SafetyLit.

Preventing Injuries by Providing Information sm

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Introduction and Executive summary

SafetyLit, short for the Safety Literature, is dedicated to saving lives and reducing injuries worldwide. Essentially it is an online, interactive, web-enabled review and summary of all articles relevant to safety from journals published in 158 of the world's nations – more than 16,000 scholarly periodicals that arise from more than 30 distinct professional disciplines. SafetyLit serves over 1200 institutions, organizations, and government entities. It currently reaches 180 countries and all 50 U.S. states. Over 30,000 individuals working in diverse fields access the SafetyLit website each month, many make inquiries of the extensive database multiple times a week.

SafetyLit began in the mid-1990s and has been supported, for the most part, by governmental agencies. Most recently several branches of the California state government provided subsidy, primarily on a project-by-project basis. As with many programs, government fiscal cutbacks resulted in a total lack of funding, and SafetyLit has continued through the perseverance of its dedicated volunteer staff of professionals.

In 2014, the non-profit 501(c)(3) SafetyLit Foundation was established with a goal of perpetuating and growing the program that is so vital to so many in the fields of accident and injury prevention. The Board of Directors and executive staff is now reaching out to organizations and individual benefactors for tax deductible support that will enable the SafetyLit program to be better organized, financially strengthened, and have its mission sustained for the future.

Inquiries may be made to David W. Lawrence, PhD, founder and executive director.

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The following page begins a detailed description of SafetyLit's case statement, mission, scope, and operations.

Injuries: a serious problem for individuals, families and society

Injuries are the most common cause of death from the first year of life through middle age. More than 180,000 people die in the USA from injury each year. Worldwide the annual injury death toll is more than 4.8 million (not counting those related to war). For every injury death in the U.S., there are about 6 others who suffer catastrophic permanent disabilities.

Injury costs

Serious injuries have high costs. More than 35,000,000 people are treated in emergency departments in the USA each year due to injuries. Not only are there treatment and rehabilitation costs but injuries often lead to devastating long-term personal, familial, and social consequences.

Good information is needed to make sound decisions

Making policy and practical decisions about safety requires knowing the factors that contribute to injury occurrence. Injury prevention usually requires applying a combination of education about risks, engineering and human factors, and enforcement of rules and laws. Making a sound decision requires drawing and balancing information from many fields. Can a particular event that leads to an injury be prevented? If the event cannot be prevented, what are the ways that the impact of the event can be minimized? How much will intervening cost and how much will non-intervention cost? Who should be responsible for the costs of intervening or for the costs of care and rehabilitation when injuries are not prevented?

SafetyLit

The purpose of SafetyLit is to allow its users to make sensible decisions about injury prevention; including current approaches, new concepts being evaluated, and methods that have been tried and failed. This knowledge can save precious time and money by avoiding the redevelopment of already established methods or attempting known failures. Over the past 20 years, there has been real progress toward making existing information available to professionals and to the public that supports or refutes research claims. Unfortunately, this information in the form of journal articles, technical reports, etc. can be very difficult to locate. SafetyLit strives to make this knowledge more accessible.

Injury causes and prevention

Common injury causes are motor vehicle crashes, natural disasters, interpersonal violence, fires, sports and recreation, and work-related incidents. A few everyday ways that injuries are successfully prevented include building fire codes, smoke and carbon monoxide alarms, air bags in automobiles, storm or wildfire warning systems, etc. Some ways injuries are prevented involve changing or preventing the event that leads to harm (anti-lock brakes can avoid a crash), others prevent injuries by lessening the impact of an event that was not avoided (airbags and seat-belts have their effect when a crash occurs), other prevention mechanisms involve changing personal behaviors such as through education (parenting classes about child-safe homes); laws (speed limits in school zones, laws and regulations concerning underage drinking and the cost of alcohol); regulations and codes (fire resistant buildings, evacuation route traffic controls).

While it is not reasonable to think about preventing all injuries; essentially all *serious* injuries can be prevented without sacrificing the thrill and enjoyment of life when a combination of approaches are applied to the problem. For example, few would argue that the modern protections afforded to race car drivers have made their sport less exciting. While a car may crash spectacularly, the driver will likely survive and often can walk away from the car. If injuries from a high-speed fiery crash can be prevented, most other serious injuries are also avoidable.

