The Working Group
on DWI System Improvements
dwiwg.tirf.ca

Using Data to Build Road Safety Strategies

This fact sheet was developed to help communities gain understanding about how and why progress reducing impaired driving is or is not being achieved in their communities. It can inform data collection and analysis to guide decision-making about impaired driving strategies aligned with the Safe System Approach (SSA).

The education resources of the Working Group on DWI System Improvements are produced by the **Traffic Injury Research Foundation** with funding from **Anheuser-Busch**. The Working Group on DWI System Improvements is a prestigious coalition of senior leaders of organizations representing frontline professionals in all segments of the criminal DWI system (law enforcement, prosecution, judiciary, supervision, and treatment).

To consider and counter impaired driving as an impediment to road safety, it is necessary to effectively and efficiently collect and analyze data and information that illustrates the role impaired driving plays. This fact sheet, developed with input from a representative group of professionals working in the impaired driving system, describes ways road safety data can be collected and analyzed to guide and support efforts to implement a Safe System Approach (SSA) to roadway safety.

Key Findings

- This fact sheet captures discussion at the 19th Annual meeting of the Working Group[1] on DWI[2] System Improvements which focused on the application of the Safe System Approach (SSA) in the DWI system. Jurisdictions require access to many different sources of data to effectively create and implement a SSA strategy and eliminate impaired driving. Essential data and information sources include collision characteristics, traffic safety performance indicators, social costs statistics, and other prevailing traffic safety culture metrics.

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- Key data and information sources that can inform and guide strategies to address impaired driving are often housed in different agencies. Important sources include state and national road safety agencies and organizations, state and local law enforcement and criminal justice agencies, medical and other treatment providers, toxicology laboratories, advocacy groups, and community organizations.

- It is essential that jurisdictions collect and analyze robust data and information sources which are accurate, complete, consistent, current, relevant, and reliable. At the same time, confidentiality and privacy policies should be associated with data and information sources. Road safety initiatives should be cognizant of how protocols and practices guide what data and information are collected, retained, shared, or disclosed. Most importantly, the use of data should abide by the conditions and credentials by which access and dissemination of data are permitted.

- The Working Group focused on how the elimination of impaired driving deaths can be achieved with the widespread application of the SSA. This fact sheet describes the importance of DWI related data and information to guide this approach, and how jurisdictions can collect and utilize data and information to guide the pursuit of DWI prevention and the use of effective countermeasures.

Introduction

The objective of the SSA is to implement strategies designed to eliminate road deaths and serious injuries of persons using the roads. This strategy stems from a comprehensive understanding of the road system which both anticipates human mistakes and reduces the impact on the human body so collisions can be survived. It argues safety must be considered an ethical imperative among the designers and owners of the transportation system (Federal Highway Administration, 2007).

Six key principles form the basis of SSA:

- Deaths and serious injuries are unacceptable.
- Humans make mistakes.
- Humans are vulnerable.
- Responsibility is shared.
- Safety is proactive.
- Redundancy is crucial.

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SSA aims to achieve zero road deaths by addressing all aspects of safety through the following five pillars that, together, create an all-encompassing philosophy based on multiple layers of protection for road users:

- Safe road users
- Safe vehicles
- Safe speeds
- Safe roads
- Post-crash care

The Working Group on DWI Systems Improvements met on October 4th and 5th, 2022 in Savannah, Georgia. Criminal justice members and several invited guests representing health, engineering, highway safety offices, toxicology and advocacy learned about and discussed the benefits and potential implementation issues associated with an impaired driving strategy based on SSA. Emerging from the discussion of the Working Group's deliberations were a series of potential outputs that could form a toolkit to guide communities in adopting an impaired driving strategy as part of the overall SSA. Similar to the all-encompassing principles and pillars of the SSA, the Working Group recognized that impaired driving is affected by the interface and ever-changing of ecological, emotional, behavioral, genetic, systemic, and engineering factors and, thus, it is impossible to solve with just one solution.

This fact sheet was developed to enable communities to gain insight and understanding into how and why progress is or is not being achieved in reducing impaired driving in their individual communities. It can inform data and information collection and analysis to guide decision-making about strategies to address impaired driving that are aligned with the SSA. Specifically, this fact sheet can assist in guiding communities to create a comprehensive picture of the impaired driving problem in their jurisdiction by examining data and information including, but not limited to, demographics, arrests and convictions, crashes, fatalities and injuries, and toxicology information. It also provides insight into considerations and courses of action related to:

- Which data and information to consider.
- Where to look for data or information.
- Selecting useful data variables.
- Practices that respect privacy, protection, and data and information sharing.

