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Guide to Strategic Planning for Environmental Prevention of ATOD Problems Using a Logic Model

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Guide to Strategic Planning for Environmental Prevention of ATOD Problems Using a Logic Model

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This guide is part of a series of community guides and manuals entitled:

Guides for States and Communities in Support of Environmental Prevention of Alcohol, Tobacco and Other Drug Problems

The guides provide instructions to assist States in supporting communities in full implementation and evaluation of the effects of environmental prevention strategies focused on alcohol, tobacco and other drug problems. The guides in this series include the following:

- Guide to Strategic Planning for Environmental Prevention of ATOD Problems Using a Logic Model
- Scientific Evidence for Developing a Local Logic Model On Alcohol-Related Motor Vehicle Crashes: *A Reference Guide for Community Environmental Prevention*
- Scientific Evidence for Developing a Local Logic Model On Underage Drinking: *A Reference Guide for Community Environmental Prevention*
- Collecting Data in Support of a Local Strategic Plan Using a Logic Model: *A Guide for States in Support of Environmental Prevention*
- Using Archival Data to Develop Local Alcohol, Tobacco, and Other Drug Problem Indicators: *Reference Guide for Community Environmental Prevention*

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Contents

KEY TERMINOLOGY USED IN STRATEGIC PLANNING USING A LOGIC MODEL	
ATOD Problem	A recognized harm or event related to alcohol, tobacco or other drug use that is undesired or unacceptable to the community, such as alcohol-related motor vehicle crashes and fatalities or underage drinking.
Causal Model	A diagram of the specific causes or key intermediate variables that interact to produce the defined or target ATOD problem. Used to demonstrate the relationships among such variables as defined by science and as a starting place for a community in the development of a local logic model.
Logic Model	A tool for strategic planning that identifies the ATOD problem that the local prevention effort wishes to reduce, the factors or intermediate variables that have been shown through science to either affect the outcome directly or affect other intermediate variables in the causal model. The logic model also specifies the strategies selected by the community that have been shown to change intermediate variables and the measures to monitor changes in those variables as well as evaluate the effectiveness of the local environmental prevention effort.
Outcome	The specific ATOD problem to be changed through the local environmental prevention effort, such as high risk drinking over the past 30 days, or a consequence of use such as alcohol-related traffic crashes.
Intermediate Variables	Factors that directly or in combination cause or contribute to a problem and that must be changed in order to achieve a prevention outcome.
Indicators (also referred to as measures)	Measurement of an intermediate variable or intervention strategy. There may be more than one indicator for an intermediate variable or strategy. This is especially true if there are concerns about the most valid measurement.
Strategy	An environmental prevention action, such as drinking and driving enforcement, that has been shown through science to change intermediate variables in order to reduce alcohol, tobacco and other drug problems and achieve the desired outcome.
Action Steps	Purposeful and planned meetings, interventions, events and activities by the environmental prevention project to implement one or more specific strategy, e.g., meeting with law enforcement or obtain resources to conduct/increase local drinking and driving enforcement.
Evaluation	Measuring changes in the prevention outcome, intermediate variables and strategies for monitoring the effectiveness of the strategies in changing the intermediate variables, and thus the desired outcome.

Introduction

Every state and community faces the strategic challenges of creating the capacity to reduce the harmful effects of alcohol, tobacco and other drug (ATOD) use, while recognizing changing policy and financial environments and the unique concerns and priorities of each community or region within the state. Environmental prevention of such ATOD problems is focused on the entire community and its population; therefore, this is an example of a public health approach to substance abuse prevention. Thus, the population and its social, cultural, economic and physical environment are considered when developing environmental prevention strategies.

What is the purpose of strategic planning?

What does science know about ATOD problems and effective actions?

How will we know we are successful?

Strategic planning using a logic model provides states and communities an advanced approach to addressing these challenges through environmental prevention. Using a logic model for environmental prevention strategic planning has been found to be the most effective way for a community to design its approach to reducing a community ATOD problem.

A logic model places primary emphasis on a chosen outcome, the best available science or evidence for intervention, and how success is measured, monitored and managed. The logic model also enables communication of progress to community members and leadership. In other words, strategic planning using a logic model provides a community with a comprehensive tool for bringing science into practice.

In addition to placing primary focus on a particular outcome and its measurement, use of a logic model advances strategic planning by utilizing available scientific evidence about the ATOD problem of concern and the expected outcomes. The scientific evidence provides a realistic picture about the problem, that is, about various factors or variables involved in the problem and how they fit together and operate in relation to each other. Using scientific evidence relieves leaders and participants from figuring out how the system works and what actions to take. Leaders and participants can also test their beliefs and experience and increase knowledge based on the scientific evidence.

Further, use of a logic model sets up the capacity to determine the overall effects and the ability to monitor progress and modify actions to increase effects over time. Effects can be documented and communicated to project participants, state and local leadership, and to the community in general.

Finally, a logic model supports the identification of strategies and necessary actions that can be taken and what effect those actions actually have on the problem or outcome.

Thus, a strategic plan for environmental prevention using a logic model identifies the ATOD problem that a community wants to focus on, the intermediate variables or factors that must be changed to achieve that outcome, and the strategies necessary to make changes in those variables. The organizing structure that brings all of these together is a logic model along with a plan for implementation to specify tasks, resources and timelines to be taken by the environmental prevention effort. Further, a management information system is required for monitoring changes over time in the outcome and factors or variables involved in the problem.

Strategic planning using a logic model requires looking beyond one's past experience and beliefs about what works or what one is typically praised for doing.

Prevention based on science means going beyond the past.

This guide is for states and communities building a logic model as the key ingredient in the process of strategic planning for a community. Several companion guides, listed in the front of this document, provide the scientific evidence about ATOD problems as well as strategies and measures to gauge success in environmental and population-based prevention strategies.

The strategic planning process described in this guide begins with a specific defined outcome or problem that the community wants to reduce or eliminate. Once defined the rest of the steps in planning and management follow and form a dynamic feedback loop that enables a community to monitor and to modify its prevention effort over time in order to increase overall and ongoing effectiveness.

Application to New or Existing Community Prevention Efforts

While this process is defined as though the community is just beginning its strategic planning, in practice this set of steps can be applied to either a new or an existing community prevention effort wishing to obtain the management and effectiveness benefits that can result. There is no reason that any existing local logic model and thus strategic plan cannot be converted using the process described below. While the process is not totally foreign, this process takes new or existing efforts to a refined level of environmental prevention.

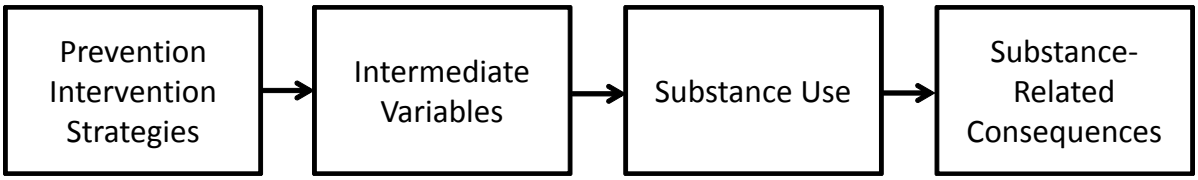
All that is necessary for an existing project is the willingness of the local prevention effort to be open to transforming their current strategic plan and its elements into a more science-grounded form that specifies local data necessary to be collected in order to monitor community changes and the ability to make adjustments in the elements of the strategic plan as needed.

The natural benefits of such a transformation is a logic model that 1) makes clear the outcome, the key intermediate variables related to the outcome, and the associated prevention strategies; 2) enables the comparison of the current logic model to scientific evidence of effects; and 3) can make dynamic adjustments over time.

Using a Logic Model for Environmental Prevention

A logic model is a dynamic means to document substance use and related problems, the desired outcome, the set of variables and their relationships that affect consumption, and the strategies to affect the variables. A logic model is shown most often as a diagram or **causal model** such as the basic one below.

Basic Causal Model



This basic causal model clearly illustrates a significant point: ***Prevention intervention strategies rarely change a problem or desired outcome directly***. Rather, intermediate variables interact to produce the outcome. Thus, a logic model first reflects the best scientific evidence about intermediate variables and their relationship to the outcome and/or other key intermediate variables. Strategies are used to affect the intermediate variables through environmental prevention actions for which there is evidence of effectiveness – that is, actually able to create changes in one or more intermediate variables and thus the selected outcome.

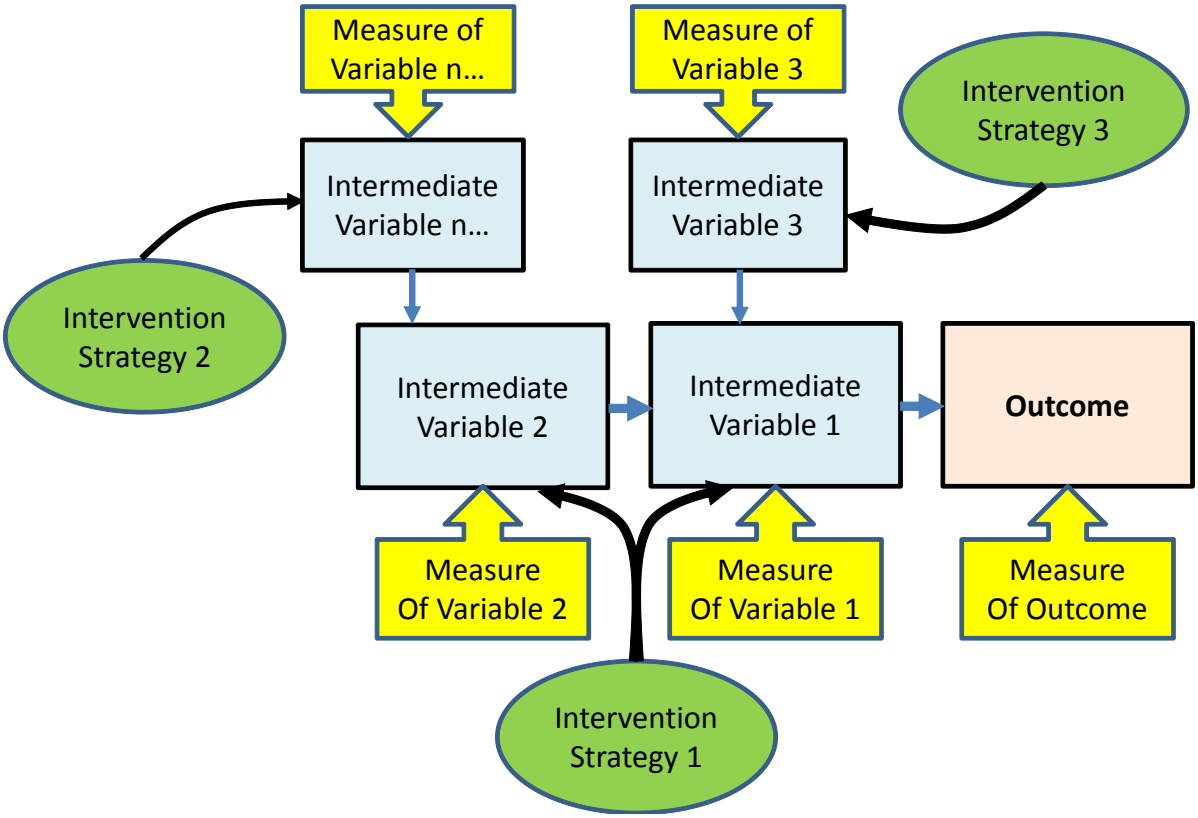
For example, underage drinking has been shown to be related to such intermediate variables as alcohol price, retail availability of alcohol to underage persons, and social availability of alcohol to underage persons. Changes in these intermediate variables through environmental prevention strategies have been shown to lower underage drinking.

In summary, a logic model is a combination of:

- A causal model that identifies the key intermediate variables that empirically explain a specific problem or outcome based on existing scientific research or theory.
- Specification of the relationships among intermediate variables and to the problem or outcome.
- The environmental prevention strategies that have scientific evidence of effect on the intermediate variables at the population or community-wide level.
- Measures of changes in each intermediate variable and the desired outcome.
- Activities of implementation may also be included in a logic model.

The template of a logic model shown below is designed to assist the community in the strategic planning process. Its use is explained in this guide. This template is available to communities in a format that can be manipulated as needed.

Logic Model Template



Preparing for a Local Strategic Planning Process

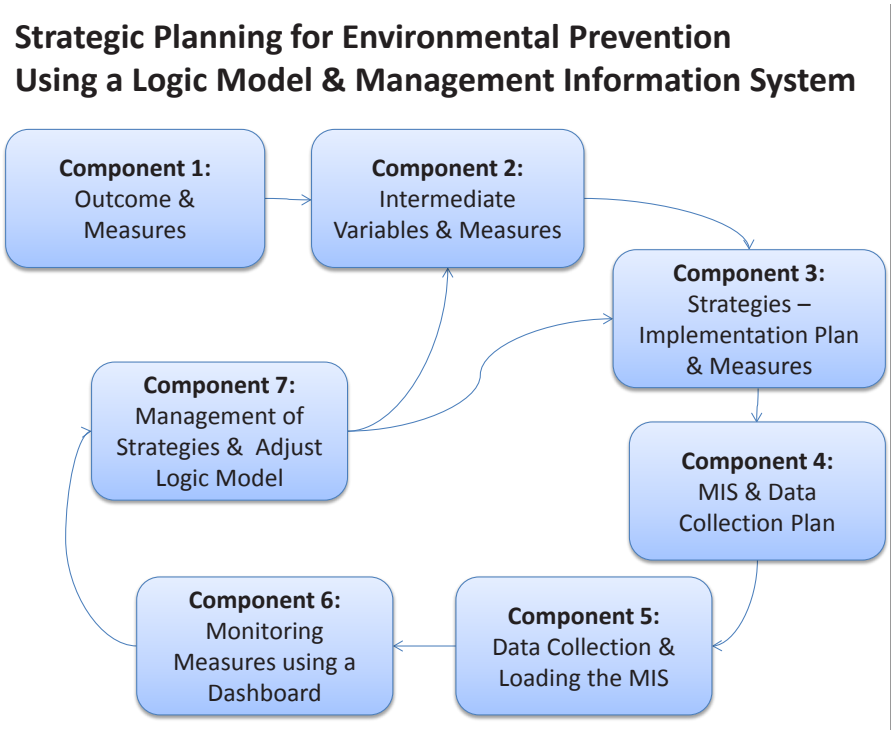
There are a number of actions and agreements necessary prior to or at the beginning of the strategic planning process. These actions might include:

- Provision of training on strategic planning using a logic model to the state substance abuse prevention staff and to members of the local staff and community coalition, staff of existing projects, and other interested parties to understand the process and commitment.
- Local support and/or approval of undertaking an environmental prevention effort that might include local agencies for substance abuse, public health, juvenile justice, law enforcement, and the city council and/or county commissioners.
- Designation of the oversight and management responsibilities for the effort.
- Agreements on participants' roles and responsibilities in undertaking such an effort.
- Technical assistance secured from the State substance abuse agency and consultants.

Once agreements for these activities have been reached, the strategic planning process using a logic model is ready to begin. The components of the process of strategic planning using a logic model are described in the following chapters.

Strategic Planning for Environmental Prevention: Seven Key Components

The process of strategic planning for environmental prevention using a logic model involves seven key components. This process is illustrated below. The process allows for incorporating new learning such that the local environmental prevention effort becomes more effective over time. Note that movement through all seven components may result in adjustment in chosen strategies and how they are implemented and even in the selected key intermediate variables and how they are measured. This process requires the use of two additional tools – a management information system (MIS) and a dashboard for reporting progress and effects. Each component is described briefly here and in more detail in the following chapters and accompanying guides.



The drawing above illustrates that this seven component approach to strategic planning is dynamic – that is, the entire process when regularly applied by local prevention staff and coalitions is never "final" depending upon the actual local results achieved. Secondly, the Seven Component Strategic Planning approach establishes a requirement for specification of local data that are organized in a management information system (MIS) and that must be collected regularly in support of monitoring and modifying (M&M) any strategic plan.

Certainly, such an approach is not "new" to substance abuse prevention but in this case, specific tools and techniques are defined and illustrated in support of the use of local data and regular assessment of the environmental prevention effort over time. No strategic plan is fixed in this process but is regularly assessed using local data and modified as necessary.

Component 1: Outcome & Measures

Identifying the specific substance abuse problem as the population level Outcome that the community wishes to address via the local environmental prevention effort and how that outcome is to be measured in order to determine effectiveness.

The identified outcome, for example, "underage drinking" or "alcohol-involved traffic crashes" is selected uniquely by each community. Therefore, this component defines the specific local outcome that is targeted and identifies the specific measure (or measures) to be used as relevant for that community in evaluating effectiveness. In addition to local needs or priorities based upon epidemiological data, the selected outcome may be based on requirements of the state and/or a grant to the community. The outcome may be further specified to focus, for example, on reduction of frequency of underage drinking or high volume of drinking among youth or reduction of alcohol-involved harm such as vehicle crashes and fatalities.

One or more measures of the outcome are selected by the community. Help in selecting outcome measures can be found in the accompanying guide entitled:

> *Using Archival Data to Develop Local Alcohol, Tobacco, and Other Drug Problem Indicators: Reference Guide for Community Environmental Prevention*

Component 2: Logic Model with Key Intermediate Variables & Measures

Utilizing scientific evidence to begin construction of a local logic model composed of key intermediate variables and their measurement that science has shown as important to reducing the specific outcome.

This component of strategic planning results in the initial logic model that relates key intermediate variables known through science to the outcome selected in Component 1. Research has shown that changes in intermediate variables produce changes in the outcome. Again, prevention activities do not change an outcome directly but rather change key intermediate variables that yield the outcome.

A requirement of this component is intensive use of the best available scientific evidence. Two science guides that summarize the best available evidence about alcohol-related motor vehicle crashes and underage drinking as outcomes in an environmental prevention effort are:

> *Scientific Evidence for Developing a Local Logic Model on Alcohol-Related Motor Vehicle Crashes: A Reference Guide for Community Environmental Prevention*

> *Scientific Evidence for Developing a Local Logic Model on Underage Drinking: A Reference Guide for Community Environmental Prevention*

For other outcomes and/or alternative sources of data about these outcomes, check published scientific journals as well as the website of the federal Centers for Disease Control and Prevention.

This component of the process clarifies the differences between the outcome and its measure(s) and the key intermediate variables and their measurement. One or more indicators can be selected for measuring changes in each intermediate variable as outlined in the scientific guide entitled:

> *Collecting Data in Support of a Local Strategic Plan Using a Logic Model: A Guide for States in Support of Environmental Prevention*

Component 3: Logic Model with Evidence-based Strategies

Utilizing scientific evidence to include in the local logic model and to implement strategies that have the potential to affect the key intermediate variables and their measurement.

Using the best available scientific evidence, this component involves review and selection of environmental strategies that have been demonstrated by research to directly impact the key intermediate variables. Again, strategies do not affect the outcome directly, but affect intermediate variables already designated in the logic model, which in turn impact the outcome. These strategies are included in the logic model. One or more measures or indicators are chosen to monitor the frequency and strength of each prevention strategy as described in the data collection guide listed above. The implementation plan is defined with detailed action steps and schedules for each strategy to enable immediate operations. Implementation begins at the end of Component 3 with priority given to earliest action steps as well as collection of necessary local data.

Component 4: Management Information System (MIS) and Data Collection Plan

Constructing a Management Information System (MIS) based upon the local Logic Model and developing a plan for data collection.

The MIS and the data collection plan are constructed to be ready for actual data entry. Both are based on the specific indicators as defined in previous components of this process. That is, the MIS should contain each of the indicators or measures for the outcome, intermediate variables and strategies reflected on the local logic model.

In practice, any community utilizing this approach to strategic planning and management will need a plan for obtaining and collecting the necessary data on a regular basis. Instructions for alternative approaches to obtaining and collecting the local and archival data specified in the logic model are provided in the data collection guide:

> *Collecting Data in Support of a Local Strategic Plan Using a Logic Model: A Guide for States in Support of Environmental Prevention*

Component 5: Collecting Data and Loading the MIS

Collecting the required data and loading, maintaining and updating the local management information system (MIS).

This is an ongoing process in which a variety of data sources are utilized depending on what and when data are available and the resources available to the community to collect data. Data collection and entry follow the data collection plan developed in Component 4.

Component 6: Monitoring Measures Using a Dashboard

Developing and utilizing a Dashboard based on the MIS to monitor measures of the outcome, intermediate variables and strategies.

Data from the local MIS is displayed in a dashboard for use by the decision makers among members of local prevention management, staff and community coalition to determine the effectiveness, strengths and limitations of current environmental work. A dashboard is a tool for displaying data in a user-friendly format. Time series data analysis can be successfully used to demonstrate the overall effectiveness of a local environmental prevention effort and the contributions of strategies and intermediate variables.

Component 7: Managing Strategies and Adjusting the Logic Model

Making decisions based on the data to manage strategies and adjust the local model to increase effectiveness of the prevention effort.

