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Using Logic Models for Strategic Planning and Evaluation

Application to the National Center for Injury Prevention and Control

Victoria A. Greenfield, Valerie L. Williams, Elisa Eiseman

Prepared for the National Center for Injury Prevention and Control
The research described in this report was conducted under the auspices of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE), a division of the RAND Corporation, for the National Center for Injury Prevention and Control.
Preface

About This Analysis

The RAND Corporation undertook this analysis to assist the National Center for Injury Prevention and Control (NCIPC) in developing its strategic plan, including goals and measures, and in preparing for its Program Assessment Rating Tool (PART) review. NCIPC sought detailed guidance in articulating and refining central components of its strategic plan and in collecting and strengthening evidence to present to the Office of Management and Budget for the PART review as part of a larger effort to establish robust strategic planning and evaluation processes. The analysis will also provide assistance to other federal agencies and programs facing similar needs.

Drawing on previous RAND analyses conducted for the National Institute for Occupational Safety and Health and others, this technical report focuses on the use of logic modeling to achieve NCIPC’s objectives. In particular, it shows how NCIPC can use logic modeling to meet its immediate needs (i.e., to develop goals and measures for its strategic plan and prepare for the PART review) and to implement sustainable, ongoing strategic planning and evaluation processes.

The RAND Safety and Justice Program

This research was conducted under the auspices of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE). The mission of RAND Infrastructure, Safety, and Environment is to improve the development, operation, use, and protection of society’s essential physical assets and natural resources and to enhance the related social assets of safety and security of individuals in transit and in their workplaces and communities. Safety and Justice Program research addresses occupational safety, transportation safety, food safety, and public safety—including violence, policing, corrections, substance abuse, and public integrity.

Questions or comments about this report should be sent to the project leaders, Victoria Greenfield (Victoria_Greenfield@rand.org) and Valerie Williams (Valerie_Williams@rand.org). Information about the Safety and Justice Program is available online (http://www.rand.org/ise/safety). Inquiries about research projects should be sent to the following address:
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Summary

The mission of the National Center for Injury Prevention and Control (NCIPC) is “to prevent premature death and disability and to reduce the human suffering and medical costs caused by injuries.” NCIPC accomplishes its mission through surveillance, intra- and extramural research, and program development and implementation.

Like all federal programs, NCIPC must comply with the terms of the Government Performance and Results Act (GPRA) of 1993 and carry out regular reviews using the Program Assessment Rating Tool (PART). PART provides a basis for evaluating programs’ performance through a series of questions devoted to purpose and design, strategic planning, management, and results and accountability. NCIPC will commence its PART review in the spring of 2006.

As part of a larger effort to implement sustainable, ongoing strategic planning and evaluation processes, NCIPC sought RAND’s assistance in developing its strategic plan, including goals and measures, and preparing for its upcoming PART review. NCIPC asked RAND to build on previous analyses that RAND has conducted for the National Institute for Occupational Safety and Health (NIOSH) and other federal agencies and programs. This report shows how NCIPC can use logic modeling to meet its immediate needs, i.e., to develop goals and measures for its strategic plan and prepare for its PART review, and to implement sustainable, ongoing strategic planning and evaluation processes. Drawing on the results of past analyses, this report emphasizes the use of a “logic model template” that incorporates operations and strategy.

Strategic Planning

In assisting NCIPC, much of our effort involved the development of NCIPC-tailored logic models. Our work with NCIPC and other federal agencies and programs indicates that logic models can serve at least two distinct yet related planning functions: First, they can serve as a means of communicating with internal and external audiences; and second, they can serve as planning tools. As planning tools, logic models can provide a framework for articulating and aligning operations, goals, and measures. In this role, the logic model can serve as a foundation for developing a strategic plan.

To assist NCIPC in strategic planning, this report presents and illustrates a replicable process for developing NCIPC-tailored logic models; the process involves tracing the path of

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NCIPC operations and then adding goals and measures to support the program’s mission. For an existing program, such as NCIPC, we start with the current path of operations and proceed, at times iteratively, to goals and measures; however, for a new program, we would typically start with goals.

Tracing the path of operations begins with gathering information about the program through discussions with staff and by reviewing existing planning documents. This provides information about the program inputs, activities, outputs, customers, and outcomes and, in conjunction with the logic model template, lays out the program’s operations.

The formulation of strategy essentially consists of using information from the operational path of the logic model and the overall template to develop goals and measures. The goals and measures are the basis of a strategic plan as they speak directly to the issue of program intent. We described three general approaches to conceptualizing strategic goals and a somewhat detailed approach for generating goals and measures from the template and operational path. Together, the depiction of operations and strategy constitutes the complete logic model and the foundation for strategic planning.

Using Evidence for Program Evaluation

We assisted NCIPC in its preparation for program evaluation, specifically for its upcoming PART review, but also more generally for program-improvement purposes. PART and other evaluation processes depend on the collection and effective use of evidence to assess whether a program is “on track,” or if mid-course corrections are needed to improve program performance. Thus, our assistance to NCIPC consisted of the identification of potential sources of evidence for PART and guidance in the selection and effective use of this evidence. For the former, we reviewed PART submissions from a number of federal agencies and provided NCIPC with a list of sources of evidence categorized by PART sections. For the latter, we used the logic model to provide guidance on the selection and effective use of the evidence.

Evidence gathered for program improvement should support or inform changes necessary to improve program performance. Within a program-improvement paradigm, knowing why a program is achieving its goals (or not) is more important than just knowing whether or not it does. Particularly important to achieving program improvements is the awareness of external factors and their impact on program outcomes.

Our logic model template includes external factors and provides a framework for identifying them in relationship to each element within the operational path. Recognizing the role of external factors for each element of the logic model can be an important means of targeting efforts for program improvement.

Conclusions and Next Steps

Implicitly, if not explicitly, this report lays the groundwork for establishing sustainable, ongoing strategic planning and evaluation processes by introducing and illustrating a broadly applicable methodology for carrying planning and evaluation processes forward.

In conclusion, we present several specific recommendations for establishing strategic planning and evaluation processes, of which two recommendations stand out prominently:
First, NCIPC should build these processes into its organizational structure and management systems; that is, they should become an integral part of the way in which NCIPC routinely “does business.” Second, NCIPC should elicit participation from a full range of stakeholders, both internal and external, at regular intervals, to benefit from their knowledge and to engender ownership of and support for policy decisions.
Acknowledgments

Sarah Foster, public health analyst in the Office of Policy, Planning, and Evaluation, was the NCIPC technical monitor for this work and took an active interest in its execution throughout. She provided useful ideas, information, and comments. In addition, representatives of each of the NCIPC divisions and offices met with us to share their perspectives on NCIPC operations and strategy and provided feedback on interim briefings.

Andrew Morral, director of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment, supported and reviewed the work. Rebecca Collins also reviewed this work. Lisa Sheldone and Lisa Spear provided additional administrative support. Christopher Nelson of RAND and John McLaughlin of McLaughlin Associates provided formal reviews, references, additional materials, and specific recommendations, which yielded significant improvements in the quality and accessibility of the overall report.

We thank them all for their contributions, but retain full responsibility for the accuracy of our findings and conclusions.
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention (formerly, Centers for Disease Control)</td>
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<tr>
<td>CPSC</td>
<td>Consumer Product Safety Commission</td>
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<tr>
<td>GAO</td>
<td>Government Accountability Office (formerly, General Accounting Office)</td>
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<td>GPRA</td>
<td>Government Performance and Results Act</td>
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<td>HHS</td>
<td>Department of Health and Human Services</td>
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<td>ICRC</td>
<td>Injury Control Research Center</td>
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<td>IHS</td>
<td>Indian Health Service</td>
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<td>NCIPC</td>
<td>National Center for Injury Prevention and Control</td>
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<td>NGO</td>
<td>nongovernmental organization</td>
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<td>NHTSA</td>
<td>National Highway Traffic Safety Administration</td>
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<td>NIOSH</td>
<td>National Institute for Occupational Safety and Health</td>
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<td>OD</td>
<td>Office of the Director</td>
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<td>OMB</td>
<td>Office of Management and Budget</td>
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<tr>
<td>PART</td>
<td>Program Assessment Rating Tool</td>
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<td>RPE</td>
<td>Rape Prevention and Education</td>
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<td>SBIR</td>
<td>Small Business Innovation Research program</td>
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In June 1992, the Centers for Disease Control and Prevention (CDC), within the U.S. Department of Health and Human Services (HHS), established the National Center for Injury Prevention and Control (NCIPC). The mission of NCIPC is “to prevent premature death and disability and to reduce the human suffering and medical costs caused by injuries.” NCIPC accomplishes its mission through surveillance, intra- and extramural research, and program development and implementation. NCIPC often undertakes these activities in partnership or collaboration with other entities.