Why is data and information important to support a Safe System Approach?

As used here, data is defined as individual facts, while information is the organization and interpretation of those facts. The two components together can identify and solve problems. Or, put another way, data is a collection of facts, while information puts those facts into context so action can be taken.

- Data is raw and unorganized whereas information is organized.
- Data points are individual and sometimes unrelated compared to information which provides a big-picture view of how it all fits together.

Data and information provide the evidence needed to determine the scope of the impaired driving problem and substantiate how best to deal with it. However, data and information must be valid, complete, consistent, readily accessible, and available in a timely manner. In other words, good data and information enable users to accurately ascertain the extent and characteristics of trends in the impaired driving problem and make decisions about countermeasures to reduce it.

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Data and information also enable legislators, policymakers, administrators, practitioners, and community members to establish priorities regarding which strategies, programs, and policies are most needed and effective, and to allocate resources accordingly. On the other hand, if data and information are incomplete then any analyses can be faulty or misinterpreted, and incorrect conclusions become much more likely. Furthermore, the efficacy of programs and policies in reducing impaired driving is difficult to determine without good data and information. Data and information that is of high-quality, complete, consistent, and timely are required to effectively inform decision-making, set priorities, and measure outcomes.

Reliable and robust data and information are the basis for identifying and understanding where and why DWI system weaknesses are occurring and what strategies might be most effective in eliminating these shortcomings and road deaths. Sound data and information allow for achievable and effective practices and policies to guide resource allocation as well as implementation efforts to close loopholes to ensure drivers are subject to appropriate responses and programs.

As part of the SSA, DWI crashes should not be seen as the result of a single issue; instead they are multidimensional and may be the result of many variables interacting in complex ways. For instance, although a driver's impairment may be considered the primary reason for a crash, secondary causes like vehicle speed, vehicle safety features (or lack thereof), and road conditions also need to be considered. Finding ways to integrate solutions that meet multiple needs is an effectual way of leveraging limited resources. By pinpointing areas that need improvement or suggesting replication, data and information are a necessary and powerful tool to help the DWI system programs and initiatives reduce impaired driving.

> *Practitioners who have access to good data and information tend to have better outcomes (e.g., reduced DWI crashes, improved conviction rates, decreased recidivism), which speaks to the power of possessing complete information.*

What data and information should be collected?

This section lists a wide-ranging, but not complete, list of potential data and information that are important to collect. The types of data and information sought should be aggregated and not contain personally identifiable individual case information. The following types of data and information can help paint a meaningful picture for a SSA to the nature and scope of impaired driving risks, causes, consequences, and solutions. Since there is often a daunting amount of data and information that can be accessed and collected, it is important to predetermine and prioritize those which are most useful and relevant to each impaired driving initiative. These priority data points can enable practitioners to better define, address and support interventions aligned with a SSA strategy and overcome obstacles to success.

Collision data and information (specific to an area, locality, statewide, or national). Possessing comprehensive knowledge of the conditions and characteristics attributed to DWI crashes allows law enforcement agencies to efficaciously apply policies that prudently deploy their workforce and effectively reduce impaired driving. Collecting and analyzing this data and information can help determine and guide the implementation of enforcement efforts to strengthen DWI deterrence (e.g., sobriety checkpoints, multi-jurisdictional enforcement, high visibility enforcement).

- Number of DWI fatalities and injuries

- Number of DWI vehicle collisions
  - Collision factors (e.g., impairment, speeding, distraction, road conditions, seat belt use)
  - Types of vehicles

- High-DWI crash locations, location of last drink consumed and/or high-arrest locations for DWI

- Number of DWI arrests and sources of impairment.

Traffic safety performance indicators related to DWI. To determine how effective efforts have been to reduce DWI fatalities and injuries, comparing the following data and information (either all or prioritized) during fixed time periods and areas will help gauge progress of a strategy or initiative over time.

- Annual number of impaired driving fatalities/injuries + fatalities/injuries per 100,000 population and per vehicle miles traveled (VMT).
  - Arrest data on number of arrests for impaired driving (e.g., licensed driver, age, sex, language, address, last drink location)
  - Prior DWI arrests per arrestee

- Impairing substance(s) identified either alone or in combination.
  - Breath or blood alcohol concentration (BAC) level
  - Percentage of drug tests administered for DWI arrests
  - Drug(s) categories and level
  - Number of test refusals if applicable

- Number and percent of drinking/drugged drivers based on observation (roadside surveys) according to BAC or drug category, together with information about the driver, passengers, trip origin, and destination.