This component requires skill in making decisions to modify and manage strategies by type and intensity based on data from the MIS and displayed in the dashboard. Further, modification may be made in the logic model itself as needed based upon these decisions. This leads back to either or both components 2 and 3 to continue use of the logic model as a living document and to keep the strategic planning process in active status.

Each of these components is described in greater detail in the following chapters.

A logic model for planning substance abuse prevention is hardly new. What is new in this guide is the intentional use of science and of specific tools and techniques to support a dynamic local effort. Such environmental prevention utilizes local data to assess, manage, and modify community efforts to increase effectiveness over time. In other words, a logic model is not an end in itself and a strategic plan is never final but updated regularly to increase effectiveness!

Component 1: The ATOD Outcome and Measure

Identifying the specific substance abuse problem as the population level Outcome that the community wishes to address via the local environmental prevention effort and how that outcome is to be measured in order to determine effectiveness.

The strategic planning process using a logic model first focuses on identifying the alcohol, tobacco and other drug (ATOD) problem that is to be the target of the local environmental prevention effort. Candidate problems are best identified through the use of data that describe local incidence and prevalence of ATOD events. Thus, local data about the extent of any problem can be used to establish priorities.

Selection of the target outcome for environmental prevention is a combination of the best local data and the priorities and concerns of the community about such problems as motor vehicle crashes, violence, death, underage drinking, drug use, addiction, tobacco use, or some other substance related consequence.

Examples of ATOD Problems

- Alcohol-related motor vehicle crashes
- Injuries and fatalities
- Underage drinking
- Public Violence and assault
- Domestic violence
- Overdosing on drugs
- Prescription drug abuse
- Tobacco use
- Drinking and driving

Remember environmental prevention is focused on the entire community population and seeks to make changes in the overall system. Therefore, strategic planning begins with the community's selection of one population level outcome that becomes the target of an environmental prevention effort. The selection process may occur through an existing task force, leadership from the local substance abuse agency, and/or input from various groups in the community including political leaders, all of whom have a valid perspective and role. Additionally, state ATOD prevention staff can provide technical support during the entire process.

Selecting one outcome focuses community attention and resources. This increases the likelihood that the local environmental prevention effort will be effective.

As an example for this guide, when deciding where to focus an environmental prevention effort, a hypothetical community named "Community ABC" might use local data to compare two concerns: (1) the number of fatalities among youth under age 21 due to motor vehicle crashes, and (2) the number of all alcohol-related motor vehicle crashes. In this example, if the number of fatalities of young drivers who have been drinking has increased significantly during recent times, that may be the greater concern for Community ABC to select the following outcome.

Reduce the number of alcohol-related motor vehicle crashes, fatalities and injuries among young people (ages 16-25) who drive after drinking.

However, if the number of crashes by all ages is significantly greater than the number of fatalities of young people, the community may want to invest its resources on the broader issue as the outcome for its environmental prevention effort.

Reduce the number of alcohol-related motor vehicle crashes among all drivers.

Other criteria affecting the choice may be requirements of a source of funding, who will manage the prevention project, or involvement of existing community ATOD projects and/or coalitions as part of the strategic plan and logic model.

While the 7-component approach begins with a specific outcome to be impacted with a local environmental effort (as though a community was just beginning its prevention planning), the same process could be utilized to revise, revamp and modify any existing local prevention effort as long as each of the seven components are implemented as described in this guide.

Once selected, the outcome must be described both conceptually and operationally.

- A **conceptual definition** is a description of the selected outcome that provides the rationale underlying its selection for purposes of communication to the general community, to city/county commissioners, to state legislators, and/or to funding sources.
- An **operational definition** describes the method for measuring changes in the outcome for purposes of internal monitoring, management, and evaluation.

Measuring the Outcome

As defined earlier, an outcome is a specific variable that is to be changed by an environmental prevention effort such as high risk drinking over the past 30 days or a consequence of such use such as alcohol-related traffic crashes.

By specifying the measurement of the outcome (the operational definition), the local prevention effort is able to document and evaluate changes over time. Thus, a valid and reliable measure of a prevention targeted outcome is necessary to provide accurate determination of changes in the outcome variable and the ability to attribute any changes to the prevention effort itself – that is, ruling out other explanations or factors.

Typically in research, an effect is attributed to comparison of a baseline measure prior to prevention implementation and following implementation – that is, pre and post measures. Such measures are traditionally used in experiments. This design has a number of limitations in practical prevention evaluation; so, if possible, longitudinal measures of the outcome are preferable.

An example of a **pre-post measure** might be a classroom in which a measure of students' alcohol and other drug use is determined through a survey prior to participating in a prevention curriculum about such drugs. This would be the pre-test measure. Following the curriculum, the same survey questions are asked of the students as the post-test measure to determine the effect of the program. Do students report lower or higher use of alcohol and other drugs?

Alternatively, a **longitudinal measure** is a series of data points collected over time, such as annually, every six months, or monthly. Such measures enable the monitoring of changes or patterns of reported alcohol and drug use over time and the consideration of naturally occurring events. For example, heavy drinking over the Christmas and New Year's holidays can result in higher numbers of those reporting such use and increased consequences of use such as alcohol-involved traffic crashes. This is often called **seasonal variation** that typically occurs every year during this time period.

In addition, outcomes can have trends that increase or decrease over time independent of seasonal influences. For example, alcohol-involved traffic crashes might decline over time due to higher gas prices or due to increased unemployment, either of which might result in people driving less. Therefore, it is possible to conclude an effect in error using pre- and post-measures if either occur during a seasonal variation or independent occurrences such as a natural downturn in longitudinal data.

Outcomes and their measures for ATOD problems can include either or both of the following:

- **Consumption and High Risk Use:** Patterns of ATOD use including initiation (first use), regular or typical use, and/or high risk use (amount, frequency, and situation/settings of use).

- **Social, Health, and Safety Problems Associated with ATOD Use:** Outcomes including mortality and morbidity or undesired events for which one or more ATOD substance is clearly or consistently involved. While specific ATOD use may not be the single cause of a societal problem, it can often be a significant contributor. To use a social, health, or safety outcome as a target of change, there must be scientific evidence supporting a causal link from ATOD use as a contributing factor to the problem.

One or more measures of the outcome are selected by the community. Help in selecting outcome measures that can be derived from archival data, which is typically collected and stored by state agencies or departments, can be found in the accompanying guide entitled:

> *Using Archival Data to Develop Local Alcohol, Tobacco, and Other Drug Problem Indicators: Reference Guide for Community Environmental Prevention*

As that guide indicates, the use of historical data that covers several years informs the community about local patterns of the problem or outcome over a long term, perhaps showing upward or downward trends or seasonal variations, as well as recent trends. The State agency responsible for ATOD problems can be instrumental in obtaining such archival data from the appropriate state agencies for a community's use.

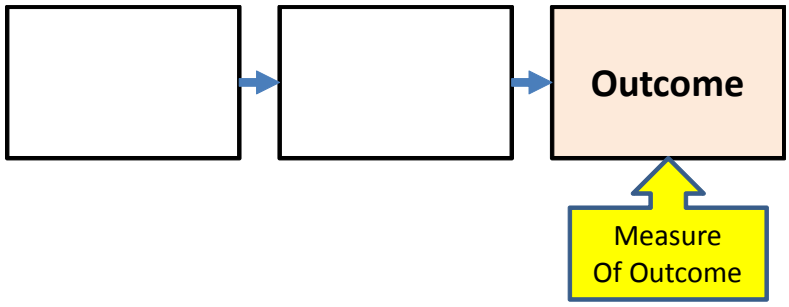
The most significant standard for measuring local environmental prevention effects is to utilize the same outcome indicator over time in a consistent and unchanging fashion. This enables the local effort to assess if the outcome is changing over time and if this change is the result of prevention strategies implemented. In practice, using more than one indicator for the outcome and each key intermediate variable can increase confidence in attributing any observed outcome changes to the local environmental prevention effort.

Initially, in Component 1, local archival data can be used to determine the extent of a problem or to compare the severity of two or more problems to support final outcome choice. However, such data are used **before** a final selection of the target outcome is completed or a logic model specified. Once the final targeted outcome and its measure are selected, ***local*** data are collected and entered into the local management information system (MIS) and updated overtime in order to monitor changes in the outcome over time.

In short, using local data to determine the extent of substance abuse problems is not the same as utilizing local data to monitor changes in the selected outcome over time.

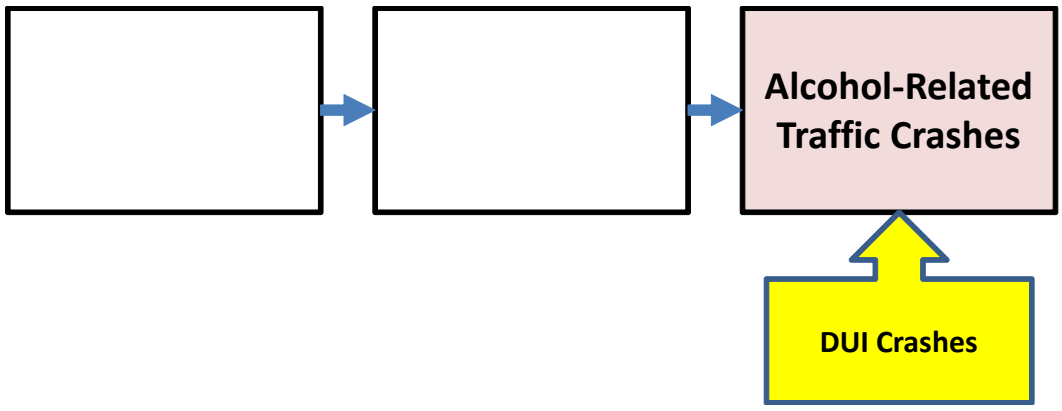
Display of the Logic Model

At this point in the planning process, the community's logic model will display the outcome and its measure. The logic model addresses the questions: What do we want to accomplish? How will we know we have been successful?



Consider for this illustration that Community ABC selects "reduction of alcohol-involved traffic crashes" as its outcome based upon a review of the local data concerning the frequency and level of such crashes, as well as a community agreement that this is a serious and unacceptable problem.

Thus, Community ABC's logic model might look like this as a result of Component 1:



In this illustration, after reviewing archival data for alternative measurements of its target outcome, the community selects "all DUI crashes" as a way to measure changes in the outcome. Of course, other measures may also be selected including "single vehicle night time crashes" or "alcohol-involved crashes based upon police officer reports". In any case, the community seeks a reduction in the number of such crashes as a result of the environmental prevention effort and uses the measure(s) as the means to determine if the change is associated with that effort.

Construction of the logic model can be accomplished by utilizing software entitled DoView[1] or a similar paper version. Examples of each are shown in the appendices.

Summary

In summary, a single, identified outcome is selected uniquely by each community. This one outcome is the specific local ATOD problem that the community chooses to reduce through a targeted environmental prevention effort based on community concerns and historical data. The selection of the first or top priority enables strategic planning to be focused and increases ability to have real effects. One or more measures of local data are selected to monitor the effectiveness of the prevention effort over time.

Experience shows it is most effective to focus on one outcome and to do it well. If a second or third ATOD problem is also important, the most effective approach is to create an additional strategic plan using a logic model for each clearly defined ATOD problem.

The next component in the strategic planning process is identification of the intermediate variables known by science to affect the selected outcome.

1. http://www.doview.com/

Component 2: Intermediate Variables and Measures

Utilizing scientific evidence to begin construction of a local logic model composed of key intermediate variables and their measurement that science has shown as important to reducing the specific outcome.

Once the community has identified an ATOD outcome as its priority, the strategic planning process using a logic model requires identification of the factors in the community that contribute to or cause the problem. These factors are known as the **intermediate variables** that affect the specific outcome.

Identification of these intermediate variables is greatly facilitated by use of the companion guides that provide summaries of scientific evidence regarding environmental prevention for underage drinking and for alcohol-related motor vehicle crashes. Guides concerning other ATOD problems are under development. See:

Scientific Evidence for Developing a Local Logic Model on Alcohol-Related Motor Vehicle Crashes: A Reference Guide for Community Environmental Prevention

Scientific Evidence for Developing a Local Logic Model on Underage Drinking: A Reference Guide for Community Environmental Prevention

In identifying the key intermediate variables for the community's logic model, **emphasis must be given to those variables that have evidence from published research in scientific journals**. These intermediate variables have been defined through science as directly affecting the outcome or as interacting with other key variables that directly affect the outcome. In other words, intermediate variables are candidates to be increased (such as perceived risk of arrest or enforcement of alcohol sales and service regulations pertaining to underage persons) or decreased (such as driving after drinking). Making desired changes in such intermediate variables can in turn contribute to reducing the targeted ATOD outcome.

According to the ATOD outcome chosen, the community can start with the generic logic model shown in the appropriate science guide listed above and then either develop that model for the particular community and possibly prune away what is not appropriate for the community.

For example, **Drinking** and **Driving after Drinking** are the key intermediate variables that result in the problem **Alcohol-Related Motor Vehicle Crashes**.

If a community's goal is to reduce the number of alcohol-related motor vehicle crashes, the level of at least one of these intermediate variables must be changed. How can this occur? Scientific research has identified other related intermediate variables and determined their relationships to each other and to the overall effectiveness in reducing crashes.

As shown in the figure, key intermediate variables that strongly affect **Drinking** are **Price**, **Alcohol Serving & Sales Practices**, and **Retail Availability**. A community needs information about these variables to determine the current status and significance of these variables locally. What is the availability of alcohol? How can it be obtained? What are the regulations? Are they enforced? If so, how often?

Likewise, science has determined that **Perceived Risk of DUI Arrest** has a strong effect on **Driving after Drinking** and thus on the outcome **Alcohol-Related Motor Vehicle Crashes**.

Measuring Intermediate Variables

Local data are essential for an environmental prevention effort to determine changes in the intermediate variables that are locally relevant and that show effectiveness over time of the intervention strategies, and ultimately changes in the selected outcome.

> Use caution in choosing data just because it is readily available or counting things just because you can.
>
> Such "low hanging fruit" are rarely accurate measures of or sensitive to changes in intermediate variables.

What do we need to know? Are key intermediate variables moving in the right direction? The selection of such indicators or measures must be made carefully and must answer the following questions:

- Is the measure accurate?
- Is it sensitive enough to detect change?

Guidance and relevant suggested measures can be selected from the following companion guide.

Collecting Data in Support of a Local Strategic Plan Using a Logic Model

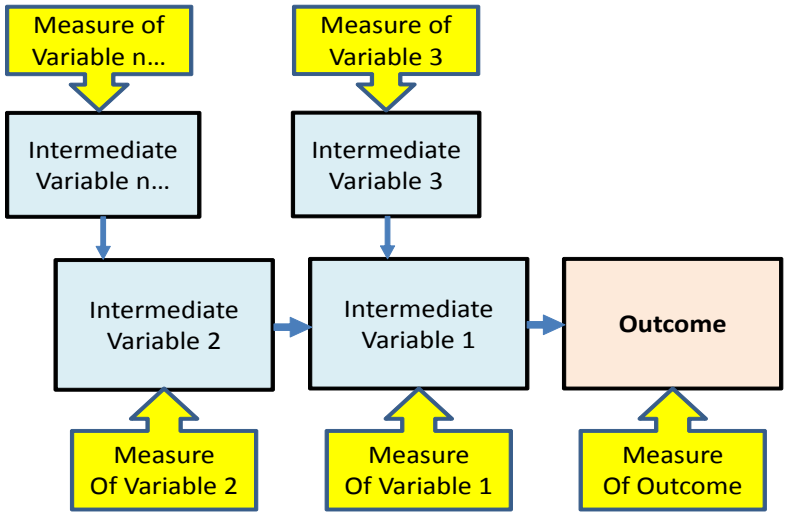
That guide is organized to provide alternatives for measuring each intermediate variable based on science. It is useful for both State and local prevention staff in providing and developing technical capacity for the local prevention effort.

Continuing the example of "alcohol-related motor vehicle crashes", the indicators or measures that might be selected from the guide on collecting data are as follows.

INTERMEDIATE VARIABLES	MEASURES
Level of Drinking and Driving	Drivers stopped at roadside checkpoints (or enforcement stops) who had been drinking, i.e., BAC > 0.0
Heavy Drinking	Self-reported heavy drinking (3+ drinks) prior to driving over past 30 days
Perceived Risk of DUI Arrest	Self-reported perception of risk of DUI arrest
Alcohol Serving & Sales Practices	Over-serving of alcohol in bars and restaurants

Display of the Logic Model with Intermediate Variables & Measures

The logic model template shown below now contains that information in addition to the outcome and its measure. Note that there can be more than one indicator or measure for each intermediate variable although this illustration does not demonstrate that possibility.

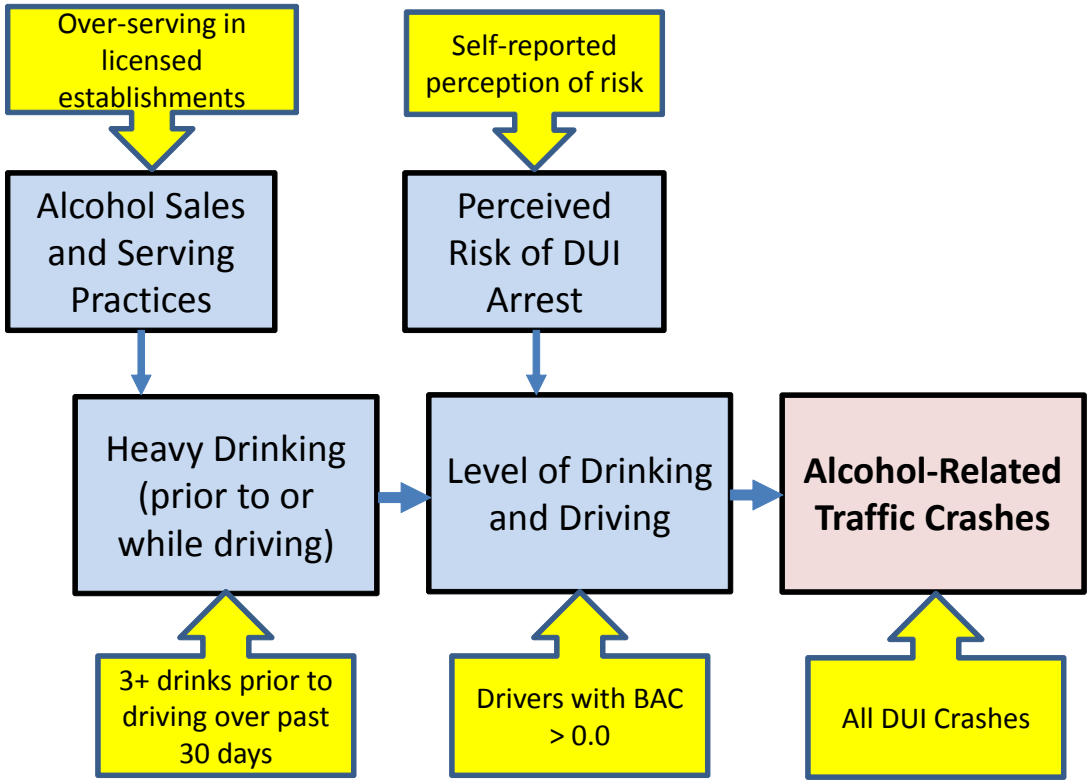


Notice that arrows link intermediate variables having a documented relationship based on science and the thickness of the arrows indicate the relative strength of those relationships based on science and the effectiveness of changing the outcome.

Most of the variables related to either underage drinking or alcohol-related motor vehicle crashes (see causal models in their respective guides) are shown with at least a solid line. A few have a theo-

retical rationale for inclusion but currently with no empirical research to confirm, so are shown with dotted lines. If there is no evidence of effect on either population-level underage drinking or crashes or on other key intermediate variables, then it is indicated by a thin line. This is also true for noting the effect of environmental prevention strategies on intermediate variables as well.

Continuing the illustration of "alcohol-related traffic crashes", Community ABC's logic model might now show:



Summary

Completion of this strategic planning component results in the selection of the intermediate variables and their measures that are of particular interest to the community. A major requirement for the successful execution of this component is the intensive use of the science guide related to the community's ATOD outcome. Remember that the changes in these intermediate variables are what produce change in the outcome.

A community is now ready to select strategies that are science-based and have the ability to effect change in the intermediate variables. This is discussed in the next chapter.

Component 3: Evidence-Based Strategies

Utilizing scientific evidence to include in the local logic model and to implement strategies that have the potential to affect the key intermediate variables and their measurement.

Further development of the logic model incorporates the local selection of the preferred strategies based upon the best available scientific evidence and fit to the local situation. Evidence concerning the effectiveness of strategies is presented in the companion science guides addressing alcohol-related motor vehicle crashes or underage drinking.

The task is now to review the research evidence concerning the various strategies, interventions, policies, programs, and other actions that have been shown capable of affecting each intermediate variable selected by the community in Component 2. This continues to rely on the fact that purposeful changes in an intermediate variable can affect the ATOD problem.

