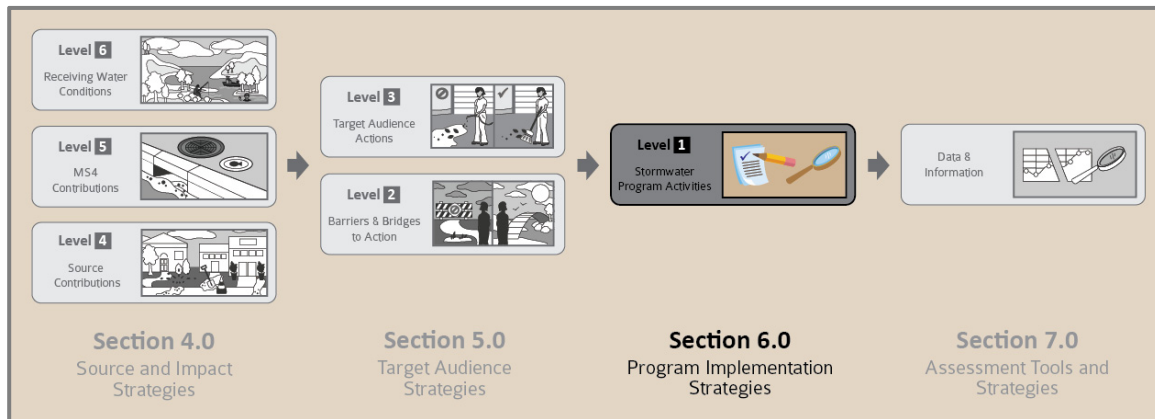


Section 6.0 Program Implementation Strategies



*This section describes the development of **Program Implementation Strategies**, the third of the four strategic planning components introduced in Section 3.0. Following the completion of Target Audience Strategies as described in Section 5.0, program implementation planning addresses Outcome Level 1. Managers will consider the target audiences, critical behaviors, and barriers and bridges already identified to develop stormwater program implementation strategies for bringing about targeted changes. Other activities needed to support general program operation and to obtain feedback for evaluating success are also considered.*

Completed Program Implementation Strategies will inform the subsequent development of Assessment Tools and Strategies in Section 7.0.

6.1 Background

Stormwater management programs encompass a remarkable variety of activities and initiatives. A typical program employs numerous types of staff such as inspectors, educators, planners, scientists, managers, and hotline operators. Together they implement policies, programs, and procedures to address almost all major sources of stormwater pollution; including construction and development sites, residential areas, municipal operations, and industrial and commercial facilities. Even a very small program must be administered to thousands of people, sites, and sources, with larger programs easily addressing more than a million people. While this broad focus makes sense, the success of MS4 programs ultimately depends on the details, i.e., whether or not individual program elements and activities are resulting in source reductions.

In Sections 4.0 and 5.0, priority water quality issues, sources and target audiences, and behavioral problems were identified. Building on the results of these planning steps, program implementation approaches must now be selected to bring about and sustain identified changes. As shown in **Figure 6.1**, Level 1 planning is a three-step process.

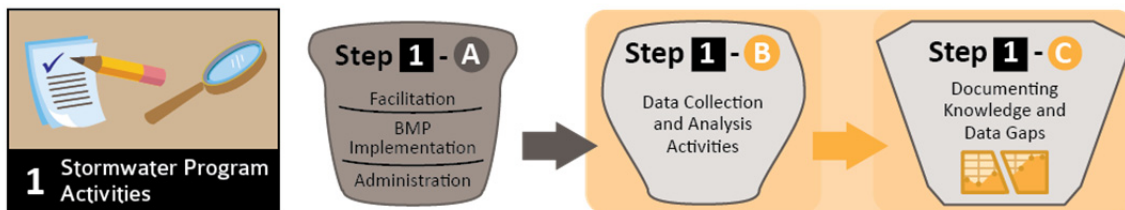


Figure 6.1: Steps for Outcome Level 1 Strategic Planning

In **Step 1-A** managers will identify the activities to be targeted during program implementation. This will initially entail the development of strategies to modify target audience behaviors, but BMPs that can be implemented directly by the stormwater program will also be identified. **Step 1-B** will focus on obtaining the feedback necessary to evaluate these activities. Finally, **Step 1-C** will identify the knowledge and data gaps discovered along the way, so that future data collection initiatives can be directed toward resolving them. Collectively, all of the activities identified in Steps 1-A through 1-C constitute the **Program Implementation Strategy**.

The starting point for Level 1 planning is a review of potential data and information inputs. **Table 6.1** identifies a variety of sources that can be useful. Virtually anything that was part of a previous planning level may be of interest, so reviews should be inclusive at this stage. Likewise, sources not previously reviewed, such as annual compliance reports or permit requirements should also be considered.

6.2 Step 1-A: Program Implementation Activities

Program implementation activities are those which are needed to implement and administer a stormwater management program. Individual activities can serve any of three types of functions:

- Facilitation of behavioral changes in target audiences;
- Direct implementation of treatment control BMPs (retention basins, treatment controls, etc.) by the program; and
- Administration of the program (maintaining source inventories, updating plans, etc.).

