

**EXECUTIVE STRATEGIES FOR  
RISK MANAGEMENT BY  
STATE DEPARTMENTS OF TRANSPORTATION**

**EXECUTIVE SUMMARY**

*Prepared for:*

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**Introduction**

State departments of transportation (DOTs) function in an environment that is extremely complex and fraught with uncertainty. Administrators, planners, engineers and construction managers must coordinate a multitude of human, organizational and technical resources. Managing risks and planning for contingent liabilities are essential components of a holistic DOT management strategy. Departments of transportation have unique challenges relating to enterprise risk management. It is incumbent upon Chief Executive Officers (CEOs) and DOT administrators to identify and manage risk.

*The results of a single negative event can erode public trust with citizens and stakeholders that took years to develop.*

This report describes how DOT executives are using risk management today. It is based on the results of a comprehensive literature review, national survey and structured interviews with DOT executives sponsored by the National Highway Research Program (NCHRP). The study identified transferrable strategies that may be useful to DOT leadership for enterprise-wide risk management. Broader understanding and adoption of these executive strategies, leading to enterprise-wide risk management, brings added value and enhances overall DOT performance.

While most DOT personnel would say that they inherently identify and manage risk in their day-to-day activities, this study found only 13 DOTs that have formalized enterprise risk management programs and an even fewer number that have a comprehensive approach encompassing risk management at the enterprise, program, and project levels (see Figure 1). In total, representatives from 43 state DOTs completed the survey for this study. The respondents from 35 of the 43 state DOTs (81%) claimed that their DOT has formal, published risk management policies and procedures. However, none of these respondents felt that their agency was always successful at applying appropriate risk management strategies at the various levels of the enterprise. Twenty-six respondents (62%) felt that they *frequently* apply the appropriate strategies, nine (21%) felt that they *seldom* applied the appropriate strategy, and seven (17%) felt that they *never* apply the appropriate strategies.

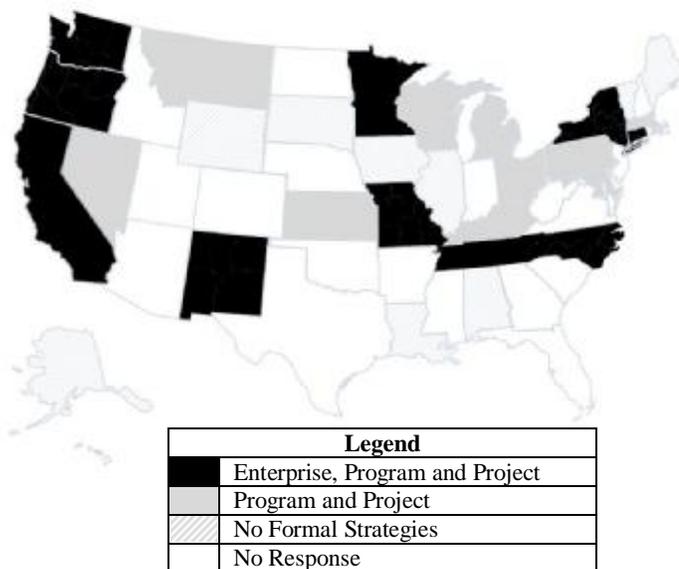


Fig. 1 DOT Risk Management Practices

This study also found that formal risk management tools exist and are adding value to those DOTs that are using them. Pockets of excellence in enterprise risk management exist throughout the country but its use is not yet consistent or pervasive. While it is impossible to avoid every risk event, CEOs have a responsibility to acknowledge that risk and uncertainty exist and to develop formalized procedures to manage it throughout the DOT enterprise.

### What is risk management?

In its broadest terms, risk is anything which could be an obstacle to achieving goals and objectives. Risk management is a process of analytical and management activities that focus on identifying and responding to the inherent uncertainties of managing a complex organization and managing capital facilities. The international standard ISO 31000 defines risk management as “*the effects of uncertainty on objectives.*” Figure 2 describes the iterative steps in the risk management process as described by ISO 31000 and other management organizations.

There are multiple levels at which to manage risks. The highest level is the enterprise. Enterprise risks relate to those uncertainties that can affect the achievement of the DOT’s strategic objectives (e.g., public opinion, declining revenues). Enterprise risk management is the consistent application of techniques to manage the uncertainties in achieving DOT strategic objectives. Therefore, enterprise risk management is not a task to complete but a process to consistently apply and improve.



Fig. 2 Cyclical Nature of the Risk Management Process (after ISO 31000)

Risk management at the program level involves managing risk across multiple projects (e.g., risk of material price escalation, design standard changes, etc. on a DOT program). Finally, some risks may be unique to a specific project. Project risk management occurs with staff that is familiar with the specifics of that project (e.g., utility relocation coordination, right-of-way purchase delays, etc.). Though the focus of this report is on enterprise risk management, techniques implemented to manage program and project risks are also discussed as they are related to the enterprise. Figure 3 illustrates the relationship between enterprise, program, and project risk management.

