

ABSTRACT

HANAWAY, CAROLYN ANN. Results-based Management and its Effect on Performance in Roads Agencies and Youth Programs. (Under the direction of Dr. James E. Swiss).

This study addressed the research question: Do results-based management tools, either separately or in combination, improve the performance of roads agencies or youth programs? The possible improvement in performance was assessed in two ways, first through managers' reported perceptions of performance improvement, and then through objective measures of the agency's outputs and outcomes.

While this study investigated results-based management tools collectively, it also individually examined the implementation and the effects of the four major components (i.e., tools) of results-based management (RBM): strategic planning, performance measurement with target setting, incentives (rewards), and process improvement tools. The four RBM tools were investigated using multiple perspectives, including how thoroughly or completely the RBM tools have been installed in the organization and how long the organizations have been using the RBM tools.

The first part of this study used responses solicited in a survey of roads agencies and youth programs. The respondents indicated which RBM tools they had implemented and which of those tools they thought were most effective. The second part of the study used objective performance data provided by the ICMA-Center for Performance Management Benchmarking Project.

A large majority of organizations report using strategic planning and performance measurement with targets, while somewhat fewer have adopted rewards and process improvement tools. The organizations indicated that information from their planning and

performance measurement tools were used for numerous purposes, but especially for budgeting.

The majority of public managers using RBM tools perceived them to have substantially improved the organization. The completeness of each individual RBM tool was a significant predictor of the tool's perceived effectiveness in improving the organization. On the other hand, how long the organization had been using the RBM tool (tool duration) most commonly had little impact on how effective the tool was perceived to be in improving the organization. In both roads agencies and youth programs, the more RBM tools the organization had adopted, the more likely they were to find the tools effective, and the more likely they were to view their organization as a top performer.

Although perceived RBM tool effectiveness was high, the analysis did not find a consistent relationship between most of the RBM tools and objective performance measures. However, there was a significant relationship between the use of one RBM tool – process improvement techniques – and the objective measure of road quality. Possible reasons for the disconnection found between perceived effectiveness and objective performance measures are discussed, including the distinctive nature of the surveyed organizations.

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Results-based Management and its Effect on Performance in Roads Agencies and Youth Programs

by
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DEDICATION

To my father, John Hanaway, for his support throughout my life.

To my husband, Lee Benjamin, for his understanding and encouragement when I felt like quitting.

Last, but not least, to my children, Henry and Helen, for their gentle prodding and motivation to complete my course of study.

BIOGRAPHY

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CHAPTER 1 : INTRODUCTION AND OVERVIEW

Chapter 1 consists of seven sections: (1) a discussion of the research question, (2) a short overview of past efforts to reform public management in the United States, (3) a review of the principles of results-based management, (4) a summary of public management literature, both theoretical and empirical, related to this study, (5) an overview of the study design, (6) a discussion of the study's contribution to the current body of knowledge and (7) a preview of subsequent chapters.

Research Question and Theoretical Models

The purpose of the current study was to address the following research question: Do results-based management tools, either separately or in combination, improve the performance of a roads agency or youth program? Data regarding the use of results-based management tools and reported perceptions was collected from responses solicited through a survey of 455 roads agencies and 71 youth programs, in order to determine which tools managers viewed as most effective. The possible improvement in performance was assessed in two ways, first through managers' reported perceptions of performance improvement, and then through objective measures of the agency's outputs and outcomes. In addition to investigating results-based management tools collectively, the current study also individually examined the implementation of the four major components of results-based management (RBM): strategic planning, performance measurement with target setting, incentives (rewards), and process improvement tools.

Conceptual models that depict the relationship between the analyzed variables are included in Chapter 1 to help illustrate the relationships hypothesized at the beginning of the study. The first model, Figure 1.1, illustrates the expected relationships between how thoroughly or completely the RBM tools are installed and the perceived effectiveness of the tools in the organizations.

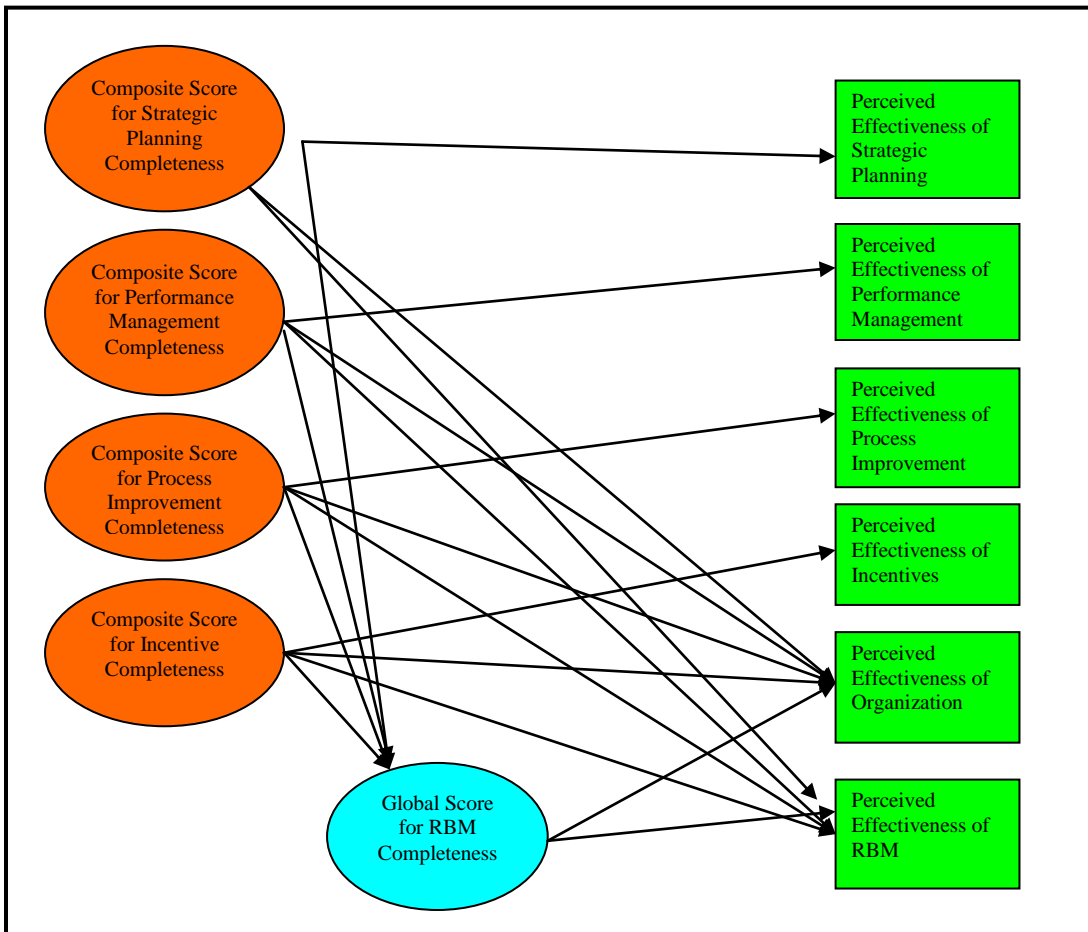


Figure 1.1: Conceptual Model (I) for Perceived Effectiveness of RBM

The independent variables in the first conceptual model are composite scores assessing the completeness of the RBM tools. For example, the composite score for *strategic planning completeness* was calculated using the following questions: (1) Does your agency have a strategic plan?, (2) What would one of the agency's long range goals be? (maximum possible score of 2), and (3) When did your agency conduct the first systematic analysis of itself and its environment as part of a strategic planning process? A "yes" response to the first question regarding having an established strategic plan was given a score of 1 point, and the composite score for the independent variable *strategic planning completeness* was the sum of these responses, ranging from 0 to 4. Similarly, the dependent variable in the model, *perceived effectiveness*, had three measures, each of which was run as a different dependent variable. Specifically, strategic planning completeness was compared to three reported effectiveness measures: (1) how well strategic planning has worked, (2) how well overall RBM has worked, and (3) how strong a performer the agency is believed to be compared to similar agencies.

The second conceptual model, Figure 1.2, illustrates the relationship between the same dependent variable, perceived effectiveness measures, and the independent variable of composite scores assessing the duration of the RBM tools.

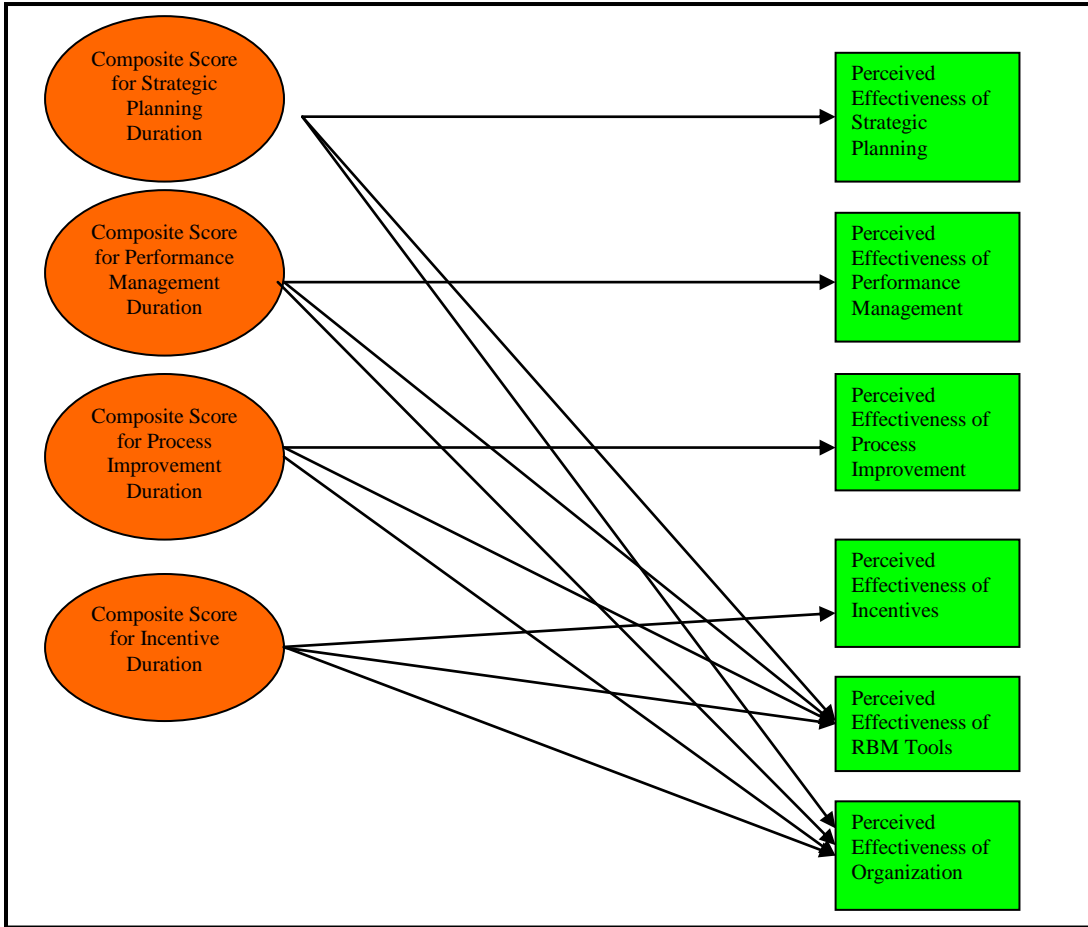


Figure 1.2: Conceptual Model (II) for Perceived Effectiveness of RBM

The conceptual model shown in Figure 1.3 shifts the dependent variable from perceived measures of effectiveness to objective measures of actual performance. These objective measures were taken from data provided by International City Managers Association (ICMA) and were made up of six measures, each run as a different dependent variable in the analysis.

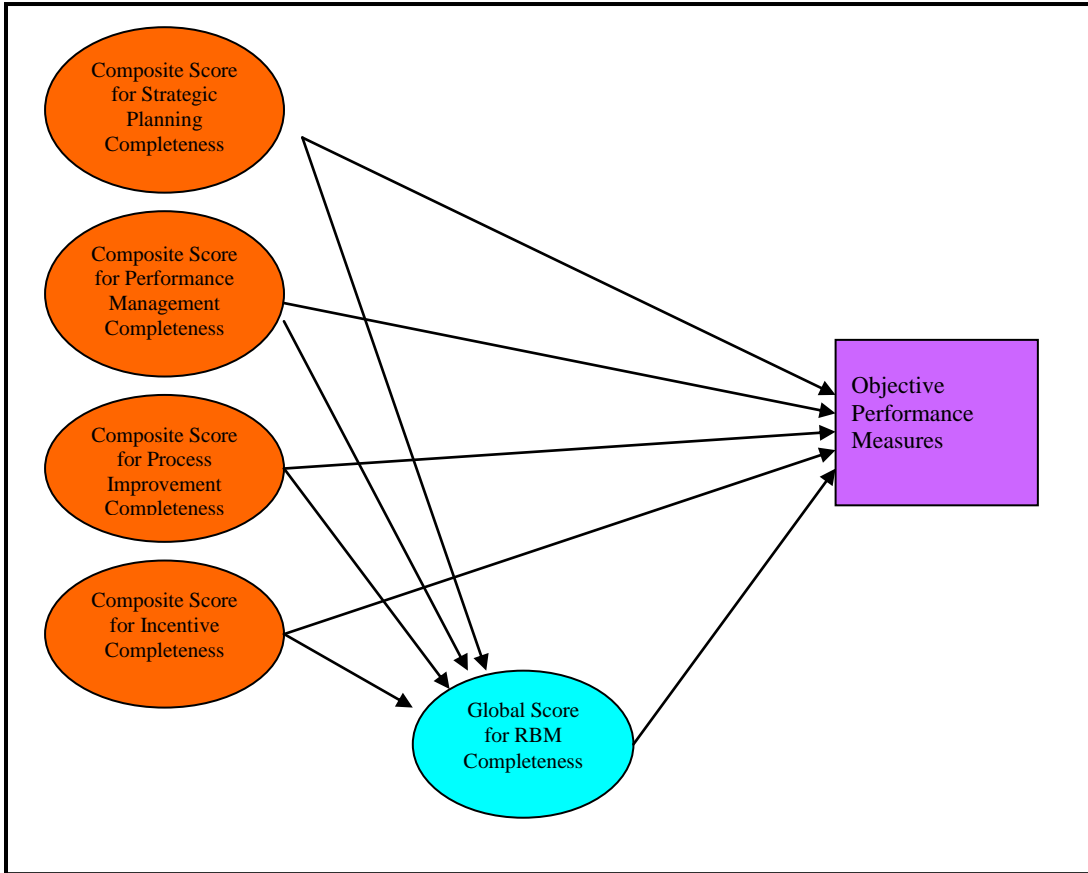


Figure 1.3: Conceptual Model for Completeness and Actual Performance of RBM

The final conceptual model, Figure 1.4, focuses on objective performance but with a new set of independent variables involving RBM tool duration. The independent variables in this model are scores assessing how long the RBM tools have been in place in the organization, based on survey respondents’ answers when asked to recall approximately when the various RBM tools were first installed with the question, “When did your agency first have a strategic plan?”

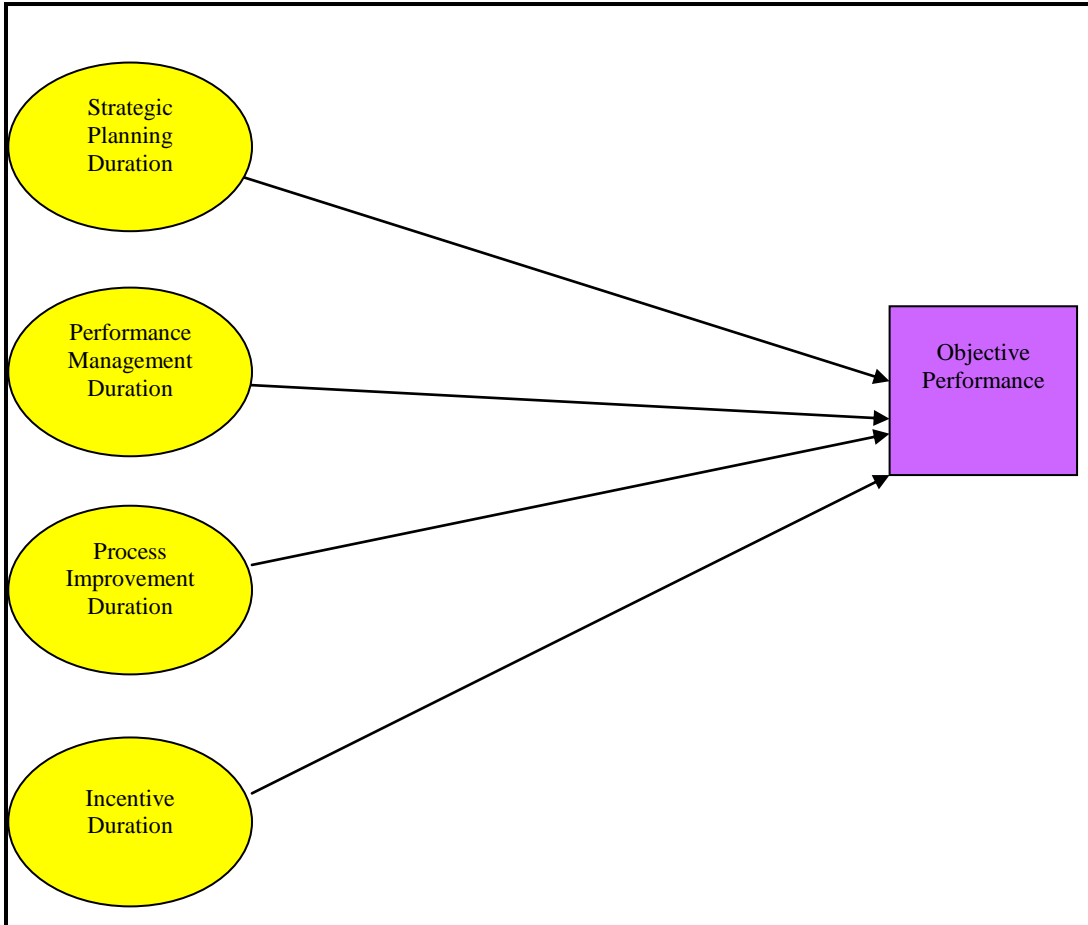


Figure 1.4: Conceptual Model for Duration and Objective Performance of RBM

As the word “duration” would imply, this model seeks to capture subtle changes in an agency’s performance over time and requires both early and more recent performance data for a complete evaluation. However, many of the roads agencies and youth programs involved in the study had not consistently provided complete performance data and, due to the limited number of respondents ultimately available for use in the analysis, this portion of the study involved exploratory research using simple statistical methods that can only suggest tentative conclusions to be made about the impact of RBM on organizational performance.

History of Reform Efforts in the United States

Results-based management (RBM) is the latest in a long series of management changes in U.S. government. The following section includes an attempt to put RBM in perspective by briefly discussing a few of the preceding management reform efforts. The primary focus of the following section will be on RBM's two immediate predecessors, management by objectives (MBO) and total quality management (TQM), because RBM contains aspects of both of these managerial predecessors.

Management reform has a long history. The Civil Service Act of 1883, also called the Pendleton Act, was passed to regulate and improve the civil service of the United States. Among other things, the act required that government jobs be awarded on the basis of merit. Over the ensuing decades, the civil service act was extended to many more federal employees, and similar management reforms were instituted by state and local governments. Working in part to more strongly emphasize management, many local governments also moved to council manager forms of governance during the early and middle 20th century.

Although many additional reform efforts followed in the next 50 years – most notably, the reforms of the two Hoover Commissions – the current management changes most directly stem from management by objectives (MBO), which was established in the federal government by Richard Nixon in 1973. Initially, MBO was introduced in the private sector by Peter Drucker in the 1950s as a system that aimed to improve performance by aligning the goals within an organization (Drucker, 1955). MBO was first instituted in several large executive agencies, with the aim of centralizing goal-setting decisions while still allowing managers some discretion in determining how to achieve the goals.

RBM is a complex approach that has many components, but its single most important aspect is performance management in identifying outcome measures, setting targets for these outcomes, and then regularly tracking progress in achieving them. MBO first introduced most of these steps to government. Compared to today's performance management systems within RBM, MBO differed in its focus on individuals instead of teams, its less self-conscious emphasis on outcomes, and its minimal ties to other organizational aspects. Nonetheless, MBO helped set the stage for management protocols.

The next major predecessor of RBM was Total Quality Management (TQM). TQM was defined by W. Edwards Deming in the 1950s, and it was based on working toward the goal of totally satisfied customers. State and local governments also adopted TQM, and a 1992 survey of the 50 United States indicated that TQM programs were underway in 31 state governments (Kravchuk & Leighton, 1993). RBM is similar to TQM in that it incorporates customer feedback and performance measurement in decision-making, and the quality circles in TQM are akin to the increased participation from frontline workers in RBM. However, in the strictest form, TQM is not entirely applicable to government; government agencies lack the well-defined customer base referenced in TQM, and TQM directs focus on inputs and processes, while RBM stresses measuring outputs and outcomes (Swiss, 1992).

The Malcolm Baldrige National Quality Award, which Congress signed into law in 1987 under President Reagan, initially fostered TQM and then RBM. The Baldrige Award was envisioned as a means to help U.S. organizations achieve world-class quality. The criteria for the Baldrige Award are designed to enhance the competitiveness of organizations by focusing on two stated goals: "delivering ever improving value to customers and

improving overall organizational performance” (University of Wisconsin, 2012). While the Baldrige Award recipients are an especially visible result of the U.S. quality movement, the award has had an even more substantial effect in its criteria, available from the Baldrige National Quality Program, which provide a set of best practices for organizations across the United States (University of Wisconsin, 2012). While overall studies support a definitive link between Baldrige Award winners and organizational performance, results are varied (Przasnyski & Tai, 1999; Przasnyski & Tai, 2002; Tai & Przasnyski, 1999; U.S. Department of Commerce, 2012).

In *Reinventing Government*, David Osborne and Ted Gaebler (1992) declared government was inefficient, ineffective, and unresponsive, and they detailed a plan of making government increasingly entrepreneurial in delivering more public service for every dollar spent. Such an entrepreneurial government is based on several principles including, but not limited to, fostering TQM, empowering citizens, and entrepreneurial leadership. Osborne and Gaebler (1992) also claimed the reinvented government would be able to cut taxes and improve services by supervising the delivery of services, rather than delivering the actual services to the public. By using competition among service providers, government could oversee the delivery of the best services at the lowest cost.

In 1993, Congress enacted the Government Performance and Results Act (GPRA), which mandated that federal agencies become results-oriented. The GPRA required long-term strategic plans that defined goals and objectives for the agency, in addition to an annual performance plan that specified measurable performance goals for all activities. It also required agencies to publish an Annual Performance Report showing actual results compared

to each annual performance goal. The Annual Performance Plan should show the expected progress toward meeting the long-term goals of the strategic plan, and both plans must describe the strategies and various resources needed to meet their goals (White House, 2012). Overall, the GPRA marked a general shift in the focus of government from processes to results.

In the same year that GPRA was signed into law, the Clinton Administration initiated the National Performance Review (NPR), a protocol that marked nearly three decades of efforts to improve the efficiency of government services. The NPR was an interagency task force charged with reinventing and creating a government that “works better and costs less” (“A Brief History,” 1997). Since 1993, the NPR, which became the National Partnership for Reinventing Government in 1998, has developed initiatives to tackle areas in need of reform. The NPR included efforts to involve employees in reform tactics and remove some of the burdensome “red tape” that traditionally frustrated employees. The NPR mandated strategic planning and performance measurement at the federal level and set up a series of benchmarks for the government's practices and performance. Notably, the NPR was criticized by some for having contradictory principles, such as calling for reductions in the federal workforce while using rhetoric about employee involvement (Swiss, 2005). During the second Clinton-Gore term, reform efforts were focused on transforming the culture in major agencies to be more results-oriented, performance-based, and customer-focused (“History,” 2001). The NPR is similar to RBM in that both protocols incorporate strategic planning, performance measurement, process improvement tools, and incentives (rewards).

In 2002, during the Bush administration, the Office of Management and Budget (OMB) announced the development of a tool for formally evaluating the effectiveness of federal programs, named the Program Assessment Rating Tool (PART). PART contains 25 items and was designed to provide a consistent approach to assessing the effectiveness of programs and identifying actions to improve results (Library of Congress, 2004). Results of the assessment tool were then posted on the OMB website in an effort to provide transparency. While PART was a response to some of the criticisms of GPRA, it is difficult to determine if PART measures the right kind of outcomes accurately and consistently (Radin, 2006). In addition, PART itself was criticized for failing to account for the differences among programs and lacking appropriate measures (Gilmour & Lewi, 2006; Gueorguieva et al., 2009).

While the performance agenda of the Obama administration is still in progress, the first two years have emphasized the following four initiatives:

- the identification of a list of programs that should have funding reduced or eliminated based on inadequate performance
- the establishment of an infrastructure to assess the impact of the American Recovery and Reinvestment Act on jobs
- the establishment by agencies, with approval of the OMB, of “high-priority performance goals,” reversing the Bush administration’s “top-down” approach to agency performance to one in which agencies are driving more of the specifics
- a significant commitment, in time and resources, to program evaluation, in part to assist with the identification of what works and what does not (Joyce, 2011).

These initiatives established by the Obama administration illuminate the performance goals of reducing the size of government and improving its management.

Overall, this history of reform efforts in the United States highlights the government's focus on performance throughout the 20th century. While each reform was unique in its emphasis and reflected its own specific approach and values, each was nonetheless built on the foundation of its predecessor and served as a building block for the reform effort that followed (Joyce, 2011).

A Review of Results-Based Management

Results-based management (RBM) is a goal-driven, proactive management strategy, and it has been the focus of public management reforms in recent years (Boyne, 2010; Moynihan, 2006). The terms “results-based management,” “performance management,” and “strategic management” are often used interchangeably but, herein, this group of management tools will always be referred to as results-based management, or RBM. RBM involves key stakeholders that define expected results and design programs to monitor progress toward goals, while using the information gathered to identify and adjust for any obstacles that may interfere with achieving objectives and expected results (Hatton & Schroeder, 2007).

At the core of the RBM process is a guiding logic model. The logic model in Figure 1.5 shows the inputs and processes leading to the outputs and outcomes:

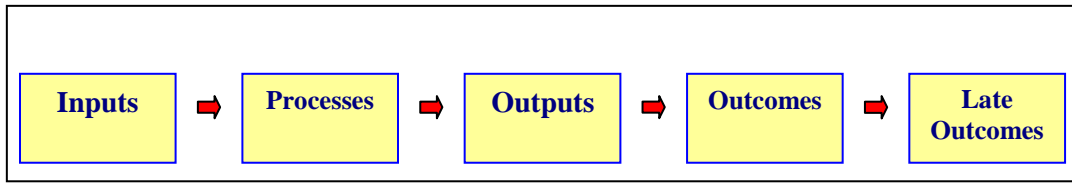


Figure 1.5: Logic Model

The first half of the logic model is made up of inputs and processes or activities. *Inputs* are the resources needed to carry out the activities, with examples including people, money, goods, materials, infrastructure, and technology. *Activities* are the completed tasks in the organization, and examples could include actions such as spreading asphalt, repairing potholes, counseling teen mothers, and dispensing infant formula.

The second half of the logic model is made up of a program's results. Results are called outputs and outcomes; outcomes can be classified as early, intermediate, or late. *Outputs*, the number of products produced or the number of services delivered, can be viewed as late process measures. For example, an output of a roads program could be the number of potholes repaired, or the output of a youth program could be the number of teens counseled. *Outcomes* are defined as program-produced effects on people, and as such they are the actual results caused by the outputs, such as the percentage of satisfied drivers or the number of teens who return to school. *Late outcomes* are the long-term, broad societal changes that the outcomes could cause; for example, decreased malnutrition among toddlers or a decline in the teen pregnancy rate might be a late outcome of a counseling program. RBM guides all management activities towards the ultimate achievement of defined results (outcomes) – the effectiveness of programs. This represents a fundamental departure from

previous management approaches that were dominated by an emphasis on processes or efficiencies of programs, the assumption being that results would follow if the inputs and activities were appropriately monitored. For example, instead of only measuring how many calls and how quickly a police agency responded to calls of distress, RBM would also, and especially, focus on the outcome of lowering the crime rate.

According to Swiss (2005), RBM is based on five principles:

1. An organization must focus on results rather than procedures and processes.
2. Organizations are more likely to produce results if they plan for them – through strategic plans which set long term goals and with shorter term plans such as annual plans, performance measurement and objectives (target setting).
3. Employees must be empowered to make decisions that can enable the agency to deliver better results.
4. Organizations should redesign structures, streamline processes, and use process improvement tools to pursue objectives and goals.
5. Managers should use both internal incentives (rewards) and external incentives (competition) for performance.

Results-based management was being used in many federal agencies, some states, and a few local governments by 2000, and its adoption continued to increase rapidly over the next decade. During the same period, RBM principles were extended to the management approaches of non-government organizations (NGOs) and higher-education institutions

(Swiss, 2005). While the widespread use of RBM is clear, a key question remains: what does our actual experience tell us about RBM?

Supporting Literature

A number of theories underlie the approaches of RBM, with its main premises stemming from goal theory.

Theoretical Grounding

Goal theory, rooted in the scientific management movement, is currently given emphasis by those arguing for evidence-based research. Edwin Locke, the most prolific researcher on goal theory, spent 30 years studying goal-setting and motivational behavior (Association for Psychological Science, n.d.). Locke (1981) noted:

Measurable goals affect worker performance by directing attention, mobilizing effort, increasing persistence, and motivating strategy development. Goal setting is most likely to improve task performance when the goals are specific and challenging, when feedback is provided to show progress in relation to the goal, and when rewards such as money are given for goal attainment. (n.p.)

In other words, goal theory would predict that organizations will perform better on measurable outcomes if they take the following actions: set broad agency goals with strategic planning; establish specific, challenging goals with performance targets; hold individuals accountable; provide feedback by using performance measurement; and reward individuals with incentives (rewards) for reaching those goals.

Goal theory supports the hypothesis that an organization employing RBM with clearly delineated goals and objectives would outperform an organization with unclear goals and objectives. Employee involvement and collaborative efforts are also integral to the goal theory philosophy. Therefore, as the primary basis for RBM is goal theory, with its emphasis on goal-setting and measurement, goal theory is also the primary basis for this research study.

Supporting Research

This study examined whether RBM increases organizational performance. Recent, similar studies have found that strategic planning, target setting, and performance measurement have a positive role in improving service delivery (Boyne & Chen, 2007; Hendrick, 2003; Hyndman & Eden, 2001; Walker & Boyne, 2006, Walker, Damanpour, & Devece, 2011). Likewise, the majority of empirical studies lend support to the hypothesis that management systems have a positive effect on organizational performance (Easton & Jarrell, 1998; Hendricks & Singhal, 1997, 2001; Rodgers & Hunter, 1991, 1992). Although cross-sectional studies are much more common, two longitudinal studies that focused exclusively in the public sector reported tangible gains in productivity (Poister & Harris, 1997; Walker & Boyne, 2006). A case study of the implementation of TQM at the IRS, on the other hand, noted a lack of demonstrated gains in productivity, though customer satisfaction was increased (Mani, 1995). At least two other studies similarly reported that TQM had a limited or negligible effect on an organization's performance (Poister & Harris, 1996; Powell, 1995).

Overview of the Study

Before discussing the measures used in addressing the research question, a review of the subjects selected—roads agencies and youth programs—is appropriate. As Swiss (1992) noted, a program can be said to have a clear technology when the inputs and processes can consistently produce specific early, intermediate, and final outcomes. Hence, roads agencies were selected because these agencies generally have a clear technology marked by explicit and tightly connected relationships between inputs, processes, outputs, and results. For example, while the processes used among local roads agencies may vary slightly, such as the frequency of repair or the depth of asphalt coverage, the general measure of road quality is essentially the same. Roads agencies frequently assess the condition of their roads with an industry-specific piece of equipment that tests the smoothness of the road. With a clear program technology and objective, along with a consistent measure of road quality, the relationship between RBM and performance should be easily ascertained.

The relationship between inputs, processes, outputs, and results is much less clear for youth programs, but proponents of RBM tools would argue that these tools would improve agency performance for all types of programs. Therefore, such proponents would predict the installation of RBM tools to have a positive impact on program outcomes such as teen pregnancy. While the program technology is not as transparent, the measures included in teen pregnancy data are objective, consistent, and standardized. It is important to note that youth programs were chosen as a unit of analysis in order to compare an engineering-based program with a social service-based program in the study, since the contrast of an engineering program with very clear technologies and a social program with much less clear

program technologies will help show the ways that different RBM tools perform differently in different arenas.

Dependent Variables

The best way to measure organizational performance is a widely debated subject in public management (Kelly & Swindell, 2002; Ostrom, 1973; Parks, 1984). Organizational performance can be defined with internal and external measures, actual and perceived results, or multidimensional constructs. In one study, 14 indicators of performance were identified when trying to measure organizational performance in the public sector, including measures such as effectiveness, efficiency, equity, and value for money (Boyne, 2002). Performance measures that are external and archival have been viewed as the gold standard but are not always readily available (Walker & Boyne, 2006). In this study, the possible improvement in performance was assessed in two ways, first through managers' reported perceptions of performance improvement, and then through objective measures of the agency's outputs and outcomes.

Additionally, this study examined some subjective measures of performance by asking managers how effective the components of RBM were at making improvements in their organization. Managers were also asked how their organization compared to similar organizations delivering the same services. Also, this study investigated some objective measures of performance. For roads agencies, this included two objective output measures, road quality and pothole repair, as well as a perceptual outcome measure, driver satisfaction. For youth programs, this study focused on three objective outcome measures: teen pregnancy data, low birth weight babies born to teen mothers, and infant mortality among teen mothers.

Independent Variables

This study individually investigated four of the major components of results-based management tools: strategic planning, performance measurement with target setting, incentives (rewards), and process improvement tools. The study also examined how these tools collectively affect organizational performance. In some cases, this study investigated whether the completeness of a management tool had any result on perceived and objective measures of effectiveness. For example, strategic planning completeness was assessed by questions in the survey that asked if the agency included such planning components such as long-range goals and environmental scans.

There were a second set of independent variables used in the study that dealt with the same RBM tools but, rather than measuring the tools' completeness, this set of independent variables investigated how long the RBM tools had been being used in the organization. In certain instances, these variables were also used to determine a composite score when multiple questions assessed when organizations implemented various RBM tools. For example, performance management duration was calculated by asking respondents how long the agency had been gathering and using information on several specific types of performance.

Contribution to Current Body of Knowledge

Empirical literature has demonstrated a link between management systems similar to, and including, RBM and perceived results. For example, Berman, West, and Milakovich (1994) published results stating that approximately three-quarters of state governments reported undertaking TQM efforts, with perceived increases in productivity, quality, and

customer satisfaction but only a modest improvement in cost reductions. Poister and Streib (2005) examined the level of RBM implementation, or the level of sophistication of RBM practices, in cities with populations over 25,000; they found that RBM practices were associated with perceived achievement of goals and objectives. A similar study found that nearly 85% of cities with populations over 100,000 used performance measures and that, in general, 2 out of 3 local governments employed some form of performance measurement (Folz, Abdelrazek, & Chung, 2009). To complement and contribute to existing data on RBM, this study sought to determine how completely an organization has integrated RBM tools along with how long they have been using RBM tools, and examined the relationship of these factors to perceived organizational performance.

Performance management is widely assumed to be an effective strategy for improving outcomes in the public sector, but relatively few studies test this assumption empirically (Sun & Van Ryzin, 2012). Performance management (PM) is similar to RBM because it involves using clear organizational goals; identifying targets and indicators to link those goals to performance outcomes; and empowering employees to take action in order to achieve set targets (Boyne, 2010; Jennings & Haist, 2004; Rainey & Ryu, 2004). Two recent studies have examined performance management with notable findings. A 2012 study by Sun and Van Ryzin researched the relationship between performance management, RBM tools, and standardized test scores in New York City schools. Their results suggested that schools which better implement performance management strategies and RBM tools do, in fact, have a higher proportion of students who work at their grade level (Sun & Van Ryzin, 2012). Similarly, a 2011 study conducted in British local governments focused on the impact of

innovations in performance management on service delivery, and the authors concluded that performance management had a direct and significant impact on organizational performance (Walker et al., 2011). To supplement these findings, this research study examined how completely an organization had integrated RBM tools and how long they had been using them, and then related the data to the organization's overall effectiveness at improving performance. Moreover, current evidence-based research is heavily concentrated on New York and Texas school districts and local jurisdictions in England (Andrews & Boyne, 2010). Thus, this research adds to the available data on the topic by comparing and examining additional jurisdictions and service areas in the United States. In addition, this research analyzed the effects of results-based management on the performance in roads agencies and youth programs using a combination of objective measures, attempting to discern the relationship between RBM and agency performance by gathering and analyzing ICMA's longitudinal performance data along with the cross-sectional, perceptual data collected from manager surveys.

Additionally, this research examined how agencies are using the performance measurement information they collect, an issue that many researchers have addressed. In fact, researchers have proposed that the use of performance information remains one of the most important, yet understudied areas of performance management (Moynihan & Pandey, 2010). Despite the fact that many governments have been quick to adopt strategic planning and performance management measures, too often they fail to implement the other integral components of RBM (Moynihan, 2006), such as using performance information. Moynihan (2009) later contended that, while governments have devoted large amounts of resources to

implementing performance management systems, they have not yet discovered how to use the information. Even more, as Van Dooren and Van de Walle (2008) noted, although the production of performance information has received prolific consideration in the available literature, very little attention has been given to the actual use of the information. While not the primary focus of this research, the survey questions in the study addressed the use of additional RBM tools and solicited information about how often performance information is reviewed and what specific areas of the organization are affected.

Application to Public Administration

The last three decades have been a period of intense reanalysis of government practices—what government does—and how it might be done better. As a result, public organizations at the national, state, and local levels are changing the way they do business to enhance performance, improve productivity, and advocate customer service. Public managers are being asked to further stretch already scarce resources because of frequent budget cuts and hiring freezes. Organizations are often required to cover more programs or more clients with fewer resources and smaller workforces. Public managers are charged with ensuring their agencies operate effectively and efficiently, and RBM has become their management strategy of choice (Hatton & Schroeder, 2007). A 2001 study of literature found that RBM was the most frequently discussed topic among practicing professionals (Streib, Slotkin, & Rivera, 2001), and its importance continues.

Given the dynamic political and institutional environment under which public agencies operate, public managers need to know if the management tools they are using are

effective. As such, this study is valuable to the field of public administration because it directly addresses a question that is important to both practitioners and theorists: Does RBM help agencies operate more effectively?

Finally this study examines roads agencies, engineering organizations with clear program technologies, as well as youth programs with much less clear program technologies, studying the contrast between the two programs in order to demonstrate where RBM tools work differently and under what varying circumstances.

Preview of Upcoming Chapters

Chapter 2 reviews the most important research literature that underlies this study. Chapter 3 discusses methodology and the operationalization of variables. Chapter 4 presents the survey results and provides analysis for roads agencies. Chapter 5 presents the survey results and provides analysis for youth programs, and also includes a section comparing the similarities and differences in the findings between roads agencies and youth programs. Finally, Chapter 6 includes a discussion of future research suggestions and a final summary.

CHAPTER 2 : LITERATURE REVIEW

The purpose of this study is to address the research question, “Do results-based management tools, either separately or combination, improve the performance of roads agencies or a youth programs?” The possible improvement in performance was assessed in two ways, first through managers’ reported perceptions of performance improvement, and then through objective measures of the agency’s outputs and outcomes.

While this study examined results-based management tools collectively, it also sought to individually investigate whether outcomes are also affected by the separate implementation of the four major components of results-based management (RBM): strategic planning, performance measurement with target setting, incentives (rewards), and process improvement tools.

Theoretical Support

Goal theory is the primary basis for RBM and, therefore, for this research. Goal theory, which is rooted in the scientific management movement, is often cited by those arguing for evidence-based practices, because the efficacy of goal-based management approaches is one of the most robust and replicable findings present in the psychological literature. A literature review of both laboratory and field studies on the effect of goal-setting when learning or performing a task revealed that 90% of those studies linked goals to positive or partially positive results (Locke, Shaw, Saari, & Latham, 1981).

Goal theory asserts that goals affect an individual’s performance by focusing attention and effort, and that goals are most likely to improve performance when they are

specific, challenging, coupled with feedback (performance measurement with targets), and tied to rewards or incentives (Locke, 1980). In fact, research studies have demonstrated that difficult, specific goals have a positive effect on performance (Mento, Steel, & Karren, 1987; Tubbs,1986). Studies have also found an increase in organizational performance when feedback was included with these difficult, specific goals (Mento et al., 1987). Thus, goal theory would predict that organizations will perform better on measurable outcomes if they first set broad agency goals with strategic planning, followed by establishing performance targets while holding individuals accountable, and finally provided feedback by using performance management techniques.

While the primary basis for RBM is goal theory, some of the specific tenets of RBM are supported by additional theories. For example, the performance measurement tool of RBM incorporates systems theory, which states that an open system, or organization, is cyclical in nature with inputs, through-puts, and outputs (Katz & Kahn, 1978). The organization renews itself from energy gained from the inputs, adjusts its course by using feedback and through-puts, and strives to maximize outputs. Hence, systems theory would predict that organizations that provide feedback through performance measurement will perform better on measurable outcomes.

Expectancy theory asserts that individuals consider the consequences of their actions and will only take action if the result is likely to be favorable (Mitchell, 1974). Expectancy theory, then, predicts that organizations which offer rewards for goal attainment will have better outcomes than organizations which do not, because the rewarded individuals would be more encouraged to take actions that lead to attaining the organizations' goals.

Literature Review of Comprehensive Management Systems

Each of the management systems preceding RBM had a unique focus. For example, management by objectives (MBO) focused on long-range planning and performance measurement, but paid little attention to customer service. While total quality management (TQM) included employee empowerment, teams, and continuous improvement in processes, it emphasized process measures and satisfied customers instead of outcomes. The specific RBM practices examined in this study include: strategic planning, performance measurement, targets, incentives or rewards, and process improvement. Although the empirical literature on RBM has grown some in recent years, it is nonetheless still nascent. Therefore, when assessing the impact of RBM on performance, it is prudent to also include studies related to both MBO and TQM, because they share many characteristics with RBM.

Studies of the Efficacy of MBO

Two large meta-analytic studies supported the positive impact of MBO on organizational performance (Rodgers & Hunter, 1991, 1992). The first analysis reviewed 70 studies of both private and public organizations; of these, 68 organizations reported gains in productivity, and only 2 studies reported a loss resulting from MBO implementation. Notably, large standard deviations suggested the possibility of moderating variables, as 29 studies used ratio scale data to enable an analysis of management commitment. Results of the meta-analysis showed that, when top-management commitment was high, the average gain in productivity was 56%. When commitment was low, however, the average gain in productivity was only 6%, a dramatic difference. The second study focused on government organizations with productivity data before and after MBO implementation. All 30 public

sector studies reported positive results. Among the 11 studies with gain estimates, the mean gain in productivity was 58.0 percent. The current study also had a large standard deviation of 43.2, suggesting that some firms would have found little or no productivity gain after implementing MBO. In line with previous study findings as discussed above, organizations had more productivity gain when top-management commitment was greater.