Figure 6.2 illustrates these three functions and shows their relationship to each other.

Table 6.1: Potential Inputs for Level 1 Strategic Planning

<p>Previous Outcome Level Results (see Section 5.x)</p> <ul style="list-style-type: none"><input checked="" type="checkbox"/> Priority constituents and stressors<input checked="" type="checkbox"/> Priority drainage areas and sources<input checked="" type="checkbox"/> Priority target audiences and characteristics<input checked="" type="checkbox"/> Identified PGA-BMP packages<input checked="" type="checkbox"/> Barriers and bridges associated with priority PGAs and BMPs<input checked="" type="checkbox"/> Outcome Level 2,3,4,5, and 6 knowledge and data gaps <p>Other Sources and Types of Program Implementation Data and Information (examples only)</p> <ul style="list-style-type: none"><input checked="" type="checkbox"/> Existing compliance reports (annual reports, Reports of Waste Discharge, electronic and hard copy records and documentation, etc.)<input checked="" type="checkbox"/> Permit requirements<input checked="" type="checkbox"/> TMDL requirements or implementation plans<input checked="" type="checkbox"/> Other (as needed)

Step 1-A-(i) Facilitation Activities

Facilitation activities are the means by which programs motivate, empower, or compel target audiences to reduce or eliminate the use of PGAs and increase their use of preferable behaviors. This can include indirect action, such as advocacy for regulatory control (“true source control”) by state and federal agencies, including actions affecting product availability to, and use by, target audiences. Collectively these activities constitute **facilitation strategies**. To illustrate, a construction program seeking to increase BMP implementation by site workers might establish a facilitation strategy that includes permitting, inspections, industry training or all three. Or a residential program element might use a combination of mass media education, incentives, and waste collection events to encourage pesticide use reduction and proper disposal. True source control initiatives, such as regulatory restrictions on the amounts of pyrethroids that can be applied in urban areas, can also be important parts of a facilitation strategy. In each case, each identified facilitation activity contributes toward achieving the desired behavioral changes. Because the success of a stormwater program is driven by its ability to influence change, the selection of these activities is one of the most critical decision points in its design.

