CHAPTER NINE
DAY-OF-EVENT ACTIVITIES

Figure 9-1
Traffic Management Team Day-of-Event Interaction

PURPOSE

The purpose of this chapter is to discuss the actual implementation and operation of the traffic management plan during the day-of-event. This constitutes the fourth phase of managing travel for planned special events. The chapter covers several areas, including sections on the *traffic management team*, *communications*, and *traffic monitoring*. This information allows the transportation management center (TMC) staff and traffic management team members to gain an understanding of how the Incident Command System (ICS) can be used for managing travel during planned special events and provide guidance on setting up a communications framework for planned special events transportation management.

INTRODUCTION

During the advance planning process, countless meetings were attended, numerous hours were spent developing and reworking the traffic management plan, and every contingency was considered. Now, the day is here and it is time to implement and operate the plan.

This chapter looks at what happens on the day(s) of the event. Not only do the requirements of the traffic management plan have to be considered, but also it is essential

to monitor what can be a very fluid situation to see how the plan is working and then determine what needs to be adjusted based on real-time traffic conditions.

Always expect the unexpected and be ready to handle that unplanned situation. Assess the adequacy of the established communications structure and determine if it is possible to deploy what is needed in a timely manner.

While there is no way to be certain until it happens, this chapter provides tools that will help practitioners deal with and manage all that might happen on the day-of-event.

Table 9-1 lists the key day-of-event activities.

Table 9-1
Day-of-Event Activities

ACTION
• Implement a management process for the traffic management team.
• Designate a multi-agency command post.
• Conduct a traffic management plan evaluation(s) during the day-of-event.
• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.
• Establish interagency communication protocol.
• Review communication equipment compatibility.
• Use the media to communicate with event patrons and other transportation users.
• Perform traffic monitoring on the day-of-event.

TRAFFIC MANAGEMENT TEAM

Stakeholder Roles and Coordination

The traffic management team includes not only many of those stakeholders that have been involved during the event operations planning phase, but all those who may be involved for the first time on the day of the event. This includes other event support stakeholders, other stakeholder representatives, and volunteer personnel. Table 9-2 lists typical stakeholders involved in day-of-event activities.

Table 9-2
Traffic Management Team Stakeholders

STAKEHOLDER
• Traffic operations agency
• Transit agency
• Law enforcement
• Public safety
• Event organizer
• Transportation consultants
• Traffic control contractors
• Emergency management agency

A planned special event represents a source of non-recurring congestion where, similar to a traffic incident, stakeholders must adopt a formal management process to ensure successful traffic management plan deployment and minimal impact to transportation system users. The Incident Command System can be used to handle traffic management during planned special events. The ICS organizes and coordinates multi-agency response to an incident by establishing responsibilities and lines of authority. An Incident Commander has overall responsibility for managing the planned special event. Depending upon the size of the event a number of individuals will report to the Incident Commander. A key to the ICS is that the reporting relationships be kept to a manageable size. If the number of people reporting to a single individual grows too large, another layer of command should be added.

Unified Command represents an ICS management process that functions to coordinate inter-jurisdictional and multi-disciplinary

stakeholders comprising the traffic management team without sacrificing agency authority, responsibility, or accountability. Figure 9-2 displays an example of a Unified Command organization for managing travel for planned special events. The Unified Command hierarchy includes the Incident Commander serving to coordinate and manage the activities performed by stakeholders classified under the following organizational elements: branches, groups, and units. A branch agency manages a specific operational function. For example, a law enforcement agency is responsible for traffic control and pedestrian accommodation. Group agencies manage and execute specific functional activities. Units execute specific functional activities. For instance, a private towing company is responsible for removing illegally parked or disabled vehicles.

Per Unified Command protocol, if an unexpected event happens during the planned special event, a transfer of command may occur. The decision to effect a transfer of command depends on the qualifications and experience of all on-site branch agency supervisors relative to that of the acting Incident Commander. For example, if a severe weather event took place during a planned special event, an emergency management agency official may assume the role of Incident Commander.

An advantage of using the ICS during a planned special event is that it clarifies how decisions are made if the traffic management plan requires adjustment. Unexpected events may necessitate adjusting the plan to meet changing circumstances. In this instance, there may not be the luxury of meeting with all stakeholders to develop a consensus on how to modify the plan. The Incident Commander should have the authority to make those adjustments that are needed.

