Research

Environmental Scanning:
Evaluation & Recommendations to
Management

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This report summarizes information about the potential that environmental scanning activities offer the Minnesota Department of Transportation (Mn/DOT).

Environmental scanning activities help an organization to anticipate, evaluate, and prepare for situations or conditions that serve as obstacles or opportunities to move toward a future vision. Environmental scanning in its broadest sense includes marketing and strategic planning, as well as identifying emerging issues, setting priorities, monitoring the environment, interpreting information, and alerting management to the need for action.

The report highlights some issues for Mn/DOT to consider as it looks at using environmental scanning as a tool and makes specific recommendations for its incorporation.

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Environmental Scanning: Evaluation & Recommendations to Management

Final Report

Prepared by

Barbara L. Nelson
Nelson & Associates
Minneapolis Minnesota

Prepared for the

Center for Transportation Studies
University of Minnesota
Minneapolis Minnesota 55455

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Office of Research Administration
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117 University Avenue
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Executive Summary

The purpose of Environmental Scanning is to help the organization to anticipate, evaluate and prepare for situations or conditions in the external environment that could impede its ability to create its preferred future. This first round of Environmental Scanning raised several provocative questions germane to developing strategic capability in the public sector and/or certain cultures. Among the more striking:

◻ **Can management act strategically** *i.e.*, **is it willing, capable and equipped to act when its information and understanding is ahead of public opinion? For environmental scanning and other future-oriented practices to achieve their promise, management must be willing to lead even if the external and/or internal environment is not receptive.**

◻ **For environmental scanning to have legitimacy in the public sector it must have access to, or be part of a process that produces a trusted interpretation of the public's preferences about the future. Does Mn/DOT management have confidence in the results of its process?**

◻ **The embryonic nature of Mn/DOT's Strategic Management Process poses a major impediment to successful scanning because the coherence among the organization's strategies and their relationship to its goals, objectives and Minnesotan's preferences about the future has yet to be cataloged. As long as this stage of the strategic platform persists, is it possible for management to conceive the kind of hard-hitting questions about its activities that are indispensable to successful use of Environmental Scanning techniques?**

◻ **Environmental scanning is a complex and continuous activity that is conducted in several overlapping stages. As such, the focal point for the activity must have the authority, the capacity, and the credibility to bring congruity to the activity and demonstrate its relevance to the organization. Its location, the Office of Strategic Initiatives (OSI), the Office of Research Administration (ORA), or top management -- will make a difference to the "take" of its institutionalization. Key in considering this issue is to locate an enduring champion capable of ensuring its acceptance in the culture.**

This first scan's process created a great deal of value for participants and potentially, for the organization as a whole. Despite the project's rocky start participants in the process were enthusiastic about:
● the amount of learning they acquired about the organization,
● how much they learned about how to think about the future, and
● the importance of the Strategic Management Process to their assignments and the overall organization.
They urged that top management be put through the same paces.

Most importantly for the further development of the Strategic Management Process, the Environmental Scanning process made the organization's implicit strategies explicit, allowing them to be named and analyzed by participants. Making the implicit visible and specific is the crux of what propels an organization to increasingly advanced levels of strategic ability because it allows the organization to become intentional about its assumptions and to test the robustness of its actions. Therefore, the Environmental Scanning process as it is currently designed has the potential to make a crucial contribution to the advancement of Mn/DOT's strategic capability, even though it may not achieve the traditional goals of a scanning process.

If the larger questions raised above are resolved affirmatively, then scanning should be implemented and institutionalized. Its ability to contribute to a holistic development of the strategic capability of the agency should be the rationale for its continuance. To accomplish this:

- Environmental Scanning should be positioned as an activity of top management, and be championed by someone recognized as either a formal or informal leader from top management's ranks.

- Top management's responsibilities should include:
  - candid analysis of the information forwarded;
  - appropriate discussion and action based on what's been learned; and,
  - communication to the management team of insights gained into Mn/DOT's strategies and the adjustments or changes made as a result.

- Participation in Environmental Scanning should be incorporated into the development of candidates for Mn/DOT's top positions.

- The issues chosen for a scan should be "stretched" toward the future by using literature searches, and scans should be executed in a more timely manner.

- The current design that emphasizes naming and analysis of Mn/DOT's current strategies relative to the organization's mission, vision and preferred future should continue and be enhanced.

Specific suggestions for making the process design more effective are made in Chapter 6. Two important recommendations related to top management's activities are:

- Top management's review of the scan's product should build on the information forwarded to them, but concentrate on determining whether Mn/DOT's strategies are robust against the uncertainties identified in the scan.

- Management should pay special attention to circulating its findings to the Mn/DOT management team. If dissemination is well-executed it will help the organization make significant progress toward meeting its learning organization objectives.

CHAPTER 1

INTRODUCTION

The purpose of this paper is to provide information to the top management of the Minnesota Department of Transportation (Mn/DOT) so that they can make informed decisions about whether to proceed with Environmental Scanning, and if they do proceed, to determine what adjustments are likely to make the work more effective and its results more meaningful to them.

This test of Environmental Scanning was developed after various other approaches were discussed and rejected. For this reason the project was organized in a way that avoided consuming Mn/DOT's internal resources. This was accomplished by working with the University of Minnesota, bringing Mn/DOT the services of Barbara Nelson, who is the author of this report and a University-affiliated consultant with expertise in private-sector Environmental Scanning techniques and process design, and Barbara Lukermann, a prominent researcher who is a Senior Fellow at the Humphrey Institute. This arrangement was advantageous to Mn/DOT in several ways. Using a respected academic instantly created a high level of competency in both theory and practice. Besides guaranteeing a scientifically valid research design that could be easily replicated in future rounds, Mn/DOT also obtained an evaluation of the project's efficaciousness written by an outsider.

This first-round trial of Environmental Scanning came about through the efforts of the Office of Research Administration (ORA) and the Office of Strategic Initiatives (OSI). The former administers research-related projects, and the latter is charged to implement strategic- and business-planning techniques from the private sector, such as Environmental Scanning. OSI is a recent addition to Mn/DOT and was formed, in part, because an internal task force (1) recommended that Mn/DOT find a way to use business techniques to improve its results.

Soon after OSI was given the assignment, it proposed that the implementation strategy be conservative. The concern was that theories and assumptions that underlie the validity of private sector techniques might not transfer to the public sector without adjustments, and that these adjustments needed to be examined to ensure that they did not undermine the theoretical basis of each particular practice. Rather than directly implementing business practices, the

strategy proposed by OSI, and agreed to by top management, was to *adapt* business planning practices in limited "experimental" settings, and to use the findings about how well they worked to make decisions about broader implementation in the agency.

This project follows the strategy agreed upon, *i.e.*, this paper evaluates the first phase of Environmental Scanning for the purpose of determining if it's "worth the effort" and, if it is, whether or not Environmental Scanning remains theoretically sound, and if it does, how it will help to further develop the strategic capabilities of Mn/DOT. It's premise is that by making adjustments based upon what was learned, the methodology will be modified to better fit Mn/DOT's needs, *i.e.*, better contribute to its effectiveness and efficiency.

It is important to keep in mind the special circumstances around development of an Environmental Scanning process in the public sector. While it is true that the public sector operates side-by-side with the private sector in the "real world", unlike the private sector market forces are not necessarily the greatest external influence on the public sector's viability. Rather, the public sector and its processes are responsive to constituencies that are both broad and diverse, and its processes are geared to debate for the purpose of developing consensus, and lacking that, to shape compromises in the political environment. In the public sector, a process cannot survive in the long run unless it captures the trust and support of relevant constituencies and the general electorate.

Mn/DOT's efforts to build its strategic management system of necessity must be incremental and experimental, not only because it must be careful not to undermine the integrity of the practices it adapts, but because it must test each step for its appropriateness and acceptance in the public sector environment before moving forward. Under ordinary circum- stances creating an interdependent planning system requires originality in conceptualizing and theorizing; its implementation likewise demands a highly specialized set of skills. Beyond these not-so-basic requirements, the architects and builders of Mn/DOT's Strategic Manage- ment Process must also take the time to negotiate coherence among its parts, yet not sacrifice achieving its stated objectives as expeditiously as possible.

Adapting techniques across systems designed to serve differing purposes is challenging. Even attempting to discuss a method out of its original context results in confusion because it is impossible to fully communicate the context surrounding particulars to others who aren't fully conversant in the other system. Without at least a dim outline of the complete picture

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attempts to discuss putting a piece of an overall system in place, much less adaptations of a piece of a system, are endlessly confusing.

In an attempt to give management a picture that is complete enough to give them confidence in their decision about Environmental Scanning, the paper follows the logic described below.

Chapter 1 - describes the audience, purpose and organization of the project, logic of the paper, and *caveats* pertaining to development of public sector process.

Chapter 2 - describes what Environmental Scanning is, why it is used and how it functions in a fully-developed private sector Strategic Management Process. The purpose of this section is to paint enough of a picture for management to imagine what a full-blown Environmental Scanning process might look like, and how they might connect it to other pieces of a fully-developed planning system comprised of private sector practices. By understanding how Environmental Scanning would ultimately function, the questions put before management in this report can be decided based upon evaluation of results in both the short- and long-term.

Chapter 3 - describes the introduction of strategic planning in the agency, the early introduction of Environmental Scanning, and then Environmental Scanning's history within the Strategic Management Process. The steps leading up to the trial of Environmental Scanning described in this paper are contained in the Endnotes and referenced in this chapter.

Chapter 4 - begins with an overview of steps taken to complete the first scan of four issues. There follows a detailed, step-by-step analysis of the process used. In turn, each step in the sequence of the scanning process is described, its pros and cons listed, and discussion of Mn/DOT's process compared to other possible process designs is discussed. For an analysis of these other possibilities, the reader is referred to the appropriate Appendix. This sequence of description, analysis and discussion is repeated for each consecutive step of the scan until all steps in the project have been interpreted.

Chapter 5 - this section looks at the process as a whole and discusses what was learned from the interaction of the steps taken. Since OSI's assignment is to adapt private sector planning technologies for Mn/DOT's use, discussion is limited to adaptations of the variety of Environmental Scanning developed and used in the private sector. The discussion assumes that once introduced in Mn/DOT, these planning techniques will incrementally tend to become more sophisticated and integrated with each other over time.

Chapter 6 - contains the over-riding conclusions that can be drawn from experience in the first round, and recommendations for top management action. It also includes technical recommendations (tailored to Mn/DOT's specific environment) to improve the process design.

CHAPTER 2

ENVIRONMENTAL SCANNING
IN
THE PRIVATE SECTOR

As referenced earlier, OSI's *raison d'etre* is to advance and to augment the organization's current planning system using careful adaptations of cutting-edge practice from the private sector. This section attempts to clarify how Environmental Scanning techniques are used in their original context by describing a typical configuration of externally-focused planning techniques (including Environmental Scanning) in the private sector and how these mesh with strategic-, business-planning and learning organization conventions.

WHAT IS ENVIRONMENTAL SCANNING?

Environmental Scanning is a set of activities that help an organization to anticipate, evaluate and prepare for situations or conditions that could impede or enhance its ability to create its preferred future. A comprehensive definition such as this includes all marketing activities as well as strategic planning exercises, because both focus on interpreting the external environment. To avoid confusion among scanning activities from other disciplines that focus on the external environment (*e.g.*, marketing), private sector organizations often use the term "Environmental Scanning" more selectively to mean an "*issues management* approach to Environmental Scanning." An issues management approach has the advantage of easy integration with information collected from endeavors such as marketing, and is particularly suited for use in a strategic framework. This paper uses the "issues management" definition of the term, rather than its more sweeping meaning.

Environmental Scanning is practiced with the understanding that its activities mesh with the organization's ongoing planning cycle, and include:
1) Scanning the environment to identify emerging issues;
2) Setting priorities among the issues on the basis of probability, impact and timing;
3) Monitoring the selected emerging issues with information gathered from a variety of sources;
4) Interpreting the information for the purpose of identifying potential opportunities and dangers;
5) communicating issue information to appropriate levels of management;
6) Identifying "trigger points" and selecting data to monitor that will alert management to the need for action.

By painting a picture of how Environmental Scanning is used in a typical private sector application, it is hoped that the reader will be able to draw their own conclusions about useful or necessary adaptations for Mn/DOT's specific environment, and will be better able to assess the recommendations that appear in Chapter 6.

WHAT IS THE PURPOSE OF ENVIRONMENTAL SCANNING?