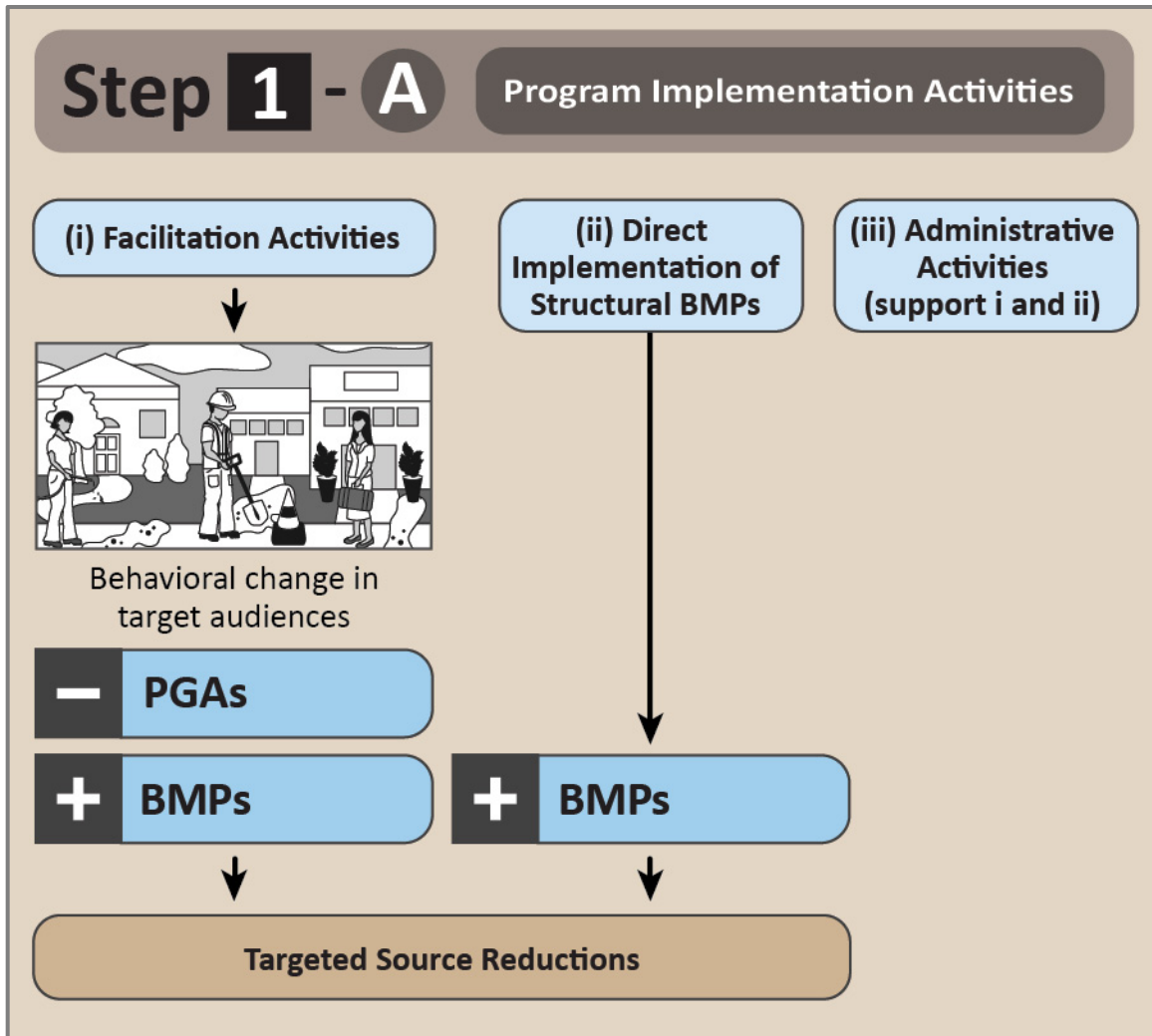


Figure 6.2: The Three Types of Program Implementation Activities

In previous steps, managers identified many of the behaviors associated with priority sources and target audiences, and the key factors that influence them. Focusing specifically on the **PGA-BMP packages** introduced in **Section 5.x**, they will now identify strategies for facilitating shifts in these behavioral patterns away from PGAs and toward BMP implementation.

Types of Facilitation Activities

There are many ways to influence changes in target audiences. In selecting options, it's important to consider the inherent strengths and limitations of each. Activity selection is largely situational, and should reflect the specific characteristics of target audiences and the likelihood of success in influencing or controlling outcomes.

Managers should also keep in mind that many facilitation activities are likely to be implemented concurrently. In accordance with the Strategic Plan Framework introduced in **Section 3.2**, they will normally be grouped according to source categories, source types, target audiences, or other organizing principles utilized by the program. The activities described below provide a good starting point for selecting facilitation activities, but managers should ultimately develop their own lists to suit specific circumstances and planning objectives.

- **Outreach** is a form of education that focuses on providing information, guidance, or assistance to external target audiences. Outreach methods can be used to bring about changes in knowledge, awareness, or behavior. Outreach is often embedded in inspection or other regulatory processes, but may also be approached independently through a variety of means. Examples of outreach types include:

- Workshops and seminars
- Community and special events
- News releases, conferences
- Presentations
- Television and radio broadcasts (PSAs, talk shows, etc.)
- Websites and hotlines
- Direct mailings, newsletters, and emails
- Materials displays (billboards, signs, kiosks, movie theatre slides, etc.)
- Newspaper advertisements, articles, editorials, inserts
- Consultations, assistance meetings
- Outreach during inspections

- **Training** is a second form of education focused on teaching the skills or knowledge needed for a particular job or activity. Training can be used to bring about changes in the knowledge, awareness, or behaviors of municipal employees, contractors, and other parties. Topics can vary from general awareness of issues or resources to very specific knowledge of BMPs and other practices. Training may be either formal or informal, and may be presented in a variety of ways (classroom, field, online, etc.).

- **Partnerships** with third parties such as professional and industry organizations, non-governmental organizations, or chambers of commerce can often extend the reach of a program. Partners can support a program's objectives in a number of ways such as developing or printing materials, conducting outreach or training for their members, or organizing clean-up events.

- **Incentives** are activities or initiatives that stimulate an individual or group to act. They can be used to motivate, reward, or recognize individuals or groups for engaging in a

particular action. They can take a wide variety of forms, and may apply both to municipal staff and external target audiences. Examples include:

- Employee recognition or time off
 - Permit streamlining or fee reductions
 - Subsidies for purchasing rain barrels, replacing lawns with drought tolerant landscaping, etc.
 - Performance-based certifications (Leadership in Energy and Environmental Design [LEED]; environmental compliance certifications, etc.)
-
- **Waste collection services** are often provided to assist residents and businesses in properly managing, disposing, or recycling of materials and wastes (e.g., household hazardous waste, used motor oil, or trash). They can include curbside pickup, collection events, or drop-offs at designated locations for a variety of materials or waste streams.
 - **Formal agreements** such as contracts with vendors or service providers, leases, covenants, settlements, and maintenance agreements (e.g., for operation and maintenance of structural controls) are often used to require contractors or other regulated parties to implement required control measures.
 - **Licenses or permits** can be used to require regulated parties to implement required control measures. Examples include local business licenses, building and grading permits, and special use or event permits.
 - **Planning conditions** are used by governments to manage the development of land within their jurisdictions. Planning restrictions typically apply where permissions are needed to build on or change the use of land. In doing so, a jurisdiction can anticipate potential water quality impacts and establish conditions to avoid or mitigate them. Examples include zoning restrictions, smart growth practices, and mitigation requirements for development projects.
 - **Corrective actions** such as formal or informal enforcement actions can be used to require a return to compliance with applicable requirements, e.g., during complaint investigations. In some cases, a program may also directly intervene to make corrections or repairs. Within a jurisdiction, disciplinary actions may serve an analogous role for municipal staff.
 - **True Source Control** regulatory actions put constraints on the availability or use of products. Many times, they are not implemented directly by programs; instead program staff advocate for the adoption of measures by state or federal agencies. For example,

changes to brake pad formulations through the adoption of SB 346, and the adoption of Surface Water Protection Regulations by the Department of Pesticide Regulation. Examples of true source control actions that can be initiated locally are banning the use of plastic bags or Styrofoam cups, or restricting their use at beaches.

