

DRAFT

Chapter 7: Strategy Sets

Chapter Purpose and Objectives:

Strategy sets provide the basis for the overall form and function of the TMC Business Plan. This chapter takes a more in-depth look at strategy sets – what they are, how they relate to the Business Concept and Value Proposition, and how to go about developing strategy sets to achieve the TMC vision, objectives, and desired end states. Up until this point, the handbook has focused on how to engage players in determining the overall role and function of the TMC in relationship to broader transportation goals, and how to articulate the ‘where does the TMC need to be’ perspective. This chapter takes the needs and objectives a step further and helps readers understand the importance of articulating specific actions and strategies to achieve the desired objectives and end states.

Key Messages/Themes:

- Strategy sets provide the basis for the overall ‘form and function’ of the TMC Business Plan.
- Articulating the vision for the TMC in terms of needs, objectives, and strategies allows those developing the business plan to outline specific directions, actions, and end results.
- Strategies translate into specific actions and outcomes so that decision-makers and authorities have a succinct understanding of overall objectives and how the end states of the Business Concept and Value Proposition can be realized.

Key Topics and Issues to be Covered:

Identifying strategies and action items that meet the objectives for the specific TMC, developing a deployment schedule, and developing an action plan.

How This Chapter Relates to Other Chapters:

This chapter builds on the business concept and value proposition chapters and provides the basis for the organization and management and financial plan chapters that will quantify the impact of the strategies that are selected.

Remaining Sections:

- 7.1 Defining Strategy Sets
- 7.2 Converting Objectives and End States into Action Items
- 7.3 Assigning Roles and Responsibilities to Stakeholders
- 7.4 Establishing Timeframes
- 7.5 Identifying and Documenting Dependencies
- 7.6 Developing Strategy Sets

7.1 Defining Strategy Sets

Strategy sets provide specific strategies or actions that are needed to meet the objectives and end states articulated in the Business Concept and Value Proposition.

Strategy sets provide specific strategies or actions that are needed to meet the objectives and end states articulated in the TMC Business Concept and Value Proposition. Defining specific strategies as part of a Business Plan is a critical element to the overall process. Although the visioning and value proposition processes allow stakeholders and key participants to identify longer term end states of how the TMC should function or need to function, the strategies help to define how to achieve the desired objectives. A typical strategy set is comprised of the following:

- Overarching objectives and desired end states;
- Action items that will allow/enable the objectives and end states previously identified, to be met;
- Stakeholder roles and responsibilities associated with the action items;
- Timeframes for the completion of the action items; and
- Dependencies that could impede or prevent completion of the action items.

Organizing these components into modular, phased sets provides the stakeholders of the TMC Business Plan with definitive, strategic direction for future activities related to organization, management, and financial planning of the TMC. **Figure 7-1** shows how strategy sets relate to the other components of the TMC Business Plan process.

