINING, | EDUCATIONAL ASPECT | QDF |
| MATERIALS/ EQUIPMENT, | EDUCATIONAL ASPECT | QE |
| AUDIO-VISUAL, MATERIALS/ EQUIPMENT, | EDUCATIONAL ASPECT | QEB |
| BOOKS, MATERIALS/ EQUIPMENT, | EDUCATIONAL ASPECT | QEC |
| EDUCATION MEASUREMENTS, | EDUCATIONAL ASPECT | CF |

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| ACHIEVEMENT TESTS, EDUCATION MEASUREMENTS, | EDUCATIONAL ASPECT | QFB |
| EXAMINATIONS, EDUCATION MEASUREMENTS, | EDUCATIONAL ASPECT | QFC |
| INTELLIGENCE TESTS, EDUCATION MEASUREMENTS, | EDUCATIONAL ASPECT | QFD |
| EDUCATION, | EDUCATIONAL ASPECT | CG |
| DRIVER, EDUCATION, | EDUCATIONAL ASPECT | GG*EO |
| SAFETY, EDUCATION, | EDUCATIONAL ASPECT | GGE |
| MEDICAL, EDUCATION, | EDUCATIONAL ASPECT | GGM |
| FIRST AID (RED CROSS), MEDICAL, EDUCATION, | EDUCATIONAL ASPECT | GGPF |
| ADVANCED (RED CROSS), MEDICAL, EDUCATION, | EDUCATIONAL ASPECT | GGMG |
| COMPREHENSIVE, MEDICAL, EDUCATION, | EDUCATIONAL ASPECT | GGMH |
| PROFESSIONAL/ PHYSICIAN, MEDICAL, EDUCATION, | EDUCATIONAL ASPECT | GGMI |
| TEACHERS/ INSTRUCTORS, | EDUCATIONAL ASPECT | GH |
| | EKG, PHYSIOLOGICAL, TESTING/ | WUPJ |
| | EFFECTIVENESS, ECONOMICS, | SCF |
| COST | EFFECTIVENESS, NATURE OF STUDY, | YCL |
| EVALUATION/ | EFFECTS, ALCOHOL, TOXICOLOGY, | CHCBC |
| PHYSIOLOGICAL | EFFECTS, CONSEQUENCES, INJURY/ | JNPG |
| LATE | EFFICIENCY, OPERATING CONDITIONS, | NKH |
| | EHF (30-300 KMC), RADIO FREQUENCY, | NLCEB |
| | EJECTION, ACCIDENT HAZARDS, | JKB |
| | EKG, PHYSIOLOGICAL, TESTING/ | WUPK |
| | ELASTIC, CONNECTIVE TISSUES/ | CAPE |
| | ELASTICITY/ MODULUS OF ELASTICITY, | NCI |
| ELASTICITY/ MODULUS OF | ELASTICITY, MECHANICAL PROPERTIES, | NCI |
| | ELBOW, ARM, UPPER EXTREMITY, | CACDB |
| | ELECTRIC PROPERTIES, PHYSICAL | NG |
| | ELECTRIC PROPERTIES, PHYSICAL | NGB |
| RESISTANCE, | ELECTRIC PROPERTIES, PHYSICAL | NCC |
| IMPEDANCE, | ELECTRIC PROPERTIES, PHYSICAL | NGC |
| CAPACITANCE, | ELECTRIC PROPERTIES, PHYSICAL | NGE |
| POTENTIAL, | ELECTRIC PROPERTIES, PHYSICAL | NGF |
| MAGNETIC, | ELECTRIC, BRAKES, VEHICLE PARTS, | CHBS |
| | ELECTRIC, ENERGY/ POWER, PHENOMENA, | NLBC |
| | ELECTRICAL SYSTEMS, POWER PLANTS, | CH- |
| | ELECTRICAL SYSTEMS, POWER PLANTS, | CHHB |
| IGNITION, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHHRB |
| DISTRIBUTORS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHHBC |
| SPARK PLUGS, IGNITION, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHHC |
| LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHFC |
| HEADLIGHTS, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHFCB |
| TAIL, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCC |
| BRAKE/ STOP, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCC |
| TURN, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCC |
| BACK-UP, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCF |
| PARKING, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCG |
| CORNERING, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCH |
| MARKERS/ CLEARANCE, LIGHTS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHCI |
| BATTERIES, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHHD |
| GENERATORS/ ALTERNATORS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHHE |
| HORNS, | ELECTRICAL SYSTEMS, POWER PLANTS, | CHFH |
| | ELECTRICAL, ENGINEERING, | VLC |
| | ELECTROCUSSION, ACCIDENT HAZARDS, | JKG |
| | ELECTROMAGNETIC SPECTRUM, | NLC |
| GAMMA RAYS, | ELECTROMAGNETIC SPECTRUM, | NLCB |
| X-RAYS, | ELECTROMAGNETIC SPECTRUM, | NLCC |
| OPTICAL, | ELECTROMAGNETIC SPECTRUM, | NLCD |
| UV (BELOW .4 MICRONS), OPTICAL, | ELECTROMAGNETIC SPECTRUM, | NLCDB |
| VISIBLE (.4-.7 MICRONS), OPTICAL, | ELECTROMAGNETIC SPECTRUM, | NLCDC |
| IR (.7-1000 MICRONS), OPTICAL, | ELECTROMAGNETIC SPECTRUM, | NLCDD |
| | ELECTROMAGNETIC SPECTRUM, | NLCE |
| RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEB |
| EHF (30-300 KMC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEC |
| SHF (3-30 KMC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCED |
| UHF (.3-3 KMC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEE |
| VHF (30-300 MC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEG |
| HF (3-30 MC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEH |
| MF (1.3-3 MC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEI |
| LF (30-300 KC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEI |
| VLF (3-30 KC), RADIO FREQUENCY, | ELECTROMAGNETIC SPECTRUM, | NLCEI |
| FAT | EMBOLISM, CONSEQUENCES, INJURY/ | JNPI |
| | EMERGENCY ROOM, HOSPITAL CARE, | JRJE |
| | EMISSION CONTROLS, EXHAUST SYSTEMS, | CHGFE |
| | EMOTIONAL STATE/ MOOD, STATE OF THE | PFC |
| STRESS/ STRAIN, | EMOTIONAL STATE/ MOOD, STATE OF THE | PEDB |
| | ENAMEL, TOOTH, DIGESTIVE SYSTEM/ | CAJCC |
| | ENAMELS, PAINT, MATERIALS | BPC |
| | ENCYCLOPEDIA, FORM, STUDY-REPORT | YDF |
| | ENDOCRINE SYSTEM, ANATOMY/ BODY, | CAQ |
| DEAD | ENDS/ CUL DE SAC, SPECIAL WAYS, | CHC |
| | ENDURANCE/ TOLERANCE, PHYSIOLOGICAL | CEB |
| | ENERGY/ POWER, PHENOMENA, PHYSICAL | NLB |
| WORK, | ENERGY/ POWER, PHENOMENA, PHYSICAL | NLBA |
| HORSE POWER, | ENERGY/ POWER, PHENOMENA, PHYSICAL | NLBB |
| ELECTRIC, | ENERGY/ POWER, PHENOMENA, PHYSICAL | NLBC |
| COMBUSTION, | ENERGY/ POWER, PHENOMENA, PHYSICAL | NLBD |
| NUCLEAR, | ENERGY/ POWER, PHENOMENA, PHYSICAL | NLBE |
| | ENFORCEMENT, LEGAL ASPECT | RD |
| POLICING/ PATROL, | ENFORCEMENT, LEGAL ASPECT | RCB |
| PLRSUIT, POLICING/ PATROL, | ENFORCEMENT, LEGAL ASPECT | RDBB |
| APPREHENSION/ SUMMONS, | ENFORCEMENT, LEGAL ASPECT | RCC |
| TRIAL/ JUDICIAL PROCESS, | ENFORCEMENT, LEGAL ASPECT | RCC |
| APPEALS, TRIAL/ JUDICIAL PROCESS, | ENFORCEMENT, LEGAL ASPECT | RDDB |
| CONVICTION, | ENFORCEMENT, LEGAL ASPECT | RDE |
| EVIDENCE, | ENFORCEMENT, LEGAL ASPECT | RDF |
| EXPERTISE, EVIDENCE, | ENFORCEMENT, LEGAL ASPECT | RDFB |
| SANCTIONS/ PUNISHMENT, | ENFORCEMENT, LEGAL ASPECT | RDG |
| JAIL, SANCTIONS/ PUNISHMENT, | ENFORCEMENT, LEGAL ASPECT | RDGB |
| FINE, SANCTIONS/ PUNISHMENT, | ENFORCEMENT, LEGAL ASPECT | RDGC |
| SUSPENSION/ REVOCATION, SANCTIONS/ PUNISHMENT, | ENFORCEMENT, LEGAL ASPECT | RDGD |
| SYSTEM, SUSPENSION/ REVOCATION, SANCTIONS/ PUNISHMENT, | ENFORCEMENT, LEGAL ASPECT | RDGDB |
| PROBATION, SANCTIONS/ PUNISHMENT, | ENFORCEMENT, LEGAL ASPECT | RDGE |
| | ENGINE LOAD, VEHICULAR, OPERATING | NKVG |
| | ENGINE PERFORMANCE, PHENOMENA, | NLZQ |
| STARTING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQB |
| WARMUP, | ENGINE PERFORMANCE, PHENOMENA, | NLZQC |
| FLOODING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQD |
| ROUGHNESS, | ENGINE PERFORMANCE, PHENOMENA, | NLZQE |
| NOISE, | ENGINE PERFORMANCE, PHENOMENA, | NLZQF |
| KNOCK, NOISE, | ENGINE PERFORMANCE, PHENOMENA, | NLZQFB |
| RUMBLE, NOISE, | ENGINE PERFORMANCE, PHENOMENA, | NLZQFC |
| SURFACE IGNITION, | ENGINE PERFORMANCE, PHENOMENA, | NLZQG |
| BACKFIRING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQH |
| SPUTTERING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQI |
| SPARK PLUG FOULING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQJ |
| RING STICKING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQK |
| VALVE BURNING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQL |

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| SCAVENGING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQM |
| VAPOR LOCK, | ENGINE PERFORMANCE, PHENOMENA, | NLZQN |
| CARBURETOR ICING, | ENGINE PERFORMANCE, PHENOMENA, | NLZQO |
| MILES-PER-GALLON, | ENGINE PERFORMANCE, PHENOMENA, | NLZQP |
| | ENGINE TEMPERATURE, INSTRUMENTS, | CHJE |
| HUMAN | ENGINEERING/ ERGONOMICS, | VU |
| | ENGINEERING/ DISCIPLINES | VL |
| CIVIL, | ENGINEERING, DISCIPLINES | VLB |
| ELECTRICAL, | ENGINEERING, DISCIPLINES | VLG |
| INDUSTRIAL, | ENGINEERING, DISCIPLINES | VLD |
| MECHANICAL, | ENGINEERING, DISCIPLINES | VLE |
| TRAFFIC, | ENGINEERING, DISCIPLINES | VLG |
| AEROSPACE, | ENGINEERING, DISCIPLINES | VLH |
| SYSTEMS, | ENGINEERING, DISCIPLINES | VLS |
| | ENGINEERING, METHODS | WO |
| DESIGN, | ENGINEERING, METHODS | WOH |
| DRAFTING, DESIGN, | ENGINEERING, METHODS | WOBB |
| SURVEY, | ENGINEERING, METHODS | WOC |
| MAPPING, SURVEY, | ENGINEERING, METHODS | WOCC |
| CONSTRUCTION, | ENGINEERING, METHODS | WOD |
| EARTHWORK, CONSTRUCTION, | ENGINEERING, METHODS | WODE |
| PREFABRICATION, CONSTRUCTION, | ENGINEERING, METHODS | WODF |
| PRESTRESSING, PREFABRICATION, CONSTRUCTION, | ENGINEERING, METHODS | WODFB |
| MAINTENANCE/ REPAIR, | ENGINEERING, METHODS | WOF |
| QUALITY CONTROL, | ENGINEERING, METHODS | WOG |
| INSTRUMENTATION, | ENGINEERING, METHODS | WOGB |
| CALIBRATION, INSTRUMENTATION, | ENGINEERING, METHODS | WOH |
| RESEARCH AND DEVELOPMENT, | ENGINEERING, METHODS | CHGB |
| | ENGINES, POWER PLANTS, VEHICLE | CHGBD |
| PISTONS, | ENGINES, POWER PLANTS, VEHICLE | GHH |
| | ENTERING, TRAFFIC FLOW, TRAFFIC | GHH |
| | ENTRANCES, RAMPS, PARTS OF WAYS, | CDKB |
| | EPIDEMIOLOGY/ ETIOLOGY, DISCIPLINES | VN |
| | EPIGASTRIC, ABDOMEN, ANATOMY/ BODY, | CAEG |
| | EPILEPSY, DEFECTS, PROBLEMS, | CRDF |
| STABILITY/ | EQUILIBRIUM, PHENOMENA, PHYSICAL | NLW |
| | EQUIPMENT | X |
| SENSORS/ TRANSDUCERS, | EQUIPMENT | XC |
| AMPLIFIERS, SENSORS/ TRANSDUCERS, | EQUIPMENT | XCB |
| FILTERS, SENSORS/ TRANSDUCERS, | EQUIPMENT | XCC |
| ACCELEROMETERS, SENSORS/ TRANSDUCERS, | EQUIPMENT | XCD |
| STRAIN GAUGE, SENSORS/ TRANSDUCERS, | EQUIPMENT | XCE |
| FIFTH WHEEL, SENSORS/ TRANSDUCERS, | EQUIPMENT | XCF |
| LCOP DETECTORS, SENSORS/ TRANSDUCERS, | EQUIPMENT | XCL |
| | TRANSMITTERS/ RECEIVERS, EQUIPMENT | XF |
| RADAR, TRANSMITTERS/ RECEIVERS, | EQUIPMENT | XFH |
| RADIO, TRANSMITTERS/ RECEIVERS, | EQUIPMENT | XFC |
| TELEVISION, TRANSMITTERS/ RECEIVERS, | EQUIPMENT | XFD |
| | DISPLAYS/ METERS, EQUIPMENT | XG |
| CATHODE-RAY TUBE, DISPLAYS/ METERS, | EQUIPMENT | XGB |
| | RECORDERS, EQUIPMENT | XH |
| DRUM/ DISK, RECORDERS, | EQUIPMENT | XHB |
| MAGNETIC TAPE, RECORDERS, | EQUIPMENT | XHC |
| PUNCHED TAPE, RECORDERS, | EQUIPMENT | XHD |
| PUNCHED CARD, RECORDERS, | EQUIPMENT | XHE |
| MAGNETIC CORE, RECORDERS, | EQUIPMENT | XHF |
| | CONTROLS, EQUIPMENT | XI |
| RELAY, CONTROLS, | EQUIPMENT | XIB |
| | SUPPLIES, EQUIPMENT | XJ |
| | COMPUTERS, EQUIPMENT | XX |
| ANALOG, COMPUTERS, | EQUIPMENT | XXH |
| DIGITAL, COMPUTERS, | EQUIPMENT | XXC |
| HYBRID, COMPUTERS, | EQUIPMENT | XXD |
| | MODELS (PHYSICAL), EQUIPMENT | XM |
| SLUGS, MODELS (PHYSICAL), | EQUIPMENT | XMB |
| DUMPIES, MODELS (PHYSICAL), | EQUIPMENT | XMC |
| ANIMALS, MODELS (PHYSICAL), | EQUIPMENT | XMD |
| CADAVERS, MODELS (PHYSICAL), | EQUIPMENT | XME |
| SCALED, MODELS (PHYSICAL), | EQUIPMENT | XMF |
| | PHOTOGRAPHY, EQUIPMENT | XP |
| AERIAL, PHOTOGRAPHY, | EQUIPMENT | XPB |
| CAMERAS, PHOTOGRAPHY, | EQUIPMENT | XPC |
| PROJECTORS, PHOTOGRAPHY, | EQUIPMENT | XPD |
| FILM, PHOTOGRAPHY, | EQUIPMENT | XPF |
| MOTION, PHOTOGRAPHY, | EQUIPMENT | XPG |
| STILL, PHOTOGRAPHY, | EQUIPMENT | XPH |
| HOLOGRAM, PHOTOGRAPHY, | EQUIPMENT | XPI |
| | MECHANICAL TEST, EQUIPMENT | XQ |
| STATIC, MECHANICAL TEST, | EQUIPMENT | XQB |
| COMPRESSION, STATIC, MECHANICAL TEST, | EQUIPMENT | XQBB |
| TORSION, STATIC, MECHANICAL TEST, | EQUIPMENT | XQBC |
| TENSILE, STATIC, MECHANICAL TEST, | EQUIPMENT | XQBD |
| WEIGHT SCALES, STATIC, MECHANICAL TEST, | EQUIPMENT | XQBE |
| | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XQC |
| DROP, DYNAMIC, MECHANICAL TEST, | EQUIPMENT | XQCB |
| SLEC, DYNAMIC, MECHANICAL TEST, | EQUIPMENT | XQCC |
| PENDULUM, DYNAMIC, MECHANICAL TEST, | EQUIPMENT | XQCD |
| CENTRIFUGES, DYNAMIC, MECHANICAL TEST, | EQUIPMENT | XQCE |
| VIBRATION PLATFORMS, DYNAMIC, MECHANICAL TEST, | EQUIPMENT | XQCF |
| DYNAMOMETERS, DYNAMIC, MECHANICAL TEST, | EQUIPMENT | XQCG |
| | MEDICAL, EQUIPMENT | XT |
| BREATH ANALYZER, MEDICAL, | EQUIPMENT | XTB |
| CHEMICAL TEST (BLOOD ALCOHOL), MEDICAL, | EQUIPMENT | XTC |
| | SPLINTS, MEDICAL, EQUIPMENT | XTF |
| STRETCHERS, MEDICAL, | EQUIPMENT | XTG |
| BACKBOARDS, MEDICAL, | EQUIPMENT | XTH |
| RESUSCITATORS, MEDICAL, | EQUIPMENT | XTI |
| ASPIRATORS, MEDICAL, | EQUIPMENT | XTJ |
| OXYGEN SUPPLY, MEDICAL, | EQUIPMENT | XTK |
| AIRWAY MAINTENANCE, MEDICAL, | EQUIPMENT | XTL |
| HEMORRHAGE CONTROL, MEDICAL, | EQUIPMENT | XTM |
| PACEMAKER, MEDICAL, | EQUIPMENT | XTP |
| DEFIBRILLATOR, MEDICAL, | EQUIPMENT | XTQ |
| HUMAN ENGINEERING/ | ERGONOMICS, DISCIPLINES | VU |
| | ESCORT, TRAFFIC DIRECTION, TRAFFIC | HCDC |
| | ESOPHAGUS, DIGESTIVE SYSTEM/ | CAJI |
| | ESTIMATION, STATISTICAL/ | WNEH |
| EPIDEMIOLOGY/ | ETIOLOGY, DISCIPLINES | VN |
| | EUSTACHIAN TUBES, EAR, HEAD, | CAICF |
| | EVALUATION/ EFFECTIVENESS, NATURE | YCL |
| DUSK/ | EVENING, TIME | LE |
| | EVIDENCE, ENFORCEMENT, LEGAL ASPECT | RDF |
| EXPERTISE, | EVIDENCE, ENFORCEMENT, LEGAL ASPECT | RDFB |
| | EXAMINATIONS, EDUCATION | CFC |

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| | EXECUTIVE BRANCHES, SOCIETY | FI |
| MILITARY, EXECUTIVE BRANCHES, SOCIETY | | FIB |
| CIVIL, EXECUTIVE BRANCHES, SOCIETY | | FIC |
| POLICE, CIVIL, EXECUTIVE BRANCHES, SOCIETY | | FICB |
| | EXHAUST SYSTEMS, POWER PLANTS, | CHGF |
| MUFFLERS, EXHAUST SYSTEMS, POWER PLANTS, | | CHGFB |
| EMISSION CONTROLS, EXHAUST SYSTEMS, POWER PLANTS, | | CHGFE |
| | EXITS, RAMPS, PARTS OF WAYS, WAYS | CCCK |
| | PAST EXPERIENCE, PERSONALITY, | PCC |
| INTERACTION WITH PEOPLE, PAST EXPERIENCE, PERSONALITY, | | PCCB |
| SOCIAL VARIABLES, PAST EXPERIENCE, PERSONALITY, | | PCCC |
| LABORATORY EXPERIMENT, NATURE OF STUDY, | | YCG |
| FIELD EXPERIMENT, NATURE OF STUDY, | | YCH |
| | EXPERIMENTAL, COLLISION, ACCIDENT | JD*WE |
| | EXPERIMENTAL, METHODS | WE |
| FIELD, EXPERIMENTAL, METHODS | | WEF |
| LABORATORY, EXPERIMENTAL, METHODS | | WEG |
| | EXPERIMENTAL, STATUS, VEHICLE | CNE |
| | EXPERIMENTAL, SURGERY, MEDICAL, | WSCF |
| | EXPERTISE, EVIDENCE, ENFORCEMENT, | RDFB |
| | EXPLOSION, ACCIDENT HAZARDS, | JXF |
| | EXPLOSIVES, COMMODITIES, MATERIALS | HRB |
| | EXPOSURE, SURVEY, METHODS | WTP |
| | EXTERNAL AUDITORY HEATUS, EAR, | CAIGC |
| | EXTRACTION OF OCCUPANT, RECOVERY OF | JRF |
| | LOWER EXTREMITY, ANATOMY/ BODY, | CAC |
| ANKLE, LOWER EXTREMITY, ANATOMY/ BODY, | | CACA |
| FOOT, LOWER EXTREMITY, ANATOMY/ BODY, | | CACB |
| TOE, LOWER EXTREMITY, ANATOMY/ BODY, | | CACC |
| HEEL, LOWER EXTREMITY, ANATOMY/ BODY, | | CACD |
| LEG, LOWER EXTREMITY, ANATOMY/ BODY, | | CADE |
| FEMUR, LEG, LOWER EXTREMITY, ANATOMY/ BODY, | | CADEB |
| FIBULA, LEG, LOWER EXTREMITY, ANATOMY/ BODY, | | CADEC |
| TIBIA, LEG, LOWER EXTREMITY, ANATOMY/ BODY, | | CADEC |
| | KNEE, LOWER EXTREMITY, ANATOMY/ BODY, | CACF |
| | THIGH, LOWER EXTREMITY, ANATOMY/ BODY, | CACG |
| | PELVIS, LOWER EXTREMITY, ANATOMY/ BODY, | CADH |
| BUTTOCKS, PELVIS, LOWER EXTREMITY, ANATOMY/ BODY, | | CACHB |
| HIPS, PELVIS, LOWER EXTREMITY, ANATOMY/ BODY, | | CADHC |
| PERINEUM/ ANUS, PELVIS, LOWER EXTREMITY, ANATOMY/ BODY, | | CADHD |
| | UPPER EXTREMITY, ANATOMY/ BODY, | CAG |
| SHOULDER, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGB |
| AXILLA, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGC |
| ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGD |
| ELBOW, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDB |
| HUMERUS, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGCC |
| FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDD |
| RADIUS, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDDA |
| ULNA, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDDC |
| WRIST, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDE |
| HAND, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDF |
| FINGER/ THUMB, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDG |
| METACARPALS, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | | CAGDH |
| | EYE, HEAD, ANATOMY/ BODY, | CAIF |
| | EYEBROW, EYE, HEAD, ANATOMY/ BODY, | CAIFB |
| | EYELASHES, EYE, HEAD, ANATOMY/ BODY, | CAIFC |
| | EYELID, EYE, HEAD, ANATOMY/ BODY, | CAIFD |
| | CORNEA, EYE, HEAD, ANATOMY/ BODY, | CAIFE |
| | SCLERA, EYE, HEAD, ANATOMY/ BODY, | CAIFF |
| | IRIS, EYE, HEAD, ANATOMY/ BODY, | CAIFG |
| CILIARY PROCESS, EYE, HEAD, ANATOMY/ BODY, | | CAIFH |
| CHOROID, EYE, HEAD, ANATOMY/ BODY, | | CAIFI |
| RETINA, EYE, HEAD, ANATOMY/ BODY, | | CAIFJ |
| AQUEOUS HUMOR, EYE, HEAD, ANATOMY/ BODY, | | CAIFK |
| CRYSTALLINE LENS, EYE, HEAD, ANATOMY/ BODY, | | CAIFL |
| VITREOUS HUMOR, EYE, HEAD, ANATOMY/ BODY, | | CAIFM |
| LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ BODY, | | CAIFN |
| NASAL DUCT, LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ BODY, | | CAIFNB |
| | EYEBROW, EYE, HEAD, ANATOMY/ BODY, | CAIFB |
| | EYELASHES, EYE, HEAD, ANATOMY/ BODY, | CAIFC |
| | EYELID, EYE, HEAD, ANATOMY/ BODY, | CAIFD |
| | FACE PROTECTORS, PERSONAL | DMKF |
| BURBLES/ SHIELDS, FACE PROTECTORS, PERSONAL | | DMKFB |
| GOGGLES, FACE PROTECTORS, PERSONAL | | DMKFG |
| | FACE, HEAD, ANATOMY/ BODY, | QAIB |
| | FACTORIAL, DESIGN, STATISTICAL/ | WHEBB |
| | FACTORS, PSYCHOLOGICAL ASPECT | PF |
| STIMULUS, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PFB |
| RESPONSE, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PFC |
| REINFORCEMENT, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PDF |
| SEQUENCE/ SCHEDULE, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PFE |
| PERCEPTUAL-MOTOR COORDINATION, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PFF |
| DISTORTIONS, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PFG |
| SET, BEHAVIORAL FACTORS, PSYCHOLOGICAL ASPECT | | PFH |
| | FADE, BRAKING/ STOPPING, VEHICULAR | NLZRJF |
| | FAILURE, PHENOMENA, PHYSICAL ASPECT | NLZL |
| BREAKDOWN, FAILURE, PHENOMENA, PHYSICAL ASPECT | | NLZLB |
| COLLAPSE, FAILURE, PHENOMENA, PHYSICAL ASPECT | | NLZLC |
| DISINTEGRATION, FAILURE, PHENOMENA, PHYSICAL ASPECT | | NLZLD |
| SHORT CIRCUIT, FAILURE, PHENOMENA, PHYSICAL ASPECT | | NLZLE |
| RUPTURE, FAILURE, PHENOMENA, PHYSICAL ASPECT | | NLZLF |
| | FALL, TIME | LK |
| | FALLING FROM MOVING VEHICLE, | JCC |
| | FAMILIES, PEOPLE | ES |
| SIZE, FAMILIES, PEOPLE | | ESB |
| INCOME, FAMILIES, PEOPLE | | ESC |
| | FARM, ZONE/ LAND USAGE, SPACE | KLD |
| | FAT EMBOLISM, CONSEQUENCES, INJURY/ | JNPI |
| | FATAL, CONSEQUENCES, INJURY/ | JNPF |
| | FATAL, INJURY/ TRAUMA, ACCIDENT | JNB |
| | FATIGUE, DEGRADATION, PHENOMENA, | NLZHD |
| | FATIGUE, STATE OF THE ORGANISM, | PEC |
| | FAUCES, DIGESTIVE SYSTEM/ | CAJD |
| | FEAR, INFERRED PSYCHOLOGICAL STATE, | PEEF |
| | FEASIBILITY STUDIES, PROGRESS | YBC |
| | FEDERAL/ NATIONAL, GOVERNMENTS, | FGE |
| | FEES, FINANCE, ECONOMICS, | SCHC |
| | FEMALE GENITAL ORGANS, UROGENITAL | CAME |
| | FEMALES, SEX, PEOPLE | EFC |
| PREGNANT, FEMALES, SEX, PEOPLE | | EFCP |
| | FEMUR, LEG, LOWER EXTREMITY, | CADEB |
| | FENDERS, BODY (UPPER), VEHICLE | CHCE |
| | FIBERS/ TEXTILES, MATERIALS | BF |
| | FIBULA, LEG, LOWER EXTREMITY, | CADEC |

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| | FIELD EXPERIMENT, NATURE OF STUDY, | YCH |
| | FIELD, EXPERIMENTAL, METHODS | WEF |
| | FIELD, TEACHING/ TRAINING, | QDC |
| VISUAL | FIELD, VISION, SENSES, | PBCG |
| | FIFTH WHEEL, SENSORS/ TRANSDUCERS, | XCF |
| TANKS/ | FILLER PIPES/ CONNECTIONS, FUEL | CHGDF |
| | FILM, PHOTOGRAPHY, EQUIPMENT | XPF |
| | FILTERS, SENSORS/ TRANSDUCERS, | XCC |
| | FINAL, PROGRESS STATUS, | YBH |
| | FINANCE, ECONOMICS, SOCIOECONOMIC | SCH |
| TAXES, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHB |
| FEES, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHC |
| ASSESSMENT, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHD |
| MONEY/ BANKING, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHE |
| INVESTMENT, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHF |
| STOCKS, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHG |
| BONDS, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHH |
| CREDIT, | FINANCE, ECONOMICS, SOCIOECONOMIC | SCHK |
| | FINANCIAL RESPONSIBILITY, CRIMINAL, | RCFD |
| | FINE, SANCTIONS/ PUNISHMENT, | RDGC |
| | FINGER/ THUMB, ARM, UPPER | CAGDG |
| | FIRE, ACCIDENT HAZARDS, ACCIDENT | JKD |
| | FIRST AID (RED CROSS), TREATMENT/ | JRGF |
| | FIRST AID (RED CROSS), MEDICAL, | QGMF |
| | FIRST AID, MEDICAL, METHODS | WSB |
| | FIRST AID, MEDICAL, METHODS | WSBC |
| RESUSCITATION, MAINTAINING AIRWAYS, | FIRST AID, MEDICAL, METHODS | WSBCR |
| MECHANICAL, RESUSCITATION, MAINTAINING AIRWAYS, | FIRST AID, MEDICAL, METHODS | WSBCRM |
| MCUTH-TC-MOUTH, RESUSCITATION, MAINTAINING AIRWAYS, | FIRST AID, MEDICAL, METHODS | WSBCRN |
| TRACHEOSTOMY, MAINTAINING AIRWAYS, | FIRST AID, MEDICAL, METHODS | WSBCT |
| | BLEEDING, FIRST AID, MEDICAL, METHODS | WSBD |
| | SPLINTING, FIRST AID, MEDICAL, METHODS | WSBE |
| | FLASHING, SIGNS/ SIGNALS, WAYS | CIF |
| | FLAT, TERRAIN/ HABITAT, SPACE | KRB |
| | FLEET, STATUS, VEHICLE | CNF |
| | FLEXIBILITY/ BRITTLNESS, | NCG |
| | FLEXIBLE, SEPARATORS, PARTS OF | CDHF |
| WET/ | FLOOD, SURFACE CONDITIONS, WEATHER | MSD |
| | FLOODING, ENGINE PERFORMANCE, | NLZQD |
| | FLOOR, MOUTH, DIGESTIVE SYSTEM/ | CAJBC |
| | FLOW CHARTS, CONTENTS, STUDY-REPORT | YEP |
| BLOOD | FLOW/ CARDIAC OUTPUT, | WUPE |
| | FLOW, AERODYNAMICS/ FLUIDICS, | NHF |
| | FLOW, TRAFFIC | GH |
| CONGESTION, CNFLICT, | FLOW, TRAFFIC | GFC |
| | FLOW, TRAFFIC | GHCB |
| FOLLOWING, | FLOW, TRAFFIC | GD |
| OVERTAKING, | FLOW, TRAFFIC | GHE |
| PLATOON, | FLOW, TRAFFIC | GHF |
| MERGING, | FLOW, TRAFFIC | GHG |
| ENTERING, | FLOW, TRAFFIC | GHH |
| SPEED CHANGE, | FLOW, TRAFFIC | GHI |
| STOPPING, | FLOW, TRAFFIC | GHJ |
| PARKING, | FLOW, TRAFFIC | GHK |
| HEADWAY, | FLOW, TRAFFIC | GHM |
| GAP ACCEPTANCE, | FLOW, TRAFFIC | GHC |
| PASSING, | FLOW, TRAFFIC | GHP |
| TURNING, | FLOW, TRAFFIC | GHT |
| LEFT, TURNING, | FLOW, TRAFFIC | GHTL |
| RIGHT, TURNING, | FLOW, TRAFFIC | GHTR |
| WEAVING, | FLOW, TRAFFIC | GHW |
| WRCNG WAY, | FLOW, TRAFFIC | GHX |
| | FLUIDICS, PHYSICAL ASPECT | NH |
| FLOW, AERODYNAMICS/ | FLUIDICS, PHYSICAL ASPECT | NHF |
| | FLUIDICS, PHYSICAL ASPECT | CAR |
| | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARB |
| LYMPH, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARC |
| BLOOD, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARD |
| CEREBROSPINAL, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARE |
| SALIVA, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARF |
| TEARS, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARG |
| GASTRIC, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARH |
| URINE, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | CARI |
| SWEAT, BODY | FLUIDS, ANATOMY/ BODY, BIOMEDICAL | JKC |
| | FLYING OBJECTS, ACCIDENT HAZARDS, | MAF |
| | FOG/ SMOG, ATMOSPHERE, WEATHER | GHC |
| | FOLLOWING, TRAFFIC FLOW, TRAFFIC | CADB |
| | FOOT, LOWER EXTREMITY, ANATOMY/ | CAGCC |
| | FOREARM, ARM, UPPER EXTREMITY, | CAGCCB |
| RADIUS, | FOREARM, ARM, UPPER EXTREMITY, | CAGCCD |
| ULNA, | FOREARM, ARM, UPPER EXTREMITY, | DECF |
| | FOREIGN, PASSENGER, MOTOR VEHICLES, | DECFB |
| OVER 100 IN., | FOREIGN, PASSENGER, MOTOR VEHICLES, | DECFD |
| 90-100 IN., | FOREIGN, PASSENGER, MOTOR VEHICLES, | DECFD |
| BELOW 90 IN., | FOREIGN, PASSENGER, MOTOR VEHICLES, | YD |
| | FORM, STUDY-REPORT TYPE | YDB |
| HANDBOOKS, | FORM, STUDY-REPORT TYPE | YCC |
| SHOP MANUALS, | FORM, STUDY-REPORT TYPE | YCD |
| DIRECTORIES, | FORM, STUDY-REPORT TYPE | YDE |
| DICTIONARY/ GLOSSARY/ THESAURUS, | FORM, STUDY-REPORT TYPE | YDF |
| ENCYCLOPEDIA, | FORM, STUDY-REPORT TYPE | YDG |
| TEXT BOOKS, | FORM, STUDY-REPORT TYPE | YDH |
| THESIS/ TERM PAPERS, | FORM, STUDY-REPORT TYPE | YDI |
| LEAFLETS/ BROCHURES, | FORM, STUDY-REPORT TYPE | YDJ |
| PRESS REPORTS, | FORM, STUDY-REPORT TYPE | YDK |
| LETTERS/ MEMORANDUMS, | FORM, STUDY-REPORT TYPE | YDL |
| POPULAR LITERATURE, | FORM, STUDY-REPORT TYPE | YDM |
| UNTRANSLATED, | FORM, STUDY-REPORT TYPE | YDN |
| COLLECTIONS, | FORM, STUDY-REPORT TYPE | YDT |
| TRAINING MANUAL, | FORM, STUDY-REPORT TYPE | QDD |
| | FORMAL, TEACHING/ TRAINING, | NLZO |
| DEPOSIT | FORMATION, PHENOMENA, PHYSICAL | NLZQJ |
| SPARK PLUG | FOULING, ENGINE PERFORMANCE, | FCD |
| | FOUNDATIONS/ SOCIETIES, CORPORATE | CCJC |
| | FOUR WAY, JUNCTIONS/ CROSSINGS, | JNH |
| | FRACTURE, INJURY/ TRAUMA, ACCIDENT | CHC |
| CHASSIS/ | FRAMES, VEHICLE PARTS, VEHICLE | CHCB |
| SUSPENSIONS, CHASSIS/ | FRAMES, VEHICLE PARTS, VEHICLE | CHCC |
| AXLES, CHASSIS/ | FRAMES, VEHICLE PARTS, VEHICLE | CHCD |
| SPRINGS, CHASSIS/ | FRAMES, VEHICLE PARTS, VEHICLE | CHCE |
| SHOCK ABSORBERS, CHASSIS/ | FRAMES, VEHICLE PARTS, VEHICLE | GDEB |
| | FREIGHT, COMMERCIAL, PURPOSE/ TRIP, | NKF |
| | FREQUENCY/ TIME, OPERATING | NKFB |
| REACTION TIME, | FREQUENCY/ TIME, OPERATING | NKFC |
| DURATION, | FREQUENCY/ TIME, OPERATING | NKFC |

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| | LATENCY, FREQUENCY/ TIME, OPERATING | NKFD |
| | REFRACTORY PERIOD, FREQUENCY/ TIME, OPERATING | NKFE |
| | DELAY, FREQUENCY/ TIME, OPERATING | NKFF |
| | PERIOD, FREQUENCY/ TIME, OPERATING | NKFP |
| | RADIO FREQUENCY, ELECTROMAGNETIC | NLCE |
| EHF (30-300 KMC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEB |
| SHF (3-30 KMC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEC |
| UHF (1.3-3 KMC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCCD |
| VHF (30-300 MC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEE |
| HF (3-30 MC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEF |
| MF (1.3-3 MC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEG |
| LF (30-300 KC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEH |
| VLF (3-30 KC), RADIO | FREQUENCY, ELECTROMAGNETIC | NLCEI |
| | FRICTION, PHENOMENA, PHYSICAL | NLZF |
| | SKIN, FRICTION, PHENOMENA, PHYSICAL | NLZFB |
| | STATIC, FRICTION, PHENOMENA, PHYSICAL | NLZFC |
| | ROLLING, FRICTION, PHENOMENA, PHYSICAL | NLZFD |
| | SLIDING, FRICTION, PHENOMENA, PHYSICAL | NLZFE |
| | FALLING FROM MOVING VEHICLE, NONCOLLISION | JCC |
| | FRONT DRIVES, TRANSMISSIONS, POWER | DFGCC |
| | FRONT, ACCIDENT | JH |
| | LEFT, FRONT, ACCIDENT | JHL |
| | RIGHT, FRONT, ACCIDENT | JHR |
| | SNOW/ FROST, ATMOSPHERE, WEATHER | MAH |
| | FUEL GAUGES, INSTRUMENTS, VEHICLE | CHJC |
| | AIR FUEL RATIO, VEHICULAR, OPERATING | NKVB |
| | FUEL SYSTEMS, POWER PLANTS, VEHICLE | CHGD |
| | CARBURETORS, FUEL SYSTEMS, POWER PLANTS, VEHICLE | CHGDC |
| | TANKS/ FILLER PIPES/ CONNECTIONS, FUEL SYSTEMS, POWER PLANTS, VEHICLE | CHGDF |
| | FUEL, MATERIALS | BG |
| | FUTURE/ PROJECTION, MATH OF | YCJ |
| | DECISION MAKING/ GAME, MATHEMATICAL, METHODS | WMF |
| | OPTIMIZATION, DECISION MAKING/ GAME, MATHEMATICAL, METHODS | WMB |
| | GAMMA RAYS, ELECTROMAGNETIC | NLCB |
| | GAP ACCEPTANCE, TRAFFIC FLOW, | CHC |
| | GASTRIC GLANDS, STOMACH, DIGESTIVE | CAJJP |
| | GASTRIC, BODY FLUIDS, ANATOMY/ | CARG |
| | GATES, BARRICADES, PARTS OF WAYS, | CDEB |
| | STRAIN GAUGE, SENSORS/ TRANSDUCERS, | XCE |
| | FUEL GAUGES, INSTRUMENTS, VEHICLE PARTS, | CHJC |
| | GEARS, POWER PLANTS, VEHICLE PARTS, | CHCI |
| | GENERAL DISCUSSIONS, CONTENTS, | YER |
| | SPEECHES, GENERAL DISCUSSIONS, CONTENTS, | YERH |
| | ANECDOTES/ JOKES, GENERAL DISCUSSIONS, CONTENTS, | YERC |
| | GENERATION/ PROPAGATION, PHENOMENA, | NLA |
| | GENERATORS/ ALTERNATORS, ELECTRICAL | CHFE |
| | MALE GENITAL ORGANS, UROGENITAL SYSTEM, | CAMD |
| | FEMALE GENITAL ORGANS, UROGENITAL SYSTEM, | CAME |
| | GEOGRAPHICAL DIVISION, SPACE | KA |
| | GEOMETRICS, WAYS (ROADS) | CG |
| | PLANNER, GEOMETRICS, WAYS (ROADS) | CGB |
| | ALIGNMENTS, GEOMETRICS, WAYS (ROADS) | CGC |
| | SIGHT DISTANCES, GEOMETRICS, WAYS (ROADS) | CGD |
| | GRADES, GEOMETRICS, WAYS (ROADS) | CGE |
| | CLEARANCES, GEOMETRICS, WAYS (ROADS) | CGF |
| | CROSS SECTIONS, GEOMETRICS, WAYS (ROADS) | CGG |
| | SUPERELEVATIONS, GEOMETRICS, WAYS (ROADS) | CGH |
| | CROWNS, GEOMETRICS, WAYS (ROADS) | CGI |
| | CURVES, GEOMETRICS, WAYS (ROADS) | CGJ |
| | STRAIGHT, GEOMETRICS, WAYS (ROADS) | CGK |
| | CRESTS/ SAGS, GEOMETRICS, WAYS (ROADS) | CGL |
| | GERIATRIC, SURGERY, MEDICAL, | WCC |
| | SALIVARY GLANDS, DIGESTIVE SYSTEM/ | CAJF |
| | LACHRYMAL GLANDS, EYE, HEAD, ANATOMY/ BODY, | CAJFA |
| NASAL DUCT, LACHRYMAL | GLANDS, EYE, HEAD, ANATOMY/ BODY, | CAJFAP |
| | GASTRIC GLANDS, STOMACH, DIGESTIVE SYSTEM/ | CAJFH |
| | GLARE, BRIGHTNESS, OPTICAL, | NDRB |
| | GLASS, MATERIALS | BK |
| | GLAZING, GLASS, MATERIALS | BKG |
| LAMINATED, GLAZING, | GLASS, MATERIALS | BKGL |
| TEMPERED, GLAZING, | GLASS, MATERIALS | BKGM |
| | GLAZING, GLASS, MATERIALS | BKG |
| LAMINATED, | GLAZING, GLASS, MATERIALS | BKGL |
| TEMPERED, | GLAZING, GLASS, MATERIALS | BKGM |
| DICTIONARY/ | GLOSSARY/ THESAURUS, FORM, | YDF |
| | GOGGLES, FACE PROTECTORS, PERSONAL | DMKFG |
| | GOVERNMENTS, SOCIETY | FC |
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| STATE/ PROVINCE, | GOVERNMENTS, SOCIETY | FGD |
| FEDERAL/ NATIONAL, | GOVERNMENTS, SOCIETY | FGE |
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| | GRAVITATION, PHENOMENA, PHYSICAL | NLU |
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| FLAT, TERRAIN/ | HABITAT, SPACE | KHC |
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| HILLY, TERRAIN/ | HABITAT, SPACE | KRE |
| MOUNTAINS, TERRAIN/ | HABITAT, SPACE | KRF |
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| VEGETATION, TERRAIN/ | HABITAT, SPACE | KDH |
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| RURAL, TERRAIN/ | HABITAT, SPACE | KHL |
| SUBURBAN, TERRAIN/ | HABITAT, SPACE | KBL |
| URBAN/ TOWN/ CITY, TERRAIN/ | HABITAT, SPACE | KBM |