Studies of the Efficacy of TQM

In most organizations, TQM has been absorbed by newer management movements such as RBM and, as a result, much of the research on TQM implementation occurred more than a decade ago. Several early studies concluded that organizations saw little or no benefit from TQM. One study concluded that the competitive advantage from TQM was not from its ideology or particular tools such as quality training, process improvement, and benchmarking; instead, intangible features of TQM like open culture, executive commitment, and employee empowerment drove the success of organizations (Powell, 1995).

A case study of the IRS investigated the TQM effort initiated in 1986 and the resulting effect on productivity and quality (Mani, 1995). The TQM program included: a strategic plan; participation in quality teams; employee training; a customer focus; and changes in organizational structure, teamwork, and promised cost savings. The author examined the effect of TQM on inputs and outputs—for example, the average number of personnel for the year (input) or the number of refunds issued (output)—and followed trends in the measures from 1987 until 1990. The findings showed that TQM had no significant impact on any input or output measures, perhaps because an impact from such a sweeping change could not be observed in just three years. However, the IRS did see increased product

satisfaction and decreased product dissatisfaction, both of which should be cited as outcome measures of organizational performance.

Securing performance data from PennDOT, Poister and Harris (1996) conducted two studies of TQM and productivity measures. The first study examined the impact of TQM on quality and productivity measures, as well as several human resource measures, from the Pennsylvania Agency of Transportation. With modest evidence and weak correlations, the authors concluded that increased employee morale was the most substantial contribution from TQM (Poister & Harris, 1996). However, a year later, using updated PennDOT data, the researchers reexamined productivity measures among the same 67 counties in Pennsylvania, with more impressive results. The labor productivity measure reflected a 20% improvement from 1987 to 1994, and there was also a considerable improvement in the maintenance backlog (Poister & Harris, 1997).

A longitudinal study using an event-study approach, with methodology similar to the current study, investigated the ability of effective TQM programs to generate real economic gains in business organizations (Hendricks & Singhal, 1997). Firms that had won quality awards were considered “effective implementers,” and performance measures included revenues, costs, capital expenditures and profitability. A sample of quality-award winners was then compared to a control sample of firms; over a 10-year period from six years before to three years after the year of winning the first quality award, there was a positive change in the operating income for the TQM firms, higher than that of the control sample. Not only was the mean change in sales for the test sample higher than that of the control sample, but there was also some evidence that TQM firms were more successful at controlling costs when

compared to non-TQM firms because award winners had a significantly lower cost per dollar of sales. Results also indicated that TQM firms had a higher growth in total assets (Hendricks & Singhal, 1997). The current study used a similar event-study approach to determine the effect of RBM implementation on performance measure data collected over a 10-year period, but attempted to measure RBM on multiple dimensions instead of just a single factor like winning a quality award.

Another study conducted in the private sector examined 108 U.S. firms and the impact TQM had on financial performance (Easton & Jarrell, 1998). The researchers tracked financial measures such as net income, operating income, sales, and daily stock returns for five years after serious efforts had been made to implement a comprehensive TQM system. These firms were then compared to matched control firms that did not have TQM systems. Firms were interviewed to determine the date of TQM implementation and the extent to which the firm had implemented TQM. The firms that implemented TQM were then divided into two subsets based on how well the TQM system was integrated and tracked for five years. Compared to the control firms, the results showed that net income, operating income, and sales increased post-TQM implementation for both subsets of TQM implementers, with the 44 companies considered to have more advanced TQM systems realizing better results. Stock returns also improved post TQM implementation with the more advanced TQM implementers having a median increase of over 20% in five years (Easton & Jarrell, 1998).

A later study involving TQM and firm performance was conducted by Hendricks and Singhal in 2001. The researchers defined firms that had won quality awards as “effective implementers” of TQM, and the long-run stock performance of these effective implementers

was compared to benchmarks of matched control firms. The researchers also analyzed stock performance during implementation and post-implementation periods, controlling for industry and size of firms. The results showed that stock performance for effective implementers was not significantly different from control firms during the implementation period, though stock performance between firms was markedly different during post-implementation. While the authors concluded that the stock market responds slowly to the benefits of TQM, results indicated a significant, positive effect on long-range stock prices when compared to the industry and size-matched control firms (Hendricks & Singhal, 2001).

Studies of the Efficacy of Results-Based Management

Although managers are not the only determining factor in an organization's effectiveness, their influence on the performance of public programs has been increasingly recognized as crucial (Boyne, Meier, O'Toole, & Walker, 2006; Ingraham, Joyce, & Donohue, 2003; Walker, Andrews, Boyne, Meier, & O'Toole, 2010). For example, a recent study involved the strategic management of English 101 authorities and their core service performance (CSP) element, which takes into account multiple performance indicators across key service areas to arrive at a weighted score for the authorities overall effectiveness. In the study, strategic management was defined as identifying objectives, the processes for delivering the services, and the interaction of the managers with individuals. The researchers were able to control for prior performance, and the study results revealed that strategic management was positively associated with higher CSP scores (Walker et al., 2010).

Performance management—a synonym for results-based management as noted earlier—was the focus of a study by Sun and Van Ryzin. Their study used data provided by

the state Department of Education for over 1000 New York City schools to examine the relationship between RBM tools and standardized test scores. Notably, the NYC Department of Education audits school management practices annually, providing a consistent assessment for the independent variables; the dependent variables of the study were the percentage of children on grade level and the percentage of children severely below grade level that demonstrated substantial improvement in their test scores. The empirical results of the study suggested that schools which are better at performance management have a higher proportion of students on grade level, even when controlling for variables such as low-income students and teaching experience (Sun & Van Ryzin, 2012). While the results were not as compelling for low-performing students, the authors note that the relatively weak findings were still statistically significant.

An empirical study of the United Kingdom's Labour Party government program of public management reform assessed RBM-based management reform and included the tools strategic planning, process improvement, non-financial incentives, and enhanced choice (Walker & Boyne, 2006). Multiple informants from 117 English localities in several service areas, including waste management, land use planning, education, and libraries, were surveyed to assess the level of implementation of reform. The level of implementation was then tested against the core service performance (CSP) score developed by the Audit Commission in England, a score based upon several measures: quantity of outputs, quality of outputs, efficiency, formal effectiveness, value for money, and consumer satisfaction. Results of the study indicated that planning, organizational flexibility, and user choice were associated with higher performance. The authors claimed that the results offer evidence for

the theory and practice of public management reform, and they maintained that those management efforts can improve public service performance (Walker & Boyne, 2006).

Yet another study, also conducted in English local governments using the CSP, tested the impact of adopting New Public Management (NPM) reforms on organizational performance (Walker et al., 2011). The unique study involved surveying multiple managerial levels in each of 136 local authorities. While the focus of the study was the impact of management innovations on service delivery, the authors also examined the direct and indirect impact of performance management on organizational performance. Like RBM, performance management (PM) includes using clear organizational goals, identifying targets and indicators to link those goals to performance outcomes, and empowering employees to take action in order to achieve those targets (Boyne, 2010; Jennings & Haist, 2004; Rainey & Ryu, 2004). The authors concluded that, while management innovations were only effective in the presence of a performance management system, PM had a significant and direct impact on organizational performance (Walker et al., 2011).

In a large study, Meier, O'Toole, Boyne, and Walker (2007) analyzed performance data from 3,041 Texas school districts. The performance measures included school exam results, attendance rates, and drop-out rates and, in a more recent article, Meier and colleagues reexamined the data to also determine the impact of management and strategic planning on a school's performance. While controlling for economic status and race, results demonstrated that both management and the strategy employed had a significant positive impact on all three result measures (Meier, O'Toole, Boyne, Walker, & Andrews, 2010).

A 2013 study conducted in the United States transit industry was very similar in design to the current study. The authors surveyed 88 small and medium-sized local transit agencies regarding management practices. The survey focused on two major components of RBM, strategic planning and performance measurement, and the responses were then combined with outcome data collected by the Federal Transit Administration. The results indicated that both strategic planning and performance measurement had positive effects on transit system ridership. Interestingly, regression analysis demonstrated that the effects of performance measurement activity outweighed the effects of formal strategic planning. The authors speculated that increasing or maintaining ridership is a common goal of virtually any transit system; as such, in regards to the transit industry, the authors concluded that strategic planning is not as essential for reaching the primary goal, making performance measurement even more important for monitoring and achieving goals (Poister, Pasha, & Edwards, 2013).

Some of the reviewed studies dealt with the public sector, while others looked exclusively at the private sector. Though private sector studies can provide important clues about how management tools will perform in government, it is important to note that they must be interpreted carefully. For example, TQM in the strictest form is not entirely applicable to government, and such a consideration must be kept in mind when reviewing TQM studies involving the private sector. Delivering a quality product to a well-defined customer base is the focus of TQM but, unlike the private sector, most government agencies deliver services to multiple, often competing groups of stakeholders (Swiss, 1992).

Section Summary

This study investigated whether RBM increases organizational performance. Research on RBM's predecessors, MBO and TQM, indicates that they have been found to be often, but not always, effective (Poister & Harris, 1996; Powell, 1995). The IRS case study reported a lack of demonstrated gains in productivity, though customer satisfaction was increased (Mani, 1995). Still, the majority of prior studies lend support to the hypothesis that these management tools have a positive effect on organizational performance (Boyne et al., 2006; Easton & Jarrell, 1998; Hendricks & Singhal, 1997, 2001; Ingraham et al., 2003; Meier et al., 2007; Poister et al., 2013; Rodgers & Hunter, 1991, 1992; Sun & Van Ryzin, 2012; Walker et al., 2011; Walker et al., 2010). Also, two longitudinal studies that focused exclusively in the public sector reported tangible gains in productivity (Poister & Harris, 1997; Walker & Boyne, 2006). While prior research seems to indicate that MBO and TQM often improve performance, the effect of RBM over time has only been directly addressed by Walker and Boyne's (2006) study of United Kingdom Labour government reforms.

The next sections of this chapter will discuss research studies that focused not on comprehensive management systems like MBO, TQM, and RBM, but instead concentrated on specific tools within these management systems. In particular, the next sections will present and discuss research on various RBM tools, such as strategic planning, target setting, and worker empowerment.

Literature Review of Management Tools

Strategic Planning

Strategic planning outlines where an organization is going, how it plans to get there, and how it will know if it has arrived in the right place. Strategic planning serves a variety of purposes in an organization, including establishing goals, communicating objectives, planning for effective use of resources, developing a systematic mechanism for measuring performance, and providing direction in an increasingly turbulent economic and politically dynamic environment (Lerner, 1999). Mandated at the federal level with the passage of the Government Performance and Results Act of 1993, strategic planning is increasingly being used in all levels of the public sector (Hernon; 1998; Moynihan, 2006).

Thirty-five years ago, in a seminal article about planning in business, Thune and House (1970) empirically tested the relationship between strategic planning and performance. Their study found that formal planners were more financially successful than informal planners, inciting decades of debate about the relationship between formal strategic planning and the performance of a firm. Although Thune and House were the first to empirically test the relationship of strategic planning and performance, the use of strategic planning as a management tool, based on goal theory, has been advocated since the 1960s (Boyd, 1991). Over the past 35 years, however, the evidence regarding the link between strategic planning and firm performance has continued to be inconsistent. Some studies have shown positive relationships between planning and performance (Langerak, Hultink, & Robben, 2004; Peel & Bridge, 1998), while others have pointed to negative relationships

(Capon, Farley, & Hulbert, 1994; Shrader, Taylor, & Dalton, 1984) or null results (Ackelsberg & Arlow, 1985).

Strategic planning has been examined in several meta-analyses. It should be noted that meta-analytic studies can be controversial, because they often attempt to combine studies that are especially heterogeneous in subject selection, use different independent variables, and employ various statistical methods. Nonetheless, meta-analyses can also be useful as syntheses of decades of prior research.

The first meta-analysis reviewed 21 studies including over 2,000 firms in the private sector (Boyd, 1991) in order to examine the impact of strategic planning on nine performance measures, which were also combined into an overall performance variable for the study. From the analysis, the author concluded that many of the studies suffered from methodological issues including, but not limited to, unreliable data, lack of moderating control variables, lack of differentiation of planning efforts, and small sample sizes. Thus, he determined that strategic planning had a weak but positive effect on each of the nine performance indicators and a weak, limited effect on overall performance (Boyd, 1991).

A second meta-analysis dealt exclusively with small businesses, defined as organizations with less than 100 employees (Schwenk & Shrader, 1993). The authors analyzed 14 studies that had examined formal strategic planning efforts and objective performance data like sales and returns on investment. Despite many findings that small firms do not benefit from strategic planning efforts (Cragg & King, 1988; Gable & Topol, 1987; Kallman & Shapiro, 1978; Orpen, 1985; Robinson & Pearce, 1983; Robinson, Logan, & Salem, 1986; Robinson, Pearce, Vozikis, & Mescon, 1984; Shrader et al., 1984; Unni,

1981; Watts & Ormsby, 1990), Schwenk and Shrader (1993) reported a significant, positive relationship between strategic planning and sales and revenue growth. The results also revealed a significant relationship between strategic planning and returns on sales and investment.

The third meta-analysis synthesized 23 years of research in an attempt to reconcile the inconsistent findings regarding strategic planning and performance in the private sector (Miller & Cardinal, 1994). The study utilized data drawn from 26 empirical studies and the findings suggested that strategic planning was strongly and positively related to growth, especially when the researchers controlled for type of industry. Strategic planning was also very positively correlated to profitability, particularly for firms in turbulent environments. This finding is particularly interesting considering the counter-intuitive assertion made by some authors that turbulent settings require less planning and decision-making (Ansoff, 1991; Mintzberg, 1990).

A recent meta-analytic analysis examined all published and unpublished studies involving strategic planning and firm performance in the private sector and conducted over the past 35 years; the researchers identified a total of 85 published studies and 17 unpublished studies (Shea-Van Fossen, Rothstein, & Korn, 2006). The unique aspect of this analysis is that unpublished works were included; in doing so, the researchers accounted for publication bias, the tendency to publish research depending on the direction and statistical significance of the results, which can skew meta-analytic results towards significant and positive results (Rothstein, Sutton, & Borenstein, 2005). The overall standardized difference in means was 0.257 with a 95% confidence interval of 0.135 to 0.378, indicating strategic

planning has a small but significant relationship with performance ($p < .001$), a finding that is consistent with prior research. Individual firm characteristics—specifically, firm size— were found to be a significant factor in controlling the relationship between strategic planning and performance, with smaller firms having the performance advantage.

Outside the works covered in the meta-analyses, a few additional empirical studies support the hypothesis that strategic planning has a positive impact on organizational performance. The first study examined strategic planning and firm performance of 113 Fortune 500, multi-product manufacturing firms (Capon et al., 1994). Multi-product firms were purposely selected in an attempt to control for economic impact from industry fluctuations. Results of the study confirmed that a positive relationship existed between well-integrated, sophisticated planning processes and firm performance and firm longevity. Capon et al. (1994) also concluded that internally driven strategic planning efforts are most successful when compared to top-down driven or stand-alone efforts.

The second study supporting the positive affect of strategic planning on organizational performance was conducted more recently and investigated the relationship of predevelopment activities to performance (Langerak et al., 2004). This study used data from 126 firms in The Netherlands to consider the impact of product predevelopment activities, including strategic planning, on organizational performance. The results provided evidence that strategic planning was positively related to new product performance, with new product performance being positively related to organizational performance. Thus, the authors argue that their findings support the link between strategic planning and organizational performance. The third study looked at 40 local departments in Welsh councils that provide

services ranging from public safety to housing, including roads agencies and social service programs. While the study focused on implementation style, results demonstrated that strategic planning was positively associated with performance (Andrews, Boyne, Law, & Walker, 2011).

All of these strategic planning studies were conducted in the private sector, which benefits from well-defined, measurable goals. However, many scholars in public administration and political science have expressed the opinion that public bureaucracies differ from private organizations in fundamental ways (Barton, 1979; Dixit 1997; Downs, 1967). While profit is the primary goal of a private organization, all firms can easily measure their performance by looking at sales and profitability. On the other hand, public organizations have multiple, often vague, hard-to-measure, and usually conflicting goals. Still, not all researchers agree that the differences between public and private organizations are so obvious (Bozeman, 1993; Lan & Rainey, 1992; Rainey, 1983; Rainey, Padney, & Bozeman, 1995). Whichever side of the argument one adopts, it is reasonable to assume that private organizations would have an easier time conducting a strategic planning process than a public agency and, therefore, may realize greater benefits from strategic planning.

Finally, a published study conducted by Andrew Frazier examined over 4,000 survey responses from state revenue agency employees about their attitudes regarding the effectiveness of strategic planning. Findings indicated that employees link strategic planning to results because individual work plans are aligned with broader agency goals (Frazier, 2008).

Section Summary

This study examined the hypothesis that strategic planning improves organizational performance and, although sometimes weakly, prior research supports the hypothesis (Andrews et al., 2011; Boyd, 1991; Capon et al., 1994; Langerak et al., 2004; Miller & Cardinal, 1994; Schwenk & Shrader, 1993; Shea-Van Fossen et al., 2006). All of the reviewed studies focus on the private sector. Thus, to complement existing research, this study examined public sector agencies, incorporating objective performance measures as well as subjective data.

Performance Measurement and Target Setting

The use of measures to track and assess services is called *performance measurement* and, to date, governments have devoted great effort and large amounts of time and resources to implementing performance management systems (Moynihan & Pandey, 2010). In the 1990s, performance measurement was often used in isolation. Many public agencies simply measured and reported their performance with the belief that providing such information would lead to improvement; however, such stand-alone performance measures failed to produce consistent improvement. Thus, most organizations now combine their performance measures with dates and targets for results, in order to determine a goal or objective. (When a performance measure is combined with a target and a date, the resulting combination is called a *goal* or *objective*, two terms that are treated herein as synonyms.) Nevertheless, a consensus of The Minnowbrook Conference in 2008 was that the use of performance information still remained one of the most important but understudied areas of performance

management in the public sector. Though governments do collect performance information, they have not yet discovered how to use it (Moynihan & Pandey, 2010).

Agencies can measure performance in several ways, specifically through amount of inputs and outputs, degree of efficiency, and types of outcomes. *Input measures* describe the amount of human or financial resources used to perform a service. *Output indicators*, also known as *workload indicators*, refer to the amount of work performed and quantify the effect of programs on clients and citizens. The ratio of inputs to outputs (or, rarely, to outcomes) provides a measure of efficiency. The 2008 Minnowbrook Conference brought attention to the fact that many governments are collecting and tracking measures, but have been slow to use the information gleaned about efficiency or results to effectively impact decisions within the agency (Moynihan & Pandey, 2010). As goal theory states, in order to be effective, goals must be specific, measurable, and difficult but achievable. While little empirical work has been done exclusively covering performance measurement and organizational performance, there have been a number of studies that examine the effect of goal-setting or target-setting on performance. A thorough review of literature revealed three studies, all of which support the hypothesis that establishing and working toward objectives improves organizational performance.

Tubbs (1986) conducted a meta-analysis of 87 studies in order to investigate the empirical evidence supporting the major principles of Edwin Locke's goal theory. Locke theorized that goal difficulty, goal specificity, feedback, and participation in setting goals all play an integral role in task performance (Locke, 1968), and the well-controlled studies included in Tubbs' analysis lent strong support for these major goal-setting propositions.

Results supported that setting difficult but specific goals lead to higher performance than with ambiguous goals or no goals, and findings also suggested that an individual's participation in the goal-setting process leads to higher performance than when goals are assigned (Tubbs, 1986).

Another meta-analysis posed essentially the same questions regarding the postulates of Locke's goal theory as Tubbs' (1986) study. Findings supported the link between goal-setting and increased performance, noting a 4% to 11% increase in productivity when difficult, specific, and participative goals are used (Mento, Steel, & Karren, 1987). Also, the researchers conducted an additional meta-analysis of performance with difficult, specific goals, specifically examining the difference in results when feedback was, or was not, included. While the number of studies included in the meta-analysis was small, results support the efficacy of coupling difficult, specific goals with feedback.

An interesting study conducted in England involved the performance of public organizations in 147 local authorities during the period from 1998 to 2003 (Boyne & Chen, 2007). To ascertain the impact of specific, stretch targets on measurable objectives, researchers studied the Local Public Service Agreement (LPSA). The LPSA is a quasi-contract negotiated with central government, under which a local authority works to meet 12 targets in exchange for a maximum reward of 2.5% of its revenue budget. From a list set by central government, local authorities entering into an LPSA were required to select at least 7 targets from areas such as education, social services, and crime reduction, in addition to a maximum of 5 targets reflecting local policy priorities. The LPSA policy represents an unprecedented experiment in United Kingdom public sector incentives, promising a

substantial reward of £1.3 billion if all the first-generation targets are attained. Due to the specifics of the LPSA policy, researchers were able to control for baseline performance and local involvement by setting targets that had a common incentive in financial reward. The study provided statistical evidence that targets with substantial rewards lead to improved performance, as local authorities that selected a target for educational performance earned higher scores than those without a target (Boyne & Chen, 2007).

In a study involving a data set from the Texas school district, Meier and colleagues (2010) examined the impact of strategy on performance. While looking at the model proposed by Miles and Snow, the researchers primarily focused on testing the type of strategic stance an organization took. Results demonstrated that examining organizational outcomes, or goals, leads to improved performance (Meier et al., 2010). Finally, in a study involving state revenue agencies, Frazier (2008) found that employees perceive performance measurement as having a positive impact on organizational effectiveness, noting that “measures that track the performance of key processes help improve processes across intra-agency boundaries from inputs through to results” (Frazier, 2008).

Section Summary

Prior research supports the current study’s hypothesis that targets and performance measurement improve organizational performance (Boyne & Chen, 2007; Meier et al., 2010; Mento, Steel, & Karren, 1987; Tubbs, 1986). While two of the meta-analyses were conducted in the private sector with private organizations that have well-defined and easily measurable goals, Boyne and Chen’s (2007) study demonstrated success using performance measurement and goal-setting (with rewards) in public organizations. To complement and

contribute to the existing research in the area of performance, the current study examined targets and performance measurement, in the absence of incentives, within roads agencies and youth programs.

Studies of the Efficacy of Incentives

Incentives or rewards are key components of RBM that are becoming increasingly popular in attempts to engage employees in the organization's success. For both practical and theoretical reasons, incentives have been generally thought to increase employee motivation and performance. Also, research has demonstrated that recognition and reward programs improve employee morale and facilitate organizational change (Cassidy & Ackah, 1997; Saunderson, 2004).

Companies offer monetary rewards like stock options, profit sharing, and gain sharing as ways to give employees a stake in the success of the company. Additionally, companies offer non-monetary rewards such as training, recognition, flexibility, education, interest in the employee, and communication. Non-monetary recognition rewards are the most commonly used incentive and are helpful as employees' needs evolve (Lawler, Mohrman, & Ledford, 1995). While there have not been many recent studies on non-financial rewards, several meta-analyses of financial incentives and performance have been conducted.

While most of the more recent studies on rewards and performance examined private organizations, an older study conducted on a college campus in 1985 sought to discover whether offering non-monetary incentives would increase participation in a blood drive (Ferrari, Barone, Jason, & Rose, 1985). In the study, trained individuals were asked to

approach college students and either offer them an incentive coupon redeemable upon donating blood, or merely inform them of the upcoming blood drive; the groups of college students were not significantly different in sex or donation history. The coupons offered the college students non-monetary rewards and were redeemable at the blood drive for discounts on merchandise, play tickets, or football tickets. In the group that received incentives, 61% donated blood, significantly more than the non-incentivized group from which only 29% donated blood. Still, however, results demonstrated that non-monetary incentives were also effective in motivating blood donor participation, supporting previous studies that had shown peer pressure to be markedly effective in recruiting donors. Interestingly, incentives were most effective at motivating first time donors (Ferrari et al., 1985). The impact of non-financial rewards was also evaluated in a study of the United Kingdom Labour government's public service improvement strategy (Walker & Boyne, 2006), as reviewed above. The study included an empirical assessment of the effect of non-financial rewards on performance. However, rewards were only measured by one survey item, and the authors finally stated that results were inconclusive.

Boyne and Chen's (2007) study in England, reviewed above, also involved financial rewards and examined public organizations in 147 local authorities that met self-selected stretch targets. To assess the impact of specific, stretch targets on measurable objectives, researchers studied the Local Public Service Agreement (LPSA). The LPSA is a quasi-contract negotiated with central government, under which a local authority works to meet 12 targets in exchange for a maximum reward of 2.5% of its revenue budget. From a list set by central government, local authorities entering into an LPSA were required to select at least 7

targets from areas such as education, social services, and crime reduction, in addition to a maximum of 5 targets reflecting local policy priorities. The LPSA policy represents an unprecedented experiment in United Kingdom public sector incentives, promising £1.3 billion if all the first-generation targets are attained. Due to the specifics of the LPSA policy, researchers were able to control for baseline performance and local involvement by setting targets that had a common incentive in financial reward. The study provided statistical evidence that targets with substantial rewards lead to improved performance (Boyne & Chen, 2007).

In a study involving financial rewards, Huselid (1995) examined various human resource management practices designed to recognize and reinforce desired behaviors. The dependent variables in the study included a variety of organizational performance measures such as turnover, productivity, and firm performance. Findings indicated that organizations with human resource systems which recognize and reward employee merit with financial rewards perform better overall and even have a lower turnover rate (Huselid, 1995).

A 2011 study analyzed the effects of a three-year effort to increase student achievement by providing teachers with financial incentives. The study awarded \$75 million over three years to schools that met 100% of the Department of Education's targets. However, statistical analysis showed that the schools in the control group outperformed the group of financially-incentivized schools (Fryer, 2011).

Two meta-analytical studies examined research pertaining to incentives and performance. The first study analyzed 41 studies concerned with financial incentives and performance (Jenkins, Mitra, Gupta, & Shaw, 1998), with performance defined by three

measures: quality, quantity, and a combined variable of quality/quantity. Results suggest that financial incentives were not related to higher performance in product quality, although there was a corrected correlation of .34 with performance in product quantity. (Jenkins et al., 1998). The second meta-analysis, conducted several years later, examined results from 45 empirical studies on incentives as motivators of performance (Condly, Clark, & Stolovitch, 2003). This analysis compared team-directed incentives to individually-directed incentives and financial rewards to non-financial rewards, as well as the length of the particular incentive program. Findings showed that team rewards were more beneficial, and that long-term programs led to greater performance gains than shorter-term programs. In these studies, money was found to result in higher performance gains than non-monetary, tangible incentives such as gifts or travel. Interestingly, the researchers also found that rewards led to slightly greater performance gains when related to manual, rather than cognitive, work. The average overall effect of all the incentive programs in every work setting and for each work task was a 22% gain in performance, with monetary rewards and non-monetary rewards increasing performance by 27% and 13%, respectively (Condly et al., 2003).

A study conducted at the business college of a large university involved an incentive program for administrative assistants. In the program, coworkers and students were given the chance to nominate individuals for service excellence, and award winners were given both non-monetary and monetary rewards. Following each of the award ceremonies, two surveys were administered to participants. The first was given to faculty, and results showed an increase of faculty satisfaction with secretarial services; the second survey was circulated among administrative assistants and questioned their perceptions of the incentive program.

Statistically significant results indicated that participants felt the program was fair and believed award recipients deserved the reward. Also, the authors followed the program over a three-year period and ultimately concluded that the incentive program yielded a positive change in service delivery (Kopelman, Gardberg, & Brandwein, 2011).

Former CEO of General Electric (GE), Jack Welch, believed in rewarding excellent performance, a cornerstone of Welch's management strategy as he streamlined and revitalized the company in the 1980s (Rynes, Gerhart, & Minette, 2004). In a study by Rynes et al. (2004), the researchers noted that people tended to understate the importance of being rewarded for performance; since the study's findings were divergent from prior research, it is possible they were over-reported. Rynes et al. (2004) also found that highly motivated, well-educated individuals in incentivized situations showed increased performance by up to 40%, and results indicated that providing monetary incentives for performance worked best when the work was challenging. Researchers have also found that assigning consequences for poor performance, including aligning rewards with evaluations and result measures, improves employee productivity (Berman & West, 2003).

Other researchers have conducted studies with different conclusions, and as such incentive programs have become a controversial and popular topic, enough so that the *Journal of Public Administration Research and Theory* recently published a special issue looking at incentives in the public sector (2010). For example, a study conducted by Duncan and Watts (2009) found that intrinsic rewards resulted in better quality performance; moreover, while the findings showed that extrinsic rewards led to an increase in quantity, it was at the expense of quality. Notably, the authors caution about generalizing these results

beyond the population studied, particularly because of the menial tasks involved in the study (Duncan & Watts, 2009). One study concluded that incentive programs actually demotivate the average performer in an organization, with an overall decrease in job satisfaction and increased turnover among performers in the organization (Grant, 2011).

When comparing public and private sector employees, a few studies have found little difference in reported motivation and effort. For example, while public sector employees perceived a weaker link between extrinsic rewards and performance, they reported no differences on scales of organizational goal clarity and motivational variables (Rainey, 1983). Likewise, Simon (1995) argues that leaders in public and private organizations are nearly identical in their capacities to reward employees. He maintains that traditional rewards are an effective way to encourage adherence to policy, but they are not the only way to motivate organization employees. Instead, Simon (1995) claims that employees will begin to identify themselves as part of the organization, at which point they will feel more like an active participant in the organization's mission. Such employees are then motivated by recognition and the successes of the organization. Finally, researchers conducting a study among public sector employees in England concluded that a focus on monetary incentives would have a detrimental effect on matching publicly-minded individuals with fitting employment—a term often referred to as “crowding out”—and would result in the inevitable need for costly reward systems to improve performance (Georgellis, Iossa, & Tabvuma, 2011).

Despite a few with contradictory findings, most studies have consistently found that public-sector employees, particularly those at professional and managerial levels, place a

high value on rewards that one would expect: on public service; on work that benefits society; on involvement with important public policies; and on self-sacrifice, responsibility, and integrity. Research has demonstrated that public managers also place a lower value on money and high income as ultimate goals, thus suggesting the need for alternative incentives or motivations in public organizations (Crewson, 1995; Hartman & Weber, 1980; Jurkiewicz, Massey, & Brown, 1998; Khojasteh, 1993; Kilpatrick, Cummings, & Jennings, 1964; Lawler, 1971; Pawls, Ullrich, & Nelson, 1975; Rainey, 1983; Siegel, 1983; Sikula, 1973a, 1973b; Wittmer, 1991).

A review on incentives would not be complete without discussing public service motivation (PSM), a concept that appeared over twenty years ago in an essay by Perry and Wise (1990). PSM refers to the altruistic motivation efforts that public service providers have to offer “out of concern for the impact of that effort on a valued social service” (Francois, 2000). Perry, Hondeghem, and Wise (2010) recently wrote an article in which they propose that, because public organizations attract individuals with high PSM, incentives are less likely to be an effective motivator of individual performance. Perry et al.’s (2010) review of existing empirical evidence was inconclusive as to whether public employees value material rewards less than private sector employees. Still, the authors state that, since public employees are drawn to organizations that have social significance, intrinsic rewards tied to performance might be more important than extrinsic rewards, but salaries, fringe benefits, and opportunities for promotion were of equal importance for public and private sector employees (Perry et al., 2010).

Section Summary

Until recently, nearly all prior research supported the current study's hypothesis regarding the positive impact of incentives on organizational performance (Boyne & Chen, 2007; Cassidy & Ackah, 1997; Condly, Clark, & Stolovitch, 2003; Huselid, 1995; Jenkins et al., 1998; Ferrari et al., 1985; Rynes et al., 2004; Saunderson, 2004;). However, the majority of prior research focuses on rewards in the private sector, and, in recent years, a large number of public administration researchers have argued that such private sector studies cannot be applied to the public sector since government employees have strong public service motivation (PSM) and are therefore much less affected by extrinsic rewards. Some public administration authors have gone even further, arguing that extrinsic rewards actually hurt government performance, because they "crowd out" public service motivation (Georgellis et al., 2011). With the previous research and findings in mind, the current study can help shed light on this controversy, as it specifically examines the effects of incentives in the public sector.

Studies of the Efficacy of Process Improvement Tools

Process improvement tools can be used proactively to help a well-working organization continue to improve, or the tools can be used to diagnose and correct shortfalls when an organization fails to meet its established performance standard. While most often including root cause analysis, flowcharts, or fishbone, Pareto, or Ishikawa charts, process improvement almost always involves a team approach. In addition, process improvement often involves employee empowerment and a flexible work environment; for example, a roads agency employee repairing a specific schedule of potholes would have the freedom and

flexibility to fill additional potholes without needing supervisor approval, even if they were not on the established repair schedule.

Successful teamwork can lead to productivity improvements and increased organizational performance. Advocates of teamwork note that group participation leads to idea generation, which leads to idea implementation and, in turn, improved productivity (Hackman & Oldham, 1980). Supporters of teamwork also claim that, during organizational change efforts, group work generates ownership and buy-in or acceptance (Kotter, 1996). Finally, empowered teams are able to take responsibility for handling customer complaints directly and can often diagnose their own quality problems.

Process improvement is an integral part of TQM. Therefore, several of the TQM studies reviewed above also researched the impact of process improvement tools on performance. For example, Powell's (1995) study of the impact of TQM on overall performance in U.S.-based firms also examined several specific TQM features and their impact on performance. Of the TQM features selected for study, only three resulted in significant, partial correlations with performance: executive commitment, open organization, and employee empowerment. While RBM considers employee empowerment an essential part of process improvement, Powell (1995) concluded that benchmarking and other process improvement tools were not important for organizational performance.

A large study of manufacturing firms in Australian and New Zealand investigated the effect of the components of TQM on organizational performance (Samson & Terziovski, 1999). In the study, the researchers circulated a survey among 5,000 organizations, with 246 questions derived using criteria from the Malcolm Baldrige Award and several other quality

awards, such as the Deming Prize and the Made in Britain Award. The study covered components common to all quality awards, including leadership, management of people, customer focus, information and analysis, process improvement, strategic planning, and quality planning. Results demonstrated that process improvement did not have a significant effect on performance, and the authors concluded that, while some of the components of TQM were not integral to performance, overall TQM was beneficial to organizations (Samson & Terziovski, 1999).

Not all of the studies dealing with process improvement and performance arrived at the same negative conclusion. A more recent study examined the causal relationships between the Malcolm Baldrige National Quality Award (MBNQA) criteria and performance (Wilson & Collier, 2000). Hypothesizing that the MBNQA categories were related, the authors therefore predicted that an increase in the leadership score would lead to an increase in the other MBNQA categories as well as the result categories. Using path analysis, results demonstrated that leadership has only an indirect effect on results, though it has a significant effect on the MBNQA categories of process management, HRM, strategic planning, and information analysis; in turn, both process management and information analysis had a significant effect on performance. Although the effect of process management on both financial performance and customer service was significant, the authors noted that the path coefficient between process management and customer service was twice as large as the path coefficient between process management and financial performance, thereby indicating that process management was twice as important when predicting customer service as when predicting financial performance (Wilson & Collier, 2000).

Four studies have examined the impact of work teams on performance, two of which were conducted in the U.S. automotive industry. The first study surveyed plants of a major U.S. automobile manufacturer in 1979 and 1986, during a time when foreign competition was revolutionizing the industry (Katz, Kochan, & Keefe, 1987). As U.S. car companies attempted to address the loss of market share to foreign competitors, they instituted new shop floor practices in an effort to reduce costs, including the introduction of teams. The researchers found that work teams had a negative impact on plant productivity. Explaining their results, Katz and colleagues hypothesized that the negative impact of work teams on plant productivity was the result of problems associated with introducing the system (Katz et al., 1987).

The second study examining the impact of work teams on performance conducted a survey of 62 automotive assembly plants regarding the idea of interrelated Human Resource tools (called HR bundles), which included team-based work systems, contingent compensation, extensive training, and low inventory practices (Macduffie, 1995). In addition, Macduffie (1995) studied the integration of HR bundles with a flexible production system. When testing both hypotheses, team-based work systems figured prominently in the bundle of innovative human resource management practices that positively impacted manufacturing performance and quality. Specifically, flexible production plants with team-based work systems and high commitment to HR practices outperformed mass production plants (Macduffie, 1995).

Researchers in 1996 conducted a longitudinal study of the effect of teamwork on manufacturing performance in four assembly lines in an electrical plant (Banker, Field,

Schroeder, & Sinha, 1996). The plant implemented teams in its assembly lines about halfway through the study, providing a valuable means of comparison. Results indicated that both quality and productivity improved over time after the formation of the teams (Banker et al., 1996). Finally, the fourth study looked at the effects of certain management practices, including teamwork, on productivity, using data from a sample of over 30 similar production lines owned by different steel companies (Ichniowski, Shaw, & Prennushi, 1997). The results demonstrate that companies using a set of innovative work practices—specifically, team work—had higher levels of productivity than those using the more traditional management approach.

Besides effecting productivity and quality, work teams appear to also have an effect on customer service. Kirkman and Rosen (1999) studied the role of team empowerment using 111 work teams in four organizations. The results indicated that empowered teams were more productive and more proactive than less empowered teams, with higher levels of customer service, job satisfaction, and organizational and team commitment as well. In a longitudinal study on customer service, Workman and Bommer (2004) examined computer call centers that had been redesigned using a team based approach. Computer technology call centers provide technical assistance to customers via telephone to solve computer hardware and software problems. Simultaneous demands for technical and customer service skills often place strain on call center employees, frequently producing poor attitudes among workers. After randomly assigning 149 employees to centers that were either team-based centers or traditionally-structured call centers and analyzing results, the findings of the field experiment

demonstrated that work teams earned improved customer satisfaction scores (Workman & Bommer, 2004).

A study based in the United Kingdom included an empirical assessment of process improvement in the Public Management Reform of the United Kingdom Labour government (Walker & Boyne, 2006). In the study, process improvement was broken down into several key components of process improvement: devolution, delegation, flexibility, and employee empowerment (termed “user choice” in the research). Results indicated that process improvement, particularly organizational flexibility and user choice, were associated with higher organizational performance.

Frazier (2008) conducted a study using employee perceptions from eight state revenue agencies. He found that process improvement tools tended to have the strongest correlation with perceived effectiveness, followed by strategic planning and performance measurement. Based on his findings, the author speculated that front-line employees, who are impacted by processes on a daily basis, can easily perceive the connection between smoothly running processes and results (Frazier, 2008).

Section Summary

Nearly all prior research supports the current study’s hypothesis regarding the positive impact of process improvement on organizational performance (Banker et al., 1996; Ichniowski et al., 1997; Kirkman & Rosen, 1999; Macduffie, 1995; Walker & Boyne, 2006; Wilson & Collier, 2000; Workman & Bommer, 2004). All but one of the studies above concentrated on the private sector so, to fill the gap in research knowledge, the current study examined work teams and process improvement in the public sector.

Chapter Conclusions

More management studies have been conducted on the private sector than on public organizations, but both public sector and private sector research studies lend support to the hypotheses studied in this dissertation. First, the literature suggests that there is a positive relationship between current management tools and organizational performance. The reviewed literature also indicates that organizations employing only some of the major components of RBM may sometimes see a performance improvement, but that free-standing tools such as strategic planning or process improvement often produce small or inconsistent results if they are not reinforced by other tools.

CHAPTER 3 : METHODOLOGY

Chapter 3 consists of four sections: (1) a brief discussion of the research question and the research models; (2) a discussion of the specific hypotheses tested; (3) an explanation of the operationalization of the variables; and (4) a discussion of the research design, including the survey structure, the data gathering, and the statistical methods used in analysis.

The Research Question and Theoretical Models

The current study attempted to answer one straightforward research question: Do results-based management (RBM) tools, either separately or combination, improve the performance of a roads agency or a youth services agency? The four examined components, or tools, of results-based management are: strategic planning, performance measurement with targets, process improvement approaches, and reward systems. Possible improvement in performance was measured in two ways, through managers' reported perceptions of performance improvement and through objective measures of the agency's outputs and outcomes.

The conceptual models that depict the hypothesized relationships between the analyzed variables are included in Figure 3.1, illustrating the expected relationships between the composite scores for how completely the RBM tools are installed and their perceived effectiveness in the organization.

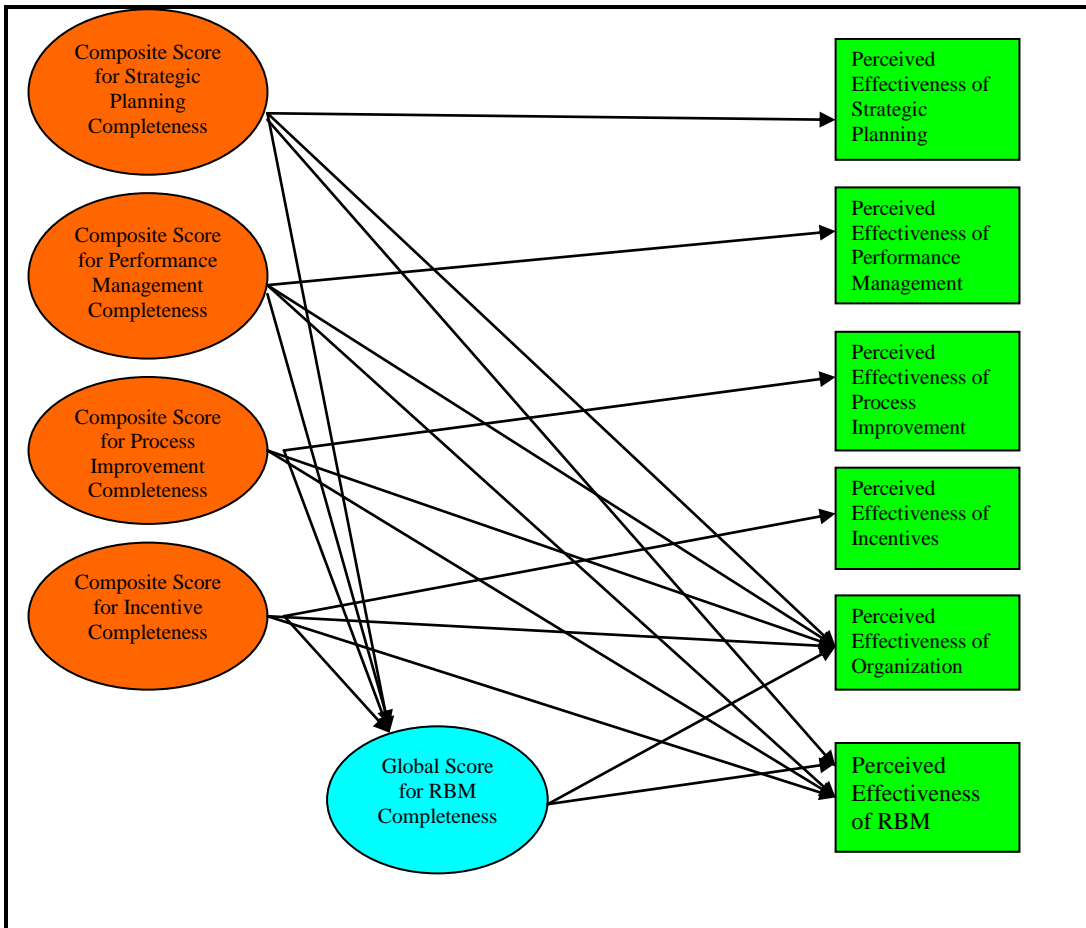


Figure 3.1: Conceptual Model (I) for Perceived Effectiveness of RBM Tools

The independent variables in the model are the individual RBM tools, which were assessed by how completely integrated the tool was in the organization. Survey items were coded and then combined for composite scores to form the independent variables used in analysis. For example, the composite score for strategic planning completeness was calculated using the following questions: (1) When did your agency first establish a strategic plan?; (2) What would one of the agency’s long range goals be? (maximum score of 2); and (3) When did your agency conduct the first systematic analysis of itself and its environment

as part of its strategic planning process? A “yes” response to the first and last question was given a score of 1 point and combined with the points received for long-range goals, to arrive at the composite for the independent variable “strategic planning completeness,” ranging from 0 to 4.