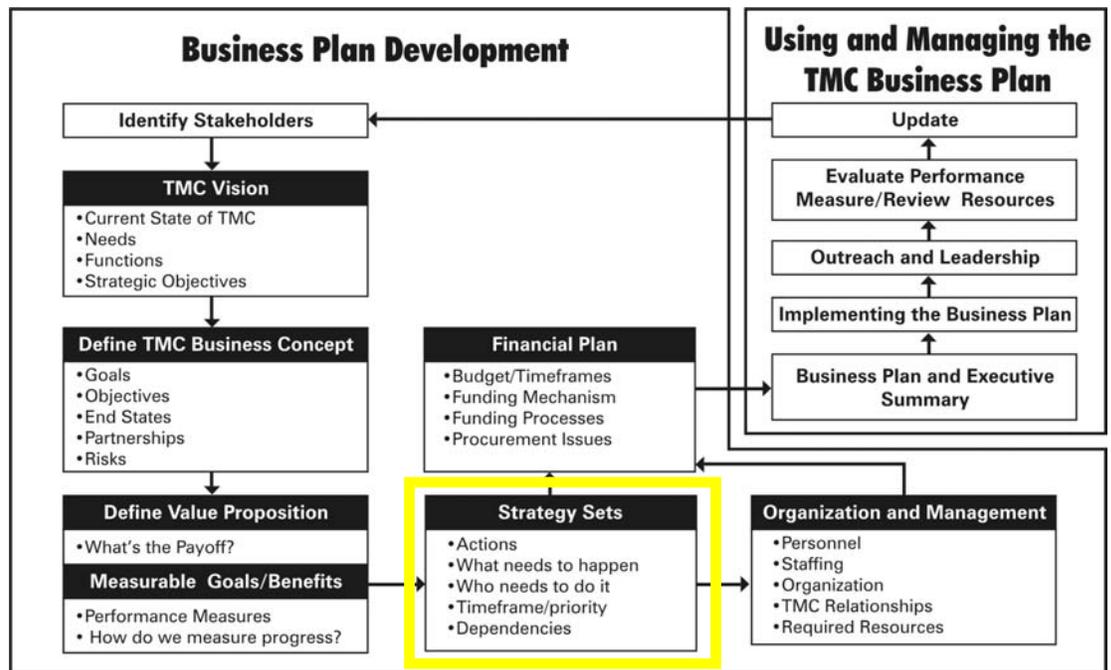


Figure 7-1: Strategy Sets Steps and Processes

As has been previously discussed, there are few documents currently available from Transportation Departments that are exclusively focused on TMC business planning. As such, there are few examples of strategy sets that contain all of the components described herein.

There are, however, numerous documents that contain some form of strategy sets as they relate to TMC planning and business planning. These de facto strategy sets are typically found in documents like Strategic Plans, Deployment Plans, and Concept of Transportation Operations. More often than not, strategies included as part of most planning documents are typically in the form of projects. Strategic Plans and Deployment Plans often consist of lists of projects and timeframes to implement necessary ITS services or components or integrate systems. In the context of Business Planning for a TMC, strategies should be aimed more at specific actions, institutional or technical requirements, partnerships, training, and other activities that are needed to achieve the desired end states. For the TMC Business Plan, some strategies might very well depend on specific projects being implemented or systems integrated; perhaps a strategy might be to 'implement near-term projects identified in the regional ITS Strategic Plan'. The challenge in business planning for a TMC is that it requires agencies and managers to shift their planning focus from project-specific to strategy development.

Discussions with several TMC managers around the country revealed that most agencies undergo some form of strategy development, either as a stand-alone effort or as part of annual program activities; as such, there are some examples of how other agencies and TMCs have developed and articulated strategies or actions to achieve desired operational goals or objectives. The terminology used to describe strategy sets varies between documents and includes the terms strategies, objectives, tasks, projects, functions, actions, and next steps.

Regardless of terminology, document title, or context, strategy sets are an integral component of the business planning process because:

- they define what specific actions need to occur to meet the overarching objectives and desired end states;
- they assign responsibility to groups or individuals who need to perform those actions;
- they establish timeframes for when those actions need to be completed, and;
- they identify what dependencies could potentially impede or prevent those actions (and ultimately the end states) from being completed or achieved.

7.2 Converting Objectives and Desired End States into Action Items

Strategy sets include specific action items (defined tasks, projects, etc.) that state what needs to happen to accomplish the objectives and end states defined in the Business Concept and Value Proposition. These action items are based on the Business Concept and Value Proposition but contrast with the high-level nature of those earlier components of the Business Plan by being specific, measurable actions or tasks. Action items are the bridge between high-level objectives and detailed work assignments. Detailed work assignments are outside of the scope of the TMC Business Plan.

The challenge in business planning for a TMC is that it requires agencies and managers to shift their planning focus from project-specific to strategy development.

