CHAPTER EIGHT

CASE STUDIES

Up to this point, this synthesis report has generally described the state of the practice related to special event stakeholder involvement, tools and techniques, supporting documentation, effectiveness of efforts, and funding sources. To better detail the planning and management of special events with respect to the aforementioned topics, three case studies were investigated. To provide variety in special event size and frequency, the following three case studies were selected: (1) the 2002 Winter Olympic Games in Salt Lake City, Utah; (2) the Phoenix International Raceway (PIR) in Phoenix, Arizona; and (3) the Annual Sweet Pea Festival of the Arts in Bozeman, Montana.

2002 WINTER OLYMPIC GAMES

At the time of this report, the state of Utah had just finished hosting the 2002 Winter Olympic Games, which were held from February 8 through 24, 2002, and the Para-Olympic Winter Games held from March 7 through 16, 2002. Therefore, the findings related to the success of any of the special event planning or management efforts for these two events are limited.

Stakeholders

Because of the size (estimated to be 1.7 million participants and spectators) and the anticipated traffic impact of the Winter Olympic Games, the level of planning required was very high and involved numerous stakeholders.

- The Salt Lake City 2002 Winter Olympic Games Organizing Committee was responsible for the overall execution of the Games.
- With respect to law enforcement, the Utah Olympic Public Safety Command (UOPSC) was responsible for public safety and limited traffic control, with jurisdiction over all Interstates, state highways, and local roads. The UOPSC was comprised of representatives of
  - Utah Department of Public Safety;
  - Provo, Utah, Public Safety;
  - University of Utah Police Department;
  - West Valley Police Department;
  - Ogden Police Department;
  - Salt Lake City Police Department;
  - Utah National Guard;
  - Federal Bureau of Investigation;
  - U.S. Secret Service;
  - Bureau of Alcohol, Tobacco, and Firearms;
  - Comprehensive Emergency Management;
  - Ogden City Fire Department;
  - Park City Fire Department;
  - Weber County;
  - Summit County;
  - Wasatch County;
  - Park City Municipal Corporation; and
  - Park City Public Works.
- UDOT provided transportation planning support to the Salt Lake City 2002 Winter Olympic Games Organizing Committee through the loan of six full-time staff members. This loan began soon after transportation preparation plans began and continued up until the Games.
- Local cities and counties in the greater Salt Lake City region were responsible for emergency management, public services, roads, and constituent impacts within their local jurisdictional boundaries.
- With a significant emphasis on TDM and use of alternate modes between the Games' venues, the UTA, and the Park City Transit Authority were involved in and responsible for providing adequate public transportation services to and from the Games.
- The Salt Lake City Airport Authority organized air transportation, including the additional arrivals and departures necessary to move the anticipated 1.7 million people.
- The Salt Lake City MPO was responsible for the development of the transportation improvement plan and funding in the urbanized areas.
- Finally, financial partners from the federal government who helped with the planning, capital, and operational costs of large transportation system improvements included the U.S. DOT, the FTA, the FHWA, the Federal Railroad Administration, the Federal Aviation Administration, the U.S. Coast Guard, and the National Highway Traffic Safety Administration.

Tools and Techniques

The magnitude of the Winter Olympic Games called for the planning and implementation of an extensive array of tools and techniques. Most of these tools and techniques were in the long-range plans of UDOT and were to be incorporated into *CommuterLink*, a traffic management

system. The Winter Olympic Games helped to accelerate their deployment.

Motorist Information

A system of VMS and HAR were already positioned throughout the region to provide real-time motorist information. Media partnerships would help to disseminate such real-time information. Before the Games, an extensive pre-event informational campaign was undertaken. Dedicated websites provided information on transportation services for the Games, including park-and-ride lots and transit. *CommuterLink* provided information on travel speeds, incidents, and construction on the roadways serving Olympic venues. To help motorists find their way to park-and-ride lots and other points of interest, special event wayfinding signage was installed.

In addition, the *Olympic Transportation Guide,* a 35-page guide documenting the transportation system to be used during the Games was published and made available free to the public and mailed to all ticketholders. Included in this comprehensive guide were driving, transit, and shuttle maps, and even tips on how to bypass the Games to make deliveries to businesses and residences located in downtown Salt Lake City.

Traffic Management

With respect to traffic management, non-law enforcement service patrols and traffic management teams provided direction and assistance to Games patrons. Aircraft patrols provided aerial surveillance of the region.