Where other agencies or programs may have regulatory or enforcement roles, NCIPC “uses the public health approach—a systematic process to

- define the injury problem;
- identify risk and protective factors;
- develop and test prevention interventions and strategies; [and]
- ensure widespread adoption of effective interventions and strategies.”

Taken together, surveillance, scientifically based research, and program development and implementation form the core of this approach. With regard to research, NCIPC describes itself as “the only organization in the federal government with the responsibility to address all phases of the injury research framework—from foundational research through dissemination research—for all major causes of injury among all age groups.”

Organizationaly, NCIPC consists of three divisions and five functional offices. The divisions are the Division of Unintentional Injury Prevention, the Division of Violence Prevention, and the Division of Injury and Disability Outcomes and Programs. Five offices are housed within the Office of the Director: the Office of Communication Resources; the Office of Policy, Planning, and Evaluation; the Office of Research Grants; the Office of Statistics and Programming; and the Office of Program Management and Operations. Each divi-

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1 The CDC was then known as the Centers for Disease Control. For more about the history of NCIPC, see NCIPC (2004c).
5 The Division of Injury and Disability Outcomes and Programs currently is undergoing a change of name and may soon be known as the Division of Injury Response.
Using Logic Models for Strategic Planning and Evaluation

NCIPC partners and collaborates with many other federal, state, local, and private organizations, including the U.S. Departments of Transportation, Justice, and Education; the Consumer Product Safety Commission. Other operating divisions within HHS include the Indian Health Service, the National Institutes of Health, the Health Resources and Services Administration, the American Academy of Pediatrics and other medical associations, state and local health departments, and community programs. Examples of outcomes arising from such collaborations include a childhood injury–mortality atlas, detailing the eight major causes of injury-related deaths among Native Americans aged 19 and younger.6

Like all federal programs, NCIPC must, within the context of its parent agency HHS, comply with the terms of the Government Performance and Results Act (GPRA) of 1993 and carry out regular program evaluations using the Bush administration’s Program Assessment Rating Tool (PART).7 GPRA requires that agencies identify goals for specific outcomes of their activities, develop performance measures to assess programmatic outputs and outcomes, gather the requisite data to evaluate performance measures, and report annually on progress toward goals. PART, which the Bush administration introduced in 2002 to further the policy objectives of budget and performance integration, is a systematic method of assessing program performance across the federal government.8 It includes a series of diagnostic questions designed to provide a consistent approach to the evaluation of federal “programs.”9 PART’s approximately 30 questions (the number varies depending on the type of program)10 are divided among four sections: Program Purpose and Design, Strategic Planning, Program Management, and Program Results and Accountability. The answers to the questions are generally written in a “Yes or No” format,11 with relevant supporting evidence, and result in a numeric score from zero to 100 for each of the four sections. These scores are then combined to achieve an overall qualitative rating: “Effective,” “Moderately Effective,” “Adequate,” or “Ineffective.” Programs that do not have acceptable performance measures or have not yet collected performance data generally receive a rating of “Results Not Demonstrated.”

Under PART, federal programs undergo review in five-year intervals. NCIPC will commence its PART review in spring 2006 as part of the 2008 fiscal year budget process.

As part of a larger effort to implement sustainable, ongoing strategic planning and evaluation processes, NCIPC sought RAND’s assistance in developing its strategic plan, including goals and measures, and preparing for its upcoming PART review. NCIPC asked RAND to build on previous analyses that RAND has conducted for the National Institute

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6 The summary of the atlas can be found at the CDC’s Injury Center Web site; see NCIPC (2005b).
7 For purposes of PART compliance, NCIPC constitutes a single “program.”
9 There is no standard definition for the term “program.” For purposes of PART, the Office of Management and Budget (OMB) describes the unit of analysis (program) as (1) an activity or set of activities clearly recognized as a program by the public, OMB, and/or Congress; (2) having a discrete level of funding clearly associated with it; and (3) corresponding to the level at which budget decisions are made (Office of Management and Budget, 2005).
10 PART categorizes programs into seven major program types that reflect different approaches to service delivery: competitive grants, block/formula grants, capital assets and service acquisition programs, credit programs, regulatory-based programs, direct federal programs, and research and development programs.
11 Section IV has a four-level scale and permits answers to reflect partial achievement of goals and evidence of results.
for Occupational Safety and Health (NIOSH) and other federal programs.\textsuperscript{12} Drawing on the results of those analyses, this report focuses on the use of logic modeling to achieve NCIPC’s short- and long-term objectives. In particular, it shows how NCIPC can use logic modeling to meet its immediate needs, i.e., to develop goals and measures for its strategic plan and prepare for its PART review, and to implement sustainable, ongoing strategic planning and evaluation processes.

The following pages provide a brief introduction to our use of logic models in general terms, without specific reference to PART requirements; to the methods that we used to construct NCIPC-tailored logic models with program-specific data for purposes of communication and as a foundation for developing a strategic plan; and to the ways in which we identified potential sources of evidence for the PART review and then used the model to frame the selection and effective use of that evidence. We address aspects of each in more detail in subsequent chapters of this report.

\textbf{Methodological Underpinnings}

This discussion provides a brief introduction to our use of logic models in general. It speaks broadly to planning, performance evaluation, and the selection and effective use of evidence of progress and results, without specific reference to PART requirements.

A logic model typically offers a simplified visual representation of the path of a program’s operations, starting with inputs and then progressing to the program’s activities, its outputs, its customers, and its intended outcomes. The model may also link the program’s operations, what the program actually does either alone or with others to fulfill its mission, to its strategy, which we define as the goals, management objectives, and performance measures that support the program’s mission.\textsuperscript{13} Operations include resources, actors, and events, whereas strategy speaks of intentions. Our approach links operations and strategy by closely considering both the horizontal flow of the model—from left to right in the case of operations, and from right to left in the case of strategy—and the vertical relationships among a program’s operational and strategic elements, including performance measures. Figure 1.1 provides a stylized depiction of our approach, which we refer to as the logic model template.

In Figure 1.1, the top row of boxes depicts the program’s operations and the bottom rows depict its strategy. To illustrate:

- Operations flow from left to right: Inputs, such as funding, staff, and planning data, generate activities, such as data collection, research, and program development, which generate outputs, such as databases, reports, and training materials, which NCIPC transfers to customers, including health care professionals, other researchers,

\textsuperscript{12} In 2003, RAND undertook an analysis for NIOSH in which it provided guidance and recommendations for developing, selecting, and applying measures of the relevance and usefulness of research activities. More recently, it has assisted NIOSH in preparing for a series of external reviews by the National Academies. Some preliminary results of that effort can be found in NIOSH (2006). RAND has undertaken related analyses for the Department of Defense and other federal agencies and programs. For a discussion of the approach, see Greenfield (2005).

\textsuperscript{13} For example, the U.S. Environmental Protection Agency, Office of Research and Development, regularly depicts strategic objectives and goals as associated with intermediate and “long-term” outcomes. See Pahl et al. (2003) and Pahl and Norland (2002).
and community-based organizations, which apply or transform outputs in ways that eventually contribute to end outcomes, such as reductions in injuries. Application and transformation can involve something as simple as disseminating a report with a cover letter or as complex as initiating a nationwide training program.

- Strategy flows from right to left: Strategic goals, such as a reduction in the incidence of a particular type of injury, derive from the program’s mission; intermediate goals, such an increase in public knowledge regarding proper safety measures, derive from strategic goals; annual goals, such as the conducting of research on proper safety measures and the publication of safety reports, derive from intermediate goals; and management objectives, such as those regarding the efficient use of NCIPC resources, derive from preceding goals.

Our logic model “template” requires vertical alignment, as indicated by the double arrows in Figure 1.1. Generally speaking, strategic goals should relate to the program’s contribution to end outcomes; intermediate goals should relate to customer activities and intermediate outcomes, such as those involving changes in knowledge, attitudes, or behavior; annual goals should relate to program activities and outputs; and management objectives should relate to program inputs and activities.