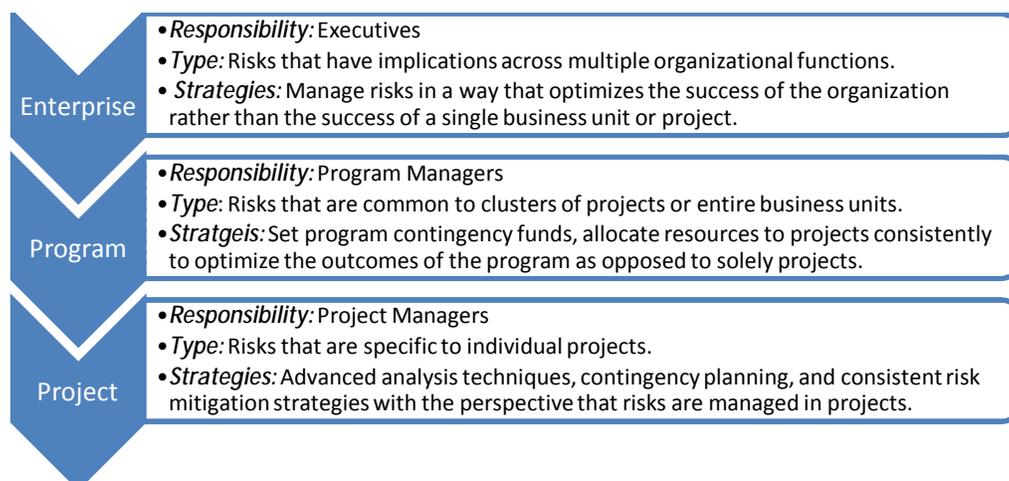


Fig. 3 Relationship between Enterprise, Program, and Project Risk Management

## Why invest in risk management?

The largest public and private organizations in the world have begun to actively employ enterprise risk management in the last two decades. DOTs are not exempt from the need to employ these approaches and, in fact, may be more susceptible to risk and uncertainty than other large organizations. The number, diversity and complexity of risks that DOTs face have grown over the last two decades. External risks have been created by the acceleration of technological advances, political uncertainty and economic volatility. Internal risks have been created by the retirement of key staff and reorganization of traditional DOT functions. In the face of these risks, formal risk management procedures can provide a positive return on investment and help CEOs avoid risk events that can erode public confidence and future funding.

*Risk Management practices can help with cooperation, communication, resource constraints, and resistance to change.*

–State DOT Executive

Risk management at any level requires an investment of time and resources. However, the avoidance of one significant risk event can prove the value of the investment in risk identification, treatment and monitoring processes. The DOTs surveyed and the literature reviewed in this study found the following added value from comprehensive risk management.

### Enterprise Risk Management

- Valuable data that enhances the ability to make objective decisions.
- Decisions that consider the risks associated with political environment and diverse stakeholder expectations.
- Improved strategic planning and performance measurement.

### Program Risk Management

- Better understanding of the program development process, including timelines, phasing, procedural requirements, and potential obstacles.
- Ability to develop appropriate contingency funds, potential program cost overruns and schedule delays.

### Project Risk Management

- More realistic estimates of individual component costs and durations, thereby allowing more reasonable expectations of total project cost and duration.
- Better understanding of what the project contingencies are, whether they are sufficient, and for what they may need to be used.

*Risk management, whether formal or informal, requires an individual be designated to those duties and provided the time and resources to address those needs. That individual needs to work closely with the agency director or the director's office in order to apply risk management to all levels of the organization.*

–State DOT Executive

### What constitutes a comprehensive approach?

DOT managers and executives have recognized that their agencies are facing new, high magnitude risks due to a variety of internal and external pressures. Though most DOTs have some level of formal or informal risk assessment in place, this study showed that few have the comprehensive approach to risk management needed to optimize resources. According to literature and the results of surveys and interviews with DOT managers and executives, a comprehensive risk management program at the enterprise level may include:

1. Executive commitment to enterprise risk management;
2. Designation of a risk executive;
3. An enterprise risk management culture, which promotes accountability throughout the organization;
4. Engagement of stakeholders;
5. Transparency of the risk communication process;
6. Integration of financial and operation risk information;
7. Use of formal risk assessment methods;
8. Constant identification of new risks; and
9. Focus on leveraging risk as opposed to mitigation.

These nine enterprise risk management attributes apply to DOTs as well as any major public or private organization.<sup>1</sup> In its Risk Management Guide for Project Development, the New York State DOT cites that *three key elements* are essential for successful risk management at the program-level in transportation organizations. These three elements echo the findings of the survey and interviews in this study.