It may at first appear that both “What” and “When” items were combined to determine the strategic planning completeness composite variable; in fact, however, throughout the survey, “When” questions were coded as two separate questions in order to keep the survey as short as possible. In other words, rather than using two separate questions in asking “Do you have a strategic plan?” and “When did your agency start strategic planning efforts?,” the survey item read, “When did your agency first start strategic planning efforts?” If respondents answered “not applicable,” the item was coded as if they did not have a strategic plan, while any other response was coded as if they had a strategic plan in place, thereby reflecting the “what” information for the completeness composite. Then, by recoding the same question using the framework of 1-2 years, 3-5 years, 6-9 years, or 10 or more years ago, the researcher was able to capture the “When” information for the duration composite.

Similarly, the dependent variable in the model, perceived effectiveness, had three measures, each of which was run as a different dependent variable. Specifically, strategic planning completeness was compared to three reported effectiveness measures: (1) how well strategic planning has worked, (2) how well overall RBM has worked, and (3) how strong a performer the agency is believed to be compared to similar agencies.

Figure 3.2 shifts the independent variable from completeness to duration measures of RBM tools, reflecting the relationship between the duration score of the completeness of each individual RBM tool and perceived performance measures of the organization.

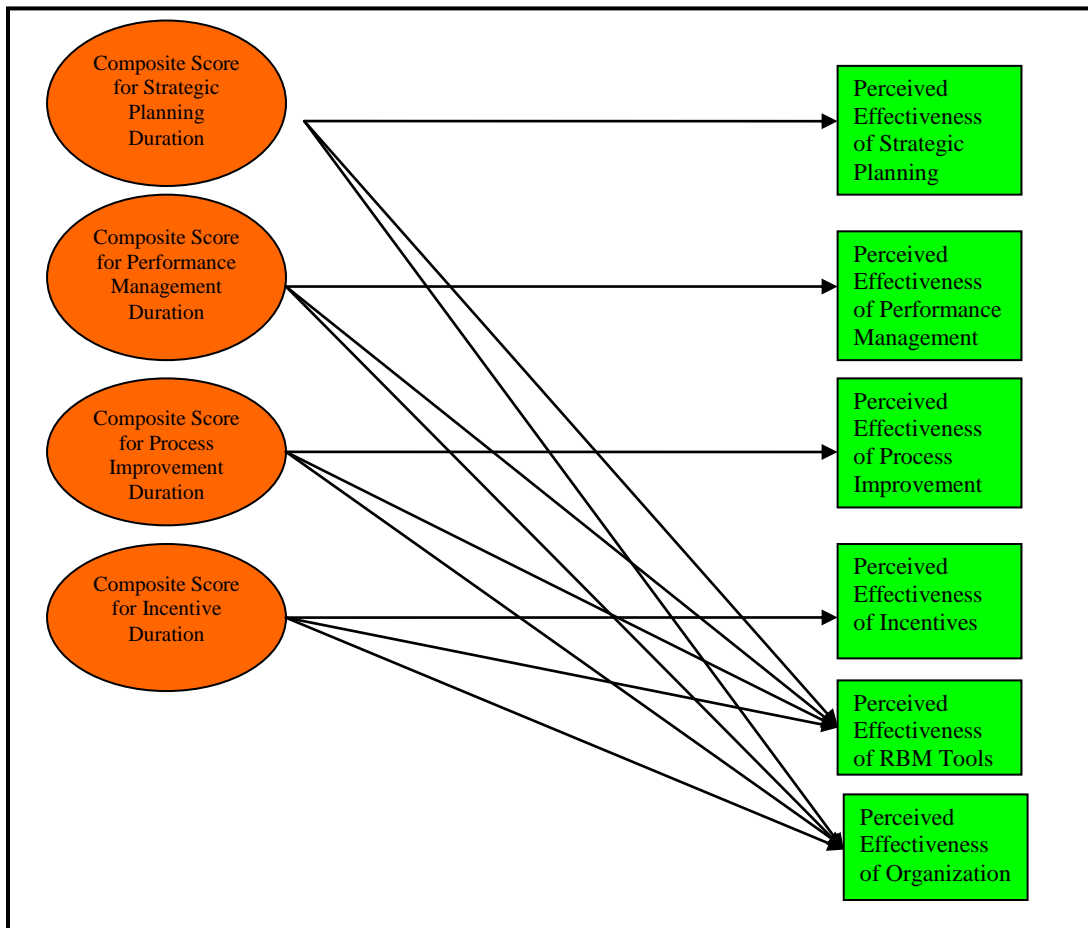


Figure 3.2: Conceptual Model (II) for Perceived Effectiveness of RBM Tools

The focus of the dependent variable then shifts from perceived measures of effectiveness to objective measures of performance in an agency's outputs and outcomes. Again, the independent variables are the completeness measures of the RBM tools. Figure

3.3 reflects the relationship between the composite score of the completeness of each individual RBM tool and objective performance measures like outputs and outcomes.

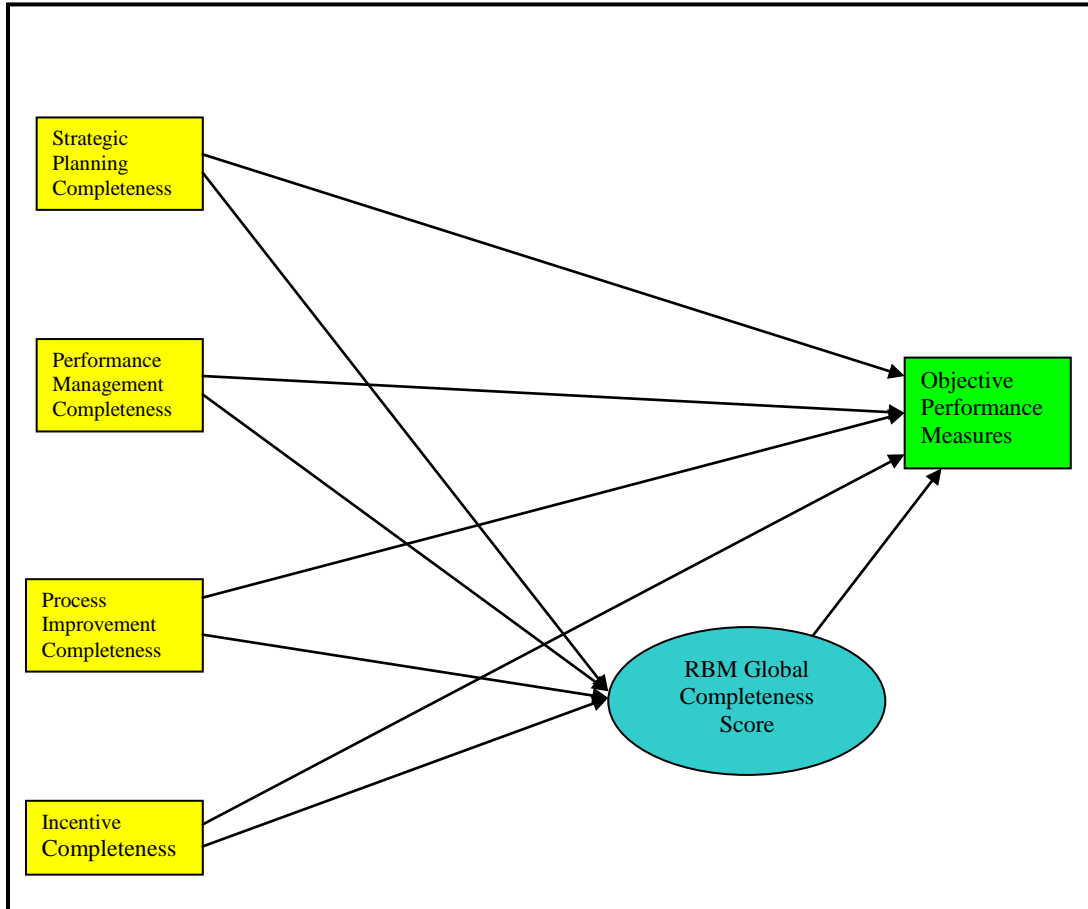


Figure 3.3: Conceptual Model for Completeness and Actual Performance of RBM

For this part of the analysis, the independent variables—the completeness of the RBM tools—were a composite of items in the survey. Objective performance was comprised of multiple measures, each run as a separate dependent variable in an analysis comparing agency performance against other agencies. For example, with roads agencies, agency performance was measured as the jurisdiction’s percentage of roads rated as being in

satisfactory condition, relative to other agencies. Also, the agencies reported approximately how long they had been using various RBM tools, helping to classify them as recent or early adopters of strategic planning, performance measurement, rewards, and process improvement tools. RBM duration was then analyzed with respect to objective performance in the multiple measures discussed in the model above, each run as an individual dependent variable.

Figure 3.4 demonstrates the model used to measure the duration of the RBM tools and objective performance.

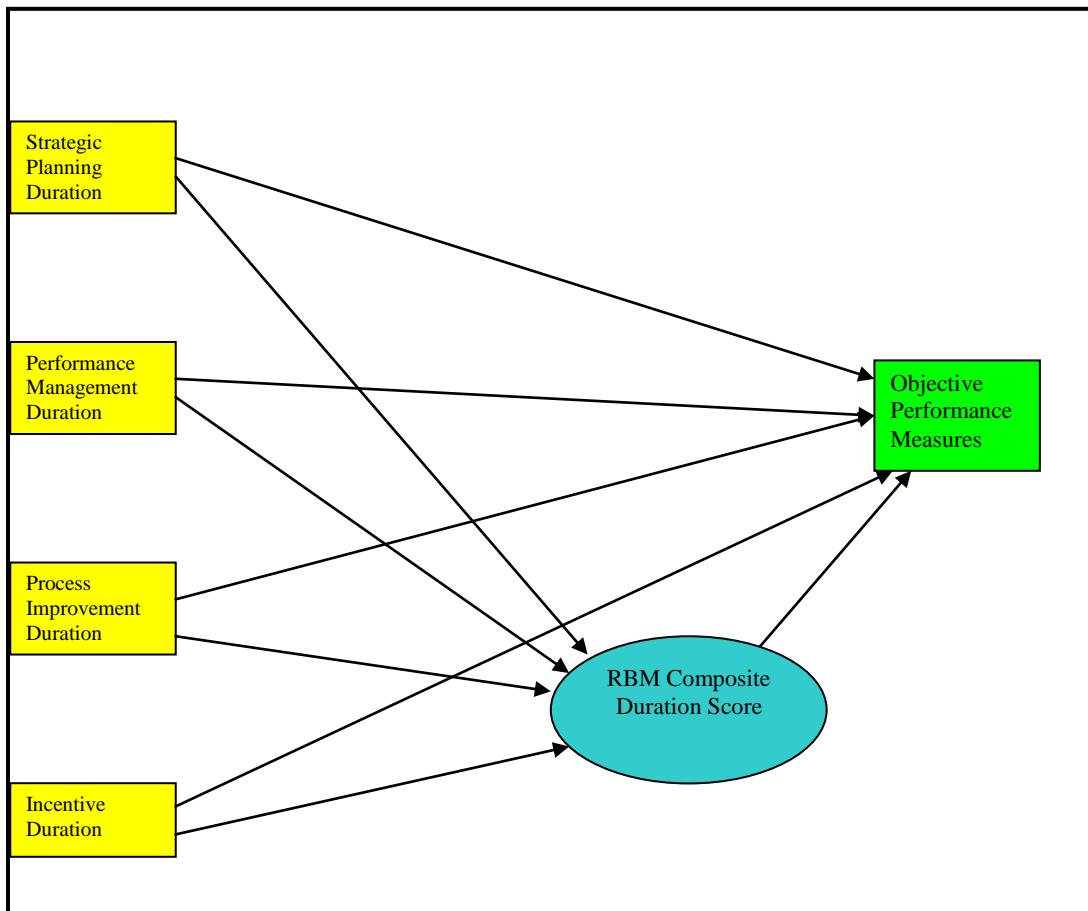


Figure 3.4: Conceptual Model for Duration and Objective Performance of RBM

For a very limited number of cases, objective performance was able to be assessed using multi-year data. Again, using road quality as an example, roads agencies performance was measured by road quality improvement over a number of reported years; to reach the performance value, the change in the agency's road quality measure was divided by the initial road quality. Because of the small number of consistently reported performance measures, the objective dependent variable will be given less emphasis than the subjective, perceptual dependent variables.

Hypotheses

The current research study worked to investigate whether RBM improves organizational performance using several different perspectives. The first approach to answering the research question was to examine if certain components of RBM have a larger perceived impact on organizational effectiveness than others. This query was broken down into hypotheses that examined the perceived effectiveness of strategic planning, performance measurement and target setting, reward systems, process improvement tools, and RBM for highway and road divisions and youth programs.

Hypotheses 1-10: Perceived Effectiveness of RBM Tools

Hypotheses 1(a,b), 2(a,b), 3(a,b), and 4(a,b), dealt with the completeness and duration of each of the individual RBM tools—strategic planning, performance measurement, incentives (rewards), and process improvement tools—and the possible impact on the perceived effectiveness of that specific RBM tool. As reference, Hypotheses 1a and 1b are

listed below, and a full listing of all hypotheses and sub-hypotheses can be found in Appendix C:

- **Hypothesis 1: Strategic planning has a positive impact on the organization's perceived effectiveness.**

H1a: Strategic planning completeness has a positive impact on the perceived effectiveness of strategic planning.

H1b: Strategic planning duration has a positive impact on the perceived effectiveness of strategic planning.

A frequency table was used to examine the perceived effectiveness of the individual RBM tools, including completeness and duration as factors. Then, when supported by the data, further analysis was performed using binomial logistic regression. It was expected that the perceived effectiveness of the RBM tool would increase the more completely the tool was installed and integrated in the organization. It was also expected that, after beginning to use RBM tools, managers would perceive it to be effective, but the perceived effectiveness was expected to increase the longer the tool was used in the organization.

The next four hypotheses looked at how completeness and duration for the individual RBM tools influenced the general perceived effectiveness of measures. Because of the limited amount of data collected on youth programs, these hypotheses were only formally tested for roads agencies. Used here in Hypotheses 5 and 6, "management tools" is a broad term referring to a collective management system. Ultimately, multiple small or zero cell counts required collapsing the variable into two categories: "agree" or "not agree." With a dichotomous dependent variable, binomial logistic regression was used to test Hypotheses 5,

6, 7, and 8 for roads agencies, while frequency tables were employed when addressing Hypotheses 5-8 for youth programs. It was expected that the overall effectiveness of the management tools would increase the more completely the tool was installed and integrated in the organization, and the longer the tool had been used in the organization. It was also expected that the likelihood of the organization being viewed as a top performer would increase the longer the tool had been used in the organization. Hypotheses 5 through 8 read:

- **Hypothesis 5: Individual RBM tool completeness increases the overall perceived effectiveness of management tools.**
- **Hypothesis 6: Individual RBM tool duration increases the overall perceived effectiveness of management tools.**
- **Hypothesis 7: RBM tool completeness increases the organization's perceived effectiveness relative to other organizations.**
- **Hypothesis 8: RBM tool duration increases the organization's perceived effectiveness relative to other organizations.**

Using a Global RBM Measure

Before leaving perceived performance measures altogether, the current study utilized a global measure of RBM tool completeness to examine Hypotheses 9 and 10, which read:

- **Hypothesis 9: The more RBM tools an organization uses, the greater the perceived overall effectiveness of RBM.**
- **Hypothesis 10: The more RBM tools an organization uses, the greater the organization's perceived effectiveness relative to other organizations.**

The phrase “RBM tools” as used in Hypotheses 9 and 10 refers to a global measure of the RBM tools. RBM Global scores ranged from 0 to 5. For example, an organization using strategic planning and performance measurement, but not using targets, rewards, or process improvement tools would have received an RBM Global score equal to 2. Frequency tables and contingency tables (for roads agencies) were used to examine the perceived effectiveness measures and the Global RBM measure. It was expected that there would be some type of synergy among RBM tools and that, the more tools an organization used, the more effective they would be perceived to be and the more likely the organization would be viewed as a top performer.

Hypotheses 11-24: Objective Effectiveness of RBM Tools

RBM Tools and Performance Measures

The second approach to the research question was to examine the effect of RBM tools on some objective variables of organizational performance. Research on goal theory has demonstrated that individuals and organizations perform better with clearly defined goals (Locke & Latham, 1990). RBM requires organizations to set broad agency goals with strategic planning, and then also establish short-term performance management goals. In addition, it requires organizations to provide rewards and incentives for excellent performance and facilitate process improvement to address shortcomings. Goal theory would predict that organizations which had adopted an array of RBM tools would perform better on measurable outcomes, i.e., objective effectiveness measures.

Hypotheses 11, 12, 13, and 14 addressed several aspects of the individual RBM tools and the possible impact on objective performance. For example, Hypothesis 11 compared

objective performance measures from organizations with individual RBM tools to those without such tools, and Hypothesis 12 compared performance measures from agencies that were early adopters of individual RBM tools to recent adopters of individual RBM tools. Hypotheses 13 and 14 examined youth organization measures. It was expected that each of the RBM tools would have a positive impact on the organizational performance measures of roads agencies and youth programs, and that early adopters of the RBM tools would perform better on objective measures. As a reference, several hypotheses and the sup-hypothesis pertaining to strategic planning are listed below, and a full listing of all hypotheses and sub-hypotheses can be found in Appendix C.

- **Hypothesis 11: Roads agencies with RBM tools perform better in objective performance measures.**

H11a: Roads agencies with strategic planning have a higher percentage of roads that are graded satisfactory or better.

H11b: Roads agencies with strategic planning have a lower average pothole repair time.

H11c: Roads agencies with strategic planning have a lower percentage of dissatisfied citizens.

A visual examination of data and t-tests were used to look at Hypotheses 11 and 12.

For Hypothesis 12, respondents were classified into groups based upon RBM tool adoption. As a reference, the sub-hypotheses pertaining to strategic planning of Hypothesis 12 are listed below, and a full listing of all hypotheses and sub-hypotheses can be found in Appendix C.

- **Hypothesis 12: Roads agencies that were early adopters of RBM tools perform better in objective performance measures.**

H12a: Roads agencies that were early adopters of strategic planning have a higher percentage of roads that are graded satisfactory or better.

H12b: Roads agencies that were early adopters of strategic planning have a lower average pothole repair time.

H12c: Roads agencies that were early adopters of strategic planning have a lower percentage of dissatisfied citizens.

Hypotheses 13 and 14 included performance measures for youth programs, and the small sample did not allow for any statistical analysis.

- **Hypothesis 13: Youth agencies with RBM tools perform better in objective performance measures.**

H13a: Youth programs with strategic planning have a lower teen birth rate

H13b: Youth programs with strategic planning have a lower rate of low birth weight babies born to teen moms.

H13c: Youth programs with strategic planning have a lower rate of infant mortality among teen moms.

- **Hypothesis 14: Youth agencies that were early adopters of RBM tools perform better in objective performance measures.**

H14a: Youth programs that were early adopters of strategic planning have a lower teen birth rate.

H14b: Youth programs that were early adopters of strategic planning have a lower rate of low birth weight babies born to teen moms.

H14c: Youth programs that were early adopters of strategic planning have a lower rate of infant mortality among teen moms.

Composite Measures of RBM Tool Completeness and Duration

There are additional ways in which we might attempt to find a relationship between the use of management tools and objective measures of performance. Perhaps it is not only the presence of the tool, but also whether it is complete or has been used for a long time that drives the objective performance measures. Thus, the next analysis utilized the composite variables used to measure RBM tool completeness and duration.

Multiple survey items were combined into a scale to determine the completeness of the management tools, or whether the organization is using all the aspects of the management tool that would typically be prescribed in textbooks or training sessions. For example, when looking at strategic planning completeness, three survey items were coded to estimate how thoroughly strategic planning was incorporated in the organization. If the agency had a strategic plan, they received 1 point; if they provided a specific, measureable, numeric goal, they received 2 points; and if they conducted a systematic scan of their environment, they received 1 point. This produces a total possible score of 4 for strategic planning completeness. Similar survey items assessed the completeness of performance measurement, rewards, and process improvement tools.

The current study specifically examined how completely the RBM tools are installed to explore the possibility that installing parts of the RBM tool is less beneficial than installing

the tool completely. Comparably, the duration of the management tools was measured in a similar way and was used in the study to try to capture an improvement in performance over time. Survey items regarding how long certain key aspects of each management tools had been happening in the organization were coded and combined in order to estimate how long the organization had been using a particular RBM tool. Using strategic planning as an example again, an organization that had been using strategic planning for 6-9 years (a score of 3) and a systematic scan of the environment for 3-5 years (score of 2) would receive a strategic planning duration score of 5. Similar survey items assessed the duration of performance measurement, rewards, and process improvement tools. The remaining composite variables and the use of scales are covered in detail in the next section of the chapter.

For Hypotheses 15 and 16, the main hypotheses had 12 sub-hypotheses to address, respectively, each of the proposed relationships between RBM tools and the objective performance measures. The remaining analyses were conducted using data gathered only from roads agencies. Multiple regression analysis was used to examine Hypotheses 15 and 16. It was expected that organizations would perform better on objective measures as RBM tool completeness and duration increased.

- **Hypothesis 15: Organizations with completely installed RBM tools (completeness) perform better on objective performance measures.**
- **Hypothesis 16: Organizations using RBM tools longer (duration) perform better on objective performance measures.**

RBM Tools and High Performers

Another approach to answering the research question was to compare an organization's performance measure to a standard for the particular benchmark, and rank them as high or low performers. The standard used for ranking was provided by ICMA as part of their ongoing benchmarking project. Since the dependent variable was dichotomous—either a high or a low performer compared to standards—binomial logistic regression was used to examine the relationship between the RBM tools and performance with respect to the standards. It was expected that organizations with RBM tools would be high performers. Twelve sub-hypotheses examined each RBM tool and each performance measure. An example of the hypotheses for one tool, strategic planning, is provided below, and a full listing of all hypotheses and sub-hypotheses can be found in Appendix C.

- **Hypothesis 17: Organizations with completely installed RBM tools (completeness) are high performers when compared to standards.**

H17a: Roads agencies with a more complete strategic planning effort (completeness) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H17b: Roads agencies with a more complete strategic planning effort (completeness) have a lower percentage of dissatisfied citizens responding to surveys conducted within the jurisdiction when compared to standards.

H17c: Roads agencies with a more complete strategic planning effort (completeness) have a smaller average pothole repair time when compared to standards.

Additionally, Hypothesis 18 had 12 similar sub-hypotheses for RBM tool duration.

- **Hypothesis 18: Roads agencies that have been using RBM tools longer (duration) are high performers when compared to standards.**

Using a Global RBM Measure

There is an additional way we can look for a relationship between tool usage and objective performance measures, by investigating if perhaps all the tools being used together produce a significant performance effect, a type of synergy.

- **Hypothesis 19: RBM has a positive impact on the organization's objective performance measures.**

Here, "RBM tools" refers to a global completeness measure, exactly like the one used in Hypotheses 9 and 10. For example, an organization using strategic planning and performance measurement, but not using targets, rewards, or process improvement tools would have received an "RBM Global" score equal to 2. RBM Global scores ranged from 0 to 5, and the average RBM Global score was 2.99, with a median score of 3. A series of t-tests will be used to compare measures of road quality in organizations using 1 or 2 RBM tools to organizations using 3 or more RBM tools. It was expected that, the more RBM tools an organization used, the more likely the organization was to be a top performer.

RBM Tools and Improved Performance

Ideally, the current study would have examined the performance of the respondents over the last decade, including the period when the RBM tools were implemented. However, there was not enough longitudinal data to make such an analysis feasible. For the study, there were 38 roads agencies that responded to the survey and had multi-year performance data.

The dependent variable was the change in road quality; early measures of agency

performance were subtracted from the most recent measure of agency performance, and the difference was then standardized by converting it into a percentage improvement. A series of t-tests were used to look at Hypothesis 20. It was expected that organizations with RBM tools would perform better over time.

- **Hypothesis 20: Organizations with RBM tools see a greater improvement in road quality over time than organizations without RBM tools.**

The 38 roads agencies were then identified as early adopters of RBM tools to address Hypothesis 21. It was expected that early adopters of RBM tools would perform better over time.

- **Hypothesis 21: Organizations that were early adopters of RBM tools have a greater improvement in road quality over time than recent adopters of RBM tools.**

Improvement over time was also examined with respect to RBM tool completeness and duration. It was expected that organizations with more completely installed RBM tools would perform better over time, and it was expected that organizations with more RBM tool duration would perform better over time. Hypotheses 22 and 23 are listed below.

- **Hypothesis 22: Organizations with more completely installed RBM tools (completeness) see a greater improvement in road quality over time than organizations without RBM tools.**
- **Hypothesis 23: Organizations that had been using RBM tools longer (duration) see a greater improvement in road quality over time than organizations without RBM tools.**

Longitudinal Data Analysis

The final analysis effort for highway and roads agencies was an attempt at a longitudinal analysis. The ideal statistical tool in this situation would be an interrupted time series model (ITS), and a number of different techniques exist to evaluate ITS effects. The simplest ITS designs involve a number of data points before and after an event of interest, in this case, the agency's performance measures before and after the implementation of RBM tools. The objective of ITS analysis would be to determine if the RBM tools had a significant effect, and there are two major types of effect: the dependent mean shifts in performance when RBM was installed (the intercept changes), and/or the rate of change in performance over time shifts at the time RBM was installed (the slope changes) (Garson, 2010). Typically, a researcher would want more than 50 observations, and the current study only had 15 observations that had reported measures spanning at least 6 years. Graphs of the available data were visually studied to identify trends to address Hypothesis 24. It was expected that organizations would perform better after RBM tools were installed.

- **Hypothesis 24: Organizations perform better on objective performance measures after installing RBM tools.**

Operationalizing the Variables

Performance measures, which attempt to indicate the effectiveness of a program, were the dependent variables of the current study, and the performance measures were divided into two groups. One group, "internal perceptions of performance," marked the agency managers' ratings of the tools' perceived effectiveness. The second group of performance measures, "externally generated performance measures," included all measures

of outcomes, both objective outcomes like pothole repair time and perceptual outcomes such as citizen satisfaction ratings. In each instance, for internal perceptions of performance and for externally generated measures of performance, the dependent variables were analyzed with respect to the individual RBM tools, as well as with respect to an overall indicator of an RBM system. The performance measures were run as separate dependent variables in the analysis.

Dependent Variables: Internal Perceptions of Performance

The internally-generated dependent variables, measuring the perceived effectiveness of each RBM tool, were determined by asking agency managers about the items listed below. Answers ranged from “Strongly Agree” (= 2) to “Strongly Disagree” (= -2), and the answers were coded in the study so that higher scores represent higher levels of agreement.

Specifically, *strategic planning effectiveness* was measured by the item:

1. Strategic planning has substantially improved my organization’s performance.

Performance management effectiveness was measured by the item:

1. Performance measurement, such as measures of road quality, has substantially improved my organization’s performance.

Incentive program effectiveness was measured by the item:

1. Rewards have substantially improved my organization’s performance.

Process improvement effectiveness was measured by the item:

1. Process improvement tools (such as the ones listed above) have substantially improved my organization’s performance.

RBM effectiveness was measured by the item:

1. Management tools have substantially improved my organization's performance.

Organizational effectiveness was measured by the item:

1. Overall, when compared to similar organizations, I view my agency as a top performer.

Dependent Variables: Externally Generated Performance Measures

Road agency performance was measured by three items:

1. percentage of paved lane miles assessed to be in satisfactory or better condition
2. the average response time to fill a pothole
3. percentage of citizens reporting roads in unsatisfactory condition

Youth program performance was measured by three items:

1. Babies born to teen mothers as a percentage of live births in the jurisdiction.
2. Babies born under 5 pounds as a percentage of babies born to teen mothers.
3. Mortality among babies under 12 months of age as a percentage of babies born to teen mothers.

Standardized improved performance over time was calculated by taking the difference in road quality and dividing by the initial road quality. For example, in 1998, City X reported that 71% (DVearly) of their roads were assessed in satisfactory or better condition and, in 2006 (Ylate), City X reported 74% (DVlate) of their roads as being assessed in satisfactory or better condition. The value for (DVearly) was then subtracted from the value for (DVlate) and divided by the value for (DVearly), thus giving a standardized percentage improvement according to the following formula:

$(DV_{\text{late}}) - (DV_{\text{early}}) = 74\% - 71\% = 4.23\%$ standardized improvement

(DV_{early}) 71%

Similar equations were used to test the significance of the individual RBM tools, in addition to a regression equation to compare the relative importance of all of the RBM tools. T-tests were used to compare the means between RBM implementers and non-implementers. Notably, though, the sample size was smaller than recommended, and a larger sample size would have provided more reliable information (Garson, 2010).

Independent Variables

This study examined a total of 18 independent variables. Eight of the independent variables were composite measures for the duration and completeness of each of the four major RBM tools: strategic planning, performance management, process improvement tools, and incentives. Four of the independent variables were the use of the individual RBM tools. An additional five independent variables were whether the organization was an early or recent adopter of strategic planning, performance measurement, targets, process improvement tools, and rewards. Finally, there was a global measure of the overall RBM system.

The Overall Results-Based Management System

A simple test of the overall RBM system was the independent variable “RBM composite score” (RBMGLB), which ranged from 0 to 5 and was calculated using responses to the following five questions:

1. When did your agency first establish a strategic plan?
2. When did your agency first start tracking quantitative measures of road quality?
3. When did your agency first measure progress toward the target or goals for road quality?
4. When did your agency first use **non-monetary** rewards to recognize outstanding performance? – OR— When did your agency first use **monetary** rewards to recognize outstanding performance?
5. When did your agency first start using a quality team?

Any response other than N/A was given a score = 1, for a total possible score of 4. A yes response on either of the questions about incentives (rewards) was considered a score = 1.

For example, if an agency had a formal strategic planning process, set goals for road quality, and tracked performance, but did not use incentives and was unfamiliar with the use of quality teams, the agency would have a score of 3 for the overall measure of their RBM system.

Strategic Planning

Strategic planning duration was assessed by the following two items:

1. When did your agency first establish a strategic plan?
2. When did your agency conduct the first systematic analysis of itself and its environment as part of its strategic planning process?

Strategic planning duration items were rated such that 0=N/A, 1=1-2 years ago, 1=3-5 years ago, 2=6-9 years ago and 2=10 or more years ago. Items were coded so that higher scores represent a strategic plan that had been in place longer, and respondents were then divided

into two categories: agencies that have been using strategic planning for 6 or more years ago (score of 3 or higher), and agencies have been using strategic planning for 1-5 years ago.

These survey items, and others like them, served a double purpose in this study. Here, they helped determine how long the agency had been using strategic planning, or the duration of each tool. Later on, when considering a tool's completeness, the questions were used again. If the respondents gave any date for environmental analysis; it was treated as a "yes." If they indicated "not applicable," then their answer was treated as a "no." The ordinal item alpha for the measure of strategic planning duration was 0.712.

Strategic planning completeness was assessed by the following three items:

1. When did your agency engage in a formal strategic planning process?
2. What would one of the agency's long range goals be?
3. When did your agency conduct the first systematic analysis of itself and its environment as part of its strategic planning process?

For all three questions, a "yes" response was equal to 1 point and the composite score for the independent variable "strategic planning completeness" was the sum of these responses and ranged from 0 to 3, where a higher score represented a more complete strategic plan in the organization. The second item, an open-ended question, was coded on a yes/no scale and was used to test the validity of other responses. Some survey respondents may not have understood the question and answered falsely, while other respondents may have answered falsely because they thought they should be using strategic planning but had not yet implemented it in their agency. The open-ended question above and the few included below were also used to provide specific examples in the discussion of results. The ordinal

coefficient alpha was computed, which assumes ordinal data and tended to give a higher alpha (Garson, 2013). Strategic planning completeness had an ordinal coefficients alpha of 0.696, which is close to the recommended cutoff. A detailed discussion of this is included in Chapter 4.

Performance Management

Performance management duration was assessed by five items:

1. When did your agency first start tracking quantitative measures of road quality?
2. When did performance on road quality start affecting decisions in the organization?
3. When did your agency first measure progress toward the target or goals for road quality?
4. When did your agency begin conducting citizen satisfaction surveys?
5. When did your agency begin collecting information regarding citizen complaints?

Performance measurement duration items were rated such that 0=N/A, 1=1-2 years ago, 1=3-5 years ago, 2=6-9 years ago, and 2=10 or more years ago. Items were coded so that higher scores reflected an earlier adoption of performance measurement and were combined to form a composite variable that represented performance measurement duration. Also, items were coded so that higher scores represent a longer use of performance measurement, and respondents were then divided into two categories: agencies that had been using performance measurement for 6 or more years ago (a score of 2 on the first item and at least a total score of 5), and agencies that had been using performance measurement for 1-5 years ago. The above survey items were also used when considering a tool's completeness. The ordinal coefficient alpha for the measure of performance measurement duration was 0.727.

Performance management completeness was assessed using the following items:

1. When did your agency tracking quantitative measures of road quality?
2. When did your agency set numerical targets or goals for road quality?
3. When did your agency begin conducting citizen satisfaction surveys?
4. When did your agency begin collecting information regarding citizen complaints?

If the respondents gave any date for environmental analysis; it was treated as a “yes.” If they indicated “not applicable,” their answer was treated as a no. The next items addressed how performance measures were used within the organization.

1. If your agency fails to meet targets or goals for road quality, is it likely to affect decisions about budget allocations?
2. If your agency fails to meet targets or goals for road quality, is it likely to affect decisions about employee training?
3. If your agency fails to meet targets or goals for road quality, is it likely to have resulted in a personnel decision?
4. If your agency fails to meet targets or goals for road quality, is it likely to result in procedural changes within the agency?
5. If your agency fails to meet targets or goals for road quality, is it likely to affect outreach efforts in the community?
6. If your agency fails to meet targets or goals for road quality, is it likely to result in capital investment?
7. If your agency fails to meet targets or goals for road quality, is it likely to affect decisions about incentive programs in the agency?

These items were rated on a yes/no scale, where higher scores represent a more thorough completeness of performance management. The final items examined how performance targets are used within the organization.

1. How often do supervisors and subordinates discuss targets?
2. How often is progress measured toward the target or goals for road quality?
3. How often does performance on targets affect a decision?

These items were rated on a five point scale that ranged from weekly to never (4=Always, 3=Very often, 2=Sometimes, 1=Rarely, and 0=Never), where higher scores represent performance management completeness. Scales used in the survey were adopted from the University of Connecticut's Likert page on designing an attitude instrument (Siegle, 2010).

1. How often do managers assign targets?
2. How often are targets negotiated between employees and managers?
3. How often are targets based on prior performance?
4. How often are targets based on similar jurisdictions?

These items were rated on a five-point scale with possible responses ranging from "always" to "never." Item 1 above was coded along with item 2, in order to penalize targets being assigned unilaterally, but still give a point for having a target, which is arguably better than not having a target at all. The second and fourth items were coded so that higher scores represent targets mostly being negotiated jointly and based upon similar jurisdictions. The third item in the table was coded to reflect that targets based on prior performance are not the ideal basis for a target. Overall, items were coded so that higher scores represent a more

complete use of targets. Ordinal item alpha for the measure of performance measurement completeness was 0.705.

Rewarding Performance

Rewarding performance duration was assessed by two items:

1. When did your agency first use monetary rewards to recognize outstanding performance?
2. When did your agency first use non-monetary rewards to recognize outstanding performance?

Rewarding performance duration was rated on a five point scale, where 0=N/A, 1=1-2 years ago, 1=3-5 years ago, 2=6-9 years ago, and 2=10 or more years ago. Items were coded so that higher scores represent longer use of the practice of rewarding performance, and respondents were then divided into two categories: agencies that had been rewarding performance for 6 or more years (a score of 2 on either item), and agencies that had been rewarding performance for 1-5 years. Items were coded so that higher scores represent an earlier adoption of an incentive program, and then combined to form a composite variable that represented reward duration. Ordinal item alpha was 0.798.

Rewarding performance completeness was assessed using the above items, where any date given as a response was treated as a “yes” and “not applicable” was treated as a “no.” Higher scores represent greater completeness of rewarding performance. The measure of rewarding performance completeness had an ordinal item alpha of 0.851.

Process Improvement Tools

Process improvement tool duration was assessed by the following item:

1. How long have you been using a quality team?

Process improvement duration was rated on a five point scale, where 0=N/A, 1=1-2 years ago, 1=3-5 years ago, 2=6-9 years ago, and 2=10 or more years ago, and coded so a higher scores represent an earlier adoption of process improvement tools.

Process improvement tool completeness was assessed using two items:

1. Has a quality team been used to analyze difficulties in achieving the road quality goal?
2. Can you give an example of an improvement to a process that was made as a result of a quality team?

These items were rated on a yes/no scale. The open-ended item was included to help validate responses and for discussion. Five additional items, listed below, assessed the use of process improvement tools in daily activities.

1. How often does your organization use root cause analysis?
2. How often does your organization use a fishbone diagram (also called cause and effect or Ishikawa charts)?
3. How often does your organization use Pareto charts (also called bar chart displays)?
4. How often does your organization use flowcharts?
5. How often does your organization use process control charts?

These items were rated on a five point scale that ranged from always to never (4=Always, 3=Very often, 2=Sometimes, 2=Rarely, 1=Never). Items were coded so that higher scores

represent a more complete integration of process improvement tools in an organization. Scores were combined to form a composite variable that represented process improvement tool completeness. Ordinal item alpha for the measure of process improvement completeness was 0.852.

Composite Scores

Where several items were combined to form composite scores, the ordinal item alpha > 0.7 was used to justify combining items and to demonstrate convergent validity, or whether constructs that should be related are, in fact, related. If items combined in a composite score are not well-correlated, they may form a misleading average with attenuated correlations (Garson, 2010).

When using a survey, it is also important to demonstrate divergent validity, or whether constructs that should not be related are, in fact, unrelated. Ordinal item alpha can also be used to demonstrate divergent validity by running all the items for any pair of constructs. If α drops below 0.7, this confirms that the items represent different dimensions. On the other hand, if all the items from two composites still have a value for $\alpha > 0.7$, it raises serious questions about whether the two constructs are really different things deserving of different labels (Garson, 2011). The only scales that failed to demonstrate divergent validity were “reward completeness” and “reward duration” with an ordinal item $\alpha = 0.762$. These two scales also had a high multi-collinearity and VIF, so only “reward duration” was used in analysis.

Controlling for Other Variables in the Models

For the hypotheses dealing with roads agencies, the factors “total lane miles,” “population,” and “region” were included to mediate the size-specific and location-specific dynamics of the responding jurisdictions. The item *total lane miles* was defined as the number of paved lane miles the jurisdiction was responsible for maintaining. *Population* was defined as the number of individuals living in the jurisdiction according to the most recent census. *Region* was defined as the geographical location of the jurisdiction, either in the North, South, Midwest, or West of the United States, or in Alaska.

For the hypotheses dealing with youth programs, information about “income per capita” and “population” was included to reflect a phenomenon referred to as differential fertility, or the fact that different types of people reproduce at different rates. Research has demonstrated an inverse relationship between socioeconomic status and teen pregnancy (Tienda, Diaz, & Smith, 1985). *Income per capita* was defined by the aggregate income of the jurisdiction divided by the population.

Data Sources, Survey Structure, and Statistical Methodology

Sampling Frame

All of the roads agencies (n=455) and youth programs (n=71) that had participated in the ICMA-CPM benchmarking project between the years of 1998 and 2011 were contacted and asked to complete the survey regarding management practices, with 96 roads agencies responding (response rate of 21%) and 24 youth programs responding (response rate of 34%).

The sampling frame was all of the roads agencies and youth programs that had ever submitted data to the ICMA-CPM benchmarking project. The roads agencies’ jurisdictions ranged in population from 6,299 to 3,765,000, with a mean of 225,867. Youth programs’ populations ranged from 11,519 to 3,694,820, with a mean of 482,605. A breakdown by geographical location for both roads agencies and youth programs, as designated by the United States Census Bureau, is located in Table 3.1 below.

Table 3.1: Geographical Information for Roads Agencies and Youth Programs

	Northeast	Midwest	South	West
Roads Agencies	23	58	85	95
Youth Programs	5	9	34	24

Considering the range in the size of the jurisdictions and the geographical location, the sampling frame is relatively representative of roads agencies and youth programs in the United States, and results are generalized with respect to that assumption. The one notable difference in the sampling frame, when compared to the population, is their participation in the ICMA benchmarking project, a factor which could suggest that the participating roads agencies and youth programs have a higher interest in implementing and integrating RBM tools than the population for whom these results are generalized.

The Choice of Organizations to be Studied

This research focuses on roads agencies and youth programs. Roads agencies were chosen because of their relatively clear program technology, meaning there is a clear connection between the desired outcomes and the inputs, activities, and management efforts

responsible for causing those outcomes (Thompson, 1967). While the processes among local roads agencies may vary slightly, they all use similar activities to arrive at the common end goal of satisfactory roads.

However, a youth program has a relatively unclear program technology, because it is less evident how the processes of a youth program can consistently produce desired end outcomes, such as lower pregnancy rates. Nevertheless, proponents of RBM tools would still argue that these tools will improve agency performance for all types of programs. Thus, while the program technology is not as transparent, the measures included in teen pregnancy data are objective, consistent, and standardized.

Using roads agencies and youth programs in the study provided an additional opportunity to examine the differences in RBM utilization between programs with different foundations. The contrast between an engineering program with very clear technologies and a social program with much less clear program technologies served to show how different RBM tools work differently in different arenas. Both service areas have a direct impact on the community, whereas some of the service areas tracked by ICMA-CPM are internal programs with an indirect impact on the community, such as human resources or information technology.

Data Sources

ICMA Data

A portion of the data used in the current study was obtained from ICMA's Center for Performance Measurement (CPM) benchmarking project in the areas of Highway and Road Maintenance and Youth Services. ICMA gathered data on the objective (externally-

generated), dependent variables in this study, including such measures as paved lane miles in good condition, time to fill a pothole, citizen satisfaction, and babies born to teen mothers.

The ICMA-CPM effort began in 1994 with an initial group of 44 cities and counties. CPM worked with managers to identify a need for accurate, fair, and comparable data about the quality and efficiency of service delivery to their citizens. ICMA then narrowed the choices of services to be measured and identified desired outputs and outcomes of service delivery. An ongoing, formalized effort to collect data from jurisdictions in 15 service areas started in 1996, with standardized, consistent definitions beginning in 1998. The number of participants varies from year to year, as does the amount of information supplied.

All outcome measures collected by ICMA-CPM are common to the respective service area and were developed by The Center for Performance Measurement. They have been developed and refined over a 12-year period by city and county managers, agency heads, and other service area specialists from the participating jurisdictions. Annual updates have provided for precise definitions and adaptations to changed tasks or technology, while at the same time maintaining the continuity necessary for year-to-year comparison. For example, the use of "lane-miles" would seem to be a logical data element for road maintenance; however, differing widths of roads, curbs, and gutters complicate this seemingly easy measure (T. Scott, personal communication, January 14, 2009).