Figure 1.1
RAND Logic Model Template

14 Note that “outputs,” such as databases, reports, and training materials, are necessary precursors to outcomes but do not constitute “outcomes.” An outcome involves a change in the intermediate or end state resulting from direct or indirect exposure to an output or intervention.
Similarly, long-term measures should enable programs to gauge their progress in meeting strategic goals; intermediate measures should enable programs to gauge their progress in meeting intermediate goals; and so forth. Relationships between operations, goals, and measures should be direct and transparent.

Recognizing that many events beyond the control of a program affect its operations, our template also incorporates external factors.

Figure 1.1 offers a simplistic depiction of operations and strategy with many possible steps—and participants—missing between inputs and end outcomes. For example, NCIPC may generate research findings that undergo several iterations of use and application before eventually reaching a final customer. To illustrate, in the case of bicycle helmet safety, NCIPC might partner with academic researchers to develop the report on the proper use of bicycle helmets, which it distributes to community-based organizations, which use the report to develop pamphlets that they then distribute to local parents who, in turn, with the knowledge that they have gained from the pamphlets, properly fasten their children’s helmets, ultimately resulting in a reduction in head trauma. In this example, we would distinguish between intermediate customers (the community-based organizations) and end customers (parents and children); we would also distinguish between intermediate and end outcomes.

The logic model can also be used to identify program boundaries and responsibilities; in particular, it can be used to show the range of a program’s sphere of influence. Typically, as the model flows from left to right, the extent of the program’s control over resources, actors, and events diminishes. For example, once NCIPC disseminates its reports on bicycle helmet safety to the community-based organization, it may have little direct control over the development of pamphlets, their distribution to parents, or the actions of parents. Nevertheless, PART asks that programs such as NCIPC take responsibility for their contributions to reductions in injuries.

Chapters Two and Three present detailed depictions of operations and strategy in NCIPC-tailored models. These depictions, though still highly stylized, account for some of these missing steps and participants.

Figure 1.2 shows how “evidence” relates to the logic model. A measure in and of itself does not demonstrate progress or results; rather, it provides a means of gauging progress or results. It is only by quantifying or qualifying each measure with “evidence” that a program can demonstrate its progress or results. Evidence, in effect, provides validation. For example, one might specify a measure of a child’s growth as the difference between his or her height at ages 11 and 12, but the actual number of inches would provide evidence of growth. It is important to note, however, that performance measures do not, in their own right, constitute performance evaluations; rather, they are—or provide—essential inputs to performance evaluations. As in the context of PART and other more general forms of program assessment, measures constitute the data that form the basis of the performance evaluation.
A primary strength of the logic model is its capacity to serve multiple purposes. Here and in the following chapters, we base our approach to strategic planning and evaluation on three interrelated roles of the logic model:

- First, it can serve as a communication device. It can provide internal and external audiences, including program partners, customers, evaluators, and other interested parties, with a clear image or map of the program’s operations and intent. The model can also be used to clearly identify program boundaries and delineate responsibilities, thereby clarifying the meaning of “impact” as it relates to the program. As such, a logic model can aid in program planning and evaluation.

- Second, it can serve as a foundation for developing strategic plans, including goals and measures. More specifically, referring back to Figures 1.1 and 1.2, it can be used to “walk back” from a program’s mission to formulate strategic goals, intermediate goals, annual goals, and management objectives, and to craft a set of closely corresponding or aligned long-term, intermediate, annual, and management measures that can be used to gauge progress and results.

- Third, having developed a strategic plan with goals and measures, it can provide a tool that facilitates the selection and effective use of evidence to demonstrate a program’s progress or results.

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15 For more information about the logic model as a communication tool, see McLaughlin and Jordan (2004, 1999).

16 For example, with regard to evaluation, a logic model itself can serve as evidence by providing a strong signal that a program understands its purpose and is “on track.”
In summary, a well-aligned logic model can serve as a means for program communication, strategy development, and evaluation.

**Research and Data Collection**

In addressing NCIPC’s short- and long-term needs, much of our effort involved the development of NCIPC-tailored logic models for purposes of communication and strategy development, the identification of potential sources of evidence for the PART review, and the application of the NCIPC-tailored logic models to frame the selection and effective use of that evidence. Here, we provide a brief overview of the research and data collection that supported our effort.

**Gleaning Information for NCIPC-Tailored Logic Models**

To develop the NCIPC-tailored logic models, we needed information about NCIPC’s operations and strategy. For the most part, we gathered this information by reviewing existing planning documents and meeting with NCIPC senior staff. We met with representatives of the Office of the Director; the Office of Policy, Planning, and Evaluation; the Office of Communications Resources; and the Office of Statistics and Programming; and with senior staff from the Division of Violence Prevention, the Division of Unintentional Injury Prevention, and the Division of Injury and Disability Outcomes and Programs to obtain their perspectives on NCIPC’s mission and goals and to learn more about NCIPC’s inputs, activities, outputs, and other aspects of its operations.

To guide our meetings, we posed a series of discussion points, framed in terms of the overall NCIPC “program” and in terms of “priority areas” as subsets of the overall program. The discussion points were intended to elicit information about NCIPC’s operations and strategy and to closely parallel the structure of the stylized logic model shown in Figures 1.1 and 1.2. In abbreviated form, we addressed the following questions:

- What is your program/priority area trying to achieve and why?
- Who are its customers, partners, and other stakeholders?
- What types of infrastructure-support activities (e.g., planning and funding processes, laboratories) are undertaken by your program/priority area?
- What other inputs do you use to “produce” activities?
- What does the program/priority area do (e.g., conducts surveillance, undertakes or funds research, develops and evaluates interventions)?
- Do you work with partners? If so, how?
- What does the program/priority area produce (e.g., papers, methods, technologies, training or educational materials, workshops, programs, other)?
- How are the outputs disseminated or transferred?
- How (and by whom) are the outputs used and for what purposes?

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17 We developed two models: The first model depicts the totality of the program but focuses largely on operations, and the second model depicts an illustrative “priority area”—a significant area of concern—within the program and addresses operations and strategy equally.
• What are the intended outcomes of your activities?
• What are the program/priority area’s boundaries and niche?
• What external factors affect your efforts?

We categorized the information gleaned from our discussions according to the basic elements of the logic model, which allowed us to develop the core of the NCIPC-tailored logic models that we present in later chapters.

In addition to meeting with NCIPC senior staff, we also reviewed existing strategic planning documents and management efforts. Sample documents included formal mission statements and program descriptions, drafts of annual strategic plans, research briefs, and drafts of program and divisional logic models.\footnote{NCIPC (2002, 2003, 2004b, 2005a).} We used materials from these documents to fill out many of the details of the logic models.

Finally, we presented draft models to NCIPC senior staff and elicited their comments and feedback, which we then used to develop more robust versions of each model. However, we did not consider the logic models to be static or final products; that is, as we continued to learn more about NCIPC and its priorities through ongoing discussions and meetings, and we continued to make appropriate adjustments to the models.

Had resources permitted, it would have been helpful to undertake additional forms of model validation, particularly external forms. For example, we might have met with other interested parties, including NCIPC’s partners, collaborators, and customers, to gain their perspectives and compare them to NCIPC’s perspectives. As a general matter, reliance on discussions with program officials can, in some instances, produce overly optimistic—or pessimistic—views of how programs work and what they accomplish.

**Identifying, Selecting, and Effectively Using Evidence**

To assist NCIPC in identifying, selecting, and effectively using evidence for the PART process, we reviewed the PART submissions of ten programs relevant to NCIPC; described the range of sources of evidence that they used to support their submissions; and, given the wide range of sources that were apparent in their submissions, provided recommendations on how NCIPC could apply its logic models to facilitate the selection and effective use of evidence.

In narrowing the field to 10 programs, we considered the PART submissions of a larger number of federal programs to identify those facing issues relevant to NCIPC. Given the unique status of NCIPC, none dealt with all of its issues, but collectively, the 10 programs we selected addressed (1) violence prevention, (2) safety, (3) surveillance, (4) research, (5) program development and implementation, and (6) partnerships.

We arrayed the information from the PART submissions in Microsoft® Excel® worksheets categorized by the four PART sections (purpose and design, strategic planning, management, and results and accountability). This format enabled us to look across the programs and assess some of the similarities and differences both in the sources of evidence and in the explanations used to support the choice of evidence within each section. We discuss our findings in Chapter Three.