For example, if one of the high-level objectives defined in the Business Concept were to decrease traffic congestion on freeways, then one of the action items under that objective could be to develop criteria, parameters, and algorithms for the TMC to include the functionality to implement adaptive ramp metering in areas currently experiencing excessive congestion. This kind of action item outlines what would need to be done prior to implementing an adaptive ramp metering project. Following the activity associated with the action documented in the Business Plan, one of the detailed work assignments resulting from the findings of the action item could be to implement adaptive ramp metering at a specific location.

Following are some real-world examples showing how agencies have gone from high-level objectives and desired end states to specific action items. While some of the documents in these examples refer to other transportation-related topics rather than a TMC business plan, the process of developing action items from objectives and desired end states is similar.

Example 1 – Wichita Falls TxDOT District Concept of Operations (Draft May 2004)

One of the goals of the Wichita Falls TMC was to improve the safety of the traveling public by providing advance traveler information and real time incident response. To meet this goal, the following action items were developed:

- Provide accurate weather conditions from the deployed Environmental Sensor Subsystem sites to warn TxDOT and the traveling public of possible icing conditions.
- Improve the dissemination of valuable information, including Amber Alerts, to the traveling public through the use of Dynamic Message Signs and the informational web site.
- Provide the City of Wichita Falls Police Department and other emergency response vehicles including EMS and Fire with critical information for responding to incidents more accurately and quickly.
- Integrate the following field devices: Dynamic Message Signs, Closed Circuit Television (CCTV) Cameras, and Environmental Sensor Stations.

Example 2 – Caltrans TMS Transportation Management Centers: Development Considerations and Constraints (December 2002)

In order to satisfy the goal that a system engineering process be used to justify the need to develop a new TMC or update an existing one, Caltrans created action items recommending studies be performed by Caltrans to:

- Develop space standards for each TMC function.
- Evaluate the impact co-location has on the long-term operating environment.
- Evaluate the current TMC organizational and staffing design.

Performing these action items was anticipated to facilitate the decision-making process for determining need, and to support the planning and development effort if need was demonstrated.

*Example 3 – Caltrans District 4 Operations Procedures and Strategies Report
(January 1994)*

District 4 of the California Department of Transportation (Caltrans) in the San Francisco Bay Area developed goals that were high level statements of desired results and were not necessarily intended to be measured. For each of the recommended goals, a group of supporting objectives was developed that could be expressed in more measurable and achievable terms. These goals and objectives supported the missions of the various operating and policy-making agencies sponsoring the San Francisco Bay Area Traffic Operations System (TOS). Specific techniques and action items were then identified to achieve the aforementioned goals and objectives.

Goals of the Bay Area TOS

- Improve Safety
- Improve Efficiency
- Improve Quality of Life
- Improve Systems Administration

Objectives were developed for each of the goals. For example, “Goal 3 – Improve Quality of Life” had two corresponding objectives: Enhance traveler comfort; and Improve Environmental Quality. Under each of these objectives were bullet lists giving more information as to what each objective entailed.

Objective 1: Enhance Traveler Comfort

- Assist stranded travelers
- Reduce traffic turbulence
- Maintain consistent travel times
- Inform travelers of traffic conditions
- Reduce travel times

Objective 2: Improve Environmental Quality

- Reduce vehicle-generated pollutants
- Reduce energy consumption
- Reduce freeway noise levels
- Support economic vitality

These objectives guided the development of specific congestion management techniques. For example, ramp metering and high occupancy vehicle (HOV) lanes were techniques identified as potentially being able to accomplish many of the bullet items under Objective 1 and Objective 2.

Example 3 – Caltrans District 4 Operations Procedures and Strategies Report (January 1994) (continued)

In order to implement the congestion management techniques identified, a set of action items was developed. For example, the action items for the technique of ramp metering included the following:

- Create consensus with local governments regarding how freeway ramp metering and traffic management strategies will be implemented and operated and how impacts upon local street systems will be monitored and controlled.
- Incorporate ramp metering and related traffic surveillance and management in reconstruction projects to reduce implementation costs and protect investments in upgraded facilities.
- As appropriate, perform ramp metering pilot projects to demonstrate the effectiveness of metering in improving traffic operations and flow. Document the results of such projects and previous Bay Area ramp metering evaluation studies. Share this information with local governments and public media organizations.