Many **other actions** are possible. This list provides a starting point, but it's important that managers continue to identify and explore other options.

Selecting Facilitation Activities

The selection of facilitation activities begins with a review the PGA-BMP packages identified for each target audience. An important input will be the **List of Targeted Changes to Barriers** identified in Step 1-A. In selecting specific activities, it's important to consider which higher level outcomes they'll be directed to. Two potential scenarios for the selection of facilitation activities are explored below.

Scenario 1 Directing Facilitation Activities to Barriers or Bridges (Level 2 Outcomes)

Figure 6.3 illustrates a PGA-BMP package with application of currently registered insecticides for ant control as the PGA, and three identified BMP options. Focusing on BMP Option 1 (Use Less Toxic Products), four potential barriers to change were identified. One of these, a lack of knowledge in the target audience, is considered further. Education (either through outreach or training) and enforcement are indicated as potential facilitation activities that are relevant to knowledge levels in the target audience. Based on this, specific educational initiatives such as radio advertisements, newspaper articles, or local workshops could be developed to increase knowledge about the environmental benefits of alternative products (along with other potential topics). Increased enforcement could also be considered, but most programs would probably first start with education.

In this case, directing education specifically to knowledge of the BMP alternative appears to provide managers the best chance of achieving positive results. A critical assumption is that existing levels of knowledge are actually low, and that this is contributing to the absence of the BMP alternative. Ideally, this conclusion would be based on documentation or analysis such as surveys of residents or interviews with compliance staff. In many cases, however, it may just be an educated guess. In both instances, though, a verifiable relationship has been posited between two variables. This relationship can be further evaluated by continuing to implement and document, or through other focused investigations. This might be as simple as using a pre- and post-survey or other follow up

measures to check in with the target audience and determine if the program activities are having the desired effect.