Forecasting trends and events is too simplistic to understand a complex environment because a great number of trends and events interact with and affect each other in ways that cannot be predetermined with any accuracy. It is a natural tendency for management to want to continue past strategies. However, there are times when it is important to consider new options, and scenario analysis is the preferred way to do analysis at the strategic level because it takes into account both complexity and uncertainty. The major utility of scenario analysis is to create effective new strategic options. Another of its benefits is identifying issues in their early developmental stage -- when they are just emerging -- giving the organization the time to frame and explore a number of responses.

Environmental Scanning also detects emerging issues, and is used to identify new, and/or fast-developing, and/or overlooked situations that could have a high degree of impact. Environmental Scanning is a less comprehensive method than the richer, more descriptive scenario method of analysis, yet it is able to be performed in an ongoing, continuous manner, so it works nicely as an adjunct between periodic scenario exercises. As with all scanning practices, distinct priorities must be established, or information overload will occur.

Environmental Scanning does not replace numbers-oriented planning, rather it supplements these analyses with perceptive, qualitative analysis. One study indicates that at least 70 companies have formal issue management groups involving full-time specialists and/or committees of managers. Arco, for example, tracks 140 separate issues.

HOW DOES ENVIRONMENTAL SCANNING WORK IN A LEARNING ORGANIZATION?

Before beginning to describe how Environmental Scanning functions in a private-sector planning process, it is important to note that Mn/DOT management, including the commis-

sioner, wish to develop Mn/DOT along the lines of a "learning organization". This adds
another wrinkle to adaptation of Environmental Scanning practices.

Planning within a learning organization is directed toward creating shared vision and
improving understanding of individual and collective assumptions about how the world works.
By enriching the individual and collective mental models of managers, they become better
equipped to take actions in the "real time" environment that strategic market management
demands (2).

WHAT ARE THE CHARACTERISTICS OF A LEARNING ORGANIZATION?
Characteristics of a learning organization were identified by Peter M. Senge in his
book, The Fifth Discipline: The Art and Practice of the Learning Organization. The five
disciplines are:
- **Personal Mastery** - the continuous personal growth and learning of individuals in the
  organization.
- **Mental Models** - deeply ingrained assumptions that influence actions.
- **Shared Vision** - a common aspiration among people in the organization.
- **Team Learning** - developing extraordinary capacities for coordinated action.
- **Systems Thinking** - a framework for seeing inter-relationships rather than things; the
  ability to see the forest *and* the trees at the same time. Systems Thinking is an
  ensemble of the other four disciplines.

When organizations embody all five disciplines, they enable individuals to orient
themselves within complex systems and grow together as a learning team. This ultimately
makes organizations more effective, and more efficient with limited resources.

Emphasizing reflective thinking about how the system will react to action(s) means that
the overall focus of these types of planning systems is conceptual, proactive thinking rather
than the shorter-term action orientation of other types of planning systems. Because of this
emphasis employees who participate in learning organization-type planning systems become
more flexible and anticipatory in their day-to-day decisions and actions. Over time,
their response to day-by-day developments reflects a more complete understanding of the
organization and its environment, and their actions become better aligned to achieving the
organization's vision. In this way, learning organizations continuously increase their ability to
create their future.

The reader should keep the requirements of both Environmental Scanning and Learning
Organizations in mind while reading the following description of private sector strategic- and
business-planning practices.

WHAT IS THE THEORETICAL JUSTIFICATION FOR ENVIRONMENTAL SCANNING?

An Environmental Scanning system that is synchronized with strategic market management practices is based on the school of thought that believes events cannot be reliably predicted far enough into the future to accurately anticipate local impacts, and that small impulses can have profound effects on a system over time (Chaos Theory). It follows that the earlier an environmental influence of interest to the organization can be identified, analyzed and a decision made about what action (if any) will impel favorable developments, the less energy the organization will have to expend to reach its objectives. It is for these reasons that both the early identification and cogent framing of issues are key features that distinguish a cost-effective Environmental Scanning process from one that is poorly focused or "stop-gap".

HOW DOES ENVIRONMENTAL SCANNING HELP AN ORGANIZATION FOCUS ON ITS STRATEGIC OBJECTIVES?

Environmental Scanning contributes directly to the strategic process private sector organizations undertake, which, in turn, defines their tactical activities. The more directly Environmental Scanning illuminates an issue's potential impact(s) on the alignment of the organization's current vision, mission and strategies, the better its potential to augment management's strategic thinking about how to most effectively and efficiently accomplish its preferred future.

Management's discussion is aided by using tools designed to bring clarity to strategy analysis, such as the one illustrated in Figure 1. The peak of the bell curve denotes when an issue has ripened and is at the height of the public agenda. Issues move up and back down the curve from left to right, depending on many factors. In general, issues gain
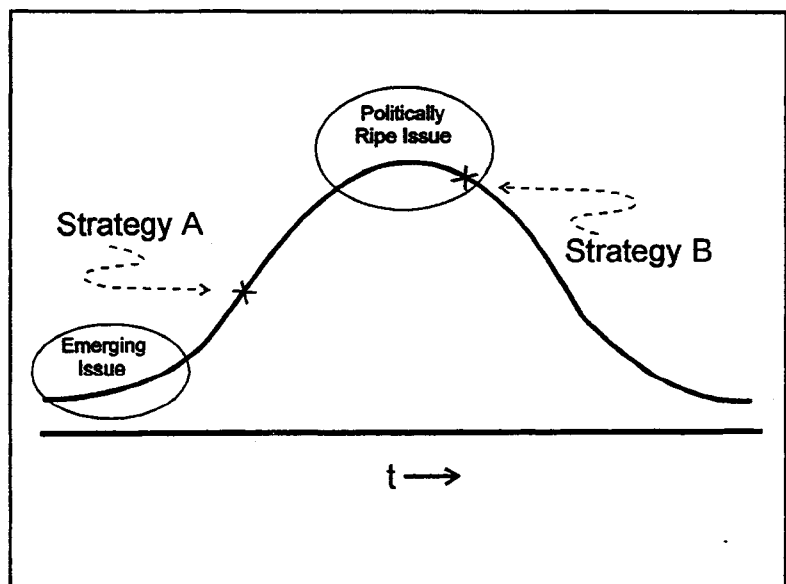

Figure 1

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definition as they gather momentum and move up on the public's agenda. Once addressed they *seem* to fade as the "solution" is implemented and constituencies move on to other concerns. However, because complexity in the environment precludes a permanent solution, issues never truly go away; they merely transform, and crystallize in a new form which eventually rises in public debate. Diagrams such as these elegantly portray the complexity of reality at a structural level and raise the intelligence of management's discourse by showing how "yesterday's solutions become today's problems."

A transportation-related example that illustrates how these diagrams work in practice appeared in George Will's column about the national speed limit (*Minneapolis Star Tribune, June 28, 1995)*. Will writes that the 55-mph national speed limit was first adopted in response to the energy crisis of 1974. When the energy crisis "went away" the national speed limit lived on, "justified as a safety measure...The speed limit issue, having been an energy issue and then a safety issue, now is a federalism-Tenth Amendment-states' rights issue, with antipaternalism in the bargain." (Although safety was a concern in 1974, it wasn't the issue's over-riding frame). The national speed limit, having once been the solution to the "energy problem" is now being defined as emblematic of "the intrusive government paternalism problem" and over-stepping the Tenth Amendment to the Constitution.

One reason this tool is particularly useful is because in order to represent management's appraisal of where the organization's strategies are located relative to the public's awareness and understanding, management must clearly articulate its strategies -- which often have unconsciously evolved over time in a piecemeal manner (3). Although it is possible that organically developed strategies will lead to the results management wants, it is more likely that the organization will be more consistently effective with a conscious, well-thought out and communicated set of stratagems than by "lucking into" desirable results in unintentional ways.

Identifying a set of its actions as its *de facto* strategy is useful to an organization in many ways. Besides providing the opportunity for debate and improvement, when the organization's strategy options are juxtaposed with the political imperatives portrayed in these diagrams management can compare current and proposed strategies in the context of their ability to bring the organization nearer to its preferred future. Moreover, diagramming issues in this way focuses discussion in on timing -- a key factor in determining the appropriateness of any

strategy as well as essential to cost-effective Environmental Scanning. As explained earlier, timing is the primary justification for spending the organization's energy on Environmental Scanning because it is assumed that the earlier one takes action the less total effort it will cost the organization to reach its goals.

HOW DOES THE USE OF ENVIRONMENTAL SCANS DIFFER FROM THE USE OF DATA GENERATED BY OTHER EXTERNALLY FOCUSED TECHNIQUES?

Unlike Environmental Scanning, which usually operates only at the policy level of organizational structure, the bulk of external information-gathering activities occur at the tactical level. Examples of information collection techniques at the tactical level include marketing research, competitive intelligence, sales force intelligence, etc. These activities are common practice in the private sector, and are defined in Endnote (4).

Managers use techniques such as these to strategize their next steps, drawing from several simultaneous perspectives and compiling the information accumulated to focus on a single task such as entering a new market or analyzing a product's attributes, etc. These activities generate data which is digested and massaged into information. The information generated from externally-focused tactical activities performed simultaneously across the organization becomes part of the grist absorbed and transformed in the organization's strategic process.

WHAT DOES ENVIRONMENTAL SCANNING LOOK LIKE IN THE PRIVATE SECTOR?

In sophisticated private sector management structures, several disciplines (each with their own techniques) operate concurrently. Management integrates the surfeit of information gathered from several externally-focused techniques that use differing conceptual frameworks with their own experience to make sense of the external environment and its changes. This use of multiple complementary perspectives gives managers a more rounded view. Indeed, expanding the scope of the application of these and other techniques from one product, to a product line, then to a business or entire Strategic Business Unit, essentially describes increasingly effective business planning practice and an increasingly informed "worldview". Each increased level of scope represents considerably more complexity in the planning

process, and corresponding increases in understanding the external environment and the effectiveness of actions proposed.

In the private sector, externally focused functions such as public relations, government relations, investor relations, strategic management, etc., usually are conducted at the organization's policy level (for example, at the top executive level of Dayton-Hudson) and may be simultaneously operating at several tactical (business) levels, for example, within operating companies (*e.g.*, Target, Meryvn's, etc.). The strategic functions (strategic *means* focused on meeting an external challenge) typically operate exclusively at the highest level of an organization unless there is a compelling reason to duplicate the function. (An example of a compelling reason might be that operating companies' milieu are completely separate and mutually exclusive.) In addition, strategic functions typically serve as internal consultants to the organization as a whole.

A comparable example from within Mn/DOT of a broad-based externally-focused activity residing at the policy level of the organization is the legislative relations function. Mn/DOT collects information about the external legislative arena using many sources throughout the organization, and the office reports directly to the commissioner because legislative strategy affects the agency as a whole, even though a number of particular bills may affect only a small part of the organization.

Another reason that Environmental Scanning is located at the strategic level is that it calls upon a set of skills that are usually latent, rather than active, in the day-to-day operations of organizations. Most externally focused tactical methodologies use convergent, reductionist methods, (*e.g.*, analysis), whereas Environmental Scanning uses divergent methods to identify and bring together bits of data across a broad spectrum, and integrative thinking methods (*e.g.*, synthesis, creativity techniques, etc.) to imagine the impacts. Individuals' innate aptitudes, learned skills, and opportunity to practice these methods of thinking varies widely, making this a consideration in both staffing the function appropriately and locating it in an area of the organization where these skills can be consciously supported, *e.g.*, in an area with similar strategic functions.

How does Environmental Scanning relate to other pieces of the private-sector planning process?

Some of what is discovered in an Environmental Scanning process has application elsewhere in the organization. One obvious place is in the analysis of opportunities and threats that is conducted piecemeal across the organization (by product, product line, business unit, etc.) as part of the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, whose conclusions then form the basis for SWOT and other analyses performed across increasingly broader levels of structure. For example, as part of strategic business planning a SWOT analysis could be performed in sequence for each product in a line of business, then by product line, then for the business as a whole. The Strategic Business Unit could also do a SWOT across its lines of businesses, building on the previous analysis, and so on, ideally, until the whole organization completes its strategic business planning cycle. What has been learned through Environmental Scanning would be "plugged in" where useful.

Secondly, some of the scan's discoveries can contribute to contingency planning. Contingency planning in its most sweeping sense refers to the entire strategic planning process, which is essentially a way to compare alternatives and choose the most robust strategies against key uncertainties, or "contingencies". The term contingency planning is also used to refer to a plan that will be put into effect should a *certain* contingency occur. Contingency planning is used in this second sense in this document.