This technical report proceeds in three additional chapters, each of which involves applications to NCIPC. Chapter Two focuses on the development of NCIPC-tailored logic models for purposes of communications and strategy development, with particular attention
to the formulation of goals and measures. Chapter Three addresses in general terms the role of the logic model in program evaluation, and more specifically, in the context of NCIPC’s preparation for the PART process and its need for particular types of evidence to support answers to OMB’s questions about the program’s purpose and design, strategic planning, management, and results and accountability. Chapter Four, the final chapter, offers conclusions and next steps for establishing sustainable, ongoing strategic planning and evaluation processes within NCIPC.
NCIPC sought RAND’s assistance in developing its strategic plan, including goals and measures, and establishing a sustainable, ongoing planning process. Our work with NCIPC and other federal agencies and programs indicates that logic models can serve at least two distinct yet related planning functions: First, they can serve as a means of communicating with internal and external audiences; and second, they can serve as planning tools.1

As communication devices, logic models, which offer simplified visual depictions of a program’s operations and intent, can reach wide-ranging internal and external audiences with varying interests in NCIPC’s strategic plans. Internal audiences include agency leadership and program staff at all levels; external audiences include program evaluators, budget examiners, members of Congress, program partners, program customers, and the general public. As planning tools, logic models can provide a framework for articulating and aligning operations, goals, and measures. In this role, the logic model can serve as a foundation for developing a strategic plan.

This chapter focuses on the development of NCIPC-tailored logic models as planning tools. In particular, we present and illustrate a replicable process for developing logic models, first by tracing the path of NCIPC operations and then by adding goals and measures to support the program’s mission. For an existing program, such as NCIPC, we start with the current path of operations and proceed, at times iteratively, to goals and measures; however, for a new program, we would typically start with goals.2

Tracing the Path of NCIPC Operations

In this section, we introduce and illustrate a replicable process for developing NCIPC-tailored logic models, starting with the path of operations. This stage of development unfolds in four steps,3 beginning with the logic model template shown in Figure 1.1:

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1 Speaking to their communicative strengths, logic models are often included as “end products” in programs’ strategic plans—and evaluation packages.

2 Starting with the path of operations creates a potential for locking a program into an inherently faulty program structure by generating goals and measures to suit that structure. As such, one must be careful to ask repeatedly, “Can or will this structure yield intended outcomes? Does the path of operations make sense?” These issues relate to those of “program improvement,” which we address in Chapter Three.

3 For expanded description of this process, see McLaughlin and Jordan (1999), where it is described as a five-stage process.
• Gather information about the program, e.g., through discussions with staff, partners, collaborators, customers, and other stakeholders, and by reviewing existing planning documents, to identify structurally significant deviations from the template.
• Modify the template to accommodate those deviations.
• Fill in program-specific details as needed to depict accurately and clearly the program’s operations.
• Validate the model, e.g., through feedback from program staff, partners, collaborators, customers, and other stakeholders. (The Appendix presents a set of questions intended for this purpose.)

With some elaboration, the template shown in Figure 1.1 provides a reasonable fit for NCIPC. However, two significant deviations emerged from our discussions with NCIPC staff and our review of existing planning documents. The first deviation involves the depiction of NCIPC’s “partners,” as distinguished from its “customers,” and the second deviation involves the depiction of interdependencies and feedback among its activities and outputs. We also found a need to call out the importance of two overarching themes relating to “coordination, collaboration, and capacity-building” and “changes in knowledge, attitude, and behavior.”

Customers often feature prominently in logic models as a critical link between program outputs and outcomes. Yet for some programs, including NCIPC, partners—defined as those who participate in activities to enable outputs—are also essential. Most traditional logic models do not include a category or “bin” for partners. However, given the importance of partnerships and collaborations in achieving the NCIPC mission, an NCIPC-tailored model must distinguish between the partners who work with NCIPC to create products and services and the customers who use products and services. Adding complexity, the same entity that serves as a partner in one context may serve as a customer in another. For example, state and local health departments work with NCIPC to produce program designs, injury-prevention infrastructure, and best practices, and can therefore be described as “partners”; however, state and local health departments also use these outputs as “customers.”

The resulting modification appears in Figure 2.1, which depicts the fully articulated path of NCIPC operations. To highlight the role of partnerships and collaborations in enabling both activities and outputs, we encompass activities and outputs in a shaded box and list some of the primary NCIPC partners and collaborators at the bottom of the box.

The second deviation involves interdependencies among NCIPC’s three primary activities: surveillance, program development and implementation, research, and feedback from outputs to activities. Conversations with NCIPC staff indicated that activities undertaken in

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4 Ideally, the modeler would collect perspectives from partners, customers, and other stakeholders; however, in this instance, we relied on input from staff and planning documents.
5 As above, we relied on feedback from NCIPC staff.
6 As a related matter, we could describe “alignment” not just in terms of the program’s internal alignment (i.e., the vertical alignment of operations and strategy), but also in terms of its alignment with its environment, including its partners, resources, culture, history, and political context. We address one aspect of external alignment in Chapter Three, where we address the role of external factors in operations, strategy, and achievement.
7 The boxes wrapping around Figure 2.1 derive almost directly from the template shown in Figure 1.1. For the purpose of tracing the operational path, we are focusing on the top row of boxes, but we retain the bottom row for context and consistency.
one category often inform activities undertaken in other categories. For example, data collected from surveillance activities inform many program activities which in turn contribute to research activities. Moreover, the outputs associated with each of these activities might feed back to other activities. In Figure 2.1, we use multiple and two-way arrows to represent interdependencies and feedbacks.

Finally, two overarching themes emerged from our conversations with NCIPC and require special consideration: First, coordination, communication, and capacity-building play a central part in NCIPC’s activities and outputs, and second, changes in knowledge, attitudes, and behavior relate to intermediate customers, the results of their efforts, and final customers. We highlight both themes with shaded boxes encompassing the relevant elements of the operational path.

In attempting to replicate this process, we note that there is a fine line between too little and too much information. One aim of a logic model is to provide a simplified representation of a program, but as a tool for strategy development, it must also provide sufficient information to establish appropriate goals and measures. In our efforts to address major deviations from the template (e.g., the roles of partners and interdependencies), we ran the risk of adding cumbersome and potentially confusing complexity. Nevertheless, we view these deviations as important aspects of the NCIPC program, having significant implications for developing a strategy and setting goals and measures. On this basis, they merit inclusion.

Other elements of the NCIPC operational path require less explanation. Inputs consist of resources that are used to produce activities, such as human resources and funding, and resources that are used to guide activity planning, such as surveillance- and intervention-effectiveness data.

The set of boxes underneath “Customers and Intermediate Outcomes” describes intermediate customers, the results of their efforts, and final customers. Many of the parties listed as intermediate customers are also listed as partners and collaborators; however, as intermediate customers, their role is decidedly different. In this capacity, they serve to apply and transform program outputs to achieve intermediate outcomes, including changes in policy, changes in physical and social environment, and adoption of best practices. This process of application, transformation, and achievement may be outside the immediate control of NCIPC and its sphere of influence, but it is an expected result of the program’s efforts. Final customers, “individuals and groups at risk of injuries,” are the primary users and ultimate beneficiaries of the intermediate outcomes. As noted previously, we incorporate a shaded box in Figure 2.1 to indicate the common theme of changes in knowledge, attitudes, and behavior. The end outcome shown in the last box to the far right of Figure 2.1, “prevention and control of injuries, disabilities, and deaths,” reflects the NCIPC mission.
Figure 2.1  
**Fully Articulated Operational Path of NCIPC-Tailored Logic Model**

**Inputs**
- Coordination, communication, and capacity-building
  - Surveillance: Collect, analyze, and interpret data to describe, monitor, and track injuries
  - Programs: Develop, test, implement, evaluate, and monitor state, local, and community-based injury-prevention and -control programs, and education and training programs
  - Research:* Investigate risk and protective factors; conduct biomechanic studies; evaluate injury-prevention and -control strategies; develop, test, and evaluate interventions; develop injury prevention technology; develop, test, and evaluate implementation and dissemination strategies
  - Partnerships/collaborations with other federal agencies (e.g., NHTSA, CPSC, IHS), state and local health departments, community-based organizations and other NGOs, health care organizations, academic injury-research programs, and others