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| | RIVER/ CANAL, WATERS, TERRAIN/ | HABITAT, SPACE | KBPC |
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| | INVENTORY, MODELS/ MODELING, | WNBC |
| ACCIDENT CAUSATION, ACCIDENT | INVESTIGATION, ACCIDENT | JLK |
| | INVESTMENT, FINANCE, ECONOMICS, | SCHF |
| | IR (1.7-1000 MICRONS), OPTICAL, | NLCCD |
| | IRIS, EYE, HEAD, ANATOMY/ BODY, | DAIFG |
| TRAFFIC | ISLANDS, SEPARATORS, PARTS OF WAYS, | CCHC |
| | JACK-KNIFING/ OFF-TRACKING, | NLZRG |
| | JAIL, SANCTIONS/ PUNISHMENT, | RDBG |
| | JAW/ CHIN, MOUTH, DIGESTIVE SYSTEM/ | CAJBF |
| | JOINTS, MUSCULO-SKELETAL SYSTEM, | CACD |
| LIGAMENTS, | JOINTS, MUSCULO-SKELETAL SYSTEM, | CACCH |
| ANECDOTES/ JOKES, GENERAL DISCUSSIONS, | | YERC |
| TRIAL/ | JUDICIAL PROCESS, ENFORCEMENT, | RDD |
| APPEALS, TRIAL/ | JUDICIAL PROCESS, ENFORCEMENT, | RDDB |
| | JUDICIARY BRANCHES/ COURTS, SOCIETY | FJ |
| | JUNCTIONS/ CROSSINGS, PARTS OF | CDJ |
| THREE WAY, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJB |
| FOUR WAY, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJC |
| MULTIWAY, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJD |
| INTERCHANGES, | JUNCTIONS/ CROSSINGS, PARTS OF | CDJE |
| CLOVERLEAF, INTERCHANGES, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJEB |
| ROTARY, INTERCHANGES, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJEC |
| INTERSECTIONS (AT GRADE), | JUNCTIONS/ CROSSINGS, PARTS OF | CDJF |
| GRADE SEPARATION, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJG |
| OVERPASS, GRADE SEPARATION, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJGB |
| UNDERPASS, GRADE SEPARATION, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJGC |
| CROSSWALKS, | JUNCTIONS/ CROSSINGS, PARTS OF | CDJH |
| RAILWAYS, | JUNCTIONS/ CROSSINGS, PARTS OF | CCJI |
| LF (30-300 | KC), RADIO FREQUENCY, | NLCEH |
| VLF (3-30 | KC), RADIO FREQUENCY, | NLCEI |
| | KIDNEYS, UROGENITAL SYSTEM, | CAMB |
| | KINDS OF TEETH, TOOTH, DIGESTIVE | CAJCG |
| | KINESIOLOGY, BIOMECHANICS, | YMBB |
| | KINETHETIC/ MOTION, SENSES, | PBC |
| | KINETICS, PHENOMENA, PHYSICAL | NLV |
| EHF (30-300 | KMC), RADIO FREQUENCY, | NLCEB |
| SHF (3-30 | KMC), RADIO FREQUENCY, | NLCEC |
| UHF (1.3-3 | KMC), RADIO FREQUENCY, | NLCED |
| | KNEE, LOWER EXTREMITY, ANATOMY/ | DADF |
| | KNOCK, NOISE, ENGINE PERFORMANCE, | NLZQFB |
| | LABORATORY EXPERIMENT, NATURE OF | YCG |
| | LABORATORY, EXPERIMENTAL, METHODS | WEG |
| OSSEOUS | LABYRINTH, EAR, HEAD, ANATOMY/ | DAIGH |
| MEMBRANEOUS | LABYRINTH, EAR, HEAD, ANATOMY/ | DAIGI |
| | LACERATION/ OPENWOUND/ PENETRATING, | JNG |
| | LACHRYMAL GLANDS, EYE, HEAD, | DAIFN |
| NASAL DUCT, | LACHRYMAL GLANDS, EYE, HEAD, | DAIFNH |
| | LACQUERS, PAINT, MATERIALS | BPD |
| SEA/ | LAKE, WATERS, TERRAIN/ HABITAT, | KBPB |
| | LAMINATED, GLAZING, GLASS, | BKGL |
| | LAND USAGE, SPACE | KL |
| RESIDENTIAL, ZONE/ | LAND USAGE, SPACE | KLH |
| SCHOOL/ HOSPITAL, ZONE/ | LAND USAGE, SPACE | KLC |
| FARM, ZONE/ | LAND USAGE, SPACE | KLD |
| PARK/ RESORT, ZONE/ | LAND USAGE, SPACE | KLE |
| BUSINESS, ZONE/ | LAND USAGE, SPACE | KLH |
| INDUSTRIAL, ZONE/ | LAND USAGE, SPACE | KLI |
| | LAND UTILIZATION, REGIONAL | SDD |
| | LANE DIRECTION, REGULATORY, TRAFFIC | HBEC |
| SINGLE | LANE, TRAFFICWAYS, WAYS (ROADS) | CCI |
| TWO | LANE, TRAFFICWAYS, WAYS (ROADS) | CCJ |

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| | MULTIPLE | LANE, TRAFFICWAYS, WAYS (ROADS) | CCK |
| | | LANES, PARTS OF WAYS, WAYS (ROADS) | CDL |
| | REVERSIBLE, | LANES, PARTS OF WAYS, WAYS (ROADS) | CDCB |
| | DIRECTIONAL, | LANES, PARTS OF WAYS, WAYS (ROADS) | CDCC |
| RIGHT TURN, DIRECTIONAL, | LANES, | PARTS OF WAYS, WAYS (ROADS) | CDCCB |
| LEFT TURN, DIRECTIONAL, | LANES, | PARTS OF WAYS, WAYS (ROADS) | CDCCC |
| THROUGH, DIRECTIONAL, | LANES, | PARTS OF WAYS, WAYS (ROADS) | CDCCD |
| SPEED CHANGE, | LANES, | PARTS OF WAYS, WAYS (ROADS) | CDJL |
| | RECTUP, | LARGE INTESTINE, DIGESTIVE SYSTEM/ | QAJLB |
| | | LARYNX, RESPIRATORY SYSTEM, | QALC |
| | LOCKS/ | LATCHES, DOORS, BODY (UPPER), | DHDCB |
| | | LATE EFFECTS, CONSEQUENCES, INJURY/ | JNPG |
| | | LATENCY, FREQUENCY/ TIME, OPERATING | NKFD |
| | | LAW/ CODE/ STATUTE, CONTENTS, | YEK |
| | | LAW, DISCIPLINES | YK |
| | CASE | LAW, LAWS, LEGAL ASPECT | RCO |
| | | LAWS, LEGAL ASPECT | RC |
| | CODES, | LAWS, LEGAL ASPECT | RCH |
| | CRIMINAL, CODES, | LAWS, LEGAL ASPECT | RCBB |
| | CIVIL, CODES, | LAWS, LEGAL ASPECT | RCBC |
| MOTOR VEHICLE, CODES, | LAWS, | LEGAL ASPECT | RCAD |
| ORDINANCES, CODES, | LAWS, | LEGAL ASPECT | RCBE |
| | STATUTES, | LAWS, LEGAL ASPECT | RCC |
| SAFETY RESPONSIBILITY, STATUTES, | LAWS, | LEGAL ASPECT | RCCB |
| | CASE LAW, | LAWS, LEGAL ASPECT | RCD |
| | CIVIL LIABILITY, | LAWS, LEGAL ASPECT | RCE |
| NEGLIGENCE, CIVIL LIABILITY, | LAWS, | LEGAL ASPECT | RCEB |
| | CRIMINAL, | LAWS, LEGAL ASPECT | RCF |
| PEDESTRIAN VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFA |
| MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFH |
| DRINKING, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBB |
| RECKLESS, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBC |
| SPEEDING, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBD |
| HIT-AND-RUN, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBE |
| WRONG WAY, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBF |
| | PARKING VIOLATIONS, CRIMINAL, | LAWS, LEGAL ASPECT | RCFC |
| | FINANCIAL RESPONSIBILITY, CRIMINAL, | LAWS, LEGAL ASPECT | RCFD |
| | IMPLIED CONSENT, CRIMINAL, | LAWS, LEGAL ASPECT | RCFE |
| BREATH ANALYZER, IMPLIED CONSENT, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFE*XTB |
| CHEMICAL TEST, IMPLIED CONSENT, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFE*XTC |
| | REGULATORY, | LAWS, LEGAL ASPECT | RCG |
| | INSPECTION, REGULATORY, | LAWS, LEGAL ASPECT | RCGB |
| MOTOR VEHICLE, INSPECTION, REGULATORY, | LAWS, | LEGAL ASPECT | RCGB*CE |
| | LICENSING, REGULATORY, | LAWS, LEGAL ASPECT | RCGC |
| MOTOR VEHICLE, LICENSING, REGULATORY, | LAWS, | LEGAL ASPECT | RCGC*CE |
| | DRIVER, LICENSING, REGULATORY, | LAWS, LEGAL ASPECT | RCGC*EC |
| REGISTRATION/ TITLES, REGULATORY, | LAWS, | LEGAL ASPECT | RCGD |
| | STANDARDS, REGULATORY, | LAWS, LEGAL ASPECT | RCGE |
| | UNIFORM, | LAWS, LEGAL ASPECT | RCU |
| | | LEAFLETS/ BROCHURES, FORM, | YDI |
| | | LEAKING, PHENOMENA, PHYSICAL ASPECT | NLZI |
| | | LEARNING, COGNITION/ INFORMATION | PDC |
| | CONDITIONING, | LEARNING, COGNITION/ INFORMATION | PDCB |
| | HABIT/ PRONENESS, | LEARNING, COGNITION/ INFORMATION | PDCB |
| TRANSFER OF TRAINING, | LEARNING, | COGNITION/ INFORMATION | PDCD |
| | RECALL, | LEARNING, COGNITION/ INFORMATION | PDCE |
| | INSIGHT, | LEARNING, COGNITION/ INFORMATION | PDCF |
| SKILLED PERFORMANCE, | LEARNING, | COGNITION/ INFORMATION | PDCG |
| | | LEAST SQUARE, DESIGN, STATISTICAL/ | WMEBE |
| | | LECTURE/ DEMONSTRATIONS, CLASS | CDHC |
| | | LEFT TURN, DIRECTIONAL, LANES, | CDCCC |
| | | LEFT, FRONT, ACCIDENT | JHL |
| | | LEFT, REAR, ACCIDENT | JIL |
| | | LEFT, SIDE, ACCIDENT | JJL |
| | | LEFT, TURNING, TRAFFIC FLOW, | CHTL |
| | | LEG, LOWER EXTREMITY, ANATOMY/ | CADE |
| FEMUR, | LEG, | LOWER EXTREMITY, ANATOMY/ | CADEB |
| FIBULA, | LEG, | LOWER EXTREMITY, ANATOMY/ | CADEC |
| TIBIA, | LEG, | LOWER EXTREMITY, ANATOMY/ | CADEE |
| | | LEGAL ASPECT | R |
| | CRIMES, | LEGAL ASPECT | RH |
| | LAWS, | LEGAL ASPECT | RC |
| | CODES, | LAWS, LEGAL ASPECT | RCH |
| | CRIMINAL, CODES, | LAWS, LEGAL ASPECT | RCHB |
| | CIVIL, CODES, | LAWS, LEGAL ASPECT | RCBC |
| MOTOR VEHICLE, CODES, | LAWS, | LEGAL ASPECT | RCBD |
| ORDINANCES, CODES, | LAWS, | LEGAL ASPECT | RCBE |
| | STATUTES, | LAWS, LEGAL ASPECT | RCC |
| SAFETY RESPONSIBILITY, STATUTES, | LAWS, | LEGAL ASPECT | RCCB |
| | CASE LAW, | LAWS, LEGAL ASPECT | RCD |
| | CIVIL LIABILITY, | LAWS, LEGAL ASPECT | RCE |
| NEGLIGENCE, CIVIL LIABILITY, | LAWS, | LEGAL ASPECT | RCEB |
| | CRIMINAL, | LAWS, LEGAL ASPECT | RCF |
| PEDESTRIAN VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFA |
| MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFB |
| DRINKING, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBB |
| RECKLESS, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBC |
| SPEEDING, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBD |
| HIT-AND-RUN, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBE |
| WRONG WAY, MOVING VIOLATIONS, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFBF |
| | PARKING VIOLATIONS, CRIMINAL, | LAWS, LEGAL ASPECT | RCFC |
| | FINANCIAL RESPONSIBILITY, CRIMINAL, | LAWS, LEGAL ASPECT | RCFD |
| | IMPLIED CONSENT, CRIMINAL, | LAWS, LEGAL ASPECT | RCFE |
| BREATH ANALYZER, IMPLIED CONSENT, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFE*XTB |
| CHEMICAL TEST, IMPLIED CONSENT, CRIMINAL, | LAWS, | LEGAL ASPECT | RCFE*XTC |
| | REGULATORY, | LAWS, LEGAL ASPECT | RCG |
| | INSPECTION, REGULATORY, | LAWS, LEGAL ASPECT | RCGB |
| MOTOR VEHICLE, INSPECTION, REGULATORY, | LAWS, | LEGAL ASPECT | RCGB*CE |
| | LICENSING, REGULATORY, | LAWS, LEGAL ASPECT | RCGC |
| MOTOR VEHICLE, LICENSING, REGULATORY, | LAWS, | LEGAL ASPECT | RCGC*CE |
| | DRIVER, LICENSING, REGULATORY, | LAWS, LEGAL ASPECT | RCGC*ED |
| REGISTRATION/ TITLES, REGULATORY, | LAWS, | LEGAL ASPECT | RCGD |
| | STANDARDS, REGULATORY, | LAWS, LEGAL ASPECT | RCGE |
| | UNIFORM, | LAWS, LEGAL ASPECT | RCU |
| | | ENFORCEMENT, LEGAL ASPECT | RD |
| | POLICING/ PATROL, | ENFORCEMENT, LEGAL ASPECT | RDB |
| PURSUIT, POLICING/ PATROL, | ENFORCEMENT, | LEGAL ASPECT | RDBB |
| APPREHENSION/ SUMMONS, | ENFORCEMENT, | LEGAL ASPECT | RDC |
| TRIAL/ JUDICIAL PROCESS, | ENFORCEMENT, | LEGAL ASPECT | RDC |
| APPEALS, TRIAL/ JUDICIAL PROCESS, | ENFORCEMENT, | LEGAL ASPECT | RDCB |
| | CONVICTION, ENFORCEMENT, | LEGAL ASPECT | RDE |
| | EVIDENCE, ENFORCEMENT, | LEGAL ASPECT | RDF |
| EXPERTISE, EVIDENCE, ENFORCEMENT, | LEGAL ASPECT | | RDFB |

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| | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | LEGAL ASPECT | RCC |
| JAIL, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | LEGAL ASPECT | RDGB |
| FINE, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | LEGAL ASPECT | RDGC |
| REVCCATION, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | LEGAL ASPECT | RDGD |
| PRCBATION, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | LEGAL ASPECT | RDGE |
| | RECORDS, | LEGAL ASPECT | RR |
| | LEGISLATURES, SOCIETY | | FH |
| | CRYSTALLINE | LENS, EYE, HEAD, ANATOMY/ BODY, | CAIFL |
| | CORRECTIVE | LENSES, PROSTHESIS, BIOMEDICAL | CCB |
| | | LETTERS/ MEMORANDUMS, FORM, | YCK |
| | BLOOD | LEVEL, ALCOHOL, TOXICOLOGY, | CBCBB |
| | EDUCATION | LEVEL, EDUCATIONAL ASPECT | CB |
| ILLITERATE, | EDUCATION | LEVEL, EDUCATIONAL ASPECT | CBB |
| GRADE SCHCOL, | EDUCATION | LEVEL, EDUCATIONAL ASPECT | QBC |
| HIGH SCHCOL, | EDUCATION | LEVEL, EDUCATIONAL ASPECT | QBC |
| COLLEGE, | EDUCATION | LEVEL, EDUCATIONAL ASPECT | QBE |
| DROP-OUT, | EDUCATION | LEVEL, EDUCATIONAL ASPECT | QBF |
| | CIVIL | LIABILITY, LAWS, LEGAL ASPECT | NLCEH |
| NEGLIGENCE, CIVIL | | LIABILITY, LAWS, LEGAL ASPECT | RCE |
| | | LIABILITY, TYPES OF INSURANCE, | RCEB |
| | | LICENSE PLATES, AUXILIARIES/ | SEDD |
| | | LICENSING, REGULATORY, LAWS, LEGAL | DMI |
| MCTOR VEHICLE, | | LICENSING, REGULATORY, LAWS, LEGAL | KGCC |
| DRIVER, | | LICENSING, REGULATORY, LAWS, LEGAL | RCGC*DF |
| | | LIFE SPAN, CAPACITY/ LIMIT, | RCGC*EC |
| | | LIGAMENTS, JOINTS, MUSCULO-SKELETAL | NKJC |
| | | LIGHTING, WAYS (ROADS) | CACDB |
| | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CH |
| HEADLIGHTS, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHHC |
| TAIL, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCB |
| RAKE/ STOP, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCC |
| TURN, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCE |
| BACK-UP, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCF |
| PARKING, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCG |
| CORNERING, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCH |
| MARKERS/ CLEARANCE, | | LIGHTS, ELECTRICAL SYSTEMS, POWER | CHCI |
| | WARNING | LIGHTS, INSTRUMENTS, VEHICLE PARTS, | CHJ |
| | CAPACITY/ | LIMIT, OPERATING CONDITIONS, | NKJ |
| THRESHOLD, | CAPACITY/ | LIMIT, OPERATING CONDITIONS, | NKJB |
| LIFE SPAN, | CAPACITY/ | LIMIT, OPERATING CONDITIONS, | NKJC |
| SATURATION, | CAPACITY/ | LIMIT, OPERATING CONDITIONS, | NKJD |
| PRECIPITATION, | SATURATION, | LIMIT, OPERATING CONDITIONS, | NKJDB |
| | SPEED | LIMIT, REGULATORY, TRAFFIC SIGNS/ | FBE |
| | | LIMITED ACCESS, TRAFFICWAYS, WAYS | CCC |
| | SHCES/ | LINEAR, ALGEBRA, MATHEMATICAL, | WMCE |
| | | LININGS, BRAKES, VEHICLE PARTS, | CHBJ |
| | | LINKAGES, STEERING SYSTEMS, VEHICLE | CHIB |
| | | LIPS, MOUTH, DIGESTIVE SYSTEM/ | CAJBB |
| POPULAR | | LITERATURE, FORM, STUDY-REPORT TYPE | YDL |
| | | LIVER/ BILIARY TRACT, DIGESTIVE | QAJM |
| ENGINE | | LOAD, VEHICULAR, OPERATING | NKVG |
| | | LOADING, WEIGHT, MASS, PHYSICAL | NBBB |
| | | LOCATION (SEARCH), COMMUNICATION, | JREE |
| POSITION/ ATTITUDE/ | | LOCATION, OPERATING CONDITIONS, | NKA |
| VAPER | | LOCK, ENGINE PERFORMANCE, | NLZQN |
| | | LOCKS/ LATCHES, DOORS, BODY | DHDCB |
| | | LOGIC/ SETS, MATHEMATICAL, METHODS | WMB |
| | | LOOP DETECTORS, SENSORS/ | XCL |
| | | LOSS DISTRIBUTION, INSURANCE/ | SEC |
| BLCCD | | LOSS/ BLEEDING, CONSEQUENCES, | JNPK |
| | | LOWER EXTREMITY, ANATOMY/ BODY, | CAC |
| ANKLE, | | LOWER EXTREMITY, ANATOMY/ BODY, | CACA |
| FOOT, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADB |
| TOE, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADC |
| HEEL, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADD |
| LEG, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADE |
| FEMUR, LEG, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADEB |
| FIBULA, LEG, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADEC |
| TIBIA, LEG, | | LOWER EXTREMITY, ANATOMY/ BODY, | CADEC |
| | | KNEE, LOWER EXTREMITY, ANATOMY/ BODY, | CADF |
| | | THIGH, LOWER EXTREMITY, ANATOMY/ BODY, | CADG |
| | | PELVIS, LOWER EXTREMITY, ANATOMY/ BODY, | CADH |
| BLTCKCS, | PELVIS, | LOWER EXTREMITY, ANATOMY/ BODY, | CACHB |
| HIPS, | PELVIS, | LOWER EXTREMITY, ANATOMY/ BODY, | CACHC |
| PERINEUM/ ANUS, | PELVIS, | LOWER EXTREMITY, ANATOMY/ BODY, | CADHD |
| | OILS/ | LUBRICANTS/ SOLVENTS, MATERIALS | BO |
| ANTIFREEZE, | OILS/ | LUBRICANTS/ SOLVENTS, MATERIALS | HOB |
| | | LUBRICATION, PHENOMENA, PHYSICAL | NLZG |
| | | LUMBAR, ABDOMEN, ANATOMY/ BODY, | CAEF |
| | | LUMINESCENCE, OPTICAL, PHYSICAL | NDF |
| | | LUNGS, RESPIRATORY SYSTEM, ANATOMY/ | CALE |
| PLEURA, | | LUNGS, RESPIRATORY SYSTEM, ANATOMY/ | CALEB |
| SPLEEN/ | | LYMPH TRACTS, DIGESTIVE SYSTEM/ | CAJN |
| | | LYMPH, BODY FLUIDS, ANATOMY/ BODY, | CARB |
| | | MACADAM, ROAD MATERIALS, MATERIALS | BEG |
| | | MACROECONOMICS, ECONOMICS, | SCH |
| | | MAGNETIC CORE, RECORDERS, EQUIPMENT | XHG |
| | | MAGNETIC TAPE, RECORDERS, EQUIPMENT | XHC |
| | | MAGNETIC, ELECTRIC PROPERTIES, | NGF |
| | | MAINTAINABILITY, OPERATING | NKI |
| | | MAINTAINING AIRWAYS, FIRST AID, | WSBC |
| RESUSCITATION, | | MAINTAINING AIRWAYS, FIRST AID, | WSBCR |
| MECHANICAL, | RESUSCITATION, | MAINTAINING AIRWAYS, FIRST AID, | WSBCRM |
| MOUTH-TO-MOUTH, | RESUSCITATION, | MAINTAINING AIRWAYS, FIRST AID, | WSBCRN |
| TRACHEOSTOMY, | | MAINTAINING AIRWAYS, FIRST AID, | WSBCT |
| | | MAINTENANCE/ REPAIR, ENGINEERING, | WOE |
| | AIRWAY | MAINTENANCE, MEDICAL, EQUIPMENT | XTL |
| | ROAD | MAINTENANCE, SERVICES | IM |
| | DECISION | MAKING/ GAME, MATHEMATICAL, METHODS | WMF |
| OPTIMIZATION, | DECISION | MAKING/ GAME, MATHEMATICAL, METHODS | WMFB |
| PLANNING/ | DECISION | MAKING, COGNITION/ INFORMATION | PDB |
| RISK TAKING, | PLANNING/ | DECISION MAKING, COGNITION/ INFORMATION | PDBB |
| DEFENSE MECHANISMS, | PLANNING/ | DECISION MAKING, COGNITION/ INFORMATION | PDBC |
| | | MALE GENITAL ORGANS, UROGENITAL | CAMD |
| | | MALES, SEX, PEOPLE | EFB |
| | | MANAGEMENT SCIENCES, DISCIPLINES | VO |
| MARKETING, | | MANAGEMENT SCIENCES, DISCIPLINES | VGB |
| ACCOUNTING, | | MANAGEMENT SCIENCES, DISCIPLINES | VOC |
| | | MANDIBLE, HEAD, ANATOMY/ BODY, | CAID |
| TRAINING | | MANUAL, FORM, STUDY-REPORT TYPE | YDT |
| | | MANUAL, PROCESSES, PHYSICAL ASPECT | NMB |
| SHCP | | MANUALS, FORM, STUDY-REPORT TYPE | YDC |
| | | MAPPING, SURVEY, ENGINEERING, | WCCB |

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| | MAPS/ DIRECTIONS, SERVICES | IB |
| | MAPS, CONTENTS, STUDY-REPORT TYPE | YEC |
| | MARKERS/ CLEARANCE, LIGHTS, | CHCT |
| | MARKETING, MANAGEMENT SCIENCES, | VOH |
| PAVEMENT | MARKINGS, SIGNS/ SIGNALS, WAYS | CTC |
| | MARRIED, PEOPLE | EP |
| | MARSH/ SWAMP, WATERS, TERRAIN/ | KHPD |
| | MASS MEDIA/ COMMUNICATIONS, SOCIETY | FK |
| | MASS TRANSFER, PHENOMENA, PHYSICAL | NLK |
| | MASS, PHYSICAL PROPERTIES, PHYSICAL | NBB |
| | MASS, PHYSICAL PROPERTIES, PHYSICAL | NBBB |
| | MASS, PHYSICAL PROPERTIES, PHYSICAL | NBBB |
| DENSITY/ SPECIFIC GRAVITY, | MASS, PHYSICAL PROPERTIES, PHYSICAL | NBBC |
| | MASS, PURPOSE/ TRIP, TRAFFIC | ODF |
| | MATERIALS | B |
| | ADHESIVES, MATERIALS | BA |
| | CEMENT, ADHESIVES, MATERIALS | BAC |
| | METALS, MATERIALS | BB |
| | STEEL, METALS, MATERIALS | BBC |
| | ALUMINUM, METALS, MATERIALS | BHF |
| | CONSTRUCTION, MATERIALS | BC |
| | BEAMS, CONSTRUCTION, MATERIALS | BCH |
| | SLABS, CONSTRUCTION, MATERIALS | BCC |
| | PILLARS, CONSTRUCTION, MATERIALS | BCD |
| | DRUGS/ AFFECTIVE AGENTS, MATERIALS | BD |
| | STIMULANTS, DRUGS/ AFFECTIVE AGENTS, MATERIALS | BOB |
| DEPRESSANTS/ TRANQUILIZERS, DRUGS/ AFFECTIVE AGENTS, | MATERIALS | BCC |
| ANESTHETICS, DRUGS/ AFFECTIVE AGENTS, | MATERIALS | BOD |
| | ROAD MATERIALS, MATERIALS | BE |
| | SOIL/ DIRT, ROAD MATERIALS, MATERIALS | BEB |
| CLAY, SOIL/ DIRT, ROAD MATERIALS, | MATERIALS | BEBB |
| | AGGREGATES, ROAD MATERIALS, MATERIALS | BEC |
| SAND, AGGREGATES, ROAD MATERIALS, | MATERIALS | BECB |
| GRAVEL, AGGREGATES, ROAD MATERIALS, | MATERIALS | BECC |
| BRICKS/ STONES, ROAD MATERIALS, | MATERIALS | BED |
| CONCRETE, ROAD MATERIALS, | MATERIALS | BEE |
| BITUMINOUS/ ASPHALT, ROAD MATERIALS, | MATERIALS | BEF |
| MACADAM, ROAD MATERIALS, | MATERIALS | BEG |
| | FIBERS/ TEXTILES, MATERIALS | BF |
| | POLYMERS, MATERIALS | BG |
| | RUBBER, POLYMERS, MATERIALS | BGB |
| PLASTIC, POLYMERS, MATERIALS | | BGC |
| NYLON, POLYMERS, MATERIALS | | BGD |
| | GLASS, MATERIALS | BK |
| | GLAZING, GLASS, MATERIALS | BKG |
| LAMINATED, GLAZING, GLASS, | MATERIALS | BKGL |
| TEMPERED, GLAZING, GLASS, | MATERIALS | BKGM |
| | CERAMICS, MATERIALS | BL |
| | MINERALS, MATERIALS | BM |
| | SALT, MINERALS, MATERIALS | BMS |
| OILS/ LUBRICANTS/ SOLVENTS, | MATERIALS | BC |
| ANTIFREEZE, OILS/ LUBRICANTS/ SOLVENTS, | MATERIALS | BOB |
| | PAINT, MATERIALS | BP |
| | SYNTHETICS, PAINT, MATERIALS | BPB |
| | ENAMELS, PAINT, MATERIALS | BPC |
| | LACQUERS, PAINT, MATERIALS | HPD |
| | FUEL, MATERIALS | BQ |
| | COMMODITIES, MATERIALS | BR |
| EXPLOSIVES, COMMODITIES, MATERIALS | | BRB |
| INFLAMMABLE, COMMODITIES, MATERIALS | | BRC |
| | CLOTHING, MATERIALS | BS |
| | HOOD, MATERIALS | BW |
| | PAPER, MATERIALS | BX |
| | HARDWARE, MATERIALS | BZH |
| | WATER, MATERIALS | BZW |
| | MATERIALS/ EQUIPMENT, EDUCATIONAL | CE |
| AUDIO-VISUAL, MATERIALS/ EQUIPMENT, EDUCATIONAL | | CEB |
| BOOKS, MATERIALS/ EQUIPMENT, EDUCATIONAL | | CEC |
| | ROAD MATERIALS, MATERIALS | BE |
| | SOIL/ DIRT, ROAD MATERIALS, MATERIALS | BEB |
| CLAY, SOIL/ DIRT, ROAD MATERIALS, | MATERIALS | BEBB |
| | AGGREGATES, ROAD MATERIALS, MATERIALS | BEC |
| SAND, AGGREGATES, ROAD MATERIALS, | MATERIALS | BECB |
| GRAVEL, AGGREGATES, ROAD MATERIALS, | MATERIALS | BECC |
| BRICKS/ STONES, ROAD MATERIALS, | MATERIALS | BED |
| CONCRETE, ROAD MATERIALS, | MATERIALS | BEE |
| BITUMINOUS/ ASPHALT, ROAD MATERIALS, | MATERIALS | BEF |
| MACADAM, ROAD MATERIALS, | MATERIALS | BEG |
| | MATHEMATICAL, METHODS | WM |
| | LOGIC/ SETS, MATHEMATICAL, METHODS | WMB |
| | ALGEBRA, MATHEMATICAL, METHODS | WMC |
| POLYNOMIAL, ALGEBRA, MATHEMATICAL, METHODS | | WMCB |
| LINEAR, ALGEBRA, MATHEMATICAL, METHODS | | WMCE |
| | ANALYSIS, MATHEMATICAL, METHODS | WMD |
| NUMERICAL/ CALCULATIONS, ANALYSIS, MATHEMATICAL, METHODS | | WMDB |
| GRAPHICAL, ANALYSIS, MATHEMATICAL, METHODS | | WMDG |
| DATA, ANALYSIS, MATHEMATICAL, METHODS | | WMDH |
| SCALING, DATA, ANALYSIS, MATHEMATICAL, METHODS | | WMDHB |
| STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WME |
| DESIGN, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEB |
| FACTORIAL, DESIGN, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEBB |
| CORRELATION, DESIGN, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEBC |
| REGRESSION, DESIGN, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEBC |
| LEAST SQUARE, DESIGN, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEBE |
| VARIANCE, DESIGN, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEBF |
| NONPARAMETRIC, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEC |
| TEST, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMED |
| DISTRIBUTION, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEE |
| STOCHASTIC, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEF |
| SAMPLING, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEG |
| ESTIMATION, STATISTICAL/ PROBABILITY, MATHEMATICAL, METHODS | | WMEH |
| | DECISION MAKING/ GAME, MATHEMATICAL, METHODS | WMEF |
| OPTIMIZATION, DECISION MAKING/ GAME, MATHEMATICAL, METHODS | | WMEB |
| CYBERNETICS/ AUTOMATIC CONTROL, MATHEMATICAL, METHODS | | WMEG |
| | MATHEMATICS, DISCIPLINES | VB |
| STATISTICS, MATHEMATICS, DISCIPLINES | | VBS |
| | MAXILLA, HEAD, ANATOMY/ BODY, | CAIE |
| VHF (30-300 MC), RADIO FREQUENCY, | | NLCEE |
| HF (3-30 MC), RADIO FREQUENCY, | | NLCEF |
| MF (.3-3 MC), RADIO FREQUENCY, | | NLCEG |
| | EDUCATION MEASUREMENTS, EDUCATIONAL ASPECT | CF |
| ACHIEVEMENT TESTS, EDUCATION MEASUREMENTS, EDUCATIONAL ASPECT | | CFB |
| EXAMINATIONS, EDUCATION MEASUREMENTS, EDUCATIONAL ASPECT | | CFC |
| INTELLIGENCE TESTS, EDUCATION MEASUREMENTS, EDUCATIONAL ASPECT | | CFD |

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| | PREVENTIVE MEASURES, ACCIDENT | JA |
| SPOT IMPROVEMENTS, PREVENTIVE MEASURES, ACCIDENT | | JAF |
| | TESTING/ MEASURES, METHODS | WU |
| | PARAMETERS, TESTING/ MEASURES, METHODS | WUB |
| | PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | WUP |
| PULSE RATE, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPB |
| RESPIRATORY RATE, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPC |
| BLOOD PRESSURE, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPD |
| BLOOD FLOW/ CARDIAC OUTPUT, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPE |
| EKG, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPJ |
| | MEASURES, PERSONALITY, | PCB |
| CAPABILITIES/ INTELLIGENCE, MEASURES, PERSONALITY, | | PCBB |
| | ATTITUDES, MEASURES, PERSONALITY, | PCBC |
| | PERFORMANCE, MEASURES, PERSONALITY, | PCBD |
| | MEASURES, SOCIOECONOMIC ASPECT | SF |
| SAFETY, MEASURES, SOCIOECONOMIC ASPECT | | SFB |
| SERVICE, MEASURES, SOCIOECONOMIC ASPECT | | SFC |
| COMMUNITY SUPPORT, MEASURES, SOCIOECONOMIC ASPECT | | SFD |
| EXTERNAL AUDITORY MEATUS, EAR, HEAD, ANATOMY/ BODY, | | CAIGC |
| | MECHANICAL PROPERTIES, PHYSICAL | NC |
| TOUGHNESS, MECHANICAL PROPERTIES, PHYSICAL | | NCB |
| TENSILE STRENGTH, TOUGHNESS, MECHANICAL PROPERTIES, PHYSICAL | | NCBH |
| | YIELD POINT, MECHANICAL PROPERTIES, PHYSICAL | NCC |
| | SHEAR STRENGTH, MECHANICAL PROPERTIES, PHYSICAL | NCD |
| | HARDNESS, MECHANICAL PROPERTIES, PHYSICAL | NCE |
| | COMPRESSIBILITY, MECHANICAL PROPERTIES, PHYSICAL | NCF |
| | FLEXIBILITY/ BRITTLENESS, MECHANICAL PROPERTIES, PHYSICAL | NCG |
| | DUCTILITY, MECHANICAL PROPERTIES, PHYSICAL | NCH |
| ELASTICITY/ MODULUS OF ELASTICITY, MECHANICAL PROPERTIES, PHYSICAL | | NCI |
| | PLASTICITY, MECHANICAL PROPERTIES, PHYSICAL | NCJ |
| | HYSTERESIS, MECHANICAL PROPERTIES, PHYSICAL | NCK |
| | STRESS/ STRAIN, MECHANICAL PROPERTIES, PHYSICAL | NCL |
| | MECHANICAL TEST, EQUIPMENT | XQ |
| | STATIC, MECHANICAL TEST, EQUIPMENT | XQB |
| COMPRESSION, STATIC, MECHANICAL TEST, EQUIPMENT | | XQBB |
| TORSION, STATIC, MECHANICAL TEST, EQUIPMENT | | XQBC |
| TENSILE, STATIC, MECHANICAL TEST, EQUIPMENT | | XQBD |
| WEIGHT SCALES, STATIC, MECHANICAL TEST, EQUIPMENT | | XQBE |
| | DYNAMIC, MECHANICAL TEST, EQUIPMENT | XCC |
| DRCP, DYNAMIC, MECHANICAL TEST, EQUIPMENT | | XQCB |
| SLED, DYNAMIC, MECHANICAL TEST, EQUIPMENT | | XQCC |
| PENDULUM, DYNAMIC, MECHANICAL TEST, EQUIPMENT | | XQCD |
| CENTRIFUGES, DYNAMIC, MECHANICAL TEST, EQUIPMENT | | XQCE |
| VIBRATION PLATFORMS, DYNAMIC, MECHANICAL TEST, EQUIPMENT | | XQCF |
| DYNAMOMETERS, DYNAMIC, MECHANICAL TEST, EQUIPMENT | | XQCG |
| | MECHANICAL, ENGINEERING, | VLE |
| | MECHANICAL, RESUSCITATION, | WSBCRM |
| DEFENSE MECHANISMS, PLANNING/ DECISION | | PDBC |
| MASS MEDIA/ COMMUNICATIONS, SOCIETY | | FK |
| | MEDIANS, SEPARATORS, PARTS OF WAYS, | CDHB |
| | MEDIASTINUM, RESPIRATORY SYSTEM, | CALG |
| | MEDICAL UNITS, SPECIAL PURPOSE, | CEHM |
| | MEDICAL, EDUCATION, EDUCATIONAL | QGM |
| FIRST AID (RED CROSS), MEDICAL, EDUCATION, EDUCATIONAL | | CGMF |
| ADVANCED (RED CROSS), MEDICAL, EDUCATION, EDUCATIONAL | | CGMG |
| COMPREHENSIVE, MEDICAL, EDUCATION, EDUCATIONAL | | CGMH |
| PROFESSIONAL/ PHYSICIAN, MEDICAL, EDUCATION, EDUCATIONAL | | CGMI |
| | MEDICAL, EQUIPMENT | XT |
| BREATH ANALYZER, MEDICAL, EQUIPMENT | | XTB |
| CHEMICAL TEST (BLOOD ALCOHOL), MEDICAL, EQUIPMENT | | XTC |
| | SPLINTS, MEDICAL, EQUIPMENT | XTF |
| | STRETCHERS, MEDICAL, EQUIPMENT | XTG |
| | BACKBOARDS, MEDICAL, EQUIPMENT | XTH |
| | RESUSCITATORS, MEDICAL, EQUIPMENT | XTI |
| | ASPIRATORS, MEDICAL, EQUIPMENT | XTJ |
| | OXYGEN SUPPLY, MEDICAL, EQUIPMENT | XTK |
| AIRWAY MAINTENANCE, MEDICAL, EQUIPMENT | | XTL |
| HEMORRHAGE CONTROL, MEDICAL, EQUIPMENT | | XTM |
| | PACEMAKER, MEDICAL, EQUIPMENT | XTP |
| | DEFIBRILLATOR, MEDICAL, EQUIPMENT | XTQ |
| | MEDICAL, METHODS | WS |
| | FIRST AID, MEDICAL, METHODS | WSB |
| MAINTAINING AIRWAYS, FIRST AID, MEDICAL, METHODS | | WSBC |
| RESUSCITATION, MAINTAINING AIRWAYS, FIRST AID, MEDICAL, METHODS | | WSBCR |
| TRACHEOSTOMY, MAINTAINING AIRWAYS, FIRST AID, MEDICAL, METHODS | | WSBCT |
| | BLEEDING, FIRST AID, MEDICAL, METHODS | WSBD |
| | SPLINTING, FIRST AID, MEDICAL, METHODS | WSBE |
| | DIAGNOSIS, MEDICAL, METHODS | WSC |
| | SURGERY, MEDICAL, METHODS | WSCD |
| | PLASTIC, SURGERY, MEDICAL, METHODS | WSDB |
| GERIATRIC, SURGERY, MEDICAL, METHODS | | WSDC |
| PEDIATRIC, SURGERY, MEDICAL, METHODS | | WSDCC |
| MILITARY, SURGERY, MEDICAL, METHODS | | WSDC |
| EXPERIMENTAL, SURGERY, MEDICAL, METHODS | | WSDC |
| AMPUTATION, SURGERY, MEDICAL, METHODS | | WSDG |
| | THERAPEUTIC, MEDICAL, METHODS | WSE |
| | ANESTHESIA, MEDICAL, METHODS | WSF |
| AUTOPSY/ PATHOLOGY, MEDICAL, METHODS | | WSI |
| | X-RAY, MEDICAL, METHODS | WSX |
| | MEDICAL, TYPES OF INSURANCE, | SEDC |
| | MELTING/ SOFTENING POINT, THERMAL, | NED |
| TYMPANIC MEMBRANE, EAR, HEAD, ANATOMY/ BODY, | | CAIGE |
| | MEMBRANOUS LABYRINTH, EAR, HEAD, | CAIGI |
| LETTERS/ MEMORANDUMS, FORM, STUDY-REPORT | | YCK |
| | MERGING, TRAFFIC FLOW, TRAFFIC | GHG |
| | METABOLISM, PROBLEMS, BIOMEDICAL | CBM |
| | METACARPALS, ARM, UPPER EXTREMITY, | CAGDH |
| | METALS, MATERIALS | BB |
| STEEL, METALS, MATERIALS | | BBB |
| ALUMINUM, METALS, MATERIALS | | BBF |
| DISPLAYS/ METERS, EQUIPMENT | | XG |
| CATHODE-RAY TUBE, DISPLAYS/ METERS, EQUIPMENT | | XGB |
| | METHODS | W |
| | HISTORICAL, METHODS | WB |
| | EXPERIMENTAL, METHODS | WE |
| FIELD, EXPERIMENTAL, METHODS | | WEF |
| LABORATORY, EXPERIMENTAL, METHODS | | WEG |
| | MATHEMATICAL, METHODS | WH |
| LOGIC/ SETS, MATHEMATICAL, METHODS | | WMB |
| ALGEBRA, MATHEMATICAL, METHODS | | WMC |
| POLYNOMIAL, ALGEBRA, MATHEMATICAL, METHODS | | WMCB |
| LINEAR, ALGEBRA, MATHEMATICAL, METHODS | | WMCE |
| ANALYSIS, MATHEMATICAL, METHODS | | WMD |