- Number and percent of drinking/drugged drivers based on self-report data gathered through public opinion polls; frequency of the behavior together with estimates about being over the legal limit or feelings of impairment.

- Direct and indirect costs of crashes including repair costs, medical costs, loss of productivity, loss of life/quality of life, investments in education campaigns, and cost-benefit analysis of various sanctions.

System responses to DWI arrests. Data and information that provide a well-defined picture of how DWIs are dealt with from arrest to disposition to completion of a sentence help to determine if there are steps in the system processing of a DWI offender that may raise concerns.

- Pre-stop driving behaviors that are most common in impaired driving arrests.

- Number of administrative license suspensions (ALS) for impaired driving. Also, ALS for driving while suspended for DWI.

- Number and type of plea reductions (e.g., pleas to lesser charges and what those charges are).

- Number of impaired driving convictions (categorized according to plea agreement, guilty plea, conviction at trial) and acquittals.

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- Types of court-ordered sentences categorized by penalty or condition (e.g., fines, screening, probation supervision, ignition interlocks, home electronic alcohol testing/random testing, vehicle impoundment, treatment intervention, incarceration, license suspension, alcohol education, victim impact panel) and recidivism rates associated with each court-ordered condition.

- Number of court-ordered sentences that are successfully completed (i.e., it is important to be aware of the outcomes of sentences that are imposed to determine what conditions are most effective with which types of offenders).

- Results from court-ordered diversion programs (Accelerated Rehabilitative Disposition or first offender diversion) and DWI courts.

Types and number of available countermeasures currently being utilized. For example, prevention, enforcement, DWI courts, probation, treatment, and their use, quality of implementation, program measures, level of oversight, and participation rates.

- Number of encounters with specific countermeasures.

- Number of sobriety checkpoints conducted with the number of drivers stopped, the number tested, and the number positive for alcohol (and at what BAC if available) and/or drugs.

- Other high-visibility enforcement efforts and associated results (e.g., reduction DWIs, speeding, crashes).

- Number of ignition interlocks ordered by the court or licensing agencies and number of ignition interlocks installed.

- Estimates of allocated resources in total and to agencies/organizations for DWI initiatives and countermeasures including funding, staffing, training, and equipment.

- Recidivism – need to create a common definition between agencies (e.g., new arrest, new conviction, supervision violation).

Traffic safety culture in jurisdictions and community organizations. It is also important to collect data and information that provides the scope of the various efforts to understand and address traffic safety issues. Data and information to consider may include:

- Public polling results - regarding attitudes and beliefs of road users towards road safety.

- Level and focus of education and prevention efforts by age of road user.

- Environmental and contextual issues pertaining to the presence and enforcement of alcohol ordinances.

- Number and type of available alternative transportation options within the jurisdiction.

- Engagement and participation of tribal entities in DWI initiatives, discussions, and partnerships.

- Communication and information-sharing mechanisms within and across agencies and practitioners to share and exchange knowledge and experience.

- Available practitioner education and training in key impaired driving issues (e.g., technologies, prevention, treatment, risk of re-offense).

- Staff experience and staff turnover within organizations involved in road safety.

- Total costs to DWI offenders in terms of program and licensing fees and costs, fines, and court costs, trends in relation to costs, and the extent to which offenders can complete court-ordered conditions and the re-licensing process.

Where to find and access data and information

This section contains steps to consider when seeking and collecting data and information with respect to where it is housed, who can permit access, and ways to request access for specific purposes.

Identifying sources of data and information. It is essential that one ascertain what data and information is needed to inform the desired process before initiating the collection of data and information. The various sources and types of available data and information may be voluminous. Some will be amorphous and not helpful. Some will be irrelevant to the needs of the initiative. Therefore, it is important to be specific about needed data and information before approaching the data owners. Determining which agency(s) collects data or information and where it is housed is a necessary next step. Be aware that often multiple agencies may collect similar data or information but perhaps use different definitions or gather it at different levels (i.e., municipal, regional, state). Understanding the similarities and differences between data and information sources is equally important so what is collected may be placed in the appropriate context.

Moreover, each state may rely on different entities to collect data and information, so identifying which agencies possess relevant data may be challenging. The final step is to identify points of contact within the agencies or organizations who oversee and manage their respective information systems.