**Activities**
- Outputs
  - Injury surveillance data and databases (e.g., WISQARS)
  - Program designs; injury-prevention and -control infrastructure; conferences; workshops; education and training materials; Web sites; trained health care professionals; best practices; technical assistance
  - Prevention messages; evidence-based models and implementation strategies; dissemination strategies; technology; reports; publications; tool kits; databases; Web sites; conferences; guidelines (e.g., Community Guides); best practices

**Outputs**
- Customers and Intermediate Outcomes
  - Changes in knowledge, attitudes, and behavior
    - Other federal agencies; state and local entities; community-based organizations and other NGOs; professional organizations; injury-control researchers; health care professionals; international organizations; media; teachers; students
  - Strategic Goals
  - Annual Goals
  - Intermediate Goals
  - External Factors

**End Outcomes**
- To prevent premature death and disability and to reduce the human suffering and medical costs caused by injuries
- Mission:
  - Prevention and control of injuries, disabilities, and deaths

**Definitions**
- Production: Human resources and funding; physical infrastructure; managerial infrastructure including planning and evaluation processes
- Planning: Surveillance and intervention effectiveness data; risk and protective factor data; customer/stakeholder input; HHS/CDC priorities; legislative mandates
- Management Objectives
- Annual Goals
- Intermediate Goals
- Strategic Goals


RAND TR370-2.1
Formulating Strategy

In this section, we discuss the formulation of strategy; specifically, we use information from the operational path of the logic model and the overall template to develop goals and measures. This exercise provides the foundation for developing a strategic plan. A program’s strategic plan establishes “who” it is, what it intends to do, and how it intends to do it. Goals and measures, which feature prominently in many or most strategic plans, speak directly to the issue of program intent. In the sections, we describe three general approaches to conceptualizing strategic goals and a somewhat detailed approach to generating goals and measures from the template and operational path. Together, the depiction of operations and strategy constitutes the complete logic model.

Approaches to Conceptualizing Goals

Broadly speaking, a program can conceptualize its goals using one of three approaches: activity-based, divisionally based, and priority area–based. Depending on the program’s structure, these approaches may be mutually exclusive or they may converge.

The first approach develops strategic goals based on program activities. For example, a program may define its goals as conducting research; conducting surveillance; or building state, local, and community capacity. For programs that define themselves in terms of what they do, activity-based goals may be an obvious choice. However, this choice may elevate process over purpose and decrease the likelihood that a program will achieve its mission. In terms of the foregoing template, it would be especially difficult to frame activity-based goals in a way that would help move a program toward attaining end outcomes; the two approaches would be fundamentally at odds.

The second approach uses divisional or organizational structure as a basis for the strategic goals. Aligning goals with divisional structure offers several advantages for management and budgeting purposes, as this provides a straightforward way to allocate resources and establish accountability for the achievement of program goals. However, if management is seeking to break down divisional boundaries or foster cross-divisional collaborations on related issues, this method may be counterproductive. Whether this approach would be likely to lead to the attainment of end outcomes would depend on the makeup and orientation of the program’s divisions. If divisions are activity-based, this would have the same result as the first approach; if divisions are outcome-oriented, this might promote more positive results.

Finally, the third approach uses “priority areas,” defined as areas of significant concern, as the basis for selecting goals. For example, a program may identify a number of priority areas based on future trend data or a recent national initiative. Selecting goals based on

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8 As noted previously, for an existing program, a clear statement of operations can provide a basis for developing goals and measures. Were a program “starting from scratch” or seeking to address design issues, it would be more appropriate to begin with goals and identify necessary inputs, activities, outputs, and so on. Indeed, even for an existing program, these may be iterative processes. For example, if an existing program sets its goals and then finds that it is not meeting them, it may choose to reconfigure its operations.

9 We identified these three approaches through previous work with other federal agencies and programs and by reviewing a wide range of recent strategic plans.
Using Logic Models for Strategic Planning and Evaluation

Using Logic Models for Strategic Planning and Evaluation

priority areas offers several advantages. Typically, priority areas are outcome-oriented and target the program’s intended achievements. Moreover, because priority areas are not limited by organizational structure, they can cut across divisional boundaries in a way that leverages the strengths of the entire organization. However, there is a risk that cross-cutting priority areas will impede management and reduce accountability; that is, if goals and measures are not divisionally based, it may be difficult to implement change and establish accountability.

In our work with NCIPC, we suggest a mixed approach to complement the program’s organizational structure and mission. To illustrate, we develop a hypothetical priority area, “sexual violence,” which is clearly an area of significant concern, but also fully contained within a particular division, the Division of Violence Prevention. For the most part, we find that NCIPC’s priority areas and divisions are aligned in the sense that few if any of its priority areas cut across divisional boundaries; each of its divisions addresses separate but conceptually related aspects of injury prevention and control, primarily from an outcome-oriented perspective.

Generating Goals and Measure

Our logic model template differs slightly from many traditional logic models in that it explicitly links operations and strategy at all points along the continuum, from inputs to outcomes on the one hand, and from strategic goals to management objectives on the other, so that the operational and strategic elements of the model are mutually supportive and consistent. We refer to this property as vertical alignment. The concept of vertical alignment also extends to long-term, intermediate, annual, and management measures, which can be used to gauge progress toward achieving each of the goals.

To illustrate our approach to generating goals and measures from the operational path and the template, we use “sexual violence” as a hypothetical priority area. Sexual violence is addressed within the Division of Violence Prevention through the Rape Prevention and Education (RPE) program and represents a significant area of investment for NCIPC, accounting for approximately 30 percent of the fiscal year 2004 budget. Figure 2.2 shows a complete logic model for sexual violence; it includes the operational path, goals, and measures. We base the operational elements of the priority-area model on actual program documents and descriptions and generate “mock” goals and measures for illustrative purposes. In the discussion that follows, we explain the process and criteria by which we generate those goals and measures.

Strategic goals should address outcomes, target groups, and approach. The strategic planning literature, including OMB PART guidance, emphasizes the importance of having strategic goals that are “outcomes-based” or, in our vocabulary, “outcome-aligned.” As such, our example uses the prevention of sexual violence, which is the end outcome of the sexual-violence priority area, as the starting point for developing a strategic goal. In addition to being “outcome-based” or “outcome-aligned,” the strategic goal should also specify the

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10 NCIPC (2004a).

11 Harman (1997); Liner et al. (2001); Office of Financial Management, State of Washington (2003). In our work with NCIPC and other agencies and programs, we typically describe strategic goals and outcomes as two sides of the same coin; one does not take precedence over the other and both directly support the program’s mission. Outcomes reside along the operational path, where “events” occur, and strategic goals reside along the strategic path, which depicts “intent.”
Figure 2.2
Complete Logic Model for Sexual-Violence Priority Area

Inputs
- Human resources and funding; managerial infrastructure; surveillance and intervention effectiveness data; customer/stakeholder inputs; HHS/CDC priorities

Activities
- Develop, test, implement, evaluate and monitor state, local, and community-based sexual violence—education programs
- Program designs; sexual violence—prevention infrastructure; education and training materials; trained professionals; best practices; technical assistance
- Coalitions; local rape crisis centers; community-based centers/NGOs; other federal agencies; state and local entities; schools; teachers

Outputs
- Intermediate Goal 1.1: Increase knowledge of sexual-violence prevention to foster changes in attitudes and behavior in high school communities through widespread implementation of effective sexual violence—education programs
- Annual Goal 1.1.1: Develop, publish, and test a pilot rape-prevention curriculum for high schools
- Annual Goal 1.1.2: Train high school teachers to use the rape-prevention curriculum
- Intermediate Measure 1.1: (2012) % increase in the number of students scoring a B or better after completing rape prevention—education programs in % of high schools in n states using the curriculum
- Annual Measure 1.1.1: (2007) n high schools in rural, urban, and suburban communities have pilot-tested the published curriculum
- Annual Measure 1.1.2: (2008) n teachers are trained to use the curriculum

End Outcomes
- Effective sexual violence—education programs
- Individuals and groups at risk for sexual violence
- Prevention of sexual violence

Customers and Intermediate Outcomes
- Mission: To prevent premature death and disability and to reduce the human suffering and medical costs caused by injury and violence
- Effective sexual violence—education programs
- Coalitions; local rape crisis centers; community-based centers/NGOs; other federal agencies; state and local entities; schools; teachers
- Individuals and groups at risk for sexual violence

Management Objectives (Measures)
- Strengthen planning process
- Relevance review for all intra- and extramural funding streams

Management Measures
- Early Implementation
- Implementation
- Evaluation

Annual Goals (Measures)
- % reduction in the incidence of sexual violence against at-risk individuals and groups through the development and implementation of effective science-based research, surveillance, and prevention programs
- % reduction in the incidence of sexual violence in high school students who have participated in rape-prevention education programs using the curriculum
- % increase in the number of students scoring a B or better after completing rape prevention—education programs in % of high schools in n states using the curriculum

Intermediate Goals (Measures)
- Annual Measure 1.1.1: (2007) n high schools in rural, urban, and suburban communities have pilot-tested the published curriculum
- Annual Measure 1.1.2: (2008) n teachers are trained to use the curriculum
- Intermediate Measure 1.1: (2012) % increase in the number of students scoring a B or better after completing rape prevention—education programs in % of high schools in n states using the curriculum
target group and approach. In our example, the target group is “individuals and groups at risk for sexual violence,” which corresponds to the final customers in the operational path, and the approach is “the development and implementation of effective science-based research, surveillance, and prevention programs.”