Example 4 – MCDOT TMC Implementation Plan: Action Plan (October 2001)

As part of its TMC Implementation Plan, Maricopa County DOT in Phoenix, AZ developed an Action Plan of recommended action items. These action items were based on the needs and functional requirements identified by stakeholders and included estimated costs, equipment, and space required to complete the action items. A timeframe for the action items was determined from the corresponding functional requirements, which were prioritized and given proposed phasing timeframes relative to planned future TMC expansion.

For example, under the functional requirement (objective) of detector data monitoring and archiving, three action items were recommended:

- Procure and integrate Traffic Management System (TMS) software and hardware.
- Complete implementation of “SMART” Corridors.
- Complete implementation of Regional Archived Data Server (RADS).

7.3 Assigning Roles and Responsibilities to Stakeholders

After taking part in developing the high-level Vision, Business Concept, and Value Proposition, it is through strategy sets that stakeholders first see their roles and responsibilities clearly defined. The assignment of action items to specific stakeholders gives these stakeholders a sense of ownership regarding the Business Plan, Business Concept, and overall Vision. The process of developing strategy sets should involve all stakeholders who will have roles and responsibilities defined by the action items in the strategy sets. Including stakeholders in the strategy process allows the stakeholders’ decision-makers and authorities to better understand how and when the end states of the Business Concept will be realized

It is through strategy sets that stakeholders can see their roles and responsibilities clearly defined.

and what decisions and actions are needed from each respective stakeholder to reach the desired end states.

Following are some examples showing how specific action items from strategy sets were assigned to participating stakeholders.

Example 1 – Caltrans TMC Master Plan (Revised December 1997)

Caltrans, in conjunction with CHP, developed strategy sets to achieve their overall goals and objectives that included specific actions to be performed by stakeholders within a defined timeframe.

For example, for the objective of “create and maintain a reliable traveler information system”, CHP was designated as the primary stakeholder responsible for accomplishing the action item of providing incident and transportation information to the TMC Caltrans employee and the media via the CHP Computer-Aided Dispatch (CAD), telephone, and fax.

Caltrans’ corresponding action items under the same objective included disseminating real-time traffic information to interested parties by operating and maintaining an Advanced Traveler Information System (ATIS).

Example 2 – MCDOT ITS Strategic Plan (October 2001)

MCDOT developed a number of action items to achieve strategic goals and objectives previously identified. A table was created that showed, among other things, the overarching objectives, the action items, and the partners or stakeholders to be involved in the implementation and funding of an action item. The Metropolitan Planning Organization (MPO) for the region, known as the Maricopa Association of Governments (MAG), was identified as a partner agency for those action items that had already been identified in the MAG Transportation Improvement Program (TIP) or the MAG ITS Strategic Plan Update because of MAG’s potential to fund the action item.

For the strategic goal or objective of expanding the Advanced Traffic Management System (ATMS) on roads of regional significance, the following action items and responsible partners were identified:

Action Items	Partners
Deploy, expand, and improve “SMART” Corridors	MCDOT ITS (Lead), Local agencies, MAG
Deploy ITS infrastructure elements (detection, CCTV cameras, Variable Message Signs (VMS), etc.) at site specific locations as needed	MCDOT ITS (Lead), MAG
Deploy communications infrastructure (center-to-center, regional backbone, center-to-device)	MCDOT ITS (Lead), Local agencies, Arizona DOT

Example 2 – MCDOT ITS Strategic Plan (October 2001) (continued)

Action Items	Partners
Deploy central signal system control in TMC - MCDOT Traffic Engineering (Lead), MCDOT ITS	
Deploy signal preemption for emergency vehicles - MCDOT ITS (Lead), MCDOT Traffic Engineering	
Integrate ITS technologies into work zone activities - MCDOT ITS (Lead), MCDOT Operations	
Establish a railroad/highway grade crossing monitoring system - MCDOT ITS	

Assigning timeframes to strategy sets permits stakeholders to evaluate how important a particular strategy set is.