> *The identification of knowledgeable individuals in each agency can facilitate the process of accessing, collecting, reporting, and analyzing data and information.*

Potential sources of impaired driving data and information may include (individual states and localities may have different monikers):

- U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA) for national data and information
  - Fatality Analysis Reporting System (FARS)
  - National Centers for Statistical Analysis
- State highway safety offices (HSO) for statewide data and information
  - Most states have an impaired driving coordinator with knowledge of programs.
  - HSOs typically provide annual reports containing impaired driving data.
- Law enforcement agencies for collision and arrest data
  - State department of public safety/state patrol
  - Municipal police departments
  - Sheriff departments

- Toxicology labs for data and information on impairing substances
  - State, county, or locally managed laboratories
  - Private laboratories
- Prosecutors' offices for number of different type of charges and plea negotiations
  - Municipal
  - County
  - State
  - Tribal
- Criminal defense attorney organizations
  - Public
  - Private
- Courts for numbers of pretrial releases, convictions, guilty pleas, sentences imposed
  - Municipal
  - County
  - State (Administrative Office of the Courts
  - Tribal
- Corrections for numbers of pretrial detainees and convicted prisoners
  - Jails – municipal or county
  - Prison – state department of corrections or private
- Community supervision services – municipal, county, state, private for numbers of:
  - Pre-trial releasees
  - Diversion clients
  - Probationers
  - Parolees
  - Violation type and recidivism information
- Department of health for trends in alcohol and drug use
  - Local
  - State
  - Tribal

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- Substance abuse and mental health assessment, treatment, and support groups for numbers of DWI clients
  - Private
  - Local or state government operated.
  - Self-help groups like Alcoholics Anonymous and Narcotics Anonymous
- Professional organizations
  - National Association of Drug Court Professionals
  - National Association of DWI Courts
  - National Center for State Courts
  - American Probation and Parole Association
  - Local Bar Association
  - Governors Highway Safety Association
  - United States Conference of Mayors
  - National Sheriffs' Association
  - International Association of Chiefs of Police
  - National Association of Counties
- Advocacy groups
  - Mothers Against Drunk Driving (MADD)
  - Students Against Destructive Decisions (SADD)
  - National Association for the Advancement of Colored People (NAACP)
- Driver licensing agencies for number of license revocations or suspensions
  - State
  - Local
- Medical examiners and/or coroners for toxicology results
  - State
  - Local
- Health care providers
  - Clinics and medical offices
  - Hospitals
- Insurance Institute for Highway Safety

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What are some of the most important data variables to consider?

Variables are specific pieces of information that tell us something about the impaired driving problem, such as demographic data, temporal data, or environmental data. Data is basically raw knowledge and, on its own, does not have any significance or purpose. Data must be put in context and interpreted to have meaning. Data can be simple, and its usefulness is usually limited until it is analyzed, organized, and interpreted. There are two main types of data:

- Quantitative data are provided in numerical form, like the weight, volume, or cost of an item.
- Qualitative data is descriptive, but non-numerical, like the name, sex, or eye color of a person.

For example, a set of data could include impaired driving arrests or crashes in a location over several years. Without any additional context, those readings have no meaning. However, when analyzed and organized into information one could determine time of day, presence of passengers in the vehicle or even broader traffic trends. Only when the data is organized and compiled in a useful way can it provide information that is beneficial.

Data and information maintained by one agency or organization may not use the same terminology as another agency or organization. Therefore, it is important when accessing data and information to define terms that are not commonly known or have multiple meanings or outcomes and create a data dictionary if one does not already exist. Definitions of specific variables or data points need to be understood and merged appropriately to make equitable comparisons. Some examples of variables which may have similar but not necessarily the same definitions across databases include:

- Vehicle, car, or automobile
- Traffic stops reasons
- Pretrial release or released on bail
- Recidivism – new arrest, new conviction, or violation of supervision conditions
- Conviction - guilty plea, court conviction, or jury conviction
- Diversion or stayed sentence
- Parole or supervised release
- AA, out-patient treatment, in-patient treatment, treatment focus (addiction, harm reduction, mental health, drugs and/or alcohol), length of treatment

Why is the quality of data and information important?

The importance of quality data and information cannot be overstated when creating an understandable and useful picture of the strengths and weaknesses of tactics to prevent, detect, and respond to impaired driving.