By working with the template and operational path, we have ensured that the resulting strategic goal, “reduce the incidence of violence against at-risk individuals and groups through the implementation of effective science-based research, surveillance, and prevention programs,” addresses an outcome, target group, and approach that are consistent with the operational structure and mission of the program.

The measure associated with the strategic goal should mirror more specifically the components of the goal. For our illustrative measure, we chose a percent reduction in the incidence of sexual violence to measure “reduction”; high school students as a “target group”; and participation in a rape-prevention program using a particular curriculum as the approach, i.e., “percent reduction in the incidence of sexual violence among high school students who have participated in rape-prevention education programs using the curriculum.” For PART, a program would also need to specify a timetable, e.g., “by 2015.”

We also use this “formula” of identifying the outcome, specifying the target group, and articulating the specific approach to generate the intermediate goal. In our example, the intermediate outcome is increasing knowledge of sexual-violence prevention to foster changes in attitudes and behavior; high school communities represent the intermediate customer; and the approach is implementation of effective sexual violence–education programs. The intermediate measure associated with this goal is the percent increase by 2012 in the number of high school students scoring a B or better after completing rape-prevention programs in a specified percentage of high schools in a specified number of states across the country using the curriculum. Note that the intermediate goal supports the attainment of the strategic goal and corresponds to the relevant elements of the operational path.

The annual goals relate directly to program activities and outputs and support the attainment of the intermediate goal. For example, annual goal 1.1.1 relates to the program activity developing and testing of local and community-based sexual violence–education programs and annual goal 1.1.2 relates to the outputs “education and training materials”; both address the needs of schools and teachers as intermediate customers.

We conclude this chapter with four methodological comments. First, for the sake of brevity, we present only one strategic, one intermediate, and two annual goals. However, programs may very well have multiple strategic and intermediate goals that can also vary in their targets and approaches. Furthermore, each strategic goal may be supported by multiple intermediate goals, which are, in turn, supported by multiple annual goals and multiple management objectives. Second, the horizontal and vertical dimensions of the logic model template provide a useful method of assessing whether goals are aligned with the operational path and are supportive of other goals. This may be used to validate goals and measures not generated from a logic model. Third, the measures associated with annual goals typically serve as indicators of a program’s efforts, whereas the intermediate and strategic goals and their associated measures are indicative of a program’s effect and may be more meaningful for evaluation purposes. Fourth, decisions about which measures to collect are management decisions. Although the logic model may be helpful in defining the range of potential measures, determining the appropriate measures depends on the measures’ purpose and the availability and reliability of the data to support those measures.
In addition to working with NCIPC on strategy development, we also assisted NCIPC in its preparation for PART review. PART and other evaluation processes depend on the collection and effective use of evidence to assess whether a program is “on track,” or if mid-course corrections are needed to improve program performance. Thus our assistance to NCIPC consisted of the identification of potential sources of evidence for PART and guidance in the selection and effective use of evidence. For the former, we reviewed PART submissions from a number of federal agencies and provided NCIPC with a list of sources of evidence categorized by PART sections. For the latter, we used the logic model to provide guidance on the identification, selection, and effective use of evidence. Figure 1.2, in Chapter One, shows how evidence relates to the logic model template and is the basis for our guidance to NCIPC.

Although identifying potential sources of evidence for PART was an important component of our work with NCIPC, this chapter focuses solely on the process of selecting and effectively using evidence to support program evaluation for the purposes of PART and for program-improvement efforts. We begin with a brief overview of PART because this was the specific purpose for which evidence was gathered. However, our larger purpose is to assist NCIPC in evaluation processes directed toward improving program performance, and we describe the types of evidence that can be used for this purpose as well.

### Gathering Evidence for PART Review

This section illustrates the process of using the logic model to facilitate the selection and effective use of evidence for the purposes of PART. As an evaluation tool, PART is designed to be evidence-based, drawing on a wide array of information, including authorizing legislation, GPRA strategic plans and performance plans and reports, financial statements, inspector general and U.S. Government Accountability Office (GAO) reports, and independent program evaluations.¹ OMB guidance for PART makes it clear that the burden of proof is on the program to show that it has fully met the evidence requirements in order to be awarded a *Yes* answer:

> The PART holds programs to high standards. Simple, acceptable compliance with the letter of the law is not enough. Rather, a program must show it is achieving its

purpose and that it is well managed. The PART requires a high level of evidence to justify a Yes response.²

Absent solid evidence to support a Yes answer, the answer is deemed not favorable and the program receives a lower rating. The requirement of hard evidence fulfills the principle that federal managers must be held accountable for proving that their programs are well designed and well managed.³ Although PART represents one type of program evaluation, the process of gathering evidence described here may be useful for other types of evaluations.

Examining a number of PART submissions suggests an abundance of potential evidence, but it also suggests that the selection and effective use of the evidence is as important as the source. Admittedly, by reviewing only 10 programs, we are limited in our ability to construct a set of objective criteria for defining the “effective use” of evidence. However, a program’s ability to articulate the significance of its evidence in the context of its goals and operations does seem to correspond to higher section scores and suggests the importance of making these connections in preparing for PART.

The logic model inherently conceptualizes the relationship between program operations, strategies, and evidence, and, as such, can provide a framework to ensure that the evidence selected is consistent with the operations of a program as well as its strategic goals. We also note the importance of using the framework of the logic model to select evidence that supports causal linkages between the “bins” in the logic model. For example, to the extent possible, evidence should demonstrate the link between violence-prevention messages (an output) and changes in behavior (an outcome). In many cases, such connections will probably have to be presented as assumptions rather than as established facts.

The evidence requirements in each section of PART are different so that the roles of the logic model are also different. Indeed, for Section II, which focuses on strategic planning, the issue is less one of “selecting and effectively using evidence” and more one of “generating” evidence. The two primary sources of evidence in Section II are valid long-term and annual performance measures. As described in Chapter Two, a program can use the logic model to generate those measures aligned with the program’s strategic and annual goals. In contrast, for Sections I, III, and IV, selection and effective use are the primary considerations.

Section IV of PART also depends upon long-term and annual goals. However, in this section, the focus is on demonstrating achievement of or progress toward achieving long-term and annual goals. The primary sources of evidence for questions in this section include historical performance data that indicate program progress in meeting long-term performance and annual goals. In this case, the elements in the operational path of the logic model can facilitate the selection of evidence to demonstrate progress in achieving (or achievement of) program goals.

For a program that has not achieved its long-term goals, it is critical to be able to trace a plausible path that suggests that the program is having the intended effects that would, over time, lead to the achievement of the long-term goals. What sources of evidence can be used for this? Because intermediate outcomes are typically one step removed from end outcomes, evidence to support adequate progress in achieving program goals can be based on

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² Office of Management and Budget (2005).
intermediate outcomes. Figure 3.1 shows a number of intermediate outcomes of NCIPC activities that can be used as evidence to support program progress. For example, the installation of safety lighting on college campuses as a result of increased knowledge based on sexual violence—prevention education programs reflects a change in a physical environment that can lead to a reduction in sexual violence. Similarly, evaluation data on the effectiveness of state and local violence-prevention programs in reducing child abuse can indicate that a program is “on track” for achieving its long-term performance goals.