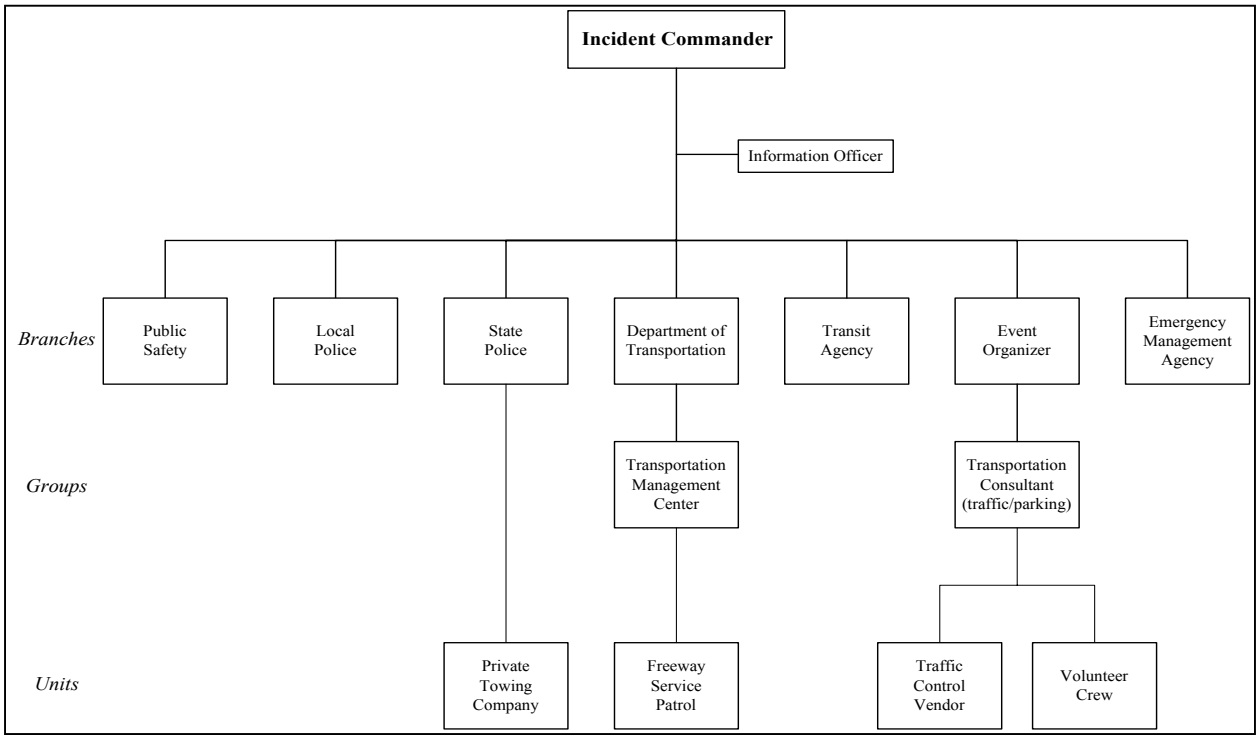

Figure 9-2
Unified Command Organization for Planned Special Events

Team Management

Typically for a planned special event, a representative of a law enforcement agency will take on the role of Incident Commander. Representatives of various agencies will, in turn, report to the Incident Commander. Among those working under the Incident Commander will be one or more transportation representatives. A lead person should be identified for each agency responsible for part of the traffic management plan. Among those who may be a part of the transportation team are representatives from the state department of transportation, local traffic agencies, toll agencies and transit agencies. Depending upon what is worked out in the event operations planning phase, all of these individuals may be represented by a single Incident Commander (e.g., transportation commander) or by individuals representing each of their respective agencies.

Command Post

The ICS will most likely be used in a multi-agency command post. Figure 9-3 shows a command post established at a freeway rest area for a major rural planned special event in Wisconsin. This will probably be at or near the venue where the planned special event takes place. Again, depending upon the size of the event, secondary command posts may exist. These secondary command posts may take on specific areas of responsibility, such as law enforcement or traffic control. Regardless of where the command post is located, or if it is located in multiple locations, the same principles of incident command will apply. An Incident Commander will still have overall responsibility for managing the event. What may differ, if there are secondary command posts, is how communications are handled to and from the Incident Commander.