The community may encounter significant decisions at this point in selecting strategies that contribute to the overall success of the environmental prevention effort. The community must also be aware of State laws; for example some states restrict the use of DUI checkpoints. One possibility is to identify strategies previously demonstrated by science to be effective that are new to the community yet are practically possible within available resources and community acceptance. Another possibility is to identify existing programs that are directed toward the same outcome. In this case, it would be practically valuable to seek integration of the logic models in order to increase effects for the community. In this process, it might be useful to prune or eliminate existing strategies that have no or weak evidence of effectiveness based on science.

Whether prevention strategies selected are new for the community or currently exist or both, it is important to determine how each fits within the logic model given the chosen outcome and intermediate variables.

Which intermediate variable does each strategy affect?

What is the current strength or "dosage" of its implementation?

Long-Term versus Short-Term Strategic Planning

While in practice strategic plans often cover several years and include a great many intermediate variables and strategies, the Seven Component Strategic Planning process described here expects that the plan using a logic model may well be modified over time in order to increase effectiveness. Within this process, it is certainly possible for a strategic plan implemented in the first year of an environmental prevention project to be different in subsequent years as a result of strategic plan modification or adjustment– that is, as already noted, to be ***dynamic*** over time.

The community may want to include everything in the logic model that it believes must be accomplished. Often such local strategic plans specify a large number of strategies. Such local plans often are considered "comprehensive" and "good" for a community.

However, science and prevention practice have demonstrated that while no strategy or intervention is likely to be "bad" or "undesired", all local prevention strategies implemented or supported consume resources including staff time, money, and community support. Thus Strategy A in practice actually competes for scarce prevention resources with Strategies B and C. As each strategy is implemented, other strategies have access to fewer resources for implementation and opportunity to be effective.

In this situation, it may be important to have a long-term logic model that includes a large number of intermediate variables and strategies that address a wide variety of concerns and activities. Yet, implementing that whole plan in one year is likely impossible and perhaps practically undesirable. Thus, it may be essential for a community to establish a long-term logic model that specifies the overall intention of the coalition, and a short-term logic model capable of being implemented within the first year and within resources currently available.

This guide recommends to avoid "letting 1,000 flowers bloom" since **more is not necessarily better**. A realistic strategic plan that is doable increases the potential for success and the community is set up to succeed from the beginning.

Build upon success.

A realistic short-term logic model would reflect what is possible to actually be implemented within the time frame, rather than some "ideal" that is beyond local capability. Research has demonstrated that doing a few potentially effective strategies very well has a better chance of actually achieving real effects – that is actually reducing the target outcome. Implementing a few strategies in an effective way and with sufficient intensity or "dosage" is better than attempting to do many strategies that lack sufficient intensity or are impractical to implement although they might look good on paper and in "comprehensive" strategic plans to funders.

The short-term strategic plan using a logic model focuses resources on current priorities, that is, the most significant strategies for immediate implementation to enable early successes for the community with the chosen outcome. In following years, the dynamic logic model may involve implementation of additional strategies if additional resources are available and added effects are required.

Continuing the example of Community ABC that selected "alcohol-related motor vehicle crashes" as the outcome in Component 1 and four intermediate variables in Component 2, the local prevention effort reviews strategies and available scientific evidence as described in:

> *Scientific Evidence for Developing a Local Logic Model on Alcohol-Related Motor Vehicle Crashes: A Reference Guide for Community Environmental Prevention*

Using the scientific guidance and considering the local situation, Community ABC might select four strategies such as those shown in the following table that have been demonstrated to directly affect the selected intermediate variables. Strength of effectiveness per science is shown by the number of stars (with *** being the strongest).

INTERMEDIATE VARIABLES	STRATEGIES
Alcohol Sales and Serving Practices	Police Enforcement Visits to Licensed Establishments **
Alcohol Sales and Serving Practices	Responsible Beverage Server Training ***
Perceived Risk of DUI Arrest	Frequent and Visible DUI Enforcement ***
Perceived Risk of DUI Arrest & Heavy Drinking	Local News Concerning Drinking and Driving Enforcement ***

Measuring Strategies

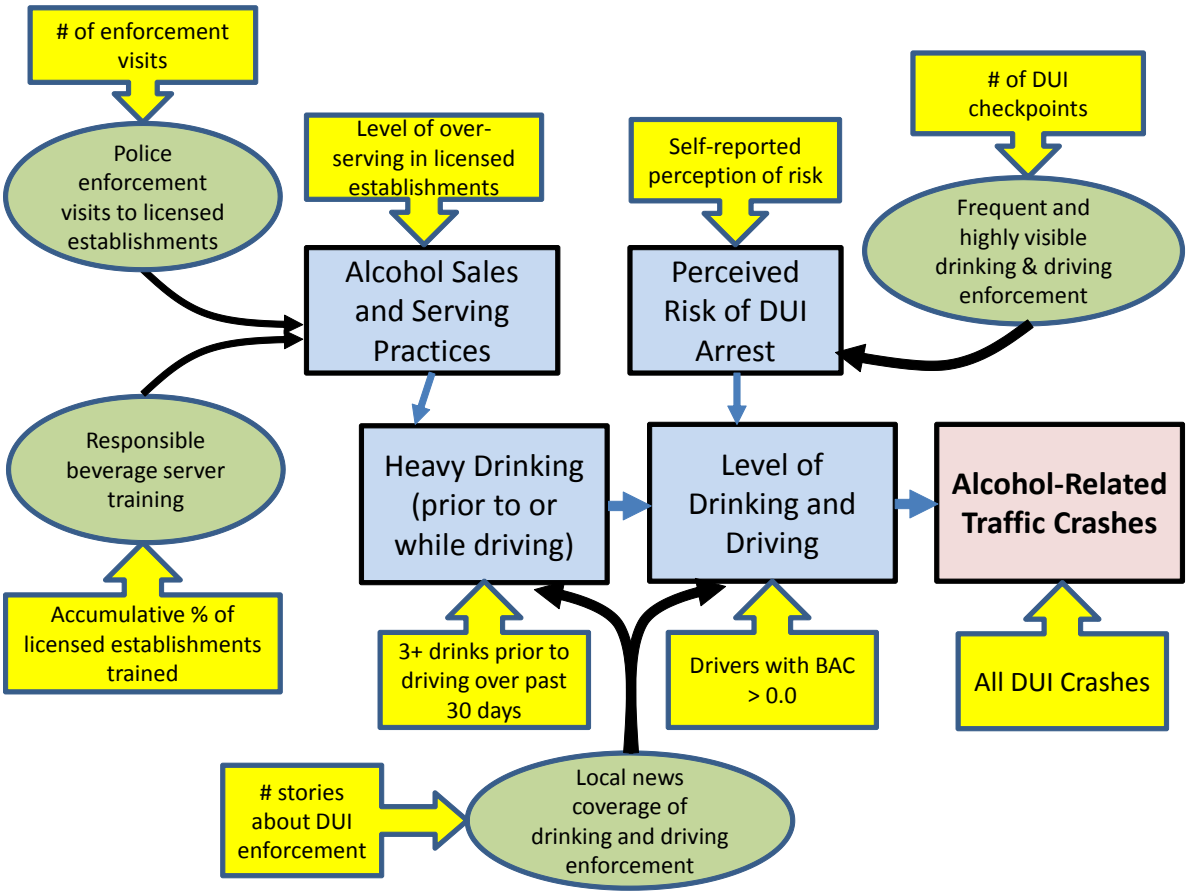
At this point, it is imperative to use the guide on collecting local data to consider and select measures appropriate to each intermediate variable. That guide identifies three alternatives for measurement of each intermediate variable that are: (1) minimum or adequate, (2) better, or (3) best/preferred. These alternatives recognize community limitations such as the current availability of data or the lack of available resources for collection of the data. The table is now expanded to show a measure for each strategy.

INTERMEDIATE VARIABLES	STRATEGIES	INDICATORS
Alcohol Sales and Serving Practices	Police Enforcement Visits to Licensed Establishments **	Monthly number of enforcement visits
Alcohol Sales and Serving Practices	Responsible Beverage Server Training ***	Accumulative % of total licensed establishments trained
Perceived Risk of DUI Arrest	Frequent and Visible DUI Enforcement ***	Number of drinking/driving checkpoints
Perceived Risk of DUI Arrest & Heavy Drinking	Local News Concerning Drinking and Driving Enforcement ***	Number of local news stories about DUI enforcement of local newspapers

Display of the Logic Model with Strategies and Measures

The logic model template now contains information about the strategies and their measurement in addition to the outcome and intermediate variables and their measures. The Community ABC logic model is becoming more complex visually, yet it is easy to see how all the factors and measures are related to the community's chosen outcome.

As shown in appendix B, the complexity of the logic model can be handled by using separate pages for each intermediate variable with its measure and strategies, and even additional pages to document greater details of implementation of each strategy as explained next.



Plan for Implementation

Planning for implementation comes next by first specifying the details for each identified strategy including specific tasks, staffing and funding resources, timelines, and approvals needed. This is an involved process that requires identification, scheduling and documentation of the actions, steps, and events necessary to implement each strategy – that is, "to make it happen".

Some tasks will of necessity require the agreement and participation of other local people. Thus, meetings and events are essential to the overall strategic plan. However, meeting(s) themselves are

not prevention interventions but essential within the planning and mobilization of the community to actually implement any prevention strategy selected for the plan.

> Meetings and other such events are action steps that are essential to the overall strategic plan and essential for implementation, but are not strategies in and of themselves.

In environmental prevention, documentation about each prevention strategy requires the determination of the date when the intervention began, the length of time or duration, and the dosage, scale or size. This information documents the level of effort, such as the number of meetings or activities necessary to impact the strategies defined in the logic model. These are action steps or activities undertaken, stimulated, or sponsored by the local prevention effort. Such local data are for local program management and NOT for reporting to funding agencies though some of these local data may be required by funding sources or state agencies.

Funding agencies often require a local environmental prevention effort to document events and activities that are not defined within the logic model. Clearly a local prevention effort will of necessity collect data required for this reporting.

> Data necessary for reporting to funding agencies or other sources are not necessarily the same data needed by the community to monitor and modify the environmental prevention effort.

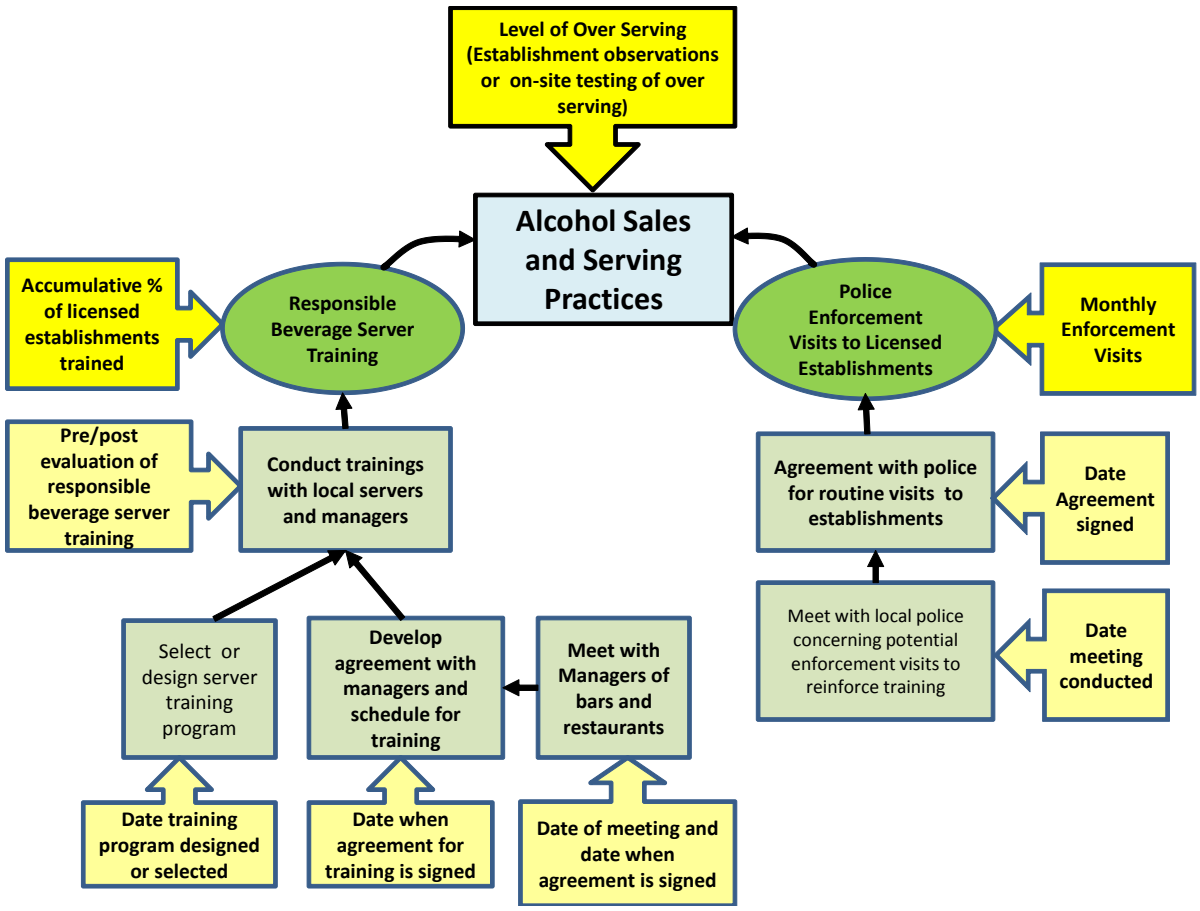
Continuing the example used previously, planning for a Responsible Beverage Server Training and Police Enforcement as strategies to affect Alcohol Sales and Serving Practices now creates the need for more detailed planning of actions to be taken. For example, implementation of a Responsible Beverage Server Training program may require selecting the alcohol server training program (and identify any necessary funding), developing an agreement to participate in the training with owners/managers of bars and restaurants, and conducting the training over time.

A similar level of detail of steps, actions, and schedules must be prepared for each strategy that is contained in the logic model. In this way, the strategic plan becomes more and more complete and operational.

From an environmental prevention perspective, such meetings, activities and agreements are essential to implement and/or support the strategies selected. For example, a preparatory meeting with local law enforcement will likely be followed by other meetings that, if carried out as planned, can lead to police visits to licensed establishments concerning over-serving of alcohol to customers and eventually to an increase in the level of law enforcement of retail sales of alcohol to underage or over-serving of alcohol.

As with the outcome, intermediate variables, and strategies, action steps require measurement within the strategic plan. Guidance for such measurement is provided in the guide entitled:

Thus, actions steps can now be added to the logic model as shown in the illustration for Community ABC below. In this case, a separate page is used to document all the strategies and their measures in relation to the intermediate variable Alcohol Sales and Serving Practices. The action steps and their measures are shown in relation to the strategy of which they are a part.



Various other technologies can be useful to support this part of the process and in anticipation of ongoing operations. For example, a Gantt chart or other management tool is useful for regular oversight and monitoring of detailed tasks and progress of implementation as shown here. Notice the same set of action steps or tasks is shown on the logic model or the Gantt chart. The specification of the detailed plan enables implementation to begin immediately.

#	% DONE	TASK	START DATE	END DATE	ACCOUNTABLE STAFF
1		Meet with local police concerning potential enforcement visits to reinforce training.	April 1, 2012	April 30, 2012	Local SA director and staff
2		Obtain formal agreement with police for routine visits to establishments	May 1, 2012	May 15, 2012	Local SA agency director
3		Select or design server training program	April 1, 2012	April 30, 2012	Local SA staff member
4		Meet with managers of bars and restaurants to discuss the local prevention effort	May 1, 2012	May 31, 2012	Local SA staff member & police
5		Develop agreement with managers and schedule training	May 1, 2012	May 31, 2012	Local SA staff member
6		Conduct trainings with local servers and managers of all on-premise restaurants and bars with in the community.	June 1, 2012	June 30, 2012	Local SA staff member & contracted trainer

What began with the specification of an outcome and identification of the intermediate variables key to an effective environmental prevention effort now becomes more and more specific for local implementation. The community's strategic plan using a logic model incorporates the best science, essential measurements for monitoring effectiveness of the environmental prevention effort, and the specifics of implementation. Implementation begins immediately.

Specific Action Plans

While the detailed action steps of the implementation plan can be specified in the logic model, a specifically purposed action plan may also be needed. For example, if local news and information is an important strategy, then a separate communication or media plan would be helpful and may become part of an agreement with local media.

A media plan might include:

- A month by month plan.
- Specific message or messages for each month.
- Medium or media to be used to deliver the message(s).
- Sources of information, data, or notes about the monthly message(s).

The strategy of "Local news coverage of drinking and driving enforcement of drinking" may require a media plan for Community ABC. An illustration of a local media plan (using only 4 months) in support of the logic model strategic plan for Community ABC is shown here. A full 9-month media plan is illustrated in appendix B. Note that the media plan shows the message or messages for each month, the method or approach to be utilized to distribute the message(s), sources of data or information, and notes or key observations.

Community ABC Local Media Plan: *Drinking and Driving Prevention--First 4 months*

MONTH –LOCAL NEWS THEME FOR MONTH	MEDIA FOR DISTRIBUTING THE MESSAGE	POSSIBLE DATA SOURCES	COMMENTS/SUGGESTIONS
Month 1 Immediate challenge facing Community ABC: High number of alcohol-involved crashes. Personal testimony of families who have lost members to drinking drivers.	Serious local problem of drinking and driving (especially among youth) Social media, e.g., Facebook, to reach youth and young adults in community.	Past 6 or 12 months of DUI crashes for Community ABC. Perhaps a chart showing past trends or comparison to state or nation (if higher). Community members who have lost loved ones to a drunk driver.	This sets stage for community to see the "problem of drinking and driving" in a new light or with renewed attention. If prior successes are available, then new challenges and special emphasis for next 6-9 months. Short period of emphasis gives intensity and urgency.
Month 2 Community ABC Coalition is implementing a special prevention effort with emphasis on drinking and driving using the latest scientific evidence and local data for increasing effectiveness.	Press conference to present Community ABC Logic Model with emphasis on best evidence and science.	Mayor or coalition chair or another community leader presents the Community ABC Logic Model. Coalition logic model concerning increased emphasis on drinking and driving over next 12 months.	Three possible local media phases: Community is initiating (or revamping) a special interest in drinking and driving. Local data and review of best science suggests key strategies. Local law enforcement supports the coalition in special emphasis.
Month 3 Emphasis on drinking and driving by youth: Risk of harm to youth resulting from drinking and driving. Increased enforcement of youth drinking and driving.	% of youth driving after drinking % of youth riding with driver who has been drinking (most often girls…important point of emphasis—"is your daughter at risk?") # of youth DUI citations and alcohol possession citations (MIPs)	Most recent youth survey plus personal experiences of local youth with drinking and driving or riding with drinking drivers. Press conference with local city police about increased emphasis on DUI enforcement with emphasis on youth drivers	The goal in this month is to emphasize that drinking and driving crashes for youth are the leading cause of injury and death for the young. As a result of this emphasis, the evidence that enforcement is actually occurring, especially with young drivers.
Month 4 Enforcement results and future plans including possible emphasis to reduce heavy drinking at local bars and restaurants. Importance of responsible beverage service by local bars, restaurants, pubs, and clubs.	Total Number of check points & # of DUI arrests. % of local drinking drivers coming from bars, restaurants, pubs, and clubs.	Police DUI statistics Local survey data self-reported drinking and driving, or "place of last drink" data from DUI arrests, or personal experiences about drinking and driving and source of alcohol.	Two phases: 1.Make public that drinking/ driving enforcement has actually occurred 2. New emphasis on providing alcohol to customers and need for responsible service of alcohol.

An alternative illustration of a local media plan created in support of a local strategic plan for reducing underage drinking is also shown in appendix B. In that example, the community concluded that social availability of alcohol to youth is more serious than retail availability and the media plan is designed to get that message out to the community and to support specific strategies. In the illustration, the media plan begins with the initial intentional message that social availability is serious for youth in the community. Later intentional messages might include plans for implementation of enforcement, the results of that enforcement such as arrests, citations and party dispersals.

Implementation Guides for Environmental Prevention

Actual implementation of the strategies of a logic model is beyond this guide that focuses on strategic planning based upon developing a logic model and the use of local data for monitoring and modifying. Implementation guides exist for many environmental prevention strategies for which there is scientific evidence of potential effects. For example: a set of implementation guides for Underage Drinking Prevention can be found at the following website:

http://www.nhtsa.gov/people/injury/alcohol/Community%20Guides%20HTML/Guides_index.html

Other operational guides for environmental prevention are available at:

- http://www.thecommunityguide.org/alcohol/index.html
- http://www.pire.org/communitytrials/index.htm
- http://www.madd.org/Professionals/Social-Host/Social-Host-Liability.aspx
- http://www.udetc.org/documents/Party_Patrol_Guidebook.pdf http://www.cadca.org/search/node/strategizer
- http://www.pire.org/communitytrials/Manuals/On-Premise.pdf
- http://www.pire.org/communitytrials/Manuals/Off-Premise.pdf
- http://www.nhtsa.gov/Impaired

Documenting and Monitoring Action Steps

In addition to regular and/or monthly measurement of the outcome, key intermediate variables, and strategies defined in the local logic model, it is essential in like manner to document and monitor progress of the Implementation Plan as defined above.