Measures based on intermediate outcomes are not under the direct control of the program; that is, the program has no direct control over the variability in these measures. In the example of the installation of safety lighting on college campuses, we note that NCIPC programs on sexual-violence prevention may “influence” the installation of safety lighting on college campuses, but NCIPC does not control whether or not this happens. Other factors, such as the college budget, the incidence of sexual violence on campuses, or the logistics involved in the installation process may be more influential in determining whether this outcome is achieved.

Figure 3.2 illustrates how program activities and outputs provide the basis for selecting evidence that can be used to indicate achievement of annual performance goals. Annual goals are aligned with program activities and outputs. Rather than indicating that a program is having an intended effect, evidence based on activities and outputs demonstrates that the program is “on track” with regard to implementation and production and speaks to the program’s efforts. For example, the number of research reports produced, the number of educational training workshops held, or the number of tool kits disseminated to health care professionals may indicate that NCIPC is “doing its job” to ensure the achievement of intended results.

Annual goals are aligned with program activities and outputs and are under the direct control of the program. Therefore, the evidence for the achievement of these goals may be easier to provide. For example, the number of research reports produced is largely dependent upon NCIPC-supported research activities and many of the factors that influence the production of these outputs, such as resource allocation strategies and the merit and peer-review processes of grants, are part of NCIPC program processes.

The use of the logic model for Sections I and III can also facilitate the selection and effective use of evidence. Though not quite as straightforward as in Sections II and IV, elements of the logic model may help identify the best possible sources of evidence that are consistent with and that connect to program operations and strategy, specifically goals and measures.

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4 See Hatry (1999) and Friedman (1997) for a discussion of the distinction between measuring a program’s efforts versus its intended effects.
Figure 3.1
Using Logic Model to Select Evidence of Intermediate Outcomes

Question 4.1. Evidence that program has demonstrated adequate progress in achieving long-term goals:

- **Prevention and control of injuries, disabilities, and deaths,** e.g., statistics of the percentage of lives saved by smoke-alarm installation and fire-safety education programs
- **Changes in policy,** e.g., mandates for bike helmets, safety belts, and drivers’ blood-alcohol concentration levels
- **Changes in physical and social environment,** e.g., safety lighting on college campuses
- **Effective injury-prevention and -control programs,** e.g., state and local violence prevention-program evaluations
- **Adoption of best practices,** e.g., “Best Practices of Youth Violence Prevention: A Sourcebook for Community Action”

Mission: To prevent premature death and disability and to reduce the human suffering and medical costs caused by injuries.
Figure 3.2
Using Logic Model to Select Evidence of Program Activities and Outputs

Inputs → Activities → Outputs → Customers and Intermediate Outcomes → End Outcomes

Coordination, communication, and capacity building

- Surveillance: Collect, analyze, and interpret data to describe, monitor, and track injuries
- Injuries surveillance data and databases (e.g., WISQARS)
- Programs: Develop, test, implement, evaluate, and monitor state, local, and community-based injury-prevention and -control programs, and education and training programs
- Program designs; injury-prevention and -control infrastructure; conferences; workshops; education and training materials; Web sites; trained health care professionals; best practices; technical assistance
- Research*: Investigate risk and protective factors; conduct biomechanic studies; evaluate injury-prevention and -control strategies; develop, test, and evaluate interventions; develop injury prevention technology; develop, test, and evaluate implementation and dissemination strategies
  *Intra- and extramural (e.g., ICRCs, peer-reviewed grants, SBIRs)
- Prevention messages; evidence-based models and implementation strategies; dissemination strategies; technology; reports; publications; tool kits; databases; Web sites; conferences; guidance (e.g., Community Guides); best practices
- Partnerships/collaborations with other federal agencies (e.g., NHTSA, CPSC, IHS), state and local health departments, community-based organizations and other NGOs, health care organizations, academic injury-research programs, and others

Management Objectives → Annual Goals → Intermediate Goals → Strategic Goals

External Factors

Question 4.2. Evidence that program has achieved its annual performance goals:
- **Surveillance**, e.g., surveillance data identifies individuals and groups at risk for injury
- **Injury-prevention and -control programs, and education and training programs**, e.g., education and training materials used to train health care professionals
- **Research**, e.g., prevention messages, reports, tool kits disseminated to injury-control researchers and health care professionals

Mission: To prevent premature death and disability and to reduce the human suffering and medical costs caused by injuries

To prevent premature death and disability and to reduce the human suffering and medical costs caused by injuries.
Section I questions are designed to assess whether a program has a clear purpose and a sound design. A wide range of evidence could potentially support a *Yes* answer to any one of the questions in this section. How can a program decide which evidence to select and how to use this evidence in a way that supports program purpose and design? Drawing from the logic model, program inputs, activities, and mission are relevant to program purpose and design. Thus, the information that populates each of these “bins” may serve as potential sources of evidence. Program inputs include the resources to support activities and the planning inputs that guide program activities. Within NCIPC, this may include surveillance data that track safety trends, such as the use of seat belts or data that monitor activities in communities with children at risk for child maltreatment. This type of data supports the need for the existence of NCIPC and can be used as evidence for PART Question 1.2, “Does the program address a specific and existing problem, interest, or need?”

Section III of PART is concerned with program management and focuses on a variety of aspects related to whether the program is managed with sufficient effectiveness to meet performance goals. Elements of the logic model that are relevant to this section include program inputs, management objectives, and management measures. For example, descriptions of program inputs, such as planning and evaluation processes, may provide evidence of efficient and effective management. Management objectives and management measures may be used to provide evidence of strong financial management practices and accountability.

**Gathering Evidence for Program Improvement**

PART represents a very specific example of program evaluation that emphasizes the demonstration of results. As such, the primary purpose of the evidence is either demonstration of achievement of results or progress toward results. However, for purposes of program improvement, the evidence gathered should indicate or support changes necessary to improve program performance. Referred to as a “Program Improvement or Learning Orientation,” this type of evaluation focuses on the following key questions:5

- What outcomes have been achieved and why?
- What aspects of my program led to these outcomes?
- What factors in our program activities and resources influenced (and are influencing) results and in what ways?
- What external factors may have influenced results, and in what ways?

The answers to these questions may explain why, for example, long-term goals have not been achieved and help managers make decisions that will improve program effectiveness. Within a program-improvement paradigm, knowing why a program is achieving its goals (or not) is more important that just knowing whether or not it does. Particularly important is the awareness of external factors and their impact on program outcomes. Programs do not operate in a vacuum. Without information on the environment in which a program functions and the external factors that may influence it, it is difficult to make informed decisions about how to improve a program.

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The logic model template shown in Figure 1.1 highlights the external factors as arrows across the bottom of the template. The implicit understanding is that at all points along the logic model external factors have an influence. Recognizing the role of external factors in each element of the logic model can be an important means of targeting efforts for program improvement.\(^7\) One example of this might be the availability of state funding for injury-prevention programs. The amount of funds available for state injury-prevention programs is not under the direct control of NCIPC, yet it is an important external factor in the implementation of injury-prevention programs, a program activity described in Figure 2.1. Realizing that reliance solely on state funding for implementation of programs is not a particularly efficient nor effective design, a program-improvement strategy might seek to create multiple funding streams through partnership development to leverage resources.

For many programs, the external factors associated with the boxes on the left side of the logic model—inputs, activities, and outputs—may be more obvious because they influence areas that are under the direct control of the program. However, awareness of the external factors that can potentially influence intermediate and end outcomes is also significant. Knowledge of these factors can result in changes in how outputs are delivered, which can also improve program performance. For example, a downturn in the economy may cause an increase in joblessness, leading to increased domestic-partner abuse. Designing programs that provide guidance on productive ways of handling the stress and frustration that often accompany joblessness is one way that NCIPC can address this external factor and improve the effectiveness of its violence-prevention program. Thus, rather than being a reason that programs do not achieve desired results, knowledge of external factors can indicate the area and the approach taken to improve program performance.

Awareness of the external factors that facilitate the achievement of program goals is also important for program improvement. For example, the size of a community may be an important external factor in the adoption of best practices for injury prevention. Informal networks present in smaller communities are more efficient in information dissemination, which leads to the adoption of best practices. A program may note this and decide to restructure its method of disseminating information to include informal networks or use its resources to target smaller communities where adoption of best practices is more likely to occur. These examples suggest that the type of program improvement may vary according to the external factor that is being addressed. Program improvements that address the external factors on the left side of the logic model tend to result in improved efficiency of program operations, whereas those on the right side—related to outcomes—may result in improvements that target service delivery or utilization by intermediate customers.