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| NUMERICAL/ CALCULATIONS, ANALYSIS, | MATHEMATICAL, METHODS | WMCB |
| GRAPHICAL, ANALYSIS, | MATHEMATICAL, METHODS | WMCG |
| DATA, ANALYSIS, | MATHEMATICAL, METHODS | WMCH |
| SCALING, DATA, ANALYSIS, | MATHEMATICAL, METHODS | WMCHB |
| STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WME |
| DESIGN, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMEB |
| NONPARAMETRIC, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMEC |
| TEST, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMED |
| DISTRIBUTION, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMEE |
| STOCHASTIC, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMEF |
| SAMPLING, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMEG |
| ESTIMATION, STATISTICAL/ PROBABILITY, | MATHEMATICAL, METHODS | WMEH |
| DECISION MAKING/ GAME, | MATHEMATICAL, METHODS | WMEI |
| OPTIMIZATION, DECISION MAKING/ GAME, | MATHEMATICAL, METHODS | WMEJ |
| CYBERNETICS/ AUTOMATIC CONTROL, | MATHEMATICAL, METHODS | WMEK |
| SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, | METHODS | WNL |
| MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, | METHODS | WNB |
| ENGINEERING, METHODS | | WD |
| DESIGN, ENGINEERING, METHODS | | WDB |
| DRAFTING, DESIGN, ENGINEERING, METHODS | | WDCB |
| SURVEY, ENGINEERING, METHODS | | WDC |
| MAPPING, SURVEY, ENGINEERING, METHODS | | WDCB |
| CONSTRUCTION, ENGINEERING, METHODS | | WDC |
| EARTHWORK, CONSTRUCTION, ENGINEERING, METHODS | | WDOE |
| PREFABRICATION, CONSTRUCTION, ENGINEERING, METHODS | | WDOF |
| MAINTENANCE/ REPAIR, ENGINEERING, METHODS | | WDE |
| QUALITY CONTROL, ENGINEERING, METHODS | | WDF |
| INSTRUMENTATION, ENGINEERING, METHODS | | WDC |
| CALIBRATION, INSTRUMENTATION, ENGINEERING, METHODS | | WDCB |
| RESEARCH AND DEVELOPMENT, ENGINEERING, METHODS | | WDH |
| PSYCHOLOGICAL, METHODS | | WP |
| MEDICAL, METHODS | | WS |
| FIRST AID, MEDICAL, METHODS | | WSB |
| MAINTAINING AIRWAYS, FIRST AID, MEDICAL, METHODS | | WSBC |
| TRACHEOSTOMY, MAINTAINING AIRWAYS, FIRST AID, MEDICAL, METHODS | | WSBCT |
| BLEEDING, FIRST AID, MEDICAL, METHODS | | WSBD |
| SPLINTING, FIRST AID, MEDICAL, METHODS | | WSBE |
| DIAGNOSIS, MEDICAL, METHODS | | WSC |
| SURGERY, MEDICAL, METHODS | | WSC |
| PLASTIC, SURGERY, MEDICAL, METHODS | | WSCB |
| GERIATRIC, SURGERY, MEDICAL, METHODS | | WSCC |
| PEDIATRIC, SURGERY, MEDICAL, METHODS | | WSCD |
| MILITARY, SURGERY, MEDICAL, METHODS | | WSCD |
| EXPERIMENTAL, SURGERY, MEDICAL, METHODS | | WSCD |
| AMPUTATION, SURGERY, MEDICAL, METHODS | | WSCD |
| THERAPEUTIC, MEDICAL, METHODS | | WSE |
| ANESTHESIA, MEDICAL, METHODS | | WSE |
| AUTOPSY/ PATHOLOGY, MEDICAL, METHODS | | WSI |
| X-RAY, MEDICAL, METHODS | | WSX |
| SURVEY, METHODS | | WT |
| CENSUS, SURVEY, METHODS | | WTB |
| QUESTIONNAIRES, SURVEY, METHODS | | WTC |
| INTERVIEWS, SURVEY, METHODS | | WTD |
| POOLS, SURVEY, METHODS | | WTE |
| EXPOSURE, SURVEY, METHODS | | WTP |
| TESTING/ MEASURES, METHODS | | WU |
| PARAMETERS, TESTING/ MEASURES, METHODS | | WUB |
| PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUP |
| PULSE RATE, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPB |
| RESPIRATORY RATE, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPC |
| BLOOD PRESSURE, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPD |
| CARDIAC OUTPUT, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPE |
| EKG, PHYSIOLOGICAL, TESTING/ MEASURES, METHODS | | WUPJ |
| ADMINISTRATIVE, METHODS | | WUPK |
| | | WW |
| | MF (.3-3 MC), RADIO FREQUENCY, | NLCEG |
| | MICROECONOMICS/ PRICE THEORY, | SCC |
| | UV (BELOW .4 MICRONS), OPTICAL, ELECTROMAGNETIC | NLCDB |
| | VISIBLE (.4-.7 MICRONS), OPTICAL, ELECTROMAGNETIC | NLCDC |
| | IR (.7-1000 MICRONS), OPTICAL, ELECTROMAGNETIC | NLCDD |
| | MIDDLE AGED, ADULTS, PEOPLE | EEB |
| | MILEAGE, DISTANCE/ RANGE, | NLGB |
| | MILES-PER-GALLON, ENGINE | NLZGP |
| | MILITARY, EXECUTIVE BRANCHES, | FIB |
| | MILITARY, SURGERY, MEDICAL, METHODS | WSDC |
| | MINERALS, MATERIALS | BM |
| | SALT, MINERALS, MATERIALS | BMS |
| | MIRRORS, AUXILIARIES/ ACCESSORIES, | CMC |
| | REARVIEW, MIRRORS, AUXILIARIES/ ACCESSORIES, | CMCR |
| | SIDEVIEW, MIRRORS, AUXILIARIES/ ACCESSORIES, | CMCS |
| | MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | SIMULATION, MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | QUEUEING, MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | INVENTORY, MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | MODELS (PHYSICAL), EQUIPMENT | XM |
| | SLUGS, MODELS (PHYSICAL), EQUIPMENT | XMB |
| | DUMMIES, MODELS (PHYSICAL), EQUIPMENT | XMC |
| | ANIMALS, MODELS (PHYSICAL), EQUIPMENT | XMD |
| | CADAVERS, MODELS (PHYSICAL), EQUIPMENT | XME |
| | SCALED, MODELS (PHYSICAL), EQUIPMENT | XMF |
| | MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | SIMULATION, MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | QUEUEING, MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | INVENTORY, MODELS/ MODELING, SYSTEMS ANALYSIS/ | WNB |
| | ELASTICITY/ MODULUS OF ELASTICITY, MECHANICAL | NCI |
| | MONEY/ BANKING, FINANCE, ECONOMICS, | SCHE |
| | CARBON MONOXIDE, POISONS, TOXICOLOGY, | CBCH |
| | MONTH, TIME | LN |
| | EMOTIONAL STATE/ MOOD, STATE OF THE ORGANISM, | PEB |
| | STRESS/ STRAIN, EMOTIONAL STATE/ MOOD, STATE OF THE ORGANISM, | PECB |
| | BEHAVIOR/ MORES, SOCIAL, SOCIOECONOMIC ASPECT | SBB |
| | RELIGION, BEHAVIOR/ MORES, SOCIAL, SOCIOECONOMIC ASPECT | SBBB |
| | ROLES, BEHAVIOR/ MORES, SOCIAL, SOCIOECONOMIC ASPECT | SBB |
| | DEVIANCY/ CONTROL, BEHAVIOR/ MORES, SOCIAL, SOCIOECONOMIC ASPECT | SBBB |
| | CULTURE, BEHAVIOR/ MORES, SOCIAL, SOCIOECONOMIC ASPECT | SBBE |
| | MORNING, TIME | LF |
| | RESTAURANTS/ MOTELS, SERVICES | ID |
| | DYNAMIC/ DISPLACEMENT, MOTION, PHENOMENA, PHYSICAL ASPECT | NLF |
| | STATIC, MOTION, PHENOMENA, PHYSICAL ASPECT | NLFB |
| | ROLLING, MOTION, PHENOMENA, PHYSICAL ASPECT | NLFC |
| | SLIDING/ SKID, MOTION, PHENOMENA, PHYSICAL ASPECT | NLFD |
| | MOTION, PHOTOGRAPHY, EQUIPMENT | NLFF |
| | KINESTHETIC/ MOTION, SENSES, PSYCHOLOGICAL | XPG |
| | MOTOR CYCLES, MOTOR VEHICLES, | PBE |

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| | MOTOR VEHICLE, CODES, LAWS, LEGAL | RCBD |
| | MOTOR VEHICLE, INSPECTION, | RCGB*DE |
| | MOTOR VEHICLE, LICENSING, | RCGC*DE |
| | MOTOR VEHICLES, VEHICLE | DE |
| | MOTOR VEHICLES, VEHICLE | DEB |
| | MOTOR VEHICLES, VEHICLE | DEC |
| FULL-SIZED (OVER 117 IN.), PASSENGER, | MOTOR VEHICLES, VEHICLE | DECB |
| INTERMEDIATE (112-117 IN.), PASSENGER, | MOTOR VEHICLES, VEHICLE | DECC |
| COMPACT (106-111 IN.), PASSENGER, | MOTOR VEHICLES, VEHICLE | DECD |
| BELOW 110 IN., PASSENGER, | MOTOR VEHICLES, VEHICLE | DECE |
| FOREIGN, PASSENGER, | MOTOR VEHICLES, VEHICLE | DECF |
| OVER 100 IN., FOREIGN, PASSENGER, | MOTOR VEHICLES, VEHICLE | DECFB |
| 90-100 IN., FOREIGN, PASSENGER, | MOTOR VEHICLES, VEHICLE | DECFD |
| BELOW 90 IN., FOREIGN, PASSENGER, | MOTOR VEHICLES, VEHICLE | DECD |
| | BUSES, MOTOR VEHICLES, VEHICLE | DEE |
| | TAXICABS, MOTOR VEHICLES, VEHICLE | DEF |
| | CARGO, MOTOR VEHICLES, VEHICLE | DEFB |
| TRUCKS, CARGO, MOTOR VEHICLES, VEHICLE | | DEFC |
| TRUCK TRAILERS, CARGO, MOTOR VEHICLES, VEHICLE | | DEFD |
| TRUCK TRACTORS, CARGO, MOTOR VEHICLES, VEHICLE | | DEG |
| | MULTIPURPOSE, MOTOR VEHICLES, VEHICLE | DEH |
| | SPECIAL PURPOSE, MOTOR VEHICLES, VEHICLE | DEHL |
| AMBULANCES, SPECIAL PURPOSE, MOTOR VEHICLES, VEHICLE | | DEHM |
| MEDICAL UNITS, SPECIAL PURPOSE, MOTOR VEHICLES, VEHICLE | | |
| | MOUNTAINS, TERRAIN/ HABITAT, SPACE | KBE |
| | POST MOUNTED, SIGNS/ SIGNALS, WAYS | CID |
| | MOUTH-TO-MOUTH, RESUSCITATION, | WSBGRN |
| | MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | CAJB |
| LIPS, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | | CAJBB |
| FLOOR, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | | CAJBC |
| CHEEK, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | | CAJBD |
| PALATE, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | | CAJBE |
| UVULA, PALATE, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | | CAJBBE |
| JAW/ CHIN, MOUTH, DIGESTIVE SYSTEM/ ALIMENTARY | | CAJBF |
| FALLING FROM MOVING VEHICLE, NONCOLLISION ON | | JCC |
| | MOVING VIOLATIONS, CRIMINAL, LAWS, | RCFB |
| DRINKING, MOVING VIOLATIONS, CRIMINAL, LAWS, | | RCFBB |
| RECKLESS, MOVING VIOLATIONS, CRIMINAL, LAWS, | | RCFBC |
| SPEEDING, MOVING VIOLATIONS, CRIMINAL, LAWS, | | RCFBD |
| HIT-AND-RUN, MOVING VIOLATIONS, CRIMINAL, LAWS, | | RCFBE |
| WRONG WAY, MOVING VIOLATIONS, CRIMINAL, LAWS, | | RCFBF |
| | MUCOSA, CONNECTIVE TISSUES/ | CAPG |
| | MUD, SURFACE CONDITIONS, WEATHER | MSF |
| | MUFFLERS, EXHAUST SYSTEMS, POWER | CHGFB |
| | MULTIPLE LANE, TRAFFICWAYS, WAYS | CKK |
| | MULTIPLE SEVERE INJURIES, | JNX |
| | MULTIPLE VEHICLE, ACCIDENT | JF |
| | MULTIPURPOSE, MOTOR VEHICLES, | CEG |
| | MULTIWAY, JUNCTIONS/ CROSSINGS, | CCJD |
| | MUSCLES, MUSCULO-SKELETAL SYSTEM, | CACC |
| | MUSCULO-SKELETAL SYSTEM, ANATOMY/ | CAC |
| BONES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | | CACB |
| VERTEBRAE/ SPINE, BONES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | | CAQBB |
| MUSCLES, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | | CACC |
| JOINTS, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | | CACC |
| LIGAMENTS, JOINTS, MUSCULO-SKELETAL SYSTEM, ANATOMY/ | | CACDB |
| | MUTUAL COMPANY, INSURANCE/ ACTUARY, | SEG |
| SKIN/ HAIR/ NAILS, CONNECTIVE TISSUES/ | | CAPB |
| | NASAL DUCT, LACHRYMAL GLANDS, EYE, | CAIFNB |
| NOSE/ NASAL SINUSES, RESPIRATORY SYSTEM, | | CALB |
| | NATIONAL ORIGINS, PEOPLE | EL |
| FEDERAL/ NATIONAL, GOVERNMENTS, SOCIETY | | FGE |
| NECK, ANATOMY/ BODY, BIOMEDICAL | | OAH |
| THROAT, NECK, ANATOMY/ BODY, BIOMEDICAL | | OAHB |
| BRONCHIAL REGION, NECK, ANATOMY/ BODY, BIOMEDICAL | | OAHC |
| HYOID, NECK, ANATOMY/ BODY, BIOMEDICAL | | OAHD |
| | NECK, TOOTH, DIGESTIVE SYSTEM/ | OAJCE |
| | NEGLIGENCE, CIVIL LIABILITY, LAWS, | RCBE |
| | NERVE, NERVOUS SYSTEM, ANATOMY/ | OAND |
| | NERVOUS SYSTEM, ANATOMY/ BODY, | DAN |
| CENTRAL, NERVOUS SYSTEM, ANATOMY/ BODY, | | OANB |
| BRAIN, CENTRAL, NERVOUS SYSTEM, ANATOMY/ BODY, | | DANBB |
| SPINAL CORD, CENTRAL, NERVOUS SYSTEM, ANATOMY/ BODY, | | DANBC |
| PERIPHERAL, NERVOUS SYSTEM, ANATOMY/ BODY, | | DANC |
| AUTONOMIC, PERIPHERAL, NERVOUS SYSTEM, ANATOMY/ BODY, | | DANCB |
| NERVE, NERVOUS SYSTEM, ANATOMY/ BODY, | | DAND |
| | NEUROSES, TYPOLOGIES/ CLINICAL | PCCN |
| | NIGHTTIME, TIME | LC |
| | NOISE, ENGINE PERFORMANCE, | NLZQF |
| KNOCK, NOISE, ENGINE PERFORMANCE, | | NLZQFB |
| RUMBLE, NOISE, ENGINE PERFORMANCE, | | NLZQFC |
| | NOISE, SOUND, PHENOMENA, PHYSICAL | NLPD |
| | NOISE, TRAFFIC UNITS, TRAFFIC | GGD |
| | NONCOLLISION ON ROAD, ACCIDENT | JC |
| OVERTURNING, NONCOLLISION ON ROAD, ACCIDENT | | JCB |
| FALLING FROM MOVING VEHICLE, NONCOLLISION ON ROAD, ACCIDENT | | JCC |
| (OTHER), NONCOLLISION ON ROAD, ACCIDENT | | JCF |
| | NONPARAMETRIC, STATISTICAL/ | WMEC |
| | NONPOWERED, VEHICLE | CB |
| BICYCLES, NONPOWERED, VEHICLE | | CBH |
| | NOSE/ NASAL SINUSES, RESPIRATORY | CALB |
| | NUCLEAR, ENERGY/ POWER, PHENOMENA, | NLBE |
| | NUMERICAL/ CALCULATIONS, ANALYSIS, | WMDB |
| | NUTRITION, PROBLEMS, BIOMEDICAL | CRN |
| | NYLON, POLYMERS, MATERIALS | BGD |
| FLYING OBJECTS, ACCIDENT HAZARDS, ACCIDENT | | JKC |
| | OCCLUSION/ THROMBOSIS/ CLOT, | JNPO |
| EXTRACTION OF OCCUPANT, RECOVERY OF INJURED, | | JRF |
| | OCCUPATIONAL, DISEASES/ | CBBB |
| | OCCUPATIONS, PEOPLE | EJ |
| | OCTANE REQUIREMENT, VEHICULAR, | NKVC |
| JACK-KNIFING/ OFF-TRACKING, VEHICULAR | | NLZRG |
| | OIL PRESSURE, INSTRUMENTS, VEHICLE | DHJD |
| | OILS/ LUBRICANTS/ SOLVENTS, | BO |
| ANTIFREEZE, OILS/ LUBRICANTS/ SOLVENTS, | | BOB |
| | OLD AGED, ADULTS, PEOPLE | EEC |
| | OLFACTORY/ SMELL, SENSES, | PBH |
| | ONE WAY, TRAFFICWAYS, WAYS (ROADS) | CCO |
| LACERATION/ OPENWOUND/ PENETRATING, INJURY/ | | JNG |
| | OPERATING CONDITIONS, PHYSICAL | NK |
| POSITION/ ATTITUDE/ LOCATION, OPERATING CONDITIONS, PHYSICAL | | NKA |
| TEMPERATURE, OPERATING CONDITIONS, PHYSICAL | | NKB |
| PRESSURE, OPERATING CONDITIONS, PHYSICAL | | NKC |
| VELOCITY/ RATE, OPERATING CONDITIONS, PHYSICAL | | NKD |

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| ACCELERATION/ DECELERATION, | OPERATING CONDITIONS, | PHYSICAL | NKE |
| FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKF |
| REACTION TIME, FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKFB |
| DURATION, FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKFC |
| LATENCY, FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKFD |
| REFRACTORY PERIOD, FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKFE |
| DELAY, FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKFF |
| PERIOD, FREQUENCY/ TIME, | OPERATING CONDITIONS, | PHYSICAL | NKFP |
| RELIABILITY, | OPERATING CONDITIONS, | PHYSICAL | NKG |
| EFFICIENCY, | OPERATING CONDITIONS, | PHYSICAL | NKH |
| MAINTAINABILITY, | OPERATING CONDITIONS, | PHYSICAL | NKI |
| CAPACITY/ LIMIT, | OPERATING CONDITIONS, | PHYSICAL | NKJ |
| THRESHOLD, CAPACITY/ LIMIT, | OPERATING CONDITIONS, | PHYSICAL | NKJB |
| LIFE SPAN, CAPACITY/ LIMIT, | OPERATING CONDITIONS, | PHYSICAL | NKJC |
| SATURATION, CAPACITY/ LIMIT, | OPERATING CONDITIONS, | PHYSICAL | NKJD |
| PRECIPITATION, SATURATION, CAPACITY/ LIMIT, | OPERATING CONDITIONS, | PHYSICAL | NKJDB |
| ACCURACY, | OPERATING CONDITIONS, | PHYSICAL | NKC |
| ABNORMALITY, | OPERATING CONDITIONS, | PHYSICAL | NKR |
| VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKV |
| AIR FUEL RATIO, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVB |
| OCTANE REQUIREMENT, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVC |
| THRUSTLE SETTING, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVD |
| IGNITION TIMING, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVE |
| COMPRESSION RATIO, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVF |
| ENGINE LOAD, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVG |
| WHEEL ALIGNMENT, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVB |
| CASTER/ CAMBER, WHEEL ALIGNMENT, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVBH |
| TOE-IN, WHEEL ALIGNMENT, VEHICULAR, | OPERATING CONDITIONS, | PHYSICAL | NKVBH |
| SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS | | | WN |
| MODELS/ MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS | | | WNH |
| SIMULATION, MODELS/ MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS | | | WNBB |
| QUEUEING, MODELS/ MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS | | | WNBC |
| INVENTORY, MODELS/ MODELING, SYSTEMS ANALYSIS/ OPERATIONS RESEARCH, METHODS | | | WNBD |
| PUBLIC OPINION, SOCIAL, SOCIOECONOMIC | | | SHE |
| OPTICAL, ELECTROMAGNETIC SPECTRUM, | | | NLCD |
| UV (BELOW .4 MICRONS), OPTICAL, ELECTROMAGNETIC SPECTRUM, | | | NLCDB |
| VISIBLE (.4-.7 MICRONS), OPTICAL, ELECTROMAGNETIC SPECTRUM, | | | NLCDD |
| IR (.7-1000 MICRONS), OPTICAL, ELECTROMAGNETIC SPECTRUM, | | | NLCDD |
| OPTICAL, PHYSICAL ASPECT | | | ND |
| BRIGHTNESS, OPTICAL, PHYSICAL ASPECT | | | NDH |
| GLARE, BRIGHTNESS, OPTICAL, PHYSICAL ASPECT | | | NDBH |
| COLOR, OPTICAL, PHYSICAL ASPECT | | | NDC |
| DENSITY/ TRANSPARENCY, OPTICAL, PHYSICAL ASPECT | | | NDD |
| REFRACTIVITY, OPTICAL, PHYSICAL ASPECT | | | NDE |
| LUMINESCENCE, OPTICAL, PHYSICAL ASPECT | | | NDF |
| REFLECTANCE, OPTICAL, PHYSICAL ASPECT | | | NDG |
| OPTIMIZATION, DECISION MAKING/ ORDINANCES, CODES, LAWS, LEGAL | | | WMFB |
| STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | RCBE |
| STATE OF AROUSAL, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PE |
| ALERT, STATE OF AROUSAL, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEB |
| DRCSY, STATE OF AROUSAL, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEBB |
| SLEEP, STATE OF AROUSAL, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEBC |
| FATIGUE, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEBD |
| EMOTIONAL STATE/ MOOD, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEC |
| STRESS/ STRAIN, EMOTIONAL STATE/ MOOD, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEC |
| INFERRED PSYCHOLOGICAL STATE, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PECH |
| FEAR, INFERRED PSYCHOLOGICAL STATE, STATE OF THE ORGANISM, PSYCHOLOGICAL ASPECT | | | PEE |
| SERVICE ORGANIZATIONS, CORPORATE BODIES, | | | PEEF |
| MALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ | | | FDE |
| FEMALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ | | | CAMD |
| PYLORUS/ ORIFICE VALVE, STOMACH, DIGESTIVE | | | CAME |
| NATIONAL ORIGINS, PEOPLE | | | CAJJC |
| ORTHOPEDIC SHOES, PROSTHESIS, | | | EL |
| ORTHOPEDIC, DEFECTS, PROBLEMS, | | | CCF |
| OSSEUS LABYRINTH, EAR, HEAD, | | | CBDE |
| TYMPANIC OSSICLES, EAR, HEAD, ANATOMY/ BCDY, | | | CAIGH |
| BLOOD FLOW/ CARDIAC OUTPUT, PHYSIOLOGICAL, TESTING/ | | | CAIGG |
| CLOUDY/ OVERCAST, ATMOSPHERE, WEATHER | | | WUPE |
| OVERHEAD, SIGNS/ SIGNALS, WAYS | | | MAC |
| OVERPASS, GRADE SEPARATION, | | | CIE |
| OVERTAKING, TRAFFIC FLOW, TRAFFIC | | | CCJGH |
| OVERTURNING, NONCOLLISION ON ROAD, | | | GHE |
| OXYGEN SUPPLY, MEDICAL, EQUIPMENT | | | JCB |
| PACEMAKER, MEDICAL, EQUIPMENT | | | XTK |
| PADDING, INTERIOR/ PASSENGER | | | XTP |
| PAIN, SENSES, PSYCHOLOGICAL ASPECT | | | CHDGF |
| PAINT, MATERIALS | | | PBK |
| SYNTHETICS, PAINT, MATERIALS | | | BP |
| ENAMELS, PAINT, MATERIALS | | | BPB |
| LACQUERS, PAINT, MATERIALS | | | BPC |
| PALATE, MOUTH, DIGESTIVE SYSTEM/ | | | BPD |
| UVULA, PALATE, MOUTH, DIGESTIVE SYSTEM/ | | | CAJBE |
| PANCREAS, DIGESTIVE SYSTEM/ | | | CAJBEB |
| DASHBOARDS/ INSTRUMENT PANELS, INTERIOR/ PASSENGER | | | CAJP |
| PAPER, MATERIALS | | | CHDGB |
| THESIS/ TERM PAPERS, FORM, STUDY-REPORT TYPE | | | BX |
| PARABOLIC, SEPARATORS, PARTS OF | | | YDH |
| PARAMETERS, TESTING/ MEASURES, | | | CDHP |
| PARAPLEGIA, DEFECTS, PROBLEMS, | | | WUB |
| PARK/ RESORT, ZONE/ LAND USAGE, | | | CBDD |
| PARKING VIOLATIONS, CRIMINAL, LAWS, | | | KLE |
| PARKING/ TERMINALS, ROADSIDE, WAYS | | | RCFC |
| PARKING, LIGHTS, ELECTRICAL | | | CRE |
| PARKING, SERVICES | | | CHMCG |
| PARKING, TRAFFIC DIRECTION, TRAFFIC | | | IH |
| PARKING, TRAFFIC FLOW, TRAFFIC | | | HCDE |
| REST AREAS/ PARKS, SERVICES | | | GK-K |
| PARTS OF WAYS, WAYS (ROADS) | | | IC |
| RIGHT-OF-WAY, PARTS OF WAYS, WAYS (ROADS) | | | CD |
| LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDH |
| REVERSIBLE, LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDC |
| DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDDB |
| RIGHT TURN, DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDCC |
| LEFT TURN, DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDCCB |
| THROUGH, DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDCCC |
| SPEED CHANGE, LANES, PARTS OF WAYS, WAYS (ROADS) | | | CDCCD |
| CURBS, PARTS OF WAYS, WAYS (ROADS) | | | CD |
| BARRICADES, PARTS OF WAYS, WAYS (ROADS) | | | CDE |
| GATES, BARRICADES, PARTS OF WAYS, WAYS (ROADS) | | | CDEB |
| SURFACE/ PAVEMENT, PARTS OF WAYS, WAYS (ROADS) | | | CF |
| ROADBED, SURFACE/ PAVEMENT, PARTS OF WAYS, WAYS (ROADS) | | | CFB |
| SHOULDERS, PARTS OF WAYS, WAYS (ROADS) | | | CDG |
| GUARDRAILS, SHOULDERS, PARTS OF WAYS, WAYS (ROADS) | | | CDGB |

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| | SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | CDH |
| | MEDIANS, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | CDHB |
| | GUARDRAILS, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | CDHC |
| | TRAFFIC ISLANDS, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | CDHD |
| | FLEXIBLE, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | CDHF |
| | PARABOLIC, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | CDHP |
| | PIPES/ CULVERTS, PARTS OF WAYS, WAYS (ROADS) | CDI |
| | JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJ |
| | THREE WAY, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJB |
| | FOUR WAY, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJC |
| | MULTIWAY, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJD |
| | INTERCHANGES, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJE |
| | CLOVERLEAF, INTERCHANGES, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJEB |
| | RECTARY, INTERCHANGES, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJEC |
| | INTERSECTIONS (AT GRADE), JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJF |
| | GRADE SEPARATION, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJG |
| | OVERPASS, GRADE SEPARATION, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJGB |
| | UNDERPASS, GRADE SEPARATION, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJGC |
| | CROSSWALKS, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJH |
| | RAILWAYS, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | CDJI |
| | ENTRANCES, RAMPS, PARTS OF WAYS, WAYS (ROADS) | CDK |
| | EXITS, RAMPS, PARTS OF WAYS, WAYS (ROADS) | CDKB |
| | BRIDGES, PARTS OF WAYS, WAYS (ROADS) | CDKC |
| | SUSPENSION, BRIDGES, PARTS OF WAYS, WAYS (ROADS) | CDL |
| | TUNNELS, PARTS OF WAYS, WAYS (ROADS) | CDLC |
| | VEHICLE PARTS, VEHICLE | CDM |
| | WHEELS, VEHICLE PARTS, VEHICLE | CH |
| | RIMS, WHEELS, VEHICLE PARTS, VEHICLE | CHA |
| | TIRES, WHEELS, VEHICLE PARTS, VEHICLE | CHAB |
| | STUCCO, TIRES, WHEELS, VEHICLE PARTS, VEHICLE | CHAC |
| | PLY, TIRES, WHEELS, VEHICLE PARTS, VEHICLE | CHACB |
| | PNEUMATIC, TIRES, WHEELS, VEHICLE PARTS, VEHICLE | CHACC |
| | HUB CAPS/ DISCS, WHEELS, VEHICLE PARTS, VEHICLE | CHACP |
| | BRAKES, VEHICLE PARTS, VEHICLE | CHAD |
| | DRUM, BRAKES, VEHICLE PARTS, VEHICLE | CHB |
| | DISC, BRAKES, VEHICLE PARTS, VEHICLE | CHBB |
| | AUXILIARY/ HAND, BRAKES, VEHICLE PARTS, VEHICLE | CHBC |
| | SHOES/ LININGS, BRAKES, VEHICLE PARTS, VEHICLE | CHBD |
| | DRUMS, BRAKES, VEHICLE PARTS, VEHICLE | CHBJ |
| | CYLINDERS/ CHAMBERS, BRAKES, VEHICLE PARTS, VEHICLE | CHBK |
| | HOSES, BRAKES, VEHICLE PARTS, VEHICLE | CHBL |
| | AIR, BRAKES, VEHICLE PARTS, VEHICLE | CHBM |
| | ELECTRIC, BRAKES, VEHICLE PARTS, VEHICLE | CHBN |
| | HYDRAULIC, BRAKES, VEHICLE PARTS, VEHICLE | CHBS |
| | VACUUM, BRAKES, VEHICLE PARTS, VEHICLE | CHBT |
| | CHASSIS/ FRAMES, VEHICLE PARTS, VEHICLE | CHBU |
| | SUSPENSIONS, CHASSIS/ FRAMES, VEHICLE PARTS, VEHICLE | CHC |
| | AXLES, CHASSIS/ FRAMES, VEHICLE PARTS, VEHICLE | CHCB |
| | SPRINGS, CHASSIS/ FRAMES, VEHICLE PARTS, VEHICLE | CHCC |
| | SHOCK ABSORBERS, CHASSIS/ FRAMES, VEHICLE PARTS, VEHICLE | CHCD |
| | BODY (UPPER), VEHICLE PARTS, VEHICLE | CHCE |
| | ROOFS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHC |
| | CONVERTIBLE, ROOFS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDA |
| | WINDOWS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDAB |
| | WINDSHIELDS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDB |
| | DOORS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDBB |
| | LOCKS/ LATCHES, DOORS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDC |
| | HINGES, DOORS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDCB |
| | HOODS/ DECKLIDS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDCC |
| | FENDERS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDD |
| | BUMPERS, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDE |
| | INTERIOR/ PASSENGER COMPARTMENT, BODY (UPPER), VEHICLE PARTS, VEHICLE | CHDF |
| | POWER PLANTS, VEHICLE PARTS, VEHICLE | CHDG |
| | ENGINES, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHG |
| | PISTONS, ENGINES, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGB |
| | TRANSMISSIONS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGBD |
| | REAR DRIVES, TRANSMISSIONS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGC |
| | FRONT DRIVES, TRANSMISSIONS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGCC |
| | 4-WHEEL DRIVES, TRANSMISSIONS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGCD |
| | FUEL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGD |
| | CARBURETORS, FUEL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGDC |
| | CONNECTIONS, FUEL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGDF |
| | DRIVE SHAFTS/ CLUTCHES, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGE |
| | EXHAUST SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGF |
| | MUFFLERS, EXHAUST SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGFB |
| | CONTROLS, EXHAUST SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGFE |
| | GOVERNORS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGG |
| | COOLING SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGH |
| | RADIATORS, COOLING SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGHB |
| | AIR, COOLING SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGHC |
| | GEARS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGI |
| | DIFFERENTIALS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHGJ |
| | ELECTRICAL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHH |
| | IGNITION, ELECTRICAL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHHB |
| | LIGHTS, ELECTRICAL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHHC |
| | BATTERIES, ELECTRICAL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHHD |
| | ALTERNATORS, ELECTRICAL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHHE |
| | HORNS, ELECTRICAL SYSTEMS, POWER PLANTS, VEHICLE PARTS, VEHICLE | CHHH |
| | STEERING SYSTEMS, VEHICLE PARTS, VEHICLE | CHI |
| | LINKAGES, STEERING SYSTEMS, VEHICLE PARTS, VEHICLE | CHIB |
| | COLUMNS, STEERING SYSTEMS, VEHICLE PARTS, VEHICLE | CHIC |
| | INSTRUMENTS, VEHICLE PARTS, VEHICLE | CHJ |
| | SPEEDOMETERS, INSTRUMENTS, VEHICLE PARTS, VEHICLE | CHJB |
| | FUEL GAUGES, INSTRUMENTS, VEHICLE PARTS, VEHICLE | CHJC |
| | OIL PRESSURE, INSTRUMENTS, VEHICLE PARTS, VEHICLE | CHJD |
| | ENGINE TEMPERATURE, INSTRUMENTS, VEHICLE PARTS, VEHICLE | CHJE |
| | WARNING LIGHTS, INSTRUMENTS, VEHICLE PARTS, VEHICLE | CHJF |
| | INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDG |
| | CASHBOARDS/ INSTRUMENT PANELS, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGB |
| | CONTROLS/ HANDLES, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGC |
| | IDENTIFICATION, CONTROLS/ HANDLES, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGC1 |
| | STEERING WHEELS, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGD |
| | COLLAPSIBLE, STEERING WHEELS, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGD1 |
| | SEATS, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGE |
| | HEADRESTS, SEATS, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGE1 |
| | PADDING, INTERIOR/ PASSENGER COMPARTMENT, BODY | CHDGF |
| | PASSENGER, MOTOR VEHICLES, VEHICLE | DEC |
| | FULL-SIZED (COVER 117 IN.), PASSENGER, MOTOR VEHICLES, VEHICLE | DECB |
| | INTERMEDIATE (112-117 IN.), PASSENGER, MOTOR VEHICLES, VEHICLE | DECC |
| | COMPACT (106-111 IN.), PASSENGER, MOTOR VEHICLES, VEHICLE | DECD |
| | BELOW 110 IN., PASSENGER, MOTOR VEHICLES, VEHICLE | DECE |
| | FOREIGN, PASSENGER, MOTOR VEHICLES, VEHICLE | DECF |
| | OVER 100 IN., FOREIGN, PASSENGER, MOTOR VEHICLES, VEHICLE | DECFB |

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| | 90-100 IN., FOREIGN, | PASSENGER, MOTOR VEHICLES, VEHICLE | DECFD |
| | BELOW 90 IN., FOREIGN, | PASSENGER, MOTOR VEHICLES, VEHICLE | DECFD |
| | | PASSENGERS, COMMERCIAL, PURPOSE/ | DECD |
| | | PASSENGERS, PEOPLE | EN |
| | | PASSING, TRAFFIC FLOW, TRAFFIC | GHP |
| | | PAST EXPERIENCE, PERSONALITY, | PCD |
| INTERACTION WITH PEOPLE, | PAST EXPERIENCE, PERSONALITY, | | PCDB |
| SOCIAL VARIABLES, | PAST EXPERIENCE, PERSONALITY, | | PCDC |
| | PATENT, CONTENTS, STUDY-REPORT TYPE | | YEL |
| | DISEASES/ | PATHOLOGICAL, PROBLEMS, BIOMEDICAL | CBB |
| OCCUPATIONAL, DISEASES/ | PATHOLOGICAL, PROBLEMS, BIOMEDICAL | | CBBB |
| AUTOPSY/ | PATHOLOGY, MEDICAL, METHODS | | WSI |
| | PATHS, SPECIAL WAYS, WAYS (ROADS) | | CBE |
| | PATROL, ENFORCEMENT, LEGAL ASPECT | | RDB |
| PURSUIT, POLICING/ | PATROL, ENFORCEMENT, LEGAL ASPECT | | RDBB |
| | TRAFFIC | PATROL, REGULATION/ CONTROL | FC |
| TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | HCD |
| INTERSECTION, TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | FCDB |
| ESCORT, TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | FCDC |
| CROWD CONTROL, TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | FCDD |
| PARKING, TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | FCDE |
| BLOCKADE, TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | FCDF |
| SURVEILLANCE, TRAFFIC DIRECTION, TRAFFIC | PATROL, REGULATION/ CONTROL | | FCDG |
| | PURSUIT, TRAFFIC | PATROL, REGULATION/ CONTROL | FCF |
| | | PAVEMENT MARKINGS, SIGNS/ SIGNALS, | CIC |
| | SURFACE/ | PAVEMENT, PARTS OF WAYS, WAYS | CDF |
| ROADBED, SURFACE/ | PAVEMENT, PARTS OF WAYS, WAYS | | CDFB |
| | PEDESTRIAN VIOLATIONS, CRIMINAL, | | RCFA |
| | PEDESTRIANS, PEOPLE | | EP |
| HITCHHIKERS, | PEDESTRIANS, PEOPLE | | EMB |
| | PEDIATRIC, SURGERY, MEDICAL, | | WCD |
| | PELVIS, LOWER EXTREMITY, ANATOMY/ | | QADH |
| BUTTOCKS, | PELVIS, LOWER EXTREMITY, ANATOMY/ | | CADHH |
| HIPS, | PELVIS, LOWER EXTREMITY, ANATOMY/ | | CADHC |
| PERINEUM/ ANUS, | PELVIS, LOWER EXTREMITY, ANATOMY/ | | CADHD |
| | PENDULUM, DYNAMIC, MECHANICAL TEST, | | XCCD |
| LACERATION/ OPENWOUND/ | PENETRATING, INJURY/ TRAUMA, | | JNG |
| | PEOPLE | | E |
| | AGE, PEOPLE | | EA |
| DRIVING AGE, AGE, | PEOPLE | | EAB |
| CHILDREN, | PEOPLE | | EC |
| INFANTS, CHILDREN, | PEOPLE | | ECB |
| PREADOLESCENTS, CHILDREN, | PEOPLE | | ECC |
| ADOLESCENTS, | PEOPLE | | ED |
| ADULTS, | PEOPLE | | EE |
| MIDDLE AGED, ADULTS, | PEOPLE | | EEB |
| OLD AGED, ADULTS, | PEOPLE | | EFC |
| SEX, | PEOPLE | | EF |
| MALES, SEX, | PEOPLE | | EFB |
| FEMALES, SEX, | PEOPLE | | EFC |
| PREGNANT, FEMALES, SEX, | PEOPLE | | EFCP |
| OCCUPATIONS, | PEOPLE | | EJ |
| RACE, | PEOPLE | | EK |
| NATIONAL ORIGINS, | PEOPLE | | EL |
| PEDESTRIANS, | PEOPLE | | EM |
| HITCHHIKERS, PEDESTRIANS, | PEOPLE | | EMB |
| PASSENGERS, | PEOPLE | | EN |
| DRIVERS, | PEOPLE | | EO |
| PROBLEM, DRIVERS, | PEOPLE | | EOB |
| PROFESSIONAL, DRIVERS, | PEOPLE | | EOP |
| CHAUFFEURS, PROFESSIONAL, DRIVERS, | PEOPLE | | EOPC |
| MARRIED, | PEOPLE | | EP |
| SINGLE, | PEOPLE | | EQ |
| WIDOWED/ DIVORCED, | PEOPLE | | ER |
| FAMILIES, | PEOPLE | | ES |
| SIZE, FAMILIES, | PEOPLE | | ESB |
| INCOME, FAMILIES, | PEOPLE | | ESC |
| ANIMALS (ZOOLOGICAL), | PEOPLE | | EZA |
| | PERCEPTION, COGNITION/ INFORMATION | | PDA |
| | PERCEPTUAL-MOTOR COORDINATION, | | PFF |
| | PERFORMANCE, BIOMEDICAL ASPECT | | OE |
| ENDURANCE/ TOLERANCE, PHYSIOLOGICAL | PERFORMANCE, BIOMEDICAL ASPECT | | CEB |
| | PERFORMANCE, LEARNING, COGNITION/ | | PCG |
| | PERFORMANCE, MEASURES, PERSONALITY, | | PCBD |
| | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQ |
| STARTING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQB |
| WARMUP, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQC |
| FLCODING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQD |
| RCUG-NESS, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQE |
| NOISE, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQF |
| KNOCK, NOISE, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQFB |
| RUMBLE, NOISE, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQFC |
| SURFACE IGNITION, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQG |
| BACKFIRING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQH |
| SPLUTTERING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQI |
| SPARK PLUG FOLLING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQJ |
| RING STICKING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQK |
| VALVE BURNING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQL |
| SCAVENGING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQM |
| VAPOR LOCK, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQN |
| CARBURETOR ICING, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQC |
| MILES-PER-GALLON, ENGINE | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZQP |
| VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZR |
| RIDE, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRB |
| SHIMMY, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRC |
| HANDLING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRD |
| CONTROL, HANDLING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZROB |
| DIRECTONAL/ STEERING, CONTROL, HANDLING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZROD |
| STABILITY, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRE |
| STEERING RATIO, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRF |
| TURNING RADIUS, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRG |
| JACK-KNIFING/ OFF-TRACKING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRH |
| CORNERING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRJ |
| BRAKING/ STOPPING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRJC |
| DISTANCE/ TIME, BRAKING/ STOPPING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRJE |
| SLACK, BRAKING/ STOPPING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRJF |
| FADE, BRAKING/ STOPPING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | NLZRJG |
| WASHCUT, BRAKING/ STOPPING, VEHICULAR | PERFORMANCE, PHENOMENA, PHYSICAL | | CADHD |
| | PERINEUM/ ANUS, PELVIS, LOWER | | NKFE |
| REFRACTORY | PERIOD, FREQUENCY/ TIME, OPERATING | | NKFP |
| | PERIOD, FREQUENCY/ TIME, OPERATING | | CANC |
| AUTONOMIC, | PERIPHERAL, NERVOUS SYSTEM, | | CANCB |
| | PERITONEUM, DIGESTIVE SYSTEM/ | | CAJO |