In some instances, a permanent TMC may serve as the primary command post. The advantage of using the TMC is that many of the communications resources and other needed tools are already in place. If the TMC is used, the ICS should still be employed if multiple agencies comprise the traffic management team. This operation would likely differ from typical activities in the TMC, given the presence of multiple outside agency representatives. In the event

Figure 9-3
Planned Special Event Command Post *(Photo courtesy of the Wisconsin DOT.)*

operations planning phase, the ICS would be used to identify who is the Incident Commander at the TMC and how activities are coordinated within the TMC during the event.

Advantages of a single command post include: (1) key agencies are represented in a single location and (2) communications among agencies are simplified.

An advantage of secondary command posts is that event management can be more easily switched if a problem develops at the primary command post.

Resource Planning

The plan developed for the resources needed for the event represent the collected best opinion on what is needed. Resource planning involves the following two parts: (1) determining the scope and amount of resources that will be used on the day-of-event and (2) identifying resources in advance in case the traffic management team needs more resources than planned to implement the traffic management plan.

The most important resource that stakeholders must plan for involve personnel resources. Planning considerations include:

- What type and quantity of skilled personnel are needed?
- Where should personnel be deployed?
- What responsibilities will individual personnel have?

Most day-of-event field personnel will work in areas different from their normal, day-to-day work location. Relief for personnel may be more difficult to obtain because of agency constraints, and relief assignment should be part of personnel planning. Field personnel may require frequent breaks in difficult weather conditions, and traffic management team officials may have to substitute back-up staff if planned relief is not available.

The operation of planned special events on the day-of-event includes three phases: ingress, the event itself, and egress. Resources need to be available for all three phases with emphasis on ingress and egress. The traffic management team will likely need fewer personnel for traffic management during the event, and part of the planning should include what level of staffing is needed during this period. Depending on the length of the event, a second shift may report to handle egress. If a first (ingress) and second (egress) shift exists, traffic management team officials can stagger work times (e.g., first shift individual reporting later and leaving later or second shift individual reporting early and leaving early) to maintain sufficient personnel on-site during the event. Another consideration concerns how quickly staff and other resources can be deployed incase the event ends sooner than expected, thus causing early departures.

Managing Traffic

While the traffic management plan and supporting implementation plan notes how stakeholders expect to manage traffic, the actual management of traffic on the day-of-event may differ from what the plan calls for. Traffic incidents, changing weather conditions, and other unexpected events can all cause the traffic management plan to be modestly modified or completely changed. After safety, successfully managing traffic represents the reason why stakeholders developed the traffic management plan in the first place and that goal must remain paramount.

For this reason, it is important that involved stakeholders understand that the traffic management plan provides guidance but is not an ironclad law that must be followed regardless of what takes place on the day-of-event.

As part of the traffic management plan, various scenarios can be addressed from best case to worst case, together with likely variations. Having different scenarios and response plans specified in the traffic management plan will help managers more quickly respond to changes. Again, not every variation can be noted, but experienced staff can modify what the traffic management plan calls for.

When done well, managing traffic is done on a proactive basis, anticipating what will happen next and reacting before problems cascade. Like an orchestra conductor, the traffic managers are calling on different elements to play as the event proceeds. A traffic queue in one area will require adjustments to signal timing on primary and alternate routes. Traffic incidents not only require response to the site of the incident but the activation of appropriate messages on roadside traveler information devices.

As a general rule, drivers tend to be more understanding about a congestion delay if they are informed of what is taking place and are assured steps are being taken to mitigate the problem.

To properly manage traffic, the managers need timely and accurate information. Staff in the field must understand the importance of the information they provide, and staff at the command center must help the managers understand the information coming in, such as pointing out what is most important. Too much information without some interpretation is almost as worthless as too little information.

Other staff should be on hand to assist with other activities taking place in the command center. This includes handling VIPs, disseminating information to the media, and addressing routine items such as equipment problems.