In closing, we emphasize two points. First, although we describe the use of the logic model for PART review and believe that it can enhance the process of evidence selection and effective use, we recognize that it may be more helpful in some instances than in others. As a tool, the structure of the logic model may impose consistency in how evidence is selected and used to demonstrate program results. However, many questions in PART are straightforward and require little or no additional “structure.” Second, we note that the identification of external factors as “external factors” should be consistent across time and space. That is,\(^7\)

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7 Another important reason to be aware of the role of external factors is to determine causal attribution. Knowledge of the external factors and where their influence is felt most directly (e.g., inputs, activities, outputs) may help a program to better distinguish its contribution to intended outcomes and ultimate impact.
whether a particular factor serves as a benefit or a detriment should not determine its assessment as an external factor. For example, a partner should not be reidentified as an “external factor” when a relationship enters a difficult period. Moreover, the importance of the external factor is not only its recognition, but also the manner in which the program addresses it.
CHAPTER FOUR
Conclusions and Next Steps

Each of the preceding chapters addresses a different aspect of the development and application of logic modeling, primarily for purposes of communication, strategic planning, and program evaluation. Chapter One provides a brief introduction to the methodology, as framed by our work with NCIPC, NIOSH, and other federal agencies and programs; Chapter Two considers specific ways in which logic models can be developed and applied to generate goals and measures; and Chapter Three addresses evaluation in general and with specific reference and application to PART requirements.

The methodology that we explore in these chapters can provide NCIPC with a means to address four fundamental questions: Who am I? What do I intend to do? How do I intend to do it? and Am I succeeding? The first three questions arise in the context of strategic planning and the last arises in the context of evaluation. Together, they concern identity, intent, and accomplishment. These questions are related: Answers to the last question may inform decisions about the first three, and answers to the first three might dictate answers to the last.

Implicitly, if not explicitly, Chapters One through Three lay the groundwork for establishing sustainable, ongoing strategic planning and evaluation processes by introducing and illustrating a broadly applicable methodology for carrying planning and evaluation processes forward; however, they do not individually nor collectively address the issue of “process” per se.

In this concluding chapter, we present several recommendations for establishing strategic planning and evaluation processes, of which two recommendations stand out prominently: First, NCIPC should build these processes into its organizational structure and management systems; that is, they should become an integral part of the way in which NCIPC routinely “does business.” Second, NCIPC should elicit participation from a full range of stakeholders, both internal and external, at regular intervals to benefit from their knowledge and to engender ownership of and support for policy decisions.1

These are two very tall orders. The challenges of integrating planning and evaluation processes into organizational structures and management systems, and eliciting broad participation, cannot be overstated. In general, an agency’s institutional culture may create sub-

1 Many of the concepts in this discussion draw from Greenfield (2002). Although written for interagency strategy and funding coordination, many of the same principles apply to individual agencies and programs, especially those representing wide-ranging interests.
stantial barriers. As a practical matter, establishing integrated and inclusive sustainable, ongoing strategic planning and evaluation processes would require two significant actions.

First, NCIPC would need to develop a regular schedule of strategic planning and evaluation sessions, tied to and coordinated with the NCIPC budget process and, potentially, staff-performance reviews. Four principles might serve as the basis for establishing a schedule: (1) address program priorities, goals, objectives, and measures as early in the annual budget process as possible; (2) formulate the program budget—or funding allocations—in view of an accepted strategy; (3) maintain flexibility in the face of changing circumstances; and (4), as noted previously, encourage broad-based internal and external participation. In other words, decide first “who you are,” “what you intend to do,” and “how you intend to do it.” Then, in view of available resources, adjust as needed. This approach may enable some amount of proactive coordination of strategy and funding.

The annual cycle of planning and evaluation sessions should “look forward” to future activities, outputs, and outcomes, and “look back” to recent accomplishments. In concept, the cycle might proceed as follows:

- Set initial priorities, goals, objectives, and measures for one-, five-, and ten-year intervals before engaging in budget deliberations or determining funding allocations. Start by establishing broad institutional priorities through the Office of the Director (OD) in consultation with division and office directors; proceed to “working-level” discussions either within divisions or existing priority areas; and work back up the administrative chain to gain cross-divisional insights, identify opportunities for cross-divisional collaboration, and resolve any potential conflicts or incongruities. Draw participation from external stakeholders, including partners and customers.
- Determine fiscal requirements to support strategy and map these to available resources. Adjust goals, objectives, and measures based on established priorities to confront and accommodate fiscal realities and “higher-level” (e.g., CDC or HHS policy mandates). Allow time for consultation between OD, division and office directors, other staff, and stakeholders as needed. With an understanding of feasible resource allocations, goals, objectives, and measures should be realistic.
- Institute regular (e.g., quarterly) internal progress reviews at the divisional or priority-area level, culminating in an annual NCIPC programwide internal review of accomplishments, goals, objectives, and measures. Consistent with PART guidance, NCIPC should also engage external reviewers to assess periodically the impact of its efforts to promote injury prevention and control.

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2 See Wildavsky (1972).
3 Planning and evaluation processes may have more institutional “teeth” if NCIPC links them to the flow of funds and staff incentives.
4 Here and below, NCIPC, like many other programs, will be constrained by legislative mandates.
5 For an example of a particular timetable tied to a specific budget process, see Greenfield (2002, pp. 24–28, 29–31, and Table 1).
6 This “top-to-bottom-to-top” process could result in changes in priorities.
7 This will require that NCIPC also establish processes to gather evidence systematically.
Second, to the extent that NCIPC seeks to work with logic models as the methodological centerpiece of its strategic planning and evaluation processes, it would need to develop internal modeling capabilities.\(^8\) In this and other projects, we have tended to view logic models as living documents, requiring adjustments as circumstances change. As such, NCIPC should not rely solely on external support; rather, it should be able to implement change from within, as needed, on a timely basis.

In summary, sustainable, ongoing strategic planning and evaluation processes should become institutionalized elements of the NCIPC culture with broad-based stakeholder participation, thereby enabling a higher degree of proactive coordination of strategy and funding and diminishing any potentially disruptive effects of periodic external demands for planning documents, goals, objectives, measures, and evidence. Concrete “next steps” for NCIPC might include establishing a schedule of strategic planning and evaluation sessions, focusing especially on establishing priority areas for the short, medium, and long term with corresponding goals, objectives, and measures.

\(^8\) Many opportunities exist for building this capacity at modest expense, including government-sponsored workshops such as those offered at the CDC summer evaluation institute.
Questions to Guide the Review of the Logic Model

Below is a set of questions that can be used to check the logic models.¹ These questions may be useful in clarifying the thinking behind the development of the logic model and ensuring that the critical information has been included in the model. The questions are divided between operations and strategy, with the operations questions referring to the elements of program operations and the strategy questions focused on the development of goals and measures.

I. Operations

1. Is the delineation between intermediate and end outcomes logical?
2. If the intermediate outcomes are achieved, will they result in predicted changes in the end outcomes?
3. Are the program’s customers described and are they the right customers, given the outcomes?
4. Are there other customers who need to be reached if the outcomes are to be achieved?
5. Are the program’s major resources, processes, and outputs described and are they logically consistent and sufficient to achieve outcomes?
6. Could activities be consolidated into strategies to make the presentation more clear?

II. Strategy

1. Are strategic goals outcome-oriented? Do they specify the expected strategic change/impact for a specific target group (e.g., older persons and persons who are disabled)?
2. Are there planning inputs that suggest the importance of this impact/change?
3. Are there missing strategic goals that would enable the mission to be realized?
4. Are the measures outcome-oriented? Do they clearly specify the anticipated change for a specific target group?
5. Does the measure relate to the goal? That is, will success with this measure lead to success with the goal?

¹ These questions were provided by John A. McLaughlin and have been modified to reflect the terminology and structure of the NCIPC logic model.
6. What specific roles, if any, do partners (internal and external to the organization) play in the success of this measure?

7. Are there missing measures that would enable the goal to be realized?
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NCIPC—see National Center for Injury Prevention and Control.

NIOSH—see National Institute for Occupational Safety and Health.