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| | PERMEABILITY, PHYSICAL PROPERTIES, | NHE |
| | PERSONAL EQUIPMENT, AUXILIARIES/ | CMK |
| | PERSONAL EQUIPMENT, AUXILIARIES/ | CMKB |
| | FACE PROTECTORS, PERSONAL EQUIPMENT, AUXILIARIES/ | CMKF |
| BUBBLES/ SHIELDS, FACE PROTECTORS, | PERSONAL EQUIPMENT, AUXILIARIES/ | CMKFB |
| GOGGLES, FACE PROTECTORS, | PERSONAL EQUIPMENT, AUXILIARIES/ | CMKFG |
| | PERSONALITY, PSYCHOLOGICAL ASPECT | PC |
| | PERSONALITY, PSYCHOLOGICAL ASPECT | PCB |
| CAPABILITIES/ INTELLIGENCE, MEASURES, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCBB |
| | PERSONALITY, PSYCHOLOGICAL ASPECT | PCBC |
| ATTITUDES, MEASURES, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCBCB |
| SIEBRECHT SCALE, ATTITUDES, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCBD |
| PERFORMANCE, MEASURES, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCC |
| TYPLOGIES/ CLINICAL DIAGNOSIS, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCCB |
| ALCOHOLISM, TYPLOGIES/ CLINICAL DIAGNOSIS, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCCC |
| SUICIDE/ HOMICIDE, TYPLOGIES/ CLINICAL DIAGNOSIS, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCCN |
| NEUROSES, TYPLOGIES/ CLINICAL DIAGNOSIS, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCCP |
| PSYCHOSES, TYPLOGIES/ CLINICAL DIAGNOSIS, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCC |
| | PAST EXPERIENCE, | PCCB |
| INTERACTION WITH PEOPLE, PAST EXPERIENCE, | PERSONALITY, PSYCHOLOGICAL ASPECT | PCCD |
| SOCIAL VARIABLES, PAST EXPERIENCE, | PERSONALITY, PSYCHOLOGICAL ASPECT | CAJH |
| | PHARYNX, DIGESTIVE SYSTEM/ | NL |
| | PHENOMENA, PHYSICAL ASPECT | NLA |
| GENERATION/ PROPAGATION, | PHENOMENA, PHYSICAL ASPECT | NLB |
| ENERGY/ POWER, | PHENOMENA, PHYSICAL ASPECT | NLBA |
| WORK, ENERGY/ POWER, | PHENOMENA, PHYSICAL ASPECT | NLBB |
| HORSE POWER, ENERGY/ POWER, | PHENOMENA, PHYSICAL ASPECT | NLBC |
| ELECTRIC, ENERGY/ POWER, | PHENOMENA, PHYSICAL ASPECT | NLBD |
| COMBUSTION, ENERGY/ POWER, | PHENOMENA, PHYSICAL ASPECT | NLBE |
| NUCLEAR, ENERGY/ POWER, | PHENOMENA, PHYSICAL ASPECT | NLC |
| ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCB |
| GAMMA RAYS, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCC |
| X-RAYS, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCD |
| OPTICAL, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCDB |
| (BELOW .4 MICRONS), OPTICAL, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCDC |
| (.4-.7 MICRONS), OPTICAL, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCDE |
| (.7-1000 MICRONS), OPTICAL, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCE |
| RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEB |
| KMC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEC |
| (3-30 KMC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEE |
| (.3-3 KMC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEF |
| MC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEG |
| (3-30 MC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEH |
| (.3-3 MC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLCEI |
| (3-30 KC), RADIO FREQUENCY, ELECTROMAGNETIC SPECTRUM, | PHENOMENA, PHYSICAL ASPECT | NLC |
| | TORQUE, PHENOMENA, PHYSICAL ASPECT | NLE |
| | IMPACT, PHENOMENA, PHYSICAL ASPECT | NLF |
| | MOTION, PHENOMENA, PHYSICAL ASPECT | NLFH |
| DYNAMIC/ DISPLACEMENT, MOTION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLFC |
| STATIC, MOTION, | PHENOMENA, PHYSICAL ASPECT | NLFD |
| ROLLING, MOTION, | PHENOMENA, PHYSICAL ASPECT | NLFF |
| SLIDING/ SKID, MOTION, | PHENOMENA, PHYSICAL ASPECT | NLGB |
| DISTANCE/ RANGE, | PHENOMENA, PHYSICAL ASPECT | NLH |
| MILEAGE, DISTANCE/ RANGE, | PHENOMENA, PHYSICAL ASPECT | NLI |
| | RESOLUTION, PHENOMENA, PHYSICAL ASPECT | NLJ |
| | DISTORTION, PHENOMENA, PHYSICAL ASPECT | NLK |
| | DIFFUSION, PHENOMENA, PHYSICAL ASPECT | NLL |
| | MASS TRANSFER, PHENOMENA, PHYSICAL ASPECT | NLM |
| | BUFFETING/ BUMPING, PHENOMENA, PHYSICAL ASPECT | NLN |
| | RADIATION, PHENOMENA, PHYSICAL ASPECT | NLO |
| | REFLECTION, PHENOMENA, PHYSICAL ASPECT | NLP |
| | PULSATION, PHENOMENA, PHYSICAL ASPECT | NLPB |
| | SOUND, PHENOMENA, PHYSICAL ASPECT | NLPC |
| ULTRASONIC/ SUPERSONIC, SOUND, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLPD |
| NCISE, SOUND, | PHENOMENA, PHYSICAL ASPECT | NLQ |
| VIBRATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLR |
| RESONANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLS |
| HEAT, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLT |
| INSULATING, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLU |
| GRAVITATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLV |
| KINETICS, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLW |
| STABILITY/ EQUILIBRIUM, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLX |
| SENSITIVITY, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLY |
| ABSORPTION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZA |
| RETARDATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZB |
| DAMPING/ DECAY, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZC |
| SPRING RATE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZD |
| DEFORMATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZE |
| COMPRESSION/ CONTRACTION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZF |
| | FRICTION, PHENOMENA, PHYSICAL ASPECT | NLZFB |
| | SKIN, FRICTION, PHENOMENA, PHYSICAL ASPECT | NLZFC |
| | STATIC, FRICTION, PHENOMENA, PHYSICAL ASPECT | NLZFD |
| | ROLLING, FRICTION, PHENOMENA, PHYSICAL ASPECT | NLZFE |
| | SLIDING, FRICTION, PHENOMENA, PHYSICAL ASPECT | NLZG |
| | LUBRICATION, PHENOMENA, PHYSICAL ASPECT | NLZH |
| | DEGRADATION, PHENOMENA, PHYSICAL ASPECT | NLZHB |
| WEAR, DEGRADATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZHC |
| DETERIORATION, DEGRADATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZHD |
| FATIGUE, DEGRADATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZHE |
| AGING, DEGRADATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZHF |
| CREEP, DEGRADATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZI |
| | LEAKING, PHENOMENA, PHYSICAL ASPECT | NLZJ |
| | CONTAMINATION, PHENOMENA, PHYSICAL ASPECT | NLZK |
| | DEFECT, PHENOMENA, PHYSICAL ASPECT | NLZL |
| | FAILURE, PHENOMENA, PHYSICAL ASPECT | NLZLB |
| BREAKDOWN, FAILURE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZLC |
| COLLAPSE, FAILURE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZLD |
| DISINTEGRATION, FAILURE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZLE |
| SHORT CIRCUIT, FAILURE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZLF |
| RUPTURE, FAILURE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZN |
| | CORROSION, PHENOMENA, PHYSICAL ASPECT | NLZO |
| | COMBUSTION, PHENOMENA, PHYSICAL ASPECT | NLZP |
| DEPOSIT FORMATION, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQ |
| CLOGGING, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQB |
| ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQC |
| STARTING, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQD |
| WARMUP, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQE |
| FLOCCING, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQF |
| ROUGHNESS, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQFB |
| NOISE, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQFC |
| KNACK, NOISE, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | NLZQG |
| RUMBLE, NOISE, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | |
| SURFACE IGNITION, ENGINE PERFORMANCE, PHENOMENA, PHYSICAL ASPECT | PHENOMENA, PHYSICAL ASPECT | |

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| BACKFIRING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQH |
| SPUTTERING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQI |
| SPARK PLUG FOULING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQJ |
| RING STICKING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQK |
| VALVE BURNING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQL |
| SCAVENGING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQM |
| VAPOR LOCK, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQN |
| CARBURETOR ICING, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQO |
| MILES-PER-GALLON, ENGINE PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZQP |
| VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZR |
| RIDE, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRB |
| SHIMMY, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRC |
| HANDLING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRD |
| CONTRCL, HANDLING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRE |
| STEERING, CONTRCL, HANDLING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRF |
| STABILITY, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRG |
| STEERING RATIO, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRH |
| TURNING RADIUS, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRI |
| JACK-KNIFING/ OFF-TRACKING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| CORNERING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| BRAKING/ STOPPING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| TIME, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| SLACK, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| FADE, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| WASHCUT, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, | PHENOMENA, PHYSICAL ASPECT | NLZRJ |
| | PHOTOGRAPHS/ ILLUSTRATIONS, | YEI |
| | PHOTOGRAPHY, EQUIPMENT | XP |
| | AERIAL, PHOTOGRAPHY, EQUIPMENT | XPB |
| | CAMERAS, PHOTOGRAPHY, EQUIPMENT | XPC |
| | PROJECTORS, PHOTOGRAPHY, EQUIPMENT | XPD |
| | FILM, PHOTOGRAPHY, EQUIPMENT | XPF |
| | MOTION, PHOTOGRAPHY, EQUIPMENT | XPG |
| | STILL, PHOTOGRAPHY, EQUIPMENT | XPH |
| | HOLOGRAM, PHOTOGRAPHY, EQUIPMENT | XPI |
| | PROFESSIONAL/ PHYSICIAN, MEDICAL, EDUCATION, | QGM1 |
| | PROFESSIONAL/ PHYSICIAN, TREATMENT/ CARE, | JRC1 |
| | PHYSICS, DISCIPLINES | VC |
| | PHYSIOLOGICAL EFFECTS, ALCOHOL, | OBCCB |
| | PHYSIOLOGICAL PERFORMANCE, | OE |
| ENDURANCE/ TOLERANCE, | PHYSIOLOGICAL PERFORMANCE, | OEB |
| | PHYSIOLOGICAL, TESTING/ MEASURES, | WUP |
| PULSE RATE, | PHYSIOLOGICAL, TESTING/ MEASURES, | WUPB |
| RESPIRATORY RATE, | PHYSIOLOGICAL, TESTING/ MEASURES, | WUPC |
| BLOOD PRESSURE, | PHYSIOLOGICAL, TESTING/ MEASURES, | WUPD |
| BLOOD FLOW/ CARDIAC OUTPUT, | PHYSIOLOGICAL, TESTING/ MEASURES, | WUPE |
| EEG, | PHYSIOLOGICAL, TESTING/ MEASURES, | WUPJ |
| EKG, | PHYSIOLOGICAL, TESTING/ MEASURES, | WUPK |
| | PILLARS, CONSTRUCTION, MATERIALS | BCO |
| | PINNA, EAR, HEAD, ANATOMY/ BODY, | OA1GB |
| TANKS/ FILLER | PIPES/ CONNECTIONS, FUEL SYSTEMS, | DHGF |
| | PIPES/ CULVERTS, PARTS OF WAYS, | CDI |
| | PISTONS, ENGINES, POWER PLANTS, | DHGBD |
| | PLANNER, GEOMETRICS, WAYS (ROADS) | CGB |
| | PLANNING/ DECISION MAKING, | PDB |
| RISK TAKING, | PLANNING/ DECISION MAKING, | PDBB |
| DEFENSE MECHANISMS, | PLANNING/ DECISION MAKING, | PDBC |
| REGIONAL | PLANNING, SOCIOECONOMIC ASPECT | SD |
| TRANSPORTATION, REGIONAL | PLANNING, SOCIOECONOMIC ASPECT | SDB |
| RESOURCE ALLOCATION, REGIONAL | PLANNING, SOCIOECONOMIC ASPECT | SDC |
| LAND UTILIZATION, REGIONAL | PLANNING, SOCIOECONOMIC ASPECT | SDD |
| POLLUTION, REGIONAL | PLANNING, SOCIOECONOMIC ASPECT | SDE |
| DIAGRAMS/ | PLANS, CONTENTS, STUDY-REPORT TYPE | YEH |
| | PLASTIC, POLYMERS, MATERIALS | BGC |
| | PLASTIC, SURGERY, MEDICAL, METHODS | WSDB |
| | PLASTICITY, MECHANICAL PROPERTIES, | NCJ |
| LICENSE | PLATES, AUXILIARIES/ ACCESSORIES, | DMI |
| VIBRATION | PLATFORMS, DYNAMIC, MECHANICAL | XQCF |
| | PLATOON, TRAFFIC FLOW, TRAFFIC | GHF |
| | PLEURA, LUNGS, RESPIRATORY SYSTEM, | QALEB |
| SPARK | PLUG FOULING, ENGINE PERFORMANCE, | NLZQJ |
| SPARK | PLUGS, IGNITION, ELECTRICAL | DHHBC |
| | PLY, TIRES, WHEELS, VEHICLE PARTS, | DHACC |
| | PNEUMATIC, PROCESSES, PHYSICAL | NME |
| | PNEUMATIC, TIRES, WHEELS, VEHICLE | DHACP |
| | PNEUMONIA, CONSEQUENCES, INJURY/ | JNPH |
| | POINT SYSTEM, SUSPENSION/ | RDGDB |
| | POINT, MECHANICAL PROPERTIES, | NCC |
| MELTING/ SOFTENING | POINT, THERMAL, PHYSICAL ASPECT | NEO |
| BOILING | POINT, THERMAL, PHYSICAL ASPECT | NEE |
| | POISON, INJURY/ TRAUMA, ACCIDENT | JNL |
| | POISONS, TOXICOLOGY, PROBLEMS, | OBCCD |
| CARBON MONOXIDE, | POISONS, TOXICOLOGY, PROBLEMS, | OBCCB |
| | POLICE, CIVIL, EXECUTIVE BRANCHES, | FICB |
| | POLICING/ PATROL, ENFORCEMENT, | RDB |
| PURSUIT, | POLICING/ PATROL, ENFORCEMENT, | RDBB |
| | POLITICS, SOCIAL, SOCIOECONOMIC | SRD |
| | POLLS, SURVEY, METHODS | WTE |
| | POLLUTION, REGIONAL PLANNING, | SDE |
| | POLYMERS, MATERIALS | BG |
| RUBBER, | POLYMERS, MATERIALS | BGB |
| PLASTIC, | POLYMERS, MATERIALS | BGC |
| NYLON, | POLYMERS, MATERIALS | BGD |
| | POLYNOMIAL, ALGEBRA, MATHEMATICAL, | WMCB |
| | POPULAR LITERATURE, FORM, | YDL |
| | POPULATION/ DEMOGRAPHY, SOCIAL, | SHC |
| | POSITION/ ATTITUDE/ LOCATION, | NKA |
| | POST MOUNTED, SIGNS/ SIGNALS, WAYS | CID |
| BILLBOARDS/ | POSTERS, ROADSIDE, WAYS (ROADS) | CRG |
| | POSTS, SIGNS/ SIGNALS, WAYS (ROADS) | CIB |
| | POTENTIAL, ELECTRIC PROPERTIES, | NGE |
| | POWER PLANTS, VEHICLE PARTS, | DHG |
| ENGINES, | POWER PLANTS, VEHICLE PARTS, | DHGB |
| PISTONS, ENGINES, | POWER PLANTS, VEHICLE PARTS, | DHGBD |
| TRANSMISSIONS, | POWER PLANTS, VEHICLE PARTS, | DHGC |
| REAR DRIVES, TRANSMISSIONS, | POWER PLANTS, VEHICLE PARTS, | DHGCB |
| FRONT DRIVES, TRANSMISSIONS, | POWER PLANTS, VEHICLE PARTS, | DHGCC |
| 4-WHEEL DRIVES, TRANSMISSIONS, | POWER PLANTS, VEHICLE PARTS, | DHGCD |
| FUEL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGD |
| CARBURETORS, FUEL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGDC |
| TANKS/ FILLER PIPES/ CONNECTIONS, FUEL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGF |
| DRIVE SHAFTS/ CLUTCHES, | POWER PLANTS, VEHICLE PARTS, | DHGE |
| EXHAUST SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGF |
| MUFFLERS, EXHAUST SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGF |
| EMISSION CONTROLS, EXHAUST SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGF |

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| | GOVERNORS, | POWER PLANTS, VEHICLE PARTS, | DHGG | |
| | COOLING SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGH | |
| | RADIATORS, COOLING SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGB | |
| | AIR, COOLING SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHGC | |
| | GEARS, | POWER PLANTS, VEHICLE PARTS, | DHGI | |
| | DIFFERENTIALS, | POWER PLANTS, VEHICLE PARTS, | DHJJ | |
| | ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHM | |
| | IGNITION, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHMB | |
| | DISTRIBUTORS, IGNITION, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHMBB | |
| | SPARK PLUGS, IGNITION, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHMC | |
| | LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHMCB | |
| | HEADLIGHTS, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCC | |
| | TAIL, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCCD | |
| | BRAKE/ STOP, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCE | |
| | TURN, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCF | |
| | BACK-UP, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCG | |
| | PARKING, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCH | |
| | CORNERING, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCH | |
| | MARKERS/ CLEARANCE, LIGHTS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCH | |
| | BATTERIES, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCH | |
| | GENERATORS/ ALTERNATORS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCH | |
| | HCRNS, ELECTRICAL SYSTEMS, | POWER PLANTS, VEHICLE PARTS, | DHCH | |
| | | POWER VEHICLE, VEHICLE | DD | |
| | RAIL, | POWER VEHICLE, VEHICLE | DOB | |
| | TRAINS, RAIL, | POWER VEHICLE, VEHICLE | DOB | |
| | AIRBORNE, | POWER VEHICLE, VEHICLE | DDC | |
| | AIRPLANES, AIRBORNE, | POWER VEHICLE, VEHICLE | DDCB | |
| | HELICOPTERS, AIRBORNE, | POWER VEHICLE, VEHICLE | DDCD | |
| | AIRCUSHION, | POWER VEHICLE, VEHICLE | DDD | |
| | HORSE | POWER, ENERGY/ POWER, PHENOMENA, | NLBB | |
| | ENERGY/ | POWER, PHENOMENA, PHYSICAL ASPECT | NLB | |
| | WORK, ENERGY/ | POWER, PHENOMENA, PHYSICAL ASPECT | NLBA | |
| | HORSE POWER, ENERGY/ | POWER, PHENOMENA, PHYSICAL ASPECT | NLBB | |
| | ELECTRIC, ENERGY/ | POWER, PHENOMENA, PHYSICAL ASPECT | NLBC | |
| | COMBUSTION, ENERGY/ | POWER, PHENOMENA, PHYSICAL ASPECT | NLBD | |
| | NUCLEAR, ENERGY/ | POWER, PHENOMENA, PHYSICAL ASPECT | NLBE | |
| | | PREADOLESCENTS, CHILDREN, PEOPLE | ECC | |
| | | PRECIPITATION, SATURATION, | NKJDB | |
| | | PREFABRICATION, CONSTRUCTION, | WDFB | |
| | PRESTRESSING, | PREFABRICATION, CONSTRUCTION, | WDFB | |
| | | PREGNANT, FEMALES, SEX, PEOPLE | EFCP | |
| | | PRELIMINARY, PROGRESS STATUS, | YHE | |
| | | PRESS REPORTS, FORM, STUDY-REPORT | YDJ | |
| | OIL | PRESSURE, INSTRUMENTS, VEHICLE | DHJD | |
| | | PRESSURE, OPERATING CONDITIONS, | NKC | |
| | BLOOD | PRESSURE, PHYSIOLOGICAL, TESTING/ | WUPD | |
| | | PRESTRESSING, PREFABRICATION, | WDFB | |
| | | PREVENTIVE MEASURES, ACCIDENT | JA | |
| | SPOT IMPROVEMENTS, | PREVENTIVE MEASURES, ACCIDENT | JAF | |
| | MICROECONOMICS/ | PRICE THEORY, ECONOMICS, | SCC | |
| | | PRIMARY, HIGHWAYS, PUBLIC, | CCCCB | |
| | | PRINCIPLES, EDUCATIONAL ASPECT | QC | |
| | | PRIVATE, SOCIAL, SOCIOECONOMIC | SBF | |
| | INDIVIDUAL, | PRIVATE, SOCIAL, SOCIOECONOMIC | SBF | |
| | | PRIVATE, TRAFFICWAYS, WAYS (ROADS) | CCB | |
| | | STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WME |
| | DESIGN, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEB | |
| | FACTORIAL, DESIGN, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEBB | |
| | COVARIANCE/ CORRELATION, DESIGN, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEBC | |
| | REGRESSION, DESIGN, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEBD | |
| | LEAST SQUARE, DESIGN, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEBE | |
| | VARIANCE, DESIGN, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEBF | |
| | NONPARAMETRIC, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEC | |
| | TEST, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMED | |
| | DISTRIBUTION, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEE | |
| | STOCHASTIC, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEF | |
| | SAMPLING, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEG | |
| | ESTIMATION, STATISTICAL/ | PROBABILITY, MATHEMATICAL, METHODS | WMEH | |
| | | PROBATION, SANCTIONS/ PUNISHMENT, | RDGE | |
| | | PROBLEMS, DRIVERS, PEOPLE | EOB | |
| | | PROBLEMS, BIOMEDICAL ASPECT | OB | |
| | DISEASES/ PATHOLOGICAL, | PROBLEMS, BIOMEDICAL ASPECT | DBB | |
| | OCCUPATIONAL, DISEASES/ PATHOLOGICAL, | PROBLEMS, BIOMEDICAL ASPECT | DBBB | |
| | TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CB | |
| | ALCOHOL, TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CBCH | |
| | BLOOD LEVEL, ALCOHOL, TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CBCHB | |
| | PHYSIOLOGICAL EFFECTS, ALCOHOL, TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CBCHC | |
| | TOBACCO, TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CBCC | |
| | POISONS, TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CBCCD | |
| | CARBON MONOXIDE, POISONS, TOXICOLOGY, | PROBLEMS, BIOMEDICAL ASPECT | CBCCB | |
| | DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CHD | |
| | BLINDNESS, DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CBDB | |
| | DEAFNESS, DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CBDC | |
| | PARAPLEGIA, DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CBDD | |
| | ORTHOPEDIC, DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CBDE | |
| | EPILEPSY, DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CBDF | |
| | COLOR BLINDNESS, DEFECTS, | PROBLEMS, BIOMEDICAL ASPECT | CBDG | |
| | METABOLISM, | PROBLEMS, BIOMEDICAL ASPECT | CBM | |
| | NUTRITION, | PROBLEMS, BIOMEDICAL ASPECT | CBN | |
| | PUBLIC HEALTH/ HYGIENE, | PROBLEMS, BIOMEDICAL ASPECT | CBP | |
| | | PROCEEDINGS, CONTENTS, STUDY-REPORT | YEB | |
| | TRIAL/ JUDICIAL | PROCESS, ENFORCEMENT, LEGAL ASPECT | RDD | |
| | APPEALS, TRIAL/ JUDICIAL | PROCESS, ENFORCEMENT, LEGAL ASPECT | RDDB | |
| | CILIARY | PROCESS, EYE, HEAD, ANATOMY/ BODY, | CAIFH | |
| | | PROCESSES, PHYSICAL ASPECT | NM | |
| | MANUAL, | PROCESSES, PHYSICAL ASPECT | NMB | |
| | AUTOMATIC/ AUTOMATED, | PROCESSES, PHYSICAL ASPECT | NMC | |
| | HYDRAULIC, | PROCESSES, PHYSICAL ASPECT | NMD | |
| | PNEUMATIC, | PROCESSES, PHYSICAL ASPECT | NME | |
| | CYCLIC, | PROCESSES, PHYSICAL ASPECT | NMF | |
| | RANDOM, | PROCESSES, PHYSICAL ASPECT | NMG | |
| | TRANSIT, | PROCESSES, PHYSICAL ASPECT | NMH | |
| | STEADY STATE, | PROCESSES, PHYSICAL ASPECT | NMI | |
| | COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PD | |
| | PERCEPTION, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PDA | |
| | PLANNING/ DECISION MAKING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PCB | |
| | LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PCD | |
| | CONDITIONING, LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PCDB | |
| | HABIT/ PRONENESS, LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PDCB | |
| | TRANSFER OF TRAINING, LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PDCD | |
| | RECALL, LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PDCE | |
| | INSIGHT, LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PDCF | |
| | SKILLED PERFORMANCE, LEARNING, COGNITION/ INFORMATION | PROCESSING, PSYCHOLOGICAL ASPECT | PDCG | |
| | | PROFESSIONAL/ PHYSICIAN, TREATMENT/ | JRGI | |

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| | PROFESSIONAL/ PHYSICIAN, MEDICAL, | LGM1 | |
| | PROFESSIONAL, DRIVERS, PEOPLE | LCP | |
| CHAUFFEURS, | PROFESSIONAL, DRIVERS, PEOPLE | EGPC | |
| | PROGRAM REVIEW, PROGRESS STATUS, | YHG | |
| | PROGRAMMED, TEACHING/ TRAINING, | GDF | |
| COMPUTER | PROGRAMS, CCNTENTS, STUDY-REPORT | YES | |
| | PROGRESS STATUS, STUDY-REPORT TYPE | YR | |
| REQUEST FOR PROPOSALS, | PROGRESS STATUS, STUDY-REPORT TYPE | YBB | |
| PROPOSALS, | PROGRESS STATUS, STUDY-REPORT TYPE | YHC | |
| FEASIBILITY STUDIES, | PROGRESS STATUS, STUDY-REPORT TYPE | YBC | |
| PRELIMINARY, | PROGRESS STATUS, STUDY-REPORT TYPE | YBE | |
| INTERIM, | PROGRESS STATUS, STUDY-REPORT TYPE | YHF | |
| PROGRAM REVIEW, | PROGRESS STATUS, STUDY-REPORT TYPE | YHG | |
| FINAL, | PROGRESS STATUS, STUDY-REPORT TYPE | YMH | |
| FUTURE/ | PROJECTION, NATURE OF STUDY, | YCJ | |
| | PROJECTORS, PHOTOGRAPHY, EQUIPMENT | XPC | |
| | PRONENESS, LEARNING, COGNITION/ | PCCC | |
| HABIT/ | PROPAGATION, PHENDMENA, PHYSICAL | ALA | |
| GENERATION/ | PROPERTIES, PHYSICAL ASPECT | NB | |
| PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBB | |
| MASS, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBBB | |
| WEIGHT, MASS, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBBB | |
| LOADING, WEIGHT, MASS, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBBB | |
| DENSITY/ SPECIFIC GRAVITY, MASS, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBHC | |
| CENTER OF GRAVITY, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBC | |
| PERMEABILITY, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBE | |
| ROUGHNESS, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBF | |
| VISCOSITY/ VISCOELASTIC, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBG | |
| SIZE/ DIMENSICN, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBH | |
| VOLUME, PHYSICAL | PROPERTIES, PHYSICAL ASPECT | NBI | |
| | MECHANICAL | NC | |
| | PROPERTIES, PHYSICAL ASPECT | NGB | |
| TOUGHNESS, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NGB | |
| TENSILE STRENGTH, TOUGHNESS, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NGB | |
| YIELD POINT, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCC | |
| SHEAR STRENGTH, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCC | |
| HARDNESS, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCE | |
| COMPRESSIBILITY, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCF | |
| FLEXIBILITY/ BRITTLENESS, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCG | |
| DUCTILITY, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCH | |
| ELASTICITY/ MODULUS OF ELASTICITY, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCI | |
| PLASTICITY, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCJ | |
| HYSTERESIS, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCK | |
| STRESS/ STRAIN, MECHANICAL | PROPERTIES, PHYSICAL ASPECT | NCL | |
| | THERMODYNAMIC | NF | |
| | PROPERTIES, PHYSICAL ASPECT | NG | |
| ELECTRIC | PROPERTIES, PHYSICAL ASPECT | NGB | |
| RESISTANCE, ELECTRIC | PROPERTIES, PHYSICAL ASPECT | NGC | |
| IMPEDANCE, ELECTRIC | PROPERTIES, PHYSICAL ASPECT | NGD | |
| CAPACITANCE, ELECTRIC | PROPERTIES, PHYSICAL ASPECT | NGE | |
| POTENTIAL, ELECTRIC | PROPERTIES, PHYSICAL ASPECT | NGF | |
| MAGNETIC, ELECTRIC | PROPERTY DAMAGE, ACCIDENT | JM | |
| | PROPERTY DAMAGE, ACCIDENT | JMD | |
| DEBRIS REMOVAL, | PROPERTY DAMAGE, ACCIDENT | JME | |
| REPAIRS, | PROPOSALS, PROGRESS STATUS, | YBB | |
| REQUEST FOR | PROPOSALS, PROGRESS STATUS, | YBC | |
| | PROSTHESIS, BIOMEDICAL ASPECT | CC | |
| CORRECTIVE LENSES, | PROSTHESIS, BIOMEDICAL ASPECT | CCB | |
| HEARING AID, | PROSTHESIS, BIOMEDICAL ASPECT | CCC | |
| WHEELCHAIR, | PROSTHESIS, BIOMEDICAL ASPECT | CCD | |
| BRACES/ CRUTCHES, | PROSTHESIS, BIOMEDICAL ASPECT | CCE | |
| ORTHOPEDIC SHOES, | PROSTHESIS, BIOMEDICAL ASPECT | CCF | |
| TRUSSES, | PROSTHESIS, BIOMEDICAL ASPECT | CCG | |
| | FACE | CMKF | |
| BUBBLES/ SHIELDS, FACE | PROTECTORS, PERSONAL EQUIPMENT, | CMKFB | |
| GOGGLES, FACE | PROTECTORS, PERSONAL EQUIPMENT, | CMKFC | |
| STATE/ | PROVINCE, GOVERNMENTS, SOCIETY | FGD | |
| | PSYCHOLOGICAL ASPECT | P | |
| | SENSES, | PSYCHOLOGICAL ASPECT | PB |
| ALDITORY/ HEARING, SENSES, | PSYCHOLOGICAL ASPECT | PBB | |
| VISION, SENSES, | PSYCHOLOGICAL ASPECT | PBC | |
| COLOR SENSE, VISION, SENSES, | PSYCHOLOGICAL ASPECT | PBCB | |
| VISUAL FIELD, VISION, SENSES, | PSYCHOLOGICAL ASPECT | PBCC | |
| TACTILE/ TOUCH, SENSES, | PSYCHOLOGICAL ASPECT | PBC | |
| KINESTHETIC/ MOTION, SENSES, | PSYCHOLOGICAL ASPECT | PBE | |
| THERMAL/ TEMPERATURE, SENSES, | PSYCHOLOGICAL ASPECT | PBF | |
| VESTIBULAR/ BALANCE, SENSES, | PSYCHOLOGICAL ASPECT | PBG | |
| OLFACTORY/ SMELL, SENSES, | PSYCHOLOGICAL ASPECT | PBF | |
| VIBRATIONAL, SENSES, | PSYCHOLOGICAL ASPECT | PBI | |
| VISCERAL, SENSES, | PSYCHOLOGICAL ASPECT | PHJ | |
| PAIN, SENSES, | PSYCHOLOGICAL ASPECT | PBK | |
| PERSONALITY, | PSYCHOLOGICAL ASPECT | PC | |
| MEASURES, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCB | |
| CAPABILITIES/ INTELLIGENCE, MEASURES, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCBB | |
| ATTITUDES, MEASURES, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCBC | |
| SIEBRECHT SCALE, ATTITUDES, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCBCB | |
| PERFORMANCE, MEASURES, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCBD | |
| TYPOLOGIES/ CLINICAL DIAGNOSIS, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCC | |
| HOMICIDE, TYPOLOGIES/ CLINICAL DIAENOSIS, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCCC | |
| NEURSES, TYPOLOGIES/ CLINICAL DIAGNOSIS, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCCN | |
| TYPOLOGIES/ CLINICAL DIAGNOSIS, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCCP | |
| PAST EXPERIENCE, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCC | |
| INTERACTION WITH PEOPLE, PAST EXPERIENCE, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCCB | |
| SOCIAL VARIABLES, PAST EXPERIENCE, PERSONALITY, | PSYCHOLOGICAL ASPECT | PCCD | |
| COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PC | |
| PERCEPTION, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PDA | |
| DECISION MAKING, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PCB | |
| LEARNING, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PCC | |
| TRAINING, LEARNING, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PCCD | |
| RECALL, LEARNING, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PCCD | |
| INSIGHT, LEARNING, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PCCF | |
| LEARNING, COGNITION/ INFORMATION PROCESSING, | PSYCHOLOGICAL ASPECT | PCCG | |
| | STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PE |
| STATE OF AROUSAL, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEB | |
| ALERT, STATE OF AROUSAL, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEBB | |
| CROWDY, STATE OF AROUSAL, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEBC | |
| SLEEP, STATE OF AROUSAL, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEBC | |
| FATIGUE, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEC | |
| EMOTIONAL STATE/ MOOD, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEG | |
| STRAIN, EMOTIONAL STATE/ MOOD, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEGB | |
| INFERRED PSYCHOLOGICAL STATE, STATE OF THE ORGANISM, | PSYCHOLOGICAL ASPECT | PEE | |
| | BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PF |
| STIMULUS, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFH | |
| RESPONSE, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFJ | |
| REINFORCEMENT, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFK | |
| SEQUENCE/ SCHEDULE, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFL | |

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| PERCEPTUAL-MOTOR COORDINATION, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFF |
| DISTORTIONS, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFG |
| SET, BEHAVIORAL FACTORS, | PSYCHOLOGICAL ASPECT | PFH |
| | INFERRED | PEE |
| FEAR, INFERRED | PSYCHOLOGICAL STATE, STATE OF THE | PEEF |
| | PSYCHOLOGY, DISCIPLINES | VJ |
| | PSYCHOSES, TYPOLOGIES/ CLINICAL | PCCP |
| | PUBLIC HEALTH/ HYGIENE, PROBLEMS, | GBP |
| | PUBLIC OPINION, SOCIAL, | SBE |
| | PUBLIC, SOCIAL, SOCIOECONOMIC | SHG |
| | PUBLIC, TRAFFICWAYS, WAYS (ROADS) | CCC |
| STREETS, | PUBLIC, TRAFFICWAYS, WAYS (ROADS) | CCCB |
| HIGHWAYS, | PUBLIC, TRAFFICWAYS, WAYS (ROADS) | CCCC |
| PRIMARY, HIGHWAYS, | PUBLIC, TRAFFICWAYS, WAYS (ROADS) | CCCCB |
| SECONDARY, HIGHWAYS, | PUBLIC, TRAFFICWAYS, WAYS (ROADS) | CCCCC |
| | PULSATION, PHENOMENA, PHYSICAL | NLO |
| | PULSE RATE, PHYSIOLOGICAL, TESTING/ | WUPB |
| | PUNCHED CARD, RECORDERS, EQUIPMENT | XHE |
| | PUNCHED TAPE, RECORDERS, EQUIPMENT | XHD |
| | PUNISHMENT, ENFORCEMENT, LEGAL | ROG |
| SANCTIONS/ | PUNISHMENT, ENFORCEMENT, LEGAL | RUGH |
| JAIL, SANCTIONS/ | PUNISHMENT, ENFORCEMENT, LEGAL | RDDG |
| FINE, SANCTIONS/ | PUNISHMENT, ENFORCEMENT, LEGAL | RDCG |
| SUSPENSION/ REVOCATION, SANCTIONS/ | PUNISHMENT, ENFORCEMENT, LEGAL | RDCDR |
| POINT SYSTEM, SUSPENSION/ | PUNISHMENT, ENFORCEMENT, LEGAL | RDCE |
| PROBATION, SANCTIONS/ | PURPOSE/ TRIP, TRAFFIC | GD |
| | PURPOSE/ TRIP, TRAFFIC | GDB |
| RECREATION, | PURPOSE/ TRIP, TRAFFIC | CCG |
| SHOPPING, | PURPOSE/ TRIP, TRAFFIC | GDC |
| BUSINESS, | PURPOSE/ TRIP, TRAFFIC | GDE |
| COMMERCIAL, | PURPOSE/ TRIP, TRAFFIC | GDEB |
| FREIGHT, COMMERCIAL, | PURPOSE/ TRIP, TRAFFIC | GDEC |
| PASSENGERS, COMMERCIAL, | PURPOSE/ TRIP, TRAFFIC | GDF |
| MASS, | PURPOSE/ TRIP, TRAFFIC | GEF |
| SPECIAL | PURPOSE, MOTOR VEHICLES, VEHICLE | DEHL |
| AMBLANCES, SPECIAL | PURPOSE, MOTOR VEHICLES, VEHICLE | DEHM |
| MEDICAL UNITS, SPECIAL | PURPOSE, MOTOR VEHICLES, VEHICLE | REBH |
| | PURSUIT, POLICING/ PATROL, | FCF |
| | PURSUIT, TRAFFIC PATROL, | CAJJC |
| | PYLORUS/ ORIFICE VALVE, STOMACH, | WDF |
| | QUALITY CONTROL, ENGINEERING, | WTC |
| | QUESTIONNAIRES, SURVEY, METHODS | WNBC |
| | QUEUEING, MODELS/ MODELING, SYSTEMS | EK |
| | RACE, PEOPLE | XFH |
| | RADAR, TRANSMITTERS/ RECEIVERS, | NLM |
| | RADIATION, PHENOMENA, PHYSICAL | CHGH |
| | RADIATORS, COOLING SYSTEMS, POWER | NLCE |
| | RADIO FREQUENCY, ELECTROMAGNETIC | NLCEB |
| EHF (30-300 KMC), | RADIO FREQUENCY, ELECTROMAGNETIC | NLCEC |
| SHF (3-30 KMC), | RADIO FREQUENCY, ELECTROMAGNETIC | NLCEE |
| UHF (1.3-3 KMC), | RADIO FREQUENCY, ELECTROMAGNETIC | NLCEG |
| VHF (30-300 MC), | RADIO FREQUENCY, ELECTROMAGNETIC | NLCEH |
| HF (3-30 MC), | RADIO FREQUENCY, ELECTROMAGNETIC | NLCEI |
| MF (1.3-3 MC), | RADIO FREQUENCY, ELECTROMAGNETIC | XFC |
| LF (30-300 KC), | RADIO FREQUENCY, ELECTROMAGNETIC | EML |
| VLF (3-30 KC), | RADIO, TRANSMITTERS/ RECEIVERS, | CAGDDH |
| | RADIOS/ TAPES, AUXILIARIES/ | NLZRF |
| | RADIUS, FOREARM, ARM, UPPER | ODR |
| TURNING | RADIUS, VEHICULAR PERFORMANCE, | ODRH |
| | RAIL, POWER VEHICLE, VEHICLE | CCJI |
| TRAINS, | RAIL, POWER VEHICLE, VEHICLE | MAG |
| | RAILWAYS, JUNCTIONS/ CROSSINGS, | CDK |
| | RAIN, ATMOSPHERE, WEATHER | CDKB |
| | RAMPS, PARTS OF WAYS, WAYS (ROADS) | CDKC |
| ENTRANCES, | RAMPS, PARTS OF WAYS, WAYS (ROADS) | NMG |
| EXITS, | RAMPS, PARTS OF WAYS, WAYS (ROADS) | NLGB |
| | RANDOM, PROCESSES, PHYSICAL ASPECT | NLZC |
| DISTANCE/ | RANGE, PHENOMENA, PHYSICAL ASPECT | WUPB |
| MILEAGE, DISTANCE/ | RANGE, PHENOMENA, PHYSICAL ASPECT | WUPC |
| VELOCITY/ | RATE, OPERATING CONDITIONS, | NLZKE |
| SPRING | RATE, PHENOMENA, PHYSICAL ASPECT | NKVH |
| PULSE | RATE, PHYSIOLOGICAL, TESTING/ | NKVF |
| RESPIRATORY | RATE, PHYSIOLOGICAL, TESTING/ | NLCB |
| STEERING | RATIO, VEHICULAR PERFORMANCE, | NKFB |
| AIR FUEL | RATIO, VEHICULAR, OPERATING | DHGC |
| COMPRESSION | RATIO, VEHICULAR, OPERATING | JJ |
| GAMMA | RAYS, ELECTROMAGNETIC SPECTRUM, | JIL |
| | REACTION TIME, FREQUENCY/ TIME, | JIR |
| | REAR DRIVES, TRANSMISSIONS, POWER | DMCR |
| | REAR, ACCIDENT | PDCE |
| LEFT, | REAR, ACCIDENT | XF |
| RIGHT, | REAR, ACCIDENT | XFB |
| | REARVIEW, MIRRORS, AUXILIARIES/ | XFC |
| | RECALL, LEARNING, COGNITION/ | XFD |
| TRANSMITTERS/ | RECEIVERS, EQUIPMENT | KCFBC |
| RADAR, TRANSMITTERS/ | RECEIVERS, EQUIPMENT | XH |
| RADIO, TRANSMITTERS/ | RECEIVERS, EQUIPMENT | XHB |
| TELEVISION, TRANSMITTERS/ | RECEIVERS, EQUIPMENT | XHC |
| | RECKLESS, MOVING VIOLATIONS, | XHE |
| | RECORDERS, EQUIPMENT | XHG |
| DRUM/ DISK, | RECORDERS, EQUIPMENT | RR |
| MAGNETIC TAPE, | RECORDERS, EQUIPMENT | JR |
| PUNCHED TAPE, | RECORDERS, EQUIPMENT | JRD |
| PUNCHED CARD, | RECORDERS, EQUIPMENT | JRE |
| MAGNETIC CORE, | RECORDERS, EQUIPMENT | JREF |
| | RECORDS, LEGAL ASPECT | JRF |
| | RECOVERY OF INJURED, ACCIDENT | JRG |
| DETECTION, | RECOVERY OF INJURED, ACCIDENT | JRCF |
| COMMUNICATION, | RECOVERY OF INJURED, ACCIDENT | JRCG |
| ALERT/ ALARM, COMMUNICATION, | RECOVERY OF INJURED, ACCIDENT | JRGH |
| LOCATION (SEARCH), COMMUNICATION, | RECOVERY OF INJURED, ACCIDENT | JRGI |
| DECISION (INTERAGENCY), COMMUNICATION, | RECOVERY OF INJURED, ACCIDENT | JRH |
| EXTRACTION OF OCCUPANT, | RECOVERY OF INJURED, ACCIDENT | JRHC |
| TREATMENT/ CARE, | RECOVERY OF INJURED, ACCIDENT | JRHD |
| FIRST AID (RED CROSS), TREATMENT/ CARE, | RECOVERY OF INJURED, ACCIDENT | JRI |
| ADVANCED (RED CROSS), TREATMENT/ CARE, | RECOVERY OF INJURED, ACCIDENT | JRID |
| COMPREHENSIVE, TREATMENT/ CARE, | RECOVERY OF INJURED, ACCIDENT | JRJ |
| PROFESSIONAL/ PHYSICIAN, TREATMENT/ CARE, | RECOVERY OF INJURED, ACCIDENT | |
| TRANSPORTATION, | RECOVERY OF INJURED, ACCIDENT | |
| TRANSPORTABILITY, TRANSPORTATION, | RECOVERY OF INJURED, ACCIDENT | |
| DEAD AT SCENE, TRANSPORTATION, | RECOVERY OF INJURED, ACCIDENT | |
| HOSPITAL ADMISSION, | RECOVERY OF INJURED, ACCIDENT | |
| CEAD ON ARRIVAL, HOSPITAL ADMISSION, | RECOVERY OF INJURED, ACCIDENT | |
| HOSPITAL CARE, | RECOVERY OF INJURED, ACCIDENT | |