Evaluation Activities

Although many hours have been spent creating the traffic management plan, the plan should remain flexible with the ability to modify and enhance it with necessary changes based on real-time traffic conditions. Updates can continue through the course of the planned special event, accounting for new situations and unexpected events. Evaluation of the plan is an ongoing activity during the event, and participants should contribute their insights as they witness the event unfolding. The traffic management team must be open to modifications of what had been agreed to during the event operations planning and implementation activities phases.

Table 9-3 indicates key traffic management plan evaluation activities on the day-of-event.

There are several different ways to accomplish this evaluation and revision process:

- Some modifications will be minor in nature and will not require significant discussion. For example, moving a traffic post may be a simple change that improves the flow of traffic. The Incident Commander may have authority to make such a change.

Table 9-3
Traffic Management Plan
Evaluation Activities

ACTION

• Establish briefing schedule and location (e.g., command post).
• Identify ranking representative of each stakeholder agency participating in briefings.
• Conduct day-of-event briefing.
  o Situation status
  o Objectives and priorities
  o Current organization
  o Personnel and equipment resource assignments
  o Communications
  o Concerns and related issues
  o Recommended changes
• Achieve consensus on recommended changes.

- A more significant change, such as the route of buses to the venue site, involves a greater number of agencies and individuals. These changes need to be discussed before being implemented to make certain everyone affected is aware of the change so that any concerns with the proposed change are addressed and overcome.
- If the suggested change is urgent, a quick discussion among the agencies involved may suffice.
- If it is not urgent, the modification can be discussed during a regularly scheduled meeting of the stakeholder representatives.

How and if these meetings are scheduled can vary depending upon the dynamics of the planned special event:

- If the event is small in scale and only a few agencies are involved, there may be no need for scheduled meetings. Revisions can be easily discussed among participants at the command post.
- On the other hand, large events involving many stakeholders would require meetings to discuss: (1) what has taken place, (2) what lies ahead, and (3) what changes are recommended.

If scheduled meetings are planned, the next question is when to hold these meetings:

- If the event stretches over several days with a clear end time each day, it is logical to conduct a meeting at the end of each day's activities. At this point, the participants will not be distracted by managing the event, and they will have the benefit of their experience that day to decide what should be revised.
- If the event is longer, perhaps even running around-the-clock, regular meetings can be scheduled during expected lulls in activity. These meetings may be specifically scheduled in anticipation of key activities, such as the egress of event patrons.
- For events where a shift change is needed in the command center, a meeting of the crew, or crew supervisor, going off-duty may be helpful so they can recommend changes to those relieving them.

Many of the same procedures used during the creation of the plan can be used to make revisions during the event. Those involved discuss the changes, call for input from those directly affected, and agree on what will be done. It is important that any changes be communicated to all involved. Major problems can develop if one group is operating under old assumptions. In many cases, having a computer and printer available will make updates easier to share. If the plan is in a notebook or manual form, the revised section can just take the place of the old section. Participants should note on the revised plan that it represents an update and when that revision was made. This makes it

easier to track changes and make certain everyone is operating with the same information.

COMMUNICATION 

Structure and Protocol

In most areas of the country, interoperable communications, in which all agencies are able to communicate on a common radio frequency, is not yet a reality. That being the case, it is necessary for a communication structure and protocol to be established. As shown in Table 9-4, the structure should include the noted primary considerations.

Table 9-4
Communications Structure
Primary Considerations

CONSIDERATION
• What radio channels or frequencies will be used. • Who will use these channels. • Will a common lexicon be used for communications.

Whatever frequency is used, it is important that all those who must use it be able to access the channel and that coverage include all areas where operations will take place.

In some cases, operating on a common frequency may require the distribution of radios to some of the stakeholders. In some instances, agencies have used cellular phones with a push-to-talk feature to provide a common channel during an event. Some agencies may already have these handsets and use them for day-to-day operations. One or more special talk channels can be established for use during the planned special event to allow only traffic management team members to be on the air. Table 9-5 lists the advantages of using this type of system.

Table 9-5
Advantages of Operating on a
Common Frequency

ADVANTAGE
• Most of the infrastructure is provided by a private company. • Coverage can be achieved over a wider area than some individual agencies enjoy. • Agencies' normal channels are freed for regular operations. • Other frequencies are not jammed with transmissions related to the planned special event.