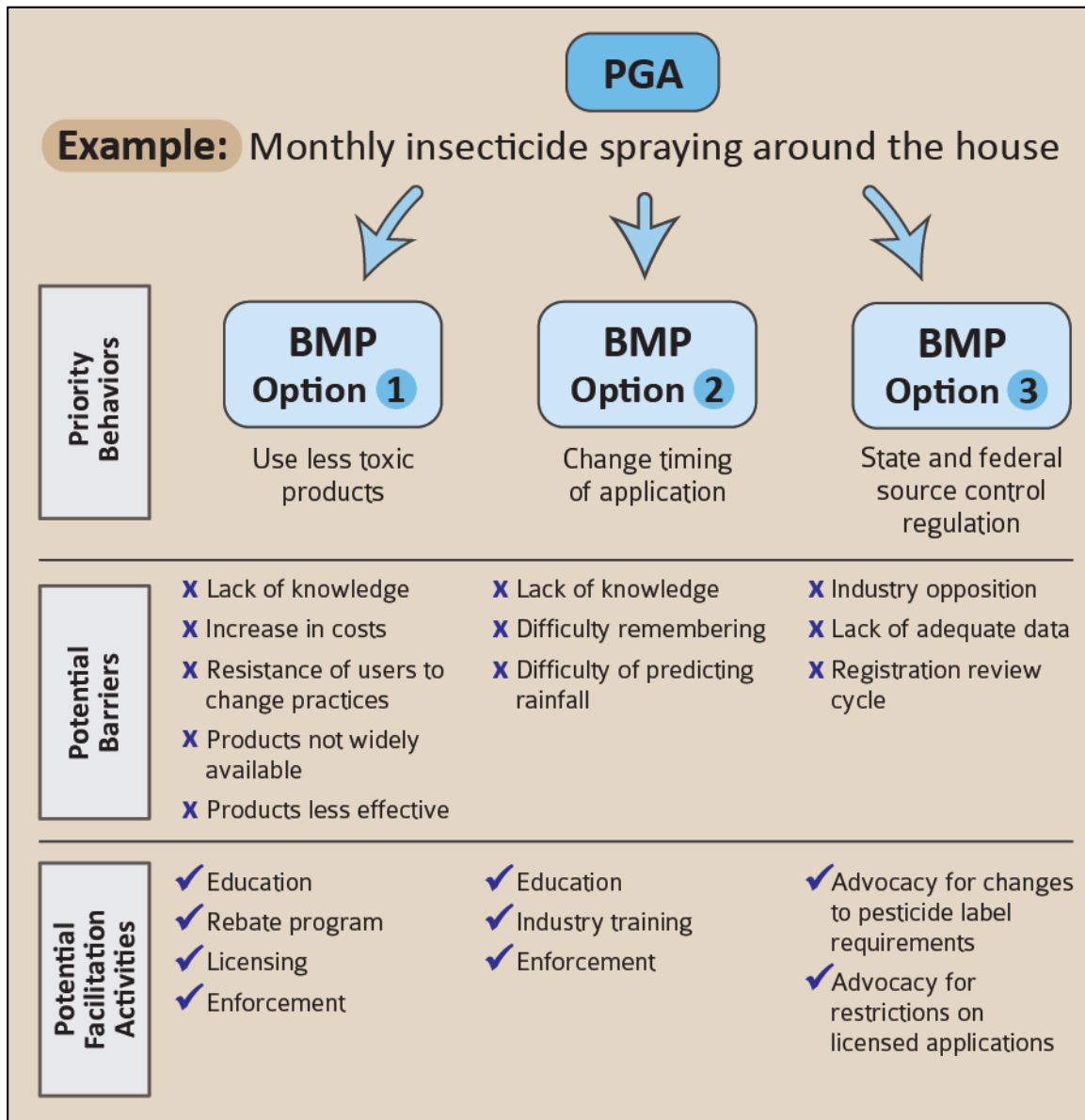


Figure 6.3 Example of Potential Facilitation Activities Associated with a PGA-BMP Package

Further analysis of Options 1 and 2, both of which involve education of pesticide users, should consider the number of pesticide users who could be expected to reduce their use of pesticides beyond the legal restrictions imposed by EPA, and the aggregate reduction that would result. If too few are willing to alter their behavior, even though positive results

may be achieved, the aggregate reductions may not be sufficient to solve the problem of pesticide toxicity in the water body.

Where end-user education is unlikely to be sufficient, other options should be considered. Option 3 is an example of influencing change indirectly control through advocacy of regulatory restrictions on pesticide use, e.g., through the California Department of Pesticide Regulation or the USEPA.

Targeting activities to influencing factors is clearly preferred in any instance where they are reasonably well-understood. Ideally managers will know both the specific behavioral changes they want to see and the barriers and bridges that must be addressed to achieve them. In this case, facilitation activities will be directed toward reducing specific barriers or building specific bridges. Normally this would result in one of the three scenarios illustrated in **Figure 6.4**. In practice relationships between facilitation activities and influencing factors often aren't known or well-characterized, and it can be challenging to define them. This should not be a discouragement. Hypothesizing and exploring potential causal relationships is a necessary part of any management approach.

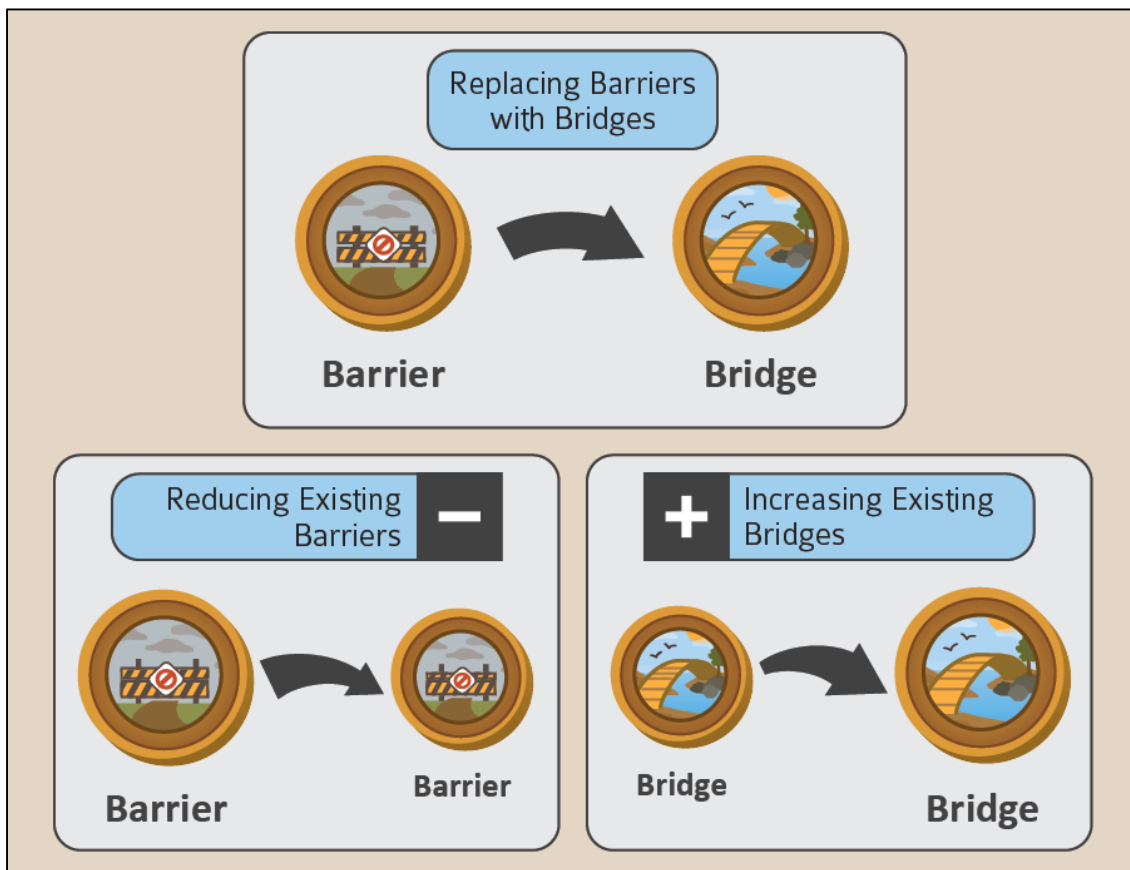


Figure 6.4: The General Ways that Facilitation Activities Act on Influencing Factors

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Scenario 2 Directing Facilitation Activities to Behaviors (Level 3 Outcomes)

In many cases, managers will know the behavioral changes they want to see, but won't know which barriers or bridges are influencing them. Unless these relationships can be established, there may be little choice but to direct facilitation activities to the behavior instead.