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| DEAD AFTER ARRIVAL, HOSPITAL CARE, | RECOVERY OF INJURED, ACCIDENT | JRJD |
| EMERGENCY ROOM, HOSPITAL CARE, | RECOVERY OF INJURED, ACCIDENT | JRJE |
| REHABILITATION, HOSPITAL CARE, | RECOVERY OF INJURED, ACCIDENT | JRJF |
| | RECREATION, PURPOSE/ TRIP, TRAFFIC | GDB |
| | RECTUM, LARGE INTESTINE, DIGESTIVE | CAJLB |
| FIRST AID (RED CROSS), MEDICAL, EDUCATION, | | QGMF |
| ADVANCED (RED CROSS), MEDICAL, EDUCATION, | | QPMG |
| FIRST AID (RED CROSS), TREATMENT/ CARE, | | JHGF |
| ADVANCED (RED CROSS), TREATMENT/ CARE, | | JRGG |
| | REFLECTANCE, OPTICAL, PHYSICAL | NDG |
| | REFLECTION, PHENOMENA, PHYSICAL | NLN |
| | REFLECTORS, AUXILIARIES/ | DMA |
| | REFLECTORS, SIGNS/ SIGNALS, WAYS | CIH |
| | REFRACTIVITY, OPTICAL, PHYSICAL | NDE |
| | REFRACTORY PERIOD, FREQUENCY/ TIME, | NKFE |
| BRONCHIAL | REGION, NECK, ANATOMY/ BODY, | QAHG |
| | REGIONAL PLANNING, SOCIOECONOMIC | SD |
| TRANSPORTATION, | REGIONAL PLANNING, SOCIOECONOMIC | SDR |
| RESOURCE ALLOCATION, | REGIONAL PLANNING, SOCIOECONOMIC | SDC |
| LAND UTILIZATION, | REGIONAL PLANNING, SOCIOECONOMIC | SDD |
| POLLUTION, | REGIONAL PLANNING, SOCIOECONOMIC | SDE |
| | REGISTRATION/ TITLES, REGULATORY, | RCGD |
| | REGRESSION, DESIGN, STATISTICAL/ | WMERC |
| | REGULATION/ CONTROL | F |
| TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FB |
| GLIDE/ DELINEATION, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBC |
| WARNING, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBC |
| WIMBLER, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBCB |
| REGULATORY, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBE |
| DIRECTION, REGULATORY, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBE |
| CROSSING, REGULATORY, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBE |
| LIMIT, REGULATORY, TRAFFIC SIGNS/ TRAFFIC SIGNALS, | REGULATION/ CONTROL | FBE |
| | REGULATION/ CONTROL | FC |
| TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCC |
| INTERSECTION, TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCCB |
| ESCORT, TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCC |
| ROAD CONTROL, TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCCG |
| PARKING, TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCC |
| BLOCKADE, TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCCF |
| SURVEILLANCE, TRAFFIC DIRECTION, TRAFFIC PATROL, | REGULATION/ CONTROL | FCCG |
| PURSUIT, TRAFFIC PATROL, | REGULATION/ CONTROL | FCC |
| | REGULATORY, LAWS, LEGAL ASPECT | RCG |
| INSPECTION, | REGULATORY, LAWS, LEGAL ASPECT | RCGH |
| MOTOR VEHICLE, INSPECTION, | REGULATORY, LAWS, LEGAL ASPECT | RCGH*DC |
| LICENSING, | REGULATORY, LAWS, LEGAL ASPECT | RCCC |
| MOTOR VEHICLE, LICENSING, | REGULATORY, LAWS, LEGAL ASPECT | RCGC*DF |
| DRIVER, LICENSING, | REGULATORY, LAWS, LEGAL ASPECT | RCGC*FC |
| REGISTRATION/ TITLES, | REGULATORY, LAWS, LEGAL ASPECT | RCGE |
| STANDARDS, | REGULATORY, LAWS, LEGAL ASPECT | RCGE |
| | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBE |
| INTERSECTION, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBCB |
| YIELD, INTERSECTION, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBEH |
| STOP, INTERSECTION, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBEBC |
| WALK/ WAIT, INTERSECTION, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBEH |
| LANE DIRECTION, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBE |
| CROSSING, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBE |
| SPEED LIMIT, | REGULATORY, TRAFFIC SIGNS/ TRAFFIC | FBE |
| | REHABILITATION, HOSPITAL CARE, | JRJF |
| | REINFORCEMENT, BEHAVIORAL FACTORS, | PCD |
| | RELAY, CONTROLS, EQUIPMENT | XIB |
| | RELIABILITY, OPERATING CONDITIONS, | NKG |
| | RELIGION, BEHAVIOR/ MORALS, SOCIAL, | SRBH |
| | REMOTE CONTROL, CONTROLLED, SIGNS/ | CICG |
| DEBRIS | REMOVAL, PROPERTY DAMAGE, ACCIDENT | JMC |
| | RENTED, STATUS, VEHICLE | CNC |
| MAINTENANCE/ | REPAIR, ENGINEERING, METHODS | WDE |
| | REPAIRS, PROPERTY DAMAGE, ACCIDENT | JME |
| JCKES, GENERAL DISCUSSIONS, CONTENTS, STUDY- | REPORT TYPE | YERC |
| PRESS | REPORTS, FORM, STUDY-REPORT TYPE | YDJ |
| | REQUEST FOR PROPOSALS, PROGRESS | YBH |
| OCTANE | REQUIREMENT, VEHICULAR, OPERATING | NKYC |
| | RESEARCH AND DEVELOPMENT, | WDF |
| SYSTEMS ANALYSIS/ OPERATIONS | RESEARCH, METHODS | WN |
| MODELS/ MODELING, SYSTEMS ANALYSIS/ OPERATIONS | RESEARCH, METHODS | WNB |
| | RESEARCH, NATURE OF STUDY, | YCB |
| | RESIDENTIAL, ZONE/ LAND USAGE, | CLB |
| | RESISTANCE, ELECTRIC PROPERTIES, | NCB |
| | RESOLUTION, PHENOMENA, PHYSICAL | NLF |
| | RESONANCE, PHENOMENA, PHYSICAL | NLR |
| PARK/ | RESORT, ZONE/ LAND USAGE, SPACE | KLE |
| | RESOURCE ALLOCATION, REGIONAL | SDC |
| | RESPIRATION, RESPIRATORY SYSTEM, | CALA |
| | RESPIRATORY RATE, PHYSIOLOGICAL, | WUPC |
| | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CAL |
| RESPIRATION, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALA |
| NOSE/ NASAL SINUSES, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALB |
| LARYNX, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALC |
| TRACHEA/ BRONCHI, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALD |
| LUNGS, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CAL |
| PLEURA, LUNGS, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALB |
| DIAPHRAGM, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALF |
| MEDIASTINUM, | RESPIRATORY SYSTEM, ANATOMY/ BODY, | CALG |
| | RESPONSE, BEHAVIORAL FACTORS, | PCF |
| FINANCIAL | RESPONSIBILITY, CRIMINAL, LAWS, | RCFD |
| SAFETY | RESPONSIBILITY, STATUTES, LAWS, | RCCB |
| | REST AREAS/ PARKS, SERVICES | IC |
| | RESTAURANTS/ MOTELS, SERVICES | IC |
| | RESTRAINT SYSTEMS, AUXILIARIES/ | DMC |
| SEAT BELTS, | RESTRAINT SYSTEMS, AUXILIARIES/ | DMCH |
| SHOULDER HARNESSES, | RESTRAINT SYSTEMS, AUXILIARIES/ | DMCC |
| (OTHER), | RESTRAINT SYSTEMS, AUXILIARIES/ | DMCD |
| | RESUSCITATION, MAINTAINING AIRWAYS, | WSBCR |
| MECHANICAL, | RESUSCITATION, MAINTAINING AIRWAYS, | WSBCHM |
| MOUTH-TO-MOUTH, | RESUSCITATION, MAINTAINING AIRWAYS, | WSBCRM |
| | RESUSCITATORS, MEDICAL, EQUIPMENT | XII |
| | RETARDATION, PHENOMENA, PHYSICAL | NLZA |
| | RETINA, EYE, HEAD, ANATOMY/ BODY, | CAIFJ |
| | REVERSIBLE, LANES, PARTS OF WAYS, | CDCH |
| PROGRAM | REVIEW, PROGRESS STATUS, | YFG |
| | REVIEWS, CONTENTS, STUDY-REPORT | YEE |
| SUSPENSION/ | REVOCATION, SANCTIONS/ PUNISHMENT, | RDGD |
| POINT SYSTEM, SUSPENSION/ | REVOCATION, SANCTIONS/ PUNISHMENT, | RDGD |
| | RIBS, THORAX, ANATOMY/ BODY, | QAFD |
| | RIDE, VEHICULAR PERFORMANCE, | NLZRB |

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| | | RIGHT TURN, DIRECTIONAL, LANES, | CCOCH |
| | | RIGHT-OF-WAY, PARTS OF WAYS, WAYS | CDM |
| | | RIGHT, FRONT, ACCIDENT | JHR |
| | | RIGHT, REAR, ACCIDENT | JIR |
| | | RIGHT, SIDE, ACCIDENT | JJR |
| | | RIGHT, TURNING, TRAFFIC FLOW, | GHTR |
| | | RIMS, WHEELS, VEHICLE PARTS, | DHAB |
| | | RING STICKING, ENGINE PERFORMANCE, | NLZQK |
| | | RISK CLASSIFICATION, INSURANCE/ | SEF |
| | | RISK TAKING, PLANNING/ DECISION | PDBH |
| | | RIVER/ CANAL, WATERS, TERRAIN/ | KNPC |
| | | ROAD MAINTENANCE, SERVICES | IM |
| | | ROAD | BE |
| | | ROAD MATERIALS, MATERIALS | HEB |
| | SOIL/ DIRT, | ROAD MATERIALS, MATERIALS | BEBB |
| | CLAY, SOIL/ DIRT, | ROAD MATERIALS, MATERIALS | BEC |
| | AGGREGATES, | ROAD MATERIALS, MATERIALS | BECM |
| | SAND, AGGREGATES, | ROAD MATERIALS, MATERIALS | BECC |
| | GRAVEL, AGGREGATES, | ROAD MATERIALS, MATERIALS | BFD |
| | BRICKS/ STONES, | ROAD MATERIALS, MATERIALS | BEF |
| | CONCRETE, | ROAD MATERIALS, MATERIALS | BEF |
| | RITUMINDUS/ ASPHALT, | ROAD MATERIALS, MATERIALS | HEG |
| | MACADAM, | ROAD MATERIALS, MATERIALS | JC |
| | NONCOLLISION ON | ROAD, ACCIDENT | JCB |
| | OVERTURNING, NONCOLLISION ON | ROAD, ACCIDENT | JCC |
| | FALLING FROM MOVING VEHICLE, NONCOLLISION ON | ROAD, ACCIDENT | JCF |
| | (OTHER), NONCOLLISION ON | ROAD, ACCIDENT | CFDB |
| | | ROADBED, SURFACE/ PAVEMENT, PARTS | C |
| | | WAYS (ROADS) | CH |
| | SPECIAL WAYS, WAYS (ROADS) | | CH#NMC |
| | AUTOMATED, SPECIAL WAYS, WAYS (ROADS) | | CRA |
| | DRIVEWAYS, SPECIAL WAYS, WAYS (ROADS) | | CBB |
| | ALLEYS, SPECIAL WAYS, WAYS (ROADS) | | CAC |
| | SERVICE ROADS, SPECIAL WAYS, WAYS (ROADS) | | CBD |
| | DEAD ENDS/ CUL DE SAC, SPECIAL WAYS, WAYS (ROADS) | | CAE |
| | CYCLE PATHS, SPECIAL WAYS, WAYS (ROADS) | | CBF |
| | TEST TRACKS, SPECIAL WAYS, WAYS (ROADS) | | CC |
| | TRAFFICWAYS, WAYS (ROADS) | | CCB |
| | PRIVATE, TRAFFICWAYS, WAYS (ROADS) | | CCC |
| | PUBLIC, TRAFFICWAYS, WAYS (ROADS) | | CCC |
| | STREETS, PUBLIC, TRAFFICWAYS, WAYS (ROADS) | | CCC |
| | HIGHWAYS, PUBLIC, TRAFFICWAYS, WAYS (ROADS) | | CCC |
| | PRIMARY, HIGHWAYS, PUBLIC, TRAFFICWAYS, WAYS (ROADS) | | CCC |
| | SECONDARY, HIGHWAYS, PUBLIC, TRAFFICWAYS, WAYS (ROADS) | | CCC |
| | LIMITED ACCESS, TRAFFICWAYS, WAYS (ROADS) | | CCD |
| | TOLL ROADS, TRAFFICWAYS, WAYS (ROADS) | | CCD |
| | UNDIVIDED, TRAFFICWAYS, WAYS (ROADS) | | CCF |
| | DIVIDED, TRAFFICWAYS, WAYS (ROADS) | | CCG |
| | SINGLE LANE, TRAFFICWAYS, WAYS (ROADS) | | CCI |
| | TWO LANE, TRAFFICWAYS, WAYS (ROADS) | | CCJ |
| | MULTIPLE LANE, TRAFFICWAYS, WAYS (ROADS) | | CCK |
| | BYPASS, TRAFFICWAYS, WAYS (ROADS) | | CCL |
| | CNE WAY, TRAFFICWAYS, WAYS (ROADS) | | CCD |
| | PARTS OF WAYS, WAYS (ROADS) | | CF |
| | RIGHT-OF-WAY, PARTS OF WAYS, WAYS (ROADS) | | CDM |
| | LANES, PARTS OF WAYS, WAYS (ROADS) | | CCC |
| | REVERSIBLE, LANES, PARTS OF WAYS, WAYS (ROADS) | | CCCB |
| | DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | CCCC |
| | RIGHT TURN, DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | CCCC |
| | LEFT TURN, DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | CCCC |
| | THROUGH, DIRECTIONAL, LANES, PARTS OF WAYS, WAYS (ROADS) | | CCCC |
| | SPEED CHANGE, LANES, PARTS OF WAYS, WAYS (ROADS) | | CCDD |
| | CURBS, PARTS OF WAYS, WAYS (ROADS) | | CDE |
| | BARRICADES, PARTS OF WAYS, WAYS (ROADS) | | CDE |
| | GATES, BARRICADES, PARTS OF WAYS, WAYS (ROADS) | | CDEH |
| | SURFACE/ PAVEMENT, PARTS OF WAYS, WAYS (ROADS) | | CF |
| | ROADBED, SURFACE/ PAVEMENT, PARTS OF WAYS, WAYS (ROADS) | | CFB |
| | SHOULDERS, PARTS OF WAYS, WAYS (ROADS) | | CDG |
| | GUARDRAILS, SHOULDERS, PARTS OF WAYS, WAYS (ROADS) | | CDGH |
| | SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | | CDH |
| | MEDIANS, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | | CDHB |
| | GUARDRAILS, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | | CDHC |
| | TRAFFIC ISLANDS, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | | CDHD |
| | FLEXIBLE, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | | CDHF |
| | PARABOLIC, SEPARATORS, PARTS OF WAYS, WAYS (ROADS) | | CDHP |
| | PIPES/ CULVERTS, PARTS OF WAYS, WAYS (ROADS) | | CDI |
| | JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJ |
| | THREE WAY, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJB |
| | FOUR WAY, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJC |
| | MULTIWAY, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJD |
| | JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJE |
| | (AT GRADE), JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJF |
| | SEPARATION, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJG |
| | CROSSWALKS, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJH |
| | RAILWAYS, JUNCTIONS/ CROSSINGS, PARTS OF WAYS, WAYS (ROADS) | | CDJI |
| | RAMPS, PARTS OF WAYS, WAYS (ROADS) | | CDK |
| | ENTRANCES, RAMPS, PARTS OF WAYS, WAYS (ROADS) | | CDKB |
| | EXITS, RAMPS, PARTS OF WAYS, WAYS (ROADS) | | CDKC |
| | BRIDGES, PARTS OF WAYS, WAYS (ROADS) | | CDL |
| | SUSPENSION, BRIDGES, PARTS OF WAYS, WAYS (ROADS) | | CDLC |
| | TUNNELS, PARTS OF WAYS, WAYS (ROADS) | | CDM |
| | GEOMETRICS, WAYS (ROADS) | | CG |
| | PLANER, GEOMETRICS, WAYS (ROADS) | | CCB |
| | ALIGNMENTS, GEOMETRICS, WAYS (ROADS) | | CCG |
| | SIGHT DISTANCES, GEOMETRICS, WAYS (ROADS) | | CCD |
| | GRADES, GEOMETRICS, WAYS (ROADS) | | CCF |
| | CLEARANCES, GEOMETRICS, WAYS (ROADS) | | CCG |
| | CROSS SECTIONS, GEOMETRICS, WAYS (ROADS) | | CCG |
| | SUPERELEVATIONS, GEOMETRICS, WAYS (ROADS) | | CGH |
| | CROWNS, GEOMETRICS, WAYS (ROADS) | | CGI |
| | CURVES, GEOMETRICS, WAYS (ROADS) | | CGJ |
| | STRAIGHT, GEOMETRICS, WAYS (ROADS) | | CGK |
| | CRESTS/ SAGS, GEOMETRICS, WAYS (ROADS) | | CGL |
| | LIGHTING, WAYS (ROADS) | | CH |
| | SIGNS/ SIGNALS, WAYS (ROADS) | | CI |
| | POSTS, SIGNS/ SIGNALS, WAYS (ROADS) | | CIB |
| | PAVEMENT MARKINGS, SIGNS/ SIGNALS, WAYS (ROADS) | | CIC |
| | POST MOUNTED, SIGNS/ SIGNALS, WAYS (ROADS) | | CID |
| | OVERHEAD, SIGNS/ SIGNALS, WAYS (ROADS) | | CIE |
| | FLASHING, SIGNS/ SIGNALS, WAYS (ROADS) | | CIF |
| | CONTROLLED, SIGNS/ SIGNALS, WAYS (ROADS) | | CIG |
| | TIME SEQUENCED, CONTROLLED, SIGNS/ SIGNALS, WAYS (ROADS) | | CIGB |
| | REMOTE CONTROL, CONTROLLED, SIGNS/ SIGNALS, WAYS (ROADS) | | CIGC |
| | REFLECTORS, SIGNS/ SIGNALS, WAYS (ROADS) | | CIH |
| | ROADSIDE, WAYS (ROADS) | | CR |

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| | SIDEWALKS, ROADSIDE, WAYS (ROADS) | CRD |
| | PARKING/ TERMINALS, ROADSIDE, WAYS (ROADS) | CRE |
| | BUILDINGS, ROADSIDE, WAYS (ROADS) | CRF |
| | BILLBOARDS/ POSTERS, ROADSIDE, WAYS (ROADS) | CRG |
| | CONSTRUCTION SITES, ROADSIDE, WAYS (ROADS) | CRH |
| | DITCHES, ROADSIDE, WAYS (ROADS) | CRI |
| | VEGETATION, ROADSIDE, WAYS (ROADS) | CRJ |
| GRASS/ GRUNCCOVERS, | VEGETATION, ROADSIDE, WAYS (ROADS) | CRJB |
| | BUSHS, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJC |
| | TREES, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJD |
| | SIDE SLOPES, ROADSIDE, WAYS (ROADS) | CRK |
| | DIKES, ROADSIDE, WAYS (ROADS) | CRL |
| | DRAINS, ROADSIDE, WAYS (ROADS) | CRM |
| | ABLMENTS, ROADSIDE, WAYS (ROADS) | CRN |
| | TELEPHONES, ROADSIDE, WAYS (ROADS) | CRT |
| | SERVICE ROADS, SPECIAL WAYS, WAYS (ROADS) | CBC |
| | TOLL ROADS, TRAFFICWAYS, WAYS (ROADS) | CCE |
| | ROADSIDE, WAYS (ROADS) | CR |
| | SIDEWALKS, ROADSIDE, WAYS (ROADS) | CRD |
| | PARKING/ TERMINALS, ROADSIDE, WAYS (ROADS) | CRE |
| | BUILDINGS, ROADSIDE, WAYS (ROADS) | CRF |
| | BILLBOARDS/ POSTERS, ROADSIDE, WAYS (ROADS) | CRG |
| | CONSTRUCTION SITES, ROADSIDE, WAYS (ROADS) | CRH |
| | DITCHES, ROADSIDE, WAYS (ROADS) | CRI |
| | VEGETATION, ROADSIDE, WAYS (ROADS) | CRJ |
| GRASS/ GROUNDCCVERS, | VEGETATION, ROADSIDE, WAYS (ROADS) | CRJB |
| | BUSHS, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJC |
| | TREES, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJD |
| | SIDE SLOPES, ROADSIDE, WAYS (ROADS) | CRK |
| | DIKES, ROADSIDE, WAYS (ROADS) | CRL |
| | DRAINS, ROADSIDE, WAYS (ROADS) | CRM |
| | ABUTMENTS, ROADSIDE, WAYS (ROADS) | CRN |
| | TELEPHONES, ROADSIDE, WAYS (ROADS) | CRT |
| | ROLES, BEHAVIOR/ MORES, SOCIAL, | SBBC |
| | ROLLING, FRICTION, PHENOMENA, | NLZFC |
| | ROLLING, MOTION, PHENOMENA, | NLFD |
| | ROLLING, TERRAIN/ HABITAT, SPACE | KBC |
| | ROOFS, BODY (UPPER), VEHICLE PARTS, | CHDA |
| CONVERTIBLE, | ROOFS, BODY (UPPER), VEHICLE PARTS, | CHDAB |
| EMERGENCY | ROOM, HOSPITAL CARE, RECOVERY OF | JRJC |
| CLASS | ROOM, TEACHING/ TRAINING, | CDB |
| DISCUSSIONS/ SEMINARS, CLASS | ROOM, TEACHING/ TRAINING, | CDBB |
| LECTURE/ DEMONSTRATIONS, CLASS | ROOM, TEACHING/ TRAINING, | CDBC |
| SIMULATORS, CLASS | ROOM, TEACHING/ TRAINING, | CDBD |
| | ROOT, TOOTH, DIGESTIVE SYSTEM/ | CAJCD |
| | ROTARY, INTERCHANGES, JUNCTIONS/ | CCJEC |
| | ROUGHNESS, ENGINE PERFORMANCE, | NLZQE |
| | ROUGHNESS, PHYSICAL PROPERTIES, | NRF |
| | RUBBER, POLYMERS, MATERIALS | BGB |
| | RUMBLE, NOISE, ENGINE PERFORMANCE, | NLZQFC |
| | RUMBLER, WARNING, TRAFFIC SIGNS/ | FHCB |
| HIT AND | RUN, ACCIDENT | JG |
| | RUNNING-OFF-ROAD, ACCIDENT | JB |
| | RUPTURE, FAILURE, PHENOMENA, | NLZLF |
| | RURAL, TERRAIN/ HABITAT, SPACE | KBK |
| | RUSH HOUR, TIME | LR |
| | SAFETY CENTERS, CORPORATE BODIES, | FDG |
| | SAFETY RESPONSIBILITY, STATUTES, | HCCH |
| | SAFETY, EDUCATION, EDUCATIONAL | QGE |
| | SAFETY, MEASURES, SOCIOECONOMIC | SFB |
| CRESTS/ | SAGS, GEOMETRICS, WAYS (ROADS) | CGL |
| | SALIVA, BODY FLUIDS, ANATOMY/ BODY, | OARE |
| | SALIVARY GLANDS, DIGESTIVE SYSTEM/ | OAJF |
| | SALT, MINERALS, MATERIALS | HMS |
| | SAMPLING, STATISTICAL/ PROBABILITY, | WMEG |
| | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | ROG |
| JAIL, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | ROGB |
| FINE, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | ROGC |
| SUSPENSION/ REVOCATION, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | ROGD |
| PCINT SYSTEM, SUSPENSION/ REVOCATION, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | RCGDB |
| PROBATION, | SANCTIONS/ PUNISHMENT, ENFORCEMENT, | ROGE |
| | SAND, AGGREGATES, ROAD MATERIALS, | BECB |
| | SATURATION, CAPACITY/ LIMIT, | NKJC |
| PRECIPITATION, | SATURATION, CAPACITY/ LIMIT, | NKJDB |
| BURNS/ | SCALDS, INJURY/ TRAUMA, ACCIDENT | JNM |
| SIEBRECHT | SCALE, ATTITUDES, PERSONALITY, | PCBCB |
| | SCALED, MODELS (PHYSICAL), | XMJ |
| WEIGHT | SCALES, STATIC, MECHANICAL TEST, | XQHE |
| | SCALING, DATA, ANALYSIS, | WMCHB |
| | SCALP, HEAD, ANATOMY/ BODY, | CAIC |
| | SCAVENGING, ENGINE PERFORMANCE, | NLZCM |
| DEAD AT | SCENE, TRANSPORTATION, RECOVERY OF | JRHD |
| SEQUENCE/ | SCHEDULE, BEHAVIORAL FACTORS, | PFE |
| | SCHOOL/ HOSPITAL, ZONE/ LAND USAGE, | KLC |
| GRADE | SCHOOL, EDUCATION LEVEL, | QBC |
| HIGH | SCHOOL, EDUCATION LEVEL, | QBD |
| | SCHOOLS, CORPORATE BODIES, SOCIETY | FDJ |
| SOCIAL | SCIENCES/ ECONOMIC SCIENCES, | VK |
| EARTH | SCIENCES, DISCIPLINES | VF |
| SOCIAL SCIENCES/ ECONOMIC | SCIENCES, DISCIPLINES | VK |
| BIOMEDICAL | SCIENCES, DISCIPLINES | VM |
| BIOMECHANICS, BIOMEDICAL | SCIENCES, DISCIPLINES | VMB |
| KINESIOLOGY, BIOMECHANICS, BIOMEDICAL | SCIENCES, DISCIPLINES | VMBB |
| MANAGEMENT | SCIENCES, DISCIPLINES | VO |
| MARKETING, MANAGEMENT | SCIENCES, DISCIPLINES | VOB |
| ACCOUNTING, MANAGEMENT | SCIENCES, DISCIPLINES | VOC |
| | SCLERA, EYE, HEAD, ANATOMY/ BODY, | OAIFF |
| | SEA/ LAKE, WATERS, TERRAIN/ | KBPB |
| LOCATION (| SEARCH), COMMUNICATION, RECOVERY OF | JREE |
| | SEAT BELTS, RESTRAINT SYSTEMS, | DMOB |
| | SEATS, INTERIOR/ PASSENGER | DHGE |
| HEADRESTS, | SEATS, INTERIOR/ PASSENGER | DHGEB |
| | SECONDARY, HIGHWAYS, PUBLIC, | CCCC |
| CROSS | SECTIONS, GEOMETRICS, WAYS (ROADS) | CGG |
| DISCUSSIONS/ | SEMINARS, CLASS ROOM, TEACHING/ | QDBB |
| COLOR | SENSE, VISION, SENSES, | PRCB |
| | SENSES, PSYCHOLOGICAL ASPECT | PB |
| AUDITORY/ HEARING, | SENSES, PSYCHOLOGICAL ASPECT | PBB |
| VISION, | SENSES, PSYCHOLOGICAL ASPECT | PBC |
| COLOR SENSE, VISION, | SENSES, PSYCHOLOGICAL ASPECT | PBCB |
| VISUAL FIELD, VISION, | SENSES, PSYCHOLOGICAL ASPECT | PBCC |
| TACTILE/ TOUCH, | SENSES, PSYCHOLOGICAL ASPECT | PBD |
| KINESTHETIC/ MOTION, | SENSES, PSYCHOLOGICAL ASPECT | PBE |
| THERMAL/ TEMPERATURE, | SENSES, PSYCHOLOGICAL ASPECT | PBF |

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| VESTIBULAR/ BALANCE, | SENSES, | PSYCHOLOGICAL ASPECT | PHG | | |
| OLFACTORY/ SMELL, | SENSES, | PSYCHOLOGICAL ASPECT | PBH | | |
| VIBRATIONAL, | SENSES, | PSYCHOLOGICAL ASPECT | PHI | | |
| VISCERAL, | SENSES, | PSYCHOLOGICAL ASPECT | PBJ | | |
| PAIN, | SENSES, | PSYCHOLOGICAL ASPECT | PBK | | |
| | SENSITIVITY, | PHENOMENA, PHYSICAL | NLX | | |
| | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XC | | |
| AMPLIFIERS, | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XCB | | |
| FILTERS, | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XCC | | |
| ACCELEROMETERS, | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XCD | | |
| STRAIN GAUGE, | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XCE | | |
| FIFTH WHEEL, | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XCF | | |
| LOOP DETECTORS, | SENSORS/ | TRANSDUCCERS, EQUIPMENT | XCL | | |
| GRADE | SEPARATION, | JUNCTIONS/ CROSSINGS, | CDJG | | |
| OVERPASS, GRADE | SEPARATION, | JUNCTIONS/ CROSSINGS, | CDJGB | | |
| UNDERPASS, GRADE | SEPARATION, | JUNCTIONS/ CROSSINGS, | CDJGC | | |
| | SEPARATORS, | PARTS OF WAYS, WAYS | CDH | | |
| MEDIANS, | SEPARATORS, | PARTS OF WAYS, WAYS | CDHB | | |
| GUARDRAILS, | SEPARATORS, | PARTS OF WAYS, WAYS | CDHC | | |
| TRAFFIC ISLANDS, | SEPARATORS, | PARTS OF WAYS, WAYS | CDHD | | |
| FLEXIBLE, | SEPARATORS, | PARTS OF WAYS, WAYS | CDHF | | |
| PARABOLIC, | SEPARATORS, | PARTS OF WAYS, WAYS | CDHP | | |
| | SEQUENCE/ | SCHEDULE, BEHAVIORAL | PFE | | |
| TIME | SEQUENCED, | CONTROLLED, SIGNS/ | CIGB | | |
| | SERVICE ORGANIZATIONS, | CORPORATE | FDE | | |
| | SERVICE ROADS, | SPECIAL WAYS, WAYS | CBC | | |
| | SERVICE STATIONS, | VEHICLE, SERVICES | IFB | | |
| | SERVICE, | MEASURES, SOCIOECONOMIC | SFC | | |
| | SERVICES | | I | | |
| MAPS/ DIRECTIONS, | SERVICES | | IB | | |
| REST AREAS/ PARKS, | SERVICES | | IC | | |
| RESTAURANTS/ MOTELS, | SERVICES | | ID | | |
| COMMUNICATIONS, | SERVICES | | IE | | |
| VEHICLE, | SERVICES | | IF | | |
| SERVICE STATIONS, VEHICLE, | SERVICES | | IFB | | |
| TOWING, VEHICLE, | SERVICES | | IFC | | |
| PARKING, | SERVICES | | IH | | |
| ROAD MAINTENANCE, | SERVICES | | IM | | |
| HOSPITAL, | SERVICES | | IO | | |
| AMBULANCE, | SERVICES | | IQ | | |
| | SET, | BEHAVIORAL FACTORS, | PFH | | |
| LOGIC/ | SETS, | MATHEMATICAL, METHODS | WMB | | |
| THROTTLE | SETTING, | VEHICULAR, OPERATING | NKV0 | | |
| MULTIPLE | SEVERE INJURIES, | CONSEQUENCES, | JNX | | |
| | SEX, | PEOPLE | EF | | |
| MALES, | SEX, | PEOPLE | EFB | | |
| FEMALES, | SEX, | PEOPLE | EFC | | |
| PREGNANT, FEMALES, | SEX, | PEOPLE | EFCP | | |
| DRIVE | SHAFTS/ | CLUTCHES, POWER PLANTS, | DHGE | | |
| | SHEAR STRENGTH, | MECHANICAL | NCD | | |
| | SHF (3-30 KMC), | RADIO FREQUENCY, | NLCEC | | |
| BUBBLES/ | SHIELDS, | FACE PROTECTORS, PERSONAL | DMKFB | | |
| | SHIMMY, | VEHICULAR PERFORMANCE, | NLZRC | | |
| | SHOCK ABSORBERS, | CHASSIS/ FRAMES, | DHCE | | |
| | SHOCK, | CONSEQUENCES, INJURY/ | JNPL | | |
| | SHOES/ | LININGS, BRAKES, VEHICLE | DHJ | | |
| ORTHOPEDIC | SHOES, | PROSTHESIS, BIOMEDICAL | OCF | | |
| | SHOP MANUALS, | FORM, STUDY-REPORT | YDC | | |
| | SHOPPING, | PURPOSE/ TRIP, TRAFFIC | GDC | | |
| | SHORT CIRCUIT, | FAILURE, PHENOMENA, | NLZLE | | |
| | SHOULDER HARNESSSES, | RESTRAINT | DMDC | | |
| | SHOULDER, | UPPER EXTREMITY, ANATOMY/ | OAGB | | |
| | SHOULDERS, | PARTS OF WAYS, WAYS | CDG | | |
| GUARDRAILS, | SHOULDERS, | PARTS OF WAYS, WAYS | CDGB | | |
| | SIDE SLOPES, | ROADSIDE, WAYS (ROADS) | CRK | | |
| | SIDE, | ACCIDENT | JJ | | |
| LEFT, | SIDE, | ACCIDENT | JJL | | |
| RIGHT, | SIDE, | ACCIDENT | JJR | | |
| | SIDEVIEW, | MIRRORS, AUXILIARIES/ | DMCS | | |
| | SIDEWALKS, | ROADSIDE, WAYS (ROADS) | CRD | | |
| | SIEBRECHT SCALE, | ATTITUDES, | PCBCB | | |
| | SIGHT DISTANCES, | GEOMETRICS, WAYS | CGD | | |
| | SIGNALS, | AUXILIARIES/ ACCESSORIES, | DMB | | |
| | SIGNALS, | REGULATION/ CONTROL | HB | | |
| GUIDE/ DELINEATION, | TRAFFIC SIGNS/ | TRAFFIC | HBC | | |
| WARNING, | TRAFFIC SIGNS/ | TRAFFIC | HBD | | |
| RUMBLER, WARNING, | TRAFFIC SIGNS/ | TRAFFIC | HBDH | | |
| REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBE | | |
| INTERSECTION, | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBEH | |
| STCP, INTERSECTION, | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBEHC | |
| WAIT, INTERSECTION, | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBEHW | |
| LANE DIRECTION, | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBECH | |
| CROSSING, | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBECH | |
| SPEED LIMIT, | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC | HBECH | |
| | SIGNALS, | WAYS (ROADS) | CI | | |
| | POSTS, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIB | |
| PAVEMENT MARKINGS, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIC | | |
| POST MOUNTED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIO | | |
| OVERHEAD, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIE | | |
| FLASHING, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIF | | |
| CONTROLLED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIG | | |
| TIME SEQUENCED, CONTROLLED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIGB | | |
| REMOTE CONTROL, CONTROLLED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIGC | | |
| REFLECTORS, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIH | | |
| | SIGNALS, | WAYS (ROADS) | CI | | |
| | POSTS, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIB | |
| PAVEMENT MARKINGS, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIC | | |
| POST MOUNTED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIO | | |
| OVERHEAD, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIE | | |
| FLASHING, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIF | | |
| CONTROLLED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIG | | |
| TIME SEQUENCED, CONTROLLED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIGH | | |
| REMOTE CONTROL, CONTROLLED, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIGC | | |
| REFLECTORS, | SIGNS/ | SIGNALS, WAYS (ROADS) | CIH | | |
| | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HB | |
| GUIDE/ DELINEATION, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBC | |
| WARNING, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBD | |
| RUMBLER, WARNING, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBDH | |
| REGULATORY, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBE | |
| INTERSECTION, | REGULATORY, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBEH |
| YIELD, INTERSECTION, | REGULATORY, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBEHC |
| STOP, INTERSECTION, | REGULATORY, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBECH |
| WALK/ WAIT, INTERSECTION, | REGULATORY, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBECH |
| LANE DIRECTION, | REGULATORY, | TRAFFIC | SIGNALS/ | TRAFFIC SIGNALS, REGULATION/ | HBECH |

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| CROSSING, REGULATORY, TRAFFIC | SIGNS/ TRAFFIC SIGNALS, REGULATION/ | F-BED |
| SPEED LIMIT, REGULATORY, TRAFFIC | SIGNS/ TRAFFIC SIGNALS, REGULATION/ | F-BEE |
| | SIMULATION, MODELS/ MODELING, | WNBB |
| | SIMULATORS, CLASS ROOM, TEACHING/ | QDBD |
| | SINGLE LANE, TRAFFICWAYS, WAYS | CCI |
| | SINGLE VEHICLE, ACCIDENT | JE |
| | SINGLE, PEOPLE | EQ |
| NOSE/ NASAL | SINUSES, RESPIRATORY SYSTEM, | DALB |
| CONSTRUCTION | SITES, ROADSIDE, WAYS (ROADS) | CRH |
| | SIZE/ DIMENSION, PHYSICAL | NBH |
| | SIZE, FAMILIES, PEOPLE | ESH |
| SLIDING/ | SKID, MOTION, PHENOMENA, PHYSICAL | NLFF |
| | SKILLED PERFORMANCE, LEARNING, | PDCG |
| | SKIN/ HAIR/ NAILS, CONNECTIVE | OAPH |
| | SKIN, FRICTION, PHENOMENA, PHYSICAL | NLZFH |
| | SKULL, HEAD, ANATOMY/ BODY, | DATA |
| | SLABS, CONSTRUCTION, MATERIALS | BCC |
| | SLACK, BRAKING/ STOPPING, VEHICULAR | NLZRJF |
| | SLED, DYNAMIC, MECHANICAL TEST, | XQCC |
| | SLEEP, STATE OF AROUSAL, STATE OF | PEBD |
| | SLEET, ATMOSPHERE, WEATHER | MAI |
| | SLIDING/ SKID, MOTION, PHENOMENA, | NLFF |
| | SLIDING, FRICTION, PHENOMENA, | NLZFE |
| SIDE | SLOPES, ROADSIDE, WAYS (ROADS) | CRK |
| | SLUGS, MODELS (PHYSICAL), EQUIPMENT | XMB |
| | SMALL INTESTINE, DIGESTIVE SYSTEM/ | DAJK |
| CAECUM, | SMALL INTESTINE, DIGESTIVE SYSTEM/ | DAJKH |
| OLFACTORY/ | SMELL, SENSES, PSYCHOLOGICAL ASPECT | PBH |
| FOG/ | SMOG, ATMOSPHERE, WEATHER | MAF |
| | SNOW/ FROST, ATMOSPHERE, WEATHER | MAH |
| | SOCIAL SCIENCES/ ECONOMIC SCIENCES, | VK |
| | SOCIAL VARIABLES, PAST EXPERIENCE, | PCDC |
| | SOCIAL, SOCIOECONOMIC ASPECT | SB |
| BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SHB |
| RELIGION, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBHB |
| ROLES, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBC |
| DEVIANCY/ CONTROL, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBHD |
| CULTURE, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBE |
| POPULATION/ DEMOGRAPHY, | SOCIAL, SOCIOECONOMIC ASPECT | SBC |
| POLITICS, | SOCIAL, SOCIOECONOMIC ASPECT | SBD |
| PUBLIC OPINION, | SOCIAL, SOCIOECONOMIC ASPECT | SBE |
| PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SBF |
| INDIVIDUAL, PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SHFB |
| PUBLIC, | SOCIAL, SOCIOECONOMIC ASPECT | SBG |
| FOUNDATIONS/ | SOCIETIES, CORPORATE BODIES, | FDD |
| | SOCIETY | F |
| COMMUNITIES, | SOCIETY | FC |
| CORPORATE BODIES, | SOCIETY | FD |
| INDUSTRIAL, CORPORATE BODIES, | SOCIETY | FDH |
| BUSINESS, CORPORATE BODIES, | SOCIETY | FDC |
| FOUNDATIONS/ SOCIETIES, CORPORATE BODIES, | SOCIETY | FDD |
| SERVICE ORGANIZATIONS, CORPORATE BODIES, | SOCIETY | FDE |
| SCHOOLS, CORPORATE BODIES, | SOCIETY | FDF |
| SAFETY CENTERS, CORPORATE BODIES, | SOCIETY | FDG |
| | GOVERNMENTS, | FG |
| TOWN/ CITY, GOVERNMENTS, | SOCIETY | FGB |
| COUNTY, GOVERNMENTS, | SOCIETY | FGC |
| STATE/ PROVINCE, GOVERNMENTS, | SOCIETY | FGD |
| FEDERAL/ NATIONAL, GOVERNMENTS, | SOCIETY | FGE |
| INTERNATIONAL, GOVERNMENTS, | SOCIETY | FGF |
| | LEGISLATURES, | FH |
| | EXECUTIVE BRANCHES, | FI |
| MILITARY, EXECUTIVE BRANCHES, | SOCIETY | FIB |
| CIVIL, EXECUTIVE BRANCHES, | SOCIETY | FIC |
| POLICE, CIVIL, EXECUTIVE BRANCHES, | SOCIETY | FICB |
| JUDICIARY BRANCHES/ COURTS, | SOCIETY | FJ |
| MASS MEDIA/ COMMUNICATIONS, | SOCIETY | FK |
| | SOCIOECONOMIC ASPECT | S |
| | SOCIAL, SOCIOECONOMIC ASPECT | SH |
| BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SHB |
| RELIGION, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SHBB |
| ROLES, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBC |
| DEVIANCY/ CONTROL, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBHD |
| CULTURE, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBE |
| POPULATION/ DEMOGRAPHY, | SOCIAL, SOCIOECONOMIC ASPECT | SBC |
| POLITICS, | SOCIAL, SOCIOECONOMIC ASPECT | SBD |
| PUBLIC OPINION, | SOCIAL, SOCIOECONOMIC ASPECT | SBE |
| PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SBF |
| INDIVIDUAL, PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SHFB |
| PUBLIC, | SOCIAL, SOCIOECONOMIC ASPECT | SRG |
| | ECONOMICS, | SC |
| MACROECONOMICS, | ECONOMICS, SOCIOECONOMIC ASPECT | SCB |
| MICROECONOMICS/ PRICE THEORY, | ECONOMICS, SOCIOECONOMIC ASPECT | SCC |
| ECONOMIC BEHAVIOR, | ECONOMICS, SOCIOECONOMIC ASPECT | SCD |
| BUSINESS CYCLES, ECONOMIC BEHAVIOR, | ECONOMICS, SOCIOECONOMIC ASPECT | SCDB |
| CONSUMER, ECONOMIC BEHAVIOR, | ECONOMICS, SOCIOECONOMIC ASPECT | SCCC |
| COSTS/ BENEFITS, | ECONOMICS, SOCIOECONOMIC ASPECT | SCE |
| COST EFFECTIVENESS, | ECONOMICS, SOCIOECONOMIC ASPECT | SCF |
| BUDGETS/ BUDGETING, | ECONOMICS, SOCIOECONOMIC ASPECT | SCG |
| | FINANCE, ECONOMICS, | SCH |
| TAXES, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHB |
| FEES, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHC |
| ASSESSMENT, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHD |
| MONEY/ BANKING, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCH E |
| INVESTMENT, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHF |
| STOCKS, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHG |
| BONDS, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHH |
| CREDIT, | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCHK |
| | REGIONAL PLANNING, | SD |
| TRANSPORTATION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDB |
| RESOURCE ALLOCATION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDC |
| LAND UTILIZATION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDD |
| POLLUTION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDE |
| | INSURANCE/ ACTUARY, | SE |
| UNINSURED, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEB |
| LOSS DISTRIBUTION, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEC |
| TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SED |
| CASUALTY, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEDB |
| MEDICAL, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SECC |
| LIABILITY, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEDD |
| DISABILITY, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEDE |
| BASIC, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEDF |
| GROUP, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEEG |
| COMPULSORY, TYPES OF INSURANCE, | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SEFH |