ICMA-CPM uses a multi-step process for cleaning the data they collect. Initially, the data is run through an outlier check and a logic check, both of which are preset to standards that are adequate for each question's possible responses. After these checks, the data points that "fail" are sent back to the jurisdiction for either verification or reworking, whichever is

deemed appropriate. Next, a visual scan checks for responses that do not seem to fit the data pool and compares responses with a jurisdiction's information from previous years. Any abnormal responses are sent back to the jurisdiction again for verification, and there is also a visual comparison of the data with the comments provided by the jurisdictions. Clarification is requested if, in the comment field, the jurisdiction suggests reasons for ICMA-CPM to believe the data point provided did not match the kind of output they were seeking. For example, if the question specifically asked the jurisdiction to exclude overhead in their response, but a comment from the jurisdiction mentions overhead, then clarification is sought (Scott, 2009).

Survey Data

In addition to the data on objective performance measures drawn from the ICMA, the current study involved conducting a survey of top managers in roads agencies and youth programs. The survey asked the managers to identify which management tools they used and how long they had used them (independent variables), along with asking their perception of the tools' effectiveness (a dependent variable).

The survey was sent to all cities which had responded to the ICMA study, resulting in data sets consisting of 503 roads agencies and 86 youth programs. After screening for obsolete contact information, 455 roads agencies and 71 youth programs were surveyed regarding approximately when they began using RBM tools, the degree of completeness of RBM tools, and their perceived effectiveness. The response rate for roads agencies and youth programs was 21% and 34%, respectively. An analysis of non-responding jurisdictions is included in Chapters 4 and 5. Other threats to validity are discussed below.

Participation in ICMA-CPM is voluntary, and responding jurisdictions are self-selected. As such, the response rate to the survey was expected to be higher than usual, because the surveyed organizations had responded to ICMA's request for performance data in the past. The unit of analysis is the agency, and all organizations used in the final analysis met the following criteria: 1) submitted performance data, 2) provided answers to survey questions regarding duration of RBM practices, and 3) provided information regarding the completeness of RBM in daily activities.

To answer the research question about objective measures of performance improvement, more than one year of performance data was needed. Only eight youth programs that had reported any performance data to ICMA also responded with information about the agency's management practices; of these, none had reported previous performance measures, making any retrospective analysis impossible. Comparably, there were more roads agencies that had reported multiple years of performance measures to ICMA and also responded with information about the agency's management practices, though only 15 jurisdictions in all, and the data was visually reviewed for trends.

Survey Design

Survey research is a popular method of data collection. While efficient and easy to administrate, however, surveys are often criticized for forcing artificial responses and oversimplifying complicated situations. Studies have also shown that, in some areas, surveys poorly predict actual behavior (Garson, 2010).

The survey used in the study was web-based. Web-based surveys are inexpensive and convenient, because the cost of printing and mailing the surveys is eliminated and the

returned data is already in an electronic format. All agencies and programs in the sample of the study were presumed to have access to the internet since they had previously corresponded to IMCA-CPM via the internet and provided email addresses. Still, some studies suggest that response rates for email and web-based surveys do not match the response rates for traditional mail surveys. (Cook, Heath, & Thompson, 2000). However, a study conducted at Michigan State University examined the merit of using a traditional mail survey on individuals with access to the internet, and the findings of the study suggest that web-based surveys are as successful. The study estimated the cost of a traditional mail survey to be approximately \$11.00 per response, and approximated the cost of a web-based survey to be \$1.32 per response, illuminating the considerable cost savings in using web-based surveys. Most importantly, though, the study found no significant difference in response rates between a traditional mail survey and a web-based survey (both at 30%), as long as the groups each received a pre-survey notification (Kaplowitz, Hadlock, & Levine, 2004).

Pilot Survey

A very small pilot survey was conducted in 2009. While pre-testing the survey with a larger sample is desirable, the number of cities consistently responding to ICMA-CPM was small. As such, the number of cities included in the first and second pilot surveys was intentionally kept small, so as not to compromise the final sample used in this research.

The survey was initially piloted to five roads agencies that had participated in the ICMA-CPM benchmarking project, with one agency responding (response rate of 20%). Surveys were emailed in an attached document, and two follow-up reminder emails were sent to encourage responses. The initial pilot survey and responses, included in Appendix A,

suggested that some terms needed expanded definitions and several questions needed further clarification. The low response rate was a noted concern, and some revisions were made to the accompanying cover letter to encourage more respondents. A final red flag was raised concerning the open-ended nature of the questions about the duration of RBM tools. The responding city was of considerable population size, yet indicated that they had only recently implemented only a few RBM tools, and with very little completeness. To address these concerns, the number of open-ended survey items was minimized, and the questions concerning RBM tool duration were rephrased as structured multiple-choice items.

After revisions were made to both the survey and the cover letter, the survey was piloted a second time, as seen in Appendix A, to 10 jurisdictions, with five agencies responding (response rate of 50%). The cover letter provided a paper copy of the survey that could be returned via email, as well as a web address for an online version of the survey. The initial email included a hyperlink to a web-based version of the survey in addition to the survey document being attached to the email. A follow-up email was sent to non-respondents. Responding organizations were of varied populations, ranging from approximately 57,000 to over 2 million. One responding agency was located in Minnesota, two were located in North Carolina, and two were located in Oregon. All but one survey was completed online. Results from the pilot surveys are summarized in Appendix A.

Several changes to the survey were made as a result of information gathered and comments made, in order to garner more explicit data and increase response rates. For example, only one city fully answered the questions requesting additional outcome data, with one of the respondents commenting that the survey itself was cumbersome. Therefore, the

final survey used in this study did not ask for additional outcome data and, instead, such outcome data was solicited in a follow-up survey after jurisdictions had responded to the RBM survey.

The most worrisome information revealed as a result of the second pilot survey was the lack of variation in the independent variable. Responding cities had either not yet implemented RBM tools or had implemented the tools in question close to 10 years prior to the study. As a result, several questions regarding the usage and completeness of RBM tools were added in each section, in the event the sample's responses mirrored those of the second pilot. The final survey product was the result of knowledge gained during the pilot surveys and in comments from experts in the field.

Assumptions

All forms of research assume that the data is free from errors, measures are accurately assessing the variable of interest, and the models are properly specified. In the current study, data screening methods were used to test assumptions such as the linearity of relationships, the same level of relationship throughout the range of the independent variable ("homoscedasticity"), interval or near-interval data, absence of outliers, and data whose range is not truncated. In addition, it is important that the model being tested is correctly specified. The exclusion of important causal variables or the inclusion of extraneous variables can change markedly the beta weights and, hence, the interpretation of the importance of the independent variables.

Missing Values: An examination of the distribution of missing values in the data reveals if values are missing at random. Ideally, key independent variables are missing at

random from the dependent variable. Cases with missing values can be deleted or imputed. In the current research study, cases with missing values were omitted from analysis because only three surveys from roads agencies were not completed; the respondents for the incomplete survey began the survey, provided demographic data, and only answered the first questions regarding strategic planning.

Normal Distribution: The t-test assumes there is an approximately normal distribution among the two samples, and may be unreliable when the two samples come from widely different-shaped distributions (Gardner, 1975). T-tests should be normally distributed for sample sizes less than 15; for samples between 15 and 40, t-tests should be approximately normal and without outliers, but may be markedly skewed when the sample size is greater than 40 (Moore, 1995). There were more than 40 available cases when t-tests were used for analysis in this study. A z distribution and a z score should fall within the -2 to 2 range when the data are normally distributed (Garson, 2010).

Dichotomous variables involved in this study were screened for the normal distribution assumption by using a 90-10 split rule (Tabachnik & Fidel, 2001).

Outliers: The variables were screened using a visual examination of normal probability plots to spot outliers.

Cell Counts: When using logistic regression or contingency tables in analysis, warning messages can result from empty or small cell counts. Also, cells with very few cases can cause a model to become unstable.

Threats to Validity

Generalizability: External validity pertains to how the findings regarding the sample are generalizable to the population of interest. A random selection of subjects is the best way to control for external validity. This research study used a convenience sample, since the two groups of subjects were responding to ICMA-CPM voluntarily. However, cities participating in the ICMA benchmarking project were a variety of populations and were located throughout the United States.

Non-response: Non-response refers to the failure to obtain observations from all of the organizations selected for the sample. Reasons for non-response can vary from being unable to answer, refusing to answer, or answer not found. Some refusals to answer are partial and the respondent answers some questions. As the non-response rate increases, so does the potential for a biased sample, wherein the obtained responses are no longer representative of the larger population and weaken the conclusions of the study. Several attempts were made to contact the non-respondents in this study to minimize non-response bias, and control variables were included in analysis in an effort to adjust for non-response. The attributes of non-respondents are reviewed in Chapter 4.

Content Validity: Content validity refers to items measuring what they are claiming to measure. For this survey, two separate pilot surveys were conducted using a small, limited number of participants from the ICMA-CPM sample; respondents included in the pilot surveys were not surveyed again or were not included in the final sample. In addition, survey items were reviewed by numerous field experts to ensure that the questions accurately assessed the implementation and usage of RBM tools.

Statistical Regression: Statistical regression occurs when variations in the results being studied are small, incremental changes that are likely to occur over time with or without the implementation of the management practices. Improvements in the performance measures for the roads agencies and youth programs could be due to the fact that the organizations were performing poorly when the management practices were introduced.

Selection Bias: Selection bias refers to differences in the individuals or the groups being studied, which cause the studied individuals to be different from the broader population with which one wishes to generalize; notably, aspects of selection bias often overlap with nonresponse problems and with sampling bias. There are many causes of selection bias. Sometimes the sampling frame produces it but, more often, it can be caused by response bias, such as an unrepresentative group answering a survey, for example. The largest potential concern with selection bias in the current study stems from the organizations contacted and responding. The organizations participating in this study were those that (a) have participated in ICMA benchmarking programs either in the past or currently, and (b) are willing to answer an extended survey on their use of management tools. Both of these winnowing aspects might lead one to expect these responding organizations to be far more committed to management improvement than those which are not represented in the survey responses. Such management-oriented organizations may be high performers and, therefore, not representative of the broader population of roads agencies or youth programs, which could cause substantial truncation of the dependent variables.

Researcher Bias: Researcher bias concerns preconceived notions about the study or subject matter that influences analysis and reporting. The researcher's involvement with and

study of RBM practices could affect the way the questions were phrased, which in turn may affect responses.

Statistical Reliability: Statistical reliability refers to the ability to reproduce the results again and again as required, and it is needed in order to ensure the validity and precision of the statistical analysis. Furthermore, statistical reliability is essential because it builds trust in the statistical analysis and the results obtained. In this study, statistical reliability would refer to measuring the same occurrences at different roads agencies and youth programs.

Other Validity Concerns: Two unique issues to be considered in a before/after study are instrumentation change and intervening events, or history. Instrumentation change occurs when variables are measured differently in the “before” and “after” studies, either through an inconsistency in observers or a change in the instrument itself. Although ICMA-CPM has made every effort to ensure the consistency of their questions and definitions through their ongoing performance measurement efforts, with the addition of new measures or clarifications of existing measures, instrumentation change still remains a threat to the study. Intervening events, or history, pose a threat to validity whenever a study utilizes data collected over time and cannot account for the impact that certain historical events have on the results. In the current study, historical events such as economic hardships, new managers, changes in the tax base/rate, or even a policy change could alter the outcome measures for the roads agencies and youth programs. To help control for such a threat to validity, outcome data was standardized before analysis. In addition, respondents were asked to recall the approximate date of installation for the various RBM tools.

Chapter Summary

Chapter 3 has addressed a variety of ways that the current study attempted to answer the research question: Do results-based management (RBM) tools, either separately or combination, improve the performance of roads agencies or youth programs? The hypotheses of the study examine both perceived and objective performance measures of performance, as well as the individual RBM tools of strategic planning, performance measurement, rewards, and process improvement tools.

CHAPTER 4 : RESULTS FOR ROADS AGENCIES

This chapter has three major sections. The first section addresses the survey's response rates and response patterns; the second section includes what the survey indicated about the extent of management tool usage for roads agencies; and the third section extensively analyzes the hypotheses for roads agencies. Chapter 5 covers similar results for youth programs. Finally, Chapter 6 includes a discussion of the implications of these results and consideration of future areas for research.

Response Rates and Response Patterns

Overall, the response rate for a web-based survey was fair, with 96 respondents out of 455 surveys, for a total response rate of 21%. Surprisingly, the response rate was lower for jurisdictions that were currently participating in the benchmarking project initiative with ICMA, as only 16% of the current participants responded to the survey, while 24% of former participants responded.

In an attempt to increase response rates, current and past participants received cover letters detailing ICMA's involvement with the study, explaining the purpose of the survey, assuring confidentiality, and offering to provide a summary of results (Garson, 2012; Simsek & Veiga, 2000). Past participants, however, were also contacted with three follow-up emails, each containing a copy of the survey (Garson, 2012). Thus, the unexpected difference in response rates could be due to differences in follow-up efforts between the two groups, and these differences may be due to resource limitations at ICMA or a change in ICMA leadership.

Only the past participants—those jurisdictions that were contacted directly by the researcher—received three, follow-up, customized emails including both their first and last names. Additionally, the emails 1) explained the importance of the research, 2) listed reasons why their response was important, 3) included PDF copies of the survey, and 4) contained detailed information about the closing date. Copies of the cover letters sent to participants and follow-up emails are located in the attached appendix.

Figure 4.1 shows an increase in responses after both follow-up emails. However, most responses were collected during the first few days after the initial email was sent.

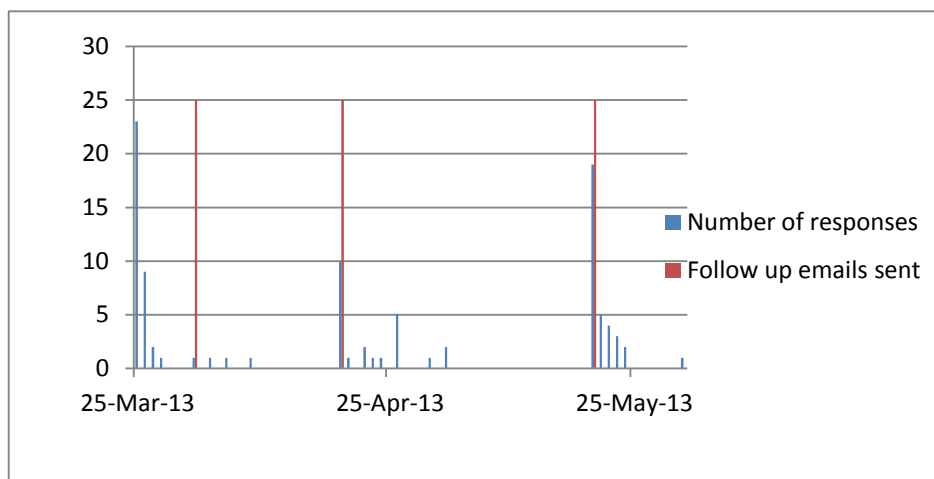


Figure 4.1: Initial Contact and Follow up Emails (Roads Agencies)

Responders and Non-responders

A quick review of the main differences between the responders and non-responders follows.

Geographical Region. When assessing region, the percentages of respondents compared to non-respondents are similar, so any findings would be generalizable to the members of ICMA that participated in the benchmarking project. However, neither group—respondents nor non-respondents—accurately represents the entire United States, because the ICMA project included relatively few roads agencies located in the Northeast.

Table 4.1: Geographical Region of Respondents and Non-respondents (Roads Agencies)

	Number of states in region represented	Percentage of Respondents	Number of states in region represented	Percentage of Non-respondents
Northeast	4	14%	6	15%
South	7	25%	12	31%
Midwest	9	32%	12	31%
West	7	25%	9	23%
Alaska and Hawaii	1	4%	0	..

ICMA Membership. The most notable difference in membership years between the respondents and the non-respondents is that very few jurisdictions that were members in 2007 responded to the survey. Records show that 2007 marked the highest number of roads agencies participating in the ICMA benchmarking project (30%), yet only 4.5% of those road cities responded to this study’s survey. Another observation is that nearly three quarters of the responding cities (74%) had participated in the benchmarking project within the last four years.

Population. The majority of respondents and non-respondents were jurisdictions with populations of 200,000 or less. While there were several large cities in the group of non-

respondents with populations of over 2 million, however, only 2% of cities in the groups of respondents and non-respondents had populations over 1 million.

Performance Measures. Table 4.2 below compares the mean, median, and standard deviations of the dependent variables (objective performance measures) that were reported to ICMA; these show subtle differences between responders and non-responders. The respondents generally had worse means and medians for the objective performance measures, but they also had much less variation. T-tests were used to determine if the difference in means was significant, and results indicated that none of the means were significantly different at the $p=.05$ level. Considering the means of the two groups are not significantly different, any findings regarding RBM tools and objective performance would be generalizable to ICMA members.

Table 4.2: Objective Performance Measures for Respondents and Non-respondents (Roads Agencies)

	Respondents			Non-respondents		
	AVGPOT	%ROADSAT	%CITBAD	AVGPOT	%ROADSAT	%CITBAD
mean	2.350714	0.748712	0.252331	3.036619	0.817127	0.238083
median	1.5	0.80001	0.17942	2	0.831314	0.166685
SD	2.070681	0.193853	0.17542	4.400059	0.889881	0.48042

**denotes significance at the $p>.05$ level*

Patterns of Management Tool Adoption and Use

Relatively little is known about which results-based management tools are most widely adopted in public organizations, which tools have the longest lives, or which ones have the highest satisfaction ratings. Such RBM tool data for roads agencies is presented and discussed in the following section. Notably, roads agencies provide a particularly useful

window into governmental use of management tools since they are often led by engineers—traditionally early adopters— and because roads agencies have clear, measurable outputs and outcomes, providing fertile ground for results-based tools.

Tools Adopted by Roads Agencies

In 1993, the Federal Government mandated strategic planning and performance measurement for federal organizations and, by 2000, many states and some local governments had begun to adopt RBM. However, as Moynihan (2006) rightly noted, “State governments were quick to adopt strategic planning and performance measurement, but have yet to adopt other integral components of RBM” (p. 77). Table 4.3 below includes data that supports such a contention, as, in local roads agencies, strategic planning and performance measurement are very widely implemented, but roads agencies have been slower to adopt equally critical RBM measures such as incentives (rewards) and process improvement tools.

Table 4.3: RBM Tool Usage among Roads Agencies

	Percentage of Road Agencies Using RBM Tool
Strategic Planning	74%
Performance Measurement	88%
Targets	75%
Non-monetary Rewards	39%
Monetary Rewards	31%
Process Improvement Teams	48%
Process Improvement Tools	
Root cause analysis	57%
Fishbone Charts	47%
Pareto Charts	63%
Flowcharts	77%
Process Control Charts	63%

Population as an Explanatory Variable

Population is commonly an explanatory variable. The majority of the responding cities (60) had populations that were less than 100,000, 22 cities had populations ranging from 100,000 to 200,000, and the remaining 14 of the cities had populations over 200,000. Specifically, it seems that larger cities with populations over 100,000 are substantially more likely to implement RBM tools, as illustrated below in Table 4.4, which displays what RBM tools have been adopted by roads agencies and includes a breakdown by population.

Table 4.4: RBM Tool Usage among Roads Agencies by Population

	Percentage of Road Agencies Using RBM Tool		
	Cities with populations less than 100,000	Cities with populations between 100,001 and 200,000	Cities with populations greater than 200,001
Strategic Planning	65%	95%	75%
Performance Measurement	83%	95%	100%
Targets	64%	100%	83%
Non-monetary Rewards	39%	32%	50%
Monetary Rewards	32%	26%	33%
Process Improvement Teams	41%	71%	42%
Process Improvement Tools			
Root Cause Analysis	54%	62%	67%
Fishbone Charts	47%	48%	50%
Pareto Charts	61%	67%	67%
Flowcharts	73%	86%	84%
Process Control Charts	63%	62%	67%

Strategic Planning

As shown in Table 4.3, 74% of roads agencies have implemented strategic planning. Of the agencies that indicated they had adopted strategic planning, 60% adopted strategic planning more than 5 years ago. While many respondents claimed to have strategic planning in place, only 15% of those responding cities could provide a truly measurable long-range

goal, and only 58% conducted a systematic analysis of the environment when establishing a strategic plan. Since long-range goals and systematic environmental analyses are integral parts of a complete strategic planning process, the lack of use reported here could indicate that some of the roads agencies were over-claiming tool use; in fact, overstating is a common measurement error when working with surveys, often because the respondent is trying to give the socially appropriate response (Belli, Traugott, Young, & McGonagle, 1999).

While possible reasons for overstating are discussed here with respect to strategic planning, most likely, there is some over-claiming of tool use for each of the other RBM tools as well. A lack of consistency in reporting tool use could also be the result of inadequate communication in the organization. For example, a study involving the implementation of RBM tools found that upper management often claimed RBM tools were being used, even if no one else in the organization reported the tools were implemented (Frazier & Swiss, 2008), confirming Belli et al.'s (1999) notion that individuals tend to over-claim when completing surveys. It is important to note, then, that these findings suggest that actual RBM tool use in roads agencies and youth programs might be lower than the percentages reported in the current study and presented in the next sections.

Of the 74% of roads agencies that adopted strategic planning, 71% of the agencies agreed that strategic planning had substantially improved the organization's performance, and 82% viewed their agency as a top performer. However, long-range goals and systematic environmental analyses are also integral parts of a complete strategic planning process, and the lack of reported use of these tools here could indicate that some of the roads agencies were over-claiming tool use.

Performance Measurement

Performance management involves not only measuring performance, but also setting goals and targets for performance and then utilizing the information gathered from reviewing performance to adjust future efforts and resource allocation. Performance measurement is usually considered less effective if it is not part of the broader approach of *performance management*. Table 4.3 shows that 88% of roads agencies use performance measurement and, of these, 70% started measuring performance more than 5 years ago. Thus, the majority of agencies measures performance (88%), uses numerical targets or goals (81%), and routinely looks at feedback regarding road quality (86%). These findings seem to imply that performance measurement is a more completely installed RBM tool than strategic planning.

How Roads Agencies Use Performance Information

At a recent Minnowbrook Conference, an area identified for future research was how local municipalities are using performance information (Moynihan & Pandey, 2010). This study can provide some insight on several different aspects of this question, the first of which is how performance information affects future efforts and resource allocation in roads agencies. Of the roads agencies surveyed, 93% reported that the budget was the area most likely affected by performance information, and 51% responded that performance information also results in changes in procedures and staffing. While budget allocations, staffing, and procedural changes were the most often cited areas influenced by performance information, other areas noted in responses include “additional training” and “community outreach.” Table 4.5 below summarizes the results.

How Roads Agencies Use Targets

The current study also examined how roads agencies use goals or targets when looking at performance. Ideally, targets are based upon performance of similar jurisdictions and negotiated between employees and managers. As shown in Table 4.6, most often, road targets are assigned by a manager (71%) or based on similar jurisdictions (69%).

Public management textbooks advise managers to regularly review and discuss targets in order to quickly refocus efforts should they fall short of a target or goal. A large majority of roads agencies (94%) reported that progress toward targets or goals is reviewed at least every two weeks, and a comparable number (97%) of youth programs reported discussing targets with supervisors at least every two weeks. Additionally, most roads agencies responded that, when the organization failed to meet a goal or target, budget allocations (68%) and capital investment (60%) were the main responses to the shortcoming. Roads agencies also reported that failure to meet a target would result in staffing changes (46%) and procedural changes (35%). Finally, of the 88% of roads agencies that adopted performance measurement, the majority of the agencies agreed that performance measurement (77%), targets (71%) and citizen feedback (59%) had substantially improved the organization's performance. For ease of review, all responses and frequencies pertaining to use of performance information and setting and reviewing targets are tallied below in Table 4.5 and Table 4.6.

Table 4.5: Use of Performance Information (Roads Agencies)

	Budget Allocations	Training	Outreach	Procedure Changes	Staffing	Incentives (Rewards)	Capital Investment	None
Quantitative measures of road quality have affected internal decisions in which of the following areas?	93%	32%	26%	51%	51%	1%	Not an available option	11%
If your organization fails to meet targets or goals for program quality which areas are you likely to use to refocus efforts?	68%	15%	18%	35%	35%	17%	60%	29%

**Note: respondents could choose more than one area*

Table 4.6: Setting and Reviewing Targets (Roads Agencies)

	Always or Very Often	Sometimes	Rarely or Never
Targets are negotiated between employees and managers	25%	38%	36%
Targets are unilaterally assigned by managers	37%	34%	29%
Targets are based on prior performance	100%
Targets are based on similar jurisdictions	19%	50%	31%
Measure progress toward goals or targets	41%	52%	6%
Discuss targets with supervisor	45%	45%	3%

Incentives (Rewards)

Nearly half of responding roads agencies (45%) reported recognizing excellent performance by offering either a non-monetary or monetary reward as incentive. Of those reporting to use incentives or rewards in their organization, 73% of agencies have been using

monetary rewards for more than five years, and 69% of agencies have been using non-monetary reward systems for more than five years. Overall, more agencies (39%) recognized outstanding performance with non-monetary rewards such as plaques, coveted parking spots, employee discounts or flex-time, than with monetary rewards (31%) like bonuses or salary increases. The majority of organizations that reward performance felt it increased agency performance.

Process Improvement Tools

Of the responding roads agencies, 63% indicated using at least one process improvement tool and 43% reported using quality teams. Of those organizations using process improvement tools, 73% of agencies have been using them for more than five years. Quality teams, flowcharts, and root cause analysis are the most popular tools used in roads agencies engaging in formal process improvement, although none of the individual tools are used on an overwhelmingly regular basis (at least every two weeks). Below, Table 4.7 details which process improvement tools are used most often in roads agencies.

Table 4.7: Use of Process Improvement Tools in Roads Agencies

	Always or Very Often	Sometimes	Rarely or Never
Quality Teams	8%	40%	51%
Root Cause Analysis	14%	27%	59%
Fishbone Diagrams	6%	17%	77%
Pareto Charts	5%	30%	65%
Flowcharts	14%	40%	46%
Process Control Charts	11%	27%	62%

While the current study examines the question of satisfaction with RBM tool completeness and duration using statistical techniques, the table below provides a picture roads agencies' overall satisfaction with the various RBM tools they are using. The majority of roads agencies perceive strategic planning (71%), performance measurement (80%), and process improvement tools (75%) as having substantially improved their organization. The sentiment is not as strong for targets (66%), feedback from citizens (61%), or rewards (51%), yet, still, the majority of respondents found the tools to be beneficial.

Table 4.8: Individual RBM Tools and Perceived Effectiveness in Roads Agencies

	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.	71%	24%	5%
Measuring program quality has substantially improved my organization's performance.	80%	17%	3%
Numerical targets have substantially improved my organization's performance.	66%	29%	5%
Feedback from citizens has substantially improved my organization's performance.	61%	31%	8%
Rewards have substantially improved my organization's performance.	51%	44%	5%
Process Improvement tools have substantially improved my organization's performance.	75%	22%	3%

Section Summary

Following are some of the most notable findings from the current study:

1. Large majorities of roads agencies (75% to 88%) had adopted three tools: strategic planning, performance measurement, and targets. Considerably fewer, however, had adopted a formal reward program or reported using process improvement tools on a regular basis

2. Ninety-three percent of roads agencies reported that organizational budget was the area most likely affected by performance information.
3. Rewards are used much less than most other management tools, with only 45% of organizations reporting using rewards.
4. A majority of roads agencies (63%) indicated that they used at least one process improvement tools, with flow charts and quality teams as the most common.
5. The majority of roads agencies perceive strategic planning (71%), performance measurement (80%), and process improvement tools (75%) as having substantially improved their organization. However, the sentiment is not as strong for targets (66%), feedback from citizens (61%), or rewards (51%).

Results for the Hypotheses

In the following section, the hypotheses are examined using regression analysis, interrupted time series analysis, and t-tests, beginning with a short review of the most important hypotheses, and followed by a discussion of the findings for the roads agencies. The next chapter will include a discussion of the finding for the youth programs.)

The hypotheses for the current study can be broken into three general categories: the first set of hypotheses measure the effectiveness of RBM tools in terms of perceived effectiveness; the second set of hypotheses measure the effectiveness of RBM tools in terms of (current) objective performance measures; and the third set of hypotheses measure the effectiveness of RBM tools by assessing changes in the objective performance measures over time using some exploratory perspectives. All of the hypotheses have sub-hypotheses that look at various measures of organizational performance and different aspects of RBM tools.

There are a total of 24 hypotheses, with different IVs (representing different tools and different tool characteristics) and different DVs (perceived effectiveness and objective

effectiveness). However, the single question underlying all of the hypotheses is: Do these management tools improve agency performance? This researcher predicts that the use of RBM tools does have a positive impact on both the perceived and the objective effectiveness of roads agencies and youth programs.

To review, the seven dependent variables measuring perceived performance were the same for roads agencies and youth programs. The seven survey items are:

1. Strategic planning has substantially improved my organization's performance.
2. Performance measurement, such as measures of road quality, has substantially improved my organization's performance.
3. Numerical targets have substantially improved my organization's performance.
4. Feedback from citizens has substantially improved my organization's performance
5. Rewards have substantially improved my organization's performance.
6. Process improvement tools (such as those listed above) have substantially improved my organization's performance
7. Management tools have substantially improved my organization's performance.

The dependent variables measuring objective performance were unique for roads agencies and were the following three items:

1. percentage of paved lane miles assessed to be in satisfactory or better condition
2. percentage of citizens reporting roads in mostly good condition
3. the average response time to fill a pothole

For the independent variables, each management tool (strategic planning, performance measurement, process improvement, and incentives) was assessed from two different aspects.

For example, strategic planning was assessed for duration, or how long the organization had been using strategic planning, as well as for completeness, or how well the organization carries out the strategic planning process.

Data Analysis

Measuring Tool Completeness

Multiple survey items were combined into a scale to determine the completeness of the management tools—in other words, whether the organization was using all the aspects of the management tool that would typically be prescribed in textbooks or training sessions. For example, when looking at strategic planning completeness, three survey items were coded to estimate how thoroughly strategic planning was incorporated in the organization: 1) if the agency had a strategic plan, they received 1 point; 2) if the agency provided a specific, measurable, numeric goal, they received 2 additional points; and 3) if they conducted a systematic scan of their environment, they received 1 more point. Therefore, for strategic planning completeness, a total score of 4 was possible. Similar survey items assessed the completeness of performance measurement, rewards, and process improvement tools.

Measuring Tool Duration

The duration of the management tools was measured in a similar way as was completeness of the tools. Survey items regarding how long certain key aspects of each management tools had been occurring in the organization were coded and combined to estimate how long the organization had been using a particular RBM tool. Again, strategic planning can be used as an example. If an organization had been using strategic planning for

6-9 years (a score of 3) and had used a systematic scan of the environment for 3-5 years (score of 2), it would receive a strategic planning duration score of 5. Similar survey items assessed the duration of performance measurement, rewards, and process improvement tools. The use of the remaining independent variables is detailed in Chapter 3.

Statistical Tests of the Indices

Ordinal item alpha was used to determine if the scale items clustered together. Ordinal coefficients alpha has recently become popular, because it assumes ordinal data and tends to give a higher alpha (Garson, 2013). To compute an ordinal coefficient alpha, a polychoric matrix must first be generated, and then the ordinal item alpha is calculated by hand using the following formula:

$$\text{Ordinal coefficient alpha} = (p * r_{ave}) / (1 + (p - 1) * r_{ave})$$

In the formula, p is the number of items in the scale and r_{ave} is the average of all the correlation coefficients from the polychoric matrix (Garson, 2013). Generally speaking, reliability coefficients above a standard alpha = 0.70 suggest that the items making up the scale are consistently measuring the construct (Garson, 2010).

The independent variable “strategic planning completeness” included three survey items and, with an alpha equal to 0.398, was below the recommended cut-off score of 0.70. Dropping the “long-range goals” item from the scale improved the coefficient. Also, as mentioned earlier in the chapter, the survey item addressing long-range goals was informative, but it did not add much to the completeness scale; nearly 75% of respondents claimed have strategic planning in place, yet only 15% of those responding cities could

provide a truly measurable long-range goal, with the remaining providing either a vague, non-measurable long-range goal or lacking a goal all together. Thus, dropping the item from the construct seems like a logical option. While the reliability coefficients were listed in the previous chapter, for convenience, they are repeated below in Table 4.9 and Table 4.10.

Table 4.9: Reliability Coefficients for RBM Tool Completeness Scales (Roads Agencies)

	Ordinal Coefficients Alpha	Number of items included in duration scale
Strategic Planning	0.698	2
Performance Measurement	0.727	10
Rewards	0.851	2
Process Improvement Tools	0.898	6

Table 4.10: Reliability Coefficients for RBM Tool Duration Scales (Roads Agencies)

	Ordinal Coefficients Alpha	Number of items included in duration scale
Strategic Planning	0.861	2
Performance Measurement	0.789	5
Rewards	0.798	2

Descriptive Statistics

Summary statistics of the means, medians, and standard deviations for the composite variables used in the analysis are depicted in Table 4.11 on the following page.

Table 4.11: Summary Statistics (Roads Agencies)

Variable	n	Mean	Std. Dev.	Median
Population	93	140299.3	230283	63115
Total lane miles	72	1437.22	2089.71	693.5
Strategic planning	96	0.739583	0.44116	1
Duration of strategic planning	96	2.104166	1.57933	2
Measureable long range goal	96	0.395833	0.71787	0
SWOT analysis	96	0.427083	0.49725	0
Strategic planning completeness	96	1.5625	1.14994	2
Performance measurement	86	0.883720	0.32243	1
Performance measurement duration	86	2.720930	1.36899	3
Performance measurement completeness	86	12.93023	4.68235	12
Targets	84	0.75	0.43561	1
Target duration	84	2.059523	1.49980	2
Performance measurement influences internal decisions involving...	85	1.376470	0.63576	1
Failure to meet targets affects...	56	1.035714	0.78541	1
Looks at feedback from citizens (complaints and/or surveys)	52	1.461538	0.72657	2
Measure progress toward goals for road quality	83	2.397590	1.05852	2
Discuss targets with managers	84	2.297619	1.08416	2
Performance on targets effects a decision	84	2.345238	1.05846	2
Negotiate targets with managers	85	1.635294	1.18368	2
Target are unilaterally assigned by managers	83	-1.03614	1.24396	-1
Targets are based on prior year performance	80	0.125	0.33280	0
Targets are based upon similar jurisdictions	81	1.580246	1.01074	2
Non-monetary rewards	84	0.392857	0.49131	0
Monetary rewards	84	0.309523	0.46507	0
Reward completeness	86	0.686046	0.82976	0
Reward duration	84	1.559523	1.81924	0
Quality teams	91	0.483516	0.50249	0
Process improvement tool duration	84	1.452380	1.62365	1
Process Improvement tool completeness	91	6.186813	4.72796	5
Root cause analysis	91	1.186813	1.23748	1
fishbone analysis	91	0.791208	0.99461	0
Pareto charts	91	1.076923	1.05652	1
Flowcharts	91	1.505494	1.10929	2
Process control charts	91	1.142857	1.12122	1
RBM Global variable	96	2.989583	1.52519	3

RBM Tools and Perceived Effectiveness

This first section will address the most basic question: Does the RBM tool's completeness or duration lead to a perception that the tool itself is working? Hypotheses 1 through 4 look at tool completeness and duration, and the perception of how the specific RBM tool has improved the organization. For example, Hypotheses H1a and H1b read:

- **Hypothesis 1: Strategic planning has a positive impact on the organization's perceived effectiveness.**

H1a: Strategic planning completeness has a positive impact on the perceived effectiveness of strategic planning.

H1b: Strategic planning duration has a positive impact on the perceived effectiveness of strategic planning.

Overview with Frequency Tables

A frequency table was used to look at the perceived effectiveness of the individual RBM tools, including completeness as a factor. While there was not an overwhelming number of responding agencies, there was still some variation as to how completely installed and integrated the RBM tools were. For example, some roads agencies had a strategic plan in place, yet did not incorporate any type of environmental analysis; others had a strategic plan but could not provide an example of a long range goal. Keeping with the example of strategic planning, roads agencies were divided into two groups based upon how completely strategic planning was installed. Similar groups were created for performance measurement, rewards, and process improvement tools, and the findings suggest a positive relationship. For

example, 100% of agencies with high performance measurement completeness thought that performance measurement improved performance, compared to only 63% of agencies with low performance measurement completeness. Likewise, strategic planning and process improvement tools had similar trends. Rewards were the only noted exception. For the remaining RBM tools, as completeness increased, the perceived effectiveness of the management tool also increased, dramatically, suggesting Hypotheses 1a, 2a, and 4a could be valid and warranting further analysis. Results are included below in Table 4.12.

Table 4.12: RBM Completeness and Perceived Effectiveness in Roads Agencies

	Percent of Agencies (Complete RBM Tool)	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.	77%	65%	29%	6%
Strategic planning has substantially improved my organization's performance.*	23%	76%	24%	..
Measuring program quality has substantially improved my organization's performance.	76%	63%	32%	5%
Measuring program quality has substantially improved my organization's performance.*	24%	100%
Rewards have substantially improved my organization's performance.	48%	57%	43%	..
Rewards have substantially improved my organization's performance.*	52%	45%	45%	10%
Process improvement tools have substantially improved my organization's performance.	69%	59%	39%	2%
Process improvement tools have substantially improved my organization's performance.*	31%	91%	9%	..

** identifies more completely integrated implementers of RBM tool*

A frequency table was also used to investigate the relationship between RBM tool duration and its perceived effectiveness. Responses were examined in light of the organizations' status as early or recent adopters. Interestingly, for RBM tools of strategic

planning and performance measurement, as duration increased, the perceived effectiveness of the management tool actually decreased. Such a relationship was unexpected and notably differs from observations regarding the other RBM tools. These results suggest that Hypotheses 1b and 2b are false, but the validity of these findings were later investigated further using logistic regression. Table 4.13 below outlines the findings for the relationship between RBM tool duration and perceived effectiveness.

Table 4.13: RBM Duration and Perceived Effectiveness in Roads Agencies

	Percent of Agencies (Recent Adopters* or Early Adopters**)	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.*	40%	78%	18%	4%
Strategic planning has substantially improved my organization's performance.**	60%	69%	26%	5%
Measuring program quality has substantially improved my organization's performance.*	30%	83%	17%	..
Measuring program quality has substantially improved my organization's performance.**	70%	79%	17%	4%
Numerical targets have substantially improved my organization's performance.*	44%	59%	33%	8%
Numerical targets have substantially improved my organization's performance.**	55%	71%	26%	3%
Feedback from citizens has substantially improved my organization's performance.*	35%	58%	33%	9%
Feedback from citizens has substantially improved my organization's performance.**	65%	63%	27%	10%
Rewards have substantially improved my organization's performance.*	23%	33%	66%	..
Rewards have substantially improved my organization's performance.**	77%	56%	37%	7%
Process Improvement tools have substantially improved my organization's performance.*	43%	76%	24%	..
Process Improvement tools have substantially improved my organization's performance.**	57%	79%	21%	..

* Identifies recent implementers of RBM tool

** Identifies early implementers of RBM tool

Analyzing through Binomial Logistic Regression

A tabular analysis, such as a contingency table or logistic regression, can be used when comparing ordinal data. However, with a data set including just fewer than 100 responses, a true tabular analysis was difficult. Moreover, responses tended to be either “undecided” or “agree,” with very few responses of “strongly agree,” leaving cells involving “disagree” or “strongly disagree” with fewer than five responses, or sometimes no responses at all. This is a general issue when dealing with categorical variables, including ordinal variables, regardless of whether or not a particular statistical test or measure provides a warning. Low-count cells in factor space (the combination of all the levels of categorical variables you are considering on a multivariate basis) are ones for which you have too little information to generalize; as such, when are there too many of these cells, the researcher should not generalize. The rule of thumb is no 0 cells and at least 80% of cells with more than a 5 count. If findings do not meet this rule of thumb, there are two main choices for the researcher: combining categories of factors so the low count cells disappear, and/or using fewer factors in any given multivariate analysis (Garson, 2013). Following the guideline, once the dependent variable was divided into those who did not agree (“undecided” and “disagree” responses) and those who agreed (“agree” and “strongly agree” responses), the cells contained enough information to generalize about the findings.

Binomial logistic regression equations were generated including the composite scores for the RBM tools (independent variables) and the perceived effectiveness of the RBM tools (dependent variables). It was expected that the more completely the RBM tools were installed, the greater the perceived effectiveness. There was a similar expectation for

duration, as it was also predicted that the longer the RBM tool had been being used in the organization, the greater the perceived effectiveness.

Checking for Multicollinearity

In logistic regression analysis, it is important to check for multicollinearity between the predictor variables. A general rule of thumb is that pairs of variables are suspect if their correlation is 0.70 or higher. Below, Table 4.14 shows the correlation matrix for the independent variables, indicating that multicollinearity is not a problem for most of the variables.

Table 4.14: Correlation Table for Independent Variables (Roads Agencies)

		Correlation Matrix								
		Constant	SPCOMP	STPDUR	TPMDUR	PMCOMP	RWDUR	RWCOMP	TEAMDUR	PITCOMP
Step 1	Constant	1.000								
	SPCOMP	.123	1.000							
	STPDUR	-.144	-.452	1.000						
	TPMDUR	-.322	-.253	.059	1.000					
	PMCOMP	-.605	-.383	-.009	-.180	1.000				
	RWDUR	.154	.177	-.254	-.193	-.064	1.000			
	RWCOMP	-.192	-.195	.204	.194	.059	-.933	1.000		
	TEAMDUR	.123	.040	-.236	-.070	.013	-.097	.045	1.000	
	PITCOMP	-.288	.094	.006	.059	-.106	.113	-.082	-.590	1.000

However, an inspection of the correlation matrix shows multicollinearity between the variables measuring reward duration and reward completeness. Double-checking the Variance Inflation Factor (VIF) for the reward duration and reward completeness, which should be less than 4, shows a VIF=9.150 and 9.433, respectively. With such a high

correlation, the variables were recognized as measuring the same construct, and the model was run again with only one of them included.

Assessing the Model

Another part of the output to review is the Nagelkerke pseudo R square. This is an estimate about how well the model predicts the outcome, but the Nagelkerke R Square is an approximation and cannot be interpreted as literally as its R-square counterpart in linear regression. The pseudo R-squares for each model are listed in the tables below, along with the coefficient estimates.

Additional information to look for among the output is the estimates of the coefficients for the variables, denoted by B . These estimates tell the amount of change (increase or decrease) in the predicted log odds of the dependent variable equaling 1, while holding all other predictors constant. For example, in this study, for every 1 unit increase in strategic planning completeness, we expect a 0.539 increase in the predicted log odds of the dependent variable (agreeing with the statement “Strategic planning has substantially improved my organization”), and holding all other independent variables constant. Since the predicted log odds is often difficult to interpret, the $\text{Exp}(B)$, or odds ratio, is often used.

Perceived Effectiveness of Individual RBM Tools

Table 4.15 below shows the results of how the two aspects of the individual management tools, completeness and duration, are related to the perceived effectiveness of that specific management tool. For example, the data indicates whether the strategic planning’s completeness or duration actually impacted the perceived effectiveness of

strategic planning itself. At the $p < 0.05$ level, strategic planning completeness, performance measurement completeness, and process improvement tool completeness are significant.