Environmental Scanning informs contingency planning both regarding issues and timing. Continuing the previous example of SWOT analysis, a particularly relevant emerging issue discovered through an organization's ongoing Environmental Scanning might be considered in greater detail during the more comprehensive and focused planning cycle for the agency as a whole. Environmental Scanning's connection to contingency planning might occur in the following way: management compares and chooses from among their organization's strategy options to select the combination they believe will be most successful across a number of key uncertainties--some of which were previously identified in an Environmental Scan. There are times when management chooses a strategy, even though they believe it is not robust against one or more key uncertainties. This rare event triggers a contingency planning exercise. This

standard management procedure attempts to ameliorate the inherent risk of pursuing a strategy known to be insufficiently robust.

The point at which a contingency planning exercise is conducted because a strategy is not robust against a key uncertainty is the point where indeterminate uncertainties are quantified into what must be monitored to alert the organization that this eventuality is becoming more and more likely. The earlier stages of the Environmental Scan are necessarily less concrete than this phase where there are express decisions to be made based upon specific questions arising from the organization's activities. These questions must be answered based on what is learned from monitoring specified conditions that have been chosen as emblematic of a change in external conditions. When a condition reaches a certain pre-determined level it triggers management action. These levels are called "trigger points". While earlier stages of Environmental Scanning can provide an annotated bibliography of sources, these cannot substitute for the data that is required to make a specific decision at the right time.

WHAT ARE THE KEY FEATURES OF AN ENVIRONMENTAL SCANNING PROCESS?

Environmental Scanning systems are designed to serve an organization's unique planning schema, and thus they vary across organizations. However, there are three main features characteristic of scanning systems which can be distinct, or overlapping each other to varying degrees, depending on design. The three features listed below incorporate the six activities encompassed by Environmental Scanning that were listed at the beginning of this section.

1. **An ongoing process for identification and monitoring of emerging issues of significance to the organization.** The operative words are `ongoing' and `emerging'. Other techniques assess the external environment, and Environmental Scanning is meant to be focused on the far-distance, across time and current concepts. For example, the technology for fax machines was available during World War II, but its time did not come until the early 90's. There is an art to identifying the issue, choosing a forcefully convincing frame and anticipating its trajectory.

2. **A process to prioritize and analyze these issues in themselves and relative to their potential impact on the organization's ability to create its preferred future.** This process includes the mechanics of gathering information about the issue from the external

environment, and the mechanics whereby the information gathered is analyzed for its impact on the organization's preferred future.

3. **Dissemination of the information collected and the knowledge gained to those who have either a need or desire to know.** Information must be communicated in a way that is well-understood so it will be integrated into the organization's mindset and actions. If this does not occur, the information essentially doesn't exist. Although it falls outside the topic area of this paper, communication and absorption of the scan's output is as crucial as the quality of the information to be communicated.

CHAPTER 3

BACKGROUND

This section briefly describes the history of strategic planning in Mn/DOT, and in greater detail, the journey that led to implementing Environmental Scanning as part of the Strategic Management Process Mn/DOT adopted. After reading this section, the reader should be able to add another piece of the picture to the understanding gained in the previous section of how Environmental Scanning performs in an organization with a fully-developed Strategic Management Process. This next piece includes:

- an understanding of the journey Mn/DOT took to arrive at implementing Environmental Scanning, and

- the stage of strategic development from which they are launching their efforts.

INTEREST IN STRATEGIC CAPABILITY

Mn/DOT took steps to create a larger strategic capability in 1987, when a voluntary Strategic Planning Committee formed. This led to the publication of Mn/DOT's first strategic plan in 1989. A new Commissioner arrived in late 1991 and strategic planning was given a special emphasis. It was late in the winter when the task of "significantly elevating the agency's strategic capabilities" was identified. In April, the Office of Strategic Initiatives was formed to implement this directive from the Commissioner and the Deputies. The first members of a professional staff were hired by late-spring of 1992.

In May, 1992, the Strategic Management Committee (SMC) was established to lead the effort. One of its first acts was to draft an ongoing "Strategic Management Process" and to direct the OSI to implement it [see Figure 2]. The SMC reasoned that the Strategic Management Process was new to many committee members, and it wanted to gain familiarity with the theory, concepts and practice of these new technologies from the private sector so that it could make its own judgement about their usefulness. After committee members felt comfortable with the concepts they planned to delegate much of the work to staff or other members of management.

A Strategic Management Process

INTERNAL

EXTERNAL

- Tasks
- Resource/ Allocation & Priorities
- Strategic Intents
- Implementation
- Mission
- Strategic Directions
- Results
- Preferred Future
- Environmental Scanning
- Scenarios
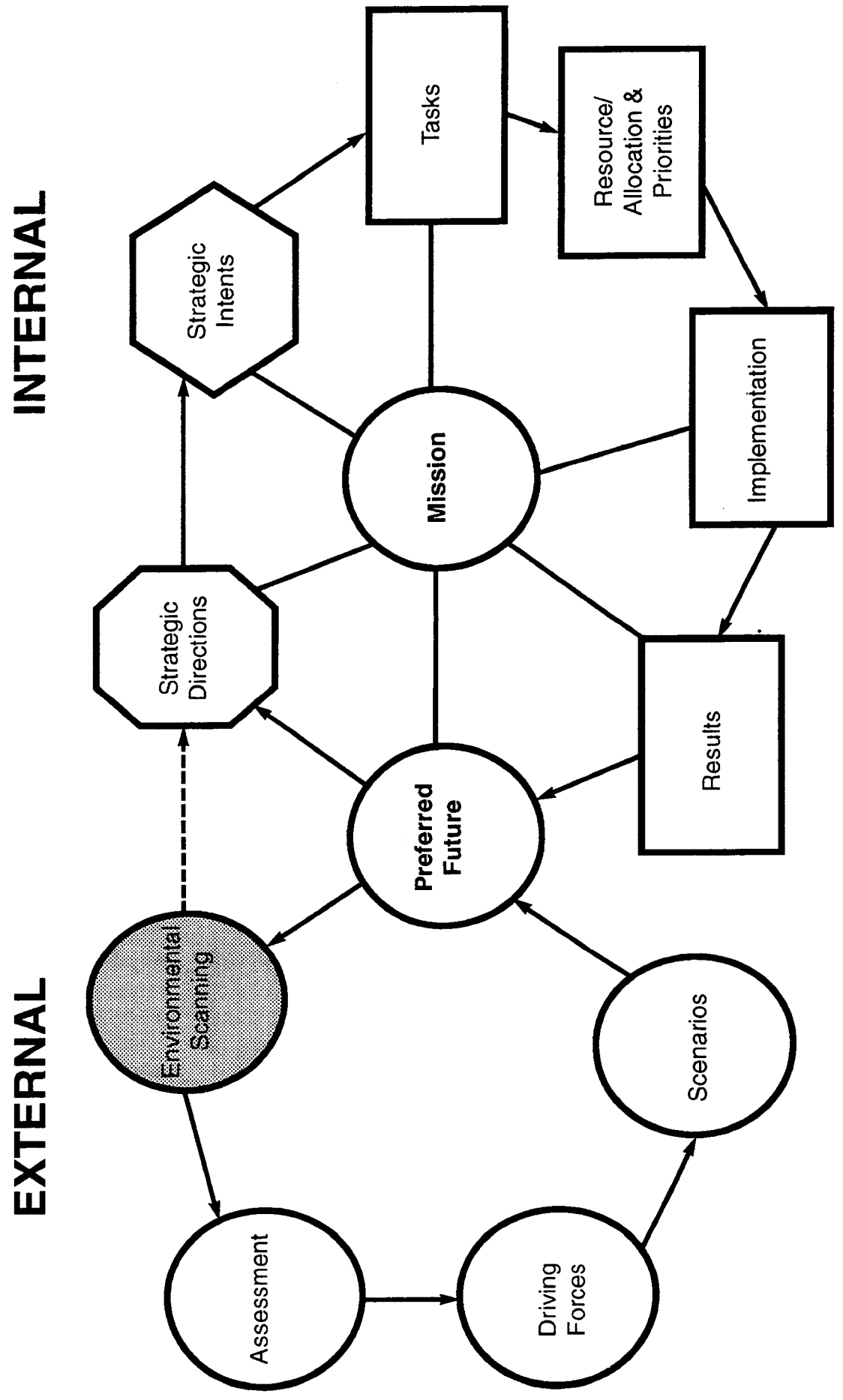- Assessment
- Driving Forces

Figure 2

As part of the committee's work on understanding private sector tools used to assess the external environment, it scheduled several presentations from an external consultant (5) about Environmental Scanning's purposes, methods, and its relationship to other elements in the strategic process. Long term, Environmental Scanning was to contribute to an ongoing strategic management process that would continuously give the agency guidance and consciously inform the choices it made.

IMPLEMENTING A STRATEGIC PROCESS

Early on, the SMC recognized that the organization was a long way from putting a full-blown, continuous strategic management process in place. A major consideration was that under the current administrative systems data was not able to be easily configured in ways that could be used for a rigorous and comprehensive numbers-oriented analysis. To bridge the gap between what existed and what was absolutely necessary to have a rudimentary strategic process operating across the organization, the SMC's strategy was to begin with putting basic data collection systems in place for strategic business planning (*i.e.*, a costing system that matched expenses to product lines, a market segmentation scheme that linked products to a comprehensive market framework, etc.). The SMC reasoned that putting an ongoing strategic process into place without the data necessary to drive informed decisions would not only be frustrating for participants, it would sabotage participants' experience of strategic business planning as a credible, reliable tool that would create results superior to those currently obtained by Mn/DOT.

In order to execute this strategy in a prudent way, the techniques of strategic management and business-planning were to be tested under limited circumstances before being promulgated organization-wide. Some of the projects that tested the utility of private-sector practices were the Pathbuilding Projects, the Sign Shop case study, etc. (6). A second element of the SMC's strategy was to concurrently begin augmenting the general management development program already in place by supplementing it with specialized training in advanced management technologies and theory about fundamental private-sector management concepts. Respective

examples of this strategy are the "Systems Thinking" training and classes in "Finance for Non-financial Managers" that were offered to key audiences.

The strategic process introduced was originally conceived to be ongoing, but once the committee recognized the amount of work necessary to collect standardized data across Mn/DOT's operations, they substituted periodic strategic reviews that could be of varying depth and effort (the first strategic review used the technique of scenario analysis and was intended to be deep. It also employed regional dialogues, a visioning conference and strategy team work). Since progress toward the Vision would not be made using business planning until a time when Mn/DOT had administrative systems in place to support business planning, the committee decided to substitute intermittent SMC solicitation of projects related to the Strategic Directions as a method to advance the organization, or some parts of it, toward the Vision and their preferred future. While this kind of programming is not nearly as focused or controlled (using the business meaning of control) as the business planning practices recommended to top management by the task force, it is consistent with the findings of research about how organizations learn effectively, and it is certainly compatible with Chaos Theory which holds that small impulses or efforts have large effects over time.

Environmental Scanning was to be implemented in this context. There was considerable discussion and several approaches to Environmental Scanning were developed, discussed and rejected by the SMC (7). The method chosen and its implementation are described and analyzed in Chapter 4.

CHAPTER 4

ANALYSIS OF ENVIRONMENTAL SCANNING

A brief overview of the work done relative to Environmental Scanning is provided in the box. The rest of the section details each step of the process and its respective pros and cons. Alternative process designs which might be used to accomplish the same step are analyzed in appendices which are referenced at the appropriate point. Lastly, the implications of the process compared to the alternatives is discussed. This sequence of description, analysis and discussion is repeated for the next step in the process until all the steps have been described and interpreted.

OVERVIEW OF WORK DONE IN THE FIRST ENVIRONMENTAL SCAN

The purpose and use of Environmental Scanning in Mn/DOT, as directed by executive management through the SMC, was early identification of issues to maintain an ongoing awareness of significant changes in the external environment. Since Mn/DOT did not have an ongoing comprehensive strategic process in place, Environmental Scanning was envisioned as a series of exercises in thinking about and interpreting the issues emerging from the external environment. Participants were to be executive management and a few others to be named later.