Using the example of a Gantt chart for Community ABC presented above, progress (% done) can be documented for each task events, agreements, etc. as specified in the logic model.

#	% DONE	TASK	START DATE	END DATE	ACCOUNTABLE STAFF
1	75%	Meet with local police concerning potential enforcement visits to reinforce training.	April 1, 2012	April 30, 2012	Local SA director and staff
2	15 %	Obtain formal agreement with police for routine visits to establishments	May 1, 2012	May 15, 2012	Local SA agency director
3	25 %	Select or design server training program	April 1, 2012	April 30, 2012	Local SA staff member
4	0 %	Meet with managers of bars and restaurants to discuss the local prevention effort	May 1, 2012	May 31, 2012	Local SA staff member & police
5	0 %	Develop agreement with managers and schedule training	May 1, 2012	May 31, 2012	Local SA staff member
6	0 %	Conduct trainings with local servers and managers of all on-premise restaurants and bars with in the community.	June 1, 2012	June 30, 2012	Local SA staff member & contracted trainer

Further, it is expected that important events and action steps planned as a part of the strategic planning process using the logic model are being documented in Component 4. An example of an event form that could be used by a local environmental prevention effort to record meetings and other planned events are shown in the guide: *Collecting Data in Support of a Local Strategic Plan Using a Logic Model: A Guide for States in Support of Environmental Prevention*. The guide calls this an "event form" that enables the prevention staff to record and monitor key meetings, decisions, actions, and events necessary to full implementation.

Summary

Completion of this strategic planning component results in the selection of strategies and their measures that are of particular interest to the community and that science shows will have a direct effect on the intermediate variables in the community's logic model. Further, the Implementation Plan lays out all the necessary actions to be taken by the environmental prevention management, staff and coalition.

At this point in the process, the community has a complete logic model that has been expanded from the designation of the outcome and its measure and the intermediate variables and their measures to now include the strategies, their measures and the action steps to show how each are to be

implemented. The Implementation Plan enables the community to take action immediately. Within this process, actual implementation begins at the end of Component 3.

Further, the community understands the difference between a long-term comprehensive plan and its short-term strategic plan using a logic model that balances resources across a variety and strength of science-based strategies and focuses on what can be accomplished successfully. The community expects to learn from the short-term experience and realizes the logic model is dynamic and may change in the process over time.

Good strategic planning within this seven component process selects strategies with best scientific evidence of potential effectiveness that can be implemented using available resources.

Component 4: Management Information System (MIS) and Data Collection Plan

Constructing a management information system (MIS) based upon the local logic model and developing a plan for local data collection.

Component 4 calls for the creation of a management information system (MIS) to document changes over time in the outcome and intermediate variables and in the prevention intervention strategies as specified in the local logic model. Data may be needed initially to identify the extent of any problem and to compare the severity of two or more problems. However, at this point in the planning process, the purpose of local data collection and monitoring is to determine if the logic model as implemented is achieving an effective outcome for the community.

Once a local logic model in support of environmental prevention is developed, the local MIS is created that includes all the measures noted in the logic model. In general, historical data describe a starting point before strategies have been implemented. On-going local data collected after prevention intervention strategies begin tell the community whether changes in key intermediate variables and strategies are occurring – that is whether there are measurable effects of local prevention interventions (in other words, "evaluation"). Measures have also been defined for each specific prevention action step such as the level, strength, and frequency to determine if and how the planned strategies have been implemented.

What do we need to know?

This is not about what local data are simply available. You don't count things just because you can.

Such "low hanging fruit" (or easily available data) is not adequate for effective prevention monitoring.

Within this component the MIS is constructed to be ready for actual data entry and the data collection plan is created to insure that the specified data is regularly collected for the MIS.

Construction of the MIS

A local management information system (MIS) is the tool to document and store all the local data in an easily retrievable form. The MIS is created using a simple spread sheet display on which the measurements of the outcome, each intermediate variable and each strategy are documented monthly.

Such a MIS is illustrated as table 1 for Community ABC in which a row is created for each of the measures of the outcome, intermediate variables and strategies. Each column is defined as a monthly total. The rationale for utilizing a month-specific spread sheet for data storage and display is that many intermediate variables and most interventions are likely to have measurements for each month (or they should) and the monthly detail can be quite useful in monitoring the current levels and changes in many intermediate variables as well as the intervention strategies.

Since the targeted outcome for Community ABC is "alcohol-involved traffic crashes", the logic model calls for measurement of the monthly level of drinking and driving (if practically possible). It also specifies a measure of level of drinking and driving enforcement because it raises the level of community perception of getting caught if someone were to drink and drive and therefore reduces drinking and driving. Creating a monthly spread sheet of all these important measurements helps reinforce the interconnectedness of all these key variables from the local logic model.

In this example, the MIS was simply constructed to allow for monthly data for two years prior to the beginning of the local environmental prevention effort in preparation for obtaining local data for entry. More years of historical data is desired and can be helpful, such as five years. Note that this example was created in Microsoft Excel; however, other spread sheet software can be used.

Local Data Collection Plan

To be useful to the community, data collected must be locally based. A plan for collecting local data must be developed that specifies the source and type of data including archival data provided by other organizations. The data collection plan specifies the actual measure, frequency of collection, data source(s) including necessary contacts or agreements, and other notes including format and other comments. The plan should also specify the responsibility for collection of each designated measure in the plan. The data collected by a local environmental prevention effort should be considered the property and responsibility of the local coalition or community leaders of the effort.

Table 1. Example of Community ABC's Management Information System (MIS) with Start Date of January 1, 2009

OUTCOME & INTERMEDIATE VARIABLES	JAN 2007	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN 2008	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2009	FEB	MAR	APR	MAY	JUN
Alcohol Involved Traffic Crashes: Number of DUI crashes																														
Level of Drinking & Driving: % of Drivers with BAC >0.0																														
Level of Heavy Drinking Prior to Driving Self-Reported % reporting 3+ drinks																														
Level of Perceived Risk of DUI Arrest: Self-reported perception (1-5 low to high)																														
Level of Alcohol Sales & Service Pattern: Level of over-serving (1-10 low to high)																														
STRATEGIES	JAN 2007	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2008	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2009	FEB	MAR	APR	MAY	JUN
Responsible Beverage Server Training: Accumulative % of total licensed establishments trained																														
Law Enforcement of Over-Serving: Number of visits to licensed establishments																														
Drinking & Driving Enforcement: Number of DUI checkpoints																														
Local News Concerning Drinking & Driving Enforcement: Number of news stories about DUI enforcement in local media																														

Local planning for data collection faces the challenge in practice of "what constitutes local?" For example, does the boundary of an incorporated city or town or village set the limits for data collection or perhaps should surrounding areas be included?

Local efforts are likely wider than one might initially expect. While this is an important decision to be made uniquely, a suggestion is that "local" be considered the potential "sphere of influence" of the environmental prevention effort. That effort can have wide influence, well beyond the legal boundaries, especially in terms of alcohol sales and service, drinking and driving, and youth drinking and related harm.

Communities have a number of obvious and not-so-obvious sources of data that can be considered for obtaining local data. Special arrangements may be needed to collect data from local agencies or organizations. Examples of potential local data sources include the following:

- State archives on alcohol sales, drinking-related problems, numbers and types of outlets, and local enforcement activities.
- Contacts with other local agencies and organizations.
- Interview and questionnaire responses obtained from patrons, servers, and the general public concerning alcohol sales and service.
- Legal, bureaucratic, and regulatory documents.
- Newspaper and other local news archives of drinking and driving, enforcement, and accidents and violence related to alcohol use.
- Obtrusive and unobtrusive community observations such as visual assessments of neighborhood conditions and activities near or in licensed alcohol outlets.
- Official data from public agencies, such as reports from local authorities that include special tabulations by officials or agencies of their contacts or activities, e.g., enforcement.
- Community reactions to alcohol availability issues as measured by community surveys or an ongoing community response panel.
- Reports from community monitors created by a prevention program.
- Special data collected by law enforcement officers and others concerned with alcohol-related problems in a community.
- State alcohol beverage control and enforcement agencies.

Table 2. Community ABC: Local Data Collection Plan

INDICATOR	FREQUENCY	SOURCE	NOTES
OUTCOME			
Total # Alcohol-Involved Traffic Crashes	Monthly --at least 5 years prior to start of project and to most recent month data is available	State agency for traffic statistics	Crash records archived with state in which police indicated "alcohol-involved"
INTERMEDIATE VARIABLES			
% of drivers with BAC >0.0	Monthly	Police record of drivers stopped by police with suspicion of any drinking (BAC>0.0).	Requires agreement with local law enforcement and data collection delayed until after first 6 months.
Community perception of DUI Arrest Risk--1-5 (low to high)	Monthly	Brief internet based survey	Small cost to implement
% reporting 3+ drinks prior to driving over past 30 days	Monthly	Brief internet based survey	Small cost to implement
Over serving of alcohol in bars and restaurants (1-10 low to high)	Monthly	Structured observations in bars and restaurants	*Not possible currently. Requires special training for conducting observations.*
STRATEGIES			
# of DUI arrests/charges	Monthly	Local enforcement records	Totals represent all enforcement agencies
# of DUI Checkpoints	Monthly	Local enforcement records	Totals represent all enforcement agencies
# of local news stories about drinking and driving enforcement	Monthly	Content analyses of local newspaper using electronic archives.	Establish a "key word" search strategy for content analyses.
# of enforcement visits to on premise establishments	Monthly	Community ABC police records	Requires written agreement with local police chief
# of server training events	Monthly	Server training records	
Accumulative % of licensed establishments trained	Monthly	Server training records & state records of alcohol licenses	

Alternative approaches or methods for utilizing archival data that are most often collected and stored by various departments and agencies at the state level are described in the following guide:

> *Using Archival Data to Develop Local Alcohol, Tobacco, and Other Drug Problem Indicators: Reference Guide for Community Environmental Prevention*

Alternative approaches or methods for obtaining or collecting local data on key intermediate variables as specified in the logic model are described in much more detail in the following guide:

> *Collecting Data in Support of a Local Strategic Plan Using a Logic Model: A Guide for States in Support of Environmental Prevention*

An example data collection plan for Community ABC is shown in table 2 as illustration of the varied sources of local data necessary to load and maintain the MIS. Notice that two indicators, while specified in the logic model, do not have a practical means to be collected currently in the data plan. These are **Level of Drinking and Driving** and **Level of Over-serving in Bars and Restaurants**. Thus, while the MIS contains rows for each indicator, all of the monthly cells indicate no data available and the local environmental prevention effort will lack data about these two key intermediate variables.

Once the community has defined what data are needed and has set up an appropriate data collecting and record keeping system, a well-organized community organization can also recruit and train a corps of volunteers to collect and record the data as necessary. The importance of establishing a strong and satisfying process for collecting reliable data cannot be overstressed. It requires skilled community workers to artfully blend the requests of planners, the workloads of data collectors, the curiosity of analysts, and the patience of report writers and presenters. But most importantly, local data provides critical management information for monitoring of the overall local environmental prevention effort.

As staff go about data collection management, some may need to serve as data collectors themselves or as monitors or will identify others who might effectively serve as observers of community situations such as alcohol serving practices of bars and restaurants. Observers, if needed, like data collectors must be recruited, trained, and supported. Some monitors might be local staff involved in the intervention strategy; others may come from the community.

Funding agencies often require a local environmental prevention effort to document events and activities that are not defined within the logic model. Clearly a local prevention effort will of necessity collect data required for this reporting.

Data necessary for reporting to funding agencies or other sources are not necessarily the same data needed by the community to monitor and modify the environmental prevention effort.

Summary

At this point, the strategic planning process for environmental prevention effort has established the structure for obtaining and managing data for the purposes of monitoring the progress and effectiveness of the entire effort. The plan specifies the ongoing collection of data as required by the logic model. The spread sheet is prepared and assignments have been made for carrying out the data collection plan. The community is now ready to collect and enter data in the MIS. That is carried out in the next component.

Component 5: Collecting Data and Loading the MIS

Collecting the required data and loading, maintaining and updating the local management information system.

This is an ongoing process in which a variety of data are utilized as specified in the local logic model and entered into the management information system (MIS). Following the local Data Collection Plan developed in Component 4, the community must routinely gather the essential data necessary for the MIS, depending upon available resources to collect local data on a regular basis. This is not a cut and dry process, especially at the beginning.

Entering and Storing Local Data

The specific data that a local community collects and stores is defined in the logic model and made operational in the MIS. The first part of this guide provided an illustration of possible intermediate variables that might be utilized by a local plan, depending upon the type of ATOD outcome that the community seeks. Obviously, every intermediate variable that is included in the logic model should be measured by at least one indicator; in some instances it may be possible to have two or more indicators for a specific intermediate variable. In like manner, all defined strategies should have at least one indicator for measurement and action steps can also have indicators to enable the local prevention staff and coalition to monitor prevention efforts in accordance with the logic model.

It is highly recommended that monthly data be obtained for the MIS. Monthly measurement enables the local environmental prevention effort to monitor community change frequently and thus have early information to make modifications and changes in strategies and local action as necessary.

Less frequent measurement (even every 6 months or every 12 months) can result in significant delays in necessary or essential prevention changes. For example, if data are available only annually or bi-annually, local prevention staff and the coalition must wait until an entire year (or more) has passed in order to obtain key information and to consider necessary modifications to effort.

> Data available only every other year (bi-annually) is practically of little real value in local environmental prevention monitoring and modification.

If data are only available annually, for example from a school survey of ATOD use, these historical values may provide valuable information about historical levels or trends for these variables. Such

available data can be entered within the month of the year of the survey is completed or alternatively a separate annual spread sheet can be created for such data.

Annual data may be available (and should be entered) for years prior to the initiation of the environmental prevention effort. Pre-intervention data provide baseline information for monitoring and evaluating the environmental prevention effects as well as documenting any historical trends or changes. However, the limitation of such data must be noted by the prevention staff. See "Storing and Displaying Local Annual Data (Example)" in the guide:

> *Collecting Data in Support of a Local Strategic Plan Using a Logic Model: A Guide for States in Support of Environmental Prevention.*

When there are no data available for a specific month or time period for the outcome, intermediate variables, strategies, or action steps, then simply enter "no data" or "ND" or "*" in the MIS to indicate that no data are available. This notation is very different from a zero that indicates that data are available and the actual monthly value is "0" meaning no activity or events.

As shown in the sample MIS for Community ABC in table 3 at the end of this chapter, months when no data are available are indicated in the MIS as "ND". In other cases, a count of zero is entered meaning data was actually obtained and is not just missing.

Practical Recommendations Concerning Data Collection and Entry

Local data within this approach to strategic planning are necessary to effective environmental prevention. This makes routine local data collection or acquisition and loading or maintaining the MIS essential to project success. The local data collection plan developed in Component 4 must be fully implemented in Component 5 and routinely continued. Some specific recommendations for data collection and entry include:

1. A local data manager should be designated with single responsibility for implementation of the data collection plan and for loading (updating) the MIS. Designation of the data manager creates clear accountability. This could be a staff person, a coalition member, or an informed volunteer, that is, a single person who oversees the entire MIS.

2. Any local data that are uniquely collected by the prevention project should be measured over time in exactly the same way. The collection approach should be consistently (and frequently) applied. In short, collecting local measurements using approach A means that approach A should be used consistently, because changing to approach B sometime in the future can yield different and inconsistent results compared to approach A. For example, if data on a key intermediate variable is collected using a specific type of local survey approach, that approach should be utilized consistently over time. Remember: changing data collection methods sometime after project initiation should be avoided if at all possible and only if absolutely necessary. All such change must be clearly documented in the MIS.

3. Local data obtained from existing local and state agencies or organizations (or about ongoing prevention activities) should be clearly documented and methods utilized by each agency or organization fully documented in the Data Collection Plan. Be aware of any

changes in data collection and/or recording methods utilized as such changes can yield inconsistent results. If any data collection or recording actually changes, such changes should be fully documented in the MIS and accounted for in interpreting the data.

4. Update the MIS with all available data at least monthly as a part of project routine. Even if there are significant missing data, this should still be routinely entered. Monthly review of the MIS reinforces the importance of such data in support of effective environmental prevention.

5. Collect only specified data. Since ALL necessary local data are specified in the strategic planning process and a routine part of effective prevention, only essential data should be collected. Resist any temptation to collect or obtain other data due to simple availability.

6. Always note missing data both in the MIS but also as a part of overall management of local data collection. Data specified in the logic model that have never been collected should always be noted and every effort made to develop some future means for collecting such data, if possible. This is especially true for measurement of key intermediate variables or strategies where missing data leaves the staff and the coalition blind to any possible changes in patterns and levels.

7. Enter data into the MIS in a consistent form. Whole numbers can be entered as available. If a measurement is only expressed as a percentage, maintain no more than two decimal points as greater accuracy is practically not necessary. Measurements expressed as an average can be rounded to next highest (or lowest) number unless the measurement range is small, for example 0-10 or less, then at least one decimal point is helpful.

8. Be aware that random events in a community can impact local data even if collected consistently with identical approaches. For example, an intensive local emphasis on drinking & driving enforcement can increase drinking and driving arrests even if the actual level of drinking and driving in a community remains unchanged. Thus monitoring arrests AND crashes is important in this example. In communities with small populations, for example, less than 100,000, events can occur infrequently and the monthly data could vary widely over time. For example, in a small population community fatal traffic crashes with alcohol involvement [the standard used by the Fatal Accident Reporting System (FARS) of the U.S. National Highway Traffic Safety Administration] can occur very infrequently. Or multiple vehicle traffic crashes in one month can result in a significant jump in the crash statistics for that month. Such variations are normal and are in themselves no reason for concern if there is no change in data collection methods.

9. Local data collection can be a tedious and sometimes boring process. Make every effort to stimulate, reward, and motivate staff and volunteers who are collecting and entering local data. Print out and review the MIS at least monthly to re-enforce its importance. Note missing data or data collection needing special attention or enhancement. The local Dashboard (described in next in Component 6) is an excellent means to reinforce the importance of data collection.

Table 3. Community ABC Management Information System (MIS): 2 years prior to start date of 1/1/2009 & 6 months after start date

OUTCOME & INTERMEDIATE VARIABLES	JAN 2007	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN 2008	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2009	FEB	MAR	APR	MAY	JUN
Alcohol Involved Traffic Crashes: Number of DUI crashes	5	13	15	12	7	10	5	11	6	8	7	9	9	8	7	12	9	6	8	8	6	11	11	10	3	12	14	13	9	5
Level of Drinking & Driving: % of Drivers with BAC >0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Level of Heavy Drinking Prior to Driving Self-Reported % reporting 3+ drinks	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41%	ND	ND	ND	ND	ND
Level of Perceived Risk of DUI Arrest: Self-reported perception (1-5 low to high)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
Level of Alcohol Sales & Service Pattern: Level of over-serving (1-10 low to high)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STRATEGIES	JAN 2007	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2008	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2009	FEB	MAR	APR	MAY	JUN
Responsible Beverage Server Training: Accumulative % of total licensed establishments trained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	10	10	10	10
Law Enforcement of Over-Serving: Number of visits to licensed establishments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drinking & Driving Enforcement: Number of DUI checkpoints	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	4	3	10	4	2	1	3	5	12	3	3	0	8	5	4
Local News Concerning Drinking & Driving Enforcement: Number of news stories about DUI enforcement in local media	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	ND

ND = no data available

Summary

The challenges of collecting data and entering in the MIS are experienced primarily during project initiation as routines and kinks in the process are worked out – who to talk with whom when and in what format it is received. In the process, the Data Collection Plan developed in Component 4 may need to be updated or tailored to new information or situations. Once relationships and the routine of obtaining data and the specifics of data entry are established, this component can become a regular set of monthly tasks from receiving the data to entering them into the MIS spread sheet. Displaying the data for purposes of monitoring and management begins with the next component.

Component 6: Monitoring Measures Using a Dashboard

Developing and utilizing a dashboard based on the MIS to monitor measures of the outcome, intermediate variables and strategies.

The purpose of a community dashboard is to display key data from the management information system (MIS) in a graphical way that enables local management and staff and the community coalition to monitor changes in the outcome, key variables, strategies, and other important indicators. Thus, the dashboard becomes a management tool to enable local assessment of the effectiveness, strengths and limitations of the environment prevention effort.

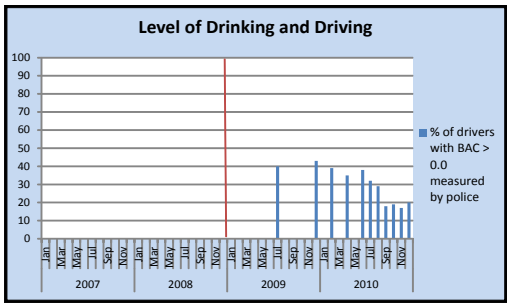
The term "dashboard" is used in many areas such as business management, computer systems, and music. The most common use of the term refers to the control panel located in front of the driver of a vehicle. In any case, a dashboard is a tool for displaying complex sets of data in a user-friendly format that supports task management—like driving.