Strategic planning duration is also significant at the $p < 0.05$ level.

Table 4.15: Logistic Regression Table for Individual RBM Tools and Perceived RBM Tool Effectiveness in Roads Agencies

<i>(Specific RBM tool) has substantially improved my organization's performance.</i>				
	B	S.E.	Exp (B)	Nag R-Square
Strategic planning completeness	0.539	0.249	1.714*	0.34
Strategic planning duration	0.291	0.109	1.338*	
Performance measurement completeness	0.339	0.092	1.403*	0.375
Performance measurement duration	0.056	0.087	1.058	
Rewards duration	0.777	0.714	2.175	
Process improvement tools completeness	0.346	0.115	1.186*	0.395
Process improvement tools duration	0.171	0.237	1.414	

**denotes significance at the $p < 0.05$ level*

Logistic regression confirms the findings suggested by the data in Table 4.12, which implies that as RBM tool completeness increases, so does the perceived effectiveness of the tool. Hence, the logistic regression analysis provides further evidence that Hypotheses 1a, 2a, and 4a are true. In general, completeness seems to be an important factor in increasing a tool's perceived effectiveness. On the other hand, a tool's duration seems to very rarely have any effect on perceived effectiveness.

An odd anomaly in one measure of duration in Table 4.15 should also be noted. Logistic regression indicates that strategic planning duration is a significant predictor of how effective strategic planning is perceived. However, in the frequency Table 4.12, fewer early adopters (69%) found strategic planning effective than recent adopters (78%). The difference between the results of the frequency table and logistic regression can be explained by the

need to collapse the dependent variable for the logistic regression analysis; moreover, it could also be a result of the frequency table's distinction between early and recent adopters, or due to the use of a scale of combined survey items to assess duration in the regression analysis.

Perceived Overall Effectiveness of Management Tools

Binomial logistic regression was also used to test Hypotheses 5 and 6, which addressed 1) how completeness and duration for the individual RBM tools influenced the perceived effectiveness of management tools, 2) how strong responders believe their organization performs relative to similar organizations, and 3) how much the responders feel a specific RBM tool has improved their organization:

- **Hypothesis 5: Individual RBM tool completeness increases the overall perceived effectiveness of management tools.**
- **Hypothesis 6: Individual RBM tool duration increases the overall perceived effectiveness of management tools.**

Used here, “management tools” is a broad term referring to a collective management system. Table 4.16 below shows the output for the binomial logistic regression model when examining the factors that influence perceived effectiveness of management tools. Results suggest that, at the $p < 0.05$ level, only performance measurement duration and rewards duration are significant. For example, using the coefficient estimate for performance measurement duration in Table 4.16 after noting it is significant at the $p = .05$ level, the logical interpretation would be to conclude that an early adopter of performance measurement is

approximately 1.5 times more likely to agree with the statement, “RBM tools have substantially improved my organization’s performance,” when holding all other variables constant. Similarly, it is approximately 1.9 times more likely that an early adopter of rewards would agree with the statement, “RBM tools have substantially improved my organization’s performance,” when holding all other variables constant. Performance measurement and the feedback provided by rewarding excellent performance are integral components of many management systems and previous studies have demonstrated that both management tools are effective (Boyne & Chen, 2007; Cassidy & Ackah, 1997; Condly et al., 2003; Ferrari et al., 1985; Huselid, 1995; Jenkins et al., 1998; Meier et al., 2010; Mento et al., 1987; Rynes et al., 2004; Saunderson, 2004; Tubbs, 1986). Arguably, it is easy to see the connection between how long organizations have been using performance measurement and rewards, and the increase in perceived effectiveness of management tools. However, what remains intriguing is the fact that, while managers think the RBM tools are effective individually, they are less willing to concur that they are also effective collectively.

Table 4.16: Logistic Regression for RBM Tools and Perceived RBM Effectiveness (Roads Agencies)

<i>Management tools have substantially improved my organization's performance.</i>			
	Nagelkerke R-Square = .560		
	B	S.E.	Exp (B)
Strategic planning completeness	-0.276	0.171	0.759
Strategic planning duration	0.132	0.392	1.414
Performance measurement completeness	0.209	0.114	1.233
Performance measurement duration	0.370	0.126	1.448*
Rewards duration	0.623	0.305	1.864*
Process improvement tools completeness	0.070	0.112	1.073
Process improvement tools duration	-5.266	1.541	0.005

**denotes significance at the $p < 0.05$ level*

Perceived Organizational Performance

Binomial logistic regression was also used to test Hypothesis 6, which addressed how completeness and duration for the individual RBM tools influences the perceived effectiveness of the organization:

- **Hypothesis 7: RBM tool completeness increases the organization's perceived effectiveness relative to other organizations.**
- **Hypothesis 8: RBM tool duration increases the organization's perceived effectiveness relative to other organizations.**

Table 4.17 below displays the results of the logistic regression analysis that examined how the two aspects of the individual management tools—completeness and duration—are related to the perceived effectiveness of the organization. Again, relatively little is significant. At the $p < 0.05$ level, process improvement tools' duration is a significant influence on the perception of the organization's performance, but in a surprising, negative direction. Explanations could include the fact that this formal, systematic approach of engaging the individuals involved in the improvement process only initially increases the perception that the organization is a top performer, or it could be that, since performance improvement tool duration is only measured by one survey item, the measurement instrument is not accurate.

Table 4.17: Logistic Regression for RBM Tools and Perceived Organizational Performance (Roads Agencies)

<i>Management tools have substantially improved my organization's performance.</i>			
	Nagelkerke R-Square = .283		
	B	S.E.	Exp (B)
Strategic planning completeness	-0.142	0.143	0.867
Strategic planning duration	-0.145	0.383	0.868
Performance measurement completeness	0.052	0.095	1.053
Performance measurement duration	0.133	0.093	1.142
Rewards duration	-0.315	0.262	0.73
Process improvement tools completeness	0.25	0.149	1.284
Process improvement tools duration	-0.976	1.305	0.377*

**denotes significance at the $p < 0.05$ level*

Using a Global RBM Measure

Before leaving perceived performance measures altogether, examining global measure of RBM tool completeness help test Hypotheses 9 and 10.

- **Hypothesis 9: The more RBM tools an organization uses, the greater the perceived overall effectiveness of RBM.**
- **Hypothesis 10: The more RBM tools an organization uses, the greater the organization's perceived effectiveness relative to other organizations.**

The phrase “RBM tools” as used in Hypotheses 7 and 8 refers to a global completeness measure of the RBM tools; for example, an organization using strategic planning and performance measurement, but not using targets, rewards, or process improvement tools would have received an “RBM Global” score equal to 2. RBM Global scores ranged from 0 to 5, and the average RBM Global score was a 2.99, with a median score of 3. Using a frequency table as presented below in Table 4.18, to examine the perceived effectiveness measures, revealed that organizations using three or more RBM tools had a higher percentage

of respondents who agreed that RBM tools were effective. Additionally, organizations using three or more RBM tools had a higher percentage of respondents who agreed that their organization was a top performer.

After condensing responses into “agree” and “not agree” categories, and then dividing organizations into those who were “using 3 or more RBM tools” or “using one or two RBM tools,” a contingency table using Fisher’s exact test for independence checked for significance. Fisher’s test is appropriate for 2x2 tables when cell counts are small (McDonald, 2009), and it yielded interesting results. Results showed a significant relationship between the number of RBM tools used and perceived RBM tool effectiveness (p-value = 0.0019), as well as between the number of RBM tools used and organizational effectiveness (p-value = 0.043). While it appears the perceived effectiveness of management tools increases with the number of RBM tools an organization uses, causality cannot be definitively shown for any of the relationships in the study. In this case, and for the other relationships in this study, the causal correlation could go either way.

Table 4.18: RBM Completeness and Perceived Effectiveness Measures in Roads Agencies

Perceived effectiveness statement	Agree	Undecided	Disagree
Management tools have substantially improved my organization’s performance.*	41%	59%	..
Management tools have substantially improved my organization’s performance. **	82%	13%	5%
Overall, when compared to similar organizations, I view my agency as a top performer.*	65%	30%	5%
Overall, when compared to similar organizations, I view my agency as a top performer.**	86%	11%	3%

**identifies organizations using one or two RBM tools*

***identifies organizations using three or more RBM tools*

Section Summary

The preceding section included an examination of the perceived effectiveness of RBM tools, measured in three ways: whether managers believed each specific tool improved the organization's effectiveness; whether the managers believed that the tools collectively improved the organization's performance; and, most indirectly, whether the managers who implemented specific tools also believed that their organization was a top performing one.

Some of the major findings include:

1. The completeness of each individual RBM tool was generally a significant predictor of how effective each individual RBM tool was perceived in improving the organization. Tool duration, on the other hand, most commonly did not increase a specific tool's perceived effectiveness in improving the organization.
2. When investigating whether managers believed that management tools as a collective improved their organizational performance, there were only two clear relationships identified. Performance measurement duration and reward duration were found to be significant predictors of how effective management tools are perceived to be in improving the organization.
3. In looking at whether particular tool adoption leads organizations to be more likely to characterize themselves as a top-performing organization, neither the individual RBM tool completeness nor the individual RBM tool duration were found to be significant predictors. However, over 80% of respondents viewed themselves as being in a high-performing organization, and the lack of significance could be a result of minimal variation in the dependent variable.

4. The majority of organizations using three or more RBM tools , when compared to organizations using two tools or less, were much more likely to view themselves as a top organization and to believe that management tools, collectively, made their organization better.

RBM Tools and Objective Performance Measures

In the following section, each RBM tool continues to be examined separately, but the dependent variable(s) will shift to objective performance measures that have been reported as part of ICMA's benchmarking project. As discussed in the literature review, goal theory would predict that organizations which had adopted this array of tools would perform better on measurable outcomes, i.e., on objective effectiveness measures. Hypotheses 11(a,b,c,d,e,f,g,h,i,j,k,l,m,n,o) and 12(a,b,c,d,e,f,g,h,i,j,k,l,m,n,o) had 15 sub-hypotheses examining each of 5 RBM tools with each of 3 objective performance measures. As discussed in the literature review, goal theory would predict that organizations which had adopted this array of tools would perform better on measurable outcomes, i.e., on objective effectiveness measures. For reference, Hypotheses 11(a,b,c) is listed below, and a full listing of hypotheses can be found in Appendix C.

- **Hypothesis 11: Roads agencies with RBM tools performed better in objective performance measures.**

H11a: Roads agencies with strategic planning had a higher percentage of roads that are graded satisfactory or better.

H1 1b: Roads agencies with strategic planning had a lower average pothole repair time.

H1 1c: Roads agencies with strategic planning had a lower percentage of dissatisfied citizens.

It was expected that organizations with RBM tools would perform better on objective performance measures. Likewise, it was expected that organizations that are early adopters of RBM tools, and therefore have a great deal of experience with using the tools, would perform better than recent adopters of RBM tools.

Initially, box plots were examined to compare objective performance measures between organizations using individual RBM tools and those not using individual RBM tools. While the means appear to be quite close on each graph, organizations that have strategic planning (shown in the upper boxes) have more tightly grouped performance on all three performance measures. Additionally, the suggested relationship appears to be in the direction that previously reviewed studies and theories would suggest: 1) the percentage of roads in satisfactory condition for organizations with strategic planning had a slightly higher mean and was clustered toward the higher end of the dependent variable; 2) organizations with strategic planning had a slightly lower mean pothole repair time and were clustered toward the lower end of the measure; and 3) organizations with strategic planning had a slightly lower mean of dissatisfied citizens. Figure 4.2 depicts the box plot results for strategic planning, with the upper boxes representing roads agencies with strategic planning.

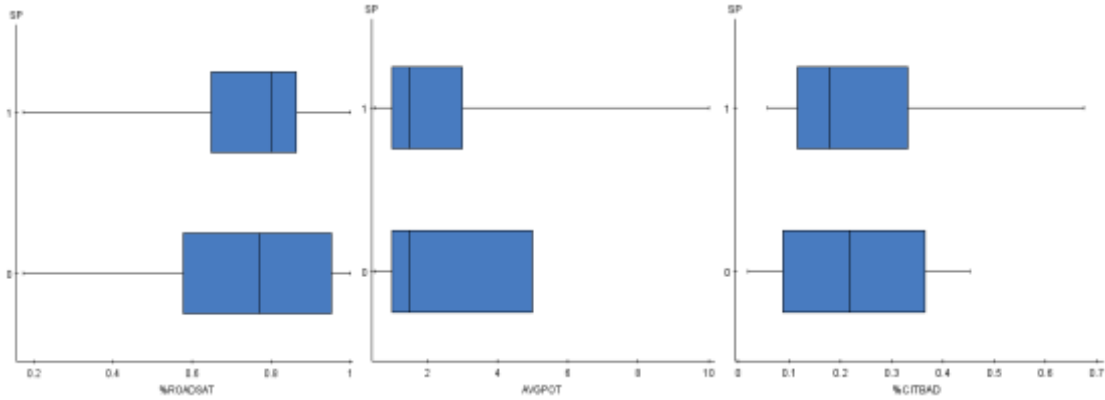


Figure 4.2: Boxplots for Strategic Planning and Objective Result Measures (Roads Agencies)
(Note: Upper box in plot represents roads agencies with strategic planning.)

Figures 4.3 through 4.6 depict similar box plots for the other RBM tools in the study. Theory and previously reviewed studies suggest graphs for performance measurement, targets, rewards, and process improvement tools would look similar. While this generally holds true, it is interesting to note that, in Figure 4.4, organizations using targets, on average, have a lower percentage of roads in satisfactory conditions and nearly identical average pothole repair times.

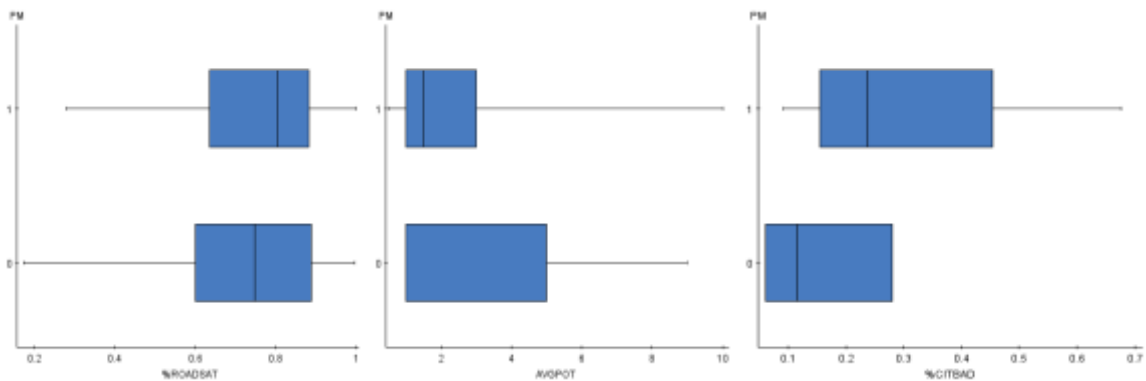


Figure 4.3: Boxplots for Performance Measurement and Objective Result Measures (Roads Agencies)
(Note: Upper box in plot represents roads agencies with performance measurement.)

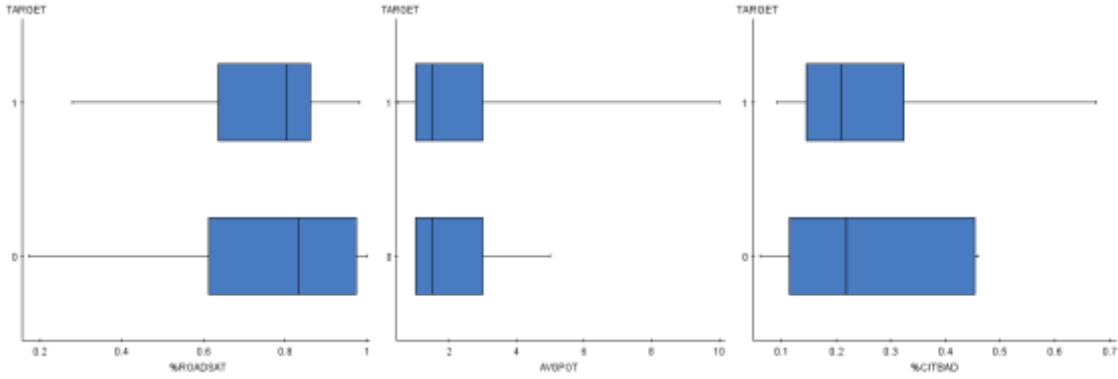


Figure 4.4: Boxplots for Targets and Objective Result Measures (Roads Agencies)

(Note: Upper box in plot represents roads agencies with targets.)

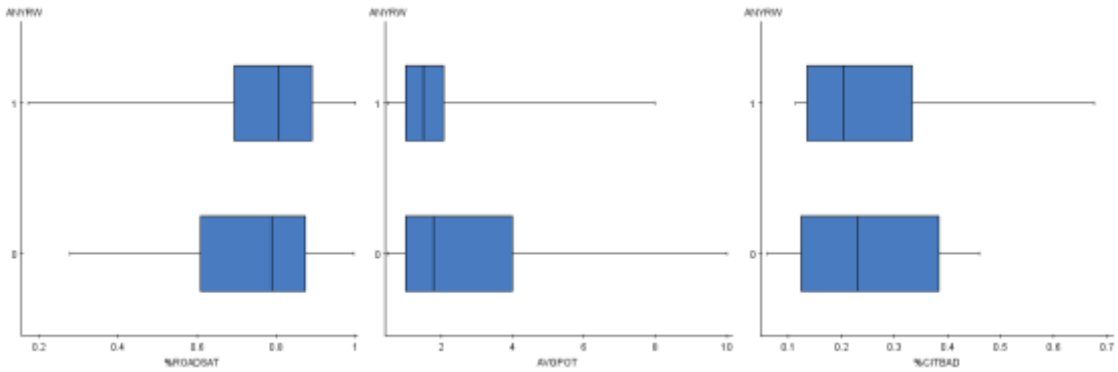


Figure 4.5: Boxplots for Rewards and Objective Result Measures (Roads Agencies)

(Note: Upper box in plot represents roads agencies with rewards.)

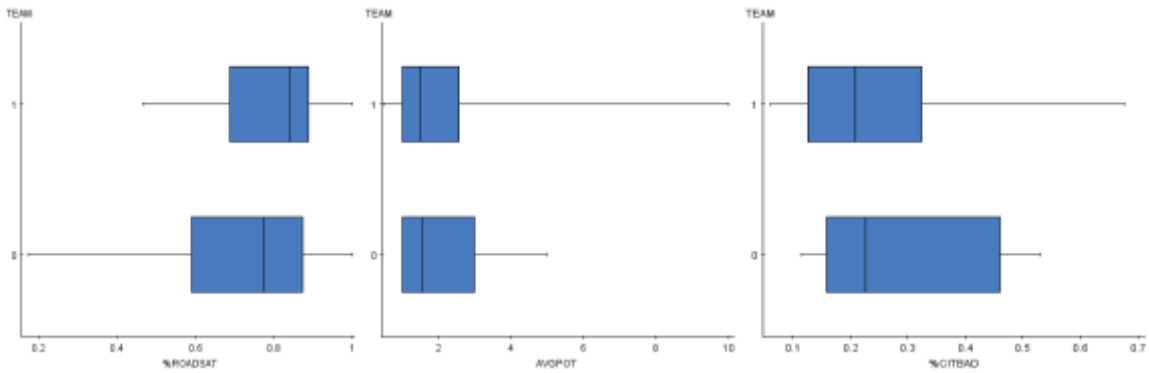


Figure 4.6: Boxplots for Process Improvement Tools and Objective Result Measures (Roads Agencies)

(Note: Upper box in plot represents roads agencies with process improvement tools.)

In summary, the box plots tended to show, with a few exceptions, that the agencies which have implemented the tools do not clearly outperform those agencies without tools, when compared on the means of three objective measures. However, the boxes on the box plots were more compact for the groups with RBM tools, thereby reflecting fewer markedly poor performers.

Box Plots for Early versus Late Adopters of the Tools

In order to investigate how the length of tool use (duration) affects objective performance measures, similar box plots were constructed to examine the objective performance measures between early and recent adopters of RBM tools. Since not all the organizations were using every one of the RBM tools, the box plots represent a subset of the 94 respondents. An example of the first few sub-hypotheses of Hypothesis 12, which addresses the correlation between duration and objective performance measures, is included below:

- **Hypothesis 12: Roads agencies that were early adopters of RBM tools performed better in objective performance measures.**

H12a: Roads agencies that were early adopters of strategic planning had a higher percentage of roads that are graded satisfactory or better.

H12b: Roads agencies that were early adopters of strategic planning had a lower average pothole repair time.

H12c: Roads agencies that were early adopters of strategic planning had a lower percentage of dissatisfied citizens.

The box plots did not reveal any consistent pattern between duration and performance management, and the results did not consistently lean in the expected direction. For example, results showed that early adopters of strategic planning have a higher percentage of satisfied citizens than recent implementers of strategic planning but, at the same time, these early adopters take longer to repair a pothole and have a lower percentage of roads in satisfactory condition. Also, results indicated that early adopters of performance management have a higher percentage of satisfied citizens, repair potholes more quickly on average, but have a lower percentage of roads in satisfactory condition. In fact, for all of the RBM tools except targets, most early implementers of RBM tools seem to perform more poorly on measures of road condition, and there was not a clear trend for the other measures of performance, the average time to fill a pothole and the percentage of citizens dissatisfied with the roads. A possible explanation could be that, while recent implementers have formally adopted RBM tools in the last few years, they could have already been implementing some aspects of RBM informally for many more years, or even using another type of management system like TQM until RBM was introduced as a new management initiative.

These findings on objective performance echo the earlier findings on perceived effectiveness, where early versus late adoption was also not a reliable predictor of performance.

Moving from Boxplots to T-Tests

Focusing on Hypotheses H11a through H11o, a series of independent t-tests were employed to compare the means of objective performance measures between organizations that used individual RBM tools and those organizations that did not.

- **Hypothesis 11: Roads agencies with RBM tools performed better in objective performance measures.**

It was expected that organizations with RBM tools would perform better on objective performance measures. Table 4.19 below shows the means and t-test results for hypotheses.

Table 4.19: T-tests Comparing RBM Tools and Objective Performance Variables (Roads Agencies)

	% of roads in satisfactory condition		Average pothole repair time		% of citizens dissatisfied with the roads	
	Mean RBM=No	Mean RBM=Yes	Mean RBM=No	Mean RBM=Yes	Mean RBM=No	Mean RBM=Yes
Strategic Planning	72.94%	75.45%	2.33 days	2.36 days	22.76%	25.89%
P-value (1-tail)	0.3268		0.5165		0.6192	
Performance Measurement	70.06%	76.65%	3.4 days	2.18 days	15.11%	28.81%
P-value (1-tail)	0.1845		0.1114		0.8925	
Targets	77.68%	75.44%	1.91 days	2.44 days	25.41%	27.08%
P-value (1-tail)	0.654		0.7669		0.5741	
Rewards	74.60%	77.25%	2.70 days	2.00 days	24.93%	27.80%
P-value (1-tail)	0.285		0.1211		0.6324	
Process Improvement Teams	71.25%	78.89%	2.23 days	2.46 days	28.59%	25.49%
P-value (1-tail)	0.0423*		0.6592		0.3645	
*-denotes significance at the p=.05 level						

Since the hypotheses clearly state a direction—that roads agencies using the RBM tools perform better on objective performance measures—the current study utilized a one-tailed significance test. Results demonstrated that roads agencies using process improvement tools had a significantly better average number of roads that were maintained in a satisfactory condition. These findings are consistent with previous studies’ findings regarding a relationship between results and process improvement teams (Banker et al., 1996; Ichniowski

et al., 1997; Kirkman & Rosen, 1999; Macduffie, 1995; Walker & Boyne, 2006; Wilson & Collier, 2000; Workman & Bommer, 2004). The lack of significant findings in the results of the remaining t-tests suggested there is no relationship between implementing RBM tools and objective performance measures.

While the box plots comparing performance measures for early and recent adopters suggested there was not a clear relationship, t-tests were used for confirmation. Hypothesis 12 addresses early adopters:

- **Hypothesis 12: Roads agencies that were early adopters of RBM tools performed better in objective performance measures.**

Looking at Hypotheses H12a through H12o, a series of independent t-tests were used to compare the means of objective performance measures between early and recent adopters of RBM tools. Again, it was expected (although the box plots seemed inconsistent) that early implementers, organizations that had been using the RBM tools for the longest time, would perform better on objective performance measures. Since the hypotheses clearly state a direction, a one-tailed significance test was used. Table 4.20 below shows the means and t-test results for hypotheses.

Table 4.20: T-tests Comparing Early versus Recent Implementers of RBM Tools and Objective Performance Variables (Roads Agencies)

	% of roads in satisfactory condition		Average pothole repair time		% of citizens dissatisfied with the road	
	Mean RBM=Early	Mean RBM=Recent	Mean RBM=Early	Mean RBM=Recent	Mean RBM=Early	Mean RBM=Recent
Strategic Planning	75.60%	74.80%	2.19	2.59	23%	36%
Significance (1-tail)	0.4416		0.272		0.1846	
Performance Measurement	76.10%	78.10%	2.04	2.5	26%	38%
Significance (1-tail)	0.6495		0.2218		0.2274	
Targets	76.90%	73.30%	2.2	2.71	30%	18%
Significance (1-tail)	0.2312		0.2436		0.8664	
Rewards	75.80%	82.90%	2.02	1.94	33%	23%
Significance (1-tail)	0.7989		0.5392		0.6489	
Process Improvement Teams	78.00%	80.60%	2.82	1.92	28%	23%
Significance (1-tail)	0.7163		0.8142		0.6821	

With the lack of significant findings, the results of the t-tests suggested that there is not a relationship between early implementation of RBM tools and objective performance measures.

Section Summary

Only a few of the above analyses demonstrated a significant relationship between RBM tools and objective measures. To summarize:

1. While the t-tests results for most of the management tools did not show a significant difference in the means of objective measures of road quality between RBM tool users and non-users, the organizations that used process improvement teams did have a significantly higher mean than non-users.
2. Although there was not a significant difference in means between RBM tool users and non-users, the box plots seemed to indicate that the presence of the RBM tools help the worst performers by bringing them closer to the average. One possibility is that, in a high performing organization, there is little room for improvement.

3. A consistent finding was that tool duration, or how long the RBM tools have been used, does not positively affect either perceived or objective performance measures.

Composite Measures of RBM Tool Completeness and Duration

There are additional ways in which we might attempt to find a relationship between the use of management tools and objective measures of performance. Perhaps it is not just the presence of the tool, but also whether it is complete or whether it has been used for a long time that drives the objective performance measures. Thus, the next analysis utilized the composite variables used to measure RBM tool completeness and duration.

Multiple survey items were combined into a scale to determine the completeness of the management tools—in other words, whether the organization was using all the aspects of the management tool that would typically be prescribed in textbooks or training sessions. For example, when looking at strategic planning completeness, three survey items were coded to estimate how thoroughly strategic planning was incorporated in the organization. If the agency had a strategic plan, they received 1 point; if they provided a specific, measurable, numeric goal, they received 2 points; and if they conducted a systematic scan of their environment, they received 1 point. This produced a total possible score of 4 for strategic planning completeness. Similar survey items assessed the completeness of performance measurement, rewards, and process improvement tools. Specifically, the current study investigated how completely the RBM tools were installed in order to explore the possibility that installing only parts of the RBM tool is less beneficial than installing the tool completely. As a reminder, RBM tool completeness was a significant predictor of how

effective the RBM tool was perceived to be, though not necessarily a predictor of its more objective effectiveness.

The duration of the management tools was measured in a similar way, in order to try and capture an improvement in performance over time. Survey items regarding how long certain key aspects of each management tools had been happening in the organization were coded and combined to estimate how long the organization had been using a particular RBM tool. Using strategic planning as an example, an organization that had been using strategic planning for 6-9 years (a score of 3) and a systematic scan of the environment for 3-5 years (score of 2) would receive a strategic planning duration score of 5. Similar survey items assessed the duration of performance measurement, rewards, and process improvement tools. The use of scales for the remaining independent variables is detailed in Chapter 3.

The main hypotheses, listed below, had 12 and 15 sub-hypotheses, respectively, to address each of the proposed relationships between RBM tools and the objective performance measures.

- **Hypothesis 15: Organizations with completely installed RBM tools (completeness) performed better on objective performance measures.**
- **Hypothesis 16: Organizations using RBM tools longer (duration) performed better on objective performance measures.**

Pearson Correlations

To start, Pearson correlations were computed for the composite variables measuring RBM tool completeness, RBM tool duration, and objective performance measures. While

Pearson correlation is typically used for continuous variables when multiple ordinal items are combined into a scale, treating the scale as interval is also widely accepted and customary (Garson, 2013). Table 4.21 below includes the Pearson correlation coefficients.

Table 4.21: Correlation Matrix: RBM Tool Completeness and Duration by Objective Performance Measures (Roads Agencies)

	Avg pothole repair time	% of roads in satisfactory or better condition	% of citizens reporting roads in satisfactory or better condition
RBM Completeness	0.056	0.339	0.486
Strategic Planning Completeness	0.332	0.157	-0.608
Performance Measurement Completeness	0.677	0.021	-0.617
Rewards Completeness	0.168	0.042	-0.622
Process Improvement Tool Completeness	-0.420	0.674	-0.098
Strategic Planning Duration	0.183	0.126	-0.226
Target Duration	0.698	0.236	-0.655
Quality Measures Duration	0.527	-0.077	-0.663
Performance Measurement Duration	0.479	0.216	-0.783
Rewards Duration	0.202	-0.068	-0.694
Process Improvement Tool Duration	-0.037	0.427	-0.266
	*-Correlation is significant at the 0.05 level (two-tailed)		
	**-Correlation is significant at the .01 level (two-tailed)		

This statistical analysis did not produce a single significant coefficient, implying that there is not a relationship between RBM tool completeness or RBM tool duration and these objective performance measures. However, there are still some additional analyses remaining to examine possible relationships between the scale variables and performance, such as verifying these results with regression and looking at tool use among high performers.

Regression Analysis

The next statistical approach was to use regression to test Hypotheses 8 and 9. While the Pearson correlation showed no apparent relationship, regression would allow for the introduction of control variables to help mediate the effects of climate and population density on road quality. The results from the two regression models are included in Tables 4.22 and 4.23 below.

For the first model, the independent variables included in were: strategic planning completeness, performance measurement completeness, reward completeness, and process improvement tool completeness. The control variables of region (C₁), total miles in jurisdiction (C₂), year (C₃), and population (C₄) were also included in the model:

$$\text{Performance} = \text{Intercept} + B_{\text{SPC}}X_{\text{SPC}} + B_{\text{PMC}}X_{\text{PMC}} + B_{\text{RWC}}X_{\text{RWC}} + B_{\text{PTC}}X_{\text{PTC}} + C_1 + C_2 + C_3 + C_4$$

The regression models were not significant and had low R-square values (the amount of variation in the dependent variable explained by the model), again indicating a lack of relationship between RBM tool completeness and objective performance measures.

Additionally, none of the completeness variables had significant coefficients. Table 4.22 below shows the results of the first regression model.

Table 4.22: RBM Tool Completeness and Objective Performance Measures (Roads Agencies)

Objective Performance Measure	R	R Square	Sig
% of Roads in Satisfactory or better condition	0.301	0.091	0.480
Average time to repair a pothole	0.398	0.158	0.478
% of citizens dissatisfied with the roads	0.717	0.515	0.396

For the second model, the independent variables included in the model were: strategic planning duration, performance measurement duration, reward duration, and process improvement tool duration. The control variables of region (C₁), total miles in jurisdiction (C₂), and population (C₃) were also included in the model:

$$\text{Performance} = \text{Intercept} + B_{\text{SPD}}X_{\text{SPD}} + B_{\text{PMD}}X_{\text{PMD}} + B_{\text{TGD}}X_{\text{TGD}} + B_{\text{RWD}}X_{\text{RWD}} + B_{\text{PTD}}X_{\text{PTD}} + C_1 + C_2 + C_3$$

The regression models were not significant and had low R-square values (the amount of variation in the dependent variable explained by the model), thus again indicating a lack of relationship between RBM tool duration and objective performance measures. Furthermore, none of the duration variables had significant coefficients. Table 4.23 below displays the results of the second regression model.

Table 4.23: Model Summaries for Hypotheses 9a-9o, RBM Tool Duration and Objective Performance Measures (Roads Agencies)

Objective Performance Measure	R	R Square	Sig
% of Roads in Satisfactory or better condition	0.336	0.113	0.581
Average time to repair a pothole	0.375	0.141	0.574
% of citizens dissatisfied with the roads	0.788	0.622	0.189

RBM Tools and High Performers

The third approach to answering the research question was to compare an organization's performance measure to a standard for the particular benchmark, and then rank the organization as being a high or low performer. The standard used for ranking was the one provided by ICMA as part of their ongoing benchmarking project. Since the dependent variable was dichotomous—a high performer compared to standards or a low

performer compared to standards—binomial logistic regression was used to look at the relationship between the RBM tools and performance with respect to the standards. Sub-hypotheses examined each RBM tool and each performance measure. An example of the hypotheses for one tool, strategic planning, is given below.

- **Hypothesis 17: Organizations with completely installed RBM tools (completeness) were high performers when compared to standards.**

H17a: Roads agencies with a more complete strategic planning effort (completeness) had a higher percentage of roads that are graded satisfactory or better when compared to standards.

H17b: Roads agencies with a more complete strategic planning effort (completeness) had a lower percentage of dissatisfied citizens responding to surveys conducted within the jurisdiction when compared to standards.

H17c: Roads agencies with a more complete strategic planning effort (completeness) had a smaller average pothole repair time when compared to standards.

There were 12 similar sub-hypotheses for Hypothesis 18 for RBM tool duration.

- **Hypothesis 18: Roads agencies that had been using RBM tools longer (duration) were high performers when compared to standards.**

A quick glance at the results revealed that neither RBM tool completeness nor RBM tool duration were significant predictors of high performance compared to the standards; thus, Table 4.24 below is abbreviated due to the lack of significant findings.

Table 4.24: Logistic Regression Coefficients for RBM Tools and High Performers (Roads Agencies)

	Road Quality	Pothole Repair	Satisfies Citizens
	Exp(B)	Exp(B)	Exp(B)
Strategic planning completeness	.890	.913	.613
Strategic planning duration	1.071	1.048	0.733
Performance measurement completeness	.973	1.093	1.166
Performance measurement duration	1.044	1.000	.834
Rewards duration	1.054	1.039	.828
Process improvement tools completeness	.984	.877	1.105
Process improvement tools duration	1.118	1.048	1.049

**denotes significance at the $p < .05$ level*

Using a Global RBM Measure

There is an additional way we can look for a relationship between tool usage and objective performance measures, by investigating if, perhaps, all the tools being used together produce a significant performance effect, a type of synergy.

- **Hypothesis 19: RBM has a positive impact on an organization’s objective performance measures.**

Here, the phrase “RBM tools” is used to refer to a global completeness measure, exactly like the one used in Hypotheses 9 and 10. For example, an organization using strategic planning and performance measurement, but not using targets, rewards, or process improvement tools would have received an “RBM Global” score equal to 2. RBM Global scores ranged from 0 to 5, and the average RBM Global score was a 2.99, with a median score of 3.

After using a series of t-tests to examine measures of road quality, results did not demonstrate a significant difference in means between organizations using 1 or 2 RBM tools and those using 3 or more RBM tools. The findings are particularly interesting, because earlier analysis showed a substantial difference in the perceived effectiveness measures of organizations using 3 or more RBM tools when compared to organizations using only 1 or 2 RBM tools. Table 4.25 below summarizing the t-test findings:

Table 4.25: T-Tests for Global RBM Tools and Objective Performance Measures (Roads Agencies)

	Percent of roads in satisfactory condition		Average pothole repair time (days)		Percent of citizens dissatisfied with road condition	
	1 or 2 RBM tools	3 or more RBM tools	1 or 2 RBM tools	3 or more RBM tools	1 or 2 RBM tools	3 or more RBM tools
Mean	70.60%	77.00%	2.079	2.379	22.10%	27.10%
Sig.	0.116		0.3208		0.2814	

**denotes significance at the $p < 0.05$ level*

Section Summary

None of the above analyses demonstrated a significant relationship between the composite measures for RBM tools and objective measures of performance. Incorporating additional RBM tools beyond strategic planning and performance measurement resulted in a notable shift in the perceived effectiveness of the organization and the perceived effectiveness of RBM tools, but these findings suggest that additional RBM tools do not translate into a significant change in actual measures of road quality. Perhaps one possible reason why the tool usage shows so little impact on the objective measures of performance is

that the objective performance measures are cross-sectional. As a snapshot of current performance, perhaps these measures fail to capture how the tools have improved performance over time, particularly for the low performers. To address this concern, longitudinal performance data was examined next.

RBM Tools and Objective Performance Measures over Time

Ideally, this study would have examined the performance of the 93 respondents over a decade, including the period when the RBM tools were implemented. However, as discussed in Chapter 3, the current study did not have enough longitudinal data to make such an analysis feasible. Still, there are a small number of cities (38 organizations) that had available multi-year data for road quality, and the next section details an exploratory look at the data.

Early measures of agency performance were subtracted from the most recent measure of agency performance, and the difference was then standardized by converting it into a percentage improvement. Table 4.26 on the following page lists the standardized road quality improvement for the respondents and the RBM tools that were used, and it also identifies early adopters of RBM tools as well.

Table 4.26: Improvement in Road Quality and RBM Tool Use (Roads Agencies)

CITY	REGION	PERCENTAGE IMPROVEMENT IN ROAD CONDITION	STRATEGIC PLANNING	PERFORMANCE MEASUREMENT	TARGET	REWARDS	PROCESS IMPROVEMENT TOOLS
1	MW	0.36	SP*	PM*		REWARD*	PIT
2	S	0.33	SP*	PM*	TARGET*	REWARD*	
3	W	0.204	SP*	PM*	TARGET*		PIT
4	N	0.19		PM	TARGET		PIT*
5	S	0.18	SP	PM*	TARGET*	REWARD*	PIT*
6	MW	0.138		PM*	TARGET*		
7	S	0.075	SP	PM*	TARGET*	REWARD*	PIT
8	W	0.056	SP	PM*	TARGET*		PIT*
9	W	0.056	SP	PM	TARGET	REWARD*	PIT
10	W	0.053	SP*	PM*	TARGET*		
11	W	0.05	SP	PM*	TARGET*	REWARD	PIT
12	S	0.049	SP*	PM	TARGET*		PIT
13	S	0.049		PM*	TARGET*	REWARD*	PIT*
14	MW	0.04		PM	TARGET		PIT*
15	W	0.026	SP*	PM*	TARGET*		PIT*
16	W	0.012	SP	PM*	TARGET*		PIT
17	W	0.012	SP		TARGET		PIT
18	W	0	SP*	PM		REWARD*	PIT*
19	MW	0					
20	S	-0.001	SP*	PM*	TARGET*	REWARD*	PIT*
21	MW	-0.026		PM			PIT
22	MW	-0.03	SP*	PM	TARGET		PIT
23	W	-0.036	SP*				
24	MW	-0.04	SP	PM	TARGET	REWARD	PIT
25	W	-0.09	SP*	PM*	TARGET*	REWARD*	PIT*
26	MW	-0.098	SP*			REWARD*	
27	W	-0.1	SP	PM	TARGET	REWARD	PIT
28	MW	-0.106	SP*	PM*	TARGET	REWARD*	PIT*
29	W	-0.114	SP	PM*	TARGET		PIT
30	S	-0.13		PM*			PIT
31	S	-0.14	SP*	PM*	TARGET*	REWARD*	PIT*
32	W	-0.175	SP*	PM*	TARGET*	REWARD*	PIT*
33	MW	-0.215	SP*	PM*	TARGET*		PIT*
34	S	-0.23					
35	MW	-0.291	SP*	PM*	TARGET*	REWARD*	PIT
36	W	-0.39	SP*	PM*	TARGET*	REWARD*	PIT*
37	MW	-0.42	SP	PM*	TARGET*		PIT
38	MW	-0.436	SP*	PM*	TARGET*	REWARD*	PIT*

* identifies early adopter of RBM tool

T-test Analyses

While at first glance there does not seem to be an obvious pattern among RBM tool use and road quality improvement, nor does there seem to be a pattern between early adopters of RBM tools and road quality improvement, further analysis involved Hypotheses 20 through 23. A series of t-tests was used to examine Hypothesis 20:

- **Hypothesis 20: Organizations with RBM tools saw a greater improvement in road quality over time than organizations without RBM tools.**

The lack of significant results from the t-tests is shown in Table 4.27 below.

Table 4.27: RBM Tool Use and Road Improvement (Roads Agencies)

RBM Tools	Standardized Improvement in Road Conditions?	
	Yes	No
Strategic Planning	-0.06%	0.02%
T-statistic	-0.923	
Performance Measurement	-0.05	0.01
T-statistic	N/A	
Targets	-0.08	-0.02
T-statistic	-0.974	
Rewards	-0.06	-0.02
T-statistic	-0.52	
Process Improvement Tools	-0.04	N/A
T-statistic	N/A	

**denotes significance at the $p < 0.05$ level*

Additionally, a series of t-tests were used to look at Hypotheses 21, which compared the performance of early and recent adopters of RBM tools:

- **Hypothesis 21: Organizations that were early adopters of RBM tools have a greater improvement in road quality over time than recent adopters of RBM tools.**

Results from the t-test series of Hypothesis 21 are listed below in Table 4.28:

Table 4.28: Early versus Recent RBM Tool Adoption and Road Improvement (Roads Agencies)

RBM Tools	Standardized Improvement in Road Conditions (Percent)	
	Mean Early Adopter	Mean Recent Adopter
Strategic Planning	-0.08	-0.20
T-statistic	-0.814	
Performance Measurement	-0.07	0.02
T-statistic	-1.204	
Targets	-0.08	-0.01
T-statistic	0.3292	
Rewards	-0.06	-0.03
T-statistic	0.91	
Process Improvement Tools	-0.07	-0.02
T-statistic	0.4789	

**denotes significance at the $p < 0.05$ level*

Regression Analyses

The above t-test analyses involved using a dichotomized independent variable. Because the analyses did not produce any significant findings, and since the data provided more information, two additional hypotheses addressed RBM tool completeness and duration:

- **Hypothesis 22: Organizations with more completely installed RBM tools (completeness) saw a greater improvement in road quality over time than organizations without RBM tools.**
- **Hypothesis 23: Organizations that had been using RBM tools longer (duration) saw a greater improvement in road quality over time than organizations without RBM tools.**

The first analysis consistently failed to demonstrate a clear relationship between RBM tool completeness and road improvement. The second analysis for RBM tool duration had a statistically significant model (p-value = 0.044) that explains a modest amount of variation in the dependent variable (adjusted R-squared value = .2119). The only significant coefficient was performance measurement duration (p-value = 0.0119); however, the coefficient was negative and suggested, surprisingly, that the longer an organization has been using performance measurement, the less improvement in road quality. Table 4.29 and Table 4.30 on the following page show the results of the regression analyses of these hypotheses.