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| CROSSING, REGULATORY, TRAFFIC | SIGNS/ TRAFFIC SIGNALS, REGULATION/ | HBED |
| SPEED LIMIT, REGULATORY, TRAFFIC | SIGNS/ TRAFFIC SIGNALS, REGULATION/ | HBEF |
| | SIMULATION, MODELS/ MODELING, | WNBB |
| | SIMULATORS, CLASS ROOM, TEACHING/ | QBBD |
| | SINGLE LANE, TRAFFICWAYS, WAYS | CCI |
| | SINGLE VEHICLE, ACCIDENT | JE |
| | SINGLE, PEOPLE | EQ |
| NOSE/ NASAL | SIMUSES, RESPIRATORY SYSTEM, | DALB |
| CONSTRUCTION | SITES, ROADSIDE, WAYS (ROADS) | CRH |
| | SIZE/ DIMENSION, PHYSICAL | NRH |
| | SIZE, FAMILIES, PEOPLE | ESH |
| SLIDING/ | SKID, MOTION, PHENOMENA, PHYSICAL | NLFF |
| | SKILLED PERFORMANCE, LEARNING, | PDCG |
| | SKIN/ HAIR/ NAILS, CONNECTIVE | DAPH |
| | SKIN, FRICTION, PHENOMENA, PHYSICAL | NLZFH |
| | SKULL, HEAD, ANATOMY/ BODY, | DAIA |
| | SLABS, CONSTRUCTION, MATERIALS | BCC |
| | SLACK, BRAKING/ STOPPING, VEHICULAR | NLZRJE |
| | SLED, DYNAMIC, MECHANICAL TEST, | XQCC |
| | SLEEP, STATE OF AROUSAL, STATE OF | PEBD |
| | SLEET, ATMOSPHERE, WEATHER | MAI |
| | SLIDING/ SKID, MOTION, PHENOMENA, | NLFF |
| | SLIDING, FRICTION, PHENOMENA, | NLZFE |
| SIDE | SLOPES, ROADSIDE, WAYS (ROADS) | CRK |
| | SLUGS, MODELS (PHYSICAL), EQUIPMENT | XMB |
| CAECUM, | SMALL INTESTINE, DIGESTIVE SYSTEM/ | DAJK |
| OLFACTORY/ | SMALL INTESTINE, DIGESTIVE SYSTEM/ | DAJK |
| FDG/ | SMELL, SENSES, PSYCHOLOGICAL ASPECT | PHH |
| | SMOG, ATMOSPHERE, WEATHER | MAF |
| | SNOW/ FROST, ATMOSPHERE, WEATHER | MAH |
| | SOCIAL SCIENCES/ ECONOMIC SCIENCES, | YK |
| | SOCIAL VARIABLES, PAST EXPERIENCE, | PCDC |
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| RELIGION, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBB |
| ROLES, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBC |
| DEVIANCY/ CONTROL, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SHDD |
| CULTURE, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBE |
| POPULATION/ DEMOGRAPHY, | SOCIAL, SOCIOECONOMIC ASPECT | SBC |
| | POLITICS, SOCIAL, SOCIOECONOMIC ASPECT | SBD |
| PUBLIC OPINION, | SOCIAL, SOCIOECONOMIC ASPECT | SBE |
| PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SBF |
| INDIVIDUAL, PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SBBB |
| PUBLIC, | SOCIAL, SOCIOECONOMIC ASPECT | SBG |
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| | SOCIETY | F |
| COMMUNITIES, | SOCIETY | FC |
| CORPORATE BODIES, | SOCIETY | FD |
| INDUSTRIAL, CORPORATE BODIES, | SOCIETY | FDB |
| BUSINESS, CORPORATE BODIES, | SOCIETY | FDC |
| FOUNDATIONS/ SOCIETIES, CORPORATE BODIES, | SOCIETY | FDD |
| SERVICE ORGANIZATIONS, CORPORATE BODIES, | SOCIETY | FDE |
| SCHOOLS, CORPORATE BODIES, | SOCIETY | FDF |
| SAFETY CENTERS, CORPORATE BODIES, | SOCIETY | FDG |
| | GOVERNMENTS, SOCIETY | FG |
| TOWN/ CITY, GOVERNMENTS, | SOCIETY | FGB |
| COUNTY, GOVERNMENTS, | SOCIETY | FGC |
| STATE/ PROVINCE, GOVERNMENTS, | SOCIETY | FGD |
| FEDERAL/ NATIONAL, GOVERNMENTS, | SOCIETY | FGE |
| INTERNATIONAL, GOVERNMENTS, | SOCIETY | FGF |
| | LEGISLATURES, SOCIETY | FH |
| | EXECUTIVE BRANCHES, SOCIETY | FI |
| MILITARY, EXECUTIVE BRANCHES, | SOCIETY | FIB |
| CIVIL, EXECUTIVE BRANCHES, | SOCIETY | FIC |
| POLICE, CIVIL, EXECUTIVE BRANCHES, | SOCIETY | FICB |
| JUDICIARY BRANCHES/ COURTS, | SOCIETY | FJ |
| MASS MEDIA/ COMMUNICATIONS, | SOCIETY | FK |
| | SOCIOECONOMIC ASPECT | S |
| | SOCIAL, SOCIOECONOMIC ASPECT | SH |
| BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBB |
| RELIGION, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBB |
| ROLES, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBC |
| DEVIANCY/ CONTROL, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SHDD |
| CULTURE, BEHAVIOR/ MORES, | SOCIAL, SOCIOECONOMIC ASPECT | SBBE |
| POPULATION/ DEMOGRAPHY, | SOCIAL, SOCIOECONOMIC ASPECT | SBC |
| | POLITICS, SOCIAL, SOCIOECONOMIC ASPECT | SBD |
| PUBLIC OPINION, | SOCIAL, SOCIOECONOMIC ASPECT | SBE |
| PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SBF |
| INDIVIDUAL, PRIVATE, | SOCIAL, SOCIOECONOMIC ASPECT | SBBB |
| PUBLIC, | SOCIAL, SOCIOECONOMIC ASPECT | SBG |
| | ECONOMICS, SOCIOECONOMIC ASPECT | SC |
| MACROECONOMICS, ECONOMICS, | SOCIOECONOMIC ASPECT | SCB |
| MICROECONOMICS/ PRICE THEORY, ECONOMICS, | SOCIOECONOMIC ASPECT | SCC |
| ECONOMIC BEHAVIOR, ECONOMICS, | SOCIOECONOMIC ASPECT | SCD |
| BUSINESS CYCLES, ECONOMIC BEHAVIOR, ECONOMICS, | SOCIOECONOMIC ASPECT | SCDB |
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| COSTS/ BENEFITS, ECONOMICS, | SOCIOECONOMIC ASPECT | SCE |
| COST EFFECTIVENESS, ECONOMICS, | SOCIOECONOMIC ASPECT | SCF |
| BUDGETS/ HUGGETING, ECONOMICS, | SOCIOECONOMIC ASPECT | SCG |
| | FINANCE, ECONOMICS, SOCIOECONOMIC ASPECT | SCH |
| TAXES, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHB |
| FEES, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHC |
| ASSESSMENT, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHD |
| MONEY/ BANKING, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCH E |
| INVESTMENT, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHF |
| STOCKS, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHG |
| BONDS, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHH |
| CREDIT, FINANCE, ECONOMICS, | SOCIOECONOMIC ASPECT | SCHK |
| | REGIONAL PLANNING, SOCIOECONOMIC ASPECT | SD |
| TRANSPORTATION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDB |
| RESOURCE ALLOCATION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDC |
| LAND UTILIZATION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDD |
| POLLUTION, REGIONAL PLANNING, | SOCIOECONOMIC ASPECT | SDE |
| | INSURANCE/ ACTUARY, SOCIOECONOMIC ASPECT | SE |
| UNINSURED, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEB |
| LOSS DISTRIBUTION, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEC |
| TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SED |
| CASUALTY, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDB |
| MEDICAL, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDC |
| LIABILITY, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDD |
| DISABILITY, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDE |
| BASIC, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDF |
| GROUP, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDG |
| COMPULSORY, TYPES OF INSURANCE, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEDH |

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| STOCK COMPANY, INSURANCE/ ACTUARY, | SOCIOECONOMIC ASPECT | SEM |
| MEASURES, | SOCIOECONOMIC ASPECT | SF |
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| SERVICE, MEASURES, | SOCIOECONOMIC ASPECT | SFC |
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| | SOIL/ DIRT, ROAD MATERIALS, | BEFB |
| CLAY, | SOLVENTS, MATERIALS | BO |
| OILS/ LUBRICANTS/ | SOLVENTS, MATERIALS | BOB |
| ANTIFREEZE, OILS/ LUBRICANTS/ | SOLVENTS, MATERIALS | BOB |
| | SONIC, SOUND, PHENOMENA, PHYSICAL | NLPB |
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| | SONIC, SOUND, PHENOMENA, PHYSICAL ASPECT | NLPB |
| ULTRASONIC/ SUPERSONIC, | SOUND, PHENOMENA, PHYSICAL ASPECT | NLPC |
| | NOISE, SOUND, PHENOMENA, PHYSICAL ASPECT | NLPD |
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| ROLLING, TERRAIN/ HABITAT, | SPACE | KBC |
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| MOUNTAINS, TERRAIN/ HABITAT, | SPACE | KBE |
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| CULTIVATED, TERRAIN/ HABITAT, | SPACE | KBH |
| RURAL, TERRAIN/ HABITAT, | SPACE | KBK |
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| RIVER/ CANAL, WATERS, TERRAIN/ HABITAT, | SPACE | KBPC |
| MARSH/ SWAMP, WATERS, TERRAIN/ HABITAT, | SPACE | KBPD |
| | ZONE/ LAND USAGE, SPACE | KL |
| RESIDENTIAL, ZONE/ LAND USAGE, SPACE | | KLB |
| SCHOOL/ HOSPITAL, ZONE/ LAND USAGE, SPACE | | KLC |
| FARM, ZONE/ LAND USAGE, SPACE | | KLC |
| PARK/ RESORT, ZONE/ LAND USAGE, SPACE | | KLE |
| BUSINESS, ZONE/ LAND USAGE, SPACE | | KLF |
| INDUSTRIAL, ZONE/ LAND USAGE, SPACE | | KLI |
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| | SPARK PLUGS, IGNITION, ELECTRICAL | DHHBC |
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| | AUTOMATED, SPECIAL WAYS, WAYS (ROADS) | CB*NMIC |
| | DRIVEWAYS, SPECIAL WAYS, WAYS (ROADS) | CBA |
| | ALLEYS, SPECIAL WAYS, WAYS (ROADS) | CBH |
| | SERVICE ROADS, SPECIAL WAYS, WAYS (ROADS) | CHC |
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| | CYCLE PATHS, SPECIAL WAYS, WAYS (ROADS) | CHE |
| | TEST TRACKS, SPECIAL WAYS, WAYS (ROADS) | CBF |
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| UV (BELOW .4 MICRONS), OPTICAL, ELECTROMAGNETIC | SPECTRUM, PHENOMENA, PHYSICAL | NLCDH |
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| MF (1.3-3 MC), RADIO FREQUENCY, ELECTROMAGNETIC | SPECTRUM, PHENOMENA, PHYSICAL | NLCEG |
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| | STABILITY, VEHICULAR PERFORMANCE, | NLZRD |
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| DROWSY, STATE OF AROUSAL, STATE OF THE | | PEBC |
| SLEEP, STATE OF AROUSAL, STATE OF THE | | PERD |
| | STATE OF THE ORGANISM, | PE |
| STATE OF AROUSAL, STATE OF THE ORGANISM, | | PEB |
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| DROWSY, STATE OF AROUSAL, STATE OF THE ORGANISM, | | PEBC |
| SLEEP, STATE OF AROUSAL, STATE OF THE ORGANISM, | | PERD |
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| INFERRED PSYCHOLOGICAL STATE, STATE OF THE ORGANISM, | | PEE |
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| | STATE/ PROVINCE, GOVERNMENTS, | FGD |
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| INFERRED PSYCHOLOGICAL | STATE, STATE OF THE ORGANISM, | PEE |
| FEAR, INFERRED PSYCHOLOGICAL | STATE, STATE OF THE ORGANISM, | PEEF |
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| | STATIC, MECHANICAL TEST, EQUIPMENT | XQB |
| COMPRESSION, | STATIC, MECHANICAL TEST, EQUIPMENT | XQBB |
| TORSION, | STATIC, MECHANICAL TEST, EQUIPMENT | XQBC |
| TENSILE, | STATIC, MECHANICAL TEST, EQUIPMENT | XQBD |
| WEIGHT SCALES, | STATIC, MECHANICAL TEST, EQUIPMENT | XQBE |
| | STATIC, MOTION, PHENOMENA, PHYSICAL | NLFC |
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| | STATISTICAL/ PROBABILITY, | WMEB |
| FACTORIAL, DESIGN, | STATISTICAL/ PROBABILITY, | WMEBB |
| COVARIANCE/ CORRELATION, DESIGN, | STATISTICAL/ PROBABILITY, | WMEBC |
| REGRESSION, DESIGN, | STATISTICAL/ PROBABILITY, | WMEBD |
| LEAST SQUARE, DESIGN, | STATISTICAL/ PROBABILITY, | WMEBE |
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| RENTED, | STATUS, VEHICLE | DNC |
| EXPERIMENTAL, | STATUS, VEHICLE | DNE |
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| COLUMNS, | STEERING SYSTEMS, VEHICLE PARTS, | DHIC |
| | STEERING WHEELS, INTERIOR/ | DHOGD |
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| RING | STICKING, ENGINE PERFORMANCE, | NLZQK |
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| GASTRIC GLANDS, | STOMACH, DIGESTIVE SYSTEM/ | QAJJB |
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| | TOE-IN, WHEEL ALIGNMENT, VEHICULAR, | NKVHC |
| | TOE, LOWER EXTREMITY, ANATOMY/ | OADC |
| ENDURANCE/ | TOLERANCE, PHYSIOLOGICAL | CEB |
| | TOLL ROADS, TRAFFICWAYS, WAYS | CCE |
| | TONGUE, DIGESTIVE SYSTEM/ | OAJE |
| | TONSILS, DIGESTIVE SYSTEM/ | OAJG |
| | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJC |
| GUM, | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJCB |
| ENAMEL, | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJCC |
| ROOT, | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJCD |
| NECK, | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJCE |
| CROWN, | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJCF |
| KINDS OF TEETH, | TOOTH, DIGESTIVE SYSTEM/ ALIMENTARY | OAJCG |
| | TORQUE, PHENOMENA, PHYSICAL ASPECT | NLD |
| | TORSION, STATIC, MECHANICAL TEST, | XQBC |
| TACTILE/ | TOUCH, SENSES, PSYCHOLOGICAL ASPECT | PBD |
| | TOUGHNESS, MECHANICAL PROPERTIES, | NCB |
| TENSILE STRENGTH, | TOUGHNESS, MECHANICAL PROPERTIES, | NCBB |
| | TOWING, VEHICLE, SERVICES | IFC |
| | TOWN/ CITY, GOVERNMENTS, SOCIETY | FGB |
| URBAN/ | TOWN/ CITY, TERRAIN/ HABITAT, SPACE | KBM |
| | TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| ALCOHOL, | TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| BLOOD LEVEL, | ALCOHOL, TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| PHYSIOLOGICAL EFFECTS, | ALCOHOL, TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| | TOBACCO, TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| | POISONS, TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| CARBON MONOXIDE, | POISONS, TOXICOLOGY, PROBLEMS, BIOMEDICAL | OB |
| | TRACHEA/ BRONCHI, RESPIRATORY | OALD |
| | TRACHEOSTOMY, MAINTAINING AIRWAYS, | WSBCT |
| TEST | TRACKS, SPECIAL WAYS, WAYS (ROADS) | CBF |
| TRUCK | TRACTORS, CARGO, MOTOR VEHICLES, | DEFD |
| | TRAFFIC | G |
| HIGHWAY CAPACITY, | TRAFFIC | GB |
| TRAFFIC COUNT, | TRAFFIC | GC |
| PURPOSE/ TRIP, | TRAFFIC | GD |
| RECREATION, | PURPOSE/ TRIP, TRAFFIC | GDB |
| SHOPPING, | PURPOSE/ TRIP, TRAFFIC | GDC |
| BUSINESS, | PURPOSE/ TRIP, TRAFFIC | GDD |
| COMMERCIAL, | PURPOSE/ TRIP, TRAFFIC | GDE |
| FREIGHT, | COMMERCIAL, PURPOSE/ TRIP, TRAFFIC | GDEB |
| PASSENGERS, | COMMERCIAL, PURPOSE/ TRIP, TRAFFIC | GDEC |
| MASS, | PURPOSE/ TRIP, TRAFFIC | GDF |
| DISTANCE, | TRAFFIC | GE |

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| | DURATION, | TRAFFIC | GF |
| | TRAFFIC UNITS, | TRAFFIC | GG |
| | SPEED, | TRAFFIC UNITS, | GGG |
| | DENSITY, | TRAFFIC UNITS, | GGC |
| | NOISE, | TRAFFIC UNITS, | GGD |
| | | TRAFFIC FLOW, | GH |
| | CONFLICT, | TRAFFIC FLOW, | GHC |
| CONGESTION, | CONFLICT, | TRAFFIC FLOW, | GHC B |
| | FOLLOWING, | TRAFFIC FLOW, | GHD |
| | OVERTAKING, | TRAFFIC FLOW, | GHE |
| | PLATOON, | TRAFFIC FLOW, | GHF |
| | MERGING, | TRAFFIC FLOW, | GHG |
| | ENTERING, | TRAFFIC FLOW, | GHH |
| | SPEED CHANGE, | TRAFFIC FLOW, | GHI |
| | STOPPING, | TRAFFIC FLOW, | GHJ |
| | PARKING, | TRAFFIC FLOW, | GHK |
| | HEADWAY, | TRAFFIC FLOW, | GHM |
| GAP ACCEPTANCE, | TRAFFIC FLOW, | TRAFFIC | GHO |
| | PASSING, | TRAFFIC FLOW, | GHP |
| | TURNING, | TRAFFIC FLOW, | GHT |
| LEFT, TURNING, | TRAFFIC FLOW, | TRAFFIC | GHTL |
| RIGHT, TURNING, | TRAFFIC FLOW, | TRAFFIC | GHTR |
| | WEAVING, | TRAFFIC FLOW, | GHW |
| | WRONG WAY, | TRAFFIC FLOW, | GHX |
| | | TRAFFIC COUNT, | GC |
| | | TRAFFIC DIRECTION, | TRAFFIC PATROL, |
| | INTERSECTION, | TRAFFIC DIRECTION, | TRAFFIC PATROL, |
| | ESCORT, | TRAFFIC DIRECTION, | TRAFFIC PATROL, |
| CROWD CONTROL, | PARKING, | TRAFFIC DIRECTION, | TRAFFIC PATROL, |
| | BLOCKADE, | TRAFFIC DIRECTION, | TRAFFIC PATROL, |
| | SURVEILLANCE, | TRAFFIC DIRECTION, | TRAFFIC PATROL, |
| | | TRAFFIC FLOW, | TRAFFIC |
| | CONFLICT, | TRAFFIC FLOW, | TRAFFIC |
| CONGESTION, | CONFLICT, | TRAFFIC FLOW, | TRAFFIC |
| | FOLLOWING, | TRAFFIC FLOW, | TRAFFIC |
| | OVERTAKING, | TRAFFIC FLOW, | TRAFFIC |
| | PLATOON, | TRAFFIC FLOW, | TRAFFIC |
| | MERGING, | TRAFFIC FLOW, | TRAFFIC |
| | ENTERING, | TRAFFIC FLOW, | TRAFFIC |
| | SPEED CHANGE, | TRAFFIC FLOW, | TRAFFIC |
| | STOPPING, | TRAFFIC FLOW, | TRAFFIC |
| | PARKING, | TRAFFIC FLOW, | TRAFFIC |
| | HEADWAY, | TRAFFIC FLOW, | TRAFFIC |
| GAP ACCEPTANCE, | TRAFFIC FLOW, | TRAFFIC | TRAFFIC |
| | PASSING, | TRAFFIC FLOW, | TRAFFIC |
| | TURNING, | TRAFFIC FLOW, | TRAFFIC |
| LEFT, TURNING, | TRAFFIC FLOW, | TRAFFIC | TRAFFIC |
| RIGHT, TURNING, | TRAFFIC FLOW, | TRAFFIC | TRAFFIC |
| | WEAVING, | TRAFFIC FLOW, | TRAFFIC |
| | WRONG WAY, | TRAFFIC FLOW, | TRAFFIC |
| | | TRAFFIC ISLANDS, SEPARATORS, PARTS | CHOD |
| | | TRAFFIC PATROL, REGULATION/ CONTROL | HC |
| | INTERSECTION, | TRAFFIC PATROL, REGULATION/ CONTROL | HCD |
| | ESCORT, | TRAFFIC PATROL, REGULATION/ CONTROL | HCD B |
| CROWD CONTROL, | PARKING, | TRAFFIC PATROL, REGULATION/ CONTROL | HCD C |
| | BLOCKADE, | TRAFFIC PATROL, REGULATION/ CONTROL | HCD D |
| | SURVEILLANCE, | TRAFFIC PATROL, REGULATION/ CONTROL | HCD E |
| | | PURSUIT, | TRAFFIC PATROL, REGULATION/ CONTROL |
| | | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ |
| GUIDE/ DELINEATION, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ | HCB |
| | WARNING, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ |
| RUMBLER, WARNING, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ | HBD |
| | REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ |
| INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ | HBB |
| YIELD, INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ | HBB B |
| STOP, INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ | HBB C |
| WALK/ WAIT, INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ | TRAFFIC SIGNALS, REGULATION/ | HBB W |
| | LANE DIRECTION, REGULATORY, | TRAFFIC SIGNALS, REGULATION/ | HBC |
| | CROSSING, REGULATORY, | TRAFFIC SIGNALS, REGULATION/ | HBC D |
| SPEED LIMIT, REGULATORY, | TRAFFIC SIGNALS, REGULATION/ | TRAFFIC SIGNALS, REGULATION/ | HBC E |
| | | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | H B |
| GUIDE/ DELINEATION, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | TRAFFIC SIGNALS, REGULATION/ | HBC |
| | WARNING, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | HBD |
| | RUMBLER, WARNING, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | HBD B |
| | REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | HBE |
| INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | TRAFFIC SIGNALS, REGULATION/ | HBB |
| YIELD, INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | TRAFFIC SIGNALS, REGULATION/ | HBB B |
| STOP, INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | TRAFFIC SIGNALS, REGULATION/ | HBB C |
| WALK/ WAIT, INTERSECTION, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | TRAFFIC SIGNALS, REGULATION/ | HBB W |
| | LANE DIRECTION, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | HBC |
| | CROSSING, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | HBC D |
| SPEED LIMIT, REGULATORY, | TRAFFIC SIGNS/ TRAFFIC SIGNALS, | TRAFFIC UNITS, TRAFFIC | HBC E |
| | | TRAFFIC UNITS, TRAFFIC | GG |
| | SPEED, | TRAFFIC UNITS, TRAFFIC | GGH |
| | DENSITY, | TRAFFIC UNITS, TRAFFIC | GGC |
| | NOISE, | TRAFFIC UNITS, TRAFFIC | GGD |
| | | TRAFFIC, ENGINEERING, DISCIPLINES | VLF |
| | | TRAFFICWAYS, WAYS (ROADS) | CC |
| | PRIVATE, | TRAFFICWAYS, WAYS (ROADS) | CCB |
| | PUBLIC, | TRAFFICWAYS, WAYS (ROADS) | CCC |
| | STREETS, PUBLIC, | TRAFFICWAYS, WAYS (ROADS) | CCCB |
| | HIGHWAYS, PUBLIC, | TRAFFICWAYS, WAYS (ROADS) | CCCC |
| PRIMARY, HIGHWAYS, PUBLIC, | TRAFFICWAYS, WAYS (ROADS) | TRAFFICWAYS, WAYS (ROADS) | CCCC B |
| SECONDARY, HIGHWAYS, PUBLIC, | TRAFFICWAYS, WAYS (ROADS) | TRAFFICWAYS, WAYS (ROADS) | CCCC C |
| | LIMITED ACCESS, | TRAFFICWAYS, WAYS (ROADS) | CCD |
| | TOLL ROADS, | TRAFFICWAYS, WAYS (ROADS) | CCE |
| | UNDIVIDED, | TRAFFICWAYS, WAYS (ROADS) | CCF |
| | DIVIDED, | TRAFFICWAYS, WAYS (ROADS) | CCG |
| | SINGLE LANE, | TRAFFICWAYS, WAYS (ROADS) | CCI |
| | TWO LANE, | TRAFFICWAYS, WAYS (ROADS) | CCJ |
| | MULTIPLE LANE, | TRAFFICWAYS, WAYS (ROADS) | CCK |
| | BYPASS, | TRAFFICWAYS, WAYS (ROADS) | CCL |
| | ONE WAY, | TRAFFICWAYS, WAYS (ROADS) | CCD |
| | TRUCK | TRAILERS, CARGO, MOTOR VEHICLES, | DEFC |
| | | TRAINING MANUAL, FORM, STUDY-REPORT | YDT |
| | TEACHING/ | TRAINING, EDUCATIONAL ASPECT | QD |
| | CLASS ROOM, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | QDB |
| DISCUSSIONS/ SEMINARS, CLASS ROOM, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | TRAINING, EDUCATIONAL ASPECT | QDB B |
| LECTURE/ DEMONSTRATIONS, CLASS ROOM, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | TRAINING, EDUCATIONAL ASPECT | QDB C |
| SIMULATORS, CLASS ROOM, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | TRAINING, EDUCATIONAL ASPECT | QDB D |
| FIELD, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | TRAINING, EDUCATIONAL ASPECT | QDC |

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| FORMAL, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | QDD |
| INFORMAL, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | QDE |
| PROGRAMMED, TEACHING/ | TRAINING, EDUCATIONAL ASPECT | QDF |
| TRANSFER OF | TRAINING, LEARNING, COGNITION/ | PDCD |
| | TRAINS, RAIL, POWER VEHICLE, | DDHB |
| DEPRESSANTS/ | TRANQUILIZERS, DRUGS/ AFFECTIVE | BDC |
| SENSORS/ | TRANSDUCERS, EQUIPMENT | XC |
| AMPLIFIERS, SENSORS/ | TRANSDUCERS, EQUIPMENT | XCB |
| FILTERS, SENSORS/ | TRANSDUCERS, EQUIPMENT | XCC |
| ACCELEROMETERS, SENSORS/ | TRANSDUCERS, EQUIPMENT | XCD |
| STRAIN GAUGE, SENSORS/ | TRANSDUCERS, EQUIPMENT | XCE |
| FIFTH WHEEL, SENSORS/ | TRANSDUCERS, EQUIPMENT | XCF |
| LOOP DETECTORS, SENSORS/ | TRANSDUCERS, EQUIPMENT | XCL |
| | TRANSFER OF TRAINING, LEARNING, | PDCD |
| MASS | TRANSFER, PHENOMENA, PHYSICAL | NLK |
| | TRANSIT, PROCESSES, PHYSICAL ASPECT | NMH |
| | TRANSMISSIONS, POWER PLANTS, | DHGC |
| REAR DRIVES, | TRANSMISSIONS, POWER PLANTS, | DHGB |
| FRONT DRIVES, | TRANSMISSIONS, POWER PLANTS, | DHGCC |
| 4-WHEEL DRIVES, | TRANSMISSIONS, POWER PLANTS, | DHGCD |
| | TRANSMITTERS/ RECEIVERS, EQUIPMENT | XF |
| RADAR, | TRANSMITTERS/ RECEIVERS, EQUIPMENT | XFB |
| RADIO, | TRANSMITTERS/ RECEIVERS, EQUIPMENT | XFC |
| TELEVISION, | TRANSMITTERS/ RECEIVERS, EQUIPMENT | XFD |
| DENSITY/ | TRANSPARENCY, OPTICAL, PHYSICAL | NDD |
| | TRANSPORTABILITY, TRANSPORTATION, | JRH |
| | TRANSPORTATION, RECOVERY OF | JRH |
| TRANSPORTABILITY, | TRANSPORTATION, RECOVERY OF | JRH |
| DEAD AT SCENE, | TRANSPORTATION, RECOVERY OF | JRH |
| | TRANSPORTATION, REGIONAL PLANNING, | SDB |
| | TRAUMA, ACCIDENT | JN |
| FATAL, INJURY/ | TRAUMA, ACCIDENT | JNB |
| INTERNAL, INJURY/ | TRAUMA, ACCIDENT | JNC |
| SUPERFICIAL, INJURY/ | TRAUMA, ACCIDENT | JND |
| CONTUSION/ CRUSHING/ BLUNT, INJURY/ | TRAUMA, ACCIDENT | JNE |
| CONCUSSION, INJURY/ | TRAUMA, ACCIDENT | JNF |
| LACERATION/ OPENWOUND/ PENETRATING, INJURY/ | TRAUMA, ACCIDENT | JNG |
| FRACTURE, INJURY/ | TRAUMA, ACCIDENT | JNH |
| DISLOCATION, INJURY/ | TRAUMA, ACCIDENT | JNI |
| SPRAIN/ STRAIN, INJURY/ | TRAUMA, ACCIDENT | JNJ |
| HEMORRHAGE, INJURY/ | TRAUMA, ACCIDENT | JNK |
| POISON, INJURY/ | TRAUMA, ACCIDENT | JNL |
| BURNS/ SCALDS, INJURY/ | TRAUMA, ACCIDENT | JNM |
| ASPHYXIA/ SUFFOCATION, INJURY/ | TRAUMA, ACCIDENT | JNN |
| DISMEMBERMENT/ DECAPITATION, INJURY/ | TRAUMA, ACCIDENT | JNC |
| CONSEQUENCES/ COMPLICATIONS, INJURY/ | TRAUMA, ACCIDENT | JNP |
| FATAL, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPF |
| LATE EFFECTS, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPG |
| PNEUMONIA, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPH |
| FAT EMBOLISM, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPI |
| ASPIRATION/ DEHYDRATION, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPJ |
| BLOOD LOSS/ BLEEDING, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPK |
| SHOCK, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPL |
| ANEMIA/ HYPOXIA, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNPM |
| THROMBOSIS/ CLOT, CONSEQUENCES/ COMPLICATIONS, INJURY/ | TRAUMA, ACCIDENT | JNPO |
| COMA, CONSEQUENCES/ COMPLICATIONS, INJURY/ | TRAUMA, ACCIDENT | JNPO |
| WHIPLASH, INJURY/ | TRAUMA, ACCIDENT | JNW |
| MULTIPLE SEVERE INJURIES, CONSEQUENCES, INJURY/ | TRAUMA, ACCIDENT | JNX |
| | TREATMENT/ CARE, RECOVERY OF | JRG |
| FIRST AID (RED CROSS), | TREATMENT/ CARE, RECOVERY OF | JRGF |
| ADVANCED (RED CROSS), | TREATMENT/ CARE, RECOVERY OF | JRGG |
| COMPREHENSIVE, | TREATMENT/ CARE, RECOVERY OF | JRGH |
| PROFESSIONAL/ PHYSICIAN, | TREATMENT/ CARE, RECOVERY OF | JRGI |
| | TREES, VEGETATION, ROADSIDE, WAYS | CRJD |
| | TRIAL/ JUDICIAL PROCESS, | RCC |
| APPEALS, | TRIAL/ JUDICIAL PROCESS, | RDBB |
| PURPOSE/ | TRIP, TRAFFIC | GD |
| RECREATION, PURPOSE/ | TRIP, TRAFFIC | GCB |
| SHOPPING, PURPOSE/ | TRIP, TRAFFIC | GCC |
| BUSINESS, PURPOSE/ | TRIP, TRAFFIC | GCD |
| COMMERCIAL, PURPOSE/ | TRIP, TRAFFIC | GCE |
| FREIGHT, COMMERCIAL, PURPOSE/ | TRIP, TRAFFIC | GDEB |
| PASSENGERS, COMMERCIAL, PURPOSE/ | TRIP, TRAFFIC | GDEC |
| MASS, PURPOSE/ | TRIP, TRAFFIC | GDF |
| | TRUCK TRACTORS, CARGO, MOTOR | CEFD |
| | TRUCK TRAILERS, CARGO, MOTOR | DEFC |
| | TRUCKS, CARGO, MOTOR VEHICLES, | DEFB |
| | TRUSSES, PROSTHESIS, BIOMEDICAL | OCG |
| CATHODE-RAY | TUBE, DISPLAYS/ METERS, EQUIPMENT | XGH |
| EUSTACHIAN | TUBES, EAR, HEAD, ANATOMY/ BODY, | DAIGF |
| | TUNNELS, PARTS OF WAYS, WAYS | CDM |
| RIGHT | TURN, DIRECTIONAL, LANES, PARTS OF | CDCCB |
| LEFT | TURN, DIRECTIONAL, LANES, PARTS OF | CDCCC |
| | TURN, LIGHTS, ELECTRICAL SYSTEMS, | DHCE |
| | TURNING RADIUS, VEHICULAR | NLZRF |
| | TURNING, TRAFFIC FLOW, TRAFFIC | GHT |
| LEFT, | TURNING, TRAFFIC FLOW, TRAFFIC | GHTL |
| RIGHT, | TURNING, TRAFFIC FLOW, TRAFFIC | GHTR |
| | TWO LANE, TRAFFICWAYS, WAYS (ROADS) | CCJ |
| | TYMPANIC CAVITY, EAR, HEAD, | DAIGD |
| | TYMPANIC MEMBRANE, EAR, HEAD, | DAIGE |
| | TYMPANIC OSSICLES, EAR, HEAD, | DAIGG |
| | TYPES OF INSURANCE, INSURANCE/ | SED |
| CASUALTY, | TYPES OF INSURANCE, INSURANCE/ | SEDB |
| MEDICAL, | TYPES OF INSURANCE, INSURANCE/ | SEDC |
| LIABILITY, | TYPES OF INSURANCE, INSURANCE/ | SEDD |
| DISABILITY, | TYPES OF INSURANCE, INSURANCE/ | SEDE |
| BASIC, | TYPES OF INSURANCE, INSURANCE/ | SEDF |
| GROUP, | TYPES OF INSURANCE, INSURANCE/ | SEDG |
| COMPULSORY, | TYPES OF INSURANCE, INSURANCE/ | SEDH |
| | TYPOLOGIES/ CLINICAL DIAGNOSIS, | PCC |
| ALCOHOLISM, | TYPOLOGIES/ CLINICAL DIAGNOSIS, | PCCB |
| SUICIDE/ HOMICIDE, | TYPOLOGIES/ CLINICAL DIAGNOSIS, | PCCC |
| NEUROSES, | TYPOLOGIES/ CLINICAL DIAGNOSIS, | PCCN |
| PSYCHOSES, | TYPOLOGIES/ CLINICAL DIAGNOSIS, | PCCP |
| | UMF (1.3-3 KMC), RADIO FREQUENCY, | NLED |
| | ULNA, FOREARM, ARM, UPPER | OAGDDC |
| | ULTRASONIC/ SUPERSONIC, SOUND, | NLPC |
| UMBILICAL, ABDOMEN, ANATOMY/ BODY, | | OAE |
| UNDERPASS, GRADE SEPARATION, | | CDJGC |
| UNDERWRITING, INSURANCE/ ACTUARY, | | SEE |
| UNDIVIDED, TRAFFICWAYS, WAYS | | CCF |
| UNIFORM, LAWS, LEGAL ASPECT | | RCU |
| UNINSURED, INSURANCE/ ACTUARY, | | SEB |

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| | MEDICAL UNITS, SPECIAL PURPOSE, MOTOR | DEHM |
| | TRAFFIC UNITS, TRAFFIC | GG |
| | SPEED, TRAFFIC UNITS, TRAFFIC | GGB |
| | DENSITY, TRAFFIC UNITS, TRAFFIC | GGC |
| | NOISE, TRAFFIC UNITS, TRAFFIC | GGD |
| | UNTRANSLATED, FORM, STUDY-REPORT | YDM |
| | UPPER EXTREMITY, ANATOMY/ BODY, | OAG |
| | SHOULDER, UPPER EXTREMITY, ANATOMY/ BODY, | OAGB |
| | AXILLA, UPPER EXTREMITY, ANATOMY/ BODY, | OAGC |
| | ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGD |
| | ELBOW, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDB |
| | HUMERUS, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDC |
| | FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDD |
| | RADIUS, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDDB |
| | ULNA, FOREARM, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDDC |
| | WRIST, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDE |
| | HAND, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDF |
| | FINGER/ THUMB, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDG |
| | METACARPALS, ARM, UPPER EXTREMITY, ANATOMY/ BODY, | OAGDH |
| | URBAN/ TOWN/ CITY, TERRAIN/ | KBM |
| | URINE, BODY FLUIDS, ANATOMY/ BODY, | QARH |
| | UROGENITAL SYSTEM, ANATOMY/ BODY, | QAM |
| | KIDNEYS, UROGENITAL SYSTEM, ANATOMY/ BODY, | QAMH |
| | BLADDER, UROGENITAL SYSTEM, ANATOMY/ BODY, | QAMC |
| | MALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ BODY, | QAMD |
| | FEMALE GENITAL ORGANS, UROGENITAL SYSTEM, ANATOMY/ BODY, | QAME |
| | ZONE/ LAND USAGE, SPACE | KL |
| | RESIDENTIAL, ZONE/ LAND USAGE, SPACE | KLB |
| | SCHOOL/ HOSPITAL, ZONE/ LAND USAGE, SPACE | KLC |
| | FARM, ZONE/ LAND USAGE, SPACE | KLD |
| | PARK/ RESORT, ZONE/ LAND USAGE, SPACE | KLE |
| | BUSINESS, ZONE/ LAND USAGE, SPACE | KLF |
| | INDUSTRIAL, ZONE/ LAND USAGE, SPACE | KLI |
| | USED, STATUS, VEHICLE | DNB |
| | LAND UTILIZATION, REGIONAL PLANNING, | SDD |
| | UV (BELOW .4 MICRONS), OPTICAL, | NLCDB |
| | UVULA, PALATE, MOUTH, DIGESTIVE | QAJBB |
| | VACUUM, BRAKES, VEHICLE PARTS, | DHB |
| | VALVE BURNING, ENGINE PERFORMANCE, | NLZQL |
| | PYLORUS/ ORIFICE VALVE, STOMACH, DIGESTIVE SYSTEM/ | QAJJC |
| | VAPOR LOCK, ENGINE PERFORMANCE, | NLZQN |
| | SOCIAL VARIABLES, PAST EXPERIENCE, | PCDC |
| | VARIANCE, DESIGN, STATISTICAL/ | WMEBF |
| | VEGETATION, ROADSIDE, WAYS (ROADS) | CRJ |
| | GRASS/ GROUNDCOVERS, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJB |
| | BUSHES, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJC |
| | TREES, VEGETATION, ROADSIDE, WAYS (ROADS) | CRJD |
| | VEGETATION, TERRAIN/ HABITAT, SPACE | KBG |
| | VEHICULAR PERFORMANCE, PHENOMENA, | NLZR |
| | RIDE, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRB |
| | SHIMMY, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRC |
| | HANDLING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRD |
| | CONTROL, HANDLING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRDB |
| | DIRECTIONAL/ STEERING, CONTROL, HANDLING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRDBH |
| | STABILITY, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRDC |
| | STEERING RATIO, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRE |
| | TURNING RADIUS, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRF |
| | JACK-KNIFING/ OFF-TRACKING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRG |
| | CORNERING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRH |
| | BRAKING/ STOPPING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRJ |
| | DISTANCE/ TIME, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRJD |
| | SLACK, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRJE |
| | FADE, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRJF |
| | WASHOUT, BRAKING/ STOPPING, VEHICULAR PERFORMANCE, PHENOMENA, | NLZRJG |
| | VEHICULAR, OPERATING CONDITIONS, | NKV |
| | AIR FUEL RATIO, VEHICULAR, OPERATING CONDITIONS, | NKVB |
| | OCTANE REQUIREMENT, VEHICULAR, OPERATING CONDITIONS, | NKVC |
| | THROTTLE SETTING, VEHICULAR, OPERATING CONDITIONS, | NKVD |
| | IGNITION TIMING, VEHICULAR, OPERATING CONDITIONS, | NKVE |
| | COMPRESSION RATIO, VEHICULAR, OPERATING CONDITIONS, | NKVF |
| | ENGINE LOAD, VEHICULAR, OPERATING CONDITIONS, | NKVG |
| | WHEEL ALIGNMENT, VEHICULAR, OPERATING CONDITIONS, | NKVH |
| | CASTER/ CAMBER, WHEEL ALIGNMENT, VEHICULAR, OPERATING CONDITIONS, | NKVHB |
| | TOE-IN, WHEEL ALIGNMENT, VEHICULAR, OPERATING CONDITIONS, | NKVHC |
| | VEINS, BLOOD VESSELS, | OAKCC |
| | VELOCITY/ RATE, OPERATING | NKD |
| | VERTEBRAE/ SPINE, BONES, | OAOBB |
| | BLOOD VESSELS, CARDIOVASCULAR SYSTEM, | OAKC |
| | ARTERIES, BLOOD VESSELS, CARDIOVASCULAR SYSTEM, | OAKCB |
| | VEINS, BLOOD VESSELS, CARDIOVASCULAR SYSTEM, | OAKCC |
| | CAPILLARIES, BLOOD VESSELS, CARDIOVASCULAR SYSTEM, | OAKCD |
| | VESTIBULAR/ BALANCE, SENSES, | PBC |
| | VHF (30-300 MC), RADIO FREQUENCY, | NLCEE |
| | VIBRATION PLATFORMS, DYNAMIC, | XQCF |
| | VIBRATION, PHENOMENA, PHYSICAL | NLQ |
| | VIBRATIONAL, SENSES, PSYCHOLOGICAL | PBI |
| | PEDESTRIAN VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFA |
| | MOVING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFB |
| | DRINKING, MOVING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFBB |
| | RECKLESS, MOVING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFBC |
| | SPEEDING, MOVING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFBD |
| | HIT-AND-RUN, MOVING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFBE |
| | WRONG WAY, MOVING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFBF |
| | PARKING VIOLATIONS, CRIMINAL, LAWS, LEGAL | RCFC |
| | VISCERAL, SENSES, PSYCHOLOGICAL | PBJ |
| | VISCOSITY/ VISCOSITY, PHYSICAL PROPERTIES, | NBG |
| | VISCOSITY/ VISCOSITY, PHYSICAL | NBG |
| | VISIBLE (.4-.7 MICRONS), OPTICAL, | NLCDC |
| | VISION, SENSES, PSYCHOLOGICAL | PBC |
| | COLOR SENSE, VISION, SENSES, PSYCHOLOGICAL | PBCB |
| | VISUAL FIELD, VISION, SENSES, PSYCHOLOGICAL | PBCC |
| | VISUAL FIELD, VISION, SENSES, | PBCC |
| | VITREOUS HUMOR, EYE, HEAD, ANATOMY/ | OAIFM |
| | VLF (3-30 KC), RADIO FREQUENCY, | NLCEI |
| | VOLUME, PHYSICAL PROPERTIES, | NBI |
| | WALK/ WAIT, INTERSECTION, REGULATORY, | HBEBW |
| | WALK/ WAIT, INTERSECTION, | HBEBW |
| | WARMUP, ENGINE PERFORMANCE, | NLZQC |
| | WARNING LIGHTS, INSTRUMENTS, | DHJF |
| | WARNING, TRAFFIC SIGNS/ TRAFFIC | HBD |
| | RUMBLER, WARNING, TRAFFIC SIGNS/ TRAFFIC | HBDB |
| | WINDSHIELD WIPERS/ WASHERS, AUXILIARIES/ ACCESSORIES, | DME |
| | WASHOUT, BRAKING/ STOPPING, | NLZRJG |
| | WATER, MATERIALS | BZM |