Another important part of the protocol involves using *common language* on a multi-agency frequency. Many agencies use verbal shorthand in the form of codes when transmitting. These codes work well when used by those who know them, but when other stakeholders are involved, the codes can be a source of confusion and miscommunication. An increasing number of agencies are now using clear language protocols on their radio frequencies, and these standards should be followed if multiple agencies have to communicate with one another. Clear language simply says that commonly understood words and phrases are used instead of codes. For instance, instead of calling an accident a Signal 11, the crash should be called an accident on the radio.

Interagency Communication

Since multiple stakeholders are involved, it is critical that they be able to communicate with one another on the day-of-event:

- The most basic, and least desirable, form of interagency communication involves messages being relayed indirectly from one agency to another. An example could include a police officer in the field wishing to coordinate a road closure with the DOT. The officer radios the in-

formation to a dispatcher who, in turn, calls the dispatcher at the DOT. The DOT dispatcher then radios the crew in the field. Coordination might take several messages being sent back and forth through this chain. This form of communication delays the sharing of information and is subject to miscommunication.

- As noted in the previous section, operating on a *common channel* with *clear language* greatly improves interagency communication. Depending upon the size of the planned special event, more than one channel may be used. For example, one channel could be deemed as the primary channel, which is used by all participants for the sharing of critical information. Another channel may be dedicated to transportation concerns.

To minimize confusion and extraneous information being shared among agencies, the question of who will use which frequencies should be decided during the planning process. Stakeholders should understand: (1) how they can reach other traffic management team members during the event, (2) which channels they will be found on, and (3) what information should be shared.

Since many of the stakeholders comprising the traffic management team may not be accustomed to interagency coordination, they should understand the importance of sharing information with their interagency partners. Information not shared with others who are affected could lead to difficulties managing traffic and cause mistrust among participating stakeholders.

Equipment

The participating agencies may normally operate on a wide variety of systems. VHF, UHF, and 800 MHz trunked systems are among those in common use, and agencies cannot normally communicate from one system to another. Before the right equipment can be identified, it is important for the stakeholders to understand what they want the communications system to do. Is it simply a means to share information, or does real-time coordination have to take place? Who has to operate on the channel? Where will they be located? Once these questions are answered, it becomes possible to identify the appropriate equipment to use for the event.

Table 9-6 lists several levels of communication that must also be studied. First, there is communication within the venue. In this relatively small area, a radio system that provides coverage just in the area of the venue may be sufficient. Hand-held units may be given to personnel who have to coordinate at the site. Communications may take place between individuals or between field staff and the command post.

Table 9-6
Levels of Communication

COMMUNICATION LEVEL
• Within the venue
• Between individual stakeholders
• Between field staff and command post
• Between command post and TMCs

Another level of communication would be between the command post and the TMCs. Here it may be more difficult to identify the best equipment to use. The TMCs may be geographically distant from each other and the command post. Because the centers are inside buildings, and often on lower floors, radios without an external antenna may not be able to reach all the participating stakeholders. In order to depend upon these communication channels, it is important that they be tested before the event. If no radio

communication is practical, a hardwire connection may be needed. In some TMCs and command centers, phone jacks are installed to allow dedicated phones to be deployed for events.

A trunked radio system provides what is needed for interagency communication during a planned special event. Other agencies, which also operate on a trunked system, may be able to modify their units to operate on a common frequency. A trunked system also allows a dedicated channel to be set aside for the event. Those agencies without the proper equipment can be loaned radios, which allow them to operate on the common channel.

Interacting with the Media

The media is an important part of the planned special event. If the event involves a lot of people, it also is a news story and the media will want to cover it like any other story. The media can also be an important part of traffic management plan implementation. Table 9-7 indicates how the media can be used to communicate with event patrons and other transportation system users.

Table 9-7
Use of Media

BEFORE EVENT
• Identify preferred routes. • Identify approved parking areas. • Identify transit alternatives. • Identify locations where event patrons can obtain travel information on the day-of-event.
DURING EVENT
• Warn people ahead of time about the routes they should take. • Advise of available options. • Alert drivers about problems, delays, and blockages. • Suggest actions travelers should take.