Table 4.29: RBM Tool Completeness and Improvement in Road Quality (Roads Agencies)

Model Statistics				
P-value of model = 0.7723				
Adjusted R-squared = .1039				
Parameter Estimates				
Variable	Estimate	Std. Err.	Tstat	P-value
Intercept	0.140656	0.140793	0.999032	0.3263
population	0.00000	4.29E-07	0.856123	0.3992
TOTMILES	-0.00004	5.12E-05	-0.84169	0.4071
Strategic planning completeness	-0.07022	0.048743	-1.44068	0.1608
Performance measurement completeness	0.00003	0.044357	0.007939	0.9937
Reward completeness	0.038326	0.046249	0.8287	0.4143
Process improvement tool completeness	-0.04209	0.040385	-1.04234	0.3062

Table 4.30: RBM Tool Duration and Improvement in Road Quality (Roads Agencies)

Model Statistics				
P-value of model = 0.044				
Adjusted R-squared = .2119				
Parameter estimates:				
Variable	Estimate	Std. Err.	Tstat	P-value
Intercept	-15.9242	16.28814	-0.97766	0.3366
TOTMILES	5.37E-06	1.20E-05	0.44616	0.6589
YEAR	0.008047	0.008112	0.991968	0.3297
Strategic planning duration	-0.01419	0.011415	-1.24282	0.2242
Performance measurement duration	-0.02297	0.008543	-2.6888	0.0119*
Reward duration	0.008195	0.011015	0.743989	0.4631
Process improvement tool duration	-0.01989	0.018403	-1.08105	0.2889

**denotes significance at the $p < .05$ level*

Longitudinal Data Analysis

The final analysis effort for highway and roads agencies was an attempt at a longitudinal analysis. Hypothesis 24 read:

- **Hypothesis 24: Organizations performed better on objective performance measures after installing RBM tools.**

The ideal statistical tool in this situation would be an interrupted time series model (ITS), and a number of different techniques exist to evaluate interrupted time series (ITS) effects. The simplest ITS designs involve a number of data points before and after an event of interest; in the case of the current study, the data was the agency's performance measures before and after the event of interest, the implementation of RBM tools. The objective of using the ITS model was to determine if the RBM tools had a significant effect on performance. There are two major types of effect that could occur: the dependent mean shifts in performance when RBM was installed (the intercept changes), and/or the rate of change in performance over time shifts at the time RBM was installed (the slope changes) (Garson, 2010).

It should be noted that, in complex designs, there may be multiple events, and such was the case in the current research because an agency would often install RBM tools over a period of time instead of in one single event. For example, an agency might start with strategic planning and performance measurement, before later implementing a formalized process improvement program. Typically, a researcher using an ITS model would want more than 50 observations, and this study had only 15 observations that had reported measures spanning at least 6 years. Hence, the number of cities that had reported enough information

about road quality was too few for any sophisticated analysis. Examples of the graphs are shown below in Figures 4.7 and 4.8.

Graphs of objective performance measures for organizations with multiple years of data were examined for trends, but there were not any clear conclusions that could be drawn from such a small sample. In some cities, road quality continued to deteriorate despite RBM tool adoption. Other cities demonstrated an improvement in road quality after installing key RBM tools. Only two cities reported little or no used of RBM tools, and both of these cities experienced a decline in road quality.

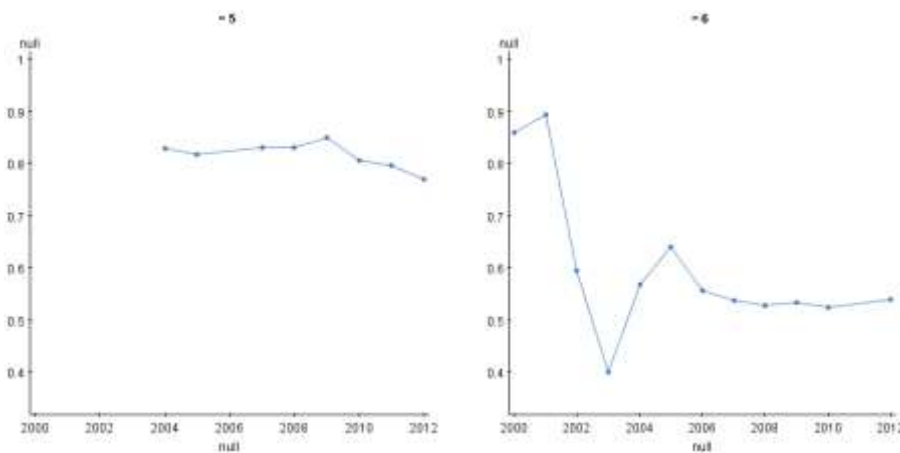


Figure 4.7: RBM Tools and Deteriorating Road Conditions (Roads Agencies)

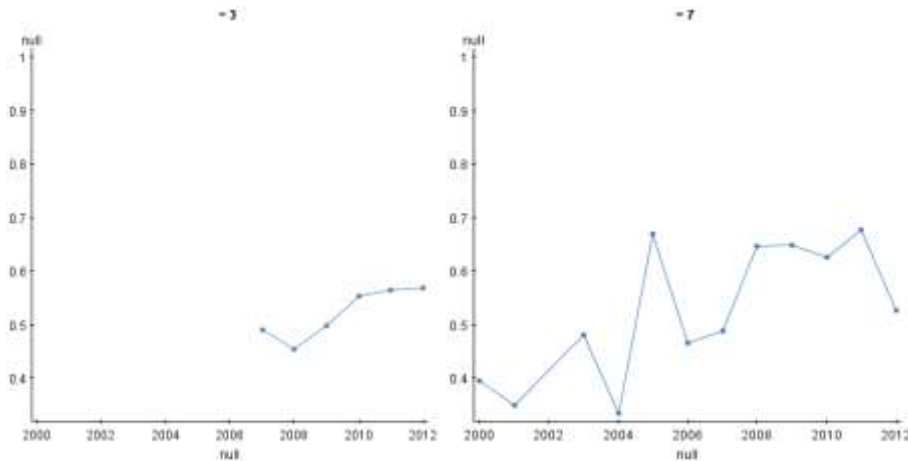


Figure 4.8: RBM Tools and Improving Road Conditions (Roads Agencies)

As predicted, the longitudinal analysis was problematic because there were so few cities that had reported enough objective measures over the years. As a result, no clear conclusions were drawn from the analysis.

Explaining the Difference between Perceived Effects of RBM Tools and Objective Measures of the Tools' Effects

The results of the current study's findings indicate that large majorities of managers believe several of the RBM tools are highly effective in improving their organization's performance; managers of agencies that had more RBM tools or more complete tools were especially inclined to report the tools' effectiveness. At the same time, however, a search for a relationship between tool usage and objective performance measures revealed only a few weak relationships.

The question that follows, then, is: what might account for the disparity? There are several possible answers. One possibility is that managers are mistaken, and the tools have not, in fact, produced any real impacts. Another consideration is that these RBM tools do not

work in general for most organizations, or even that the relatively routine work of roads agencies does not provide ample grounds for employing these tools. Or, perhaps roads agencies are well-managed already and have less variance in performance compared to other organizations, such as social services agencies, and as such RBM tools have less chance to work. The data gathered in the current study did not enable the definitive exclusion of any of these possibilities.

In fact, though, multiple studies published in the last 10 years have found positive effects for these RBM tools (Boyne et al., 2006; Easton & Jarrell, 1998; Hendricks & Singhal, 1997, 2001; Ingraham et al., 2003; Meier et al. , 2007; Poister & Harris, 1997; Poister et al., 2013; Rodgers & Hunter, 1991, 1992; Sun & Van Ryzin, 2012 ; Walker et al., 2010, 2011; Walker & Boyne, 2006). Therefore, it is also possible that the subjective opinions of managers are right, and that the tools have produced positive effects that this study's objective measures may have missed. If true, one possible explanation would be that the study sample is small and made up of cities that had willingly participated in the ICMA benchmarking project. While the sample seems to pull cities from multiple states in varied geographical regions, it nonetheless still may not be representative of other populations in either the use of RBM tools or performance. More specifically, participating roads agencies could be unusually high performers; an important piece of supporting evidence is the fact that, when classifying roads agencies as "high performers" based on the percentage of roads in satisfactory condition, the majority (81%) of respondents were placed in the category.

Chapter Summary

While individual section summaries are included above, the following chapter summary attempts to pull some of the findings together. Some notable findings of the investigation into RBM tool usage, perceived effectiveness, and performance include:

RBM Tool Usage

1. Large majorities of responding roads agencies had adopted strategic planning, performance measurement and targets, and at least one process improvement tool. Of the process tools, 43% of roads agencies reported using quality teams and 54% reported using flowcharts. Of all the RBM tools, reward systems were the least used.

RBM Tools and Perceived Effectiveness

1. The majority of roads agencies using the individual RBM tools perceive the tools as effective. Specifically, RBM tool users perceive strategic planning (71%), performance measurement (80%), and process improvement tools (75%) as having substantially improved their organization. The sentiment is not as strong for targets (66%), feedback from citizens (61%), or rewards (51%).
2. As would be expected, the completeness of each individual RBM tool is often a significant predictor of its perceived effectiveness in improving the organization. On the other hand, the duration of each tool—the time it has been used in the organization—is very rarely a significant predictor of its perceived effectiveness.

3. The majority of organizations using three or more RBM tools believed management tools are effective (82%), but notably fewer organizations using only one or two tools believed management tools are effective (41%).

RBM Tools and Objective Measures

1. Organizations that used process improvement tools did have a significantly higher mean for roads maintained in satisfactory condition than non-users, results which are consistent with previous studies finding a relationship between results and process improvement teams. However, despite employing multiple ways of measuring tool usage and objective performance measures, the current study failed to identify any other significant relationships between tool usage and objective performance.
2. Despite little difference in means between tool users and non-users, the box plots of the objective measures seem to suggest that the presence of the RBM tools help the worst performers by moving them closer to the average. One possibility for the lack of evidence that RBM tools help high performers in the same way may be that, in a high-performing organization, there is little room for improvement.
3. There is a large disparity between the perceived effectiveness of RBM tools and the objective measures of tool effectiveness. A number of explanations are possible:
 - a. Managers' perceptions may be mistaken, and the tools are, in fact, objectively ineffective.

- b. The measures of road quality may be distorted, perhaps because there are insufficient control variables to account for different roads' weather conditions and usage.
- c. The RBM tools may be effective for many public organizations, but the unusually simple mission of a roads agency could mean that only process improvement tools are really necessary or effective.
- d. The dissertation's sample may be unrepresentative. High-performing agencies, those where marked improvement is perhaps least possible, may be greatly overrepresented in the study, because the sample was chosen from those voluntarily participating in ICMA's benchmarking program and because of the self-selection of responders.

Overall, there is not enough evidence to confidently identify one reason, or even one particular combination of reasons, for the disparity found in the study. Aside from the single exception of process improvement tools, further research is therefore needed to explain the large gap between managers' very positive view of the tools' effectiveness and the lack of objective evidence of tool effectiveness.

CHAPTER 5 : RESULTS FOR YOUTH PROGRAMS

Chapter 5 focuses on the analysis and results for youth programs. Section 1 addresses survey response rates and response patterns. Section 2 presents descriptive statistics showing the extent of management tool use among youth programs. Section 3 includes an examination of the hypotheses in light of the data gathered on youth programs. Section 4 contains a comparison of responses from highway and roads agencies with those from the youth programs. The chapter concludes with a brief summary of the findings.

Compared to roads agencies, far fewer youth services agencies are analyzed because only a small number of youth programs (71 organizations) participated in the ICMA-CPM benchmarking project, and an even smaller number of these agencies (24 total) responded to the current study's survey. Of those 24 respondents, only 8 had reported objective benchmarking data to ICMA; therefore, statistical analysis was not an option. Although the hypotheses of the current study were analyzed in light of the youth programs' responses, the responses were treated as if they were case studies.

Response Rates and Response Patterns

Overall, the response rate for the web-based survey of youth programs was a respectable 35%. However, because of the limited participation in the ICMA benchmarking project, the 35% response rate finally yielded only 24 completed surveys; out of these, 50% of the respondents were current participants of the benchmarking, and 50% were former participants of the benchmarking project.

Both current and past youth services program participants received cover letters explaining the purpose of the survey and assuring confidentiality (Simsek & Veiga, 2000). Due to ICMA resource limitations, only past youth program participants were contacted again, via three follow-up emails that 1) explained the importance of the research, 2) listed reasons why their response was important, 3) included PDF copies of the survey, and 4) contained detailed information about the deadline date. Copies of the cover letters, follow-up emails, ICMA web postings, and the ICMA spotlight article can be found in the Appendix. Figure 5.1 shows that the number of responses received increased after the first two follow-up emails. However, most responses were received in the first few days after the initial contact email.

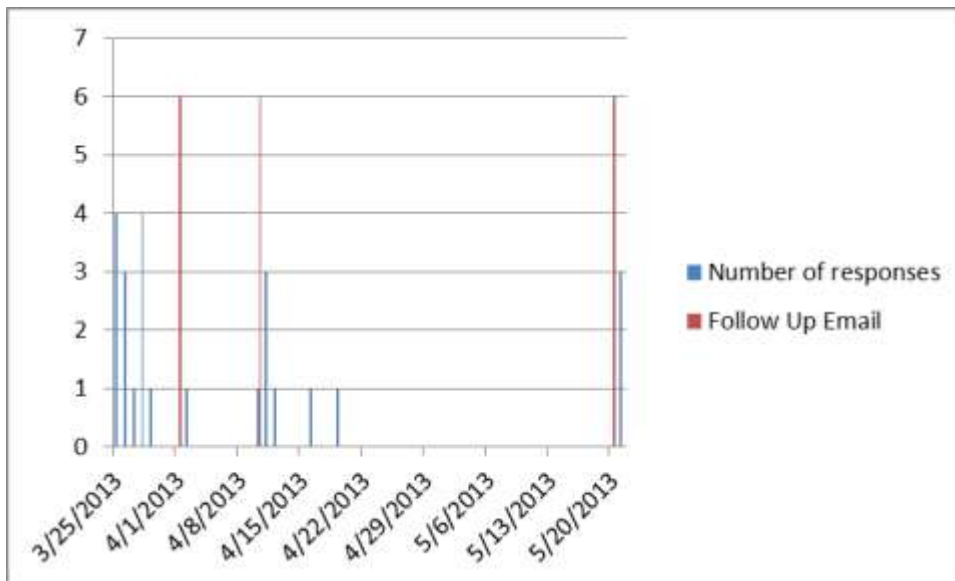


Figure 5.1: Initial Contact and Follow-Up Emails (Youth Programs)

Following is a quick breakdown of the demographic information for the responders and non-responders to the study. Information was reviewed by state and region, followed by initial benchmarking membership year, then population, and finally by a comparison of objective performance measures between the two groups. More states are represented in the group of non-respondents but, when looked at by region, the percentages of respondents and non-respondents are similar.

Geographical Region

When looking at region, the percentages of respondents compared to non-respondents is similar, so any findings would be generalizable to the members of ICMA that participated in the benchmarking project. However, based on these percentages, neither the respondent nor the non-respondent group accurately represents the entire United States, because most participants and respondents from youth service programs seem to be located in the West and South. Table 5.1 below shows a tally of the geographic representation in the responder and non-responder groups.

Table 5.1: Geographical Region of Respondents and Non-respondents (Youth Programs)

	Number of states in region represented	Percentage of Respondents	Number of states in region represented	Percentage of Non-respondents
Northeast	1	8%	4	6%
South	4	45%	7	47%
Midwest	1	8%	5	6%
West	5	39%	7	41%

Population

Among the non-respondents, 11% are larger cities with populations over 1 million, and the largest city in the respondents has a population of just over 700,000. The majority of cities in both the respondent (83%) and non-respondent (71%) groups have populations of less than 300,000. The average population for the group of responding cities was 203,000 (median population of 89,000), and the average population of non-responding cities was 409,000 (median population of 215,000). Notably, 50% of the responding cities had populations of less than 100,000.

Objective Performance Measures

A table comparing the mean, median, and standard deviations of the dependent variables made up of objective measures is included below and shows subtle differences between the responding and non-responding cities. Overall, respondents appear to perform better on objective performance measures than non-respondents. T-tests were used to determine if the difference in means was significant, but only the difference in means for low birth rates was statistically significant. Normally, this would speak to the generalizability of the results of this study, but, with only 24 respondents, any findings must be viewed as truly exploratory in nature. Below, Table 5.2 provides a summary of objective performance measures of youth service programs in responding and non-responding cities:

Table 5.2: Objective Performance Measures for Respondents and Non-respondents (Youth Programs)

	Respondents			Non-respondents		
	Teen Birth Rate	Low Birth Rate Among Teens	Infant Mortality Rate Among Teens	Teen Birth Rate	Low Birth Rate Among Teens	Infant Mortality Rate Among Teens
mean	3.39%	6.80%*	5.10%	4.20%	21.20%*	6.40%
median	3.50%	7.70%	3.50%	3.40%	17%	3.60%
SD	1.20%	2.20%	6.30%	4.10%	24.30%	6.40%

**denotes significance at the $p < .05$ level*

Patterns of Management Tool Adoption and Use

As noted in Chapter 4, relatively little is known about which results-based management tools are most widely adopted in public organizations, which tools have the longest lives, or which have the highest satisfaction ratings. Because the current study only involved 24 youth programs, any generalizations beyond the sample itself must be approached with great caution. Nonetheless, even a limited group of youth programs can provide a useful counterexample to roads agencies, particularly because the organizations differ in two important ways. First, youth programs are commonly led by social services managers who often have less quantitative training (and perhaps less quantitative interest) than the engineer managers of many roads agencies. Second, youth service program results are much more difficult to consistently deliver, and even to measure, than road program results; in other words, youth service programs have a much less clear organization technology than do roads agencies.

In 1993, the Federal Government mandated strategic planning and performance measurement for federal organizations and, by 2000, many states and some local governments had begun to adopt RBM strategies. However, as Moynihan (2006) noted, state governments did not adopt the other integral components of RBM as quickly as they did strategic planning and performance measurement.

Tools Adopted by Youth Programs

The local youth programs' responses indicated that, just as Moynihan (2006) observed, strategic planning and performance measurement are very widely implemented in the organizations. However, contrary to Moynihan's claim, with the exception of monetary rewards, most other management tools have also been implemented by roughly the same number of youth programs. As shown in Table 5.3, the RBM tool-adoption percentages seem high, conflicting with the Alliance for Children and Families' (2010) claim that performance measurement information is generally more difficult to obtain from human service organizations. Notably, it is possible that these percentages are higher than expected because of a selection bias in the fact that organizations using the RBM tools were the organizations inclined to respond. It is also possible that the respondents are over-claiming RBM tool use in the youth programs because they feel some internal pressure to report what they think should be happening. Table 5.3 below outlines the reported RBM tool usage among the responding youth programs.

Table 5.3: RBM Tool Usage among Youth Programs

	Percentage of Youth programs Using RBM Tool
Strategic Planning	79%
Performance Measurement	75%
Targets	75%
Non-monetary Rewards	67%
Monetary Rewards	42%
Process Improvement Teams	67%
Process Improvement Tools	
Root Cause Analysis	83%
Fishbone Charts	75%
Pareto Charts	79%
Flowcharts	83%
Process Control Charts	75%

Population is commonly an explanatory variable. The majority of the responding youth programs (14) were from smaller cities with populations of less than 100,000, and several (7) were from cities with populations greater than 200,000, leaving only three cities with populations between 100,000 and 200,000. Table 5.4 below again displays the results indicating which RBM tools were adopted by the responding youth programs, but this time a breakdown by population is also included. Just as with roads agencies, results showed the larger cities were most likely to adopt the RBM tools. But, for cities with populations between 100,000 and 200,000, the difference between their RBM tool usages is not as pronounced.

Table 5.4: RBM Tool Usage among Youth Programs by Population

	Percentage of Youth Agencies Using RBM Tool		
	Cities with population less than 100,000	Cities with population between 100,001 and 200,000	Cities with population greater than 200,001
Strategic Planning	66%	83%	100%
Performance Measurement	67%	67%	100%
Targets	58%	83%	100%
Non-monetary Rewards	50%	67%	100%
Monetary Rewards	50%	17%	50%
Process Improvement Teams	50%	83%	83%
Process Improvement Tools			
Root Cause Analysis	83%	67%	100%
Fishbone Charts	67%	67%	100%
Pareto Charts	83%	50%	100%
Flowcharts	75%	83%	100%
Process Control Charts	67%	83%	83%

How Youth Programs Use Performance Information

An area identified for future research at the 2010 Minnowbrook Conference was how local municipalities are using performance information (Moynihan & Pandey, 2010). The current study addressed several different aspects of this question, beginning with how performance information affects future efforts and resource allocation. Of the youth programs, 67% reported that staffing was the area most likely affected by performance information, and 62% responded that performance information also results in changes in procedures. While staffing and procedural changes were most often the areas cited as being influenced by performance information, other areas included budget allocations, additional training, applying for additional grants, identification of new goals and objectives, and soliciting information from stakeholders. These results are summarized in Table 5.5.

To investigate the use of performance information another way, this study examined how youth programs incorporate, use, and review goals or targets when addressing

performance. Ideally, targets are in part based upon the performance of similar jurisdictions, and then also negotiated between employees and managers. Table 5.6 below shows that, in youth programs, targets are most often negotiated between an employee and a manager, or assigned by a manager. With regard to how often targets are reviewed and discussed with a supervisor, as well as how an organization refocuses efforts should they fall short of a target or goal, 59% of youth programs reported that progress toward targets or goals was reviewed at least every two weeks, and 44% reported that targets are discussed with supervisors at least every two weeks.

Most youth programs (62%) responded that, when the organization failed to meet a goal or target, additional training was the most likely effort employed to address the shortcoming. They also reported that failure to meet a target would result in changes regarding budget allocations (46%) and procedural changes (42%). Information about establishing and reviewing performance measures was also gathered from the subset of youth programs that reported using targets. All responses and frequencies pertaining to performance use information in the responding youth programs are tallied in Table 5.5 and Table 5.6 below.

Table 5.5: Use of Performance Information in Youth Programs

	Budget allocations	Training	Procedure changes	Staffing	Outreach	Incentive	Capital Investment	None
Quantitative measures of youth services program quality have affected internal decisions in which of the following areas?	54%	54%	62%	67%	46%	21%	Not an available choice	8%
If your organization fails to meet targets or goals for program quality, which areas are you likely to use to refocus efforts?	46%	62%	42%	37%	Not an available choice	17%	17%	13%

(Note: respondents could choose more than one area.)

Table 5.6: Setting and Reviewing Targets (Youth Programs)

	Always or Very often	Sometimes	Rarely or Never
Targets are negotiated between employees and managers	55%	33%	12%
Targets are unilaterally assigned by managers	34%	33%	33%
Targets are based on prior performance	..	5%	95%
Targets are based on similar jurisdictions	17%	39%	44%
Measure progress toward goals or targets	58%	42%	..
Discuss targets with supervisor	44%	50%	6%

Youth Programs' Level of Satisfaction with RBM Tools

The question of youth organizations' satisfaction with respect to RBM tool completeness and duration is examined in the next section, but Table 5.7 below provides an overall picture of how satisfied youth programs are with the various RBM tools they are using. The majority perceive strategic planning (74%), performance measurement (78%), and feedback from citizens (95%) as having substantially improved their organization. Notably, the sentiment is not as strong for targets (56%), rewards (53%), or process improvement tools (50%), but, still, the majority of respondents believed the tools were beneficial.

Table 5.7: Individual RBM Tools and Perceived Effectiveness in Youth Programs

	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.	74%	26%	..
Measuring program quality has substantially improved my organization's performance.	78%	22%	..
Numerical targets have substantially improved my organization's performance.	56%	17%	17%
Feedback from citizens has substantially improved my organization's performance.	95%	5%	..
Rewards have substantially improved my organization's performance.	53%	47%	..
Process improvement tools have substantially improved my organization's performance.	50%	44%	6%

Results for the Hypotheses

Descriptive Statistics

Means, medians and standard deviations for the composite variables used in the analysis are included below in Table 5.8.

Table 5.8: Summary Statistics (Youth Programs)

Variable	n	Mean	Std. Dev.	Median
Population	24	203795	307044.44	88857
Income per Capita by State	24	27970.29	3120.16	27476.50
Income per Capita by City	24	\$28,691.13	\$9,270.04	\$26,959.00
Strategic planning	24	0.792	0.415	1
Duration of strategic planning	24	1.833	1.494	1.5
Measureable long range goal	24	0.333	0.637	0
SWOT analysis	24	0.541	0.509	1
Strategic planning completeness	24	1.667	0.963	2
Performance measurement	24	0.750	0.442	1
Performance measurement duration	24	2.375	4.663	3
Performance measurement completeness	24	16.625	5.539	17
Targets	24	.75	0.442	1
Target duration	24	2.375	1.637	3
Performance measurement influences internal decisions involving...	24	1.458	0.658	2
Failure to meet targets affects...	24	1.458	0.721	2
Looks at feedback from citizens (complaints and/or surveys)	24	1.375	0.824	2
Measure progress toward goals for program quality	24	2.652	1.229	2
Discuss targets with managers	24	2.417	1.139	2
Performance on targets effects a decision	24	2.375	1.135	2
Negotiate targets with managers	24	2.1667	1.307	2.5
Target are unilaterally assigned by managers	24	-0.917	1.100	1
Targets are based on prior year performance	24	0.667	0.702	1
Targets are based upon similar jurisdictions	24	1.583	1.139	2
Non-monetary rewards	24	0.667	0.482	1
Monetary rewards	24	0.417	0.504	0
Reward completeness	24	1.083	0.830	1
Reward duration	24	2.542	1.817	4
Quality teams	24	0.667	0.482	1
Process improvement tool duration	24	2.125	1.777	2.5
Process improvement tool completeness	24	7.917	4.781	7.5
Root cause analysis	24	1.500	0.978	2
Fishbone analysis	24	1.167	0.963	1
Pareto charts	24	1.458	1.102	1
Flowcharts	24	1.625	1.056	2
Process control charts	24	1.500	1.319	1
RBM Global Variable	24	3.667	1.606	4

RBM Tools and Perceived Effectiveness Measures

Review

This study predicted that the use of RBM tools has a positive impact on both the perceived effectiveness and the objective effectiveness of an organization. To review, the seven dependent variables (survey items) measuring perceived performance were the same for roads agencies and youth programs, and they are listed below:

1. Strategic planning has substantially improved my organization's performance.
2. Performance measurement, such as measures of road quality, has substantially improved my organization's performance.
3. Numerical targets have substantially improved my organization's performance.
4. Feedback from citizens has substantially improved my organization's performance.
5. Rewards have substantially improved my organization's performance.
6. Process improvement tools (such as the ones listed above) have substantially improved my organization's performance.
7. Management tools have substantially improved my organization's performance.
8. When compared to similar agencies, I view my organization as a top performer.

The unique dependent variables measuring objective performance for youth programs are the following three items:

1. babies born to teen mothers as a percentage of live births in the jurisdiction
2. babies born under 5 lbs. as a percentage of babies born to teen mothers
3. death among babies under 12 months of age as a percentage of babies born to teen mothers

For the independent variables, each management tool (strategic planning, performance measurement, process improvement, and incentives) was assessed on two different aspects. For example, strategic planning was first assessed for how long the organization had been using strategic planning, and then assessed for how completely the tool was implemented, i.e., whether the tool included all the aspects that would be recommended by most management textbooks or consultants.

To review, the hypotheses could be broken into three general categories. The first set of hypotheses involved the perceived effectiveness of RBM tools with sub-hypotheses that addressed various measures of perceived performance and different aspects of RBM tools. The second set of hypotheses involved objective effectiveness as captured by performance measures, and the third set of hypotheses involved an exploratory longitudinal perspective of the objective performance measures. While the second and third sets of hypotheses are explored below, limitations of the data and the small sample size do not allow true statistical analysis; therefore, the discussion will be brief.

Hypotheses 1 through 4 examine each individual RBM tool's completeness and duration with respect to how effective the respondents think each RBM tool has been. Generally speaking, a minimum sample size of 30 is needed to perform statistical analysis. When looking for a 95% level of confidence with the current study's sample size of $n=24$, the margin of error is just over 40% (Springate, 2012). However, using some frequency tables, the below hypotheses are discussed in light of the very small sample of youth programs.

Hypotheses 1(a,b), 2(a,b), 3(a,b), and 4(a,b) addressed the completeness and duration of the individual RBM tools—strategic planning, performance measurement, incentives (rewards), and process improvement tools—and the possible impact on that specific RBM tool’s perceived effectiveness. For example, Hypotheses 1a and 1b read:

- **Hypothesis 1: Strategic planning has a positive impact on the organization’s perceived effectiveness.**

H1a: Strategic planning completeness has a positive impact on the perceived effectiveness of strategic planning.

H1b: Strategic planning duration has a positive impact on the perceived effectiveness of strategic planning.

A frequency table was used to investigate the perceived effectiveness of the individual RBM tools, including completeness and duration as factors. While the number of responding youth programs was small, there was still some variation as to how completely installed and integrated the RBM tools were in the different organizations. For example, some youth programs had a strategic plan in place, yet did not incorporate any type of environmental analysis or could not provide an example of a long range goal. Keeping with the example of strategic planning, youth programs were divided into two groups based upon how completely strategic planning was installed. Similar groups were also created for the other RBM tools of performance measurement, rewards, and process improvement tools.

The findings suggested a positive relationship. For example, 80% of youth programs with high strategic planning completeness thought strategic planning did, indeed, improve performance, compared to only 33% of those with low strategic planning completeness.

Results from performance measurement, rewards, and process improvement tools revealed similar trends. Without exception, as the RBM tool completeness increased, the perceived effectiveness of the management tool also increased, dramatically, suggesting Hypotheses 1a through 4a were valid. Still, any further analysis was limited by the sample size. Results are displayed in Table 5.9 below.

Table 5.9: RBM Completeness and Perceived Effectiveness (Youth Programs)

	Percentage of Programs (*Complete RBM Tool)	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.	29%	33%	67%	..
Strategic planning has substantially improved my organization's performance.*	71%	80%	20%	..
Measuring program quality has substantially improved my organization's performance.	46%	55%	45%	..
Measuring program quality has substantially improved my organization's performance.*	54%	85%	15%	..
Rewards have substantially improved my organization's performance.	47%	38%	62%	..
Rewards have substantially improved my organization's performance.*	53%	66%	33%	..
Process improvement tools have substantially improved my organization's performance.	67%	27%	66%	7%
Process improvement tools have substantially improved my organization's performance.*	33%	75%	25%	..

** identifies more completely integrated implementers of RBM tool*

On the following page, Table 5.10 again displays perceived effectiveness of measures, but with RBM tool duration broken out into early versus recent implementers in order to analyze Hypotheses 1b through 4b. Table 5.10 below also includes some key aspects of performance measurement like targets and citizen feedback. Results showed that a higher percentage of early implementers perceived the RBM tool as effective when compared to recent implementers, suggesting that Hypotheses 1b through 4b are also valid. Interestingly, 80% of recent implementers felt targets improved organizational performance, but only 60% of early implementers felt targets were beneficial, a noted exception to the observed trend in the rest of the table.

Table 5.10: RBM Duration and Perceived Effectiveness (Youth Programs)

	Percentage of Programs (Recent Adopters* or Early Adopters**)	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.*	37%	67%	33%	..
Strategic planning has substantially improved my organization's performance.**	63%	86%	14%	..
Measuring program quality has substantially improved my organization's performance.*	22%	75%	25%	..
Measuring program quality has substantially improved my organization's performance.**	78%	79%	24%	..
Numerical targets have substantially improved my organization's performance.*	28%	80%	..	20%
Numerical targets have substantially improved my organization's performance.**	72%	60%	23%	15%
Feedback from citizens has substantially improved my organization's performance.*	37%	86%	14%	..
Feedback from citizens has substantially improved my organization's performance.**	63%	100%
Rewards have substantially improved my organization's performance.*	18%	44%	56%	..
Rewards have substantially improved my organization's performance.**	82%	63%	37%	..
Process Improvement tools have substantially improved my organization's performance.*	25%	25%	50%	25%
Process Improvement tools have substantially improved my organization's performance.**	75%	58%	42%	..

* identifies recent implementers of RBM tool

**identifies early implementers of RBM tool

While not directly related to any of the above hypotheses, the current findings can also offer some insight regarding incentives, or rewards. Some research has questioned the effectiveness of financial incentives in the public sector. Researchers have written, “Financial rewards increase quantity, at the expense of quality” (Mason & Watts, 2009). Others have maintained, “Financial rewards promote unethical behavior, while eroding intrinsic

motivation” (Grant & Singh, 2011). Despite such scholarly contentions, the majority of youth programs (71%) reported using some type of incentive or reward to recognize excellent performance, and more than half (53%) agreed that such rewards had substantially improved organizational performance. In the youth programs that employed rewards as incentive, non-monetary rewards were used in all but one, and monetary rewards were used in 59% of the organizations. Additionally, on the survey, there was an open-ended opportunity for comment; here, one respondent specifically addressed rewards in the work place:

I work for local government which means we don't generally have a so-called “reward system” for a job well done... [Instead, I use] a “praise and reward” philosophy. I believe that the words “thank you” should be used often and that hard work should be rewarded...the outcome is a win-win for both the employer and the employee.

Using a Global RBM Measure

Before leaving perceived performance measures altogether, a global RBM measure of RBM tool completeness was examined in order to investigate Hypotheses 9 and 10.

- **Hypothesis 9: The more RBM tools an organization uses, the greater the perceived overall effectiveness of RBM.**
- **Hypothesis 10: The more RBM tools an organization uses, the greater the organization's perceived effectiveness relative to other organizations.**

Here, “RBM tools” refers to a global completeness measure of the RBM tools. For example, an organization using strategic planning and performance measurement, but not using targets,

rewards, or process improvement tools would have received an “RBM Global” score equal to 2. RBM Global scores ranged from 0 to 5, and the average RBM Global score was a 3.42, with a median score of 4. Using a frequency table to look at the perceived effectiveness measures showed that organizations using three or more RBM tools had a higher percentage of respondents agreeing RBM tools were effective. Additionally, organizations using three or more RBM tools had a higher percentage of respondents concurring that their organization was a top performer. Though limited, the findings suggest that Hypotheses 9 and 10 are valid, and Table 5.11 below outlines the data.

Table 5.11: RBM Completeness and Perceived Effectiveness Measures (Youth Programs)

Perceived effectiveness statement	Agree	Undecided	Disagree
Management tools have substantially improved my organization’s performance.*	41%	59%	..
Management tools have substantially improved my organization’s performance. **	82%	13%	5%
Overall, when compared to similar organizations, I view my agency as a top performer.*	65%	30%	5%
Overall, when compared to similar organizations, I view my agency as a top performer.**	86%	11%	3%

**identifies organizations using one or two RBM tools*

***identifies organizations using three or more RBM tools*

RBM Tools and Objective Performance Measures

The second approach to the research question was to examine the effect of RBM tools on some objective variables of organizational performance. As discussed in the literature review, goal theory would predict that organizations which had adopted this array of tools would perform better on measurable outcomes, i.e., on objective effectiveness measures.

Hypotheses 13 addressed several the individual RBM tools and the possible impact on objective performance, while Hypothesis 14 compared programs that were early adopters of strategic planning to recent adopters. Also, Hypothesis 13(a,b) through Hypothesis 14 had sub-hypotheses to look at each individual RBM tool and each objective performance measure. A full listing of all hypotheses and sub-hypotheses can be found in Appendix C. As a reference Hypotheses 13(a,b,c) and Hypotheses 14(a,b,c) are listed below.

- **Hypothesis 13: Youth programs with RBM tools performed better in objective performance measures.**

H13a: Youth programs with strategic planning had a lower teen birth rate

H13b: Youth programs with strategic planning had a lower rate of low birth weight babies born to teen moms.

H13c: Youth programs with strategic planning had a lower rate of infant mortality among teen moms.

- **Hypothesis 14: Youth programs that were early adopters of RBM tools performed better in objective performance measures.**

H14a: Youth programs that were early adopters of strategic planning had a lower teen birth rate.

H14b: Youth programs that were early adopters of strategic planning had a lower rate of low birth weight babies born to teen moms.

H14c: Youth programs that were early adopters of strategic planning had a lower rate of infant mortality among teen moms.

It was expected that organizations with RBM tools would perform better on objective performance measures. It was also expected that organizations that were early adopters of RBM tools would perform better than recent adopters of RBM tools. Unfortunately, however, very few youth programs that responded to the survey also reported objective performance measures to ICMA. Therefore, it is impossible to draw any conclusion about the impact of RBM tools on objective performance measures in youth programs. Below, Table 5.12 lists the objective organizations' performance measures, along with the management tools used by that organization, as well as indicating whether the organization was an early adopter that had been using the tool for six or more years.

In reading the table, a useful comparative statistic to remember is that, according to the Centers for Disease Control (2013), the average per capita income in the United States in 2011 was \$27,334, and the teen birth rate was 8.25%, the lowest birth rate in years. Still, with only nine cases, it is difficult to make any generalizations or draw any conclusions from the data. Equally problematic are the measures themselves. Without jurisdiction for specific income-per-capita information to standardize the metrics, it is difficult to truly identify top performers. Another major concern is that most youth services organizations have other programs addressing various youth service concerns, such as investigations of child abuse, juvenile correction, community involvement, substance abuse, and mentoring programs. Thus, the activities and management of the youth programs alone are not likely the only causes of any increases or decreases in the objective performance measures.

With regard to the current study's findings, reviewing Table 5.12 below for obvious patterns reveals a couple of notable points. First, all of the organizations are using strategic

planning, performance measurement, and targets, and most of the organizations are using incentives or rewards and process improvement tools as well. With the study subset being so small, though, it is hard to draw any solid conclusions from this pattern. However, when comparing these organizations to the national average, all but one of the organizations included in the table would be considered high-performing. Such results lend further support to the idea that the study’s sample was unrepresentative, which is also one of the possible reasons findings suggested a major disparity between the perceived effectiveness of the tools and the objective measures of tool effectiveness. It seems that high-performing organizations, where improvement is arguably least possible, may have been greatly overrepresented in the study due to the fact that the sample was selected from those voluntarily participating in ICMA’s benchmarking program and because of the self-selection of responders.

Table 5.12: RBM Tools and Objective Performance Measures (Youth Programs)

	Approximate	Teen Birth	Teen Low Birth	Teen Infant	Strategic	Early	Performance	Early		Early		Early	Process Improvement	Early
Population	Income/Capita	Rate	Weight Rate	Mortality Rate	Planning	Adopter	Measurement	Adopter	Target	Adopter	Rewards	Adopter	Tools	Adopter
>50,000	\$20,300	2.17%	14.30%		x		x		x					
>50,000	\$38,162	2.18%	2%		x	x	x	x	x	x	x*	x	x	x
>50,000	\$25,400	3.21%	0%	22%	x	x	x	x	x	x	x*	x	x	
>50,000	\$18,500	3.32%	6.10%	7.14%	x	x	x	x	x	x	x		x	x
>25,000	\$29,600	3.82%		0%	x	x	x	x	x	x	x		x	x
>500,000	\$26,900	4.30%	6.22%	3.40%	x		x	x	x	x	x		x	x
>500,000	\$30,300	4.50%	5.72%	9.80%	x		x	x	x	x	x*	x	x	x
>100,000	\$26,000	6.60%			x		x	x	x	x			x	
>250,000	\$31,700	9.30%	8.60%		x	x	x	x	x	x	x*	x	x	x

* - denotes organization uses both monetary and non-monetary rewards to recognize outstanding performance

Comparisons between Road Agencies and Youth Services Programs

This study collected data from two very different groups of organizations, in order to compare the use of RBM tools in roads agencies and youth programs. The next few paragraphs address the adoption of RBM tools and the perceived effectiveness of RBM tools in these two organizations.

Similarities and Differences in Tool Adoption

Table 5.13 below displays the RBM tool usage for both roads agencies and youth services program, and suggests their RBM tool adoption and usage patterns are similar. In both types of organizations, strategic planning and performance measurement are the most frequently adopted management tools, with rewards and process improvement tools being used less often. The largest differences found between the two organizations was that youth programs reported using incentives/rewards and process improvement tools substantially more often than roads agencies; while this certainly could be true among the study's respondents, it conflicts with what has been observed in other studies. As discussed in Chapter 4, over-claiming by respondents could be the explanations for this particular finding, along with some other possible reasons. Additionally, while the majority of organizations in the study reported using strategic planning and performance measurements with targets, in both roads agencies and youth programs, fewer have adopted rewards and process improvement tools.

Table 5.13: RBM Tool Adoption, Roads Agencies versus Youth Programs

	Percentage of Roads Agencies Using RBM Tool	Percentage of Youth Programs Using RBM Tool
Strategic Planning	74%	79%
Performance Measurement	88%	75%
Targets	75%	75%
Non-monetary Rewards	39%	67%
Monetary Rewards	31%	42%
Process Improvement Teams	48%	67%
Process Improvement Tools	..	33%
Root Cause Analysis	57%	83%
Fishbone Charts	47%	75%
Pareto Charts	63%	79%
Flowcharts	77%	83%
Process Control Charts	63%	75%

Perceived Effectiveness

Table 5.14 below compares the perceived effectiveness of individual RBM tools, indicating that both roads agencies and youth programs are somewhat skeptical of numerical targets. Yet, it remains apparent that, in both roads agencies and youth programs, RBM tools are thought to have improved the organization overall.

Table 5.14: Perceived Effectiveness of RBM Tools, Roads Agencies versus Youth Programs

	Road Agencies			Youth Programs		
	Agree	Undecided	Disagree	Agree	Undecided	Disagree
Strategic planning has substantially improved my organization's performance.	71%	24%	5%	74%	26%	..
Measuring program quality has substantially improved my organization's performance.	80%	17%	3%	78%	22%	..
Numerical targets have substantially improved my organization's performance.	66%	29%	5%	56%	17%	17%
Feedback from citizens has substantially improved my organization's performance.	61%	31%	8%	95%	5%	..
Rewards have substantially improved my organization's performance.	51%	44%	5%	53%	47%	..
Process Improvement tools have substantially improved my organization's performance.	75%	22%	3%	50%	44%	6%

Perceived Performance

Below, Table 5.15 outlines the perceived performance of the management tools and of the organizations as a whole. In Chapter 4 and earlier in Chapter 5, perceived performance was compared using a global measure of RBM tools. Despite large differences in the sample sizes of roads agencies and youth programs, the numbers are surprisingly similar, with only one exception. Compared to roads agencies, not as many youth program organizations using three or more RBM tools thought management tools substantially improved performance, a disparity that could be attributed to inherent differences between engineering-based roads agencies and social service-based youth programs, or it could be due to over-claiming by respondents. For example, if some of the youth service programs claimed that they used more tools than were actually in place, it could have affected the final percentages for those

organizations that thought management tools improved performance. In both roads agencies and youth programs, the more RBM tools an organization had adopted, the more likely they were to find them effective. Likewise, the more RBM tools an organization had adopted, the more likely they were to view their organization as a top performer.