Borrowing information developed in the earlier in-depth strategic review that used the technique of Scenario Analysis, issues the agency needed to address were identified. Issues that arose from the scenario chosen to represent the agency's preferred future had been called Strategic Directions and were already being addressed in the mainstream Strategic Management Process. The remaining issues were derived from the non-preferred scenarios and migrated to the Environmental Scanning process. These issues were brought to the SMC for prioritization on the basis of probability, impact and timing. The top ranking four issues were given to the University's researcher and her graduate research assistant to investigate.

The researcher created a design that combined a modified Delphi approach with literature searches. The data gathered was organized into four papers in a standardized format. These papers were used by a group of Mn/DOT staffers who were convened to draw conclusions about the implications of the research for the organization, and to determine what information, if any, needed to be forwarded to top management.

- **Step 1 - Identifying, clarifying, updating and timing of the issues:**

To identify issues for Environmental Scanning, it was decided to borrow from an earlier process that had been used to create scenarios. In that process, over a period of several months, groups from across the state were brought together and an inferential reasoning

process was used to identify 10-12 forces driving change. Alternative assumptions were made about these forces, and a factor analysis conducted for 30-plus factors. The data this generated was classified thematically, and brief scenarios were constructed. All scenarios were examined for explicit and implicit issues which the agency would need to address. One scenario was chosen as a preferred future (those issues are systematically being addressed in the Strategic Management Process). Issues exclusive to the other two scenarios migrated to the Environmental Scanning process. The pros and cons of using this approach are:

Pros:

► low out-of-pocket costs
► issues known to be of concern to the public
► identification through group process educates a wider public about the issue, as well as appropriate ways to think about the future, and assures "buy-in"
► was relatively quick to get up-and-running

Cons:

► process is highly involved in coordinating people's time, collecting and storing data in retrievable ways, etc., and it is periodic (rather than continuous)
► process depends on current knowledge and intuitive and reasoning abilities of participants, and hence, does not employ sources known to be reliable sources of "virgin" information
► if not done well, the outcome may be more damaging than doing nothing

Alternatives to the process Mn/DOT used are: 1) systematic literature searches conducted by an assigned individual (either internal or external), or split among a group of individuals; 2) internal and/or external group process to identify issues from data sources (periodicals and/or individuals) outside the organization. This differs form the previous category in that it adds opinions of individuals to what is discovered from a non-systematic reading of periodicals; and 3) holding an individual responsible to identify issues using data sources (periodicals and/or individuals) outside the organization. This option creates an Environmental Scanning "guru" position, a person who is responsible to think about and network with others to identify emerging issues. Analysis of these alternatives to Step 1 is contained in Appendix A.

<u>Implications from work in Step 1</u>:

◻ *Group process is not well suited to identifying issues that are in a truly emergent state of development.*

Group process needs to be used appropriately, *i.e.*, when there is a need that it uniquely addresses, *e.g.*, to create momentum, to build consensus or to educate. When it is used indiscriminately or poorly executed, its risks far outweigh its benefits. A systematic review of literature holds more promise for identifying issues in their embryonic form as a replicable outcome. Creating a *quality* outcome (process results are replicable, process has little to no variation) at this first stage upon which all other stages build is crucial to the efficaciousness of the final outcome.

Since a group process had recently taken place and it was not difficult to "borrow" issues from it that had not yet been addressed, in this case it made sense to "bootstrap" Environmental Scanning from the scenario analysis project. This kind of pragmatic bootstrapping is unlikely to recur. If management decides to proceed with Environmental Scanning in future rounds it presumably will want to use the methods most likely to achieve success at each step.

Aside from being resource intensive and having the side-effect of creating a group dynamic that must be attended to, group process as a technique does not lend itself to reproducing repeatable results unless it is designed *and* executed with a high level of proficiency. For example, Mn/DOT used scenarios that represented the intuitive judgement of a great number of people to brainstorm the borrowed issues. The knowledge and intuitive understandings across a broad range of participants who come from various fields of expertise presumably produces a high quality product. That is, using the same process with different participants the results could be reproduced reliably and with little variability. Smaller groups and poor selection or process facilitation techniques would undermine the reliability of the design that was used. It seems unlikely that such a group could be consistently assembled for Environmental Scanning without considerable effort, and the logistical and process requirements of doing so are an unnecessary burden at this step. In general, unless participants of an inferential group process are people who are consistently aware of cutting-edge developments in their own field and others, a broad literature review holds more promise for consistent early

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identification of emerging issues, and has the added benefit of requiring fewer resources to manage it well.

Although well designed and executed group processes have the advantage of educating participants about the utility of scans and creating positive energy and momentum around an issue, they are time and resource consuming and it is likely that the education of participants could be conducted more cost-effectively. In addition, the energy and momentum that well-executed group processes create can be difficult to direct productively, and unless there is a need to create momentum at this early stage of identification, participants could become frustrated and/or misunderstood in trying to use that momentum on ambiguous issues in an early stage of development. These risks and expenses can be avoided by using literature searches to identify and monitor issues.

As argued elsewhere, the ability to achieve *early* identification of issues is the fundamental justification for spending organizational time and resources on Environmental Scanning. Therefore it is important at this point to use the technique most suited to choosing issues in an emergent stage. However, if a participatory process in place for another purpose happens to identify an emerging issue, it could be *added* to the issues identified through a literature scan as a candidate for prioritization.

Figure 3 demonstrates the practical application of a literature search. It charts the time dimension from past to future (historical to visionary) moving from bottom to top. Suggested sources for identifying issues at various stages of development are listed. If one could imagine superimposing the bell curve from Figure 1 onto Figure 3 with the peak of the curve in the area of "mass media" and "institutional response", one gets a sense of the way literature tracks the issues moving through society into our institutions. As an organization develops its strategic capability its literature reviews will move steadily toward the sources listed at the top of the column, thus targeting the earliest recorded appearance of issues in their emerging stage.

VISIONARY UNINHIBITED	-ARTISTIC, POETIC WORKS
	-SCIENCE FICTION
	-FRINGE MEDIA, UNDERGROUND PRESS
RENDERING IDEA TO SPECIFICS	-UNPUBLISHED NOTES AND SPEECHES
	-MONOGRAPHS, TREATISES
	-SCIENTIFIC, TECHNICAL, PROFESSIONAL JOURNALS
CORROBORATION OF DETAILS	-STATISTICAL DOCUMENTS
	(SOCIAL, INDICATORS, STATISTICAL SERVICES)
	-ABSTRACTING SERVICES, JOURNALS
DIFFUSION OF AN IDEA AMONG OPINION LEADERS	-DATASEARCH COMPOSITES (PREDICAST)
	-EGGHEAD JOURNALS (e.g., SCIENCE, SCIENTIFIC AMERICAN)
	-INSIDER "DOPESHEETS" (e.g., PRODUCT SAFETY LETTER)
INSTITUTIONAL RESPONSE	-POPULAR INTELLECTUAL MAGAZINES (e.g., HARPERS, ATLANTIC)
	-NETWORK COMMUNICATIONS (BULLETINS, NEWSLETTERS)
MASS MEDIA	-JOURNALS FOR THE CAUSE (e.g., CONSUMER REPORTS, ASBESTOS REPORTER)
	-GENERAL INTEREST PUBLICATIONS (e.g.,TIME, NEWSWEEK)
	-CONDENSATION OF GENERAL LITERATURE (e.g.,READER'S DIGEST)
	-POLL DATA, PUBLIC OPINION, BEHAVIORAL AND VOTER ATTITUDES
POLITICIZING THE ISSUE	-LEGISLATIVE/GOVERNMENTAL SERVICES, REPORTS
	-BOOKS
	-FICTION - NOVELS PROVIDE SOCIAL ANALYSES OF THE TIMES
	-NON-FICTION - PULL TOGETHER DISCORDANT PARTS INTO EASILY UNDERSTOOD WHOLE
INSTANTANEOUS COVERAGE FOR MASS CONSUMPTION	-NEWSPAPERS (NEW YORK TIMES & WASHINGTON POST EARLY, SOUTHERN RURAL PAPERS LATE COMMENTATORS)
	-RADIO & TELEVISION (NETWORKS COMMENT EARLIER THAN LOCAL STATIONS)
EDUCATING THE PEOPLE TO THE NEW NORM	-EDUCATION JOURNALS
HISTORICAL ANALYSIS	-HISTORICAL ANALYSES
	-TRADITIONAL DOCTORAL THESES

Figure 3 - *Source*: **Public Policy Forecast**

◨ *Due to the embryonic nature of Mn/DOT's current Strategic Management Process, achieving the clarity of intention necessary to give a scan enough definition is a major impediment.*

The conceptual framework in which an issue is defined, as well as its breadth, depth and reach, all have a great deal to do with the usefulness of its exploration. Understanding an organization's conceptual framework, *i.e.*, its goals, objectives and the expected outcomes of its current strategies, and how they are connected to creating the organization's preferred future results from having a well-developed ongoing strategic process in place. The clarity achieved from having thought through all of these connections is what allows management to formulate hard-hitting questions about its activities. Without focused questions arising directly from its activities, it is difficult to have a clear understanding of the situation that spawned the inquiry, hence it is difficult to formulate a precise question about issues or to know the goal of their discussion.

It follows that without a firm grasp of what management wants to ask, without a cogent, useful question, issues that are just emerging from the shadows are equally impossible for a researcher to frame. The researcher's task of winnowing the relevant from a plethora of data becomes hopeless. This is not to say that discussing ambiguous issues is not useful. It is meant to imply that if the organization wishes to get actionable value, as distinguished from intellectual value and/or psychological relief, from discussing such issues, it is urgent to have clear, actionable goals, to employ an artful process design, to monitor data and to follow through with action when it is warranted.

Given the embryonic nature of Mn/DOT's strategic process, its questions are less focused than would be ideal for a scanning process. Therefore, Mn/DOT must be especially clear about what it is trying to achieve using Environmental Scanning, and in order to have a *reasonable* chance of success it should use highly competent process designers and facilitators.

No matter the setting or the process used to identify the issues, the issues to be examined will be unclear in largely the same degree that the conceptual framework of management (*i.e.*, their goals, objectives and strategies to achieve them) is obscure. The inverse is equally true; going to an overload of data without a clearly defined intention results in unfocused, generalized issues being identified. Neither serves the objective of creating new strategic options. If

the Strategic Management Process continues to be vigorously developed, Mn/DOT's ability to frame questions will undoubtedly improve greatly in a short time. Nevertheless, the current design of an Environmental Scanning function should reflect the current reality, and then evolve as organizational conditions change.

◻ *Identifying what will be considered predictive of a specific change in the external environment, monitoring those elements, and following through with action when warranted is the final, concrete step of Environmental Scanning, and what gives it its practical value.*

An effective and efficient method the organization can use to conduct ongoing monitoring must be thoughtfully developed if scans are to have practical value. Given the probable diversity of issues that will eventually be tracked, it seems reasonable to establish a focal point and accountability for the monitoring function. The use of one responsible staffer could create quality results and an experience of continuity in monitoring indicators.

● Step 2 - Selection and Prioritization of Issues:

As earlier referenced, staff of OSI met with the external consultant who had designed and facilitated the public process from which scenarios and issues were identified. Issues embodied in the alternative scenarios and dialogues with the public were updated, augmented and brought to the SMC for prioritization by probability, impact and timing. The pros and cons of the process used by Mn/DOT are:

Pros:
- ▸ issues chosen were known to be of concern to the public
- ▸ identification through group process was educational and assured "buy-in"
- ▸ used material already generated in the regional dialogues, so fostered a quick start to get Environmental Scanning up-and-running
- ▸ use of Regional Dialogues created management acceptance of issues' and process' significance for its purposes
- ▸ the introduction of the Strategic Management Process through several presentations created early familiarity with issues and implications, theory and practice of Environmental Scanning
- ▸ captured management's instincts about the pertinence of issue up-front

Cons:
- ▸ process is dependent on time of top staff
- ▸ process is periodic rather than continuous

- staff work/preparation of issues requires retro-fitting the issue into a framework appropriate for Environmental Scanning, and there may be disparity between redeveloped material given to the top staff and the original intent of dialogue participants
- process depends on intuitive and reasoning abilities of participants
- time consuming for top management when other tasks may be more material to developing and institutionalizing a Strategic Management Process
- selection and framing of the issues may be biased by internal considerations, personalities

Alternatives to the process Mn/DOT used are: 1) broad-based internal group process to narrow and prioritize the list of issues previously identified (the internal group to be inclusive of several levels of hierarchy, including representation from top management); and 2) charging a individual to narrow and prioritize the list of identified issues. Analysis of alternative processes to Step 2 is contained in Appendix B.