Communication with the media should start before the event. If there is pre-event advice that stakeholders wish to disseminate, then the media can be a conduit to the public.

During the event, the media can be used to provide real-time updates about transportation system delays and blockages. Again, advice on how to avoid the delays can be provided.

Most agencies already have some forms of communication in place with the media. However, these may not be the best way to communicate during the planned special event. For example, many agencies work with traffic reporting services during periods of recurring congestion. The planned special event may be taking place on a weekend or holiday when the traffic reporting service is not in service. Alternate means to get real-time information to broadcasters may be needed.

The media may also find that the usual means they use to get traffic information are unavailable during the planned special event. Due to security concerns, airspace near the site may be off limits. This makes the media more dependent upon the agencies to provide them with updates.

Unless a proactive decision is made otherwise, most agencies would not want the media to call the command post for updates. Calls to and from the TMC may be the best way to get information to the media. Wherever the media are directed to call, it is important that the person handling those calls has the most up-to-date, accurate information available. For the media to trust this source, they must believe that this is the best place to get information. Since most media want to verify information on their own, agencies should be prepared for the media to

seek out other sources. The media may also acquire information via cell phones from event patrons driving to the planned special event, and the media will want to verify the information the public provides with the transportation agencies. If trust is lost between the media and the agencies, the agencies may lose control of the flow of information.

Traveler Information Dissemination

Traveler information will have two important audiences during the event: (1) those who plan to attend and (2) those who want to avoid the delays the event may cause. In both cases, traveler information tools can be used to effectively disseminate information.

Table 9-8 presents various pre-trip and en-route traveler information dissemination methods.

Table 9-8
Traveler Information
Dissemination Methods

METHOD
• Newspapers and printed material
• Radio and television
• Internet (e.g., websites and e-mail)
• Changeable message signs
• Highway advisory radio
• Telephone information systems (e.g., 511)

The dissemination of traveler information begins before the event with warnings of what may occur, preferred routes to the site and around it, and where drivers can get updates on the day-of-event. Different tools lend themselves to particular uses. Newspapers and other printed material, for example, lend themselves to graphic information such as maps. The Internet represents a powerful medium for disseminating pre-trip travel information to event patrons and other transportation system users. Figure 9-4 shows a Seattle Department of Transportation web page detailing specific planned special event traffic impacts and multi-modal travel options.

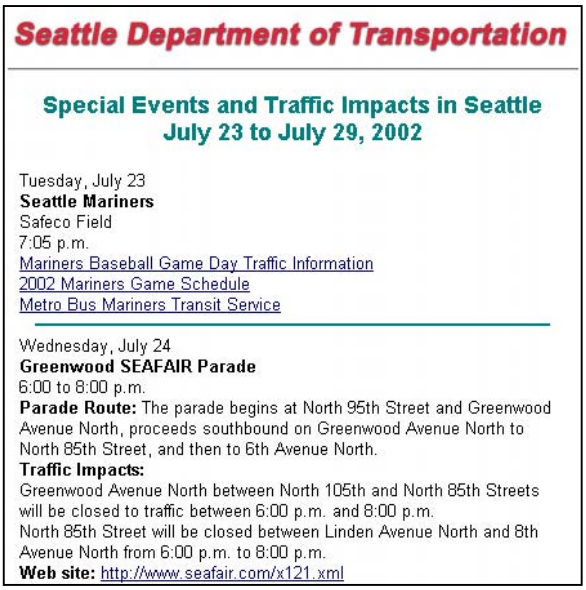

Figure 9-4
Internet Traveler Information *(Graphic courtesy of the Seattle DOT.)*

Changeable message signs function best to raise awareness of a potential problem while road users are en-route, and highway advisory radio is somewhere in the middle, being able to provide more detail than signs, but less than printed material. The planned special event is likely to require the deployment of portable changeable message signs because a greater concentration of information is needed and because the event may be taking place in a location where permanent devices are not in place. Portable highway advisory radio stations may also be considered to reach motorists.

In planning for the event, stakeholders must consider: (1) which devices will be used, (2) approved messages that can be displayed,

and (3) how to disseminate the information to event patrons and other transportation system users.