7.4 Establishing Timeframes

Assigning timeframes to action items in a strategy set permits stakeholders to evaluate how important a particular action item is in terms of meeting the goals and objectives developed previously in the Business Planning process. In particular, those action items with the best payoff, or return on investment, as defined in the Value Proposition, should be given the highest priority. Funding and other dependencies should be considered in establishing timeframes for the completion of action items.

It is important to note that high priority items might not always translate into near-term achievable actions. There are several factors that could impact the likelihood of being able to carry out specific actions, such as funding, institutional barriers or challenges, maturity of technology, required partnerships. Some of these are internal to the TMC managing agency and/or key partners; others could be external, such as regional planning processes or legislative decisions that could impact available funding. The next subsection of this chapter discusses these and other dependencies and the importance of documenting specific (or potential) dependencies in the Business Plan.

By focusing on the action items with immediate and near-term (three to five years) priorities, stakeholders can better identify facility, resource, staffing, partnering, budget and technical requirements in the subsequent Business Planning steps of Organization and Management (Chapter 8) and Financial Plan (Chapter 9). Longer-term strategy sets should feed into future updates of the Business Plan, a process that will be described in Chapter 10.

Example 1 – Caltrans TMS Master Plan (Draft undated)

Caltrans divided its strategy sets into short-term and long-term horizons. For the short-term horizon (two to three years), specific action items were identified to help Caltrans meet the goal of preparing for and supporting future aggressive TMS implementation. For the long-term horizon (four to ten years), specific action items addressed how Caltrans will meet the goals of restoring lost capacity, reducing projected freeway congestion, and improving travel time reliability.

Example 2 – Wichita Falls TxDOT District Concept of Operations (Draft May 2004)

As was previously mentioned in Section 7.2, the Wichita Falls TxDOT District developed the following action items to meet the goal of improving the safety of the traveling public by providing advance traveler information and real time incident response:

- Provide accurate weather conditions from the deployed Environmental Sensor Subsystem sites to warn TxDOT and the traveling public of possible icing conditions.
- Improve the dissemination of valuable information, including Amber Alerts, to the traveling public through the use of Dynamic Message Signs and the informational web site.
- Provide the City of Wichita Falls Police Department and other emergency response vehicles including EMS and Fire with critical information for responding to incidents more accurately and quickly.
- Integrate the following field devices: Dynamic Message Signs, Closed Circuit Television (CCTV) Cameras, and Environmental Sensor Stations.

The aforementioned action items were then prioritized to assist decision-makers in understanding which action items should be implemented first. The order of priority, from highest to lowest, was:

- Environmental Sensor Stations.
- Dynamic Message Signs.
- Public information web site.
- CCTV cameras.
- External access to the system to the City of Wichita Falls Police Department.
- External access to the system to TxDOT Area Offices.
- Vehicle detection.

7.5 Identifying and Documenting Dependencies

While there may be several objectives and corresponding action items that stakeholders desire to implement with respect to the TMC, it must be recognized that there are factors that could impede, prevent, or otherwise adversely impact their implementation. These factors are typically termed dependencies or constraints.

Identifying and documenting potential dependencies up front provides stakeholder decision-makers with the information they need to identify critical path items, weigh their options and the implications of those options on the overall Business Concept, and ultimately determine which action items should be pursued. Timeframes and priorities associated with action items may need to be adjusted to account for these dependencies.

Dependencies also include risks. Most private sector business plans document risks so that stakeholders/shareholders/investors can make informed decisions about potential or known impacts.

Documenting potential dependencies upfront provides stakeholder decision-makers with the information they need to determine which action items should be pursued.