Injuries are not unavoidable "accidents" that just "happen". They are preventable or may be greatly decreased in severity by planning. Prevention methods have a strong scientific foundation and information about prevention may be found in the publications of many professional disciplines.

The Multi-Disciplinarily of Safety

At least 30 distinct professional disciplines contribute their knowledge to the science and practice of injury prevention. Nonetheless, when preparing to take action, few experts in any one of these fields will take the trouble to consult the published works of persons working in other disciplines. Even when they might want to do so, they very likely do not know where to look – there are hundreds of specialty databases that serve as indices to the literature of the various disciplines. SafetyLit provides a single

place that combines the publications of these many disciplines and provides a search system that is quite straightforward to use.

Professional Disciplines Represented in SafetyLit

Agriculture, anthropology, archaeology, architecture, biology, business & public administration, chemistry, consumer product testing, criminology, demography, dentistry, economics, education, engineering specialties, epidemiology, ergonomics, faith scholarship, fire suppression & prevention, forensic specialties, genetics, geography, geology, history, industrial design, interior design, journalism, law & law enforcement, literature, mathematics, media studies, medicine, meteorology, nursing, occupational safety & hygiene, oceanography, pharmacology, philosophy, physics, physiology, political science & policy, psychology, public health, social work, sociology, sports & kinematics, statistics, theology, toxicology, transportation, urban planning, and other fields.

Literature databases and their use

Indices to the published literature have existed for about 100 years, but for the first 50 years these were provided in print form and only available at university libraries. Modern literature databases are organized digital collections of references to published literature. They are an abundant resource for information and there are an abundance of databases. There is a wealth of available information but only a small part of it is included in each discipline's standard bibliographic databases. Performing a search of a literature database can seem straightforward. Searching databases of scholarly material is not like Google where you enter a word and receive pages of listings. The Google system is able to provide a searcher with mostly relevant items because the company has a record of a user's past searches and the web pages he or she has visited. When the information-seeker who uses an academic database enters a familiar term and finds a satisfyingly long listing of results; more often than not, this long list can be misleading. The search results can omit key items or include many unrelated records. The search systems of most literature databases are designed to be used by information science professionals, not by the professionals who publish in their discipline. These databases have query systems that require the use of arcane often counter-intuitive terms and controls. Few researchers or practice specialists in the disciplines listed above have the skills needed to thoroughly search within their field's own databases much less the skills to find and search within other databases. Their education and training about the use of bibliographic databases, if it includes anything, is typically limited to an hour or two of introduction and overview.

Someone seeking information that cuts across multiple specializations (such as most injury prevention topics) would need to 1) suspect that relevant information exists in the literature of another profession; 2) know the databases that index that literature; 3) know the search terms and jargon used; 4) have access to the relevant databases; 5) have the time and inclination to travel to a university library (subscription databases are not available online to the public or even to university alumnae) and perform a convoluted search of multiple databases.

Most databases use search terms specifically designed for use with that particular database and by library and information systems experts in the field for which the database was designed. Other than SafetyLit, databases are not intended to meet the needs of any user in general. They focus on meeting the needs of a particular professional discipline. Each database contains articles from journals specific to the special interests of those working in that particular discipline. The contents of these specialty databases don't typically overlap and the terms used for similar concepts are often quite different. Most existing databases lack search terms for accurate and consistent searching for safety-related material. Even professional librarians who work in the reference section of university libraries don't attempt to know how to thoroughly search every specialty database. They specialize on being efficient on a select few.

Perhaps, most importantly, commercial literature databases require costly subscriptions and thus, are available only in the libraries of larger universities, not just any college or university library – only those that can pay the database fees. A small research university typically pays about \$1 million each year for database access (in addition to the subscription fees for their scholarly journals). Larger universities pay \$3 million or more for these databases.

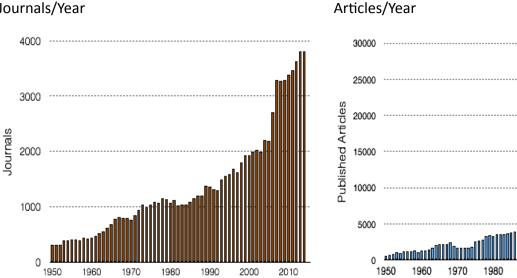
These costs are beyond the reach of most local and state agencies (advisory boards, recreation departments, school districts, community colleges, etc.) and far beyond that of local organizations. These costs and the necessary search skills can put a thorough search for relevant information out of the reach of these groups within the US and their equivalents outside the US. In summary, without SafetyLit, information-based decision-making can be expensive and requires knowing where to look for information they seek, and experience in searching arcane databases.