| | | |
|-----------------------|---------------------------------------|-------|
| | WATERS, TERRAIN/ HABITAT, SPACE | KBP |
| SEA/ LAKE, | WATERS, TERRAIN/ HABITAT, SPACE | KBPB |
| RIVER/ CANAL, | WATERS, TERRAIN/ HABITAT, SPACE | KBPC |
| MARSH/ SWAMP, | WATERS, TERRAIN/ HABITAT, SPACE | KBPD |
| THREE | WAY, JUNCTIONS/ CROSSINGS, PARTS OF | CDJB |
| FOUR | WAY, JUNCTIONS/ CROSSINGS, PARTS OF | CDJC |
| WRONG | WAY, MOVING VIOLATIONS, CRIMINAL, | RCFB |
| WRONG | WAY, TRAFFIC FLOW, TRAFFIC | GHX |
| ONE | WAY, TRAFFICWAYS, WAYS (ROADS) | CCO |
| | WEAR, DEGRADATION, PHENOMENA, | NLZHB |
| | WEATHER | H |
| | ATMOSPHERE, WEATHER | MA |
| SUNSHINE, | ATMOSPHERE, WEATHER | MAC |
| CLOUDY/ OVERCAST, | ATMOSPHERE, WEATHER | MAD |
| DUST, | ATMOSPHERE, WEATHER | MAE |
| FOG/ SMOG, | ATMOSPHERE, WEATHER | MAF |
| RAIN, | ATMOSPHERE, WEATHER | MAG |
| SNOW/ FROST, | ATMOSPHERE, WEATHER | MAH |
| SLEET, | ATMOSPHERE, WEATHER | MAI |
| STORM, | ATMOSPHERE, WEATHER | MAJ |
| WIND, | ATMOSPHERE, WEATHER | MAK |
| | TEMPERATURE, WEATHER | MB |
| COLD, | TEMPERATURE, WEATHER | MBC |
| HOT, | TEMPERATURE, WEATHER | MBD |
| | SURFACE CONDITIONS, WEATHER | MS |
| CLEAR, | SURFACE CONDITIONS, WEATHER | MSB |
| DRY, | SURFACE CONDITIONS, WEATHER | MSC |
| WET/ FLOOD, | SURFACE CONDITIONS, WEATHER | MSD |
| ICY, | SURFACE CONDITIONS, WEATHER | MSE |
| MUD, | SURFACE CONDITIONS, WEATHER | MSF |
| | SUBSURFACE CONDITIONS, WEATHER | MT |
| | CLIMATE, WEATHER | MW |
| | WEAVING, TRAFFIC FLOW, TRAFFIC | GHW |
| | WEEK, TIME | LO |
| | WEEKEND, TIME | LT |
| | WEIGHT SCALES, STATIC, MECHANICAL | XQBE |
| | WEIGHT, MASS, PHYSICAL PROPERTIES, | NBBB |
| LOADING, | WEIGHT, MASS, PHYSICAL PROPERTIES, | NBBBB |
| | WET/ FLOOD, SURFACE CONDITIONS, | MSD |
| | WHEEL ALIGNMENT, VEHICULAR, | NKVH |
| CASTER/ CAMBER, | WHEEL ALIGNMENT, VEHICULAR, | NKVHB |
| TOE-IN, | WHEEL ALIGNMENT, VEHICULAR, | NKVHC |
| FIFTH | WHEEL, SENSORS/ TRANSDUCERS, | XCF |
| | WHEELCHAIR, PROSTHESIS, BIOMEDICAL | CCO |
| STEERING | WHEELS, INTERIOR/ PASSENGER | DHGGD |
| COLLAPSIBLE, STEERING | WHEELS, INTERIOR/ PASSENGER | DHGGD |
| | WHEELS, VEHICLE PARTS, VEHICLE | DHA |
| | RIMS, WHEELS, VEHICLE PARTS, VEHICLE | DHAB |
| | TIRES, WHEELS, VEHICLE PARTS, VEHICLE | DHAC |
| STUDDER, | TIRES, WHEELS, VEHICLE PARTS, VEHICLE | DHACH |
| PLY, | TIRES, WHEELS, VEHICLE PARTS, VEHICLE | DHACC |
| PNEUMATIC, | TIRES, WHEELS, VEHICLE PARTS, VEHICLE | DHACP |
| HUB CAPS/ DISCS, | WHEELS, VEHICLE PARTS, VEHICLE | DHAD |
| | WHIPLASH, INJURY/ TRAUMA, ACCIDENT | JNW |
| | WIDOWED/ DIVORCED, PEOPLE | ER |
| | WIND, ATMOSPHERE, WEATHER | MAK |
| | WINDOWS, BODY (UPPER), VEHICLE | DHDB |
| WINDSHIELDS, | WINDOWS, BODY (UPPER), VEHICLE | DHDBB |
| | WINDSHIELD WIPERS/ WASHERS, | DME |
| | WINDSHIELDS, WINDOWS, BODY (UPPER), | DHDBB |
| | WINTER, TIME | LL |
| WINDSHIELD | WIPERS/ WASHERS, AUXILIARIES/ | DME |
| INTERACTION | WITH PEOPLE, PAST EXPERIENCE, | PCOB |
| | WOOD, MATERIALS | BW |
| | WORK, ENERGY/ POWER, PHENOMENA, | NLBA |
| | WRIST, ARM, UPPER EXTREMITY, | OAGDE |
| | WRONG WAY, MOVING VIOLATIONS, | RCFBF |
| | WRONG WAY, TRAFFIC FLOW, TRAFFIC | GHX |
| | X-RAY, MEDICAL, METHODS | WSX |
| | X-RAYS, ELECTROMAGNETIC SPECTRUM, | NLCC |
| | YEAR, TIME | LM |
| | YIELD POINT, MECHANICAL PROPERTIES, | NCC |
| | YIELD, INTERSECTION, REGULATORY, | HBEBB |
| | ZONE/ LAND USAGE, SPACE | KL |
| RESIDENTIAL, | ZONE/ LAND USAGE, SPACE | KLB |
| SCHOOL/ HOSPITAL, | ZONE/ LAND USAGE, SPACE | KLC |
| FARM, | ZONE/ LAND USAGE, SPACE | KLD |
| PARK/ RESORT, | ZONE/ LAND USAGE, SPACE | KLE |
| BUSINESS, | ZONE/ LAND USAGE, SPACE | KLF |
| INDUSTRIAL, | ZONE/ LAND USAGE, SPACE | KLI |
| | ANIMALS (ZOOLOGICAL), PEOPLE | EZA |

STRUCTURED GENERIC DISPLAY

H
 BA
 BAC
 BB
 BBC
 BBF
 BC
 BCB
 BCC
 BCD
 BD
 BOB
 BDC
 BDD
 BE
 BEB
 BEBB
 BEC
 BECB
 BECC
 BED
 BEE
 BEF
 BEG
 BF
 BG
 BGB
 BGC
 BGD
 BK
 BKG
 BKGL
 BKGM
 BL
 BM
 BMS
 BO
 BOB
 BP
 BPH
 BPC
 HPD
 BQ
 BR
 HRB
 HRC
 BS
 HW
 BX
 HZH
 BZW

MATERIALS
 ADHESIVES
 CEMENT
 METALS
 STEEL
 ALUMINUM
 CONSTRUCTION
 BEAMS
 SLABS
 PILLARS
 DRUGS/ AFFECTIVE AGENTS
 STIMULANTS
 DEPRESSANTS/ TRANQUILIZERS
 ANESTHETICS
 ROAD MATERIALS
 SOIL/ DIRT
 CLAY
 AGGREGATES
 SAND
 GRAVEL
 BRICKS/ STONES
 CONCRETE
 BITUMINOUS/ ASPHALT
 MACADAM
 FIBERS/ TEXTILES
 POLYMERS
 RUBBER
 PLASTIC
 NYLON
 GLASS
 GLAZING
 LAMINATED
 TEMPERED
 CERAMICS
 MINERALS
 SALT
 OILS/ LUBRICANTS/ SOLVENTS
 ANTIFREEZE
 PAINT
 SYNTHETICS
 ENAMELS
 LACQUERS
 FUEL
 COMMODITIES
 EXPLOSIVES
 INFLAMMABLE
 CLOTHING
 WOOD
 PAPER
 HARDWARE
 WATER

C
 CB
 CB*NMC
 CBA
 CBB
 CBC
 CBD
 CBE
 CBF
 CC
 CCB
 CCC
 CCCB
 CCCC
 CCCC
 CCCC
 CCCC
 CCCC
 CDD
 CCE
 CCF
 CCG
 CCI
 CCJ
 CCK
 CCL
 CCD
 CD
 CDB
 CDC
 CDCB
 CCCC
 CCCC
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 CDD
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 CDEB
 CDF
 CDFB
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 CDJD
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 CDJEB
 CDJEC
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 CDJGC
 CDJH
 CDJI
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 CDKB
 CDKC
 CDL
 CDLC
 CDM
 CG
 CGB
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 CGD
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 CGF
 CGG
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 CGI
 CGJ
 CGK
 CGL
 DH
 DI
 DIB
 DIC
 DID
 DIE
 DIF
 DIG
 DIGB
 DIGC
 DIH
 DR
 DRD
 DRE
 DRF
 DRG
 DRH
 DRI
 DRJ
 DRJB
 DRJC
 DRJD
 DRK
 DRL
 DRM
 DRN
 CRT

WAYS (ROADS)
 SPECIAL WAYS
 AUTOMATED
 DRIVEWAYS
 ALLEYS
 SERVICE ROADS
 DEAD ENDS/ CUL DE SAC
 CYCLE PATHS
 TEST TRACKS
 TRAFFICWAYS
 PRIVATE
 PUBLIC
 STREETS
 HIGHWAYS
 PRIMARY
 SECONDARY
 LIMITED ACCESS
 TOLL ROADS
 UNDIVIDED
 DIVIDED
 SINGLE LANE
 TWO LANE
 MULTIPLE LANE
 BYPASS
 ONE WAY
 PARTS OF WAYS
 RIGHT-OF-WAY
 LANES
 REVERSIBLE
 DIRECTIONAL
 RIGHT TURN
 LEFT TURN
 THROUGH
 SPEED CHANGE
 CURBS
 BARRICADES
 GATES
 SURFACE/ PAVEMENT
 ROADBED
 SHOULDERS
 GUARDRAILS
 SEPARATORS
 MEDIANS
 GUARDRAILS
 TRAFFIC ISLANDS
 FLEXIBLE
 PARABOLIC
 PIPES/ CULVERTS
 JUNCTIONS/ CROSSINGS
 THREE WAY
 FOUR WAY
 MULTIWAY
 INTERCHANGES
 CLOVERLEAF
 ROTARY
 INTERSECTIONS (AT GRADE)
 GRADE SEPARATION
 OVERPASS
 UNDERPASS
 CROSSWALKS
 RAILWAYS
 RAMPS
 ENTRANCES
 EXITS
 BRIDGES
 SUSPENSION
 TUNNELS
 GEOMETRICS
 PLANER
 ALIGNMENTS
 SIGHT DISTANCES
 GRADES
 CLEARANCES
 CROSS SECTIONS
 SUPERELEVATIONS
 CROWNS
 CURVES
 STRAIGHT
 CRESTS/ SAGS
 LIGHTING
 SIGNS/ SIGNALS
 POSTS
 PAVEMENT MARKINGS
 POST MOUNTED
 OVERHEAD
 FLASHING
 CONTROLLED
 TIME SEQUENCED
 REMOTE CONTROL
 REFLECTORS
 ROADSIDE
 SIDEWALKS
 PARKING/ TERMINALS
 BUILDINGS
 BILLBOARDS/ POSTERS
 CONSTRUCTION SITES
 DITCHES
 VEGETATION
 GRASS/ GROUNDCOVERS
 BUSHES
 TREES
 SIDE SLOPES
 DIKES
 DRAINS
 ABUTMENTS
 TELEPHONES

| | | | |
|--------|----------------------------------|-------|----------------------------|
| D | VEHICLE | DH1B | LINKAGES |
| DB | NONPOWERED | DH1C | COLUMNS |
| DBB | TRICYCLES | DH1J | INSTRUMENTS |
| DC | ANIMAL DRIVEN | DH1B | SPEEDOMETERS |
| DD | POWER VEHICLE | DH1C | FUEL GAUGES |
| DDB | RAIL | DH1D | OIL PRESSURE |
| DDBB | TRAINS | DH1E | ENGINE TEMPERATURE |
| DDC | AIRBORNE | DH1F | WARNING LIGHTS |
| DDCB | AIRPLANES | DH | AUXILIARIES/ ACCESSORIES |
| DDCD | HELICOPTERS | DMA | REFLECTORS |
| DDD | AIRCUSHION | DMB | SIGNALS |
| DE | MOTOR VEHICLES | DNC | MIRRORS |
| DEB | MOTOR CYCLES | DNCR | REARVIEW |
| DEC | PASSENGER | DMCS | SIDEVIEW |
| DECB | FULL-SIZED (OVER 117 IN.) | DMO | RESTRAINT SYSTEMS |
| DECC | INTERMEDIATE (112-117 IN.) | DMDB | SEAT BELTS |
| DECD | COMPACT (106-111 IN.) | DMDC | SHOULDER HARNESSSES |
| DECE | BELOW 110 IN. | DMDD | (OTHER) |
| DECF | FOREIGN | DME | WINDSHIELD WIPERS/ WASHERS |
| DECFB | OVER 100 IN. | DMH | TIRE CHAINS |
| DECFD | 90-100 IN. | DMI | LICENSE PLATES |
| DECFD | BELOW 90 IN. | DMJ | AIR CONDITIONERS |
| DEE | BUSES | DMJB | DEFROSTERS/ DEFOGGERS |
| DEE | TAXICABS | DMJC | HEATERS |
| DEF | CARGO | DNK | PERSONAL EQUIPMENT |
| DEFB | TRUCKS | DNKB | HELMETS |
| DEFC | TRUCK TRAILERS | DNKF | FACE PROTECTORS |
| DEFD | TRUCK TRACTORS | DNKFB | BUBBLES/ SHIELDS |
| DEG | MULTIPURPOSE | DNKFG | GOGGLES |
| DEH | SPECIAL PURPOSE | DML | RADIOS/ TAPES |
| DEHL | AMBULANCES | DMR | ANCHORAGES |
| DEHM | MEDICAL UNITS | DN | STATUS |
| DH | VEHICLE PARTS | DNB | USED |
| DHA | WHEELS | DNC | RENTED |
| DHAB | RIMS | DNE | EXPERIMENTAL |
| DHAC | TIRES | DNF | FLEET |
| DHACH | STUDDED | DNG | ABANDONED |
| DHACC | PLY | | |
| DHACP | PNEUMATIC | | |
| DHAD | HUB CAPS/ DISCS | | |
| DHB | BRAKES | | |
| DHBB | DRUM | | |
| DHBC | DISC | | |
| DHBD | AUXILIARY/ HAND | | |
| DHBJ | SHOES/ LININGS | | |
| DHBK | DRUMS | | |
| DHBL | CYLINDERS/ CHAMBERS | | |
| DHBM | HOSES | | |
| DHBR | AIR | | |
| DHBS | ELECTRIC | | |
| DHBT | HYDRAULIC | | |
| DHBU | VACUUM | | |
| DHC | CHASSIS/ FRAMES | | |
| DHCB | SUSPENSIONS | | |
| DHCC | AXLES | | |
| DHCD | SPRINGS | | |
| DHCE | SHOCK ABSORBERS | | |
| DHD | BODY (UPPER) | | |
| DHDA | ROOFS | | |
| DHDAB | CONVERTIBLE | | |
| DHDJ | WINDOWS | | |
| DHDBB | WINDSHIELDS | | |
| DHDC | DOORS | | |
| DHDCB | LOCKS/ LATCHES | | |
| DHDCD | HINGES | | |
| DHDD | HOODS/ DECKLIDS | | |
| DHDE | FENDERS | | |
| DHDF | BUMPERS | | |
| DHDG | INTERIOR/ PASSENGER COMPARTMENT | | |
| DHDGB | DASHBOARDS/ INSTRUMENT PANELS | | |
| DHDGC | CONTROLS/ HANDLES | | |
| DHDGCI | IDENTIFICATION | | |
| DHDGD | STEERING WHEELS | | |
| DHDGDC | COLLAPSIBLE | | |
| DHDGE | SEATS | | |
| DHDGEB | HEADRESTS | | |
| DHDGF | PADDING | | |
| DHG | POWER PLANTS | | |
| DHGB | ENGINES | | |
| DHGBD | PISTONS | | |
| DHGC | TRANSMISSIONS | | |
| DHGCB | REAR DRIVES | | |
| DHGCC | FRONT DRIVES | | |
| DHGCD | 4-WHEEL DRIVES | | |
| DHGD | FUEL SYSTEMS | | |
| DHGDC | CARBURETORS | | |
| DHGDF | TANKS/ FILLER PIPES/ CONNECTIONS | | |
| DHGE | DRIVE SHAFTS/ CLUTCHES | | |
| DHGF | EXHAUST SYSTEMS | | |
| DHGFB | MUFFLERS | | |
| DHGFE | EMISSION CONTROLS | | |
| DHGG | GOVERNORS | | |
| DHGH | COOLING SYSTEMS | | |
| DHGHM | RADIATORS | | |
| DHGHC | AIR | | |
| DHGI | GEARS | | |
| DHGJ | DIFFERENTIALS | | |
| DHM | ELECTRICAL SYSTEMS | | |
| DHMB | IGNITION | | |
| DHMBB | DISTRIBUTORS | | |
| DHMBD | SPARK PLUGS | | |
| DHMC | LIGHTS | | |
| DHMCB | HEADLIGHTS | | |
| DHCC | TAIL | | |
| DHCCD | BRAKE/ STOP | | |
| DHCE | TURN | | |
| DHCF | BACK-UP | | |
| DHCG | PARKING | | |
| DHCH | CORNERING | | |
| DHCI | MARKERS/ CLEARANCE | | |
| DHD | BATTERIES | | |
| DHE | GENERATORS/ ALTERNATORS | | |
| DHM | HORNS | | |
| DHI | STEERING SYSTEMS | | |

E
 EA
 EAB
 EC
 ECB
 ECC
 ED
 EE
 EEB
 EEC
 EF
 EFH
 EFC
 EFCP
 EJ
 EK
 EL
 EM
 EMB
 EN
 EO
 EOB
 EOP
 EOPC
 EP
 EQ
 ER
 ES
 ESB
 ESC
 EZA

PEOPLE
 AGE
 DRIVING AGE
 CHILDREN
 INFANTS
 PREADOLESCENTS
 ADOLESCENTS
 ADULTS
 MIDDLE AGED
 OLD AGED
 SEX
 MALES
 FEMALES
 PREGNANT
 OCCUPATIONS
 RACE
 NATIONAL ORIGINS
 PEDESTRIANS
 HITCHHIKERS
 PASSENGERS
 DRIVERS
 PROBLEM
 PROFESSIONAL
 CHAUFFEURS
 MARRIED
 SINGLE
 WIDOWED/ DIVORCED
 FAMILIES
 SIZE
 INCOME
 ANIMALS (ZOOLOGICAL)

F
 FC
 FD
 FDB
 FDC
 FDD
 FDE
 FDF
 FDG
 FG
 FGB
 FGC
 FGD
 FGE
 FGF
 FH
 FI
 FIB
 FIC
 FICB
 FJ
 FK

SOCIETY
 COMMUNITIES
 (AMPLIFY WITH ENVIRONMENT FACETS)
 CORPORATE BODIES
 INDUSTRIAL
 BUSINESS
 FOUNDATIONS/ SOCIETIES
 SERVICE ORGANIZATIONS
 SCHOOLS
 SAFETY CENTERS
 GOVERNMENTS
 TOWN/ CITY
 COUNTY
 STATE/ PROVINCE
 FEDERAL/ NATIONAL
 INTERNATIONAL
 LEGISLATURES
 EXECUTIVE BRANCHES
 MILITARY
 CIVIL
 POLICE
 JUDICIARY BRANCHES/ COURTS
 (SEE ALSO LEGAL ASPECT, R)
 MASS MEDIA/ COMMUNICATIONS

G
 GH
 GC
 GD
 GDH
 GDC
 GDD
 GDE
 GDEB
 GDEC
 GDF
 GE
 GF
 GG
 GGB
 GGC
 GGD
 GH
 GHCB
 GHCB
 GHCB
 GHE
 GHF
 GHG
 GHH
 GHI
 GHJ
 GHK
 GHM
 GHO
 GHP
 GHT
 GHTL
 GHTR
 GHW
 GHX

TRAFFIC
 HIGHWAY CAPACITY
 TRAFFIC COUNT
 PURPOSE/ TRIP
 RECREATION
 SHOPPING
 BUSINESS
 COMMERCIAL
 FREIGHT
 PASSENGERS
 MASS
 DISTANCE
 DURATION
 TRAFFIC UNITS
 SPEED
 DENSITY
 NOISE
 TRAFFIC FLOW
 CONFLICT
 CONGESTION
 FOLLOWING
 OVERTAKING
 PLATOON
 MERGING
 ENTERING
 SPEED CHANGE
 STOPPING
 PARKING
 HEADWAY
 GAP ACCEPTANCE
 PASSING
 TURNING
 LEFT
 RIGHT
 WEAVING
 WRONG WAY

H
 HB
 HBC
 HBD
 HBDB
 HBE
 HBEB
 HBEBB
 HBEC
 HBEBW
 HBEC
 HBED
 HBEE
 HC
 HCD
 HCDB
 HCDB
 HCDD
 HCDE
 HCDF
 HCDG
 HCF

REGULATION/ CONTROL
 TRAFFIC SIGNS/ TRAFFIC SIGNALS
 GUIDE/ DELINEATION
 WARNING
 RUMBLER
 REGULATORY
 INTERSECTION
 YIELD
 STOP
 WALK/ WAIT
 LANE DIRECTION
 CROSSING
 SPEED LIMIT
 TRAFFIC PATROL
 TRAFFIC DIRECTION
 INTERSECTION
 ESCORT
 CROWD CONTROL
 PARKING
 BLOCKADE
 SURVEILLANCE
 PURSUIT

I
 IB
 IC
 ID
 IE
 IF
 IFB
 IFC
 IH
 IM
 IO
 IQ

SERVICES
 MAPS/ DIRECTIONS
 REST AREAS/ PARKS
 RESTAURANTS/ MOTELS
 COMMUNICATIONS
 VEHICLE
 SERVICE STATIONS
 TOWING
 PARKING
 ROAD MAINTENANCE
 HOSPITAL
 (SEE ALSO HOSPITAL CARE, JRJ)
 AMBULANCE
 (SEE ALSO RECOVERY OF INJURED, JR)

J ACCIDENT
 JA PREVENTIVE MEASURES
 JAF SPOT IMPROVEMENTS
 JH RUNNING-OFF-ROAD
 JC NONCOLLISION ON ROAD
 JCB OVERTURNING
 JCC FALLING FROM MOVING VEHICLE
 JCF (OTHER)
 JD COLLISION
 (WITH PEOPLE, VEHICLES, FIXED OBJECTS - USE COMPONENTS)
 JD*WE EXPERIMENTAL
 JE SINGLE VEHICLE
 JF MULTIPLE VEHICLE
 JG HIT AND RUN
 JH FRONT
 JHL LEFT
 JHR RIGHT
 JI REAR
 JIL LEFT
 JIR RIGHT
 JJ SIDE
 JJJ LEFT
 JJJR RIGHT
 JK ACCIDENT HAZARDS
 JKB EJECTION
 JKC FLYING OBJECTS
 JKD FIRE
 JKE SUBMERSION
 JKF EXPLOSION
 JKG ELECTROCUTION
 JL ACCIDENT-INVESTIGATION
 JLK ACCIDENT CAUSATION
 JLR ACCIDENT-RECORDS
 JM PROPERTY DAMAGE
 JMD DEBRIS REMOVAL
 JME REPAIRS
 JN INJURY/ TRAUMA
 JNB FATAL
 JNC INTERNAL
 JND SUPERFICIAL
 JNE CONUSION/ CRUSHING/ BLUNT
 JNF CONCUSSION
 JNG LACERATION/ OPENWOUND/ PENETRATING
 JNH FRACTURE
 JNI DISLOCATION
 JNJ SPRAIN/ STRAIN
 JNK HEMORRHAGE
 JNL POISON
 JNM BURNS/ SCALDS
 JNN ASPHYXIA/ SUFFOCATION
 JNO DISMEMBERMENT/ DECAPITATION
 JNP CONSEQUENCES/ COMPLICATIONS
 JNPF FATAL
 JNPG LATE EFFECTS
 JNPH PNEUMONIA
 JNPI FAT EMBOLISM
 JNPJ ASPIRATION/ DEHYDRATION
 JNPK BLOOD LOSS/ BLEEDING
 JNPL SHOCK
 JNPM ANOXIA/ HYPOXIA
 JNPO OCCLUSION/ THROMBOSIS/ CLOT
 JNPQ CJMA
 JNW WHIPLASH
 JNX MULTIPLE SEVERE INJURIES
 JR RECOVERY OF INJURED
 JRD DETECTION
 JRE COMMUNICATION
 JRED ALERT/ ALARM
 JREE LOCATION (SEARCH)
 JREF DECISION (INTERAGENCY)
 JRF EXTRACTION OF OCCUPANT
 JRG TREATMENT/ CARE
 (SEE ALSO MEDICAL METHODS - WS)
 JRGF FIRST AID (RED CROSS)
 JRGG ADVANCED (RED CROSS)
 JRGH COMPREHENSIVE
 JRGI PROFESSIONAL/ PHYSICIAN
 JRH TRANSPORTATION
 (SEE ALSO SPECIAL PURPOSE VEHICLES, DE4)
 JRHC TRANSPORTABILITY
 JRHD DEAD AT SCENE
 JRI HOSPITAL ADMISSION
 JRID DEAD ON ARRIVAL
 JRJ HOSPITAL CARE
 JRJD DEAD AFTER ARRIVAL
 JRJE EMERGENCY ROOM
 JRJF REHABILITATION

K SPACE
 KB TERRAIN/ HABITAT
 KBB FLAT
 KBC ROLLING
 KBD HILLY
 KBE MOUNTAINS
 KBF DESERT
 KBG VEGETATION
 KBH CULTIVATED
 KBK RURAL
 KBL SUBURBAN
 KBM URBAN/ TOWN/ CITY
 KBP WATERS
 KBPB SEA/ LAKE
 KBPC RIVER/ CANAL
 KBPD MARSH/ SWAMP
 KL ZONE/ LAND USAGE
 KLB RESIDENTIAL
 KLC SCHOOL/ HOSPITAL
 KLD FARM
 KLE PARK/ RESORT
 KLF BUSINESS
 KLI INDUSTRIAL
 KN GEOGRAPHICAL DIVISION
 (USE KEY NAME)

L TIME
 (SEE ALSO FREQUENCY/ TIME, NKF)
 LB DAYTIME
 LC NIGHTTIME
 LD DAWN
 LE DUSK/ EVENING
 LF MORNING
 LG AFTERNOON
 LI SPRING
 LJ SUMMER
 LK FALL
 LL WINTER
 LM YEAR
 LN MONTH
 LO WEEK
 LP DAY
 LR RUSH HOUR
 LS HOLIDAY/ SPECIAL
 LT WEEKEND

M WEATHER
 MA ATMOSPHERE
 MAC SUNSHINE
 MAD CLOUDY/ OVERCAST
 MAE DUST
 MAF FOG/ SMOG
 MAG RAIN
 MAH SNOW/ FROST
 MAI SLEET
 MAJ STORM
 MAK WIND
 MB TEMPERATURE
 MBC COLD
 MBD HOT
 MS SURFACE CONDITIONS
 MSB CLEAR
 MSC DRY
 MSD WET/ FLOOD
 MSE ICY
 MSF MUD
 MT SUBSURFACE CONDITIONS
 MW CLIMATE

| | | | |
|-------|-----------------------------------|---------|----------------------------|
| N | PHYSICAL ASPECT | NLI | DISTORTION |
| NL | PHYSICAL PROPERTIES | NLJ | DIFFUSION |
| NPP | MASS | NLK | MASS TRANSFER |
| NBBB | WEIGHT | NLL | BUFFETING/ BUMPING |
| NBBB | LOADING | NLM | RADIATION |
| NBBC | DENSITY/ SPECIFIC GRAVITY | NLN | REFLECTION |
| NBD | CENTER OF GRAVITY | NLO | PULSATION |
| NBE | PERMEABILITY | NLP | SOUND |
| NBF | ROUGHNESS | NLPB | SONIC |
| NBG | VISCOSITY/ VISCOELASTIC | NLPC | ULTRASONIC/ SUPERSONIC |
| NBH | SIZE/ DIMENSION | NLPT | NOISE |
| NBI | VOLUME | NLQ | VIBRATION |
| NC | MECHANICAL PROPERTIES | NLR | RESONANCE |
| NCB | TOUGHNESS | NLS | HEAT |
| NCBB | TENSILE STRENGTH | NLT | INSULATING |
| NCC | YIELD POINT | NLU | GRAVITATION |
| NCD | SHEAR STRENGTH | NLV | KINETICS |
| NCE | HARDNESS | NLW | STABILITY/ EQUILIBRIUM |
| NCF | COMPRESSIBILITY | NLX | SENSITIVITY |
| NCG | FLEXIBILITY/ BRITTLENESS | NLY | ABSORPTION |
| NCH | DUCTILITY | NLZA | RETARDATION |
| NCI | ELASTICITY/ MODULUS OF ELASTICITY | NLZB | DAMPING/ DECAY |
| NCJ | PLASTICITY | NLZC | SPRING RATE |
| NCK | HYSTERESIS | NLZD | DEFORMATION |
| NCL | STRESS/ STRAIN | NLZE | COMPRESSION/ CONTRACTION |
| ND | OPTICAL | NLZF | FRICITION |
| NDB | BRIGHTNESS | NLZFB | SKIN |
| NDBB | GLARE | NLZFC | STATIC |
| NDC | COLOR | NLZFD | ROLLING |
| NDD | DENSITY/ TRANSPARENCY | NLZFE | SLIDING |
| NDE | REFRACTIVITY | NLZG | LUBRICATION |
| NDF | LUMINESCENCE | NLZH | DEGRADATION |
| NDG | REFLECTANCE | NLZHB | WEAR |
| VE | THERMAL | NLZHC | DETERIORATION |
| NEB | SPECIFIC HEAT | NLZHD | FATIGUE |
| NCC | CONDUCTIVITY | NLZHE | AGING |
| NED | MELTING/ SOFTENING POINT | NLZHF | CREEP |
| NEE | BOILING POINT | NLZI | LEAKING |
| NF | THERMODYNAMIC PROPERTIES | NLZJ | CONTAMINATION |
| NG | ELECTRIC PROPERTIES | NLZK | DEFECT |
| NGB | RESISTANCE | NLZL | FAILURE |
| NGC | IMPEDANCE | NLZLB | BREAKDOWN |
| NGD | CAPACITANCE | NLZLC | COLLAPSE |
| NGE | POTENTIAL | NLZLD | DISINTEGRATION |
| NGF | MAGNETIC | NLZLE | SHORT CIRCUIT |
| NH | AERODYNAMICS/ FLUIDICS | NLZLF | RUPTURE |
| NHF | FLOW | NLZM | CORROSION |
| NK | OPERATING CONDITIONS | NLZN | COMBUSTION |
| NKA | POSITION/ ATTITUDE/ LOCATION | NLZO | DEPOSIT FORMATION |
| NKB | TEMPERATURE | NLZP | CLOGGING |
| NKC | PRESSURE | NLZQ | ENGINE PERFORMANCE |
| NKD | VELOCITY/ RATE | NLZQB | STARTING |
| NKE | ACCELERATION/ DECELERATION | NLZQC | WARMUP |
| NKF | FREQUENCY/ TIME | NLZQD | FLOODING |
| NKFB | REACTION TIME | NLZQE | ROUGHNESS |
| NKFC | DURATION | NLZQF | NOISE |
| NKFD | LATENCY | NLZQFB | KNOCK |
| NKFE | REFRACTORY PERIOD | NLZQFC | RUMBLE |
| NKFF | DELAY | NLZQG | SURFACE IGNITION |
| NKFP | PERIOD | NLZQH | BACKFIRING |
| NKG | RELIABILITY | NLZQI | SPUTTERING |
| NKH | EFFICIENCY | NLZQJ | SPARK PLUG FOULING |
| NKI | MAINTAINABILITY | NLZQK | RING STICKING |
| NKJ | CAPACITY/ LIMIT | NLZQL | VALVE BURNING |
| NKJB | THRESHOLD | NLZQM | SCAVENGING |
| NKJC | LIFE SPAN | NLZQN | VAPOR LOCK |
| NKJD | SATURATION | NLZQO | CARBURETOR ICING |
| NKJDB | PRECIPITATION | NLZQP | MILES-PER-GALLON |
| NKQ | ACCURACY | NLZR | VEHICULAR PERFORMANCE |
| NKR | ABNORMALITY | NLZRB | RISE |
| NKV | VEHICULAR | NLZRC | SHIMMY |
| NKVH | AIR FUEL RATIO | NLZRD | HANDLING |
| NKVC | OCTANE REQUIREMENT | NLZRDB | CONTROL |
| NKVD | THROTTLE SETTING | NLZRDBB | DIRECTIONAL/ STEERING |
| NKVE | IGNITION TIMING | NLZRDC | STABILITY |
| NKVF | COMPRESSION RATIO | NLZRE | STEERING RATIO |
| NKVG | ENGINE LOAD | NLZRF | TURNING RADIUS |
| NKVH | WHEEL ALIGNMENT | NLZRG | JACK-KNIFING/ OFF-TRACKING |
| NKVHB | CASTER/ CAMBER | NLZRH | CORNERING |
| NKVHC | TOE-IN | NLZRJ | BRAKING/ STOPPING |
| NL | PHENOMENA | NLZRJD | DISTANCE/ TIME |
| NLA | GENERATION/ PROPAGATION | NLZRJE | SLACK |
| NLB | ENERGY/ POWER | NLZRJF | FADE |
| NLBA | WORK | NLZRJG | WASHOUT |
| NLBB | HORSE POWER | NN | PROCESSES |
| NLBC | ELECTRIC | NNB | MANUAL |
| NLBD | COMBUSTION | NNC | AUTOMATIC/ AUTOMATED |
| NLBE | NUCLEAR | NND | HYDRAULIC |
| NLC | ELECTROMAGNETIC SPECTRUM | NNE | PNEUMATIC |
| NLCB | GAMMA RAYS | NNF | CYCLIC |
| NLCC | X-RAYS | NNG | RANDOM |
| NLCD | OPTICAL | NNH | TRANSIT |
| NLCDB | UV (BELOW .4 MICRONS) | NNI | STEADY STATE |
| NLCDC | VISIBLE (.4-.7 MICRONS) | | |
| NLCDD | IR (.7-1000 MICRONS) | | |
| NLCE | RADIO FREQUENCY | | |
| NLCER | EHF (30-300 KMC) | | |
| NLCEC | SHF (3-30 KMC) | | |
| NLCED | UHF (1.3-3 KMC) | | |
| NLCEE | VHF (30-300 MC) | | |
| NLCEF | MF (3-30 MC) | | |
| NLCEG | MF (1.3-3 MC) | | |
| NLCEH | LF (30-300 KC) | | |
| NLCEI | VLF (3-30 KC) | | |
| NLD | TORQUE | | |
| NLE | IMPACT | | |
| NLF | MOTION | | |
| NLFR | DYNAMIC/ DISPLACEMENT | | |
| NLFC | STATIC | | |
| NLFD | ROLLING | | |
| NLFF | SLIDING/ SKID | | |
| NLG | DISTANCE/ RANGE | | |
| NLGB | MILEAGE | | |
| NLH | RESOLUTION | | |

| | | | |
|--------|------------------------------------|-------|---|
| D | BIOMEDICAL ASPECT | 0AKCD | CAPILLARIES |
| 0A | ANATOMY/ BODY | 0AL | RESPIRATORY SYSTEM |
| 0AB | CELL | 0ALA | RESPIRATION |
| 0AC | TISSUE | 0ALB | NOSE/ NASAL SINUSES |
| 0AD | LOWER EXTREMITY | 0ALC | LARYNX |
| 0ADA | ANKLE | 0ALD | TRACHEA/ BRONCHI |
| 0ADB | FOOT | 0ALE | LUNGS |
| 0ADC | TOE | 0ALEB | PLEURA |
| 0ADD | HEEL | 0ALF | DIAPHRAGM |
| 0ADE | LEG | 0ALG | MEDIASTINUM |
| 0ADEB | FEMUR | 0AM | UROGENITAL SYSTEM |
| 0ADEC | FIBULA | 0AMB | KIDNEYS |
| 0ADED | TIBIA | 0AMC | BLADDER |
| 0ADF | KNEE | 0AMD | MALE GENITAL ORGANS |
| 0ADG | THIGH | 0AME | FEMALE GENITAL ORGANS |
| 0ADH | PELVIS | 0AN | NERVOUS SYSTEM |
| 0ADHH | BUTTOCKS | 0ANB | CENTRAL |
| 0ADHG | HIPS | 0ANBB | BRAIN |
| 0ADHD | PERINEUM/ ANUS | 0ANBC | SPINAL CORD |
| 0AE | ABDOMEN | 0ANC | PERIPHERAL |
| 0AEB | INGUINAL CANAL | 0ANCB | AUTONOMIC |
| 0AEC | ILIAC | 0AND | NERVE |
| 0AED | HYPOGASTRIC | 0AD | MUSCULO-SKELETAL SYSTEM |
| 0AEE | UMBILICAL | 0ADB | BONES |
| 0AEF | LUMBAR | 0ADBB | VERTEBRAE/ SPINE |
| 0AEG | EPIGASTRIC | 0ADC | MUSCLES |
| 0AEH | HYPOCHONDRIAC | 0ADD | JOINTS |
| 0AF | THORAX | 0ADDB | LIGAMENTS |
| 0AFH | BREASTS | 0AP | CONNECTIVE TISSUES/ INTEGUMENTARY SYSTEMS |
| 0AFD | RIBS | 0APB | SKIN/ HAIR/ NAILS |
| 0AG | UPPER EXTREMITY | 0APC | ADIPOSE |
| 0AGB | SHOULDER | 0APD | CARTILAGE |
| 0AGC | AXILLA | 0APE | ELASTIC |
| 0AGD | ARM | 0APF | TENDONOUS |
| 0AGDB | ELBOW | 0APG | MUCOSA |
| 0AGDC | HUMERUS | 0AQ | ENDOCRINE SYSTEM |
| 0AGDD | FOREARM | 0AR | BODY FLUIDS |
| 0AGDDB | RADIUS | 0ARB | LYMPH |
| 0AGDDC | ULNA | 0ARC | BLOOD |
| 0AGDE | WRIST | 0ARD | CEREBROSPINAL |
| 0AGDF | HAND | 0ARE | SALIVA |
| 0AGDG | FINGER/ THUMB | 0ARF | TEARS |
| 0AGDH | METACARPALS | 0ARG | GASTRIC |
| 0AH | NECK | 0ARH | URINE |
| 0AHB | THROAT | 0ARI | SWEAT |
| 0AHC | BRONCHIAL REGION | 0B | PROBLEMS |
| 0AMD | HYOID | 0BB | DISEASES/ PATHOLOGICAL |
| 0AI | HEAD | 0BBB | OCCUPATIONAL |
| 0AIA | SKULL | 0BC | TOXICOLOGY |
| 0AIB | FACE | 0BCB | ALCOHOL |
| 0AIC | SCALP | 0BCBB | BLOOD LEVEL |
| 0AID | MANDIBLE | | (SEE MEDICAL EQUIPMENT, XTH, XTC) |
| 0AIE | MAXILLA | | PHYSIOLOGICAL EFFECTS |
| 0AIF | EYE | 0BCBC | TOBACCO |
| 0AIFB | EYEBROW | 0BCD | POISONS |
| 0AIFC | EYELASHES | 0BCDB | CARBON MONOXIDE |
| 0AIFD | EYELID | 0BD | DEFECTS |
| 0AIFE | CORNEA | 0BDB | BLINDNESS |
| 0AIFF | SCLERA | 0BDC | DEAFNESS |
| 0AIFG | IRIS | 0BDD | PARAPLEGIA |
| 0AIFH | CILIARY PROCESS | 0BDE | ORTHOPEDIC |
| 0AIFI | CHOROID | 0BDF | EPILEPSY |
| 0AIFJ | RETINA | 0BDG | COLOR BLINDNESS |
| 0AIFK | AQUEOUS HUMOR | 0BM | METABOLISM |
| 0AIFL | CRYSTALLINE LENS | 0BN | NUTRITION |
| 0AIFM | VITREOUS HUMOR | 0BP | PUBLIC HEALTH/ HYGIENE |
| 0AIFN | LACHRYMAL GLANDS | 0C | PROSTHESIS |
| 0AIFNB | NASAL DUCT | 0CB | CORRECTIVE LENSES |
| 0AIG | EAR | 0CC | HEARING AID |
| 0AIGB | PINNA | 0CD | WHEELCHAIR |
| 0AIGC | EXTERNAL AUDITORY MEATUS | 0CE | BRACES/ CRUTCHES |
| 0AIGD | TYMPANIC CAVITY | 0CF | ORTHOPEDIC SHOES |
| 0AIGE | TYMPANIC MEMBRANE | 0CG | TRUSSES |
| 0AIGF | EUSTACHIAN TUBES | 0D | ANTHROPOMETRY |
| 0AIGG | TYMPANIC OSSICLES | 0E | PHYSIOLOGICAL PERFORMANCE |
| 0AIGH | OSSEOUS LABYRINTH | 0EB | ENDURANCE/ TOLERANCE |
| 0AIGI | MEMBRANEOUS LABYRINTH | | |
| 0AJ | DIGESTIVE SYSTEM/ ALIMENTARY TRACT | | |
| 0AJB | MOUTH | | |
| 0AJBB | LIPS | | |
| 0AJBC | FLOOR | | |
| 0AJBD | CHEEK | | |
| 0AJBE | PALATE | | |
| 0AJBEB | UVULA | | |
| 0AJBF | JAW/ CHIN | | |
| 0AJC | TOOTH | | |
| 0AJCB | GUM | | |
| 0AJCC | ENAMEL | | |
| 0AJCD | ROOT | | |
| 0AJCE | NECK | | |
| 0AJCF | CROWN | | |
| 0AJCG | KINDS OF TEETH | | |
| 0AJD | FAUCES | | |
| 0AJE | TONGUE | | |
| 0AJF | SALIVARY GLANDS | | |
| 0AJG | TONSILS | | |
| 0AJH | PHARYNX | | |
| 0AJI | ESOPHAGUS | | |
| 0AJJ | STOMACH | | |
| 0AJJB | GASTRIC GLANDS | | |
| 0AJJC | PYLORUS/ ORIFICE VALVE | | |
| 0AJK | SMALL INTESTINE | | |
| 0AJKB | CAECUM | | |
| 0AJL | LARGE INTESTINE | | |
| 0AJLB | RECTUM | | |
| 0AJM | LIVER/ BILIARY TRACT | | |
| 0AJN | SPLEEN/ LYMPH TRACTS | | |
| 0AJO | PERITONEUM | | |
| 0AJP | PANCREAS | | |
| 0AK | CARDIOVASCULAR SYSTEM | | |
| 0AKB | HEART | | |
| 0AKC | BLOOD VESSELS | | |
| 0AKCB | ARTERIES | | |
| 0AKCC | VEINS | | |

| | | | |
|--------|-----------------------------------|-------|-------------------------|
| P | PSYCHOLOGICAL ASPECT | Q | EDUCATIONAL ASPECT |
| PB | SENSES | QB | EDUCATION LEVEL |
| PBB | AUDITORY/ HEARING | QBB | ILLITERATE |
| PBC | VISION | QBC | GRADE SCHOOL |
| PBCB | COLOR SENSE | QBD | HIGH SCHOOL |
| PBCC | VISUAL FIELD | QBE | COLLEGE |
| PBD | TACTILE/ TOUCH | QBF | DROP-OUT |
| PBE | KINESTHETIC/ MOTION | QC | PRINCIPLES |
| PBF | THERMAL/ TEMPERATURE | QD | TEACHING/ TRAINING |
| PBG | VESTIBULAR/ BALANCE | QDB | CLASS ROOM |
| PBH | OLFACTORY/ SMELL | QDBB | DISCUSSIONS/ SEMINARS |
| PBI | VIBRATIONAL | QDBC | LECTURE/ DEMONSTRATIONS |
| PBJ | VISCERAL | QDBD | SIMULATORS |
| PBK | PAIN | QDC | FIELD |
| PC | PERSONALITY | QDD | FORMAL |
| PCH | MEASURES | QDE | INFORMAL |
| PCCB | CAPABILITIES/ INTELLIGENCE | QDF | PROGRAMMED |
| PCCB | ATTITUDES | QE | MATERIALS/ EQUIPMENT |
| PCCBCB | SIEBRECHT SCALE | QEB | AUDIO-VISUAL |
| PCCBD | PERFORMANCE | QEC | BOOKS |
| PCC | TYPOLOGIES/ CLINICAL DIAGNOSIS | QF | EDUCATION MEASUREMENTS |
| PCCB | ALCOHOLISM | QFB | ACHIEVEMENT TESTS |
| PCCC | SUICIDE/ HOMICIDE | QFC | EXAMINATIONS |
| PCCN | NEUROSES | QFD | INTELLIGENCE TESTS |
| PCCP | PSYCHOSES | QC | EDUCATION |
| PCD | PAST EXPERIENCE | QC*ED | DRIVER |
| PCDB | INTERACTION WITH PEOPLE | QGE | SAFETY |
| PCDC | SOCIAL VARIABLES | QGM | MEDICAL |
| PD | COGNITION/ INFORMATION PROCESSING | QGMF | FIRST AID (RED CROSS) |
| PDA | PERCEPTION | QGMG | ADVANCED (RED CROSS) |
| PDB | PLANNING/ DECISION MAKING | QGMH | COMPREHENSIVE |
| PDBB | RISK TAKING | QGMI | PROFESSIONAL/ PHYSICIAN |
| PDBC | DEFENSE MECHANISMS | QH | TEACHERS/ INSTRUCTORS |
| PDC | LEARNING | | |
| PDCB | CONDITIONING | | |
| PDCC | HABIT/ PRONENESS | | |
| PDCD | TRANSFER OF TRAINING | | |
| PDCE | RECALL | | |
| PDCF | INSIGHT | | |
| PDCG | SKILLED PERFORMANCE | | |
| PE | STATE OF THE ORGANISM | | |
| PEB | STATE OF AROUSAL | | |
| PEBB | ALERT | | |
| PEBC | DROWSY | | |
| PEBD | SLEEP | | |
| PEC | FATIGUE | | |
| PED | EMOTIONAL STATE/ MOOD | | |
| PEDB | STRESS/ STRAIN | | |
| PEE | INFERRED PSYCHOLOGICAL STATE | | |
| PEEF | FEAR | | |
| PF | BEHAVIORAL FACTORS | | |
| PFB | STIMULUS | | |
| PFC | RESPONSE | | |
| PFD | REINFORCEMENT | | |
| PFE | SEQUENCE/ SCHEDULE | | |
| PFF | PERCEPTUAL-MOTOR COORDINATION | | |
| PFG | DISTORTIONS | | |
| PFH | SET | | |