Table 7-1 shows potential dependencies and key questions planner should ask when evaluating risks and contingencies.

Table 7-1 – Potential Dependencies

Dependencies	Key Questions
Facilities	<ul style="list-style-type: none"> • Are the current facilities adequate for what the TMC needs to accomplish? • Are there any restrictions on space, usage, functions, or partnerships relative to the facilities? • Does it have to fit into an existing building/space?
Technologies	<ul style="list-style-type: none"> • Is there a technology plan in place to address new or maintenance of existing systems? • What other groups, divisions or partners need to provide input (or approval) for technology issues?
Partnerships (existing and future)	<ul style="list-style-type: none"> • Are there functions or roles that the TMC needs to address that will require active participation of partners? • Who are those partners and are they willing to participate? • Are there needs that have been undefined by the partnership? • Will partners be required to make financial commitments?
Leadership and organizational structure	<ul style="list-style-type: none"> • What are the current institutional issues or challenges that could impact the overall TMC Business Concept? • Are there internal or external management practices or processes that the Business Plan needs to work through?
Funding (amounts as well as schedules for fiscal programming)	<ul style="list-style-type: none"> • Is adequate funding available in time to carry out the actions, address technical or facility needs, and other operations/maintenance requirements?

Dependencies	Key Questions
Personnel and staffing resources (including numbers and types of staff)	<ul style="list-style-type: none"> • Is there adequate staffing to fulfill the functional and operational end states identified in the Business Concept? • Are there staffing needs or gaps, either in numbers of staff or technical capabilities?
Project implementations/timeframes	<ul style="list-style-type: none"> • Are there significant projects that will need to be in place to support the functional or operational end states identified in the Business Concept? • Who is/are responsible for those projects? • Are they funded and programmed? • Do the timeframes for those projects or programs fit within the timeframes and objectives outlined in the Business Plan?
Legislation	<ul style="list-style-type: none"> • Are there pending legislative issues that could impact the organization, funding or project implementations or that may be required? • What is the role of the legislature in determining agency priorities, and what kinds of factors need to be considered?

Following are examples of how agencies identified and documented dependencies as they relate to the action items of strategy sets.

Example 1 – Caltrans TMC Master Plan (Revised December 1997)

Caltrans identified a number of dependencies that needed to be satisfied before the proposed action items related to developing TMCs could be implemented. These dependencies included:

- Justification for development (needs analysis).
- Identified source of funding.
- Approval of a Project Report.
- The State TMC Architecture must be compliant with the National ITS Architecture.

Example 2 – Arizona DOT Fiscal Years 2005-2009 Strategic Plan (Draft 2003)

To increase the probability that funding could be secured annually for the operations and maintenance of transportation infrastructure and equipment, ADOT recommended the action item that Life Cycle Costing be applied to the operations and maintenance costs for any new features that might be added to ADOT's system. Implementation of this action item hinged on the dependency that legislative approval was required.

Example 3 – FHWA TMC Concept of Operations Implementation Guide (December 1999)

This document identified several dependencies, or constraints, on agencies with regards to TMCs. These dependencies included:

- Ensuring adequate staffing levels and budget for TMC operations and maintenance.
- Losing qualified TMC maintenance personnel to the private sector.
- Addressing technological evolution and obsolescence.
- Estimating the time it takes for a TMC to become operationally stable.
- Mitigating false alarm rates.
- Workloads.

7.6 Developing Strategy Sets

In summary, then, a strategy set is comprised of the following:

- Overarching objectives and desired end states;
- Action items that will allow/enable the objectives and end states previously identified, to be met;
- Stakeholder roles and responsibilities associated with the action items;
- Timeframes for the completion of the action items; and
- Dependencies that could impede or prevent completion of the action items.

Stakeholders should be involved in developing each component of a strategy set. The strategy sets should then be compiled in a format that allows the reader to easily identify how the strategy sets define what specific actions need to occur to meet the overarching objectives and desired end states, who needs to perform those actions, when those actions need to be completed, and what dependencies could potentially impede or prevent those actions from being completed.