The growth of 511 services represents another important avenue to disseminate information. As 511 becomes more well known and more widespread, travelers are more likely to think about dialing 511 before they go or while they are en-route to get the latest information. Even where 511 is not yet in use, other recorded telephone services can be used.

No one system will reach all of the people that stakeholders wish to alert. In fact, even if all systems are used, operators will not reach every transportation system user. But, by using a variety of tools, the traffic management team will be able to reach a critical mass of people so that delays will be minimized and the customer requirements of all users satisfied.

On the day-of-event, it must be clear who will update traveler information devices and how timely and accurate information will get to the officials responsible for providing the updates. These individuals must be part of the communication chain. Again, assigning a dedicated person to handle the updates would be ideal. Conflicting priorities could result in out-of-date information being disseminated if one person is asked to handle too many tasks.

TRAFFIC MONITORING

Traffic monitoring represents an important day-of-event activity, serving to provide traffic and incident management support in addition to performance evaluation data. Timely deployment of contingency plans developed during the event operations planning phase depends on the accurate collection and communication of real-time traffic data between traffic management team members. This section describes how traffic monitoring activities support real-time traffic management and control decisions during the day-of-event.

Purpose

Agencies responsible for managing planned special events require numerous types of information on the current conditions of the system to support delivery of effective service for the planned special event. This required information varies widely depending on: (1) the service being provided, (2) how often it needs to be collected, and (3) how accurate it needs to be (e.g., for traffic control and traveler information purposes, simply knowing whether pavement is wet/icy or not may suffice; for purposes of managing snow and ice control activities, more detailed information is required).

Information is crucial for successful operations of the transportation network. As noted in an FHWA TEA-21 reauthorization proposal: "Operating the highway system to achieve security, safety, and reliability objectives requires an ability to know what is happening on the system. Real-time information on highway system performance and weather conditions / events is vital to assist highway professionals in managing the available capacity, responding to disruptions to capacity (including emergencies, evacuations, and security threats), and to system users in planning the timing, mode, and route for their trips." In essence, the many benefits of the various planned special event management strategies cannot be fully realized unless practitioners are aware of the real time conditions on the highway network.

Traffic Management Support

In a traffic management system, the traffic monitoring component, or surveillance component, is the process in which data is collected in the field. This data is used to supply information about conditions in the field to other system components including personnel located in the field on the day-of-event. Surveillance provides the information needed to perform the functions identified in Table 9-9.

Table 9-9
Use of Surveillance Information

FUNCTION
• Measure traffic and environmental conditions in real-time.
• Make control decisions.
• Disseminate traveler information.
• Monitor and evaluate system and plan performance.

Surveillance is not limited to collecting and monitoring traffic condition information alone, nor in some instances are they automated in nature. Surveillance is applied to weather and pavement conditions to provide operators and maintenance staff more information to support their traffic and transit management responsibilities. These systems also are being used to manage snow removal, icy roadway treatment, to detect limited sight distance problems caused by fog or smoke, and to detect high water levels along roadways. While much traffic surveillance (detection) is accomplished via automated means, manual detection, most notably via in-field personnel on cell phones or two-way radios and cell-phone calls from motorists, is a viable and reliable strategy for planned special event management. In many instances of planned special event management, the surveillance must be microscopic rather than macroscopic, i.e., a particular point or location must be monitored rather than an area or region, and this strategy of manual detection is the most cost-effective and efficient.

Various technologies that exist for collecting this information are described in Table 9-10.

Table 9-10
Data Collection Methods

METHOD
• In-roadway and over-roadway sensors for measuring traffic flow parameters
• Vehicle probes for collecting data on travel times and origin-destination information
• Closed circuit television (CCTV) systems for viewing real time video images of the roadway
• Road weather information systems (RWIS) for gathering information on pavement and weather conditions
• Traffic signal and system detectors to measure congestion on streets
• Parking management systems to monitor available capacity in parking garages or lots
• Manual methods

Detection and surveillance, whether highly technical and automated or simple and manual, is the cornerstone of traffic monitoring. Traffic management strategies and Intelligent Transportation Systems (ITS) technologies can assist in reducing congestion, improving safety, and enhancing mobility. However, without the capability to know the current operating conditions, coupled with the cooperation and coordination among personnel in the responsible agencies, the potential benefits of these strategies and technology systems may not be realized. To that end, it is not a simple matter to quantify benefits from detection and surveillance alone, but instead to understand the benefits realized from traffic management strategies and ITS technologies that rely on detection and surveillance. Some benefits of particular importance are noted in Table 9-11.