Creation of the dashboard by management and staff in an environmental prevention effort on a regular basis enables continuous monitoring of the measures of the outcome, intermediate variables and strategies identified during the development of the logic model. Such regular monitoring enables corrective actions to be taken in a timely manner to increase the potential for the project's success.

Creation of a Dashboard

Creating a dashboard includes plotting the local data in user-friendly charts, creating trend lines, organizing the information in a presentable form, and updating it over time. The dashboard is essential to maintain focus on the local environmental prevention effort and the strategic plan based on the logic model. Information provided by the dashboard can enable practical decisions to be made over time concerning modifications in the local environmental prevention effort to increase effectiveness.

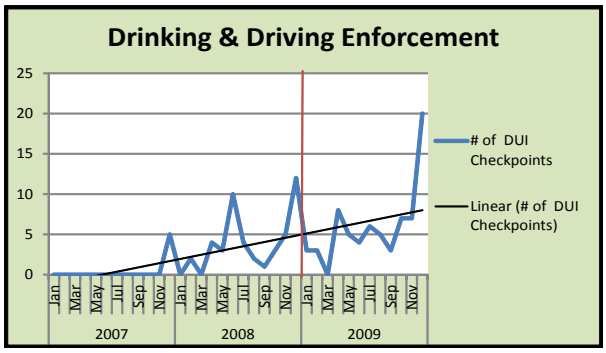
Display of the Measures



A chart can be created for each indicator or measure as specified in the community's logic model. The data for a chart are directly available from the MIS as stored in a spread sheet format. The frequency with which data are available to the effort guides the type of chart chosen to display that data. Data that are available only intermittently (missing data for several months) are best displayed as a **bar chart** or **column chart**.

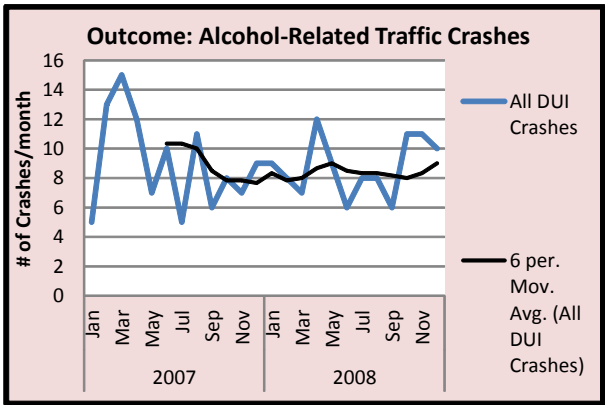
Data available each month or on a consistent basis (with no missing data) can be displayed as a **time series** line plot in which each value is connected to the points on either side (before and after). Review of charts can provide information for an assessment of the overall effectiveness of a local environmental prevention effort and the timely contributions of strategies and intermediate variables.

> Time series refers to a set of sequential time measurements of a specific indicator. While one measurement is like a snapshot, a time series is like a motion picture of what happened to the data over time.



Additional information can be shown in any chart using **trend lines** as illustrated in the following charts. The first chart shows a **linear trend line** that indicates the direction of changes in the number of DUI checkpoints occurring over time. This steady increase over time is appropriately illustrated by the linear trend line (solid straight black line) and demonstrates that DUI checkpoints have been increasing over time from none in 2007 up through 2009.

The second chart is an illustration of the monthly number of alcohol-related motor vehicle crashes. The blue line is a line plot of the monthly number of crashes over two years and is formed by drawing a line from each monthly value to the values before and after. Such a time series line chart demonstrates the notable monthly variations over the 24 months prior to project initiation. In any community this variation often reflects random events as well as changes in monthly drinking and driving, for example, during the holidays. Thus, a straight line or linear trend line might obscure the variation.



A **moving average** can be used to smooth highly variable monthly data so pattern and trend are more easily discernible. Therefore, in order to provide a better graphical picture of the pattern of such local crashes, a moving average is calculated over this 24 month period.

A moving average is average or mean over a specific number of months such that the value for a specific month, say July, is replaced by the average of a specific number of months prior to and following any month. In this example, we have elected a moving average of 6 months such that each of the monthly values is indicated by a 6-month average as a black solid line. Note in this example, that the first point of the moving average occurs after six months of data and is the average of the first six months (January-June). Each month thereafter is the average of the prior six months (February-July and so on).

In this example, the moving average indicates that the pattern or trend of alcohol-related motor vehicle crashes has not changed much during 2007 and 2008, showing between 8 and 10 such crashes per month. Thus, there is no significant trend in the actual number of crashes over the 24 month period even with the obvious monthly variability.

Selecting an approach to documenting the trend or movement of the data over the time shown in any chart should reflect a practical need. The purpose of any trend line is to smooth out the monthly variability shown when you plot data over time or in a time series. There are a number of alternative methods for determining the pattern or trend in any time series chart in a community dashboard. While specific details are beyond this guide, a sensible question might be: (a) is there a need or reason for a trend line, and (b) if so, what is the approach that is most accurate for the data used in the chart? A moving average simply smoothes out the time series and enables the community to determine if there is evidence of a significant trend over time or not. If there is evidence in the time series of a clear upward or downward trend, then a linear trend line could be used.

The process of creating a dashboard from the MIS with a trend line or moving average involves using the capability of software such as Microsoft Excel or MacBook Numbers. Both tools provide the means to create bar or column charts, trend lines and moving averages as well as other types of charts. The dashboard report itself can be created as a separate worksheet within Excel or Numbers. Or, the charts can be copied and pasted into other software such as Microsoft Word or PowerPoint, or MacBook Pages or Keynote. If using Word or PowerPoint, a tip is to "Copy" in Excel and then "Paste Special" and select "Picture (Enhanced Metafile)". This feature maintains the integrity of the chart while changing the size of the chart on the dashboard.

Organizing the Dashboard

To be most useful, a dashboard must be arranged in a way to:

- Communicate easily and simply.
- Provide data and its source from the community MIS for the given time period.
- Present the information visually.
- Maintain focus on selected measures without other distractions.
- Provide a consistent format over time.
- Reference the dates and responsible organization with contact information.

Recognize that such reports will be shared by members of the coalition and other participants. Therefore, it is important that appropriate reference information be provided on each dashboard such

as the name of the organization responsible for the report and the date of publication. Likewise providing the source of the data of each chart increases the perception of the reliability of the data and quality of the dashboard itself.

Using the Dashboard

In any local logic model, a determination needs to be made of which indicators are most useful for monitoring the environmental prevention effort. This determination is based upon the information most needed to manage the environmental prevention effort. Thus, the MIS only becomes useful with regular (a) collection of necessary local data, and (b) display of data in a form that is informative to staff and the coalition. This display is called a "dashboard".

Data from the local MIS displayed in a dashboard provides an essential tool for seeing patterns and trends over time. Such a tool enables a group of decision makers who have varying degrees of experience with data analysis and interpretation to make sense of such data. The challenge is for members of the local staff and community coalition to determine the effectiveness, strengths and limitations of current environmental work.

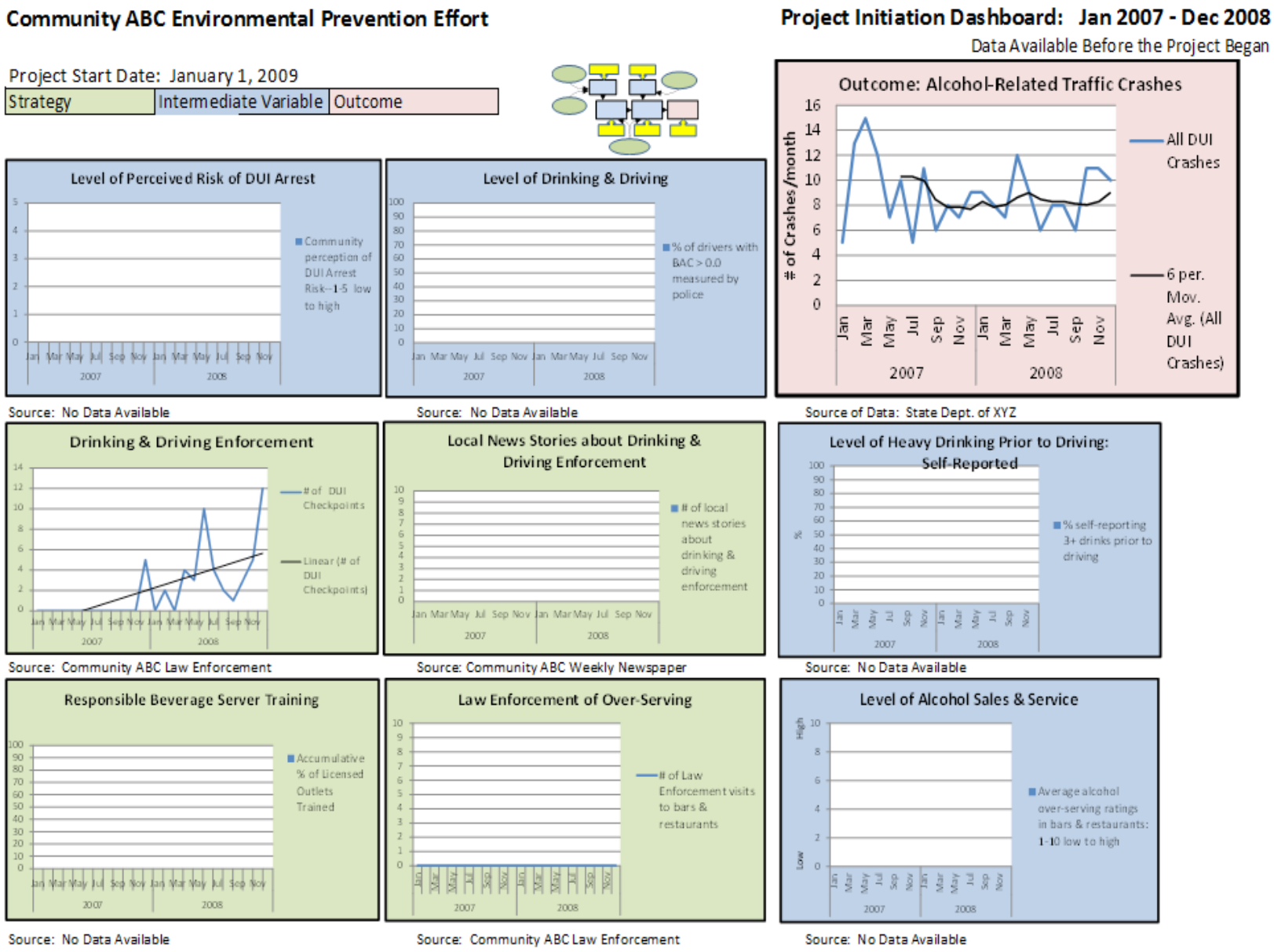
Reading and interpreting the charts on a dashboard requires training. Therefore it is important to provide guidance for management and staff of local prevention efforts and for the community coalition. See Component 7 discussed in the next chapter on Management of Strategies and Adjusting the Logic Model for guidance on interpreting measures and taking action.

Monitoring the data on a regular basis alerts management to unexpected changes or lack of effectiveness that requires adjustments in one or more strategies. A good practice is for staff to monitor all data on at least a monthly basis and to inform management and select members of a coalition of significant evidence of lack of effects. Using a dashboard in addition to the spread sheets of data helps in quickly identifying changes and maintaining focus on the measures selected for the outcome, intermediate variables and strategies.

As a practical recommendation, a local dashboard should be reviewed on a monthly basis for the most up-to-date community information and local environmental prevention at least by local prevention staff and perhaps an executive committee of the coalition. Review by the full coalition can be done less frequently depending upon the local situation.

The following discussion illustrates how local data from the MIS can be displayed in a dashboard for these purposes at different stages in the process. When plotted in an easy to use form, the information can be valuable for assessing the overall effectiveness of the environmental prevention effort including potential changes in the outcome and also in key intermediate variables. As a result, effectiveness can consider not only the outcome but changes in key intermediate variables and strategies that in turn can impact the outcome.

Figure 1. Community ABC Project Initiation Dashboard



Community ABC Agency Name Dashboard Published January 15, 2009

Project Initiation: What's Been Happening in Our Community?

At the beginning of the environmental prevention effort, an initial dashboard can be created to display for the community what is known about the level and history of the selected ATOD problem - the Outcome - and about the intermediate variables and strategies that have been selected. Such a dashboard is also useful in communicating with upper management and leadership for approval of implementing the local effort and with potential funding sources. Primarily, the dashboard is a useful tool for supporting management and staff in determining priorities and allocating resources on implementing new strategies and adjusting existing strategies.

Historical local data provides key information about the status quo. What has been happening?

Data that cover at least two years (*five years is recommended*) prior to the beginning of the local environmental prevention effort are used to address such questions as:

- What do we know about the level, pattern and history of the outcome?
- What do we know about the level and pattern of key intermediate variables?
- What do we know about the level and pattern of any existing strategies specified in the logic model?
- What action steps are needed in year 1 in support of the local strategic plan?

In many cases no previous data are available. In other cases, data that are available may be quite limited in scope or frequency. These issues first appeared as a result of attempting to build the MIS and develop the data collection plan in Component 4. Where data are available, more is known about the historical pattern of the outcome, the key intermediate variables, and existing strategies. Further, these data can be used to determine what variables or strategies need special attention. In addition to supporting the need for the local prevention effort, the initial dashboard provides a baseline against which the effects of the effort can be evaluated and communicated over time.

As an example, the Community ABC environmental prevention effort has targeted alcohol-involved traffic crashes as its outcome. The selection of this outcome might have been based upon epidemiological data from the community or a simple needs assessment of the community (perhaps as a result of serious fatal crashes recently involving one or more drinking drivers) or a combination of both.

The initial dashboard is prepared for management and staff as the documentation of the status of alcohol-related traffic crashes in Community ABC from available data at the beginning of the effort. Note that documentation of each component over time as addressed in appendix A provides a valuable history and reference for actions taken from the point of view of management. Further, the dashboard documents the effects of those actions and can be valuable in publicizing the success of the effort for the community.

The Project Initiation Dashboard for Community ABC presents in figure 1 data about the community covering the two years (January 2007 through December 2008) before the environmental project actually begins on January 1, 2009. Notice that while the number of alcohol-involved traffic

crashes in Community ABC is known, not much is known about the key intermediate variables that affect such crashes. The missing data would be addressed by the local data collection plan as an approach to obtaining necessary local data.

Continuing the color scheme of the logic model, the large pink chart in the dashboard is the measure selected as an indicator of alcohol-related traffic vehicle crashes (the Outcome) and covers the period before the environmental prevention effort has begun. The chart is based upon monthly data obtained from the State and/or local law enforcement and entered in the

Community ABC MIS. This chart shows monthly number of DUI crashes for the community (solid blue line), that is, crashes determined to have involved least one drinking driver as a result of police officer investigation. See discussion of alternative measurement in:

> *Using Archival Data to Develop Local Alcohol, Tobacco, and Other Drug Problem Indicators: Reference Guide for Community Environmental Prevention.*

In addition, there is a solid black line that is the moving average of all traffic crashes involving drinking under the influence of alcohol (DUI). In this example, the moving average is the average over the past 6 months and therefore, the first point in the black line is June as the average over the first 6 months of the year. The next value in July is the average of the values over February through July, and so forth.

A moving average is a simple way to present trends and patterns. Monthly plots of data are quite irregular with ups and downs. This is typical of such data and a moving average can be used to "smooth" out such jumps.

Looking at the moving average during this period before the local environmental prevention effort begins, in general (even with the irregular highs and lows), the average level of alcohol-involved traffic crashes has not substantially changed over time, but seems to be oscillating around the middle of this series. In other words, there is no evidence that such crashes are declining (or increasing) before the local effort begins.

The blue charts present measurements of the key intermediate variables. Looking at the charts of the Level of Drinking and Driving, the Level of Perceived Risk of DUI Arrest, the Level of Heavy Drinking Prior to Driving, and the Level of Alcohol Sales and Service, there are no local data available on these key variables. ***All the charts are empty***. As a result nothing is known about how much drinking and driving or heavy drinking prior to driving actually occurs locally in Community ABC. This situation is not unusual for many communities and illustrates the importance of local data over time in support of making environmental prevention effective.

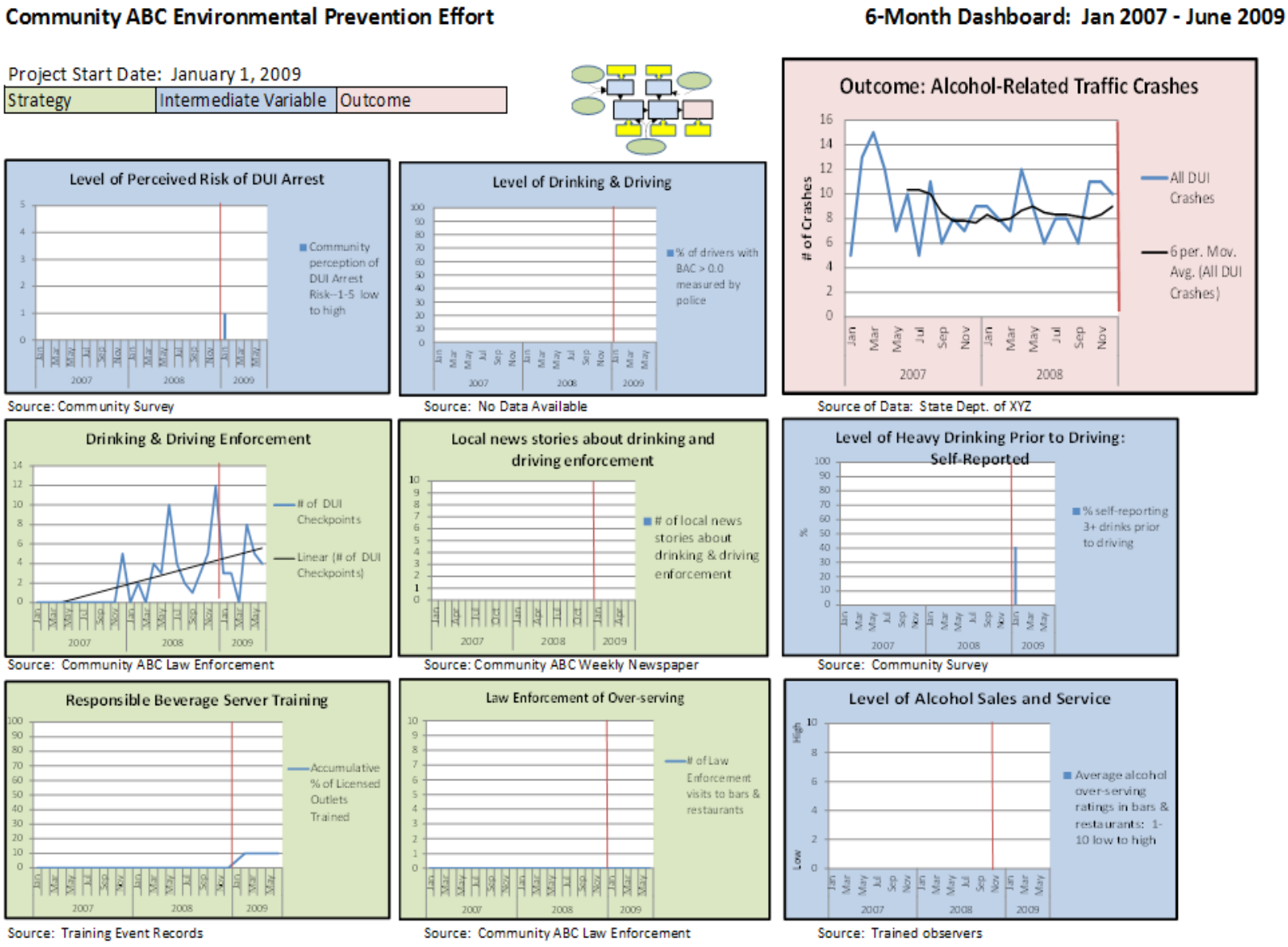
Since these important variables have scientific evidence of their effect on alcohol-involved traffic crashes, there is significant practical need for the community to collect data about these four intermediate variables. The lack of pre-project initiation data of Community ABC does suggest that much work is to be done for this environmental prevention effort to be effective in both changing the key intermediate variables that science demonstrates affect the outcome directly, and also in the selection of and management of the intensity or dosage of science-based strategies based upon the Community ABC Logic Model.

Looking further at the Project Initiation Dashboard, the green chart of the strategy called Drinking and Driving Enforcement shows the number of DUI checkpoints per month over the period prior to the beginning of the project. In this illustration, the monthly number of checkpoints during 2007 shows primarily enforcement emphasis in December, likely during holiday periods. While checkpoints increased in the next year, the number and frequency of enforcement checkpoints are irregular since there is no real evidence of changes in alcohol-involved crashes, then one might question if the current levels of enforcement are sufficient to cause alcohol-involved crashes to decline.