SafetyLit offers an alternative to this. SafetyLit is the only multidisciplinary user-friendly database containing comprehensive, unbiased information about how to approach an injury problem in the population served by the decision-maker.

The available literature on injury prevention is vast and increasing

The number of scholarly journals that publish four of more articles per year that meet the SafetyLit inclusion criteria (see appendix 5) is increasing as is the number of articles published (Figure 1). Keeping up-to-date without using some sort of aid like SafetyLit is all but impossible.

Figure 1. Number of Journals Publishing 3 or More Relevant Articles per Year and Number of Articles Published per Year, 1950-2014



Journals/Year

SafetyLit is a free service that provides comprehensive information

SafetyLit is a database that provides an index to the world's literature on safety – the publications of the many professional disciplines from 158 of the world's nations (Figure 2). SafetyLit volunteers regularly examine issue-by-issue the contents of more than 4900 current scholarly journals to find relevant material. At least 10,000 more are examined for relevant articles one or more times per journal volume. The back-files of now-extinct journals are also mined for relevant articles. Other sources are technical reports from government agencies and "think tanks" (bodies such as Rand Corporation), doctoral theses, and books. As of April 2016, the SafetyLit database contains more than

1990

2000

2010

500,000 journal articles and almost 35,000 books, reports and theses. SafetyLit makes a serious effort to find documents representing *all points of view* on each topic, especially the controversial ones (weapons issues, red-light cameras, the line between child abuse and spanking, etc).





*Nations where current journals are published and are in SafetyLit are indicated by the color green.

SafetyLit offers a way to keep up-to-date on recently published material

In addition to the database of material published in the past, SafetyLit also provides a weekly Update Bulletin that summarizes recently published literature relevant to researchers, practitioners, and policy-makers. Each weekly bulletin contains more than 350 items. Each item is assigned to two or more of 38 categories, (age groupings; recreation and sports; occupational issues; engineering and design issues; laws and enforcement; home and consumer product safety; weapons; interpersonal violence; self-harm and suicide; school issues; disaster preparedness and evacuation; poisoning; economics of injury and safety; alcohol and other drug use; research techniques; program evaluation; and others) for the convenience of SafetyLit readers who may care about only one or two of these topics. The Update Bulletin is available in three formats: a pdf document, a web page, and RSS feeds for each of the 38 categories. The RSS feeds allow readers to immediately see current items as they are added to the SafetyLit system or scheduled to arrive at any interval the reader may desire (from once an hour to once every month).

SafetyLit is widely used as an information resource

The 3,500-plus websites that provide links to SafetyLit.org include more than 900 educational institutions and 212 government agencies world-wide. The SafetyLit website is presented in 17 languages and has regular visitors from 179 of the 193 United Nations member states and from every U.S. state and territory (Figure 3). Most of the 50,000-plus unique visitors (145,000 total visits, 1,200,000 page views) to SafetyLit each month are from local government agencies or private organizations where the costs of searching commercial databases are prohibitive and the knowledge needed to search multiple literature databases is beyond reach. About one-fourth of SafetyLit users visit several times each week.



Figure 3. Nations Originating 5 or More SafetyLit Visitors per Month*

*Nations with fewer than 5 visitors per month are shown in gray.

SafetyLit is a free service

Originally, the task of collecting bibliographic data was left to private enterprise. It is only recently that the U.S. and other governments began providing bibliographic indices at no or nominal cost. These government databases focus upon the *specific interests of the agency*. Each of these has an annual budget ranging from about \$3 million to tens of millions of dollars and employs tens to hundreds of taxpayer-supported personnel. These U.S. federal databases can contain many articles relevant to safety but the database search systems make it very difficult to find them – even for experienced users. There is little if any overlap of contents across these government databases. However, it has

been demonstrated that if a safety-related article is in any one of these US government-supported systems, it is also (or soon will be) included in SafetyLit – and in a way that it may be found by searchers and incorporated into their work. Indeed, SafetyLit uses these databases as a resource for identifying items for inclusion in its own database system. These government databases contribute about 35% of SafetyLit contents. Thus, their existence is instrumental to SafetyLit's success at identifying suitable material. In contrast, it must be noted that SafetyLit regularly provides its records to two of these government-supported bibliographic systems.