This time using a different PGA-BMP example, installing smart irrigation systems is identified as a BMP alternative to overwatering, but barriers and bridges have not been identified. Although a number of potential reasons might exist, it's entirely possible that managers would have no specific idea of why some people choose not to install the systems. Without an idea of what these potential barriers or bridges are, it's difficult to know how to direct facilitation activities. Assuming that implementation can't always be delayed until influencing factors are better understood, managers must use best professional judgment in selecting and implementing a reasonable set of facilitation activities that can be implemented "experimentally." That is, by committing to specific facilitation activities, implementing them, and monitoring their success in bringing about desired behavioral changes. This "trial and error" approach may be perfectly reasonable where barriers and bridges are unknown or difficult to characterize, or where programs are not resourced to invest in their characterization.

In the absence of specific knowledge, some caution should be exercised in making commitments. Educational approaches are normally a good starting point because knowledge and awareness are often found to be lacking. If increases in knowledge or awareness are achieved, and not found to bring about targeted behavioral changes, managers can move on to other potential barriers or bridges. Managers should always seek to understand the role of applicable influencing factors, but this is not to say that behavioral changes achieved without this understanding aren't successes in their own right. Ultimately, it's the behavioral changes that count, and managers should choose the approaches that work best for them.

Setting Implementation Targets for Facilitation Activities

Once facilitation activities have been selected, managers will need to establish implementation targets for each of them. It can often be quite challenging to determine what levels are appropriate or achievable. Potential approaches for setting targets are described below. Given the variety of potential activities, and the need to consider the specific context of their application, there is no simple formula for targeting facilitation

activities. Regardless of which approaches are chosen, managers are reminded that multiple facilitation activities are normally directed to a particular behavior or influencing factor. Because the most important consideration in targeting is the cumulative impact of all the activities within the facilitation strategy, targeting should also recognize that pollutant load reduction goals might be achievable with less than maximum BMP implementation or total elimination of all PGAs. Since "successes" and "failures" are likely to offset each other, it's important that implementation targets remain flexible and be adjusted as necessary to accommodate this fluidity.



Setting Targets to Comply with Regulatory Requirements

Regulatory requirements, particularly those established in permits and TMDLs, should always be considered up front. These requirements may be explicit (e.g., minimum inspection frequencies) or implicit (e.g., levels of outreach or enforcement needed to achieve required reductions in dry weather discharges). Because they are legally enforceable, regulatory requirements may sometimes override other potential targets. As previously described, managers must remain compliant with legal and regulatory obligations, but may also need to advocate for flexibility or regulatory change when they present conflicts.



Setting Targets to Achieve Specific Level 2 or 3 changes

This should be the preferred approach when targets have been defined for the higher outcome level changes, and their relationship to the facilitation activity is quantifiable. Since the magnitude of the Level 2 or 3 outcomes is assumed to be a function of the magnitude of the facilitation activity (or activities), a change in one should cause a corresponding change in the other. In this instance, the facilitation activity target will be set to the specific quantifiable change it is expected to bring about in the Level 2 or 3 outcome. Ideally both endpoints are known and quantifiable. Where they are not, relationships between them can still be explored "experimentally" as described below.



Setting Targets to Resource Availability



These considerations are often necessary because programs don't always have the staffing, budget, or other resources needed to pursue targets established through other approaches. Where possible, managers are always encouraged to optimize the allocation of available resources rather than assuming that a target is resource-limited. Moreover, it's important to remember that targets which are too low may not be effective. Rather than under-targeting because of resource limitations, it may make more sense to

defer the implementation of some activities until additional resources can be obtained, or to divert those existing resources to another priority problem.



Setting Targets to Learn and Adapt

Although managers usually have a good idea of the levels of program activity they can achieve within defined resource commitments, they don't usually know what it takes to bring about specific changes in target audience behaviors. In some cases, it just makes sense to establish targets for the purpose of learning. By "dialing" a particular activity up or down, managers can explore implications of that action over time. One way is to set **stretch targets**, which involves increasing a particular activity over a previous level. This is a simple way of testing what can be cost-effectively accomplished.

Experimental targets are similar to stretch targets, but are instead intended to explore and test assumptions or hypotheses about relationships between outcomes. If managers have a good idea of the types and levels of activities that can be directed to a target audience, they might establish a working hypothesis about the behavioral changes they hope to see in them. By establishing and tracking measurements for both types of outcomes, they may be able to establish linkages over time.