Implications from work in Step 2:

Comparing the alternatives and their pros and cons with the process used by Mn/DOT implies that an internal process is likely to produce the best selection and prioritization of issues, but that it *must* be well-designed and *must* be facilitated by competent, reflective staffing whether internal or external to the agency. Again, processes that are poorly designed and unfocused are highly likely to result in frustration for participants as well as to generate questions about the value of the entire exercise. If the frustration is repeated, or generalized to its proponents, this may cause doubt to be cast upon the value of strategic practices in general, or other specific applications of them. Given the risks of participative involvement (time consuming, costly, quality designers rare, etc.), it is understandable that most users of Environmental Scanning techniques opt to keep it highly specialized.

A high degree of skill in process design is a rare commodity. Ideally a process designer understands how to build a process around its participants' strengths in a way that provides and reinforces development of new skills. This capability and its coexistence with prior knowledge of Environmental Scanning and expertise in strategic management will be even more rare. Advance information will not do an organization any good if it is not assimilated in a way that is understandable and relevant. Because this combination of process skill and expertise in Environmental Scanning is critical to a quality outcome, most private sector organizations do

not use the group process route at this step. Because Mn/DOT's culture is highly participative, it would seem sensible to assign prioritization of issues to an individual *unless and until* a highly competent facilitator with the combination of process design and prior knowledge of Environmental Scanning is available. In that case, group process could be a considerable advantage in raising the participant's learning curve only because of Mn/DOT's high-consensus culture.

- ## Step 3 - Analysis of Prioritized Issues:

Part 1 - Research

There was considerable controversy among the staff at the onset of the research process about the research design and its appropriateness for the organization, given the organization's action-orientation. This was thoroughly explored by OSI staff and the University's consultant and researcher, and it was agreed that the issues, as they were currently defined, fell somewhere in between contingency planning and Environmental Scanning. It was therefore decided that since the process to be implemented was Environmental Scanning, the issues prioritized by the SMC would be "stretched" toward their emerging components as far as possible through the research. There remained a certain level of discomfort in as much as moving toward emerging issues was moving *away* from an action-orientation. However, it was thought this move away from action and toward skilled, reflective consideration of emerging issues could possibly serve as one way to help combat the "ready, fire, aim" cultural inclination that was observed to undercut the strategic approach OSI was charged with promulgating.

Moreover, moving toward contingency planning was deemed impractical because Mn/DOT does not have a critical mass of the essential parts of sophisticated externally-focused planning systems operating, including no formal contingency planning that is connected to strategic business planning as described in Chapter 2 (emergency contingency plans do exist in Mn/DOT but they are not at the strategic level). Furthermore, using the selected issues in an action-oriented way (*somewhat* similar to contingency planning) would have been confusing because it would have required intervening in the operations of the organization. Directly confronting the organization's strategies through an exercise in contingency planning might be interpreted as meddling without prior knowledge, and was not thought to be an artful way to

gain the support of operating personnel. Moreover, these operating strategies have not yet been named, much less ranked or confronted through a comprehensive process such as strategic business planning.

After extensive discussions about how to proceed, the University researcher designed and conducted the investigation under the auspices of the Center for Transportation Studies. The Center for Transportation Studies engaged an outside consultant with previous experience in Environmental Scanning, to provide guidance and advice to the University's researcher and to report progress and learning to the Principal Investigator and Mn/DOT's Contract Officer. A graduate student in Public Administration assisted the researcher by gathering data from outside sources. Forms were developed to record data by topic and identify its source. OSI's staff (8) expedited meetings with the Office of Information Policy to ensure that the activities were conducted in ways that left a well-documented path so that information architecture requirements that might come at a later date would be met.

The pros and cons of the process described above are:

Pros:
- academic expertise in research design yields high quality results
- outsider status does not replicate internal biases present, and may serve as a useful challenge to the status quo
- outside experts may have more initial credibility to deliver "surprising" information and insights
- collaboration efficiently brings breadth and depth of experience and intellectual intensity to bear on difficult tasks
- creates alliance with the University of Minnesota and draws on its credibility

Cons:
- outside expertise requires "hard" dollars
- acceptance of an outside expert may be an issue, especially in the short-term before credibility and trust is earned
- still requires staff connection into the organization to assure relevance of analysis

Alternative processes(es) that merit consideration, *e.g.*, analysis done internally, either by staff, individuals, or groups was discussed and discarded earlier by the SMC for reasons previously explained.

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Part 2 - Analysis

The University's researcher and her graduate research assistant drafted a (12-page) compilation of findings for each of four issues researched. A standard format for a 6-page brief was developed through subsequent discussion and critique between the University's researcher and consultant. The four papers were circulated to a limited number of people for review prior to convening an internal group to add to the initial analysis.

The researcher and consultant jointly designed a process whereby internal managers would add value to the external research and identify "trigger points" for management's use (Appendix C).

The pros and cons of the process used by Mn/DOT and described in Appendix C are:

Pros:
- connection of the organization's preferred future is made explicit and direct across the range of participants, increasing commitment to the degree that it appears achievable
- participants are adept at strategies to overcome barriers in the environment, making the results realistic

Cons:
- people in the meeting were generally without the power to take action on these macro-issues, and, information without the ability to act could lead to frustration with the process if participants require immediate and direct results. This is a common problem in any complex process that is conducted in segments.

Alternative processes(es) that merit consideration, *e.g.*, analysis done by individuals with recommendations to top staff were previously discussed and rejected by the SMC as too burdensome and time consuming.

Implications from work in Step 3:

◻ *The process used helped participants understand the necessity of the Strategic Management Process and how it related to their jobs because it made the organization's strategies explicit.*

Participants uniformly agreed that it was the *process* that was valuable to them personally and to the organization as a whole. The elements they found most compelling were that by being involved personally they had learned first-hand how important it was to think in skilled

ways about the future; they had learned how scans worked and how they fit into the Strategic Management Process, which in turn made that process' relevance to their own jobs apparent. The organization's strategies, which were formerly implicit and masked their assumptions, now were explicit to them, and participants began to see the conflicts and narrow path management treads in making policy decisions. They felt this learning was dependent on the experience of the process designed by the researcher and consultant and strongly recommended that top management be put through the same paces. However, the consultant and researcher agree that top management's differing need requires a differing, and surely truncated, process in terms of time requirement and design.

◻ *A successful institutionalization of Environmental Scanning will require Mn/DOT to support the thinking with action, take risks and exercise leadership in ways it may not have consciously done before.*

When management deliberates the scan's impact on the organization's strategies and their alignment with its vision and preferred future, another, more troubling issue is likely to arise, namely that Environmental Scanning puts the organization ahead of the curve relative to the general public's thinking, and foursquare into a conundrum that surrounds development of a strategic capability in the public sector. That is, if management is thinking ahead, and if they have confidence in their strategic analysis, and if it was developed using valid techniques to identify the public's preferences, can they and/or will they and /or are they equipped to do what is necessary to lead the agency toward those preferences when the political climate is neutral or not yet ripe (one assumes if the political climate is welcoming, this issue would become irrelevant)? The issues of leadership and personal courage that underlie an answer to this question and the ramifications of its answer are beyond the scope of this paper, but fundamental to management's decision about whether or not Environmental Scanning should be implemented and institutionalized at Mn/DOT.

◻ *The pace of the process, as originally conceived, needs to be adjusted in two ways:*
   ➤ *it should be paced to the amount of time top management is willing to devote to consideration of its products, and*

> ► *the tempo of each piece needs to be slowed because they are intellectually intense and use latent skills.*

The process designed by the University's researcher and consultant required 12 hours of internal participants' time. Mn/DOT personnel whose jobs required familiarity with these issues and other reflective thinkers (15 total) were invited to participate. Although participants were uniformly convinced of the exercise's value to the organization and to themselves personally, based on the experience of conducting the exercise the researcher and consultant are convinced that four issues are too many to process in an 8-hour period. A more satisfying experience for participants and a better value to the organization would be to explore two issues in a 6-hour session (which seems to consume the intellectual energy available). A short (1-2 hour) follow-up session to allow time for participants to consolidate their learning and gain objectivity about what is important to the organization as a whole could then be held to bring closure to the analysis of issues. Recommendations from these extensive discussions would be brought to top management.

Three issues *could* be done in 8 hours if the organization feels an urgency to cover the issues justifies the strain and frustration that will result. However, based on a moderate pace for developing a strategic process and taking into account the amount of time and thinking that will be required to implement both strategic- and business-planning in an organization the size of Mn/DOT, it would be specious at this time to recommend too much emphasis on Environmental Scanning in top management's strategic deliberations. This is not to say that Environmental Scanning should not be given careful attention and become institutionalized. Even though top management has "bigger fish to fry" with respect to installing a credible Strategic Management Process in the agency, Environmental Scanning delivers value to the organization today, and has the added benefit of creating conditions that are likely to accelerate development of other pieces of the process.

● Step 4 - Dissemination of information/knowledge

A second process was designed for: 1) a follow-up discussion about the issues, 2) learning the perceived value of the work done in the previous step, and 3) critique of participation (see Appendix D for a description of the process design). The most promising outcome, albeit

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unanticipated, that came about during the previous step was that the group identified and made explicit the organization's strategies relative to these issues and the preferred scenario. This process was designed to build on, and enhance this earlier outcome.

The pros and cons of the process Mn/DOT used, which is described in Appendix D are:

Pros:
- ► makes visible implicit strategies of the organization and reveals their assumptions to personnel who participate in the process of examining these issues
- ► as a rigorous exercise and education in a systematic strategic methodology, participation adds value to decision-making in participants' jobs throughout the organization
- ► participation helps personnel understand the Strategic Management Process and to gain skill in techniques of thinking about the future

Cons:
- ► people in the meeting were generally without the power to take action on these macro-issues, and, as is prevalent in complex processes conducted in segments, information without the ability to act could lead to frustration with the process if participants expect immediate and direct results
- ► attendance at both meetings varied, which hurt the continuity of the experience

Alternatives to the process Mn/DOT used are: 1) top staff could be put through the process, and they could disseminate their learnings and conclusion to their own staff; and 2) the written analyses derived from the process used in this scan could be circulated to a list. Analysis of these alternatives to Step 4 is contained in Appendix D.

Implications from work in Step 4:

The personnel who participated in this process are probably not representative of Mn/DOT managers as a whole. The people invited to participate were those known to be "good at this stuff" or those whose current jobs would be affected by the issues being studied. Nevertheless, the reasoning behind their ringing endorsement of the work is valid. While others in the organization may not have as much innate affinity for the type of work as those who were selected in the first round, any organization that hopes to be well-led needs to have a sizeable pool of those who are equipped to think seriously and skillfully about the future, and all managers have a "leg up" if they are aware of the organization's strategies and how their assignments are affected by both emerging and current issues in the external environment.

Environmental Scanning could benefit Mn/DOT beyond its uses in the strategic process if this step were implemented inclusive of successive groups of managers, selecting them based on their desires as expressed through participation in succession planning. Using outside resources to scan and facilitate a process for internal participants is inexpensive management training, and has the added benefit of providing an actionable product for top management.

An unanticipated benefit was the insight participants gained into the usefulness of scans, the importance of strategy and an overall understanding of the Strategic Management Process. Familiarity with these concepts becomes more important in the selection of personnel for successively higher posts in Mn/DOT. Since participants who attended the meetings were enthusiastic about the usefulness of the scan both personally and to the organization as a whole, one could expect similar reaction from successive groups. Linking participation to the agency's succession planning curriculum would probably offset any overt lack of enthusiasm, and would surely help to ensure more consistent participation, which would benefit both the results and the group as a whole.

As with any ongoing program that benefits a wide range of people, someone must have the responsibility for its smooth execution and accountability for achieving its intended results. As mentioned earlier, Environmental Scanning is particularly useful as a supplement to a scenario analysis approach, which is the preferred strategic methodology because it copes with both uncertainty and complexity. How well it does this depends on the richness of the scenarios. Because the Environmental Scanning program is the ongoing part and therefore the more continuously visible component of strategic environmental analysis, the assignment of these duties is not a trivial matter.

CHAPTER 5

DISCUSSION

This section of the paper examines issues that arise from the combination of steps discussed in Chapter 4 and their interaction with each other. The discussion reflects the private sector's experience with Environmental Scanning and assumes that Mn/DOT will continue to develop adaptations of private sector techniques to augment its management practices.