There is evidence that information-seekers come to SafetyLit when they suspect that their search results from one of the free U.S. government databases missed important information. A recent Alexa Clickstream report found that, for 8 percent of SafetyLit searchers, the website they visited immediately before reaching SafetyLit was one of the government databases mentioned above.

SafetyLit also draws its contents from many sources that are not included in any of the US government-supported databases. SafetyLit provides, in one place, information about interpersonal violence (gangs, partner violence, child abuse, terrorism), suicide and self-harm, and unintentional injuries from incidents involving traffic crashes, burns at home or at work, poisoning, falls, natural disasters, and recreation. Also included are reports about the risk factors for injuries (such things as alcohol and drug use, engineering and design failures, behavioral problems, etc.); the individual, familial, and societal costs and consequences resulting from injuries to individuals or to communities from natural or man-made disasters; individual and enforcer response to laws and regulations; willingness to respond to calls for evacuation or other action; and other relevant topics.

The SafetyLit database contains records from journals (including non-English ones) that are not in any other database – at least for the short term. As noted above, once the articles are added to SafetyLit they are offered to appropriate government database systems, just as SafetyLit identifies new items from those government systems. For example, in early 2014, SafetyLit obtained copies of the complete back-files of several nineteenth century and early- to mid-twentieth century German-language journals concerning the skills and abilities necessary to operate various machines and vehicles. The article titles and summaries were transcribed, translated into English, and both language versions

added to the SafetyLit database. These records were offered to the U.S. Transportation Research Board for their use in the TRID database.

All SafetyLit services are provided at no cost to the user and are presented without advertising. Keeping SafetyLit without cost and free from influences that could limit its scope or bias its focus is important. Since SafetyLit is a free service, many publishers have provided their material to us without cost. If SafetyLit were to begin charging subscription fees, some of these publisher agreements would be lost and the cost to access this data would be prohibitive.

Commercial databases charge high fees to subscribers but provide added value for searchers by optionally including information about all of the references in each article or all of the later articles that cite the original article itself. This allows their academic users to track back and follow forward to gather more information about the contents of the article. Thus, the strengths of private enterprise and profit-driven innovation cannot be contested. While these extras are indeed useful – particularly for academic report-writing – there remains a need for access to information by those outside the ivory towers of universities and think-tanks. SafetyLit is an index of the literature and provides a path to finding the full text of articles of interest online; to identifying nearby libraries with collections that hold the wanted item; or to allow a local librarian to obtain the articles at no or very low cost (via inter-library loan programs).

Although SafetyLit does not contain the text of materials it indexes, most records contain an abstract or summary of the content. SafetyLit allows a user to know if information about a topic exists. Published products of research transcend professional disciplines, geography, and language. SafetyLit not only brings together the research and policy papers of more than 30 distinct professional disciplines but provides a service not available with most commercial databases — item summaries include a brief "interpretation" of highly technical language or confusing terms used by the authors so that the information can be understood by any reasonably educated English-speaking person anywhere in the world. A very simple example of this would be distinguishing articles about football. An author (forgetting that their article may be read by people across the world) may use the word "football" without any further explanation. SafetyLit will modify the report's summary to clarify if the article is about American football, Association football (soccer), Australian football, Canadian football, or Gaelic football—different games with different rules and equipment and very different risks for injuries. Entering the word "football" (or some other ambiguous term) in the SafetyLit search system will display a query-clarification page that provides a listing of links to the various query topics so that the searcher may avoid paging through hundreds of items that are irrelevant to their needs.

American Football: 696	Futsal (indoor football): 14	
Australian Rules Football: 252	Gaelic Football: 28	
Canadian Football: 10	Rugby: 855	
Flag Football: 13	Soccer: 1140**	

Table 1. Items in SafetyLit with the word "football"	' (total 2862 items)*
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*Number of items does not sum to 2862 because some articles are about more than one of these topics.