Step 1-A-(ii) Direct Implementation of Treatment Control BMPs by MS4 Programs

Another important type of implementation activity is the **direct implementation of treatment control BMPs** by the MS4 program. The purpose of this step is simply to ensure the consideration of these BMPs in the overall Program Implementation Strategy. Given the increasingly stringent performance expectations put on MS4 programs in recent years, both for permit and TMDL requirements, emphasis on the direct implementation of structural treatment controls has also increased. Traditionally, a number of other BMP types (street sweeping, MS4 cleaning, waste collection, etc) are implemented by municipalities. These BMPs are not included in this category because they're already addressed as municipal operations under facilitated activities above¹.

¹ A critical difference between direct implementation and the activities described in Step 1-A(i) is the absence of a separate target audience to which facilitation activities are directed. This category addresses only structural controls implemented directly by the MS4 program, and because it assumes direct implementation, facilitation is unnecessary. Because there is no consistent division between MS4 program staff and other municipal staff within municipalities, some managers may find that the activities described

Many programs are also now planning and funding the construction and maintenance of regional or sub-regional treatment control BMPs. Because MS4 programs exert a much higher degree of control over the construction and long-term maintenance of these BMPs than for those implemented by external target audiences, they can be critical to a successful implementation strategy.

Normally there should be a greater ability to forecast the potential benefits of directly-implemented BMPs than those facilitated through target audiences. Setting targets for BMP performance should be approached by first allocating a portion of the desired loading reductions within a defined drainage area to MS4 structural BMPs. Together with other reductions projected for facilitated target audiences, this should constitute the overall targeted reductions for the drainage area. Portions of the structural BMP allocation can then be divided over all potential or planned structural BMPs for that area. Given that each structural BMP is built to specific design and performance standards, this process should be straightforward.

Selection, sizing, and location of specific BMPs will reflect a variety of considerations, including pollutants of concern, wet and dry weather targets, design and construction costs, experience with the BMP type, community support, and maintenance responsibilities and costs.

Step 1-A-(iii) Administrative Activities

Administrative activities support the effective operation and management of the stormwater program. They focus on the operation of the program itself rather than its relationship to target audiences or direct BMP implementation. Examples include reviewing and updating source inventories and program documentation such as policies or procedures. Many administrative activities are explicitly required by stormwater permits, and must therefore be assessed and reported to maintain regulatory compliance; others are implicitly required, or simply necessary to assure the ongoing implementation of the program. It's important that they be identified as part of the larger Program Implementation Strategy because they're necessary to ensure that essential functions are completed or supported. **Table 6.2** identifies some general categories and examples of administrative activities.

here actually apply to municipal staffs that are considered target audiences. Where the line is drawn is less critical than that each activity type is given due consideration.

Table 6.2 Examples of Administrative Activities

Administrative Activity Type	Description
Program Plan Updates	Various strategic and operational plans define Stormwater Management Program control strategies and guide their implementation. Depending on the permit requirements, a program may have one or more plans associated with it. Periodic reviews and updates of these plans are necessary to ensure they remain current and reflective of regulatory requirements.
Source Inventory Updates	Inventories of commercial businesses, construction sites, and other sources must be developed and maintained. Individual or categorical source priorities must also be established and updated as necessary.
Legal Authority Updates	Ordinances, codes, and other legal authorities must be established and periodically updated to enable enforcement of program requirements.
Supporting Program Documentation Updates	Policies, procedures, guidelines, forms, and various other types of program documentation are necessary to support program implementation. Periodic reviews and updates are necessary to ensure they remain current and reflective of regulatory requirements.

6.3 Step 1-B Data Collection and Analysis Activities

Data collection and analysis activities provide managers the feedback necessary to assess conditions, evaluate changes, and determine whether specific objectives are being achieved. The purpose of this step is simply to ensure that managers have anticipated data collection and analysis in the design of their Program Implementation Strategies. Analysis of data and information will be considered further in **Section 7.0**.

There are a number of ways in which the data needed for planning and assessing stormwater programs can be collected. These are illustrated in **Figure 6.5**. **Data collection strategies** should encompass all of the data and information needed to track and evaluate conditions or outcomes identified in Level 1 through 6 planning. Depending on the situation, a number of options may exist for obtaining any desired data and information, each of which has inherent advantages and disadvantages. The selection of activities should reflect the nature and relative importance of the feedback being sought, as well as the ability of the program to effectively and economically obtain the data and information.

These categories are not completely distinct. For instance, site investigations might include direct documentation of observations, or monitoring and sampling by Stormwater

Management Program staff. Any of these activities might also be conducted routinely or as part of special investigations.



Figure 6.5: Types of Data Collection Activities

There are also a number of ways in which the analysis of data collected by stormwater programs can be approached. These are illustrated generally in **Figure 6.6**. Approaches to data analysis are further explored in **Section 7.5**.