◘ *Unexpected outcomes:* It became clear during the participative process convened that one of the benefits internal participants were gaining was the ability to name Mn/DOT's implicit strategies. By thinking about how Mn/DOT could get to the preferred future even if the issue being examined were to unexpectedly move in the wrong direction, participants were able to question the organization's assumptions and actions in a non-threatening, indirect manner, and with the atmosphere of inquiry created by the process as a backdrop, a full and stimulating dialogue ensued.

The ability to clearly define the organization's strategy around an issue and connect it to a desired outcome (the preferred scenario) for executive management's consideration should net out as a positive for the organization, even though it is disappointing that the issues scanned in this first round turned out to be developed far past an emerging stage. If the next round of scanning results in further revealing Mn/DOT's implicit strategies, the accumulation of successive rounds of these results of scanning could greatly advance the organization's progress toward installing a Strategic Management Process and business planning for its operations toward a par with private sector practice.

◘ *Timing of issues:* One of the consequences of the two-year period between the creation of the scenarios and the use of Environmental Scanning to examine some of the issues they raised, was that certain issues originally identified as emerging developed very quickly and were already in the forefront of public discussion by the time research began. Their immediacy made these issues more tangible and increased the amount of information available, but at the same time it diminished the amount of influence the agency could bring to bear on the

issue, seriously undermining the fundamental justification for the use of Environmental Scanning. This made it difficult to identify a trigger point and the items to monitor that would indicate a change in the external environment, because the point where the agency needed to act was already upon it, and the agency was already responding to the changes the scan was attempting to anticipate in the external environment.

Participants' insights into the organization created value that offset the lack of anticipated preventive and pro-active results, *i.e.*, the ability to impact the development of an issue in its early stages. This was because the analysis process in part focused on how each issue was likely to impact the alignment of Mn/DOT's strategy, Vision and preferred future, and their relationship to each other.

The currency of issues also related to another quandary: whether or not the researchers should interview to the agency's inside "experts" on the issue. If a researcher collects information from inside an organization, which is later confirmed with little additional learning from outside sources, the question of `why did we do this, we didn't learn anything we didn't already know' is raised. On the other hand, if the researcher only uses outside sources, people in the agency who have expertise often believe that their input has been slighted. This process erred on the side of using external sources. As far as we know, there was no adverse reaction.

◻ *Synergy of the work team:* The research design used a combination of literature reviews and interviews with experts. It devoted a total of 30-40 hours to data gathering, and at least that much time to digesting the research into a useable form for participants, which was far more time consuming than anticipated. It worked well to have a collaboration between the University-affiliated external consultant and researcher. It would not have been possible for the University's researcher to target the papers to Mn/DOT's needs in this first round without the familiarity with the agency's agenda or approach to these provided from the external consultant (9). Condensing the original 12-page issue summaries down to 5-6 pages certainly benefitted from extensive dialogue between the consultant and researcher. Besides helping shape the presentation of the information, the consultant and researcher were able to play devil's advocate for each other's ideas, and together created a process design for internal participants superior to what either could have created separately.

◪ *Design of tasks and quality of interim products:* There were several difficulties around researching the issues within the timeframe and in the priority that was determined by the SMC. First, the logistics of obtaining the names of external experts, notifying them of the project and the researchers' wish to speak with them about a specific subject, and capturing time from their busy schedules was a challenge. Secondly, several of the issues as they were defined overlapped each other, and separating the formidable amount of information into four separate papers was an exercise in shades of gray. To strictly follow the order of prioritization for the second round simply was not possible, given that the researchers had just spoken with some of these inaccessible experts in the first round, never mentioning that they later would like to know about something related -- the project designers were not that far ahead in their thinking. In addition, with some of the issues developing so quickly, it was impossible to know if the priorities set two years earlier remained valid. It was decided that the University's researcher, who had the most current assessment of the external environment, should recommend which issues should be covered in the next quarter. For efficiency's sake, she asked to choose issues that were related to each other. Even allowing for the time spent to get the project up-and-running in the first quarter, the timeframe set for researching the next sets of issues, and turning around the analysis in the second round was too ambitious.

The percent of time estimated for research work by the student seems about right at 10 hours per week, although if it were expanded somewhat a more thorough job could be done. According to the graduate research assistant, a lot more time wouldn't create better information in the 6-page summary prepared for internal participants, but a little more time would allow for better contacts with outside sources. The consultant and researcher's time were also underestimated by quite a bit.

The University's researcher and graduate assistant each drafted two written research summaries. There was a noticeable discrepancy in the analysis, with the researcher's experience and insights being the difference. Whether or not this is germane is arguable, since the Mn/DOT people were quite capable of making inferences from both sets of material. In fact, the standardized format used encouraged such inferences.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

The following four issues are of over-riding importance, and will need to be resolved before a reasoned decision can be reached about whether institutionalizing an Environmental Scanning process in Mn/DOT is appropriate.

◘ *Top management needs to discuss and resolve the agency's commitment to and its ability to act strategically when its information puts it ahead of the curve relative to public opinion.*

The use and institutionalization of Environmental Scanning by Mn/DOT raises two larger issues that need to be resolved prior to deciding whether or not Environmental Scanning will create enough value to offset the effort it will take to implement and manage inside Mn/DOT, or whether the responsibility and applicability of techniques such as these resides elsewhere in government.

The first issue is that Environmental Scanning, by its very nature, identifies issues at their earliest recognizable stage of emergence and lends itself to thinking farther ahead than other techniques in the strategic management toolkit. This is all well and good if one wants to be strategic, but because of its distinctive focus on the far-distant future, the action an organization would typically need to take to effectively respond will most likely be correspondingly "ahead of its time" and raises two questions:

- whether or not a public-sector organization such as Mn/DOT has the obligation and/or the capability to act when the political climate may be anywhere from neutral to merely not ripe, to downright hostile; and,

- whether or not it is possible to implement strategies that may be "ahead of their time" inside an organization that is conservative, bureaucratic and participatory in its culture; and, if it is possible, by what method can this be accomplished?

Both questions stem from the same dilemma; *i.e.*, are non-elected public servants obligated and organizationally equipped to lead? Some assume that in a democracy citizens are the

designated leaders. However, in the republic form of government, citizens elect representatives and hire civil servants who are charged with acting on deliberative decisions made based upon their assessment of the issues. It follows that non-elected public servants, who must study the issues if they are to competently perform their duties, are obligated to bring their intelligence and experience-based understanding to the attention of both elected representatives and citizens, and to act in ways that create desirable outcomes based upon their knowledge and experience. In a republic, the people further rely on their representatives and public servants to increase the enlightenment of the electorate. The people retain the power to elect the government and recall those who abuse their franchise.

Thomas Jefferson eloquently expressed this idea of the people having the paramount power in our system of government:

> I know of no safe depository of the ultimate powers of society but the people
> themselves: and if we think them not enlightened enough to exercise their
> control with a wholesome discretion, the remedy is not to take it from them, but
> to inform their discretion by education.

The pertinent skills to be explored regarding the conduct of agencies is their will to lead through education, and if willing, their level of knowledge and skill about how to lead without consensus, and their level of comfort and degree of proficiency in dealing with conflict both in internal and external settings.

Willingness has two facets. Firstly, does management believe they possess the prerogative to act on issues affecting the organization? If not, where does the responsibility lie, what are management's current efforts, and what have been the results of these efforts in the past? If management's efforts have been largely ineffective, the location of responsibility or assignment of personnel should be appraised. If the insights gained from scans cannot be acted upon by an agency because it is not their proper role, the answer is not inattention to the issues or avoidance of techniques that inform thinking but may uncover issues that are difficult to address or manage; a more productive approach might be to cite strategic thinking techniques in the place where the responsibility does reside. For example, perhaps Environmental Scanning capability and process would more appropriately be located or be reported in the legislature's Transportation Committees. Secondly, willingness pertains to management's ready acceptance of their appropriate responsibility. Members of management who are

reluctant to devote the time and/or the effort that is required to become skilled in these advanced techniques of thinking about the future, conduct inappropriate discussion, etc., are indisputably debilitating the organization's ability to act effectively and negligent in their duty to the organization and their peers.

Finally, can internal conflicts be resolved without inadvertently sacrificing individuals (change agents/messengers/champions) or creating divisive turmoil that hurts the organization as a whole? If these questions cannot be answered affirmatively, then the insights derived from Environmental Scans will not be effectively acted upon because by definition, they raise issues prior to the consensus stage of public or internal discussion and actions may, at times, become controversial.

If management's response to these issues is avoidance or negative, one must conclude that the outlook for society as a whole is dismal, and question whether the republican form of democracy is structured to serve the ideals for which it was originally conceived, or staffed to accomplish the people's best interest.

◻ *For Environmental Scanning to have legitimacy, it must draw upon a trustworthy interpretation of the public's preferences about the future.*

Mn/DOT management must have confidence that their "picture" of what the agency is franchised to create, their Vision of the world that Mn/DOT is contributing to building, is an accurate reflection of the public's preferences. This can only be done if there is a credible process in place to spell out that Vision. In the absence of a trustworthy process at the state level, Mn/DOT management must have confidence in their own methods. The current Strategic Management Process technique for identifying the public's preference, scenario analysis, is state-of-the-art. Should the quality of the process used to produce a preference about the future and it's more tangible adjunct, the Vision, slip, the use of Environmental Scanning techniques could become counter-productive.

◻ *As a complex and continuous activity that is conducted in several overlapping stages, there needs to be a focal point for the activity and a strong champion to ensure its acceptance and institutionalization in the culture.*

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No matter how agonizing or painful, navigating uncharted waters is the province of top management. Indeed, it is top management's obligation to search out those waters and attempt to ameliorate the many risk(s) they pose to the organization and/or its goals. It is important for the senior staff to understand, champion and willingly devote time to grappling with the thorny predicaments that are presented to them as the product of Environmental Scans. Because difficult activities are frequently those that are avoided, it is crucial that top management do more than simply schedule and participate in the activity. It must advocate for the activity and avoid protesting the need to participate in the activities associated with it. Furthermore, if the presenter of "tough choices" is not a respected, accepted, and trusted member from within its own ranks who can champion the activity without losing position, promoting frank exploration of tough issues will be an undesirable and highly risky undertaking. If this becomes the case, top management will be remiss in their duty to serve society and to protect the organization's activities from threats (both known and those they should have known had they competently performed).

□   *Knowledge of Environmental Scanning should be made a requirement for top management positions.*

Any organization that hopes to be well-led needs to have a sizeable pool of those who are equipped to think seriously and skillfully about the future, and all managers have a "leg up" if they are aware of the organization's strategies and how their assignments are affected by both emerging and current issues in the external environment. Linking participation into succession planning programming would be a logical step. Then, as successive pieces of the SMC strategy are put in place (*e.g.*, administrative data systems that allow rigorous numbers-oriented analysis similar to that conducted in the private sector), the planning system will more easily evolve to a state where Environmental Scanning's products can be coupled with a developing strategic business plan, in much the same way as the private sector does. The time that this will take to happen depends upon the intensity with which Mn/DOT develops its business planning process.

RECOMMENDATIONS

1. Implement Environmental Scanning in order to increase the agency's strategic capability.

If management decides that the issues highlighted in the first two conclusions are sufficiently resolved, then institutionalizing Environmental Scanning at this time clearly is "worth it" for the agency, even though its benefits will not center around the process' goal of "helping the organization to anticipate, evaluate and prepare for situations or conditions that could impede its ability to create its preferred future."

That is not likely to happen until Mn/DOT's planning systems further evolve, when the results of scans can be more readily assimilated and linked to its preferred future. Mn/DOT's Strategic Management Process is currently in an embryonic form, and at this time the organization's conceptual framework is only rudimentarily defined. The goals, objectives, expected outcomes and the inter-relationships of these three elements with Mn/DOT's current strategies, and how they connect to creating the organization's preferred future remain to be delineated. Once all of these connections have been thought through the organization will have achieved the clarity necessary to conduct a fully operational strategic process. This clarity is necessary for management to ask itself and the organization hard-hitting questions about its activities. Highly focused questions are required to define clear goals and priorities for an ambiguous activity such as Environmental Scanning, for without clearly defined limits the technique quickly deteriorates into generalities. In addition, when scanning a vast amount of information, a focused query keeps information overload at bay. It is impossible to create sharp frameworks to discuss fuzzy questions about an organization's activities.