The Project Initiation Dashboard also displays measures of other strategies from the logic model including zero enforcement visits concerning over-serving of alcohol in local bars and restaurants. Also, displayed are monthly counts of news stories in local media about drinking and driving enforcement and monthly accumulative percent of bars/restaurants trained in ways to prevent over-serving of alcohol. Notice that no data are available for the latter two strategies prior to project initiation.

Consistent inclusion on the dashboard of all charts of data specified by the logic model and MIS is necessary to increase the awareness of the status of each aspect of the logic model from the beginning as well as make clear what is NOT known concerning key factors in the logic model.

Figure 2. Community ABC Six-Month Dashboard



After Six Months: What Information is Available?

The first six months of a local environmental prevention effort gives time to implement new strategies and to adjust existing strategies. This is an important point where management and staff review all data together to determine the initial effects (if any) of the effort. While it is quite possible to show significant effects within six months, it may appear that not much has happened especially if emphasis has been on implementation of new strategies.

Some adjustment may be needed as a result. Review of the strength or intensity of each strategy may reveal if greater intensity is needed for one or more strategies. The involvement of the community coalition may also be important at this time. The Six-Month Dashboard utilizes data collected during the first six months of the project as well as the data from the pre-project phase.

Continuing the illustration, Community ABC Six-Month Dashboard in figure 2 shows the layout of charts as previously displayed now with additional data as available for the first six months of the effort. Since the local data collection plan developed in Component 4 specifies the collection of data that was missing prior to the beginning of the project, the Six-Month Dashboard provides more up-to-date information about the community. Traffic crash data may be delayed in availability and therefore, no new updates are available on the level and pattern of DUI crashes for the Six-Month Dashboard in this illustration.

However, the project has obtained new specific local data for the first time as called for in the community logic model and data collection plan. As a result of this local data collection (for example by implementing an internet based community survey), the dashboard now presents data on the intermediate variables of the Level of Heavy Drinking Prior to Driving and the Level of Perceived Risk of DUI Arrest. As shown, community heavy drinking prior to driving is close to 40% and not surprisingly drivers believe their risk of being arrested for drinking and driving is relatively low (around 1 on a 5 point scale, where 5 is "highly likely of being arrested").

While the data collection plan calls for local data to be available on Level of Drinking and Driving after mid-year of the first year of the project, no data are currently available on this intermediate variable at this point in time. Even though there appears to be a modest increase during these six months in DUI checkpoints as the measure of Drinking & Driving Enforcement, there is no local news concerning such enforcement, which likely means there is limited overall potential effectiveness of such enforcement.

Likewise, there is no data for the Level of Alcohol Sales and Service on over-serving of alcohol in bars and restaurants, but one might infer no change since there are no law enforcement visits to bars and restaurants and only 10% of bars and restaurants licensed to serve alcohol on-premise have participated in Responsible Beverage Service Training.

What can be learned from the Six-Month Dashboard that can be used to adjust and modify the environmental prevention activities specified under the strategic plan at this time? Based upon the limited data available for Community ABC at the end of the first six months, the dashboard shows that since drinkers who drive believe they have low risk of being arrested even with local increases in DUI checkpoints based on a community survey, the local environmental project has the challenge in Component 7 to support local law enforcement in increasing the frequency and number of drinking and driving enforcement events in their community. Further, the local prevention project can implement its Local Media Plan and utilize local news in a variety of media in order to inform the public

about the increased DUI enforcement. To date, there have been no local news stories about drinking and driving enforcement.

There are no data about over-serving in bars and restaurants and nothing is known about this key intermediate variable. The companion guide entitled *Collecting Data in Support of a Local Strategic Plan Using a Logic Model* can provide valuable assistance to local staff to obtain such data. The environmental prevention effort can increase its effectiveness in reducing over-serving by working with local law enforcement (and if available, enforcement agents from the state alcohol beverage control agency) to increase visits to bars and restaurants that can complement greater participation in alcohol server training among local alcohol-licensed establishments.

First Year Dashboard: What is the Effect on the Outcome after One Year of Effort?

The Year One Dashboard including all data should be prepared for review by the entire community coalition with management and staff at the end of the first project year. The major consideration at this time is: What does the data tell the community now and what changes are needed?

The process of sharing the data with the coalition probably involves educating members who are not familiar with interpreting data charts and cautioning against over or under interpretation of the data. However, it is most important for the community coalition to be fully aware of information provided by the dashboard and limitation of missing local data about key factors in the logic model. This is essential to a determination of progress made and challenges addressed by the local environmental prevention effort. The Year One Dashboard for Community ABC is shown in the next chapter.

Second and Third Year Dashboards as Local Report Cards

What is the effect on the outcome at the end of two years? At the end of three years? By the end of the second and third years, trends and patterns should show a definite effect and be easily seen on the dashboard. Any adjustments of intensities in strategies can show changes in the measures of those strategies and possibly in corresponding intermediate variables that are impacted by these strategies. The community will now be able to trace the effects on the selected outcome locally and communicate that to the community at large.

Continued collection and monitoring of data and presentation in a dashboard annually thereafter to management and the coalition as well as to city council or county commissioners reinforces the success of the environmental prevention effort. Success must be publicized whenever it is achieved, especially if the political or economic environment may cut prevention funds. A community can use positive results to defend or ask for funding from county commissioners or the state legislature if it can show the amount of dollars saved by reducing traffic crashes and/or injuries by X percent. Cost-effectiveness is discussed in Component 7.

Summary

The creation and use of a dashboard showing charts of the measures or indicators for a community's environmental prevention effort facilitates monitoring data patterns and trends and communicating progress made. Community ABC's Project Initiation and Six-Month dashboards are given as examples of both how the dashboard can be displayed and how they are used.

Examples of Community ABC dashboards as report cards for end of project years 1, 2, and 3 are discussed under Component 7 along with considerations and decisions concerning essential changes that need to be made by the local environmental prevention project in order to increase effectiveness.

Component 7: Managing Strategies and Adjusting the Logic Model

Making decisions based on the data to manage strategies and adjust the local model to increase effectiveness of the prevention effort.

As the environmental prevention effort progresses, it is imperative to guide implementation and operations and to ensure the attainment of the overall effects on the outcome. This requires skill in making decisions based on data to assess progress and to modify the type and intensity of strategies and prevention actions as necessary. Further, modification may be made in the logic model itself as needed based upon these decisions. This leads back to either or both components 2 and 3 to continue use of the logic model as a living document and to keep the strategic planning process in active status (as shown in the seven components of strategic planning drawing).

Change brings about its own unexpected challenges and each community is different. Therefore, the strategic plan becomes a living document that responds to monitoring of results and allows room for management decisions to adjust actions over time and drive the effects of strategies toward the desired outcome – in other words, M&M (monitor and modify) over time.

In preparation for examining community dashboards for each key time period, there are a number of considerations and suggestions for monitoring local data, interpreting the dashboard, and making decisions about future steps and adjustments in the local logic model.

Some suggestions include:

- Utilize the information from dashboards as a "whole", not focusing only on one "success" or "failure" that appears in any individual chart. In short, always look at the big picture for any community and determine if there is evidence of overall success. This may mean that several desired changes in key factors (intermediate variables or strategies) would occur simultaneously to achieve real effects.

- Rarely take full credit for success (reduction in a specific outcome or indicator) or for failure (increase in the outcome) without confirming that the change is actually the result of the prevention strategies implemented by the community's environmental prevention effort. For example, an increase in gas prices alone can reduce driving events and thus drinking and driving and thus alcohol-involved crashes. In other words, avoid over claiming for successes or for failures.

- Avoid the temptation of quick fixes when problems or "no effects" appear. Effective environmental prevention effects often take time to achieve and are rarely shown quickly in data. This means that having as much long term and up-to-date local data as possible is important. For example, while a specific strategy may be potentially effective, the

prevention frequency and intensity or dosage may not yet be sufficient to achieve a change in population behavior. Further, science shows that using public education or any other individual strategy alone is rarely the simple fix for problem events in a community.

- Improvements in effectiveness are always possible. The value of the type of longitudinal local data prescribed in this strategic planning approach is that such data enables the community to determine if there is evidence of effects on the outcome, and if so, how can this effect be increased in the future? If there is evidence of no effect, then what additional actions, strategies, or intensity are needed NOW?

- Community-level problems and key variables often change slowly. Therefore, the effects of environmental prevention can delay (lag) behind the start date of strategies and prevention activities.

- When looking at the time series chart for the outcome, taking account of historical patterns and trends in the indicator is essential. Let's say local alcohol-involved traffic crashes have been historically trending upward for some time (say two years). Following environmental prevention interventions the trend declines, this can be evidence of potential effects. However, if the trend flattens or does continue upward at a slower rate, this might also be evidence of positive effects. In this case the target problem is not declining but its rate of growth or upward trend has been slowed as a result of local prevention.

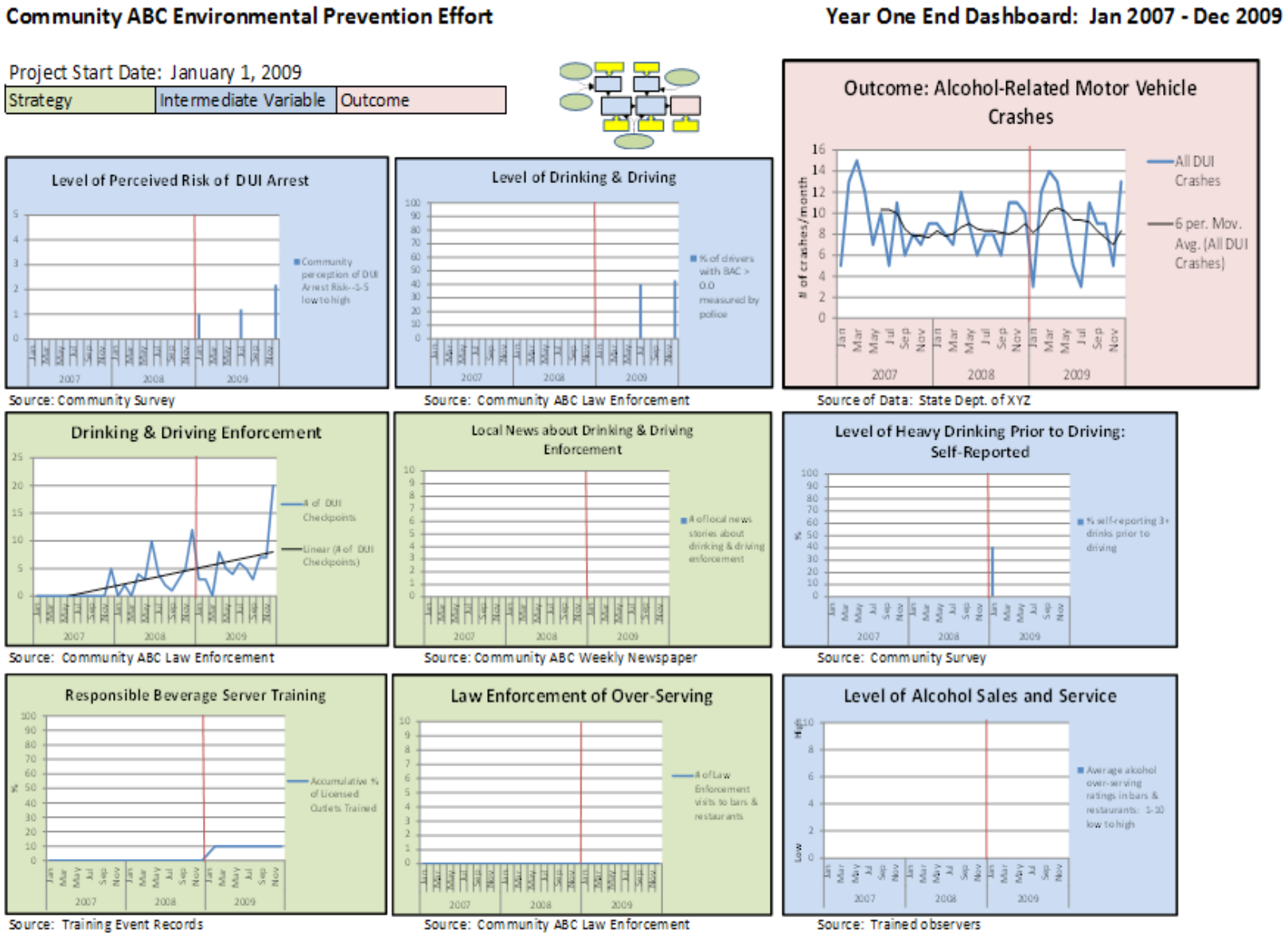
- Encourage staff and coalition members to be realistic about population-level impacts of prevention. One risk associated with clear measurement of outcomes and key intermediate variables is that early effects may not be shown in early data and coalition members could become discouraged. Thus, looking at several charts simultaneously in the dashboard may show success in some elements, for example, increase in enforcement events over time, but no effect on reducing the specific harm or outcome. Thus, look at all key intermediate variables and strategies in order to determine what else is needed in the environmental prevention effort.

- As shown in the illustrations, monthly data for any factor is often quite variable over time. This is a natural characteristic and one reason that using trend lines and moving averages are helpful. However, it is important to look for notable changes in the trend lines, not small changes that might simply be the result of random events in the community.

In this component, using the above guidance, management and staff of the environmental prevention effort and the community coalition, if designated, review the community's strategic plan using a logic model and the data presented on the dashboard on a regular routine. They must keep the effort focused on the desired outcome and identify potential problems.

Component 6 discusses the dashboard presentation of data for measures of the outcome, of each intermediate variable, and of the strategies. These data were compiled in Component 5 using a management information system (MIS) and displayed as a dashboard in Component 6.

Figure 3. Community ABC Year One Dashboard



Community ABC Agency Name, City, State Dashboard Published January 15, 2010

Decisions based upon Community ABC Dashboard at the End of Year One

The Dashboard at the end of the first complete year of the Community ABC environmental prevention project is shown in figure 3. The dashboard can now be reviewed by staff and the coalition. Looking at the plot of DUI crashes, there is some evidence that the project may have had an impact in reducing the monthly number of alcohol-involved motor vehicle crashes, comparing the rather stable level of crashes shown in the two years prior to project initiation. The moving average for DUI crashes during 2009 shows a downward trend that is a positive result, but more time is needed to determine if this trend is the result of the efforts of the project or caused by other factors or simply an anomaly.

Looking at the key intermediate variables from the logic model, the Level of Drinking and Driving is rather high (based upon the two data points provided during Year One), that is, a notable percentage of drivers stopped had blood alcohol concentrations (BAC) greater than zero. This suggests that while drivers may not be above the defined legal BAC limit, they could be impaired by drinking and could have an increased risk of a crash.

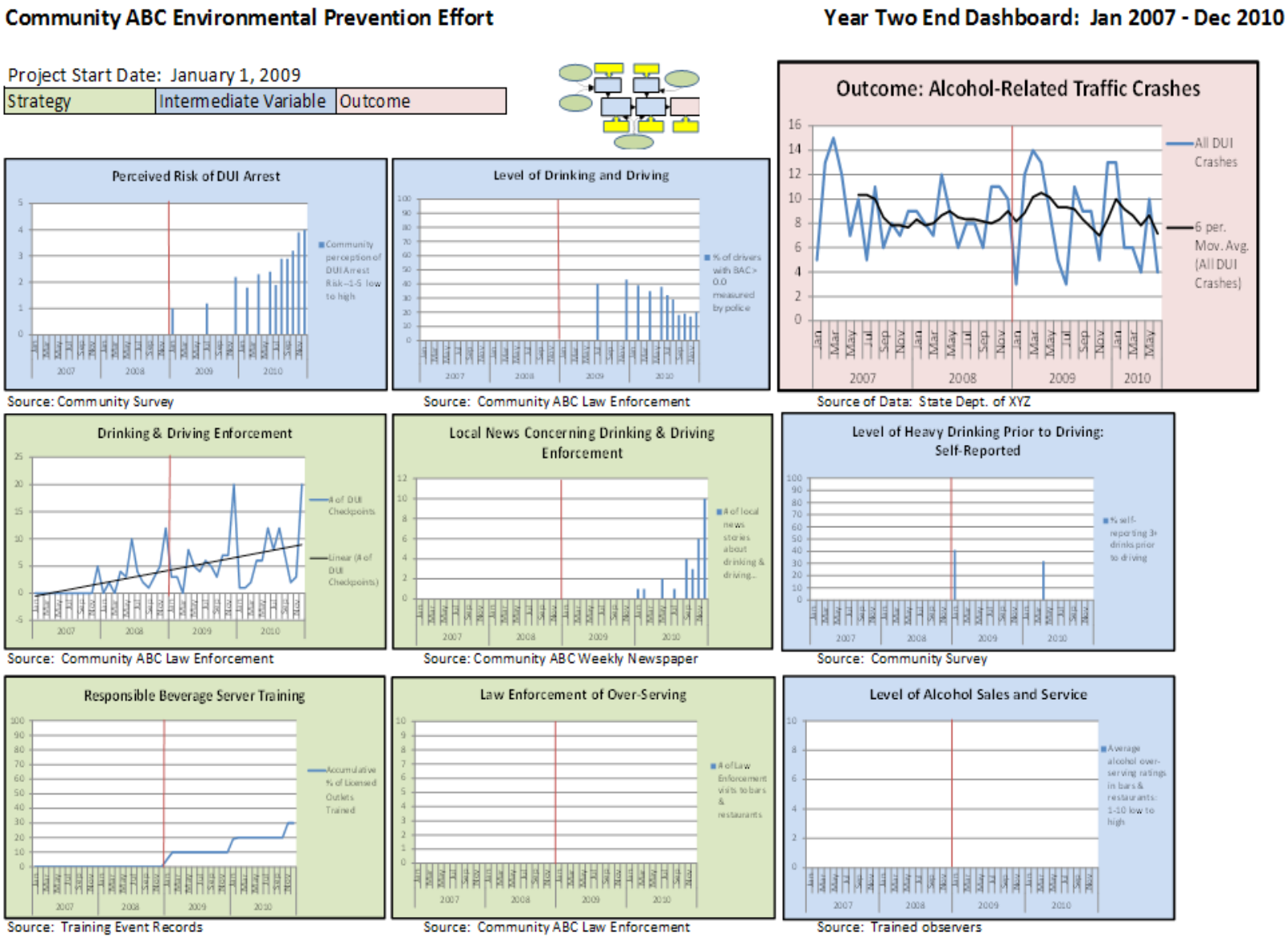
In addition, the monthly percent of drinkers reporting subsequent driving remains relatively high and while the perceived risk of DUI arrest has increased since project initiation, the level is still relatively low (about 2 on the 5 point scale). Also, the accumulative percent of total bars and restaurants trained in responsible beverage service remains low while no independent information is available about potential over serving of alcohol by bars and restaurants. The lack of local data about level of over-service of alcohol in bars and restaurants is notable.

Thus, while DUI enforcement checkpoints are increasing, the lack of local news attention to DUI enforcement is evident and thus the potential impact of the local DUI checkpoints and DUI enforcement is reduced. While a local media plan for Community ABC exists, it has not been implemented.

Recommended actions to be taken include:

- Implementing the local media plan that emphasizes DUI enforcement.
- Finding a means to increase the percentage of bars and restaurants participating in training to reduce heavy drinking in their establishments.
- Supporting law enforcement visits to these licensed establishments.

Figure 4. Community ABC Year Two End Dashboard



Review of the Community ABC Dashboard at the End of Year Two

As was illustrated by the review of Project Year One Dashboard, Community ABC is expected to review the Dashboard before the end of Project Year Two as frequently as necessary (as additional data are available) in order to monitor effects prior to the end of Project Year Two.

Traffic crash data at the end of year two (see figure 4) is only complete for the first 6 months for that year (due to lag in data availability) but the moving average now clearly supports a conclusion that overall drinking and driving crashes are declining, that is, trending downward. This is confirmed in a clear decline in Level of Drinking and Driving and confirmed by both the self-reported drinking prior to driving from the community survey results that show declines as well as the increase in perceived risk at the end of year two at a level of 4 out of 5, which represents a notable increase in this key intermediate variable. This is most likely the result of increased news about DUI enforcement in the second year of the project.

While there is evidence of the effects of increased visible drinking and driving enforcement, decisions about changes in intensity and environmental intervention for the following year include:

- Need for continued consistent and visible DUI Checkpoints in the community but most importantly greater news attention of such efforts with the intention of providing "boosters" to the community to increase perception of risk of DUI arrest and thus to lower the percent of drinkers who subsequently drive.

- A continued need for increased attention to enforcement visits to bars and restaurants and greater effort to enroll bars and restaurants who have not participated in alcohol service training often called Responsible Beverage Service or RBS.

The results from the community survey suggest that heavy drinking prior to driving has declined but still remains at a relatively high level suggesting that over-serving of alcohol continues even with greater DUI enforcement. Without data concerning direct observation of over-serving in bars and restaurants, it is difficult to confirm that the self-reported results are directly associated with a change in practice among bars and restaurant. However, there is continued absence of local enforcement visits to these establishments and low participation in alcohol service training.