R LEGAL ASPECT
 RB CRIMES
 RC LAWS
 RCB CODES
 RCBB CRIMINAL
 RCBH CIVIL
 RCBH MOTOR VEHICLE
 RCBH ORDINANCES
 RCC STATUTES
 RCCB SAFETY RESPONSIBILITY
 RCD CASE LAW
 RCE CIVIL LIABILITY
 RCEB NEGLIGENCE
 RCF CRIMINAL
 RCFB PEDESTRIAN VIOLATIONS
 RCFB MOVING VIOLATIONS
 RCFBB DRINKING
 RCFBC RECKLESS
 RCFBD SPEEDING
 RCFBE HIT-AND-RUN
 RCFBF WRONG WAY
 RCFB PARKING VIOLATIONS
 RCFB FINANCIAL RESPONSIBILITY
 RCFE IMPLIED CONSENT
 RCFE*XTB BREATH ANALYZER
 RCFE*XTC CHEMICAL TEST
 RCFEB CHEMICAL TEST
 RCG REGULATORY
 RCGB INSPECTION
 RCGB*DE MOTOR VEHICLE
 RCGC LICENSING
 RCGC*DE MOTOR VEHICLE
 RCGC*ED DRIVER
 RCGD REGISTRATION/ TITLES
 RCGE STANDARDS
 RCU UNIFORM
 RD ENFORCEMENT
 RDH POLICING/ PATROL
 RDHB PURSUIT
 RDC APPREHENSION/ SUMMONS
 RDD TRIAL/ JUDICIAL PROCESS
 RDDB APPEALS
 RDE CONVICTION
 RDF EVIDENCE
 RDFB EXPERTISE
 RDG SANCTIONS/ PUNISHMENT
 RDGB JAIL
 RDGC FINE
 RDGD SUSPENSION/ REVOCATION
 RDGDB POINT SYSTEM
 RDGE PROBATION
 RR RECORDS
 (SEE ALSO ACCIDENT-RECORDS, JLR)

S SOCIOECONOMIC ASPECT
 SB SOCIAL
 SBB BEHAVIOR/ MORES
 SBBB RELIGION
 SBBC ROLES
 SBBB DEVIANCY/ CONTROL
 SBBE CULTURE
 SBC POPULATION/ DEMOGRAPHY
 SBD POLITICS
 SBE PUBLIC OPINION
 SBF PRIVATE
 SBFB INDIVIDUAL
 SBG PUBLIC
 SC ECONOMICS
 SCB MACROECONOMICS
 SCC MICROECONOMICS/ PRICE THEORY
 SCD ECONOMIC BEHAVIOR
 SCDB BUSINESS CYCLES
 SCDC CONSUMER
 SCE COSTS/ BENEFITS
 SCF COST EFFECTIVENESS
 SCG BUDGETS/ BUDGETING
 SCH FINANCE
 SCHB TAXES
 SCHC FEES
 SCHD ASSESSMENT
 SCHE MONEY/ BANKING
 SCHF INVESTMENT
 SCHG STOCKS
 SCHH BONDS
 SCHK CREDIT
 SD REGIONAL PLANNING
 SDB TRANSPORTATION
 SDC RESOURCE ALLOCATION
 SDD LAND UTILIZATION
 SDE POLLUTION
 SE INSURANCE/ ACTUARY
 SEB UNINSURED
 SEC LOSS DISTRIBUTION
 SED TYPES OF INSURANCE
 SEDB CASUALTY
 SEDC MEDICAL
 SEDD LIABILITY
 SEDE DISABILITY
 SEDF BASIC
 SEDG GROUP
 SEDH COMPULSORY
 SEE UNDERWRITING
 SEF RISK CLASSIFICATION
 SEG MUTUAL COMPANY
 SEH STOCK COMPANY
 SF MEASURES
 SFB SAFETY
 SFC SERVICE
 SFD COMMUNITY SUPPORT

V
VB
VBS
VC
VD
VF
VJ
VK
VL
VLB
VLC
VLD
VLE
VLF
VLS
VMB
VMBB
VN
VO
VOB
VOC
VQ
VQB
VR
VU

DISCIPLINES
 MATHEMATICS
 STATISTICS
 PHYSICS
 CHEMISTRY
 EARTH SCIENCES
 PSYCHOLOGY
 SOCIAL SCIENCES/ ECONOMIC SCIENCES
 ENGINEERING
 CIVIL
 ELECTRICAL
 INDUSTRIAL
 MECHANICAL
 TRAFFIC
 AEROSPACE
 SYSTEMS
 BIOMEDICAL SCIENCES
 BIOMECHANICS
 KINESIOLOGY
 EPIDEMIOLOGY/ ETIOLOGY
 MANAGEMENT SCIENCES
 MARKETING
 ACCOUNTING
 INFORMATION/ COMMUNICATION
 DOCUMENTATION
 LAW
 HUMAN ENGINEERING/ ERGONOMICS

W
WB
WE
WEF
WEG
WM
WMB
WMC
WMCB
WMCE
WMD
WMDB
WMDG
WMDH
WMDHB
WME
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WNBC
WNBD
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WOB
WOB B
WOC
WOCB
WOD
WODE
WODF
WODFB
WOE
WOF
WOG
WOG B
WOH
WP
WS

METHODS
 HISTORICAL
 EXPERIMENTAL
 FIELD
 LABORATORY
 MATHEMATICAL
 LOGIC/ SETS
 ALGEBRA
 POLYNOMIAL
 LINEAR
 ANALYSIS
 NUMERICAL/ CALCULATIONS
 GRAPHICAL
 DATA
 SCALING
 STATISTICAL/ PROBABILITY
 DESIGN
 FACTORIAL
 COVARIANCE/ CORRELATION
 REGRESSION
 LEAST SQUARE
 VARIANCE
 NONPARAMETRIC
 TEST
 DISTRIBUTION
 STOCHASTIC
 SAMPLING
 ESTIMATION
 DECISION MAKING/ GAME
 OPTIMIZATION
 CYBERNETICS/ AUTOMATIC CONTROL
 SYSTEMS ANALYSIS/ OPERATIONS RESEARCH
 MODELS/ MODELING
 SIMULATION
 QUEUEING
 INVENTORY
 ENGINEERING
 DESIGN
 DRAFTING
 SURVEY
 MAPPING
 CONSTRUCTION
 EARTHWORK
 PREFABRICATION
 PRESTRESSING
 MAINTENANCE/ REPAIR
 QUALITY CONTROL
 INSTRUMENTATION
 CALIBRATION
 RESEARCH AND DEVELOPMENT
 PSYCHOLOGICAL
 MEDICAL
 (SEE ALSO TREATMENT/ CARE, JRG)
 FIRST AID
 MAINTAINING AIRWAYS
 RESUSCITATION
 MECHANICAL
 MOUTH-TO-MOUTH
 TRACHEOSTOMY
 BLEEDING
 SPLINTING
 DIAGNOSIS
 SURGERY
 PLASTIC
 GERIATRIC
 PEDIATRIC
 MILITARY
 EXPERIMENTAL
 AMPUTATION
 THERAPEUTIC
 ANESTHESIA
 AUTOPSY/ PATHOLOGY
 X-RAY
 SURVEY
 CENSUS
 QUESTIONNAIRES
 INTERVIEWS
 POLLS
 EXPOSURE
 TESTING/ MEASURES
 PARAMETERS
 PHYSIOLOGICAL
 PULSE RATE
 RESPIRATORY RATE
 BLOOD PRESSURE
 BLOOD FLOW/ CARDIAC OUTPUT
 EEG
 EKG
 ADMINISTRATIVE

WSB
WSBC
WSBCR
WSBCRM
WSBCRN
WSBCT
WSBD
WSBE
WSC
WSD
WSD B
WSDC
WSDD
WSD E
WSD F
WSDG
WSE
WSF
WSI
WSK
WT
WTB
WTC
WTD
WTE
WTP
WU
WUB
WUP
WUPB
WUPC
WUPD
WUPE
WUPJ
WUPK
WW

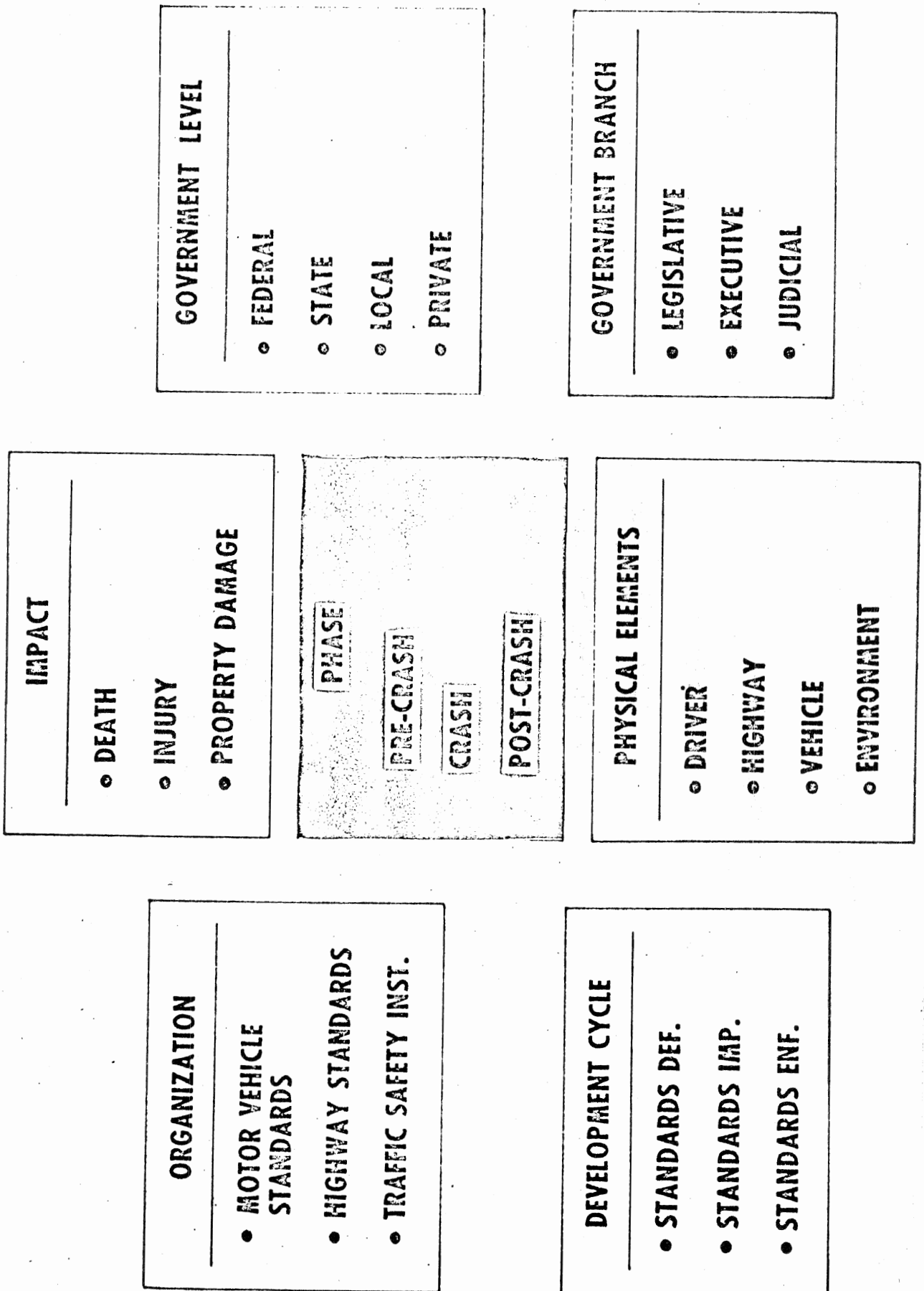
| | | | |
|------|-------------------------------|------|---------------------------------|
| X | EQUIPMENT | Y | STUDY-REPORT TYPE |
| XC | SENSORS/ TRANSDUCERS | YB | PROGRESS STATUS |
| XCB | AMPLIFIERS | YBB | REQUEST FOR PROPOSALS |
| XCC | FILTERS | YBC | PROPOSALS |
| XCD | ACCELEROMETERS | YBD | FEASIBILITY STUDIES |
| XCE | STRAIN GAUGE | YBE | PRELIMINARY |
| XCF | FIFTH WHEEL | YBF | INTERIM |
| XCL | LOOP DETECTORS | YBG | PROGRAM REVIEW |
| XF | TRANSMITTERS/ RECEIVERS | YBH | FINAL |
| XFB | RADAR | YC | NATURE OF STUDY |
| XFC | RADIO | YCB | RESEARCH |
| XFD | TELEVISION | YCC | STATE-OF-THE-ART |
| XG | DISPLAYS/ METERS | YCD | SURVEY |
| XGB | CATHODE-RAY TUBE | YCE | THEORETICAL |
| XH | RECORDERS | YCF | SYSTEMS STUDY |
| XHB | DRUM/ DISK | YCG | LABORATORY EXPERIMENT |
| XHC | MAGNETIC TAPE | YCH | FIELD EXPERIMENT |
| XHD | PUNCHED TAPE | YCI | DESIGN |
| XHE | PUNCHED CARD | YCJ | FUTURE/ PROJECTION |
| XHG | MAGNETIC CORE | YCK | CASE STUDY |
| XI | CONTROLS | YCL | EVALUATION/ EFFECTIVENESS |
| XIB | RELAY | YD | FORM |
| XJ | SUPPLIES | YDB | HANDBOOKS |
| XK | COMPUTERS | YDC | SHOP MANUALS |
| XKB | ANALOG | YDD | DIRECTORIES |
| XKC | DIGITAL | YDE | DICTIONARY/ GLOSSARY/ THESAURUS |
| XKD | HYBRID | YDF | ENCYCLOPEDIA |
| XM | MODELS (PHYSICAL) | YDG | TEXT BOOKS |
| XMB | SLUGS | YDH | THESIS/ TERM PAPERS |
| XMC | DUMMIES | YDI | LEAFLETS/ BROCHURES |
| XMD | ANIMALS | YDJ | PRESS REPORTS |
| XME | CADAVERS | YDK | LETTERS/ MEMORANDUMS |
| XMF | SCALED | YDL | POPULAR LITERATURE |
| XP | PHOTOGRAPHY | YDM | UNTRANSLATED |
| XPB | AERIAL | YDN | COLLECTIONS |
| XPC | CAMERAS | YDT | TRAINING MANUAL |
| XPD | PROJECTORS | YE | CONTENTS |
| XPF | FILM | YEB | PROCEEDINGS |
| XPG | MOTION | YEC | BIBLIOGRAPHY |
| XPH | STILL | YED | ABSTRACTS |
| XPI | HOLOGRAM | YEE | REVIEWS |
| XQ | MECHANICAL TEST | YEF | DATA STATISTICS |
| XQB | STATIC | YEG | TABLES/ GRAPHS |
| XQBB | COMPRESSION | YEH | DIAGRAMS/ PLANS |
| XQHC | TORSION | YEI | PHOTOGRAPHS/ ILLUSTRATIONS |
| XQBD | TENSILE | YEJ | HEARINGS |
| XQBE | WEIGHT SCALES | YEK | LAW/ CODE/ STATUTE |
| XQC | DYNAMIC | YEL | PATENT |
| XQCB | DROP | YEM | INSTRUCTIONS/ SPECIFICATIONS |
| XQCC | SLED | YEN | STANDARDS |
| XQCD | PENDULUM | YED | MAPS |
| XQCE | CENTRIFUGES | YEP | FLOW CHARTS |
| XQCF | VIBRATION PLATFORMS | YEQ | HIOGRAPHIES |
| XQCG | DYNAMOMETERS | YER | GENERAL DISCUSSIONS |
| XT | MEDICAL | YERB | SPEECHES |
| XTB | BREATH ANALYZER | YERC | ANECDOTES/ JOKES |
| XTC | CHEMICAL TEST (BLOOD ALCOHOL) | YES | COMPUTER PROGRAMS |
| XTF | SPLINTS | | |
| XTG | STRETCHERS | | |
| XTH | BACKBOARDS | | |
| XTI | RESUSCITATORS | | |
| XTJ | ASPIRATORS | | |
| XTK | OXYGEN SUPPLY | | |
| XTL | AIRWAY MAINTENANCE | | |
| XTM | HEMORRHAGE CONTRDL | | |
| XTP | PACEMAKER | | |
| XTQ | DEFIBRILLATOR | | |

A P P E N D I X F

NHSB ORIENTATION AIDS

DIMENSIONS OF THE HIGHWAY SAFETY PROBLEM

FIGURE A



NEED FOR DECISION ORIENTED STRUCTURES

296

CLASSIFICATION

- PROBLEMS
- STATE OF KNOWLEDGE
- COUNTERMEASURES
- PROGRAMS

IDENTIFICATION

- PROGRAM REQUIREMENTS
- RESEARCH NEEDS
- DATA NEEDS
- TRADE-OFFS

DEVELOPMENT

- PROGRAM PLANS
- RESEARCH PLANS
- MATHEMATICAL MODELS & ANALYSES

FIGURE B

FIGURE C

CRASH SEQUENCE CLASSIFICATION

| PHASE | SEQUENCE | OBJECTIVE | ILLUSTRATIVE PROBLEMS |
|------------|--------------------------------|-----------------------------|--|
| PRE-CRASH | 1. SELECTION & DEVELOPMENT | | ○ DRUNKEN DRIVING |
| | 2. OPERATING | PREVENTION | ○ ROAD MAINTENANCE ○ MECHANICAL & MEDICAL FACTORS |
| CRASH | 1. FIRST COLLISION | | ○ CRASH DESIGN: VEHICLE AND HIGHWAY |
| | 2. SECOND COLLISION | AMELIORATION | ○ SAFETY HELMETS |
| POST CRASH | 1. SIGNAL GENERATION | | ○ RAPIDITY & QUALITY OF RESPONSE |
| | 2. SIGNAL RECEIPT | SALVAGE, HUMAN AND PROPERTY | ○ EXTRACTION FROM VEHICLE |
| | 3. RESPONSE-DISPATCH-ARRIVAL | | ○ REMOVAL OF DEBRIS |
| | 4. LEAVE ACCIDENT SCENE | | ○ "ACCIDENT" ANALYSIS AND SURVIVAL |
| | 5. ARRIVAL AT MEDICAL FACILITY | | |

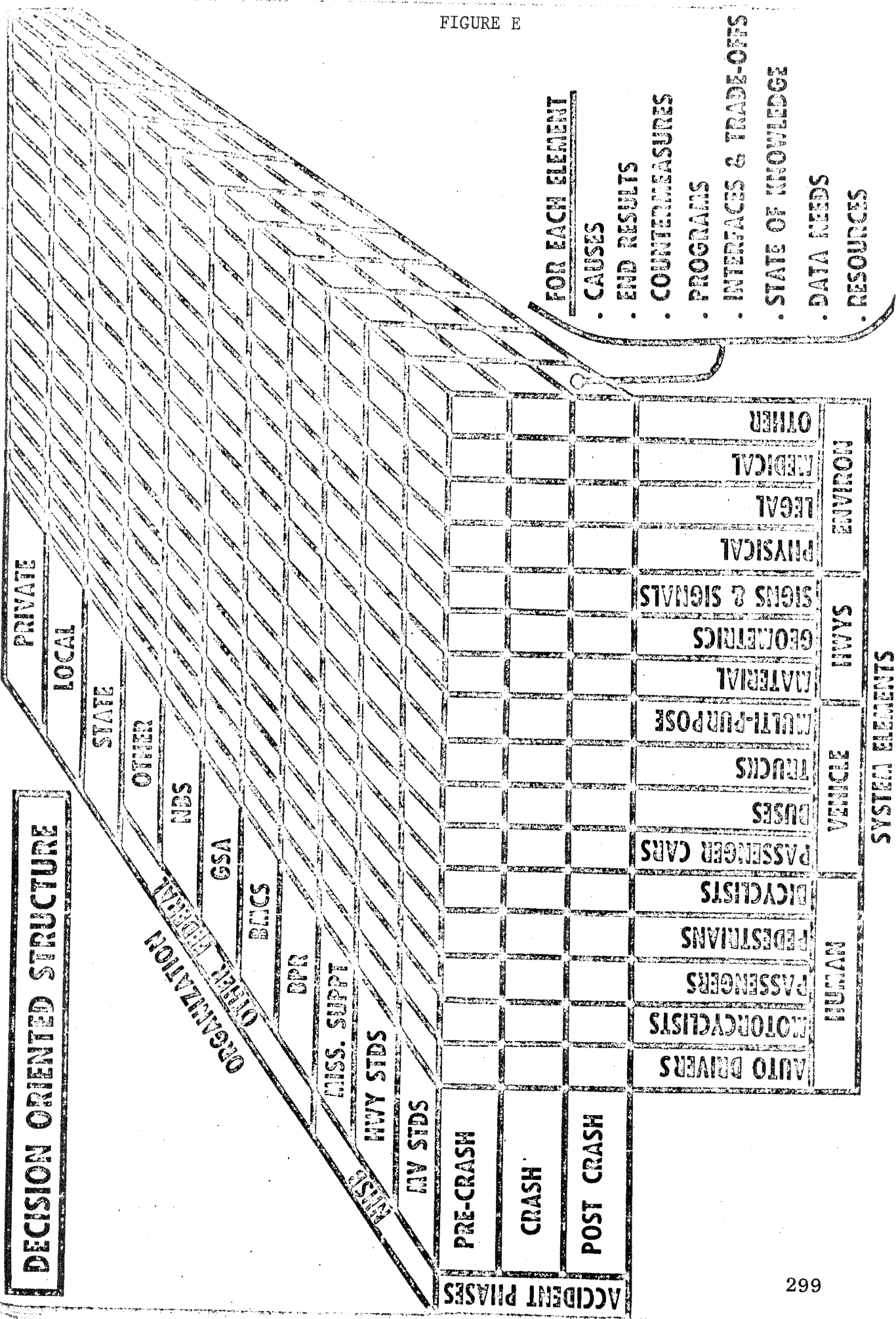
COMBINATION OF CLASSIFICATIONS

PHASE AND PHYSICAL ELEMENT

| | HUMAN | VEHICLE | HIGHWAY | ENVIRONMENT |
|------------|-------|---------|---------|-------------|
| PRE-CRASH | | | | |
| CRASH | | | | |
| POST-CRASH | | | | |

FIGURE D

FIGURE E



A P P E N D I X G

LEGAL INFORMATION

EXHIBIT A

MICHIGAN VEHICLE CODE (Revision of 1965)

(258) 257.625a Motor vehicles; driving under influence of intoxicating liquor; tests, evidence. [MSA 9.2325(1)]

51 'a

b

c

d

e

f

g

h

i

Sec. 625a. (1) [In any criminal prosecution relating to driving a vehicle while under the influence of intoxicating liquor,] [the amount of alcohol in such person's blood at the time alleged as shown by chemical analysis of the person's blood, urine, breath or other bodily substance shall be admissible and shall give rise to the following presumptions, and in the event any such tests are given,] [the results of such tests shall be made available to the person so charged or his attorney prior to the day of the trial and must be introduced into evidence by the prosecution upon the demand of the defendant:]

(a) If [there was at that time 0.05% or less by weight of alcohol in the defendant's blood,] [it shall be presumed that the defendant was not under the influence of intoxicating liquor.]

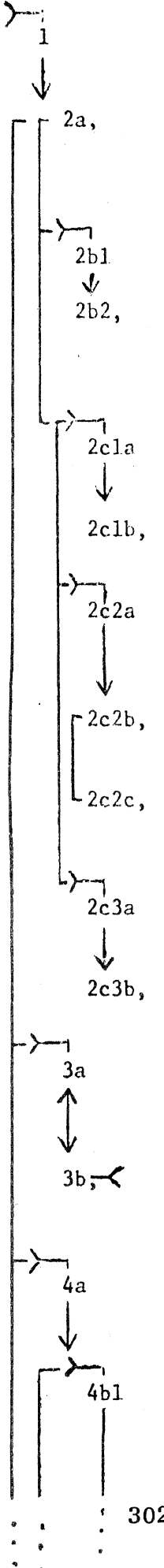
(b) If [there was at that time in excess of 0.05% but less than 0.15% by weight of alcohol in the defendant's blood,] [such fact shall not give rise to any presumption that the defendant was or was not under the influence of intoxicating liquor,] but [such fact may be con-

sidered with other competent evidence in determining the guilt or innocence of the defendant.]

(c) If [there was at that time 0.15% or more by weight of alcohol in the defendant's blood,] [it shall be presumed that the defendant was under the influence of intoxicating liquor.]

j

k



- If
1. the criminal prosecution relates to driving a vehicle while under the influence of intoxicating liquor, S1a'
then
 2. a. the amount of alcohol in such person's blood at the time alleged as shown by chemical analysis of the person's blood, urine, breath or other bodily substance, shall be admissible and shall give rise to the following presumptions, and S1b
 b. if S1c
 1. any such tests are given S1c
then
 2. the results of such tests shall be made available to the person so charged or his attorney prior to the day of the trial and must be introduced into evidence by the prosecution upon the demand of the defendant, and S1d
 - c. 1. if S1e
 - a. there was at that time 0.05% or less by weight of alcohol in the defendant's blood, S1e
then
 - b. it shall be presumed that the defendant was not under the influence of intoxicating liquor, and S1f
 2. if S1g
 - a. there was at that time in excess of 0.05% but less than 0.15% by weight of alcohol in the defendant's blood, S1g
then
 - b. such fact shall not give rise to any presumption that the defendant was or was not under the influence of intoxicating liquor, and S1h
 - c. such fact may be considered with other competent evidence in determining the guilt or innocence of the defendant, and S1i
 3. if S1j
 - a. there was at that time 0.15% or more by weight of alcohol in the defendant's blood, S1j
then
 - b. it shall be presumed that the defendant was under the influence of intoxicating liquor, and S1k
3. if and only if S2a'
 - a. a person is a duly licensed physician, or a licensed nurse or medical technician under the direction of a licensed physician, acting at the request of a police officer, S2a'
then
 - b. that person can withdraw blood for the purpose of determining the alcoholic content therein under the provisions of this act, and S2b'
 4. if S3a'
 - a. a person is charged with driving a vehicle while under the influence of intoxicating liquor, S3a'
then
 - b. if S3b'
 1. the person takes a chemical test administered under the direction of a police officer as provided in subsections (2) and (3), S3b'



4b2,

then

2. the person shall be given a reasonable opportunity to have a person of his own choosing, administer one of the chemical tests as provided in this section within a reasonable time after his detention, and

S3c'

4b3,

3. the results of such test shall be admissible if offered by the defendant and shall be considered with other competent evidence in determining the innocence or guilt of the defendant, and

S3d

c. 1. if

4cla

a. facilities are reasonable available to administer such test,



then

4clb,

b. the person charged shall have the right to demand that one of the tests provided for in subsection (2) must be given him, and

S4b'

4c2,

2. the results of such test shall be admissible if offered by the defendant and shall be considered with other competent evidence in determining the innocence or guilt of the defendant, and

S4d

4d1,

d. 1. the person charged shall be advised of his right to refuse to take any test provided for in this act, and

S5a

4d2,

2. the refusal on the part of any person to submit to any such test shall not be admissible in any criminal prosecution relating to driving a vehicle while under the influence of intoxicating liquor, and

S5b

5

5. the provision of this section shall not be construed as limiting the introduction of any other competent evidence bearing upon the question of whether or not the defendant was under the influence of intoxicating liquor.

S6

- 1, 1. a person operates a vehicle upon any highway or any other place open to the general public, including any area designated for the parking of motor vehicles, within this state, and S7b'
- 2. due to consumption of intoxicating liquor, narcotic drugs, barbital or any derivative or barbital, he has visibly impaired his ability to operate the vehicle, S7c
- then
- 3, 3. that operation of the vehicle is unlawful and punishable as provided in this section, and S7a'
- 4. if
 - 4a, a. a person is charged with violating section 625a, S8a'
 - then
 - 4b, b. a finding of guilty shall be permissible under this section, S8b
 - and
- 5, 5. any person convicted of a violation of this section may be imprisoned in the county jail for not more than 90 days or fined not more than \$100.00, or both, together with costs of prosecution, and S9
- 6, 6. on a second and subsequent conviction under this section or a local ordinance substantially corresponding thereto, he may be imprisoned for not more than 1 year or fined not to exceed \$1,000.00, or both, and S10
- 7. the division of driver and vehicle services, within 10 days after the receipt of a properly prepared abstract, shall record 4 points for each conviction under this section. S11

A SUPPLEMENTARY BIBLIOGRAPHY
ON THE RETRIEVAL OF LEGAL INFORMATION

- American Bar Association
Review of the articles on the use of Computers in law that have appeared in 1961-1966.
- Cowan, Thomas A.
"Decision Theory in Law, Science, Technology," 17 RUTGERS L. REV. 499 (1963).
- Dennis, Sally
"The Design and Testing of a Fully Automatic Indexing-Searching System for Documents Consisting of Expository Text" (A paper for presentation at the National Colloquium on Information Retrieval, May 12, 1966).
- Elridge, William, and Dennis, Sally
"The Computer as a Tool of Legal Research," 28 LAW & CONTEMP. PROB. 78 (1963).
- IOWA L. REV.
"Computer Storage of Title Records Offers Solution to Paper-Work Explosion," 47 IOWA L. REV. 382 (1962).
- Kayton, Irving
"Can Jurimetrics Be of Value to Jurisprudence?" 33 GEORGE WASHINGTON L. REV. 287-317 (1964).
- Kayton, Irving
"Retrieving Case Law by Computer: Fact, Fiction, and Future," 35 GEORGE WASHINGTON L. REV. 1-49 (1966).
- Hess, S. W., and Weaver, J. B.
"A Procedure for Nonpartisan Districting; Development of Computer Techniques," 73 YALE L. J. 288 (1963).
- Lawlor, Reed C.
"Copyright Aspects of Computer Usage," 11 BULL. COPYRIGHT SOC. 380 (Aug. 1964); 7 COMMUNICATIONS OF THE ACM 572 (1964).
- Link, David T.
"RIRA--A Legal Information System in Internal Revenue Services," 43 TAXES 231 (Apr. 1965).
- Loevinger, Lee
"Jurimetrics: The Methodology of Legal Inquiry," 28 LAW & CONTEMP. PROB. 5 (1963).
- Mendelson, Wallace
"The Untroubled World of Jurimetrics," 26 J. POLITICS 914 (1964).

Meyer, Perry

"Jurimetrics: The Scientific Method in Legal Research,"
44 CAN. B. REV. 1-24 (1966).

SCIENTIFIC AMERICAN

Review of any set of three of the articles that appear in the
September 1966 issue.

Stone, Julius

"Man and Machine in the Search for Justice or Why Appellate
Judges Should Stay Human," Essay No. 3 in LAW AND THE SOCIAL
SCIENCES: THE SECOND HALF CENTURY (Univ. of Minn. Press,
1966).

Swets, John A., and Feurzeig, Wallace

"Computer-Aided Instruction," 150 SCIENCE 572 (Oct. 29, 1965).

Wilson, Robert A.

"Computer Retrieval of Case Law", 16 SW. L. J. 409 (1962).

APPENDIX H

KINDS OF ARTICLES USED BY MAJOR MAGAZINES

Number of Issues Carrying Articles on:

| Magazine | Circulation | Automobiles-Drivers | Automobiles-Driving | Automobiles-Industry & Trade | Automobiles-U.S. | Automobiles-Safety Devices & Measures | Automobiles-Study & Teaching | Express Highways | Roads | Safety | Traffic |
|---------------------------|----------------------|---------------------|---------------------|---------------------------------|------------------|--|---------------------------------|------------------|-------|--------|---------|
| America | wk. 102,465 | 2 | 2 | 2 | 6 | | | | | | 4 |
| American City | | 1 | | | 1 | | | 1 | | | 7 |
| American Home | 10/year 3,357,988 | | 2 | | | | 1 | | | | |
| Architectural Forum | mo. 30,000 | | | | | | | 3 | | | |
| Atlantic | mo. 280,000 | 2 | 1 | 1 | | 1 | | | 1 | | |
| Better Homes & Gardens | mo. 6,750,000 | 1 | 8 | | | 4 | | 2 | | | 4 |
| Business Week | wk. 500,000 | | 1 | 3 | 3 | 18 | 1 | | | | |
| Changing Times | mo. 1,200,000 | 2 | 3 | | | 3 | 2 | | 1 | | 1 |
| The Christian Century | wk. 43,000 | | | | | 1 | | | | | 1 |
| Commentary | mo. 59,000 | | | | | 1 | | | | | |
| Commonweal | wk. 43,000 | | | | | 4 | | | | | 1 |
| Consumer Bulletin | | 1 | 1 | | | 8 | | | | 6 | |
| Consumer Reports | mo. 100,000 | | | | | 19 | | | | | 1 |
| Dun's Review | mo. 135,000 | | | | | 1 | | | | | |
| Esquire | mo. 955,876 | | | | 1 | | | | | | |
| Fortune | mo. 450,000 | | | | | 1 | | | | | |

Number of Issues Carrying Articles on:

| Magazine | Circulation | Automobiles-Drivers | Automobiles-Driving | Automobiles-Industry & Trade | Automobiles-U.S. | Automobiles-Safety Devices & Measures | Automobiles-Study & Teaching | Express Highways | Roads | Safety | Traffic |
|-------------------------|-------------------|---------------------|---------------------|---------------------------------|------------------|--|---------------------------------|------------------|-------|--------|---------|
| Good House-keeping | | | 5 | | | 1 | | | | | 1 |
| Harper's | mo. 286,755 | | | 1 | | | | | | | |
| Hot Rod | | | 1 | | | 2 | 1 | | | | |
| Ladies Home Journal | mo. 6,706,000 | 1 | 1 | | | | | | | | |
| Life | wk. 6,400,000 | | | | | 3 | 1 | | 2 | | 1 |
| Look | bi/wk. 7,700,000 | 1 | 1 | | | 5 | | | | | 2 |
| McCalls | mo. 8,500,000 | 2 | | | | | | | | | |
| Mademoiselle | mo. 650,000 | 1 | | | | | | | | | |
| Motor Trend | | | 5 | | | 9 | 1 | | 3 | | 4 |
| The Nation | wk. 29,470 | | | | | 10 | 1 | 1 | | | 2 |
| National Review | bi/wk. 95,782 | | | | | 1 | | | 1 | | |
| Nation's Business | mo. 775,000 | 1 | | | | 4 | | | | | 2 |
| New Republic | wk. 121,200 | 1 | | 1 | 1 | 13 | | | | | 2 |
| New Yorker | wk. 468,419 | | 1 | | | 1 | | | | | |
| New York Times Magazine | S. 1,283,785 | 3 | 1 | 1 | | 3 | 1 | | | | 4 |
| Newsweek | wk. 2,000,000 | | 1 | 4 | 7 | 22 | 1 | | 3 | 2 | 11 |
| The PTA Magazine | mo. Sept-June 330 | 3 | 1 | | | | | | | | 2 |
| Parents' Magazine | mo. 2,000,000 | | | | | 6 | 1 | | | | 2 |

Number of Issues Carrying Articles on:

| Magazine | Circulation | Automobiles-Drivers | Automobiles-Driving | Automobiles-Industry & Trade | Automobiles-U.S. | Automobiles-Safety Devices & Measures | Automobiles-Study & Teaching | Express Highways | Roads | Safety | Traffic |
|--------------------------|------------------|---------------------|---------------------|---------------------------------|------------------|--|---------------------------------|------------------|-------|--------|---------|
| Popular Electronics | mo. 400,445 | | 1 | | | 2 | | | | | |
| Popular Mechanics | mo. 1,650,000 | 1 | 4 | | | 2 | 1 | | 3 | | 3 |
| Popular Photography | mo. 428,000 | | | | | | | | | | 1 |
| Popular Sci. Monthly | mo. 1,500,000 | 1 | 5 | | | | 1 | 3 | | 1 | 2 |
| Reader's | mo. 15,603,312 | 4 | 4 | 2 | | 1 | 1 | | 3 | 2 | 6 |
| Redbook | mo. 4,400,000 | | | | | | | | | | 1 |
| The Reporter | mo. 14,000 | | | | | | | | | 1 | |
| Saturday Evening Post | bi/mo. 7,000,000 | 1 | | | | | | | | | |
| Saturday Review | wk. 463,138 | | | 1 | | 3 | | | | | |
| Science | wk. 130,554 | | | | | 4 | | | | | 3 |
| Science Digest | mo. 144,383 | 1 | 2 | | | 5 | | 1 | | 1 | 1 |
| Science News | wk. 100,000 | | | | | 3 | | | | | 2 |
| Science Newsletter | | 1 | 1 | | | 1 | | | 2 | | 4 |
| Scientific American | mo. 400,000 | | 1 | 1 | | | | | | | |
| Senior Scholastic | | 5 | 3 | 1 | | 9 | | | 2 | 1 | 6 |
| Seventeen | mo. 1,110,712 | 1 | | | | | | | | | 1 |
| Successful Farming | mo. 1,329,432 | 1 | | | | | | | 1 | | |

Number of Issues Carrying Articles on:

| Magazine | Circulation | Automobiles-Drivers | Automobiles-Driving | Automobiles-Industry & Trade | Automobiles-U.S. | Automobiles-Safety Devices & Measures | Automobiles-Study & Teaching | Express Highways | Roads | Safety | Traffic |
|-----------------------------|---------------|---------------------|---------------------|---------------------------------|------------------|--|---------------------------------|------------------|-------|--------|---------|
| Time | wk. 3,000,000 | 2 | 2 | 4 | 2 | 20 | 2 | 1 | 2 | 1 | 8 |
| Today's Health | mo. 700,544 | 2 | 2 | | | 8 | 1 | | 1 | 1 | 7 |
| Travel | mo. 302,017 | | 1 | | | 1 | | | | | |
| U.S. News & World Report | wk. 1,550,000 | 4 | | | | 21 | 2 | | 2 | 1 | 6 |
| Vital Speeches | | 1 | | | 1 | 5 | | | 1 | | 3 |
| | | 47 | 58 | 23 | 17 | 233 | 16 | 14 | 27 | 19 | 108 |