Find out whether the source of the sought after data or information has established procedures and processes (manual and electronic) to ensure the quality (e.g., accurate, complete, current, verifiable, and reliable) of the data or information collected and maintained. Source of data needs to have similar or consistent reporting and testing/data generation capabilities. Determine if there are reviews of the quality of the data or information it originates, and can they identify data or information that may be inaccurate, incomplete, or unverifiable.

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Failure to maintain appropriate data and information quality protections can result in:

- Harm to individuals.
- Public criticism and loss of confidence in and cooperation with the agency or initiative.
- Lawsuits and liability.
- Limited ability to share information.
- Proliferation of agency databases with inaccurate, out-of-date, or incomplete data.
- Damage to the credibility of agencies or initiatives that act on inaccurate or incomplete data.

As such, knowledge of the strengths and limitations of any dataset is essential information to guide the interpretation and appropriate use of data to support accurate conclusions.

Respecting data and information privacy, protection, and sharing policies

Privacy is a core right protected by federal and state constitutions and expected by citizens. Protecting data and information privacy is a fundamental responsibility of agencies that collect and share personally identifiable data and information. Privacy is more than the right to be left alone or the right to be free from unreasonable searches and seizures or the freedom of association. Privacy also includes the fair gathering, collection, and use of personally identifiable data and information. Privacy policies articulate appropriate gathering and collection of it, and allowable uses for data and information.

Agencies will likely have established and implemented privacy protections policies and practices for the data and information they collect, store, maintain, access, and share. Agencies and their staff are expected to be responsible stewards of the collected personally identifiable data and information and operate with respect for individual privacy and the law. Data and information used for research purposes that enable the identification of individuals requires the approval and oversight of an institutional review board. To avoid the need for an institutional review board to oversee the gathering and analyses of data and information, do not work with any personally identifiable information. It is for these reasons that any endeavor to collect data and information should focus on aggregate data and information that is anonymized thus steering clear of personally identifiable information.

Prior to approaching an agency or organization to access their data and information, be aware of the specific applicable laws relevant to seeking and receiving data and information (e.g., HIPAA or Health Insurance Portability and Accountability Act). Be prepared to clearly explain the reason for the data or information request. It is helpful to learn what data and information may not be sought, retained, shared, or disclosed by the entity (e.g., for reasons of discrimination). Ascertain the conditions and credentials by which access, and disclosure of records retained by the entity will be provided. Determine whether the entity maintains a record of the source of all the data and information collected and shared. It may be wise to develop a memorandum of understanding (MOU) that clearly outlines who owns the data and information, each entities' responsibilities and how the collected data and information will be used. The MOU should also describe how the data will be maintained, and for how long, and its destruction upon completion of the endeavor.

Finally, prior to collecting data and information, examine the privacy implications of data collection, analysis, and sharing of information so that privacy practices and policies to address any vulnerabilities can be designed and implemented. Pilot test the collection process to determine if the data and information is sound and/or if any gaps exist prior to formally collecting, storing, protecting, sharing, and managing.

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Conclusion

Good data are a cornerstone to the successful implementation of an impaired driving strategy based on the SSA. Initiatives developed to effectively address impaired driving using a SSA must be guided by available data and information about impaired driving in each jurisdiction. Equally important, initiatives should engage with individuals who can capably analyze it; and ensure that it is only used in a way that protects privacy concerns. Possessing the essential data and information about the people, places, circumstances, and responses related to the prevention, enforcement, and intervention of impaired driving provides the evidence necessary to ascertain the scale of the problem. It can also inform how to best address the impaired driving issue using a comprehensive plan of multi-agency shareholders to move closer to reaching the goals of zero road deaths.

Footnotes

[1] A coalition of senior leaders of organizations representing frontline professionals in all segments of the criminal DWI system (law enforcement, prosecution, judiciary, supervision, and treatment). The group has been in existence since 2003.

[2] The abbreviation DWI (driving while impaired or intoxicated) is used throughout this report as a convenient descriptive label and to create consistency, even though some states use other terms such as OWI (operating while impaired or intoxicated) or DUI (driving under the influence), and in some states they refer to different levels of offense severity.

To view more fact sheets, or to get more information about alcohol, its effects on driving skills, and impaired driving, visit **dwiwg.tirf.ca**.

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Traffic Injury Research Foundation

The mission of the Traffic Injury Research Foundation (TIRF) is to reduce traffic-related deaths and injuries. TIRF is a national, independent, charitable road safety research institute. Since its inception in 1964, TIRF has become internationally recognized for its accomplishments in a wide range of subject areas related to identifying the causes of road crashes and developing programs and policies to address them effectively.

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