1. A strong commitment in the organization, beginning with senior management, for developing and maintaining a risk management program and culture;
2. Open communication and teaming among project development and industry partners in order to promote successful implementation; and
3. Being proactive in implementation to improve performance and outcomes.

### What are the challenges to implementation?

Research shows that two obstacles to enterprise risk management are competing priorities and insufficient resources. The challenge of establishing consensus among decision makers can also prove to be difficult. Another challenge of enterprise risk management implementation is changing the thinking of all members of the organization from *considering only their function's objectives to considering how decisions can affect the entire agency*. Though it may be relatively simple to understand how risk management practices can impact one DOT function, applying this perspective to the enterprise level can prove difficult. Consequently,

*Risk management cannot mean public agencies overstressing administrative procedures, regulatory controls and action avoidance, but should mean being able to systematically assess circumstances, being prepared to make informed judgments about policy, operations, financial, and political situations, and being willing to act.*

-NYSDOT Risk Management Guide for Project Development

<sup>1</sup> Adapted from Aon's Global Enterprise Risk Management Survey of more than 200 companies.

developing enterprise risk management into a living process and not just an annual task can prove difficult for many organizations.

A final challenge in enterprise risk management implementation is the organization having the ability to quantify all risks. However, many of the larger risks that an enterprise risk management program will look to address (e.g., human resource risks and political uncertainty) may not need or be able to be quantified and are better served by simply having a mitigation strategy. Numerous methods for quantifying and analyzing risks (e.g., Monte Carlo Analysis) are available and many frameworks suggest quantification strategies that fit within the framework. The research report that accompanies this executive summary discusses several quantification strategies.

### What can and should a CEO do?

This research has shown that strong support from senior management is critical to successful implementation of enterprise risk management. The CEO should set the vision for enterprise risk management and provide the resources for successful implementation. The CEO should also support the risk management planning process. The roles and responsibilities table (Table 1) has been adapted from the Federal Highway Administration as one example of where a top DOT administration integrates into the process. The roles and responsibilities should be tailored to the goals of the risk management process and each individual DOT organizational structure. Table 1 provides one example of how an agency could approach the process. While many structures can be successful, leadership involvement is critical to successful implementation.

Table 1. Example Roles and Responsibilities

Process Tasks	Role and Responsibility		
	CEO or Chief Risk Executive	Program Manager	Project Managers
Identify & Define Transportation Problems, Opportunities and Potential Risks	L	A	
Risk Management Planning	S	A	L
Risk Identification and Refinement	S	A	L
Qualitative / Quantitative Risk Analysis		A	L
Risk Determination and Mitigation Planning		A	L
Risk Monitoring and Control		A	L
Final Risk Performance Reporting	A	L	S

Legend:

L – Lead role

S – Support role

A – Approval authority

Developing a culture of risk management throughout the DOT is essential to the effective implementation of enterprise risk management. Representatives from 13 of the agencies that responded to this survey indicated that their organization had formal enterprise risk management techniques and were confident that they could answer questions about their agencies. These DOT representatives identified the following communication and organizational management strategies.

#### Enterprise Risk Management

- Appoint a chief risk executive with authority and resources to implement the program.
- Communicate risk management issues through formal memoranda and public communications.
- Develop state policies and procedures.
- Participate in the development of national policies and standards.

#### Program Risk Management

- Provide training and education for risk management implementation.
- Develop business plans with performance measures and regularly monitor progress.

#### Project Risk Management

- Maintain project risk registers and regularly monitor progress.
- Conduct regular project status meetings.
- Develop personnel performance measures relating to risk management.

Mainstreaming enterprise risk management is essential and training process must be ingrained within the corporate culture. Terminology needs to be clear and understood by all employees and employees need to understand their role in the enterprise risk management process. As one DOT executive risk manager states, “the risk management program office should consistently manage the enterprise risk management processes, techniques, tools, workshops, training, and develop a sense of community around enterprise risk management.”

### Conclusions

Though this study has shown that many agencies are considering enterprise risk management, enterprise risk management is truly in its formative stages in the United States. National guidance through Transportation Research Board research initiatives and American Association of State Highway Transportation Official knowledge transfer will be essential to the long-term success of risk management in the highway sector. An efficient and effective enterprise risk management program can be a powerful tool for state DOTs. The benefits of such a program are both quantitative, such as better controls over costs and delivery schedules, and qualitative, such as less likelihood of negative public relations issues. While each state likely has a different level of maturity, this study has identified a set of common actions that DOT executives can take to advance enterprise risk management in their state and throughout the country.

1. **Take a leadership role** in developing state risk management policies and communicate the importance of the program.

2. ***Support the integration of enterprise risk management*** into strategic planning, department controls and department performance measures.
3. ***Appoint a chief risk executive*** and provide the individual with the resources for implementing the enterprise risk management program.
4. ***Participate in the development of national policies and standards*** to support the enterprise risk management process.
5. ***Provide resources*** for risk management tools, training and workshops.