Table 9-11
Benefits of Detection and Surveillance

BENEFIT
• Reduction in delay and congestion related to early detection and verification of incidents. • Reduction in secondary accidents as a result of early incident detection. • Reduction in capital (e.g., salt) and recurring (e.g., plow crews) costs associated with snow and ice removal with the use of Remote Weather Information Sensor technology. • Improved traveler information.

The information collected through the monitoring effort is valuable for post-event activities. After the event, the information gathered and/or observed can be used as part of the program or event evaluation. The data collected provides: (1) input into estimating the benefits of the traffic management plan and operation and (2) input into planning for future planned special events. An example of some statistics or measures that can be obtained from traffic monitoring on the day-of-event, and can commonly be used to evaluate the effectiveness of the event traffic management plan and operation includes:

- Reduction in delay
- Change in mode
- Increase in transit ridership
- Reduction of travel time
- Increase in travel speed
- Reduction in loaded cycle lengths at signalized intersections

In summary, most of the benefits realized during planned special events results in some way from the real-time information provided by traffic monitoring.

Performance Evaluation Data

Performance measures provide the basis for identifying the location and severity of problems (such as congestion and delay), and for evaluating the effectiveness of the implemented planned special event management strategies. Table 9-12 indicates uses of this monitoring information. In essence, performance measures are used to measure how the transportation system, and therefore the traffic management plan, performs with respect to the adopted goals and objectives, both for ongoing management and operations of the special event and the evaluation of future options.

Table 9-12
Traffic Monitoring Information Uses

USE
• Track changes in system performance during the event. • Identify locations or corridors with poor performance. • Identify potential causes and associated remedies (i.e., contingency plans). • Identify specific areas that require improvement/enhancements for future events. • Provide information to decision-makers and the public. • Provide input to post-event evaluation.

Most measures for planned special event management are congestion-based and are measures that can be quickly and efficiently assessed. Table 9-13 indicates key performance evaluation measures. Certainly other non-transportation measures are important to successful planned special event management; however, these are neither accurate nor timely enough to allow for day-of-event management.

Table 9-13
Performance Evaluation Measures

MEASURE
• Parking occupancy and turnover rate
• Arrival and departure service rate at parking area access points
• Time to clear parking lots
• Vehicle delay at intersections
• Queue length
• Travel time and delay on freeways and streets
• Traffic volume to capacity ratio
• Traffic speed
• Number and location of crashes and other incidents
• Traffic incident clearance time

Table 9-14 lists some of the reasons that agencies have instituted performance measures and the associated monitoring and evaluation processes.

Table 9-14
Reasons for Traffic Monitoring and Evaluation

REASON
• Provide better information about the transportation system to the public and decision makers (in part due, no doubt, to a greater expectation for accountability of all government agencies).
• Improve management access to relevant performance data.
• Improve agency efficiency and effectiveness, particularly where demands on the transportation agency have increased while available resources have become more limited.

In managing travel for planned special events, a direct relationship exists between the performance measures selected and the data needed in the performance measurement process. The data and information used in decision-making must be of high quality because the remedies have to be performed immediately. They must originate from reliable, consistent sources and meet the needs of the decision makers. Moreover, the decision makers must have confidence in the information, or it will not be used.

The most common data problems are acquiring the required information in the exact form desired, and in ascertaining the quality of the data. The ''garbage in, garbage out'' concept applies to the data used in a performance measurement system. If the data gathered are highly uncertain, then the conclusions drawn by converting those data into performance measures also will be highly uncertain and will have reduced value to interested stakeholders. For this reason, great care needs to be taken in data collection. In reality, however, some things either cannot be measured accurately or cannot be measured accurately at an acceptable cost and in an acceptable timeframe. Transportation agencies need to consider the uncertainty introduced by inaccurate data when taking action based on their system of performance measures, especially in planned special event management, where the modifications have immediate, and possibly disastrous, results.

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