Table 5.15: Perceived Performance, Roads Agencies versus Youth Programs

Perceived Effectiveness Statement	Roads Agencies			Youth Programs		
	Agree	Undecided	Disagree	Agree	Undecided	Disagree
Management tools have substantially improved my organization's performance. *	41%	59%	..	50%	50%	..
Management tools have substantially improved my organization's performance. **	82%	13%	5%	67%	33%	..
Overall, when compared to similar organizations, I view my agency as a top performer. *	65%	30%	5%	62%	38%	..
Overall, when compared to similar organizations, I view my agency as a top performer. **	86%	11%	3%	87%	..	13%

* identifies organizations using 1 or 2 RBM tools

** identifies organizations using 3 or more RBM tools

Chapter Summary: Findings and Implications

Due to such a small number of respondents, the current research study was not able to directly test the proposed hypotheses regarding RBM tools and performance for youth programs. To recap some of the survey findings:

1. Strategic planning (79%) and performance measurement (75%) were the most frequently adopted tools by youth programs, while slightly fewer organizations

- adopted rewards (71%) and process improvement tools (67%). These findings were similar to those for roads agencies.
2. Youth organizations using strategic planning, performance measurement, targets, rewards or incentives, and process improvement tools generally perceived them to be effective. In particular, youth programs found strategic planning and performance measurement to be the most effective tools. These findings were similar to those for roads agencies. However, in contrast to the roads agencies, nearly all (95%) of the youth organizations perceived feedback from citizens to be beneficial.
 3. Youth organizations that were early adopters of individual RBM tools were more likely to perceive the tools as effective when compared to recent adopters. This was in contrast to the findings for roads agencies, where duration generally had no effect.
 4. In the large majority (88%) of youth services organizations, targets were negotiated between employees and managers, and a slight majority (58%) of youth organizations review the targets on a regular basis. When there was a failure to meet the target, additional training (62%) was the most likely effort employed to address the shortcoming, followed by changes regarding budget allocations (46%) and procedural changes (42%).
 5. Youth programs using more RBM tools were more likely perceive the tools as effective, a pattern similar to that for roads agencies. In addition, the more RBM tools a youth organization had adopted, the more likely they were to view their organization as a top performer, the same findings as for roads agencies.

CHAPTER 6 : CONCLUSIONS

Chapter 6 contains three sections. The first section briefly recaps the study's main findings and how they relate to current literature. The second section contains a summary of practical implications for practitioners and working managers. The third section takes a brief retrospective look at how this study could have been designed differently, and also addresses areas for future research.

The study addressed the research question: Do results-based management tools, either separately or in combination, improve the performance of roads agencies or youth programs? Possible improvement in performance was defined in two ways, first through managers' reported perceptions of performance improvement, and then through objective measures of the agency's outputs and outcomes.

While this study examined results-based management tools collectively, it also investigated the implementation of the four major components (i.e., tools) of results-based management (RBM): strategic planning, performance measurement with target setting, incentives (rewards), and process improvement tools. The RBM tools were investigated using two different perspectives: first, how thoroughly or completely the RBM tools had been installed in the organization and, then, how long the organizations had been using the RBM tools.

Summary of Findings

The following section includes a review of notable findings regarding tool usage, as well as a subsequent discussion of findings involving the hypotheses. With 24 hypotheses

and numerous sub-hypotheses, the following discussion is grouped by the major questions as addressed by the hypotheses.

RBM Tool Usage

This study began by examining patterns of RBM tool adoption and usage. The contrast of an engineering-based program with very clear program technology and a social service program with much less clear program technology helped illuminate some similarities and differences between the two types of local organizations. Some of the major findings are reviewed below.

1. With the exception of rewards, there is little difference in RBM tool adoption when comparing roads and youth organizations. Large majorities (75% to 88%) of roads agencies had adopted three tools: strategic planning, performance measurement, and targets. Fewer reported using process improvement tools (63%) on a regular basis and considerably fewer had adopted a formal reward program (45%). Strategic planning (79%) and performance measurement (75%) were also the most frequently adopted tools by youth organizations, while slightly fewer had adopted rewards (71%) and process improvement tools (67%).
2. Youth organizations indicated that when they failed to meet a goal or target, additional training (62%) was the most likely effort employed to address the shortcoming, followed by changes in budget allocations (46%) and procedural changes (42%). By contrast, roads agencies indicated that when the organization failed to meet a goal or target, budget allocations (68%) was the most likely effort

employed to address the shortcoming, followed by changes in capital investment (60%).

3. In the majority of youth services organizations, targets were reported to be negotiated between employees and managers (88%). In contrast, in roads agencies, targets were often assigned by a manager (71%) and sometimes based upon similar jurisdictions (69%).

Usage Findings Relative to Current Literature

The findings of the current study serve to advance the extant knowledge on performance by providing a preliminary understanding of how organizations use performance information. The 2008 Minnowbrook Conference brought attention to the fact that many governments are collecting and tracking measures, but have been slow to use the information to impact decisions within the agency (Moynihan & Pandey, 2010). Thus, this dissertation introduces data about how agencies arrive at targets, how often progress toward targets is reviewed, what areas are most likely impacted by performance information, and the kinds of typical agency responses to falling short of a goal or target.

The findings of the study also supplement the current knowledge by offering an introductory idea about which RBM tools local organizations are using beyond strategic planning and performance measurement. In addition to these, the majority of organizations have also implemented process improvement tools. Notably, fewer roads agencies had adopted a formal reward program, but the difference was not as pronounced in youth programs.

RBM Tools and Perceived Effectiveness

The current study examined the perceived effectiveness of RBM tools, measured in three ways: whether managers believed each specific tool improved the organization's effectiveness; whether managers believed that the tools collectively improved the agency's performance; and, most indirectly, whether managers who implemented specific tools also believed that their organization was a top performer. Some notable findings about perceived effectiveness are reviewed below.

1. There is little difference in RBM tool adoption when comparing roads and youth organizations. The majority of both organizations use strategic planning and performance measurement with targets, while fewer have adopted formal reward systems. One difference is that roads agencies are more likely than youth programs to use process improvement tools, which is as might be expected since uniform processes are more important to an engineering-oriented roads agencies than to a social services youth organization.
2. Overall, a substantial majority of both roads and youth organizations thought that the specific RBM tools improved organizational effectiveness.
3. The more RBM tools that a roads or youth organization adopted, the more likely they were to view themselves as a top-performing organization, and the much more likely they were to believe that, collectively, management tools made their organization better.
4. In roads agencies, the completeness of each individual RBM tool was generally a significant predictor of how effective each individual RBM tool was perceived to be

at improving the organization. Tool duration, on the other hand, most commonly had little impact on the tool's perceived effectiveness in improving the organization. (Although there were far fewer cases, there did seem to be a relationship with duration and perceived effectiveness in youth organizations.)

Perceived Effectiveness Findings Compared To Current Literature

The findings of this study are consistent with what Frazier (2004) found, as his results also demonstrated a positive correlation between RBM tools and their perceived impact on organizational effectiveness. In his study, Frazier (2004) noted that, in State Revenue Agencies, process improvement tools were generally thought to be the most effective.

The current study examined two different types of local organizations, roads agencies and youth programs, and found that both perceive strategic planning and performance measurement to be the most effective RBM tools. However, roads agencies also viewed process tools very positively. The current study and its findings advance scholarly knowledge because they addressed additional service areas and incorporated composite measures; additionally, the study also investigated composite measures attempting to evaluate the individual RBM tools for completeness and duration.

RBM Tools and Objective Results

The current study also evaluated some objective performance measures and their relationship to the RBM tools. The RBM tools were compared to the objective result measures in multiple ways, looking at tool adoption, tool completeness and duration, and global measures of tool use.

As noted, there were too few responding youth organizations to examine statistically. However, some major findings for roads agencies are reviewed below.

1. While most of the t-tests results do not show a significant difference in the means of objective measures of road quality between RBM tool users and non-users for the management tools, the organizations that used process improvement teams did have a significantly higher mean than non-users.
2. Although there is not a significant difference in means between RBM tool users and non-users, the box plots seem to suggest that the presence of RBM tools help the worst performers by moving them closer to the average. One possibility is that, in a high-performing organization, there is little room for improvement.
3. How long the RBM tools have been being used by the organizations was consistently found to have no effect on either perceived or objective measures.
4. Although only process improvement tools were significantly related to an objective measure of roads agency performance, roads agency managers perceived the other RBM tools to also clearly improve agency performance. Therefore, there is a substantial gap between managerial perception and objective measures of RBM tool effectiveness that invites further research.

Objective Measures of Performance Findings Compared to Current Literature

The findings of this study are not consistent with the majority of current literature, as most previously conducted studies found there to be a positive association between management systems and objective measures of results (Boyne et al., 2006; Easton & Jarrell,

1998; Hendricks & Singhal, 1997, 2001; Ingraham et al., 2003; Meier et al., 2007; Poister et al., 2013; Rodgers & Hunter, 1991, 1992; Sun & Van Ryzin, 2012; Walker et al., 2010, 2011). Two longitudinal studies that focused exclusively in the public sector also reported tangible gains in productivity (Poister & Harris, 1997; Walker & Boyne, 2006). Moreover, most of the current literature finds a positive correlation between strategic planning and performance measurement and objective measures (Andrews et al., 2011; Boyd, 1991; Boyne & Chen, 2007; Capon et al., 1994; Cassidy & Ackah, 1997; Condly et al., 2003; Ferrari et al., 1985; Huselid, 1995; Jenkins et al., 1998; Langerak et al., 2004; Meier et al., 2010; Mento et al., 1987; Miller & Cardinal, 1994; Rynes et al., 2004; Saunderson, 2004; Schwenk & Shrader, 1993; Shea-Van Fossen et al., 2006; Tubbs, 1986).

One consistency between the current study's findings and most previous research is that the current study did find a positive relationship between process improvement tools and objective measures of performance. This finding is consistent with many previous studies (Banker et al., 1996; Ichniowski et al., 1997; Kirkman & Rosen, 1999; Walker & Boyne, 2006; Wilson & Collier, 2000; Workman & Bommer, 2004; Macduffie, 1995). Notably, however, most previous studies were conducted in the private sector, and the findings of this study therefore advance the existing knowledge because they examine the use of process improvement tools in the public sector.

The current study also investigated the use of rewards in the public sector. Until recently, nearly all prior research supported this study's hypothesis regarding the positive impact of incentives or rewards on organizational performance (Boyne & Chen, 2007; Cassidy & Ackah, 1997; Condly et al., 2003; Ferrari et al., 1985; Huselid, 1995; Jenkins et

al., 1998; Rynes et al., 2004; Saunderson, 2004). Additionally, the majority of the prior research focused on rewards in the private sector; however, in recent years a large number of public administration authors have argued that private sector studies of rewards cannot be applied to the public sector, because government employees have strong public service motivation (PSM), and are therefore much less affected by extrinsic rewards. Some public administration authors have gone further and argued that extrinsic rewards actually hurt government performance, because they “crowd out” or interfere with public service motivation (Georgellis, 2011). The current study failed to find any significant impact of rewards on objective performance. Still, the majority of respondents in organizations with a formal reward system felt that rewards had significantly improved the organization.

RBM Tools and Objective Results over Time

There was very limited data available in the current study to effectively evaluate the impact of RBM tools on performance over time. There were 38 roads agencies, and the standardized percentage improvement in performance measures over time was used as the dependent variable. Fifteen roads agencies reported multiple performance measures since 1998, but an elementary analysis of the graphs failed to reveal any patterns between RBM tools and performance over time. Therefore, there were no statistically significant findings, suggesting there is ample opportunity for future research to continue studying RBM tool use and multi-year benchmark data.

Some Practical Implications

The current study can offer several recommendations to practitioners and public managers, but the disconnection between managers' very positive perceptions and the much weaker objective measures of performance signifies that all recommendations must be tentative.

One tentative suggestion is that managers should consider implementing RBM tools. The primary reason for such a claim is that managers in high-performing organizations believe these tools have had an important positive effect on their agency, and the strong opinion of successful, experienced managers should carry weight. In addition, the box plots comparing RBM tool users and non-users indicated that the presence of the RBM tools helps the worst performers by moving them closer to the average. Managers in low-performing organizations should, therefore, consider the installing RBM tools if improving organizational performance is one of their goals.

The findings of the current study also allow the tentative suggestion that it is best to implement most or all of the RBM tools, rather than just one. For example, comparing roads agencies using 1 or 2 RBM tools with organizations using 3 or more tools revealed a potentially interesting, though not statistically significant, difference in road quality (70% versus 77%, respectively). Additionally, agencies using more RBM tools were much more likely to view themselves as a top organization and to believe that management tools, collectively, made their organization better. Hence, with these findings in mind, managers in organizations using only strategic planning and performance measurement should consider adding targets, process improvement tools, and incentives or rewards. Such organizations

could not only benefit from improved performance, but may also increase the general morale of their workplace.

If poorly performing organizations lack the resources to install RBM, as is often the case, the current study can offer another recommendation. The results of the study tied process improvement tools to perceived effectiveness, as well as to one objective measurement of high performance. Thus, managers of poorly performing organizations that are lacking resources could perhaps consider using some of the more popular process improvement tools like quality teams, flowcharts, and root cause analysis, which offer a possible way to benefit from RBM tools without a full commitment of resources.

Finally, while the use of incentives or rewards is currently a controversial topic in the public sector, the majority of respondents felt that rewards substantially improved their organization's performance. Arguably, with today's economy, a monetary reward system might not be feasible, but public managers should consider recognizing a job well-done with a non-monetary incentive or reward.

Future Research

The current study found an overwhelmingly positive perception of the effect of RBM tools among local organizations. In addition, one tool, process improvements, also seemed to improve objective results, and there was an interesting discrepancy between the managers' perceptions and the objective results for the other tools. In retrospect, two things in the current study should have been done differently:

1. *Gathering objective data earlier.* Once the research topic was chosen, the ICMA participants should have been contacted right away to solicit objective performance data, rather than rely on historically archived ICMA data. Most respondents were open to answering follow-up questions, suggesting they would have also been amenable to providing performance data, year after year, as the study unfolded. Such a change in methodology would have provided input about the usefulness of the measures ICMA collects on an annual basis, as well as enabling the inclusion of a true longitudinal approach to complement the cross-sectional analysis.
2. *Broadening the pool of the surveyed parties.* Realizing now how very little variation there was in some of the variables among the ICMA benchmark participants, it seems that a group of non-members should have been selected and contacted as well. For example, when classifying roads agencies as “high performers” based on the percentage of roads in satisfactory condition, 81% of respondents were high performers. Also, while at 8.25% the teen birth rate in the United States is the lowest birth rate in decades, still, 89% of the responding youth programs reported lower teen birth rates. Even if there was a markedly lower response rate for the non-members, the additional data they would have provided could have served as a very useful comparison during multiple points of the analysis.

Suggestions for Additional Research

If future researchers wish to build on the findings of the current study, four possible avenues seem especially promising:

1. *Investigating additional agencies.* The current study examined two local organizations, roads agencies and youth programs. The most obvious recommendation for future research, then, is to expand the scope of the programs studied by investigating other service areas in the public sector.
2. *Examining tool completeness.* Future studies could expand the “completeness” composite variables to examine other RBM tools are implemented and integrated in the organizations, similar to the way the current study took an in-depth look at performance measurement. Future surveys should include several open-ended questions when looking at completeness. The survey used in the current study, for example, asked respondents to identify a long-range, measurable goal, and having such a goal is an integral part of any strategic plan.
3. *Examining the disconnection between perceived and objective measures.* As noted several times in earlier chapters, the disconnection between managers’ high opinions of the RBM tools and the weak relationship of many of the tools to objective performance measures is puzzling. With this in mind, it would be valuable to examine the possible causes of such a disconnection in other organizations, in part by using additional objective performance measures, and in part by interviewing managers to determine the bases of their positive opinions.
4. *Determining the specifics of tool interactions.* A final opportunity for future research could be to take a closer look at how the interaction of the different RBM tools impacts performance. Frazier (2004) found that the perceived effectiveness of the individual RBM tools was enhanced when the practices were managed as a system.

Furthermore, Patton (1990) noted that “effective administration isn’t the management of the practices separately, but the management of the *interactions* of the practices. (as cited in Frazier, 2004, p. 15). The current study found that organizations with more RBM tools, or with more complete RBM tools, perceived the tools as having a greater impact on organizational effectiveness. Notably, this finding provides partial support for Frazier’s findings, but additional research could help specify which tool interactions are most important.

REFERENCES

- A Brief History of the National Performance Review*. (1997, February). Retrieved from <http://govinfo.library.unt.edu/npr/library/papers/bkgrd/brief.html>
- Alliance for Children and Families. (2010). *Alliance National Benchmarking Initiative*. (2013). Retrieved from <http://www.alliance1.org/benchmarking-about>
- Ackelsberg, R., & Arlow, P. (1985). Small businesses do plan and it pays off. *Long Range Planning*, 18(5), 61-67.
- Andrews, R., & Boyne, G. (2010). Better public services. *Public Management Review*, 12(3), 307-321.
- Andrews, R., & Boyne, G.A., Law, J., Walker, R.M. (2011). Strategy implementation and public service performance. *Administration & Society*, 43(6), 643-671.
- Ansoff, H.I. (1991). Critique of Henry Mintzberg's "The design school: Reconsidering the basic premises of strategic management." *Strategic Management Journal*, 12(6), 449-461.
- Association for Psychological Science. (n.d.). *2005 James McKeen Cattell Fellow Award: Edwin Locke*. Retrieved from <http://www.psychologicalscience.org/awards/cattell/citations/locke.cfm>
- Banker, R.D., Field, J.M., Schroeder, R.G., & Sinha, K.K. (1996). Impact of work teams on manufacturing performance: A longitudinal field study. *The Academy of Management Journal*, 39(4), 867-890.
- Barton, A.H. (1979). A diagnosis of bureaucratic maladies. *American Behavioral Scientist*, 22(5), 483-493.

- Belli, R.F., Traugott, M.W., Young, M., & McGonagle, K.A. (1999). Reducing vote overreporting in surveys: Social desirability, memory failure, and source monitoring. *The Public Opinion Quarterly*, 63(1), 90-108.
- Berman, E.M., & West, J.P. (2003). Solutions to the problem of managerial mediocrity: Moving up to excellence (Part 2). *Public Performance & Management Review*, 27(2), 30-52.
- Berman, E.M., West, J.P., & Milakovich, M.E. (1994). Implementing TQM in the states. *Spectrum: The Journal of State Government*, 67(2), 6-13.
- Boyd, B.K. (1991). Strategic planning and financial performance: A meta-analysis review. *Journal of Management Studies*, 28(4), 353-374.
- Boyne, G. (2002). Concepts and indicators of local authority performance: An evaluation of the statutory frameworks in England and Wales. *Public Money and Management*, 22(2), 17-24.
- Boyne, G.A. (2010). Performance management: Does it work? In R.M. Walker, G. A. Boyne, and G.A. Brewer (Eds.), *Public management and performance: Research directions* (pp. 207-226). Cambridge: Cambridge University Press.
- Boyne, G.A., & Chen, A.A. (2007). Performance targets and public service improvement. *Journal of Public Administration Research and Theory*, 17(3), 455-477.
- Boyne G.A., Meier, K.J., O'Toole, L.J., Jr., & Walker, R.J. (Eds.). (2006). *Public services performance: Perspectives on measurement and management*. Cambridge, MA: Cambridge University Press.

- Capon, N., Farley, J.U., & Hulbert, J.M. (1994). Strategic planning and performance: More evidence. *Journal of Management Studies*, 31(1), 105-110.
- Cassidy, E., & Ackah, C. (1997). A role for reward in organizational change? *Irish Business and Administrative Research*, 18, 52-62.
- Centers for Disease Control. (2013). Retrieved from <http://www.cdc.gov/>
- Condly, S.J., Clark, R.E., & Stolovitch, H.D. (2003). The effects of incentives on workplace performance: A meta-analytic review of research studies. *Performance Improvement Quarterly*, 16(3), 46-63.
- Cook, C., Heath, F., & Thompson, R.L. (2000). A meta-analysis of response rates in web- or internet-based surveys. *Educational and Psychological Measurement*, 60(6), 821-836.
- Cragg, P.B., & King, M. (1988). Organizational characteristics and small firms' performance revisited. *Enterprise Theory and Practice*, 13, 49-64.
- Crewson, P.E. (1995). *The public service ethic* (Unpublished doctoral dissertation). American University, Washington, DC.
- Dixit, A. (1997). Power of incentives in private versus public organizations. *American Economic Review*, 87(2), 378-382.
- Downs, A. (1967). *Inside Bureaucracy*. Boston, MA: Little, Brown.
- Drucker, P.F. (1955). *Practice of management*. London: William Heinemann Ltd.
- Easton, G.S., & Jarrell, S.L. (1998). The effects of total quality management on corporate performance: An empirical investigation. *Journal of Business*, 71(2), 253-307.
- Ferrari, J.R., Barone, R.C., Jason, L.A., & Rose, T. (1985). The use of incentives to increase blood donations. *The Journal of Social Psychology*, 125, 791-793.

- Folz, D.H., Abdelrazek, R., & Chung, Y. (2009). The adoption, use, and impacts of performance measures in medium-size cities: Progress toward performance management. *Public Performance & Management Review*, 33, 1, 63-87.
- Francois, P. (2000). "Public service motivation" as an argument for government provision. *Journal of Public Economics*, 78(3), 275-299.
- Frazier, A. (2004). *Employee perceptions of the deployment and effectiveness of management practices in eight state revenue agencies* (Unpublished doctoral dissertation). North Carolina State University, Raleigh, NC.
- Frazier, A. (2008). The significance of the hard framework on agency performance. *Public Performance & Management Review*, 32(1), 76-102.
- Frazier, A., & Swiss, J.E. (2008). Contrasting views of results-based management tools from different organizational levels. *International Public Management Journal*, 11(2), 214-234.
- Fryer, R.G. (2011). *Teacher incentives and student achievement: Evidence from New York City public schools*. (Working Paper No. 16850). Cambridge, MA: National Bureau of Economic Research. Retrieved from www.nber.org/papers/w16850
- Gable, M., & Topol, M.T. (1987). Job satisfaction and Machiavellian orientation among agency store executives. *Psychological Reports*, 60, 211-216.
- Gardner, P.L. (1975). Scales and statistics. *Review of Educational Research*, 45, 43-57.
- Garson, G.D. (2010). *Multiple correlation and regression*. Retrieved from North Carolina State University website: <http://faculty.chass.ncsu.edu/garson/PA765/regress.txt>

- Garson, G.D. (2011). *Statnotes: Topics in multivariate analysis*. Asheboro , NC: Statistical Associates Publishing. Retrieved from <http://www.statisticalassociates.com/booklist.html>
- Garson, G.D. (2012). *Testing statistical assumptions*. Asheboro, NC: Statistical Associates Publishing. Retrieved from <http://www.statisticalassociates.com/assumptions.pdf>
- Garson, G.D. (2013). *Scales and measures*. Asheboro, NC: Statistical Associates Publishing.
- Georgellis, Y., Iossa, E., & Tabvuma, V. (2011). Crowding out intrinsic motivation in the public sector. *Journal of Public Administration Research and Theory*, 21(3), 473-493.
- Gilmour, J.B., & Lewi, D.E. (2006). Does performance budgeting work? An examination of the Office of Management and Budget's PART Scores. *Public Administration Review*, 66(5), 742–752.
- Grant, A., & Singh, J. (2011, Mar. 30). *The problem with financial incentives—and what to do about it*. Retrieved from the University of Pennsylvania at Wharton website: <http://knowledge.wharton.upenn.edu/article/the-problem-with-financial-incentives-and-what-to-do-about-it/>
- Grant, P. (2011). How the declining marginal utility of rewards accentuates MR-MC divergence at profit optimization. *Journal of Leadership, Accountability & Ethics*, 8(5), 91-102.
- Gueorguieva, V., Accius, J., Apaza, C., Bennett, L., Brownley, C., Cronin, S., & Preechyanud, P. (2009). The Program Assessment Rating Tool and the Government Performance and Results Act: Evaluating conflicts and disconnections. *The American Review of Public Administration*, 39(3), 225-245.

- Hackman, J.R., & Oldham, G.R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Hartman, R.W., & Weber, A.R. (1980). *The rewards of public service: Compensating top federal officials*. Washington, DC: Brookings Institution.
- Hatton, M., & Schroeder, K. (2007). Results-Based Management: Friend or Foe? *Development in Practice, 17*(3), 426-432.
- Hendrick, R. (2003) Strategic planning environment, process, and performance in public agencies: A comparative study of departments in Milwaukee. *Journal of Public Administration Research and Theory, 13*(4), 491–519.
- Hendricks, K.B., & Singhal, V.R. (1997). Does implementing an effective TQM Program actually improve operating performance? *Management Science, 43*(9), 1258-1274.
- Hendricks, K.B., & Singhal, V.R. (2001). The long-run stock price performance of firms with effective TQM programs. *Management Science, 47*(3), 359-368.
- History of the National Partnership for Reinventing Government Accomplishments, 1993 – 2000: A Summary*. (2001, Jan. 12). Retrieved from <http://govinfo.library.unt.edu/npr/howeare/appendixf.html>
- Hernon, P. (1998). Government on the web: A comparison between the United States and New Zealand. *Government Information Quarterly, 15*(4), 419-443.
- Huselid, M.A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *The Academy of Management Journal, 38*(3), 635-672.

- Hyndman, N., & Eden, R. (2001) Rational, management, performance targets and executive agencies: Views from agency Chief Executives in Northern Ireland. *Public Administration*, 79(3), 579-598.
- Ichniowski, C., Shaw, K., & Prennushi, G. (1997). The effects of human resource management practices on productivity: A study of steel finishing lines. *The American Economic Review*, 87(3), 291-313.
- Ingraham, P.W., Joyce, P.G., Donahue, A.K. (2003). *Government performance: Why management matters*. Baltimore, MD: Johns Hopkins University Press.
- Jenkins, G.D., Jr., Mitra, A., Gupta, N., & Shaw, J.D. (1998). Are financial incentives related to performance? A meta-analytic review of empirical research. *Journal of Applied Psychology*, 83(5), 777-787.
- Jennings, E.T., Jr., & Haist, M.P. (2004). Putting performance measurement in context. *The Art of Governance: Analyzing Management and Administration*. Washington, DC: Georgetown University Press.
- Joyce, P.G. (2011). The Obama Administration and PBB: Building on the Legacy of Federal Performance-Informed Budgeting? *Public Administration Review*, 71(3), 356-367.
- Jurkiewicz, C.L., Massey, T.K., & Brown, R.G. (1998). Motivation in public and private organizations: A comparative study. *Public Productivity & Management Review*, 21(3), 230-250.
- Kallmann, E.J., & Shapiro, H.J. (1978). The motor freight industry-A case against planning. *Long Range Planning*, 11, 81-86.

- Kaplowitz, M.D., Hadlock, T.D., & Levine, R. (2004). A comparison of web and mail survey response rates. *Public Opinion Quarterly*, 68(1), 94-101.
- Katz, D., & Kahn, R.L. (1978). *The social psychology of organizations* (2nd ed.). New York, NY: John Wiley and Sons.
- Katz, H.C., Kochan, T.A., & Keefe, J.H. (1987). Industrial relations and productivity in the U.S. automobile industry. *Brookings Papers on Economic Activity*, 3, 685-727.
Retrieved from <http://digitalcommons.ilr.cornell.edu/articles/12/>
- Kelly, J.M., & Swindell, D. (2002). A multiple-indicator approach to municipal service evaluation: Correlating performance measurement and citizen satisfaction across jurisdictions. *Public Administration Review*, 62(5), 610-620.
- Khojasteh, M. (1993) Motivating the private vs. public sector managers. *Public Personnel Management*, 22(3), 391-401.
- Kilpatrick, F.P., Cummings, M.C., & Jennings, M.K. (1964). *The image of the federal service*. Washington, DC: Brookings Institution.
- Kirkman, B.L., & Rosen, B. (1999). Beyond self-management: Antecedents and consequences of team empowerment. *Academy of Management Journal*, 42(1), 58-74.
- Kopelman, R.E., Gardberg, N.A., & Brandwein, A.C. (2011). Using a recognition and reward initiative to improve service quality: A quasi-experimental field study in a public higher education institution. *Public Personnel Management*, 40(2), 133-149.
- Kotter, J.P. (1996). *Leading change*. Boston, MA: Harvard Business Press.

- Kravchuk, R.S., & Leighton, R. (1993). Implementing total quality management in the United States. *Public Productivity & Management Review*, 17(1), 71-82.
- Lan, Z., & Rainey, H.G. (1992). Goals, rules, and effectiveness in public, private, and hybrid organizations: More evidence on frequent assertions about differences. *Journal of Public Administration Research and Theory*, 2(1), 5-28.
- Langerak, F., Hultink, E.J., & Robben, H.S.J. (2004). The role of predevelopment activities in the relationship between market orientation and performance. *R&D Management*, 34(3), 295-309.
- Lawler, E.E. (1971). *Pay and organizational effectiveness: Psychological view*. New York, NY: McGraw-Hill.
- Lawler, E.E., Mohrman, S.A., & Ledford, G.E., Jr. (1995). *Creating high performance organizations*. San Francisco, CA: Jossey-Bass.
- Lerner, A.L. (1999). *A strategic planning primer for higher education* (Unpublished doctoral dissertation). California State University, Northridge, CA.
- Library of Congress, Congressional Research Service. (2004). *The Bush Administration's Program Assessment Rating Tool (PART)*. Retrieved from www.policyarchive.org/handle/10207/163
- Locke, E.A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, 3(2), 157-189.
- Locke, E.A., & Latham, G.P. (1990) *A theory of goal setting & task performance*. Englewood Cliffs, NJ: Prentice Hall,

- Locke, E.A., Shaw, K.N., Saari, L.M., & Latham, G.P. (1981). Goal setting and task performance: 1969-1980. *Psychological Bulletin*, 90(1), 125-152.
- Macduffie, J.P. (1995). Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *Industrial and Labor Relations Review*, 48(2), 197-221.
- Mani, B.G. (1995). Old wine in new bottles tastes better: A case study of TQM implementation in the IRS. *Public Administration Review*, 55(2), 147-158.
- Mason, W., & Watts, D.J. (2009). Financial incentives and the performance of crowds. *SIGKDD Explorations*, 11(2), 100-108.
- McDonald, J.H. (2009, Sep. 12). Handbook of biological statistics: Fisher's exact test of independence. Retrieved from <http://udel.edu/~mcdonald/statfishers.html>
- Meier, K.J., O'Toole, L.J., Jr., Boyne, G.A., Walker, R.M. (2007). Strategic management and the performance of public organizations: Testing venerable ideas against recent theories. *Journal of Public Administration Research and Theory*, 17(3), 357-377.
- Meier, K.J., O'Toole, L.J., Jr., Boyne, G.A., Walker, R.M., & Andrews, R. (2010). Alignment and results: Testing the interaction effects of strategy, structure, and environment from Miles and Snow. *Administration & Society*, 42(2), 160-192.
- Mento, A.J., Steel, R.P., & Karren, R.J. (1987). A meta-analytic study of the effects of goal setting on task performance: 1966-1984. *Organizational Behavior and Human Decision Processes*, 39(1), 52-83.

- Miller, C.C., & Cardinal, L.A. (1994). Strategic planning and firm performance: A synthesis of more than two decades of research. *The Academy of Management Journal*, 37(6), 1649-1665.
- Mintzberg, H. (1990). The design school: Reconsidering the basic premises of strategic management. *Strategic Management Journal*, 11(3), 171-195.
- Mitchell, T.R. (1974). Expectancy models of job satisfaction, occupational preference and effort: A theoretical, methodological, and empirical appraisal. *Psychological Bulletin*, 81(12), 1053-1077.
- Moore, D.S. (1995). *The basic practice of statistics*. New York, NY: W.H. Freeman and Company.
- Moynihan, D.P. (2006). Managing for results in state government: Evaluating a decade of reform. *Public Administration Review*, 66(1), 77-89.
- Moynihan, D.P. (2009). Through a glass darkly: Understanding the effects of performance regimes. *Public Performance & Management Review*, 32(4), 586-598.
- Moynihan, D.P., & Pandey, S.K. (2010). The big question for performance management: Why do managers use performance information? *Journal of Public Administration Research and Theory*, 20(4), 849-886.
- Orpen, C. (1985). The effects of long-range planning on small business performance: A further examination. *Journal of Small Business Management*, 23(1), 16-23.
- Osborne, D., & Gaebler, T. (1992). *Reinventing Government*. Boston, MA: Addison-Wesley Publishing.

- Ostram, E. (1973). The need for multiple indicators in measuring the output of public agencies. *Policy Studies Journal*, 2(2), 85–92.
- Parks, R.B. (1984). Linking objective and subjective measures of performance. *Public Administration Review*, 44(2), 118-127.
- Pawls, J.R., Ullrich, R.A., & Nelson, O.T. (1975). A comparison of managers entering or reentering the profit and nonprofit Sectors. *Academy of Management Journal*, 18, 616-622.
- Peel, M.J., & Bridge, J. (1998). How planning and capital budgeting improve SME performance. *Long Range Planning*, 31(6), 848-856.
- Perry, J.L., Hondeghem, A., & Wise, L.R. (2010). Revisiting the motivational bases of public service: Twenty years of research and an agenda for the future. *Public Administration Review*, 70(5), 681-690.
- Perry, J.L., & Wise, L.R. (1990). The motivational bases of public service. *Public Administration Review*, 50(3), 367-373.
- Poister, T.H., & Harris, R.H. (1996). Service delivery impacts of TQM: A preliminary investigation. *Public Productivity & Management Review*, 20(1), 84-100.
- Poister, T.H., & Harris, R.H. (1997). The impact of TQM on highway maintenance: Benefit/cost implications. *Public Administration Review*, 57(4), 294-302.
- Poister, T.H., Pasha, O.Q., & Edwards, L.H. (2013). Does performance management lead to better outcomes? Evidence from the U.S. public transit industry. *Public Administration Review*, 73(4), 625-636.

- Poister, T.H., & Streib, G. (2005). Elements of strategic planning and management in municipal government: Status after two decades. *Public Administration Review*, 65(1), 45-56.
- Powell, T.C. (1995). Total quality management as competitive advantage: A review and empirical study. *Strategic Management Journal*, 16(1), 15-37.
- Przasnyski, Z.H., & Tai, L.S. (1999). Stock market reaction to Malcolm Baldrige Quality Award announcements: Does quality pay? *Total Quality Management*, 10(3), 391-400.
- Przasnyski, Z.H., & Tai, L.S. (2002). Stock performance of Malcolm Baldrige National Quality Award winning companies. *Total Quality Management*, 13(4), 475-488.
- Radin, B.A. (2006). Performance Management and Federal Grants: Some Second Thoughts. *Conference Papers - American Political Science Association*, 1-18.
- Rainey, H.G. (1983). Public agencies and private firms: Incentive structures, goals, and individual roles. *Administration and Society*, 15(2), 207-242.
- Rainey, H.G., Pandey, S., & Bozeman, B. (1995). Research note: public and private managers' perceptions of red tape. *Public Administration Review*, 55(6), 567-574.
- Rainey, H.G., & Ryu, J.E. (2004). Framing high performance and innovativeness in government. In P.W. Ingraham & L.E. Lynn (Eds.), *The art of governance: Analyzing management and administration* (pp. 20-45). Washington, DC: Georgetown Univ. Press.
- Robinson, R.B., Jr., Logan, J.E., & Salem, M.Y. (1986). Strategic versus operational planning in small retail firms. *American Journal of Small Business*, 10(3), 7-16.

- Robinson, R.B., Jr., & Pearce, II, J.A. (1983). The impact of formalized strategic planning on financial performance in small organizations. *Strategic Management Journal*, 4(3), 197-207.
- Robinson, R.B., Jr., Pearce, J.A., II, Vozikis, G.S., & Mescon, T.S. (1984). The relationship between stage of development and small firm planning and performance. *Journal of Small Business Management*, 22(2), 45-52.
- Rodgers, R., & Hunter, J.E. (1991). Impact of management by objectives on organizational productivity. *Journal of Applied Psychology*, 76(2), 322-336.
- Rodgers, R., & Hunter, J.E. (1992). A foundation of good management practice in government: Management by objectives. *Public Administration Review*, 52(1), 27-39.
- Rothstein, H.R., Sutton, A.J., & Borenstein, M. (Eds.). (2005). *Publication bias in meta-analysis: Prevention, assessment, and adjustments*. Chichester, UK: John Wiley & Sons.
- Rynes, S.L., Gerhart, B., Minette, K.A. (2004). The importance of pay in employee motivation: Discrepancies between what people say and what they do. *Human Resource Management*, 43(4), 381-394.
- Samson, D., & Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management*, 16(3), 226 -237.
- Saunderson, R. (2004). Survey findings of the effectiveness of employee recognition in the public sector. *Public Personnel Management*, 33(3), 255-275.

- Schwenk, C.R., & Shrader, C.B. (1993). Effects of formal strategic planning on financial performance in small firms: A meta-analysis. *Entrepreneurship: Theory and Practice*, 17(3), 53-64.
- Shea-Van Fossen, R.J., Rothstein, H.R., & Korn, H.J. (2006). Thirty-five years of strategic planning and firm performance research: A meta-analysis. *Academy of Management Proceedings*, M1-M6.
- Shrader, C.B., Taylor, L., & Dalton, D.R. (1984). Strategic planning and organizational performance: A critical appraisal. *Journal of Management*, 10(2), 149-171.
- Siegel, G.B. (1983). Who is the public employee? In W.B. Eddy (Ed.), *Handbook of Organization Management* (pp. 105-144). New York, NY: Marcel Dekker.
- Siegle, D. (2010, Nov. 24). *Likert scale*. Retrieved from University of Connecticut website: <http://www.gifted.uconn.edu/siegle/research/instrument%20Reliability%20and%20Validity/Likert.html>
- Sikula, A.F. (1973a). The values and value systems of governmental executives. *Public Personnel Management*, 2, 16-22.
- Sikula, A.F. (1973b). The values and value systems of industrial personnel managers. *Public Personnel Management*, 2, 305-309.
- Simon, H.A. (1995). Organizations and markets. *Journal of Public Administration Research and Theory*, 5(3), 273-294.
- Simsek, Z., & Veiga, J.F. (2000). The electronic survey technique: An integration and assessment. *Organizational Research Methods*, 3(1), 92-114.

- Springate, S.D. (2012). The effect of sample size and bias on the reliability of estimates of error: A comparative study of Dahlberg's formula. *European Journal of Orthodontics*, 34(2), 158-163.
- Streib, G., Slotkin, B.J., & Rivera, M. (2001). Public administration research from a practitioner perspective. *Public Administration Review*, 61(5), 515-525.
- Sun, R., & Van Ryzin, G.G. (2012). Are performance management practices associated with better public outcomes? Empirical evidence from New York public schools. *The American Review of Public Administration*, 43(3). doi: 10.1177/0275074012468058
- Swiss, J.E. (1992). Adapting Total Quality Management (TQM) to government. *Public Administration Review*, 52(4), 356-362.
- Swiss, J.E. (2005). *Results-Based Management in Government*. Unpublished.
- Tabachnik, B.G., & Fidel, L.S. (2001). *Using multivariate statistics* (4th ed.). Needham Heights, MA: Allyn and Bacon.
- Tai, L.S., & Przasnyski, Z.H. (1999). Baldrige Award winners beat the S&P 500. *Quality Progress*, 32(4), 45-51.
- Thune, S.S., & House, R.J. (1970). Where long-range planning pays off. *Business Horizons*, 13(4), 81-87.
- Tienda, M., Gonzalez-Diaz, V., & Smith, S.A. (1985). Community education and differential fertility in Peru. *Canadian Studies in Population*, 12(2), 137-157.
- Thompson, J.D. (1967). *Organizations in action*. New York, NY: McGraw-Hill.
- Tubbs, M.E. (1986). Goal setting: A meta-analysis examination of the empirical evidence. *Journal of Applied Psychology*, 71(3), 474-483.

- U.S. Department of Commerce, National Institute of Standards and Technology. (2012). *Baldrige Performance Excellence Program*. Retrieved from <http://www.nist.gov/baldrige/>
- University of Wisconsin Board of Regents. (2012). *Malcolm Baldrige Award Frequently Asked Questions (FAQ)*. Retrieved from <http://www.uwstout.edu/about/mba/faq.cfm#4>
- Unni, V.K. (1981). The role of strategic planning in small businesses. *Long Range Planning*, 14(2), 54-58.
- Van Dooren, W., & Van de Walle, S. (2008). Reality is merely an illusion, albeit a persistent one: Introduction to the performance measurement symposium. *International Review of Administrative Sciences*, 74(4), 531-534.
- Walker, R.M., & Boyne, G.A. (2006). Public management reform and organizational performance: An empirical assessment of the U.K. Labour government's public service improvement strategy. *Journal of Policy Analysis and Management*, 25(2), 371-393.
- Walker, R.M., Andrews, R. Boyne, G.A., Meier, K.J., O'Toole, L.J., Jr. (2010). Wakeup call: Strategic management, network alarms, and performance. *Public Administration Review*, 70(5), 731-741.
- Walker, R.M., Damanpour, F., Devece, C.A. (2011). Management innovation and organizational performance: The mediating effect of performance management. *Journal of Public Administration Research and Theory*; 21(2), 367-386.

- Watts, L.R., & Ormsby, J.G. (1990). The effect of operational and strategic planning on small firm performance. *Journal of Small Business Strategy*, 1(2), 27-35.
- White House Office of Management and Budget. (2012). *Government Performance and Results Act of 1993*. Retrieved from <http://www.whitehouse.gov/omb/mgmt-gpra/gplaw2m>
- Wilson, D.D., & Collier, D.A. (2000). An empirical investigation of the Malcolm Baldrige National Quality Award causal model. *Decision Sciences*, 31(2), 361-383.
- Wittmer, D. (1991). Serving the people or serving for pay: Reward preferences among government, hybrid sector, and business managers. *Public Productivity & Management Review*, 14(4), 369-383.
- Workman, M., & Bommer, W. (2004). Redesigning computer call center work: A longitudinal field experiment. *Journal of Organizational Behavior*, 25(3), 317-337.

Works Consulted

- Achen, C.H. (1991). *A polychotomous linear probability model*. Berkeley, CA: Political Methodology Society.
- Baber, W.F. (1987). Privatizing public management: The Grace Commission and its critics. *Proceedings of the Academy of Political Science*, 36(3), 153-163.
- Backoff, R., Wechsler, B., & Crew, R.E., Jr. (1993). The challenge of strategic management in local government. *Public Administration Quarterly*, 17(2), 127-144.
- Bartol, K.M., & Martin, D.C. (1991). *Management*. New York, NY: McGraw-Hill.

- Berry, W.D. (1993). *Understanding regression assumptions*. Series: Quantitative applications in the social sciences (Book 92). Thousand Oaks, CA: SAGE Publications.
- Brady, R.H. (1973). MBO goes to work in the public sector. *Harvard Business Review*, 31, 65-74.
- Bryan, J.F., & Locke, E.A. (1967). Goal setting as a means of increasing motivation. *Journal of Applied Psychology*, 56, 274-277.
- Couper, M.P. (2000). Web surveys: A review of issues and approaches. *Public Opinion Quarterly*, 64(4), 464-494.
- D'Aveni, R.A. (1995). *Hyper-competitive rivalries: Competing in highly dynamic environments*. New York, NY: Free Press.
- Gargan, J.J. (1989). Strategic management in city government: Continuing the interplay of rationality and politics. In J. Rabin, G.J. Miller, & W.B. Hildreth (Eds.), *Handbook of Strategic Management* (pp. 403-423). New York, NY: Marcel Dekker.
- Grant, R.M., Shani, R., & Krishnan, R. (1994). TQM's challenge to management theory and practice. *Sloan Management Review*, 35(2), 25-35.
- Linn, A. (2011, Dec. 15). *More companies ending the year without the bonus*. Retrieved from <http://www.today.com/money/more-companies-ending-year-without-bonus-6C9677580>
- Locke, E.A. (1975). Personnel attitudes and motivation. In M.R. Rosenzweig & L.W. Porter (Eds.), *Annual review of psychology*. Palo Alto, CA: Annual Reviews.