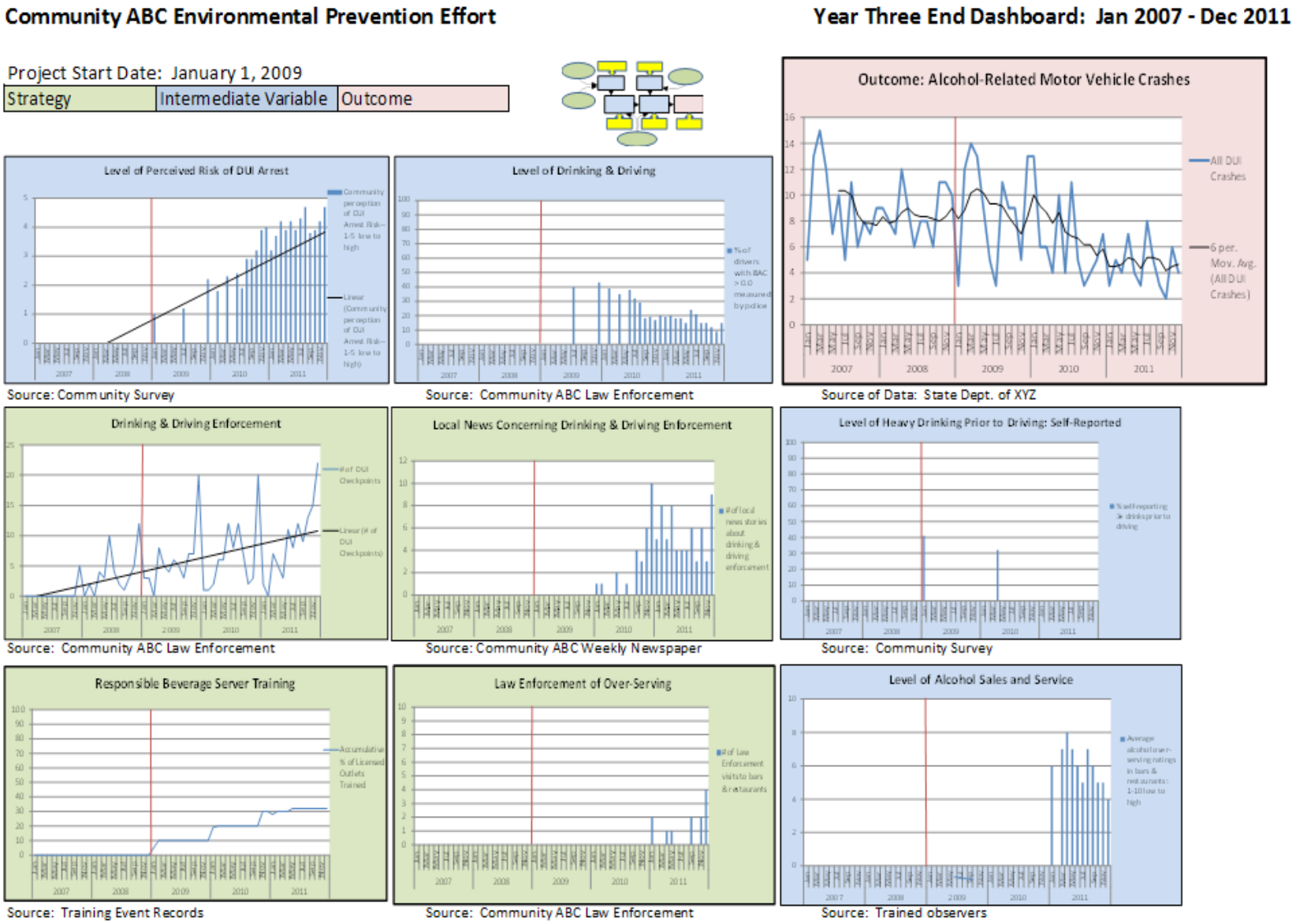
Concerning over-serving of alcohol to customers in bars and restaurants, there is relatively limited exposure of staff/managers from local alcohol establishments to training about alcohol service. Only about one-third of total community bars and restaurants have participated in such training.

In many ways, a review of the Community ABC Year Two Dashboard suggests a similar challenge for the project as was concluded at the Year One review concerning over serving alcohol in bars and restaurants, that is:

- A need for more consistent visible drinking and driving enforcement in which there is greater news attention to this enforcement (thus increasing visibility).

- Over-serving in bars and restaurants needs attention by the environmental project as the level of over-serving appears to be unchanged.

Figure 5. Community ABC Year Three Dashboard



End of Project Year Three Community ABC Dashboard Review

As a result of local data collection, review of data in the dashboard, and informed decisions that staff and coalition have made concerning adjustments and modifications in the Community ABC strategic plan, the three-year dashboard provides clear evaluation evidence of effects of this local effort.

The trend in the moving average of DUI crashes for Community ABC (see figure 5) now confirms the continuing downward decline in crashes and provides a strong basis for Community ABC to take credit for demonstrated effects both in reducing crashes and also in lowering the percent of drinkers who drive and increasing the public perception of risk for DUI arrests. These effects could certainly be the basis for a press conference to announce this success and provide evidence of the potential capacity and long term success of this local environmental prevention project to local, state, and federal funding sources.

With such confirming evaluation based upon local data and the result of thoughtful project management, the staff, coalition, and community leadership can be justifiably proud. Also even in times of limited public funding, these results can be utilized to justify the continued support of this environmental prevention project.

Appendix C shows the full management information system for Community ABC including the two years prior to project initiation and the three years after initiation on which the example Dashboards have been based. Please note the frequent missing data as might be expected.

What are future challenges for Community ABC at the end of Project Year Three?

Scientific research has demonstrated that perceived risk of DUI arrest can decay over time, especially if actual drinking and driving enforcement is not increased and/or at least maintained at current levels. This suggests that two challenges in enforcement are continued into year four and beyond:

1. Finding a way to continue community support for the current level of DUI enforcement as well as seeking to increase enforcement via additional resources or local resource allocation.

2. Continuing to provide news media attention to DUI enforcement, a need to vary types of news coverage and to provide "boosters" to past news and media attention.

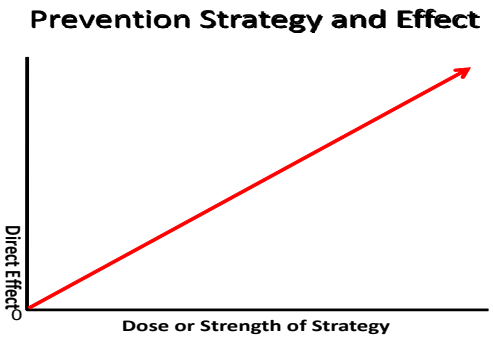
During Year Three for the first time, local observational data on level of over serving of alcohol in bars and restaurants are available showing that (as might be expected) bars and restaurants are continuing a process of alcohol sales and service to customers who drive that increases the risk of alcohol-involved crashes after leaving the establishment. Based upon the observational data from visits to local bars and restaurants, over serving of alcohol is rather high, that is, between 7 and 10 on a 10 point scale, where 10 is a "very high" incidence of over serving. This is certainly not independent of the lack of law enforcement of over-serving in bars and restaurants (shown in the dashboard for Year Three). There is an increase during Year Three in local law enforcement visits to bars and restaurants concerning over-serving of alcohol but such visits are irregular and the end of year increase in enforcement visits appears specifically linked to end of year holidays.

A change in the local strategic plan is necessary to focus more project resources and attention to both increasing visible enforcement of over-serving and the percentage of licensed establishments participating in training. There is also a challenge to add a new strategy to the local plan which would be to increase news attention to the risks of alcohol over-serving (not only in reducing drinking and driving and associated crashes but also alcohol related violence and non-traffic injuries) and the increase law enforcement of over service. This type of local news coverage concerning enforcement of over-serving of alcohol as news has a similar relationship as news about DUI enforcement; that is, increasing the perceived risk of enforcement by managers and servers in order to change their behavior and thus to reduce alcohol over-serving.

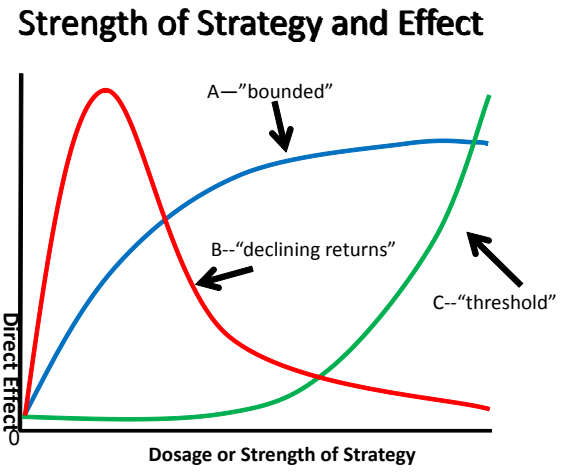
Again, continuing the example, by viewing the measures of the strategies it is clear that news stories have been sporadic, so this may be where management wants to increase attention in an effort to more strongly reach adults in the community and thus affect the overall outcome. Further adjustments in the implementation or the operation of a strategy or in the selection of intermediate variables are made as needed.

Relationship of Prevention Strategies to Effects

An important consideration for utilizing and interpreting data in a local dashboard is to recognize that the relationship between any strategy and its impact or effectiveness rarely follows a straight line. For this to be true, for every increase in the strength, intensity or dosage of a strategy, there would be a consistent and commensurate increase in its effects. This assumption is illustrated in the chart to the right. While there is limited research concerning the "dose to effect" relationships that may exist, practical experience suggests that a simple linear relationship is unlikely in actual prevention practice.



The accompanying illustration (below) shows a series of possible hypothetical relationships of intensity to effect, none of which is linear as illustrated above. While one can postulate any number of possible relationships, this diagram illustrates at least three that are realistic in practice. Therefore, in examining the charts on the local dashboard any one of these types of relationships might be active and should be considered.



The relationship curve marked A – "bounded" may be rather typical in practice in which at some point, any more dosage or intensity of a strategy achieves little or no additional effect. Once the prevention strategy reaches that upper bound, then little is actually achieved – in short "more" is not always better.

The relationship curve marked B – "declining return" is of particular concern in that while the strategy achieves some early significant effects, after a certain level of intensity, the effects actually decline and overall effectiveness is reduced. This might illustrate a situation where there is a backlash to increased intensity of a strategy and thus lower effects – in short "more" is actually worse!

Relationship curve marked C – "threshold" illustrates a situation where the effects of a strategy can be lagged or require a critical point or threshold to be reached before any substantial effects are achieved. Thus, a community prevention effort would need to be patient while increasing intensity until sufficient dosage is achieved beyond which the effect increases substantially – in short, "more" can be better to achieve this tipping point or threshold.

Of course, these are only three examples of perhaps many relationships. The point is made here only as a reminder that practical prevention is rarely linear.

Costs, Effects and Benefits of Local Environmental Prevention

Most communities are concerned with the benefits of any local prevention effort. The discussion to this point has emphasized effects or changes in the targeted outcome. Another consideration is prevention cost (as an investment by the community) relative to effects and to benefits. The actual calculation of the cost and the effects and benefits of a specific environmental prevention effort could be documented if achieved using the Seven Component Strategic Planning process described in this guide. The value of prevention can be described in a number of ways. Up to this point the primary "benefit" to the community is reduced harm via reducing the outcome that the strategic planning process targets.

One could further compare the benefit to the community obtained with the investment of cost of the environmental prevention effort. In other words, "what was the return on our investment?" The simple equation that expresses a return on prevention investment or cost can be shown as:

> **Cost/Effectiveness = (Total Cost of Prevention Effort) ÷ (Total Number of Problems Reduced) = Prevention Cost or Expenditures per Problem Reduced**

In other words how much did the community pay per each problem prevented?

Applying this approach using the example of Community ABC, the effect (or benefit to the community) of environmental prevention effort is the number of alcohol-involved traffic crashes reduced. A simple equation to express cost/effectiveness could be expressed as:

> **Cost/Effectiveness = (Total Cost of Prevention Effort) ÷ (Total Number of Crashes Reduced) = Prevention Cost or Expenditure per Crash Reduced**

Determining the number of crashes reduced or prevented requires calculating (or estimating) how many crashes might have occurred if there was no prevention. One might utilize the annual average of alcohol-involved crashes over the 3 to 5 years prior to the start of the environmental prevention effort to a "pre-project baseline". For example:

Total Number of Crashes Reduced = ((Average Annual Pre-project baseline of crashes) X (Number of project years)) - (Total Number of Crashes after Project Began)

Other approaches to estimating the expected annual number of crashes without the prevention effort could be utilized based upon other assumptions about local historical crash patterns if desired. For Community ABC, the equation for Cost/Effectiveness above, can calculate the prevention cost per crash prevented.

One may also wish to express the benefit to the community in cost or economic terms. In other words, what is the monetary return on the prevention investment? Thus the effects (as defined above) are then expressed in terms of reduced cost to the community or cost savings, that is, for each one dollar (or $100 or $1000) spent on prevention, the community saves an estimated cost per event or problem or harm prevented or averted. This becomes the real return on the investment in prevention in monetary terms. The effect (or benefit) is then converted to "cost savings". A simple equation for annual cost savings can be expressed as:

Annual Cost Savings = ((Annual # of events reduced) * (community cost per event)) - (Annual Cost of Prevention Effort)

In the example, the Community ABC environmental prevention effort must estimate the cost savings associated with the number of crashes reduced (for which it can take credit). This becomes the economic benefit (or "effect" described in monetary terms). While the cost of the Community ABC environmental prevention effort is known, the average cost for a crash must be calculated or estimated considering vehicle damages, medical care, rehabilitation, enforcement, loss wages, etc. associated with one crash on the average. The challenges faced in actually calculating cost saving include measuring local costs associated with specific outcomes (community problems) and determining the number of events actually reduced.

Note: economists may utilize much more complicated approaches to calculating cost/effects or cost/benefits. These illustrations here are straightforward approaches to presenting the benefits of local environmental prevention to a community and its leadership. Certainly other or more technical and complex approaches can be used if desired.

Summary

Component 7 represents the culmination of a dynamic cycle of strategic planning using the tools of a logic model, a management information system and a dashboard.

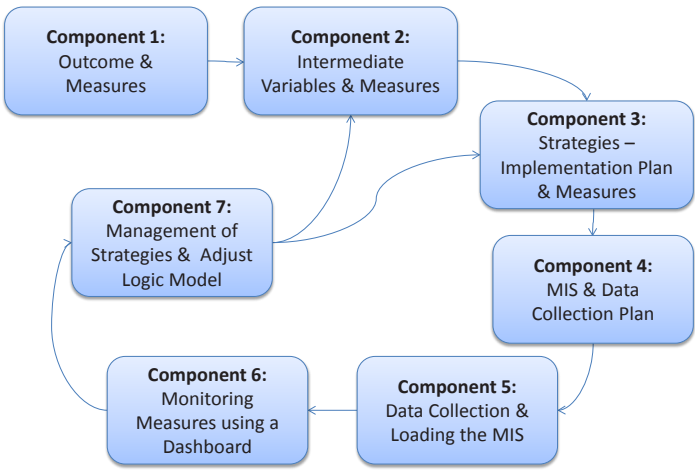
When management, staff and the community coalition have reached this point in the process – whether at the end of the first six months of the environmental prevention effort or the first or second or third year, there is that sense of accomplishment due to use of local data. There is more knowledge about the community than there was at project start. There is also a sense of starting fresh as adjustments and fine tuning have been considered in the effort to achieve greater success. Having local data informs decisions for refining the logic model and managing strategies to move closer and closer to being effective, that is, reducing the targeted community problem or outcome.

Depending on the decisions made to refine the logic model, the time has come to return to either Component 2: Intermediate Variables or Component 3: Strategies and Implementation Plan.

If decisions have been made to add an additional intermediate variable and its measure in the future and/or add a measure to an existing intermediate variable, then return to Component 2.

If decisions are to adjust the intensity or dosage of an existing strategy and/or to implement an additional strategy and its measure, go to Component 3.

Changes in either case will mean updating the MIS and data collection process in Components 4 and 5 and the dashboard for continued monitoring in Components 6 and 7.



This is also a good time to focus on communication with local politicians, funding sources and the general public about the progress of the environmental prevention effort and giving credit to all participants, for example, local organization and agencies, law enforcement, elected officials, owners of bars and restaurants or alcohol retail sales outlets, particularly as effects are achieved and if cost effectiveness can be calculated.

The Seven Component Strategic Planning process using a Logic Model is obviously a dynamic one in which there is regular assessment, evaluation, and modification of effort to increase potential effectiveness of environmental prevention over time. This approach to strategic planning is built upon the assumption that while science gives much informed information needed in any community, no community is exactly the same. Thus a strategic plan must be dynamic and subject to regular review and modification based upon local data.

> Any strategic plan for environmental prevention that is fixed and unchanged over time is very likely to fail.
>
> The bad news is the lack of local data can hide that truth.

As the Community ABC example illustrates the process is never finished nor completed and adjustments, additional data, additional effort (or reduced effort for strategies that are not achieving effect), are always a part of this ongoing process. The advantage to the community is that any environmental prevention effort that utilizes this process is "self correcting" by increasing the potential to be effective over time, using local data in new and creative ways. Such a process also pushes (and rewards) the local prevention effort to be more and more relevant to the community situation while utilizing the best science evidence available. ***In short, this is a true learning community approach to effective local prevention.***

Final Thoughts

The approach to community prevention described in this guide contains many elements shown in other strategic planning frameworks. The use of a logic model for a local strategic plan is certainly not new. Many planning approaches emphasize (a) logic models and (b) change and adjustment. What is added here is a set of practical science-based evidence, tools and technology that can be used by a local environmental prevention effort to become more cost-effective. Local data provides the greatest benefit to the community!

In this Seven Component Strategic Planning approach, evaluation is built-in. *No distinction is made here between outcome evaluation and process evaluation*. Rather, local data as specified in the full logic model creates the essential foundation for the local prevention effort to monitor key intermediate variables, strategies, and actions and to make changes/modifications to increase potential effectiveness. That is, reduction in targeted outcomes is supported by changes in local strategies as they impact key intermediate variables. The complete MIS also provides for documenting action steps and events that are necessary for effective prevention following the logic model.

Actually implementing all seven components in current local prevention practice is rare. To implement all seven components over time can be helpful to the community but may not be recognized or supported by state or federal (or even local) funding sources. In such situations, a community may therefore make a decision on its own to implement this approach including the science-based evidence, tools and technology that are essential to effective prevention.

Again, this Seven Component Strategic Planning process is not necessarily "new" in that planning, modification, and feedback are natural aspects of many strategic planning approaches to substance abuse prevention. What this process adds are specific tools and technology, a strong reliance on scientific evidence and local data in order to equip the community environmental prevention effort to be as effective as possible.

However, to fully implement all seven components in a community will in practice require a trusting and supportive partnership between state and local prevention. Such a partnership can actually achieve effects that will be a unique gift to both the community and the state but also demonstrate that, indeed, prevention "does work".

Appendix A: Documenting the Strategic Planning Process

Historical documentation of the entire strategic planning process should be required for the following reasons:

- To record the original logic model and reasons for its design.
- To record subsequent changes made in the logic model over time and the decisions made based on measurement of the outcome, intermediate variables, and strategies.
- To validate the process for purposes of reporting to the community at large, city council members or county commissioners, or the State or other funding sources.
- To provide reference for future undertakings in the community for other environmental prevention efforts.
- As a basis for training or educating new members of the prevention staff or community coalition.
- To record data for all measures specified in the logic model both historical prior to the beginning of the effort and over the entire time period of the effort as the basis for monitoring and managing the effort.