Determining implementation costs and staffing resource requirements associated with each action item are not part of a strategy set, as defined herein, but are the next natural steps in the Business Planning process and will be discussed in further detail in subsequent chapters (Organization and Management – Chapter 8 and Financial Plan – Chapter 9).

Following are examples of strategy sets that contain the components described above. These examples also include many of the other components of the Business Planning process, including financial and staffing needs within the strategy sets,

Stakeholders should be involved in developing each component of a strategy set.

illustrating that agencies may choose to discuss these issues in conjunction with the development of strategy sets.

Example 1 – Nebraska ITS/CVO Business Plan (August 1998)

After defining the overall mission, vision, goals, and objectives, the Nebraska ITS/CVO Business Plan identified needs and then corresponding strategy sets (called tasks in this document) to meet those needs. Each strategy set contained the following headings:

- Task description.
- Objective.
- Outcome.
- Lead agency.
- Other participating agencies.
- Market.
- Approach.
- Key issues.
- Products.
- Schedule.
- Cost.
- Estimated task management requirement (staffing needs).

In this example, the action item (task description) is stated first and is followed by the overarching objective and outcome (desired end state). The roles and responsibilities of the stakeholders are next identified. Then, the schedule provides a timeframe for the completion of the action item and the key issues highlight the major dependencies.

To further assist stakeholders in understanding the proposed strategy sets, all of the action items were prioritized in order of importance. The action items were also grouped by:

- Stakeholder responsibilities.
- Deployment scheduling.
- Costs and funding sources.

Presenting these tasks, or strategy sets, in various formats allowed the stakeholders to quickly find the information they were looking for and in the format that best suited their purposes.

Example 2 – MAG Regional Concept of Transportation Operations (January 2004)

Maricopa Association of Governments (MAG) in Phoenix, AZ developed a series of technical memorandums that covered much of the Business Planning process. First, vision and mission statements were established, followed by 3-year and 5-year goals, performance measures, and policies and practices needed to achieve the goals. A set of functions, or objectives, were then developed that mapped to the 3-year and 5-year goals.

For each function, a table was created that included:

- Specific action items.
- Roles and responsibilities of stakeholders (broken down into planning, implementation, operations, and maintenance).
- Resources required and estimated costs.
- Additional pertinent information (such as dependencies).

While not explicitly stated, the timeframe for the action items was either three or five years, depending on which goal the overarching objective was mapped to.

Applied specifically to the TMC Business Planning process, a sample strategy set might be developed as shown below. The Business Plan would then contain several such tables of strategy sets.

Strategy Set #1

Objective #1: Improve Incident Management Response on Freeways

Action #1: Develop incident response protocol guidelines

- Responsible Stakeholder(s): DOT and Highway Patrol (Co-Leads), other local emergency response agencies
- Timeframe/Priority: Complete 6 months prior to construction of TMC
- Dependency:
- 1) Assumes coordination between DOT TMC operators, Highway Patrol dispatchers, and local emergency response units
 - 2) DOT and Highway Patrol expected to equally fund action item

Action #2: Prepare CCTV Camera and DMS Deployment Plan

- Responsible Stakeholder(s): DOT (Lead), Highway Patrol, local transportation, and law enforcement agencies
- Timeframe/Priority: Complete 12 months prior to construction of TMC
- Dependency:
- 1) Assumes funding is available for deployment of field equipment
 - 2) Assumes completion of ongoing FMS conduit/fiber infrastructure

Action #3: Procure central system software to control, display cameras and DMS

Responsible Stakeholder(s): DOT (Lead), Highway Patrol, State Information Technology Department

Timeframe/Priority: Complete 6 months prior to construction of TMC

Dependency:

- 1) Assumes MPO funding will be available
- 2) Software must be compatible with existing field equipment and ITS standards compliant