**A 'football' query by someone seeking soccer items would miss 690 records without this SafetyLit utility.

Thus, SafetyLit attempts to help its users to find information they need – even when they are only vaguely aware of the nuances of a problem – and may assist with demonstrating that what at first seems to be the troublesome issue is in reality the product of some other greater but more remediable problem. For some, information-seeking is strongly based upon curiosity. These people are willing to devote a great deal of effort to finding all pertinent information before making a decision. However, most people who need information because of time and other constraints follow the *principle of least effort* (Ferrero/Zipf). They do not know the requirements of gathering comprehensive information so they look at only one or two resources. Unless they are looking for their information in SafetyLit, they risk avoiding information from the perspective that can lead to the best solution. Further, searchers can use simple language to identify the items they seek. The SafetyLit system "knows" about synonyms of terms for key topics. Entering *domestic violence* will optionally also find all items containing *intimate partner violence* or any of the other 90+ terms for this concept.

SafetyLit indexes publications on all sides of any issue – particularly controversial ones. We do not attempt to filter out material that any SafetyLit staff or volunteer believes runs counter to science or to their political or social beliefs. To make sound decisions it is necessary to have access to all perspectives on any issue. (See Appendix 3.) To respond to news articles about research findings it is important to be able to quickly find the item that prompted the news piece.

SafetyLit not only is useful for finding information but makes report-writing less tedious

SafetyLit takes pride in simplifying the task of providing references and footnotes when writing reports. The reference formatting requirements often are complex to the point of absurdity (see box to right). Unlike other databases, great care is taken to assure that citation information is complete and in a consistent format that will allow a bibliography to be formed with no (or very little) editing – particularly when reference management software is used.

SafetyLit provides complete metadata for its contents in any of five different standard formats to allow users of any brand of bibliography management software to seamlessly capture reference information with a single click. Authors who use this software to assist their writing have expressed their appreciation for this attention to detail that eliminates most of the tedium of inserting references and formatting a bibliography. For example, the Chicago Manual of Style states:

"Authors' names are normally given as they appear on the title pages of their books or above their articles. Certain adjustments, however, should be made to assist correct identification. First names may be given in full in place of initials. If an author uses his or her given name in one cited book and initials in another (e.g., "Mary L. Jones" versus "M. L. Jones" versus "Mary Jones" versus "Mary Lois Jones" versus "M. Jones"), the same form, preferably the fuller one, should be used in all references to that author. To assist alphabetization, middle initials or names should be given wherever known". [¶14.72] (emphasis added)

There are similar requirements with other citation styles. (See: APA Guideline 6.27.) Without some assistance, it can be all but impossible to follow this requirement.

How is one to know if the M.L. Jones is Mary L. Jones, Michael Lewis Jones, or someone else? For some university professors, this blind attention to following the details of a style guide can make the difference between a passing or a failing grade. For manuscript submission this can be the difference between acceptance and rejection as attention to citation formatting may be used as a gauge of an author's attention to scholarly detail.

SafetyLit provides (or attempts to provide):

• full author names even when the source document only provides initials – we consult multiple sources to verify authorship whenever names are incomplete or ambiguous; and

• standardized source and item title capitalization in "sentence case" to enable reference management software to convert the titles to the format required by the citation style.

SafetyLit history

SafetyLit began in the mid-1990s and was partially supported by the Louisiana Office of Public Health and the US Centers for Disease Control. Later, SafetyLit received support from the US Health Resources and Services Administration, the State and Territorial Injury Prevention Directors Association, the Society for the Advancement of Violence and Injury Research, and several branches of California state government. By and large, these funds were provided for special projects (moving from a weekly email message containing journal article citations to a web format that also includes technical reports books, and dissertations; expanding to include a database of not only current items but older publications as well; the addition of a simple-to-use but nonetheless quite powerful system to search the database) and not for day-to-day administrative costs.

SafetyLit needs

Financial sustainability is a key element for any service provider. Funding has never fully supported all the costs (expert personnel, maintaining and improving a robust web server computer, office staff and expenses). The current system is operated only through the efforts of volunteers and donations to cover the necessary costs. This is not sustainable. This resource should not remain dependent upon a handful of people who, even if willing to work without pay, could become unable to continue due to other obligations, age or infirmity.