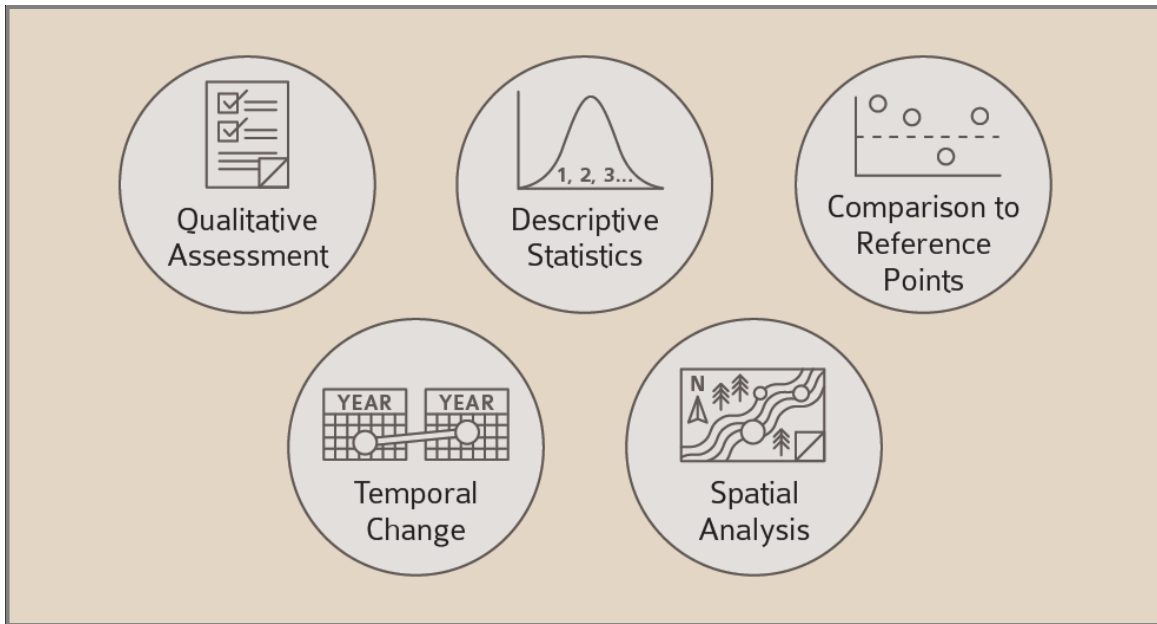


Figure 6.6: Types of Data Analysis Activities

6.4 Sustainability Considerations

Any MS4 Program Implementation Strategy will represent a large commitment of public funds toward the resolution of identified problems. As previously described in **Section 3.0 (Key Concept 3.5)**, stormwater strategic planning should be guided by a balance of environmental, economic, and social considerations. The three critical points in the planning process where this is imperative are the prioritization of problems, the targeting of end-state conditions, and the selection of program implementation strategies.

Up to now, all discussion of Level 1 activity selection has centered on technical considerations, primarily the anticipated benefits of implementation in bringing about behavioral changes and source reductions. Sustainability approaches look beyond technical considerations to guide managers toward priorities and solutions with the best chances of long-term success.

At this point, managers will have developed a provisional list of program implementation activities to be directed to priority target audiences and PGA-BMP packages. Building on these results, they are encouraged to further review their Program Implementation Strategies in the context of the economic feasibility and social acceptance of each proposed activity. This will apply primarily to facilitation activities and direct BMP implementation since these normally constitute the most significant program commitments.

- **Economic factors** are essential because every potential action comes at a cost that must be balanced with the implications of non-action and managers' ability to expend resources. Specific costs may ultimately be borne by the MS4 program, target audiences, or society at large. Questions that may be considered include the following:
 - What are the costs of implementation? Are they one-time or ongoing?
 - Who bears the costs (taxpayers, businesses, permit applicants, etc.)?
 - What is the cost-effectiveness of the proposed action? How do costs compare to benefits? What is the return on investment?
- **Social factors** are those related to society at large or specific segments within it. Perceptions and opinions regarding proposed implementation activities can be important to prioritization. Although the public may often be unaware of many of the details of a MS4 program, they expect to utilize and enjoy receiving waters, and they play a role in the control measures instituted to protect them. It's important to know if specific activities are more or less acceptable to the public, as well whether or not they're directed to issues or problems that are important to the public.

Based on this additional review, managers may or may not conclude that a prioritization of activities within the program implementation strategy is needed.

6.5 Step 1-C: Documenting Knowledge and Data Gaps

It can often appear that knowledge and data gaps are of less concern for Level 1 than during other planning steps because managers have direct access to much of the program data they need. In some cases this is true, but a significant potential exists for some types of Level 1 gaps.

Critical gaps must be addressed in the development of program implementation strategies to ensure that they are resolved over time. **Table 6.3** provides examples of general areas of inquiry where Level 1 knowledge and data gaps are likely to be encountered. These are intended to provide a framework for identifying actual knowledge and data gaps, which will be much more specific than those listed here.

Table 6.3: Potential Areas of Program Implementation Knowledge and Data Gaps

- ✓ Effectiveness of facilitation activities
- ✓ Effectiveness of treatment controls
- ✓ Costs and cost-effectiveness of potential implementation options (treatment controls, source controls, etc.)
- ✓ Support for facilitation activities
- ✓ Relationship of implementation activities to target audience behaviors
- ✓ Relationship of implementation activities to barriers and bridges
- ✓ Knowledge of incentive-based and other non-traditional approaches
- ✓ Adequacy of documentation of facilitation activities
- ✓ Adequacy of data collection activities (ability to support analysis, etc.)
- ✓ Knowledge of economic and social factors affecting program implementation