During this first round, the process designed by the consultants was enthusiastically endorsed by Mn/DOT participants. Participants felt it helped them to learn new ways to think about the future, convinced them of the importance of Mn/DOT pursuing strategic activities and showed them the connection these have with their day-to-day jobs. Even more importantly for the further development of the Strategic Management Process, and Environmental Scanning as one part of it, the process revealed to participants the organization's implicit strategies, and allowed them to be named. Making the implicit explicit, specific and tangible is the crux of what propels an organization to increasingly advanced levels of strategic ability.

Therefore, the Environmental Scanning process in its current form of development has the potential to make a crucial contribution to the advancement of Mn/DOT's strategic capability even though the current strategic platform does not allow it to achieve the traditional goals of a scanning process, *i.e.*, "helping the organization to anticipate, evaluate and prepare for situations or conditions that could impede its ability to create its preferred future."

The immediate benefits of institutionalizing Environmental Scanning will be:

- participant's increased understanding of the importance of thinking about the future,
- participant's increased understanding of the Strategic Management Process and its connection to their daily work,
- participant's ability to link the issues to the organization's current strategies and connect the organization's strategy and the issue to their own assignment, and
- holistic development of the Strategic Management Process.

Each of these benefits were evident in the process used for the first scan, and have far more significant implications for the organization's ability to successfully implement a strategic process than the scanning process' ability to anticipate and affect the development of the issues at this time. If there are other, equally effective, methods to teach managers about how to think about the future already present inside Mn/DOT, they are not as obvious. For these reasons, Environmental Scanning can be used as a way to holistically develop the Strategic Management Process, and raise middle-management's comfort and familiarity with it.

2. Improve the Process Design

Proceeding from the premise that the continuing Environmental Scanning process will be of greater benefit to Mn/DOT than devoting the time managers will spend on it to other activities, the following paragraphs address what would seem to be the highest value process, based on experience and the preceding analysis.

The recommendations in this section have as their premise that Mn/DOT will adopt the participatory-type process recommended in Step 3. Without the ongoing identification and naming of the organization's implicit strategies, the identification of emerging issues will continue to be the most difficult step and issues will tend to either be framed in generalities, or be focused closer to the present than desirable, or both. It is from the discussions that will

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take place in Step 3 that the organization will become more aware of its *de facto* strategies, and more able to ask focused questions about its activities' relationship to future developments in the external environment. Essentially, if the exploration of the issues does not at some point help to reveal the organization's implicit strategies, introducing Environmental Scanning at this point in Mn/DOT's development of its strategic function adds little value to the organization's activities.

Improvements to Step 1 - Identifying emerging issues

1-1. *Literature searches should be used to identify emerging issues.* It would be well worth a focused effort to identify issues that truly qualified as emerging using a systematic and wide-ranging literature search. If the task were assigned to an individual, or divided among a small number of individuals (either internal or external) it would probably yield a more consistent result and more continuity from ongoing scans than other options. This same method could be used to perform ongoing monitoring, or this could be done on a periodic update basis by the researcher. Based on this round of experience, it would not be feasible to combine monitoring responsibilities with doing the research because of its time consuming nature, unless the organization decided that this activity should become a specialty and be willing to develop a specialist position.

1-2. *The skill level of the process designer is critical.* If a highly competent process designer who is familiar with Environmental Scanning is not available, group process should be foregone in favor of using an individual to consult with a small group of top management. If a highly skilled process-designer-facilitator with experience in Environmental Scanning is available, framing issues would be most productively accomplished by submitting the raw data gathered from the process of identifying new issues to a discussion group comprised of the scanner(s), the researcher, the directors of the ORA and the OSI, and a few others. The group dynamic could ensure that a new issue's breadth, depth and reach be carefully defined, and a firm understanding of the question that is being asked could be reached. It is also important that the issues be researched in a more timely manner, although if the issues identified are truly at the emergent stage, a speedy process would not be as critical to the result as it was in this round.

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1-3. *Link Environmental Scanning to Business Planning as it develops.* Emerging issues (and key uncertainties identified in Step 3) should be forwarded to other appropriate business planning processes within Mn/DOT as they are developed. This not only will leverage the utility of Environmental Scans and make their connection to "real work" more clear, it will help to achieve integration among Mn/DOT's planning processes and foster cooperative linkages among Mn/DOT's staff functions.

Improvements to Step 2 - Prioritizing issues

2-1. *A select group should prioritize the issues.* The group should include a few members of top management and be widely representative of the organization's different functions and hierarchy. Again, if a highly competent process designer with familiarity in Environmental Scanning is not available to design an artful process for prioritizing issues, this would be better accomplished by an individual consulting with a small group of top management. Based on the premise that this process' value at this time is drawn partly from its management development potential, it might enrich the experience of participants if the group that prioritized issues is also called upon to analyze the data collected by the researcher(s). Participants would then have continuity, and a chance to learn how to take amorphous and abstract elements and work them through to a tangible, usable form that in some cases, will be extremely valuable to the organization.

2-2. *Gear the process to the volume of information and issues that top management is willing and able to digest.* The number of issues selected to be researched should also consider the amount of time management is willing to divert process participants' from their regular duties. Middle-managers who have been chosen to participate in the scans become disillusioned and cynical about their involvement if top management does not act on the information they develop and forward. Because Mn/DOT's strategic- and business-planning processes are in an early state of development and there are many concurrent activities fundamental to establishing them, Environmental Scanning's needs should be considered relative to other pressing matters before the agency. A schedule of 1-2 issues per month, with an hour's discussion for each, may seem inordinately slow and frustrating considering that there are many emerging issues yet to be considered from strategic viewpoint. However,

given the press of business at the executive level, 1-2 issues monthly may seem like a heavy load. Yet, this pace seems both do-able and prudent to begin to tackle the (presumably long) list of issues awaiting analysis and action.

Improvements to Step 3 - Analyzing the issues and creating results for top management's consideration

3-1. *The process used for mid-level internal participants should be retained.* The directors of ORA and OSI and a few members of their staff should always participate in this process and participants should be drawn more broadly from the management and technical ranks of the organization than they were in this first round. The discussion that takes place in this step was universally endorsed by participants. According to participants, the process created an understanding of ways to think about the future, and the utility of the Strategic Management Process, and its connection to the participants' work tasks. More importantly, it revealed the organization's implicit strategies to them. This increase in clarity is absolutely fundamental to an organization's ability to begin to think with precision about itself and its activities. With these discussions as a backdrop, it may be possible to inch the identification of issues further and further toward their emergent stage in each successive round of Environmental Scanning. Until the emerging stage is reached, the ratio of effort it takes to implement and manage an Environmental Scanning process to the results it produces is questionable unless the organization is accruing equally valuable by-products from these activities. Even though one could argue that the education of managers about "things strategic" might be accomplished for less investment of time and money, the process' result of creating understanding and acceptance of the overall Strategic Management Process combined with its potential to amplify the development of the agency's strategic capability justifies its continuance and institutionalization.

One minor enhancement of the process to better reveal Mn/DOT's implicit strategies would be if, after listing the events that would need to occur to reach the preferred future, the participants were required to draft them into a narrative that tells the story of how Mn/DOT reached its preferred future. Writing, rather than discussing, at this juncture, would create a way for participants to become even more specific and clear in their thinking, and surely would sharpen the following discussion of the organization's strategies.

Improvements to Step 4 - Disseminating information and knowledge

4-1. *A truncated process should be designed for top management.* In this way it can benefit from the research and its subsequent enhancement and insights gained from the internal process, and make decisions about when and/or whether action is warranted. Top management's process design should quickly shift from passing along the information to building upon it by focusing on the organization's strategies and their efficacy. Time should be spent discussing whether the strategies identified by participants are the strategies management believes they are pursuing, and then shift to whether or not the organization's strategies are robust against the uncertainties raised earlier in the scan and reservations in their own minds. The items that were flagged for top management's attention should be given special consideration, and assignments to monitor specific items that were identified by earlier participants as indicative of a change in circumstances should be made.

4-2. *A focal point should be created for the monitoring activity.* This activity was not part of the first pass and remains to be designed and implemented. Ideally one person should be responsible for monitoring issues. Either OSI or ORA could coordinate reporting and ongoing monitoring for these items and the issue that was their source, alerting executive management with exception reports, or updating them, depending upon management's desires.

4-3. *Communicating the insights gained is crucial to the organization.* If information is not understood and acted upon, it is as if it did not exist. Once top management has completed their review of the work, it would be customary for the Assistant Commissioners to devote time with their own staffs to discussing the organization's strategies and the conclusions reached. Another possibility might be to take one-half day of a manager's meeting to work through the issues with the whole team of 140. Managers have indicated in the past that they desired more process-oriented meetings, and using their time once a year in an artful process design to examine a limited number of the organization's assumptions and strategies, such as those identified by this scanning process, would serve at least two Learning Organization principles besides providing new knowledge around the issues themselves:

▸ it would advance common aspirations among the management team, and

▸ the dialogue would enhance the possibility of coordinated action among the management team.

4-4. *An evaluation of the performance of the process needs to be assigned and designed to focus on agency actions.* Given the amount of effort conducting and institutionalizing an Environmental Scanning process will take, and its relationship to the development of the Strategic Management Process, it would be prudent to internally review the process' performance relative to its objectives on a yearly basis, at first. The evaluation should focus on answering the question, "How are Mn/DOT behaviors and actions different because of the Environmental Scanning activity?" To reiterate, foresighted activities such as these need to be focused and actionable or they fail to create tangible value. A more thorough and objective evaluation of the scanning process, and possibly the entire Strategic Management Process, should be conducted by an outside expert within three years from the date of this report, to ensure that management is fully informed of the efficaciousness and deficiencies of these efforts, so that improvements and/or adjustments can be made in a timely manner.

APPENDIX A
PROS AND CONS
OF
ALTERNATIVES TO STEP 1

PROS AND CONS OF ALTERNATIVES TO STEP 1

1. Systematic literature searches conducted by an assigned individual (either internal or external), or split among a group of individuals.

> Pros:
> ► likely to reliably yield high quality data
> ► ongoing sources
> ► broadens the input to issues present in early emergence stage

> Cons:
> ► Mn/DOT culture challenges credibility of non-engineering expertise unless a participative method is found for involvement
> ► early stage identification of issues means direct connection to strategy is less apparent
> ► could fail to tap intelligence inside the agency
> ► filtering all issues through one person would not compensate for personal bias
> ► this person would have no career path through Mn/DOT. This might be ameliorated if the department determined that a long-term specialist position was justified.

2. Internal and/or external group process to identify issues from data sources (periodicals and/or individuals) outside the organization. This differs from the previous category in that it adds opinions of individuals to what is discovered from a non-systematic reading of periodicals.

> Pros:
> ► wide participation, especially from outside could be networking/learning opportunity
> ► could rely on "volunteered" time
> ► if broadly participatory, possibly the most diverse accumulation of information

> Cons:
> ► if not closely managed, would produce widely varying outcomes
> ► to get a sufficiently broad scope the group would need to be quite large and diverse, with all the attendant process and group dynamic issues; if diversity were obtained through sequential small groups, integrative thinking would be more difficult, plus the accumulation of group output would be cumbersome to manage into an outcome
> ► consumes time from several areas in the organization (more than other processes)
> ► staff, or someone from outside, still has to conduct process of analysis which will require enough familiarity with the issues to execute well
> ► personal/professional/internal biases in identification could give uneven results
> ► unclear accountability for quality product
> ► difficult to know if aptitude for the work is self-selecting into volunteers, or invitees

3. Individual responsible to identify issues using data sources (periodicals and/or individuals) outside the organization. This option creates an Environmental Scanning "guru" position, a person who is responsible to think about and network with others to identify emerging issues.