- Locke, E.A. (1984). *Goal setting: A motivational technique that works*. Englewood Cliffs, NJ: Prentice Hall.
- Locke, E.A., & Bryan, J.F. (1968). Goal setting as a determinant of the effects of knowledge of score in performance. *American Journal of Psychology*, *81*, 398-406.
- Locke, E.A., & Bryan, J.F. (1969). The directing functions of goals in task performance. *Organizational Behavior and Human Performance*, *4*, 35-42.
- Locke, E.A., Cartledge, N., & Knerr, C.S. (1970). Studies on the relationship between satisfaction, goal setting and performance. *Organizational Behavior and Human Performance*, *5*, 135-158.
- Malek, F.V. (1974). Managing for results in the federal government. *Business Horizons*, *17*, 32-38.
- McDaniel, M.A., Hirsh, H.R., Schmidt, F.L., Raju, N.S.; & Hunter, J.E. (1986). Interpreting the results of meta-analytic research: A comment on Schmitt, Gooding, Noe, and Kirsch (1984). *Personnel Psychology*, *39*(1), 141-148.
- McGregor, D. (1960). *The human side of enterprise*. New York, NY: McGraw-Hill.
- Quinn, R.E., Faerman, S.R., Thompson, M.P., & McGrath, M.R. (1996). *Becoming a master manager: A competency framework*. New York, NY: John Wiley & Sons.
- Rainey, H.G., & Bozeman, B. (2000). Comparing public and private organizations: Empirical research and the power of the A Priori. *Journal of Public Administration Research and Theory*, *10*(2), 447-470.
- Stedry, A.C., & Kay, E. (1966). *The effects of goal difficulty on performance*. Crontonville, NY: General Electric Co. Behavioral Research Service.

Streib, G. (1992). Applying strategic decision making in local government. *Public Productivity and Management Review*, 15(3), 341-355.

U.S. Department of Commerce, National Institute of Standards and Technology. (1999). *Baldrige Stock Study 2001: Results of 1990-1999 Baldrige Award Recipients 10-Year Common Stock Comparison*. Retrieved from http://www.nist.gov/public_affairs/factsheet/stockstudy2001.cfm

Zander, A., & Newcomb, T.T., Jr. (1967). Group levels of aspiration in United Fund campaign. *Journal of Personal Social Psychology*, 6(2), 157-162.

APPENDICES

Appendix A: Surveys and Coding Sheet

Highway and Road Division Survey

General Information

1. Please complete the following information. All responses and results will be kept confidential.

Name: _____

Position: _____

City, State, Zip: _____

Email: _____

(Your email address will only be used by myself if there is a follow-up question and will never be shared or sold.)

Strategic Planning

2. Some agencies participate in formalized strategic planning efforts. When did your organization first establish a strategic plan? Please mark 'N/A' if this does not apply to your organization.

(Strategic planning involves a systematic analysis of an organization's objectives for the next 3 to 5 years and sets several important, specific goals or results to be achieved)

N/A – my organization does not have a formal strategic plan

approximately 1-2 years ago

approximately 3-5 years ago

approximately 6-9 years ago

approximately 10 or more years ago

3. What would one of the organization's long range goals be?

4. Some agencies participate in a systematic analysis of itself and its environment as part of its strategic planning process. When did your organization first conduct such an analysis? Please mark 'N/A' if this does not apply to your organization.

(For example, one commonly used type of analysis is a SWOT analysis. An organization scans the external environment for opportunities and threats and looks internally at its strengths and weaknesses.)

- N/A – my organization does not include such an analysis as part of this process
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

5. If your organization uses strategic planning, please indicate your agreement with the following statement:

Strategic planning has substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

Performance Measurement and Targets

6. Some agencies track quantitative measures of road quality. Please check the approximate year your organization started tracking quantitative measures of road quality, or mark 'N/A' if this does not apply to your organization.

(Examples of quantitative measures of road quality could include: average time

to repair a pothole, average time to repair a signal or measures of pavement smoothness)

- N/A – my organization does not track measures of road quality
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

7. Quantitative measures of road quality have affected internal organization decisions in which of the following areas? (Please check all that apply)

- Budget allocations
- Training
- Procedure changes
- Staffing
- Rewards (for example, bonuses and promotions)
- Other _____
- N/A

8. Some agencies use information about road quality when making internal decisions about staffing, training, the budget or other areas. When did performance measures of road quality start affecting internal decisions? Please mark 'N/A' if this does not apply to your organization.

- N/A – performance measures do not affect internal decisions
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

9. If you do use measures of road quality, please indicate your agreement with the following statement:

Measuring road quality has substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

10. Some agencies combine performance measures with numerical targets, also called numerical goals or objectives. When did your organization first measure progress toward the target or goals for road quality? Please mark 'N/A' if this does not apply to your organization.

Examples of targets would be: 'Maintain 85% or more of our roads in a satisfactory or better condition' or 'Reduce citizen complaints by 50%'.

- N/A – my organization does not use numerical goals or targets for road quality
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

11. If your organization fails to meet targets or goals for road quality which areas are you likely to use to refocus efforts? (check all that apply);

- N/A – my organization does not use numerical targets
- budget allocation
- additional training
- personnel decision
- procedural changes
- community outreach
- capital investment
- incentive programs
- other _____

12. If you do use targets, please indicate your agreement with the following statement:

Numerical targets have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

13. Some agencies conduct citizen satisfaction surveys. When did your agency begin conducting such surveys? Please mark 'N/A' if this does not apply to your agency.

- N/A – my agency does not use citizen satisfaction surveys
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

14. Some agencies collect information from citizen complaints. When did your agency begin collecting such information? Please mark 'N/A' if this does not apply to your agency.

- N/A – my agency does not look at citizen complaints
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

15. If your agency looks at feedback from citizens (either complaints or surveys), please indicate your agreement with the following statement:

Feedback from citizens has substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

16. Some agencies conduct citizen satisfaction surveys. When did your agency begin conducting such surveys? Please mark 'N/A' if this does not apply to your agency.

- N/A – my agency does not use citizen satisfaction surveys
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

17. Some agencies collect information from citizen complaints. When did your agency begin collecting such information? Please mark 'N/A' if this does not apply to your agency.

- N/A – my agency does not look at citizen complaints
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- approximately 10 or more years ago

18. If your agency looks at feedback from citizens (either complaints or surveys), please indicate your agreement with the following statement:

Feedback from citizens has substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

19. How frequently do the following occur?

	Always	Very Often, at least every two weeks	Sometimes	Rarely	Never
Measure progress toward the target or goals for road quality					
Supervisors and subordinates discuss targets					
Performance on targets affects a decision					

20. What is the basis of your targets? Please mark below.

A single target may be set while using several of these tools. For example, virtually all targets may be set through negotiation, but the negotiation may be based on a consideration of prior performance. In that case, please mark both.

	Always	Very Often	Sometimes	Often	Never
Targets are negotiated between employees and managers.					
Targets are unilaterally assigned by managers.					
Targets are based on prior performance.					
Targets are based on similar jurisdictions.					

Rewarding Performance

21. Some agencies use a reward system to recognize outstanding performance. When did your organization first use **non-monetary** rewards? (Non-monetary rewards would include celebratory dinners, time off, special parking, plaques, and other forms of recognition.)

- N/A – my organization does not use **non-monetary** rewards
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

22. Some agencies use **monetary** rewards to recognize outstanding performance. When did your organization first use rewards, such as bonuses or salary increases, to recognize outstanding performance?

- N/A - my organization does not use **monetary** rewards
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

23. If your organization uses any type of reward to recognize excellent performance, please indicate your agreement with the following statement:

Rewards have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

Process Improvement

24. Some agencies use a group of employees, especially frontline workers, brought together regularly to improve a production process – often called a quality team or a process improvement team. How long have you been using a team to improve a process within the organization? (Your organization may use a different term to describe a quality team.)

- N/A – my organization does not use such teams
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

25. How often does your organization use the process improvement tools in the following table?

	Always	Very Often, at least every two weeks	Sometimes	Rarely	Never
Root cause analysis					
Fishbone (also called cause and effect or Ishikawa charts)					
Pareto charts (also called bar chart displays)					
Flowcharts					
Process control charts					

26. If you use process improvement tools, please indicate your agreement with the following statement:

Process improvement tools (such as the ones listed above in the chart) have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

Results-based Management

27. If your organization uses **any** of the management tools we have discussed in this survey, please indicate your agreement with the following statement:

Management tools have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

28. Please indicate your agreement with the following statement:

Overall, when compared to similar agencies I view my organization as a top performer.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

29. Are there any other things we should know to better understand the role of management tools in your organization?

Thank you for taking the time to complete this survey!

Youth Services Survey

General Information

1. Please complete the following information. All responses and results will be kept confidential.

- a. Name: _____
- b. Position: _____
- c. City, State, Zip: _____
- d. Email: _____

(Your email address will only be used by myself if there is a follow-up question and will never be shared or sold)

Strategic Planning

2. Some agencies participate in formalized strategic planning efforts. When did your organization first establish a strategic plan? Please mark 'N/A' if this does not apply to your organization.

Strategic planning involves a systematic analysis of an organization's objectives for the next 3 to 5 years and sets several important, specific goals or results to be achieved

- ___ N/A – my organization does not have a formal strategic planning process
- ___ approximately 1-2 years ago
- ___ approximately 3-5 years ago
- ___ approximately 6-9 years ago
- ___ 10 or more years ago

3. What would one of the organization's long range goals be?

4. Some agencies participate in a systematic analysis of itself and its environment as part of its strategic planning process. When did your organization first conduct such an analysis? Please mark 'N/A' if this does not apply to your organization.

(For example, one commonly used type of analysis is a SWOT analysis. An organization scans the external environment for opportunities and threats and looks internally at its strengths and weaknesses.)

- N/A – my organization does not include such an analysis as part of this process
 approximately 1-2 years ago
 approximately 3-5 years ago
 approximately 6-9 years ago
 10 or more years ago

5. If your agency uses strategic planning, please indicate your agreement with the following statement:

Strategic planning has substantially improved my organization's performance.

- Strongly agree
 Agree
 Uncertain
 Disagree
 Strongly disagree

Performance Measurement and Targets

6. Some agencies track quantitative measures of program quality. Please check the approximate year your organization started tracking quantitative measures of road quality, or mark 'N/A' if this does not apply to your organization.

Examples of quantitative measures of youth services quality could include:

live

birthrates among teenage mothers, infant mortality rates among teen age mothers,

or the number of low birth weight babies born to women under the age of 18.

- N/A – my organization does not track measures of program quality
 approximately 1-2 years ago
 approximately 3-5 years ago
 approximately 6-9 years ago
 10 or more years ago

7. Quantitative measures of youth program quality have affected internal organization decisions in which of the following areas? (Please check all that apply)

- Budget allocations
- Training
- Procedure changes
- Staffing
- Rewards (for example, bonuses and promotions)
- Other _____
- N/A

8. Some agencies use information about program quality when making internal decisions about staffing, training, the budget or other areas. When did performance measures of program quality start affecting internal decisions? Please mark 'N/A' if this does not apply to your organization.

- N/A
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

9. If you do use measures of program quality, please indicate your agreement with the following statement:

Measuring youth program quality has substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

10. Some agencies combine performance measures with numerical targets, also called numerical goals or objectives. When did your organization first measure progress toward the target or goals for youth program quality? Please mark 'N/A' if this does not apply to your organization.

(Examples of targets would be, 'Counsel 85% of pregnant teenagers about pre-natal care' or 'Reduce client complaints by 50%'.)

- N/A – my organization does not use numerical goals or targets for youth program services
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

11. If your organization fails to meet targets or goals for program quality which areas are you likely to use to refocus efforts? (check all that apply);

- N/A – my organization does not use numerical targets
- budget allocation
- additional training
- personnel decision
- procedural changes
- community outreach
- capital investment
- incentive programs
- other _____

12. If you do use targets, please indicate your agreement with the following statement:

Numerical targets have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

13. Some agencies conduct citizen satisfaction surveys. When did your agency begin conducting such surveys? Please mark 'N/A' if this does not apply to your agency.

- N/A – my agency does not use client satisfaction surveys
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

14. Some agencies collect information from citizen complaints. When did your agency begin collecting such information? Please mark 'N/A' if this does not apply to your agency.

- N/A – my agency does not look at client complaints
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

15. If your agency looks at feedback from clients (either complaints or surveys), please indicate your agreement with the following statement:

Feedback from clients has substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

16. How frequently do the following occur?

	Always	Very often, at least every two weeks	Sometimes, at least every quarter	Rarely	Never
Measure progress toward the target or goals for youth program quality					
Supervisors and subordinates discuss targets					
Performance on targets affects a decision					

17. What is the basis of your targets? Please mark below.

A single target may be set while using several of these tools. For example, virtually all targets may be set through negotiation, but the negotiation may be based on a consideration of prior performance. In that case, please mark both.

	Virtually all targets	Most targets	Some targets	Few targets	No targets
Targets are negotiated between employees and managers					
Targets are unilaterally assigned by managers					
Targets are based on prior performance					
Targets are based on similar jurisdictions					

Rewarding Performance

18. Some agencies use a reward system to recognize outstanding performance. When did your organization first use **non-monetary** rewards? (Non-monetary rewards would include celebratory dinners, time off, special parking, plaques, and other forms of recognition.)

- N/A – my organization does not use **non-monetary** rewards
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

19. Some agencies use **monetary** rewards to recognize outstanding performance. When did your organization first use rewards, such as bonuses or salary increases, to recognize outstanding performance?

- N/A - my organization does not use **monetary** rewards
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

20. If your organization uses any type of reward to recognize excellent performance, please indicate your agreement with the following statement:

Rewards have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

Process Improvement

21. Some agencies use a group of employees, especially frontline workers, brought together regularly to improve a production process – often called a quality team or a process improvement team. How long have you been using a team to improve process within the organization? (Your organization may use a different term to describe a quality team.)

- N/A – my organization does not use such teams
- approximately 1-2 years ago
- approximately 3-5 years ago
- approximately 6-9 years ago
- 10 or more years ago

22. How often does your organization use the process improvement tools in the following table?

	Always	Very often, at least every two weeks	Sometimes, at least once a quarter	Rarely	Never
Root cause analysis					
Fishbone (also called cause and effect or Ishikawa charts)					
Pareto charts (also called bar chart displays)					
Flowcharts					
Process control charts					

23. If you use process improvement tools, please indicate your agreement with the following statement:

Process improvement tools (such as the ones listed above in the chart) have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

Results-based Management

24. If your organization uses **any** of the management tools we have discussed in this survey, please indicate your agreement with the following statement:

Management tools have substantially improved my organization's performance.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

25. Please indicate your agreement with the following statement:

Overall, when compared to similar agencies I view my agency as a top performer.

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

26. Are there any other things we should know to better understand the role of management tools in your organization?

Thank you for taking the time to complete this survey!

Coding Sheet for Survey Items

1. Demographic information recorded as is, no coding required

Strategic Planning

2. (SP2) N/A=0, any other response=1.
3. (SP3) valid goal=1, invalid =0, missing goal=0
4. (SP4) N/A=0, any other response=1.
5. (**PEFFSP**) DV: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2

The values for SP2-SP4 were added together for a possible score of 3 for the composite score for the variable *strategic planning completeness (SPCPM)*. If SP3 has an invalid response SP2 is recoded=0.

Performance Management

6. (PM6) N/A=0, any other response=1.
7. (PM7) no areas checked=0, one or two areas checked=1, three or more areas checked=2
8. (PM8) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.
This item's score for early versus recent implementers is not included in the composite score for performance management.
9. (**PEFFPM**) DV: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2

10. (*PM10*) N/A=0, any other response =4. Item was coded with a 4 (along with question 17) so that having a target that was unilaterally assigned by a manager was still better than not having a target at all.
11. (*PM11*) no areas checked=0, two areas checked=1, three or more areas checked=2
12. (**PEFFT**) DV: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2
13. (*PM13*) N/A=0, any other response=1.
14. (*PM14*) N/A=0, any other response=1.
15. (**PEFFF**) DV: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2
16. (*PM16A, PM16B, PM16C*) Always=4, Very often=3, Sometimes=2, Rarely=1, Never=0.
17. For the first and last items in the table: (*PM17A, PM17D*) Always=4, Very Often=3, Sometimes=2, Rarely=1, Never=0. The second item in the table: (*PM17B*) Always=-3, Very Often=-2, Sometimes=-1, Rarely=0, Never=1. This item was coded this way (along with question 10) to penalize targets being assigned unilaterally, but still give a point for having a target – which is better than not having a target at all. Item (*PM17C*) in the table: Always=0, Very Often=0, Sometimes=1, Rarely=1, Never=2.. This item was coded this way to represent that targets based on past performance are not ideal, but better than not having a target and better than unilaterally assigned targets.

The values for *PM6*, *PM7*, *PM8*, *PM10*, *P11*, *PM13*, *PM14*, *PM16A-C*, and *PM17A-D*, were added together for a total possible score of 32 for the composite score for the variable *performance management completeness (PMCMP)*.

Rewarding Performance

18. (*RP18*) N/A=0, any other response=1.

19. (*RP19*) N/A=0, any other response=1.

20. (***PEFFRP***) **DV**: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2

RP18 and *RP19* were added together for a total possible score of 2 for the composite score for the variable *rewarding performance completeness (RPCMP)*.

Process Improvement

21. (*PIT21*) N/A=0, any other response=1.

22. (*PIT22A*, *PIT22B*, *PIT22C*, *PIT22D*, *PIT22E*) The items in the table were coded:

Always=4, very often=3, Sometimes=2, Rarely=1, Never=0.

23. (***PEFFPT***) **DV**: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2

The values for *PIT21*, *PIT22A-E* were added together for a total possible score of 21 for the composite score for the variable *process improvement tool completeness (PITCMP)*.

Results-based Management

24. (*PEFF*) DV: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2

25. (*PEFFAG*) DV: Strongly agree=2, Agree=1, Uncertain=0, Disagree= -1, Strongly disagree= -2

RBM Composite Scores

In the composite score for assessing *RBM system completeness (RBMCMP)* each of the four tools was given an equal weight. Since the total possible scores on the variables *strategic planning duration (SPCMP)*, *performance management duration (PMCMP)*, *rewarding performance duration, (RPCMP)*, *process improvement tool duration (PITCMP)* ranged from 0 to 32, scores were adjusted to reflect a maximum score corresponding to a 10 – making the highest possible score for *RBM system duration (RBMCMP)* = 40.

There was also a composite score that served as a global measure of how agencies were using RBM tools. *RBM Global (RBMGLB)*, with scores ranging from 0 to 4, was made up of the independent variables *SP2*, *PM6*, *PM10*, *R18*, *R19* and *PIT21*. Variables *SP2* and *PIT21* were scored either 0 or 1 and variables *PM6*, *PM10*, *R18* and *R19* were given a score of 0 or 0.5 in order to give equal weights to the RBM tools in the composite score.

Early versus Recent Implementers

Several of the items above were coded to look at RBM tool duration and performance.

(*SP1*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2

(*SP3*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2

The above variables were combined to form the composite (*SPDUR*) for a total possible score of 4.

(*PM1*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.

(*PM3*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2. (*PM6*)

N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.

(*PM7*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.

The above variables were combined to form the composite (*PMDUR*) for a total possible score of 8.

(*RP1*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.

(*RP2*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.

The above variables were combined to form the composite (*SPDUR*) for a total possible score of 4.

(*PIT1*) N/A=0, 1-2 years ago or 3-5 years ago=1, 6-9 years ago or more than 10=2.

The above variable was called (*PITDUR*) for RBM duration analysis and the total possible score was 2.

In the composite score for assessing *RBM system duration (RBMDUR)* each of the four tools was given an equal weight. Since the total possible scores on the variables *strategic planning duration (SPDUR)*, *performance management duration (PMDUR)*.

rewarding performance duration, (RPDUR), process improvement tool duration (PITDUR) ranged from 0 to 8, scores were adjusted to reflect a maximum score corresponding to a 4 – making the highest possible score for *RBM system duration (RBMDUR)* = 16.

Appendix B: ICMA Correspondence

October 11, 2011

Carolyn,

Thanks for hanging in there while CPM struggles to get through these issues

ICMA has come to an agreement on what will be provided in assisting you in your research. Once you get approval to move forward from the advisory committee, ICMA will pass on an agreement letter to be signed outlining that you will keep the data confidential, provide an article for ICMA, and the roles by each party in the survey circulation/collection.

ICMA-CPM will circulate the survey to current Center participants that submit Highways and/or Youth templates. Part of this communication will be a cover letter from ICMA stating why this research is important, and what they can hope to gain from participating. It would direct participants to communicate with you directly with questions and responses. Our role will be to introduce the topic and e-mail the communication you provide to CPM. We reserve the right to edit your communication, but our mutual goal would be to encourage the highest participation rate possible.

You requested that the survey reach all participants from 1998-present. There are many participants that were members once but no longer. As we currently have no relationship with these local governments, we would not be able to pass on your survey. However, we would be willing to come up with a list of participating jurisdictions from earlier years and leave it up to you on how or if to contact them on your own.

In order for ICMA to pass on your survey, we would need for you to draft up the communication with the objectives outlines above. Subject to our final approval, we would then pass on the message to our contacts at the local governments.

We do agree that the research could be invaluable, and are eager to help how we can. Please let us know if this arrangement is satisfactory and when you are ready to move on to the agreement and circulation of the surveys.

Corey Orlosky
Management Associate
ICMA Center for Performance Measurement™
777 N Capitol St, NE Suite 500
Washington, DC 20002
corlosky@icma.org
202-962-3693
202-962-3603 (Fax)

From: cahanaway@aol.com [<mailto:cahanaway@aol.com>]
Sent: Tuesday, October 11, 2011 9:42 AM
To: cahanaway@aol.com; Corey Orlosky
Subject: Re: CPM Data and Survey

Corey,

It has been a couple of weeks since I heard from you and I wanted to check in. Has ICMA had a chance to discuss or has made a decision about my survey? I am hoping to circulate my prospectus among my advisory committee this month, but I need an answer from ICMA before I can proceed. If there is anything I could do provide to help with the decision process - please let me know.

Best,

Carolyn Hanaway
Public Administration
North Carolina State University
Raleigh, NC

-----Original Message-----

From: cahanaway <cahanaway@aol.com>

To: corlosky <corlosky@ICMA.org>

Sent: Fri, Sep 30, 2011 4:43 pm

Subject: Re: CPM Data and Survey

Corey-

I was following up on the email I sent while you were out of the office. While ICMA contemplates circulating my survey to local roads agencies and youth programs, I wanted to provide a few additional points in favor of collecting this information.

My survey solicits information about how well local city governments integrate management practices such as strategic planning and performance measurement, it also asks questions about how measures and targets influence decisions within the agency. This will allow the research to drill deeply into how the performance information collected is being used by public managers. A consensus of The Minnowbrook Conference in 2008 was that use of performance information was one of the most important, yet understudied areas of performance management in the public sector. In a recent issue of The Journal of Public Administration Research and Theory (October, 2010), Donald Moynihan and Sonjay Pandey state "Governments have devoted large amounts of resources into implementing performance management systems, but have not yet discovered how to use the information". This survey will provide answers to some of these questions and ICMA will then be able to disseminate the information to city managers.

Thank you again for considering this effort and please let me know if I can be of further assistance or answer any additional questions.

Best,

Carolyn Hanaway
Public Administration
North Carolina State University
Raleigh, NC

-----Original Message-----

From: cahanaway <cahanaway@aol.com>

To: corlosky <corlosky@ICMA.org>

Sent: Fri, Sep 16, 2011 12:50 pm

Subject: CPM Data and Survey

Corey,

Thank you for your timely reply. Hopefully I can address your concerns.

1. I never signed an agreement, but verbally committed to keeping all data confidential. I would be happy to sign a confidentiality agreement if needed.
2. As for circulating the survey, I would like to circulate it as soon as possible. I am trying to complete my dissertation in the next 18 months or so. The few things that have to happen before I could circulate the survey:
 - ICMA-CPM would agree to support my effort as soon as possible
 - Submission of these surveys to the North Carolina State University Institutional Review Board for approval (September 2011)
 - My defense of this prospectus in front of my advisory committee (October 2011)
 - Circulation of the surveys (November 2011)
3. I would gladly draft an article for ICMA, in fact I had already verbally agreed to write an article summarizing my findings.
4. Actually, I am most interested in aggregate data and trends. I have no use for the specific names of the jurisdictions in my dissertation - other than to match the survey responses with any performance data for statistical analysis. Once I have married the data, I plan to de-identify the jurisdictions. Even if I was referencing examples in the discussion of results, I would not need to include specifics about the jurisdiction.
5. When I was granted access to the CPM data, the idea was that I would select a few service areas based on the available performance measures ICMA had collected (I chose roads and youth services), and then select specific management tools to investigate in the localities based upon a comprehensive literature review (strategic planning, performance measurement, process improvement tools and incentives). The goal was to identify which management tools have the greatest impact service delivery. Since ICMA encourages and supports localities to collect performance data for benchmarking purposes, my research seemed like a perfect way to aid CPM participants in improving service delivery. At that time, ICMA had verbally committed (pending approval of my survey) to circulating a survey regarding management practices, or at least penning a cover letter introducing me and the survey to jurisdictions to encourage response, all in exchange for an article summarizing my findings. I

am asking ICMA to circulate my management survey to any of the Highway and Road Divisions and the Youth programs that submitted performance measures from 1998-present. If that is no longer an option, then I would ask ICMA to provide a cover letter introducing my (web-based) survey and requesting a response.

In a perfect world, the survey would ask jurisdictions to provide performance data from prior years - but after piloting the survey to a handful of cities in North Carolina, I decided it was better to try and keep the survey as brief as possible.

With the current economic downturn and a push for governmental accountability, these research findings will be important to city managers and public administrators. Very few public sector studies have had a longitudinal focus, and even less have compared differences between service areas, or looked at various combinations of these tools for effectiveness. It is an excellent way to put ICMA's archived data to use for ICMA's members.

If you feel it would be better to further discuss this on the telephone, I can set up a time to call or you can reach me at 919.593.6721.

Thank You,
Carolyn Hanaway
North Carolina State University
Raleigh, NC

Dated: January 9, 2013

Carolyn,

I'm writing to let you know that tomorrow is my last day with ICMA. As such, I won't be able to be your contact for your dissertation project any longer. CPM will still assist you. I've passed on all the materials and information to my colleague Hannah Wolford (hwolford@icma.org; 202-962-3622). Please contact her when you're ready to move forward. Good luck!

Corey Orlosky

Management Associate

Center for Performance Measurement™

International City/County Management Association (ICMA)

202/962-3693

Dated: March 1, 2013

Hannah,

I understand, of course, I just received their approval. At least I will be in good shape for the upcoming timeline. Is there a April PMI?

Enjoy your weekend,

Carolyn

Sent from my mobile

On Mar 1, 2013, at 3:28 PM, Hannah Wolford <hwolford@icma.org> wrote:

I'm sorry. Even if you receive the approval, I cannot distribute the links as the language has not been updated.

From: Carol [<mailto:cahanaway@aol.com>]
Sent: Friday, March 01, 2013 3:18 PM
To: Hannah Wolford
Subject: Re: ICMA agreement

My reviewer was out sick today and working from home. The IRB office is calling her at home and said they would be right back with me.

Sent from my mobile

On Mar 1, 2013, at 3:10 PM, Hannah Wolford <hwolford@icma.org> wrote:

I am sorry, we will not have the time to finalize our newsletter if we wait for the IRB approval.

Hannah

From: Carol [<mailto:cahanaway@aol.com>]
Sent: Friday, March 01, 2013 2:27 PM
To: Hannah Wolford
Subject: Re: ICMA agreement

Hannah,

What if my approval comes thru yet today? The web surveys are updated and ready to go.

Carolyn

Sent from my mobile

On Mar 1, 2013, at 1:53 PM, Hannah Wolford <hwolford@icma.org> wrote:

Hi Carolyn,

Based on your email below, we will have to revise our distribution plan for your survey. As I mentioned previously, the deadline for final documents (which includes live links) was **March 1st**. CPM cannot wait until you receive formal approval and must pull the article.

Unfortunately, now that your survey has been pushed back from late February, your proposed timeline would directly conflict CPM's data deadline. Our first priority is to our participants and CPM cannot risk confusing our participants with multiple surveys, contracts and conflicting dates. That said, we are happy to assist you with the schedule below and feel it ensures CPM can deliver its core service to our participants while assisting you with in obtaining the data you need in more appropriate and concrete timeframe.

- March 18: All completed and updated documents due to CPM, including the email to non-participants
- March 25: CPM distributes the survey via email to our primary coordinators and posts a spotlight to our website.
- April 15: Survey closes. While that is up to you, I believe that is the time frame you are proposing.

I have also attached a revised version of the cover letter, as we found some of the language to be misleading. Please change "The ICMA Center for Performance Measurement™ is conducting a research project in conjunction with Carolyn Hanaway..." to "The ICMA Center for Performance Measurement™ is assisting a research project conducted by Carolyn Hanaway..." anywhere where it appears (the cover letter and within the survey itself), as CPM is not conducting any of the research. Additionally, we feel providing only your name and contact information will provide clarity for survey takers, as CPM will not field questions related your survey but forward you any email that comes to us.

Beginning in early April, CPM will be heavily focused on data collection, cleaning and analysis. It will be very difficult for us to re-tool a timeline if your survey is further delayed. We understand that the IRB review is largely out of your hands, but appreciate your understanding as we balance our work with you on this project to the commitments we've made to our participants.

I am glad to speak with you directly about the schedule or answer any questions.

Regards,
Hannah Wolford
Analyst
Center for Performance Measurement

202 962 3622
202 962 3500 fax
hwolford@icma.org

Dated: March 26, 2013

Hello Carolyn,

I wanted to provide an update on the release of your email and website spotlight. As you can see below, yesterday your email went out to 231 PCs. I have also posted your website copy to our website as a spotlight, with an article attached. I have provided screenshots below. Please let me know if you need anything else. Also, please send me the date the surveys will close so I know when the spotlight needs to be removed.

Delivery Summary

Title	Research Project
Message Type	Outreach
Site	CENTER FOR PERFORMANCE MANAGEMENT
Scheduled By	Nikiah Wade
Send Time	03/25/2013 02:00 PM (ET)
Email Completed	03/25/2013 02:00 PM (ET)
Selected Contacts	231 Successfully reached 231 (100%)
Languages	English*

Thanks,

Hannah Wolford
Analyst

Center for Performance Measurement

202 962 3622
202 962 3500 fax
hwolford@icma.org

Dated: April 8, 2013

Carolyn,

I'm sorry. I am unable to send out another mass email. Hopefully you will get more respondents this week.

Hannah

From: cahanaway@aol.com [<mailto:cahanaway@aol.com>]

Sent: Monday, April 08, 2013 10:40 AM

To: Hannah Wolford

Subject: Re: CPM Email and Website

Hannah,

I have been reviewing the survey responses. For the road survey, only about 35 of the 231 PC's have opened the survey and many of them have not finished it. For the youth services survey, only about 20 of the PC's have opened it and 9 have finished it.

Can you send out an email letting the PC's know that the survey will close on Saturday? I can draft up something simple. Let me know.

Best,

Carolyn

Appendix C: Hypotheses

Perceived Effectiveness of RBM Tools

Hypotheses 1(a,b), 2(a,b), 3(a,b), and 4(a,b) addressed the completeness and duration of the individual RBM tools: strategic planning, performance measurement, incentives (rewards), and process improvement tools, and investigated the possible impact of each specific RBM tool on that tool's perceived effectiveness.

Hypothesis 1: Strategic planning has a positive impact on the organization's perceived effectiveness.

H1a: Strategic planning completeness has a positive impact on the perceived effectiveness of strategic planning.

H1b: Strategic planning duration has a positive impact on the perceived effectiveness of strategic planning.

Hypothesis 2: Performance measurement has a positive impact on the organization's perceived effectiveness.

H2a: Performance measurement completeness has a positive impact on the perceived effectiveness of strategic planning.

H2b: Performance measurement duration has a positive impact on the perceived effectiveness of strategic planning.

Hypothesis 3: Rewards have a positive impact on the organization's perceived effectiveness.

H3a: Rewards completeness has a positive impact on the perceived effectiveness of strategic planning.

H3b: Rewards duration has a positive impact on the perceived effectiveness of strategic planning.

Hypothesis 4: Process improvement tools have a positive impact on the organization's perceived effectiveness.

H4a: Process improvement tool completeness has a positive impact on the perceived effectiveness of strategic planning.

H4b: Process improvement tool duration has a positive impact on the perceived effectiveness of strategic planning.

Completeness and Duration of RBM Tools

Hypothesis 5: Individual RBM tool completeness increases the overall perceived effectiveness of management tools.

Hypothesis 6: Individual RBM tool duration increases the overall perceived effectiveness of management tools.

Hypothesis 7: RBM tool completeness increases the organization's perceived effectiveness relative to other organizations.

Hypothesis 8: RBM tool duration increases the organization's perceived effectiveness relative to other organizations.

Using a Global RBM Measure

Hypothesis 9: The more RBM tools an organization uses, the greater the perceived overall effectiveness of RBM.

Hypothesis 10: The more RBM tools an organization uses, the greater the organization's perceived effectiveness relative to other organizations.

RBM Tools and Performance Measures

Hypothesis 11: Roads agencies with RBM tools perform better in objective performance measures.

H11a: Roads agencies with strategic planning have a higher percentage of roads that are graded satisfactory or better.

H11b: Roads agencies with strategic planning have a lower average pothole repair time.

H11c: Roads agencies with strategic planning have a lower percentage of dissatisfied citizens.

H11d: Roads agencies with performance measurement have a higher percentage of roads that are graded satisfactory or better.

H11e: Roads agencies with performance measurement have a lower average pothole repair time.

H11f: Roads agencies with performance measurement have a lower percentage of dissatisfied drivers.

H11g: Roads agencies with targets have a higher percentage of roads that are graded satisfactory or better.

H11h: Roads agencies with targets have a lower average pothole repair time.

H11i: Roads agencies with targets have a lower percentage of dissatisfied drivers.

H11j: Roads agencies with rewards have a higher percentage of roads that are graded satisfactory or better.

H11k: Roads agencies with rewards have a lower average pothole repair time.

H11l: Roads agencies with rewards have a lower percentage of dissatisfied drivers.

H11m: Roads agencies with process improvement tools have a higher percentage of roads that are graded satisfactory or better.

H11n: Roads agencies with process improvement tools have a lower average pothole repair time.

H11o: Roads agencies with process improvement tools have a lower percentage of dissatisfied drivers.

Early versus Recent Adopters

Hypothesis 12: Roads agencies that were early adopters of RBM tools perform better in objective performance measures.

H12a: Roads agencies that were early adopters of strategic planning have a higher percentage of roads that are graded satisfactory or better.

H12b: Roads agencies that were early adopters of strategic planning have a lower average pothole repair time.

H12c: Roads agencies that were early adopters of strategic planning have a lower percentage of dissatisfied citizens.

H12d: Roads agencies that were early adopters of performance measurement have a higher percentage of roads that are graded satisfactory or better.

H12e: Roads agencies that were early adopters of performance measurement have a lower average pothole repair time.

H12f: Roads agencies that were early adopters of performance measurement have a lower percentage of dissatisfied drivers.

H12g: Roads agencies that were early adopters of targets have a higher percentage of roads that are graded satisfactory or better.

H12h: Roads agencies that were early adopters of targets have a lower average pothole repair time.

H12i: Roads agencies that were early adopters of targets have a lower percentage of dissatisfied drivers.

H12j: Roads agencies that were early adopters of rewards have a higher percentage of roads that are graded satisfactory or better.

H12k: Roads agencies that were early adopters of rewards have a lower average pothole repair time.

H12l: Roads agencies that were early adopters of rewards have a lower percentage of dissatisfied drivers.

H12m: Roads agencies that were early adopters of process improvement tools have a higher percentage of roads that are graded satisfactory or better.

H12n: Roads agencies that were early adopters of process improvement tools have a lower average pothole repair time.

H12o: Roads agencies that were early adopters of process improvement tools have a lower percentage of dissatisfied drivers.

Objective Measures and Youth Agencies

Hypothesis 13: Youth agencies with RBM tools perform better in objective performance measures.

H13a: Youth programs with strategic planning have a lower teen birth rate

H13b: Youth programs with strategic planning have a lower rate of low birth weight babies born to teen moms.

H13c: Youth programs with strategic planning have a lower rate of infant mortality among teen moms.

H13d: Youth programs with performance measurement have a lower teen birth rate

H13e: Youth programs with performance measurement have a lower rate of low birth weight babies born to teen moms.

H13f: Youth programs with performance measurement have a lower rate of infant mortality among teen moms.

H13g: Youth programs with targets have a lower teen birth rate.

H13h: Youth programs with targets have a lower rate of low birth weight babies born to teen moms.

H13i: Youth programs with targets have a lower rate of infant mortality among teen moms.

H13j: Youth programs with rewards have a lower teen birth rate

H13k: Youth programs with rewards have a lower rate of low birth weight babies born to teen moms.

H13l: Youth programs with rewards have a lower rate of infant mortality among teen moms.

H13m: Youth programs with process improvement tools have a lower teen birth rate

H13n: Youth programs with process improvement tools have a lower rate of low birth weight babies born to teen moms.

H13o: Youth programs with process improvement tools have a lower rate of infant mortality among teen moms.

Hypothesis 14: Youth agencies that were early adopters of RBM tools perform better in objective performance measures.

H14a: Youth programs that were early adopters of strategic planning have a lower teen birth rate.

H14b: Youth programs that were early adopters of strategic planning have a lower rate of low birth weight babies born to teen moms.

H14c: Youth programs that were early adopters of strategic planning have a lower rate of infant mortality among teen moms.

H14d: Youth programs that were early adopters of performance measurement have a lower teen birth rate.

H14e: Youth programs that were early adopters of performance measurement have a lower rate of low birth weight babies born to teen moms.

H14f: Youth programs that were early adopters of performance measurement have a lower rate of infant mortality among teen moms.

H14g: Youth programs that were early adopters of targets have a lower teen birth rate.

H14h: Youth programs that were early adopters of targets have a lower rate of low birth weight babies born to teen moms.

H14i: Youth programs that were early adopters of targets have a lower rate of infant mortality among teen moms.

H14j: Youth programs that were early adopters of rewards have a lower teen birth rate.

H14k: Youth programs that were early adopters of rewards have a lower rate of low birth weight babies born to teen moms.

H14l: Youth programs that were early adopters of rewards have a lower rate of infant mortality among teen moms.

H14m: Youth programs that were early adopters of process improvement tools have a lower teen birth rate.

H14n: Youth programs that were early adopters of process improvement tools have a lower rate of low birth weight babies born to teen moms.

H14o: Youth programs that were early adopters of process improvement tools have a lower rate of infant mortality among teen moms.

Composite Measures of RBM Tool Completeness and Duration

Hypothesis 15: Organizations with completely installed RBM tools (completeness) perform better on objective performance measures.

Hypothesis 16: Organizations using RBM tools longer (duration) perform better on objective performance measures.

RBM Tools and High Performers.

Hypothesis 17: Organizations with completely installed RBM tools (completeness) are high performers when compared to standards.

H17a: Roads agencies with a more complete strategic planning effort (completeness) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H17b: Roads agencies with a more complete strategic planning effort (completeness) have a lower percentage of dissatisfied citizens responding to surveys conducted within the jurisdiction when compared to standards.

H17c: Roads agencies with a more complete strategic planning effort (completeness) have a smaller average pothole repair time when compared to standards.

H17d: Roads agencies with a more complete performance measurement effort (completeness) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H17e: Roads agencies with a more complete performance measurement effort (completeness) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H17f: Roads agencies with a more complete performance measurement effort (completeness) have a smaller average pothole repair time when compared to standards.

H17g: Roads agencies with a more complete rewards effort (completeness) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H17h: Roads agencies with a more complete rewards effort (completeness) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H17i: Roads agencies with a more complete rewards effort (completeness) have a smaller average pothole repair time when compared to standards.

H17j: Roads agencies with a more complete process improvement effort (completeness) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H17k: Roads agencies with a more complete process improvement effort (completeness) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H17l: Roads agencies with a more complete process improvement effort (completeness) have a smaller average pothole repair time when compared to standards.

Hypothesis 18: Roads agencies that have been using RBM tools longer (duration) are high performers when compared to standards.

H18a: Roads agencies that have been using strategic planning longer (duration) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H18b: Roads agencies that have been using strategic planning longer (duration) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H18c: Roads agencies that have been using strategic planning longer (duration) have a smaller average pothole repair time when compared to standards.

H18d: Roads agencies that have been using performance measurement longer (duration) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H18e: Roads agencies that have been using performance measurement longer (duration) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H18f: Roads agencies that have been using performance measurement longer (duration) have a smaller average pothole repair time when compared to standards.

H18g: Roads agencies that have been using rewards longer (duration) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H18h: Roads agencies that have been using rewards longer (duration) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H18i: Roads agencies that have been using rewards longer (duration) have a smaller average pothole repair time when compared to standards.

H18j: Roads agencies that have been using process improvement tools longer (duration) have a higher percentage of roads that are graded satisfactory or better when compared to standards.

H18k: Roads agencies that have been using process improvement tools longer (duration) have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to standards.

H18l: Roads agencies that have been using process improvement tools longer (duration) have a smaller average pothole repair time when compared to standards.

Using a Global RBM Measure

Hypothesis 19: RBM has a positive impact on the organization's objective performance measures.

H19a: Roads agencies using more RBM tools have a higher percentage of roads that are graded satisfactory or better when compared to agencies using fewer RBM tools.

H19b: Roads agencies using more RBM tools have a lower percentage of dissatisfied drivers responding to surveys conducted within the jurisdiction when compared to agencies using fewer RBM tools.

H19c: Roads agencies using more RBM tools have a smaller average pothole repair time when compared to agencies using fewer RBM tools.

RBM Tools and Improved Performance

Hypothesis 20: Organizations with RBM tools see a greater improvement in road quality over time than organizations without RBM tools.

H20a: Organizations with strategic planning see a greater improvement in road quality over time.

H20b: Organizations with performance measurement see a greater improvement in road quality over time.

H20c: Organizations with targets see a greater improvement in road quality over time.

H20d: Organizations with rewards see a greater improvement in road quality over time.

H20e: Organizations with process improvement tools see a greater improvement in road quality over time.

Hypothesis 21: Organizations that were early adopters of RBM tools have a greater improvement in road quality over time than recent adopters of RBM tools.

H21a: Early adopters of strategic planning see a greater improvement in road quality over time than recent adopters.

H21b: Early adopters of performance measurement see a greater improvement in road quality over time than recent adopters.

H21c: Early adopters of targets see a greater improvement in road quality over time than recent adopters.

H21d: Early adopters of rewards see a greater improvement in road quality over time than recent adopters.

H21e: Early adopters of process improvement tools see a greater improvement in road quality over time than recent adopters.

Hypothesis 22: Organizations with more completely installed RBM tools (completeness) see a greater improvement in road quality over time than organizations without RBM tools.

Hypothesis 23: Organizations that had been using RBM tools longer (duration) saw a greater improvement in road quality over time than organizations without RBM tools.

Longitudinal Data Analysis

Hypothesis 22: Organizations performed better on objective performance measures after installing RBM tools.