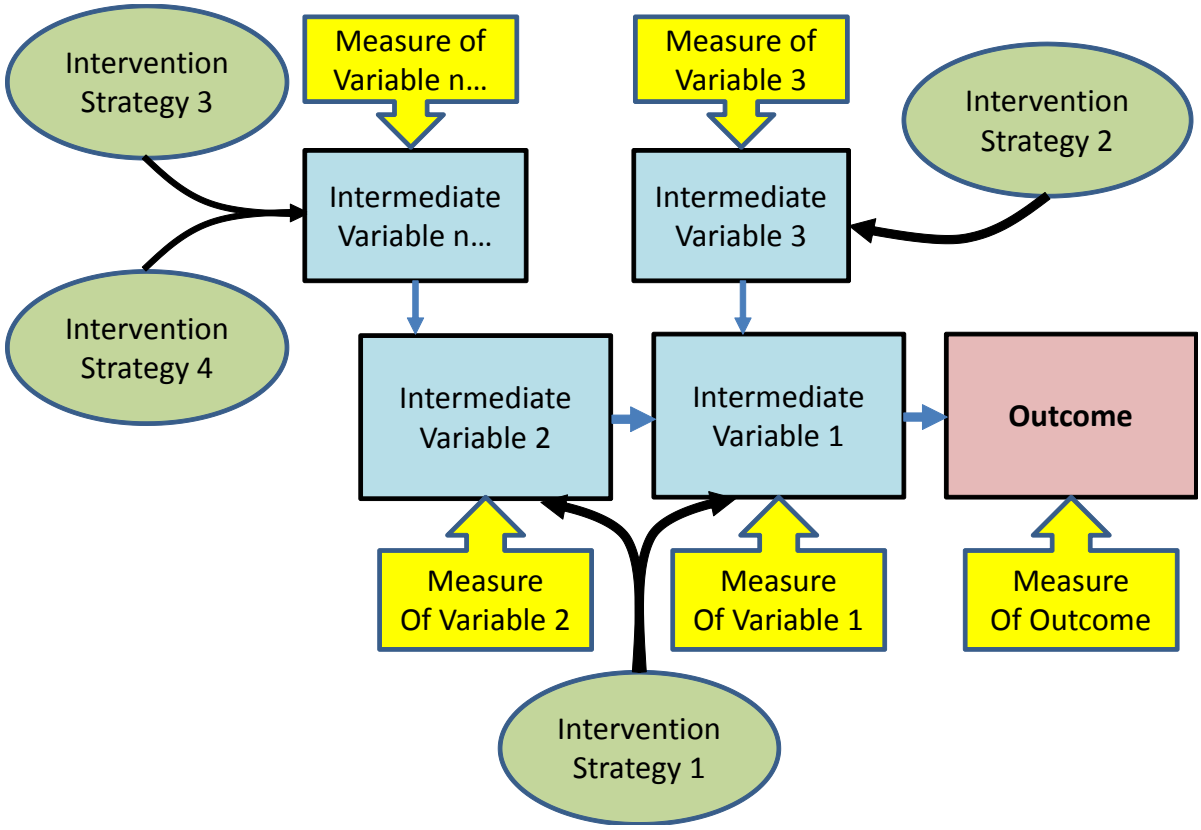
Documenting the Logic Model

The logic model templates that follow can be used in training as well as the actual process of strategic planning to record ideas under consideration as well as progress made in each step of the process until the logic model is completed. Further, the templates can be used to document the dynamic changes in the logic model that might occur as a result of Component 7 of the process. Two possible templates are shown.

Logic Model Template Using Microsoft PowerPoint

The template was created in Microsoft PowerPoint 2010. Here the logic model can be built top down or left to right as desired. In general, an arrangement that shows clearly how all intermediate variables relate to each other and/or ultimately to the outcome reminds the viewer of its scientific basis and of the overall purpose to affect the outcome and achieve the effects originally selected by the community.

Notice that this template uses different colors to distinguish between the outcome, intermediate variables, strategies and the measures (or indicators) for each. Maintaining consistency in this way facilitates understanding of the purposes or roles of each and communication to those who have not participated in the process of development of the logic model. Note also that the arrows linking intermediate variables with the outcome and each other can be of different thicknesses indicating the strength of the science backing their relationships.

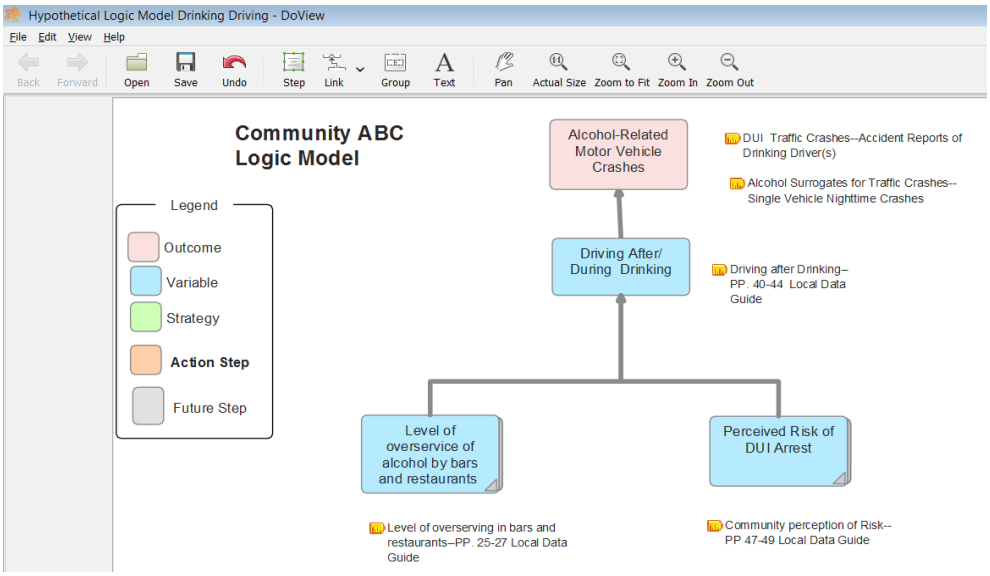


Logic Model Template Using DoView

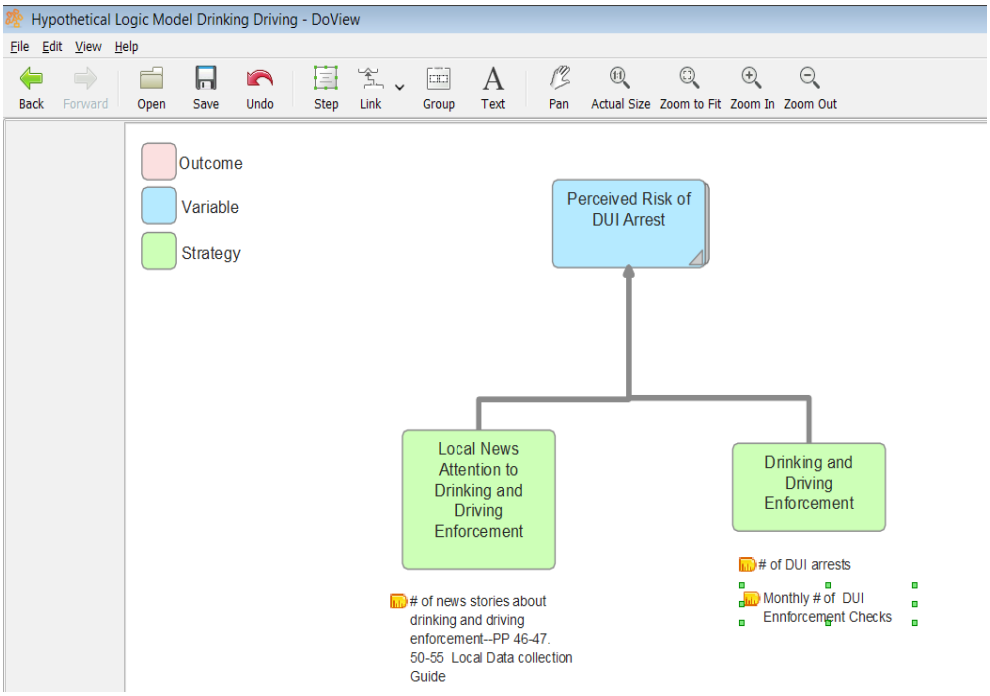
This second template was developed using software entitled DoView that is designed specifically as a strategic planning tool for visualizing outcome and using logic models.[1] DoView has the capability of handling complex relationships using multiple pages. Note the legend where the same color scheme is used to distinguish between parts of the logic model. Measures for each are shown as yellow rulers.

Again, DoView provides many capabilities, such as setting the width of arrows to indicate strength of relationship between variables, and can be built top down or right to left.

1. See http://www.DoView.com



For example, clicking on the grey triangle in the box of the intermediate variable called "Perceived Risk of DUI Arrest" takes the user to a second page as shown here. Note the measures given for each strategy on this page.



Appendix B. Examples of a Local Media Plan

The following are two examples of local media plans – one for Drinking and Driving and one for Underage Drinking offer a structured way to work with local news media whether print, televised or digital by focusing on a particular monthly theme.

Community ABC Local Media Plan: Drinking and Driving Prevention--First 9 months

MONTH –LOCAL NEWS THEME FOR MONTH	STORIES/NEWS CONFERENCES	POSSIBLE DATA SOURCES	COMMENTS/ SUGGESTIONS
Month 1 Immediate Challenge facing Community ABC: **high number of alcohol-involved crashes**. Personal testimony of families who have lost members to drinking drivers.	Serious local problem of drinking and driving (especially among youth). How to reduce drinking and driving locally.	Past 6 or 12 months of DUI crashes for Community ABC. Perhaps a chart showing past trends or comparison to state or nation (if higher).	This sets stage for community to see the "problem of drinking and driving" in a new light or with renewed attention. If prior successes are available, then new challenges and special emphasis for next 6-9 months. Short period of emphasis gives intensity and urgency.
Month 2 Community ABC Coalition is implementing a special prevention effort with emphasis on drinking and driving using the latest scientific evidence and local data for increasing effectiveness of the effort.	Press conference to present Community ABC Logic Model with emphasis on best evidence and science.	Mayor or coalition chair or another community leader presents the Community ABC Logic Model. Coalition Plan concerning increased emphasis on drinking and driving over next 12 months.	Three possible local media phases: Community is initiating (or revamping) a special interest in drinking and driving. Local data and review of best science suggests key strategies. Local law enforcement supports the coalition in special emphasis.
Month 3 Emphasis on drinking and driving by youth: Risk of harm to youth resulting from drinking and driving. Increased enforcement of youth drinking and driving.	% of youth driving after drinking --% of youth riding with driver who has been drinking (most often girls…important point of emphasis—"is your daughter at risk?") # of youth DUI citations and alcohol possession citations (MIPs).	Most recent youth survey plus personal experiences of local youth with drinking and driving or riding with drinking drivers. Press conference with local city police about about increased emphasis on DUI enforcement with emphasis on youth drivers	The goal in this month is to emphasize that drinking and driving crashes for youth are the leading cause of injury and death for the young. As a result of this emphasis, there is evidence that enforcement is actually occurring, especially with young drivers.

MONTH –LOCAL NEWS THEME FOR MONTH	STORIES/NEWS CONFERENCES	POSSIBLE DATA SOURCES	COMMENTS/ SUGGESTIONS
Month 4 Enforcement results and future plans including possible emphasis to reduce heavy drinking at local bars and restaurants. Importance of **responsible beverage service** by local bars, restaurants, pubs, and clubs.	Total numbers of checkpoints & of DUI arrests. % of local drinking drivers coming from restaurants, bars, pubs, and clubs.	Police DUI statistics. Local survey data self-reported drinking and driving, or "place of last drink" data from DUI arrests, or personal experiences about drinking and driving and source of alcohol.	Two phases: 1. Publicize that drinking & driving enforcement has actually occurred. 2. New emphasis on providing alcohol to customers and need for responsible service of alcohol.
Month 5 **Youth action** to reduce underage drinking and driving.	Youth hold press conference(s) to express concern about harms to youth from drinking and driving (especially if there has been a serious crash in the recent past) and to announce their public campaign.		A special project for a youth group or club. The entire effort should include giving interviews, perhaps preparing a video. Opportunity to warn adults about risks of providing alcohol to youth and of youth drinking and driving.
Month 6 Summary of coalition and local community efforts to enlist local bars, restaurants, etc. in learning about responsible service of alcohol..	News about efforts (to date) to enlist alcohol establishments in training concerning reducing drinking and driving.	Data about numbers of training events, participants, and % of local licensed premises actually participating in training. Personal interviews with "interested" managers and owners.	This follows up the emphasis in Month 4 on responsible service of alcohol to demonstrate the level of cooperation and participation of local bars, restaurants, etc.
Month 7 Six month Community ABC **report card** on results of drinking and driving enforcement.	News conference about evidence of (a) enforcement, and (b) changes in drinking driving crashes (if data available?)	Most recent data on alcohol crashes as well as enforcement statistics including checkpoints and DUI arrests.	This month becomes a way to: (a) remind the community of the special emphasis on drinking/driving, and (b) show any success or effects.
Month 8 Update on responsible service of alcohol in Community ABC Local enforcement of "over serving" of alcohol in bars, restaurants, etc.	Local news about local bars, restaurants, etc. who have changed alcohol service to reduce harm. News about a "retailer reward" program. Reports about enforcement visits, citations, warnings to local establishments	Most recent data on participation in responsible beverage training. Results (if available) of "tests of over-serving" Local law enforcement data (both number of enforcement events but also tickets and citations or warnings)	Two Focal Points: Reward local establishments who are involved in training. Law enforcement is now checking establishments for safe alcohol service practice.
Month 9 Evidence of **effectiveness** of Community ABC Drinking and Driving Effort.	News about changes in drinking and driving crashes, enforcement, and arrests. Personal testimony about people who appreciate the effort and the continuing concern about families who are harmed via drinking and driving.	Most recent data on alcohol crashes as well as enforcement statistics including checkpoints and DUI arrests.	The point of this is to celebrate success and demonstrate that real "effects" can be achieved.

Community ABC Media Plan: Underage Drinking Prevention – First 9 Months

MONTH -NEWS THEME FOR MONTH	SUGGESTED STORIES/ NEWS CONFERENCES	POSSIBLE DATA SOURCES?	COMMENTS/ SUGGESTIONS
Month 1 Immediate Challenge Facing Community ABC: **Underage drinking** in social and informal situations.	Community ABC has been successful in reducing retails sales to Youth Immediate challenge: social provision and availability of alcohol	Most recent Youth Survey data on current levels of drinking with emphasis on where youth are obtaining alcohol (retail versus social sources) as well as # of compliance checks over past year (show frequency of checking). Alcohol sources named in most recent survey for alcohol by %.	This sets stage for community to see the "problem of underage drinking" in a new light, plus shows success from past efforts…new challenge and special emphasis for next 6-9 months. Short period of emphasis gives intensity and urgency.
Month 2 **Community ABC Coalition** –special emphasis on Underage Drinking. Plans for increased enforcement of social availability of alcohol to underage persons	Press conference to present Logic Model with emphasis on best evidence and science. Report from local law enforcement about importance of reducing social availability of alcohol to youth	Perhaps Mayor or coalition chair or another community leader presents the Community ABC Logic Model. Coalition Report concerning increased emphasis on social availability over next 12 months.	Three possible local media phases: Community is initiating (or revamping) a special interest in underage drinking. Most recent data emphasizes need for coalition to emphasize social sources Local law enforcement will increase, and emphasize social sources in this year.
Month 3 **Risk of harm** to youth resulting from drinking and driving. Increased **enforcement** of youth drinking and driving Increased emphasis on **social availability** of alcohol, with attention to prom and high school graduation.	% of drinking youth with 5+ drinks in 30 days % of youth driving after drinking % of youth riding with driver who has been drinking (most often girls…important point of emphasis—"is your daughter at risk?"	Most recent youth survey plus personal experiences of local youth with drinking and driving or riding with drinking drivers. Press conference with local city police about increased emphasis. Press release from SC Highway patrol about increased DUI enforcement with emphasis on youth	The goal in this month is to build upon regular emphasis on drinking and school events, but to do more than "sober prom" but also emphasis enforcement, especially of drinking and driving by youth or riding with a drinking driver.
Month 4 Enforcement results and **future plans** including possible emphasis to reduce youth drinking. Emphasis of youth drinking and driving (perhaps from state patrol as well as local police)	Number of check points, number of DUI arrests for youth Citations or party disruptions Previous success of ABC Coalition Efforts (looking at DUI crashes, youth versus adults)	Police DUI statistics Law enforcement data about social enforcement (also compliance checks results to remind citizens of regular enforcement) Crash data about Community ABC Youth DUI crashes compared to Adults crashes	Publicize that enforcement emphasis has actually occurred and any evidence of effects/results from local data. Also set up attention to youth drinking and social sources during summer. Establish that Community ABC Coalition has been successful and is prepared to make a difference.

MONTH -NEWS THEME FOR MONTH	SUGGESTED STORIES/ NEWS CONFERENCES	POSSIBLE DATA SOURCES?	COMMENTS/ SUGGESTIONS
Month 5 **Youth action** to reduce underage drinking and harm	Youth hold press conference(s) to express concerns (especially if there have been crashes in the recent pass) but to announce their public campaign. Also news conference about adult risks for purchasing or providing alcohol to youth (not their own children). Legal risks.		This could be a special project for a youth group or club. The entire effort should include giving interviews, perhaps preparing a video. Opportunity to warn adults about risks of providing alcohol to youth.
Month 6 Summary of coalition and **local community efforts** to date to reduce underage drinking and harm. Evidence of effectiveness including parents and youth involvement.	News about level of alcohol enforcement, with special emphasis on youth	Alcohol Enforcement data and any evidence about results to date…depending upon available data.	This is a 6 month retrospective of "what has been accomplished" and what challenges remain. Could be interview with local Police Chief, Mayor, or Coalition Chair (or all of them).
Month 7 Challenge of underage drinking still exists but progress has been made.	News conference about evidence of current youth drinking and % of youth who are drinking 5+ drinks, drinking and driving, and riding with drinking drivers.	Recent school brief surveys (or internet survey) and any personal testimony from youth and parents.	Could be matched to the start of school with acknowledgement of the problem of youth drinking and related harm. (depending upon the school schedule),
Month 8 Renewed emphasis on **social availability** of alcohol and the importance of enforcement.	Law enforcement press conference about enforcement of social sources of alcohol	Local law enforcement data (both number of enforcement events but also tickets and citations or warnings)	Reminder of social enforcement of alcohol.
Month 9 Evidence of **effectiveness to date** from the special emphasis on underage drinking and social availability of alcohol	News about changes in youth drinking or related harm.	Youth survey data, e.g., brief school survey or internet survey. Injury, DUI crash data, reports of drinking and driving and riding with a drinking driver.	The point of this is to celebrate success and demonstrate that real "effects" can be achieved.

Appendix C. Community ABC's Management Information System

OUTCOME & INTERMEDIATE VARIABLES	JAN 2007	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN 2008	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2009	FEB	MAR	APR	MAY	JUN
Alcohol Involved Traffic Crashes: Number of DUI crashes	5	13	15	12	7	10	5	11	6	8	7	9	9	8	7	12	9	6	8	8	6	11	11	10	3	12	14	13	9	5
Level of Drinking & Driving: % of Drivers with BAC >0.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Level of Heavy Drinking Prior to Driving Self-Reported % reporting 3+ drinks	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	41%	ND	ND	ND	ND	ND
Level of Perceived Risk of DUI Arrest: Self-reported perception (1-5 low to high)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND
Level of Alcohol Sales & Service Pattern: Level of over-serving (1-10 low to high)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
STRATEGIES	JAN 2007	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2008	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2009	FEB	MAR	APR	MAY	JUN
Responsible Beverage Server Training: Accumulative % of total licensed establishments trained	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	10	10	10	10	10
Law Enforcement of Over-Serving: Number of visits to licensed establishments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Drinking & Driving Enforcement: Number of DUI checkpoints	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	4	3	10	4	2	1	3	5	12	3	3	0	8	5	4
Local News Concerning Drinking & Driving Enforcement: Number of news stories about DUI enforcement in local media	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	ND

OUTCOME & INTERMEDIATE VARIABLES	JULY 2009	AUG	SEPT	OCT	NOV	DEC	JAN 2010	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN 2011	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Alcohol Involved Traffic Crashes: Number of DUI crashes	3	11	9	9	5	13	13	6	6	4	10	4	11	5	3	4	5	7	3	5	4	7	4	3	8	5	3	2	6	4
Level of Drinking & Driving: % of Drivers with BAC >0.0	40	ND	ND	ND	ND	43	ND	39	ND	35	ND	38	32	29	18	19	17	20	19	20	18	18	15	24	21	15	15	12	9	15
Level of Heavy Drinking Prior to Driving Self-Reported % reporting 3+ drinks	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Level of Perceived Risk of DUI Arrest: Self-reported perception (1-5 low to high)	1.2	ND	ND	ND	ND	2.2	ND	1.8	ND	2.3	ND	2.4	1.9	2.9	2.9	3.2	3.9	4.0	3.2	3.7	4.2	3.9	4.2	3.9	4.3	4.7	3.8	3.9	4.2	4.7
Level of Alcohol Sales & Service Pattern: Level of over-serving (1-10 low to high)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	ND	7	8	7	6	5	7	6	5	5	4
STRATEGIES	JULY 2009	AUG	SEPT	OCT	NOV	DEC	JAN 2010	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN 2011	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Responsible Beverage Server Training: Accumulative % of total licensed establishments trained	10	10	10	10	10	10	19	20	20	20	20	20	20	20	20	20	30	30	28	30	30	30	32	32	32	32	32	32	32	32
Law Enforcement of Over-Serving: Number of visits to licensed establishments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	0	0	0	2	0	2	4
Drinking & Driving Enforcement: Number of DUI checkpoints	6	5	3	7	7	20	1	1	2	6	6	12	8	12	7	2	3	20	2	0	7	5	3	11	8	12	9	13	15	22
Local News Concerning Drinking & Driving Enforcement: Number of news stories about DUI enforcement in local media	ND	ND	ND	ND	ND	ND	1	1	0	0	2	0	1	0	4	3	6	10	5	8	5	8	4	4	4	6	3	6	3	9