> Pros:

- ▸ accountability for rigorous process and quality product is more easily managed
- ▸ professionalism in research methodology could be specified prerequisite

> Cons:

- ▸ lack of familiarity with the agency requires someone to serve as a liaison to outsider

APPENDIX B

PROS AND CONS
OF
ALTERNATIVES TO STEP 2

PROS AND CONS OF ALTERNATIVES TO STEP 2

1. Broad-based internal group process to narrow and prioritize the list of issues previously identified. The group would be inclusive of several levels of the hierarchy (including representation from top management):

   Pros:
   - broader base of judgement brought to bear, depending on the group's diversity in hierarchy and how broadly it is distributed across the organization
   - spreads familiarity with issues and implications, theory and practice more widely
   - if well accomplished, could get the effects of group synergy

   Cons:
   - time consuming to get individuals up-to-speed so they can make informed judgements
   - lack of closure at end of selection
   - prioritization task could be frustrating for participants
   - if participants aren't invited to participate steadily throughout the process, they could feel "used"; conversely, if they don't show up when invited, they compromise the results by narrowing the determined diversity and reach of participants
   - quality of outcome could vary with each repetition
   - selection and framing may be biased by personality of individuals or internal considerations
   - although there is more possibility of a higher total creativity/ability to deal with abstract issues in a larger number, without highly skilled design and facilitation, group process often stymies individual creativity, degenerates into groupthink and consensus building and therefore generates outcomes destructive to dialogue and learning

2. Individual charged to narrow and prioritize the list of identified issues:

   Pros:
   - if working off clearly defined selection criteria, could be most efficient
   - clear accountability
   - stable quality

   Cons:
   - one person, plus overseer's judgement doesn't control for possibility of building in bias
   - represents less familiarity with overall organization than management or broad-based group
   - selection and framing may be biased by internal considerations, personalities

APPENDIX C

PROCESS DESIGN FOR STEP 3

PROCESS DESIGN FOR STEP 3

FOUR ISSUES:
1. Marketplace Expectations and Willingness to Pay, including Road Pricing
2. Role of the Private Sector
3. Value Conflicts and Competition for Resources
4. Effectiveness of Traffic Demand Management (TDM) Strategies on Behavior change

HANDOUTS:
1. Copy of Mn/DOT's "Preferred Scenario of the Future"
2. Copies of the four issue papers (six pages each)

* * * * * * *

Introduction
1. Background to the research project.
2. Expected product of today's discussion -- identification of key issues to take to top management with identification of trigger points (point at which Mn/DOT must take action to insure achieving the preferred future.
3. Overview of process:
   - take one issue at a time to select critical issues - share these as a full group
   - read through the preferred scenario for the future and in small groups and imagine the vents that would lead us to that future
   - go back to the issues to pick out what events could blindside us
   - as a full group decide which are the most critical events and which appear as "trigger points" for agency action
   - after ISSUE ONE - all following papers will build on the first set of issues, events and trigger points - thus moving the process along faster.

   GOAL IS TO HAVE THE FIRST TWO ISSUES COMPLETED IN THE MORNING

Step 1 *(repeated four times - once for each issue)*
- Ask participants to read through an issue paper, keeping in mind the question:
  What are the critical issues to you, as a key Mn/DOT staff person, that you feel the agency should be paying attention to?
  After reading it through once, go back and circle the KEY issues and then pick your top three.
- Use nominal process (once around the group, then open discussion) to identify the key issues, recording them on hexagons; after the first pass ask:
  What issues are important related to this subject, that aren't up there yet? Are there other issues that weren't included in the paper?
- Cluster the hexagons, asking "what seems to go together"?
- Name the clusters

   B R E A K

Step 2
- Split into groups of two (different partner for each issue's small group discussion) and
- Ask participants to read through the Preferred Scenario and then ask yourself *"What would have to happen to lead us to this future in terms of what the market expects and would be willing to pay for."* Write this down as a short paragraph or tabulation of events.
- Now look at the issues up on the board and pick out events that would *prevent* this future from happening. Make a brief list.
- Pick out from this list the events that could blind-side Mn/DOT. That is, things that would require Mn/DOT to revise its strategies (these could be positive as well as negative, *i.e.*, decline of gas tax revenues; technologies for road pricing delayed or accelerated, etc.

Step 3
Move back to the full group.
- Share the small group findings.
- Summarize and get agreement on what could blindside Mn/DOT
- Using criteria of:
  - ▸ urgency (timeliness)
  - ▸ efficiency
  - ▸ do-ability (Mn/DOT has control)

  select the most critical issues (vote)
- Agree on the points where Mn/DOT has to take some action in order to keep on track with it preferred vision (i.e, trigger points)

B R E A K

2 issues in the morning, 2 issues in the afternoon
brief evaluation of the day and its usefulness

APPENDIX D

PROCESS DESIGN FOR STEP 4

PROCESS DESIGN FOR STEP 4

Materials distributed in advance:
- verbatim transcription of hexagons and tear sheets from 2/6/95
- addendums to issue papers

Process

Time	Task
8:30	**Discuss expectations for the day**

- Revisit and affirm or revise understandings previously reached
- Gather the group's advise for which issues (if any) might be highlighted for top management, and in what form?
- Gather suggestions for improvements/changes to the process of soliciting their input

8:45	**Consecutively revisit issue addendums**

- Does it accurately reflect the group's wisdom?
- Is it complete as it stands?

Refine and winnow compilation of blind-siding events
- Group and name
- Consensus
- What needs to be monitored? Why?
  - How do you recognize it when you see it? How do you know there's a problem?
- Recommendation for who should do it?

11:30	**Evaluate the process of group's involvement**

- Discuss whether the group believes it added value to the research
- Do they believe their work has extracted the essential awareness relative to these issues in a form useful to 1) top staff and 2) themselves?
- What were individual's expectations when they received an invitation to participate? Why did they decide to attend?
- Were the two days worthwhile? If so, what were the benefits? What could be improved or changed?
- Were the products the participants received worthwhile?

12:00	**Adjourn**

APPENDIX E

PROS AND CONS
OF
ALTERNATIVES TO STEP 4

PROS AND CONS OF ALTERNATIVES TO STEP 4

Alternative Processes(es) that merit consideration are:

1. Top staff could be put through the process, and they could disseminate their learnings and conclusion to their own staff.

    Pros:
    ▸ would put management in the position of making policy explicit in a way that would give them the fullest understanding to be gained from Environmental Scanning
    ▸ top management has the power to act, and therefore the issues identified could be addressed in a straightforward manner if and when they merit immediate action
    ▸ would create a better understanding of the Strategic Management Process among top management

    Cons:
    ▸ is time consuming and needs to be ranked against the other demands on top management
    ▸ top staff communicating to their own staffs has had varying success in the past
    ▸ this option is top-down and non-involving of several levels of the organization

2. The written analyses derived from the process used in this scan could be circulated to a list.

    Pros:
    ▸ managers could read about what happened at their leisure, and it would be possible to reach more managers than the 7 - 11 that constitute an ideal size group
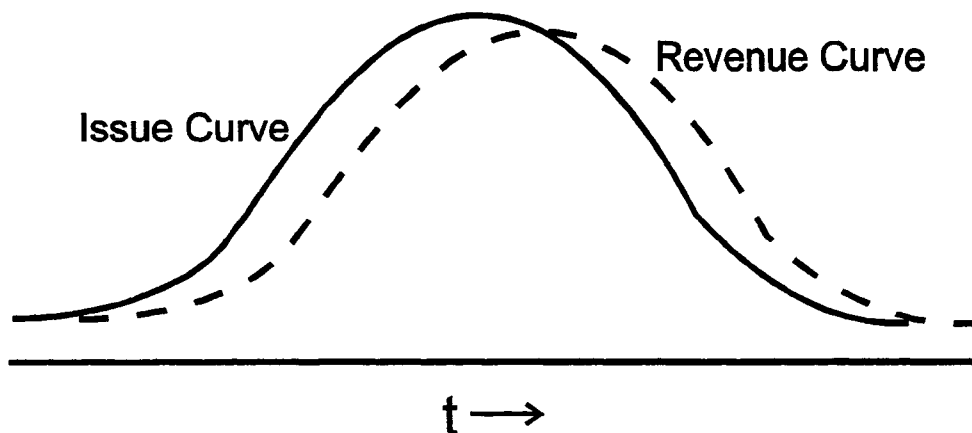
    Cons:
    ▸ there is no guarantee that the material would be read or retained
    ▸ it is contrary to learning organization principles not to set it up so that people can think through for themselves how the issues relate to the organization as a whole and their own work, in particular. This would also eliminate the examination of an individual's own assumptions that was incorporated in the process design.

ENDNOTES

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1. The task force recommended using business techniques to improve the way Mn/DOT is managed. Their exploration of the subject convinced them that private sector practices were likely to lead to more efficient use of Mn/DOT's resources. The task force, chaired by Merritt Linzie with members representing several levels of hierarchy, conducted its work over a period of about one year. This recommendation was presented to Deputy Staff in the interim between Commissioners Riley and Denn while Ed Cohoon was the Acting Commissioner.

2. The difference between strategic planning and strategic market management is that the latter information about the market is acquired and responded to in real time by the organization, rather than periodically. In order to keep pace with many small and incremental changes that can have large effects over time, a system that delivers information about the external environment in real time is of great importance to strategic capability. Assuming that Mn/DOT will enrich its information environment eventually achieving access to real-time data, the effort to upgrade its strategic capability was deliberately called strategic *management* rather than strategic *planning*.

3. The curve can also be drawn to show that revenue lags the public ripening of an issue and that revenue streams generally erode under the pressure brought to bear from the following sequence of issues ripening at the curve's peak. For public sector agencies who must plan their issue strategies based on the amount of resources dedicated to their solution, adding this additional element to the discussion seems to be especially relevant and could be particularly useful to management's consideration of scanning results. The process for management to react to the results of this first scan had not been designed at the time this report was written. This extension of the diagram is included for the reader's information.

4. *Competitive intelligence* is the gathering of data about a competitor's financial and market status/strategies, operating practices, etc., for the purpose of better understanding one's interactions in the external environment. *Sales force intelligence* is the practice of systematically collecting data from the sales force about its interaction with customers (and potential customers), analyzing it, and plugging it into the appropriate place(s) in the organization's ongoing strategic-business planning cycle.

5. Neil Gustafson, a consultant who specializes in ways to think about the future, was engaged to help OSI implement the start-up activities around its Strategic Management Process.

6. These activities ultimately led the SMC to decide in the summer of 1994 to go forward in adopting the business planning techniques tested. These projects uniformly demonstrated that the business planning techniques did work in Mn/DOT and would significantly change management practices for the better.

7. The thinking behind the implementation of the Environmental Scanning project is described below.

    Over the course of several meetings, the committee discussed and subsequently discarded several plans put forward by OSI staff to implement Environmental Scanning. The first plan presented by staff and discussed by the committee was Plan I.

    - **Plan I**--involve volunteers from across the organization in identifying, monitoring and analyzing issues. Although the design differed, the execution was similar to an earlier attempt to institute Environmental Scanning by members of the former Strategic Planning Committee.

    The SMC quickly adopted, then abandoned this plan, because it was perceived as unwieldy to manage and consumed too much time; it was also thought that this would overload personnel. OSI staff was directed to come up with a staff model for implementation. The next model put forward by staff for implementation was Plan II.

    - **Plan II**--staff suggested that an OSI manager could supervise one half-time person, possibly a mobility from elsewhere in the agency, who would devote the first six months to identifying issues which would then be prioritized, researched, analyzed and summarized for the committee and other key staff members designated by the committee.

    The committee criticized the need for additional personnel from inside Mn/DOT (beyond the OSI) and the additional workload projected onto its already heavy upcoming schedule of work. Staff was directed to explore outside sources to conduct Environmental Scanning.

    After giving OSI this directive, the committee began to work on activities preparatory to Environmental Scanning. In order to streamline the work, it was decided to borrow issues already identified during the earlier in-depth strategic review (i.e., the scenario analysis). The SMC discussed a list of issues identified jointly with the public and managers at the Visioning Conference that were not being addressed as "strategic directions" in the mainstream Strategic Management Process. Subsequently, the SMC set aside a morning retreat for its deliberations about priorities. They used an "option finder"

software to prioritize the list of issues, which had been revised to reflect their previous discussion.

One month later, October 14, 1993, the committee discussed postponing the implementation of Environmental Scanning to late-1994 or early-1995. However, in the interim between the committee's prior directive and this decision, a researcher from the University of Minnesota who is highly regarded both in the community and in academia had agreed to work on the project, and OSI was in the process of finalizing a contract. In light of these developments the SMC Chair directed OSI to proceed with the first phase of work. Its results and evaluation were scheduled to be presented to the SMC in late-1994 to early-1995.

8. Nan Swift and Karla Stacey were the staffers in the Office of Strategic Initiatives who helped to launch the project.

9. Barbara Nelson, of Nelson & Associates, was the external consultant on the project, and as such is the author of this document. The reader should be aware that immediately preceding employment as a consultant to The Center for Transportation Studies at the University of Minnesota, Nelson held the position of Director of the Office of Strategic Initiatives (OSI). As Director of OSI, her duties included augmenting Mn/DOT's strategic capability and implementing business planning. As a consultant, the viewpoint presented in this report, Nelson contributed to the design of the process, reviewed and critiqued materials and produced this written evaluation of the project's results.