SafetyLit is a vital resource. It is proven to be needed and well-utilized. While donations have enabled SafetyLit to mostly cover its ongoing physical (office space, utilities) and basic electronic and web infrastructure costs; the project needs a paid, experienced administrator; experts in relevant subjects; and information system professionals. The SafetyLit search system should be improved to make it even more accessible and user-friendly to non-experts. Funding is also needed to maintain and support improvements to the SafetyLit computers and servers to meet ever increasing demand and to protect against the almost constant malicious attacks that have become common to all websites.

Further information about the SafetyLit Foundation as a non-for-profit organization: Read the GuideStar review of SafetyLit at: <u>http://www.guidestar.org/profile?id=46-3470743</u>

View US IRS 990 tax forms at: <u>http://www.safetylit.org/tax-docs.htm</u>

For an in-depth discussion of information-seeking and injury prevention see, *The information-seeking behaviors* of professionals and information sources in the field of injury prevention and safety promotion; a doctoral thesis at: <u>http://www.safetylit.org/thesaurus/thesis-all.pdf</u> (large file).

The most recent edition of the SafetyLit Weekly Update Bulletin may be found at: <u>http://www.safetylit.org/archive.php</u>

Appendix 1.

SafetyLit Foundation Board of Directors

(All directors serve without compensation)

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Appendix 2.

SafetyLit Science Advisory Committee

(All committee members serve without compensation)

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Appendix 3.

How is SafetyLit content selected?

For SafetyLit content, we focus upon injuries that occur during a short period of time, as opposed to the effects of repeated exposures to chemical agents or cumulative damage from repetitive motions. The SafetyLit vision is to include every article relevant to injury prevention and safety promotion that is published in any journal with text or abstract in English.

SafetyLit includes summaries of reports about injury occurrence and risk factors. Articles are considered relevant if they concern any of the pre-event or event elements of Haddon Matrix model (see below); the epidemiology of injury; or the financial, personal, or societal costs or consequences of the any injury or risk factor. Articles concerning treatment for injuries or complications of medical care are excluded except when the article also contains information on one of the inclusion criteria. SafetyLit also includes reports on other topics that may help a reader to make decisions about research or prevention strategies and priorities.

The criteria for selecting report for inclusion are simple. If the answer to any of the following questions is "yes", then the report is likely to be included:

- Does the report meet the inclusion criteria above?
- Do the SafetyLit reviewers find the report interesting?
- Are SafetyLit readers likely to hear of a report from a colleague and want to respond knowledgeably?
- Are SafetyLit readers likely to be questioned about the report from a member of the population they serve?
- Does the report contain findings that are likely to be used to oppose the actions or recommendations of a SafetyLit reader?

The Haddon Matrix

Developed by William Haddon in 1970, his "phase-factor matrix" was developed to facilitate an assessment of the many things that contribute to injury occurrence and severity. Using this framework, one can then evaluate the relative importance of combinations of contributing factors and use that assessment to design prevention strategies.

Factors → Phases ↓	Personal Factors	Equipment Factors	Physical Environmental Factors	Social Environmental Factors
Pre-event	Driver skills Driver attentiveness	Maintenance of brakes, tires, headlamps, brake lights, etc.	Roadway condition	Attitudes to drink driving, mobile phone use, and speeding
	Sobriety	Windshield cleanliness	Darkness or glare	Use of restraints
Event	Human tolerances to crash forces	Vehicle crashworthiness Energy absorbing design	Presence of fixed objects near roadway Unsecured objects	Enforcement of mandatory seatbelt and child restraint use laws
	Wearing of seatbelts	Airbags	within the vehicle	
Post-event	Crash victims general health status	Petrol tanks designed to minimize likelihood of post- crash fire	Availability of effective emergency response	Public support for trauma care and rehabilitation

Example: A Simple Haddon Matrix For Motor Vehicle Occupant Safety (Selected Risk and Protective Factors)



The mission of SafetyLit (http://www.SafetyLit.org) is to provide a comprehensive, easy-to-use, searchable, Internet-based bibliographic database of scholarly journal articles, technical reports, and theses concerning all issues of safety arising from many professional disciplines and nations. The items will be indexed in a way that access to information by policy-makers, practitioners, researchers, and the general public will not be hindered by obscure professional jargon or arcane search terms.