CommuterLink provided electronic surveillance of the region. *CommuterLink* is based at UDOT's Traffic Operations Center and linked to the traffic control centers in Salt Lake City and Salt Lake County. Through *CommuterLink*, more than 150 CCTV cameras provided real-time images and a means to verify incidents before dispatching response personnel. A network of traffic sensors placed every one-half mile on the freeway provided real-time traffic volumes and speeds.

Approximately 25 ramp meters situated on various on-ramps along the freeway helped to control freeway congestion. To manage traffic on the surface arterials and streets, approximately 550 traffic signals throughout the Salt Lake City region were connected to *CommuterLink*. With data from the traffic sensors, appropriate timing plans were developed to ease congestion and assist with incidents.

Other traffic management techniques included temporary lane closures; major capacity improvements, including the I-15 reconstruction project; towing contracts to more quickly clear incidents; and increased snow removal to improve both safety and efficiency.

Travel Demand Management

In addition to simply managing existing traffic demand, Salt Lake City sought to actively manage the potential traffic demand. To encourage transit use, any Winter Olympic Games event ticketholder could use the shuttle bus system or any UTA service free on the day of that event. Free park-and-ride and park-and-walk lots, within easy access to the Game venues by means of shuttle bus or on foot, were also prevalent throughout the region.

Strategies were also considered to reduce congestion by Olympic nonpatrons. These included alternate work and delivery schedules for businesses, carpooling and ride-sharing incentives, and telecommuting. Commercial and commuter routes were developed to reduce impacts on nonevent traffic. Also, the transit system in the area was significantly improved with UTA's TRAX light-rail system, which now has 18 stations. To further accommodate the increased demand on the light-rail-system during the Games, the UTA borrowed 33 additional light-rail vehicles. Finally, 1,000 buses were borrowed to supplement the existing 600 owned by the UTA.

Simulation and Prediction Tools

Because of the size and uniqueness of this event, the UDOT developed an in-house macroscopic model to predict the location, magnitude, and duration of transportation problems. In addition, a series of microsimulation models was developed to better analyze individual problem locations.

Effectiveness of Current Efforts

Although limited because of the recentness of the Games, some post-evaluations have taken place. Before the Winter Olympic Games, transportation was rated an area of concern by 60% of those questioned in a public poll. In a poll taken by the *Salt Lake City Tribune* after the Games, 87% rated the transportation as either *good* or *excellent*. Participants were also asked to cite two of the biggest negatives of the Games. Only 4% specified transportation as one of their answers (Harpst 2002).

To provide readers with a sense of the magnitude of the Games, transit statistics were compiled after their close. It was estimated that 2.52 million transit rides were provided during the Games. On an average day, 100,000 light-rail

rides, 42,000 shuttle bus rides, and 80,000 regular bus rides were provided. The Mountain Venue Express, a shuttle bus service, took approximately 30,000 people out of cars, which is approximately equivalent to removing 12,500 vehicles from the roads, assuming a higher than average vehicle occupancy for special event patrons (Harpst 2002).

The *CommuterLink* website also saw increased usage. Prior to the Games, the website received approximately 700 visits per day. On an average day during the Games, the site received approximately 9,400 visits (Harpst 2002).

PHOENIX INTERNATIONAL RACEWAY

PIR hosts automobile races, with attendance ranging from several thousand to approximately 150,000. The raceway is located in the Phoenix Valley and is approximately 393 acres in size. Access to the facility is by means of the Interstate and state highway system, with surface arterials leading to the raceway.

To help mitigate some of the challenges caused by the large events held at PIR, a set of objectives was developed (Wall et al. 2000).

- Improve arterial and freeway access to the event,
- Improve parking guidance and internal circulation,
- Increase automation of traffic control,
- Centralize traffic management functions,
- Develop a coordinated incident management plan,
- Improve static and changeable signage on event routes,
- Minimize the impacts on nearby residential traffic, and
- Coordinate with the local media.

To formally pursue these objectives, the PIR Special Event Traffic Management System was developed.

Stakeholders

The development of the Special Event Traffic Management System for PIR was a cooperative effort by many agencies and organizations including the Maricopa County DOT (MCDOT), Maricopa County Sheriff's Office (MCSO), the Arizona DOT (ADOT), the Arizona Department of Public Safety (DPS), PIR officials, and a consultant, Kimley–Horn and Associates. Secondary stakeholders included M&M Parking, the media, and the various vendors.

Kimley–Horn and Associates was responsible for conducting a needs assessment and system design, including opportunities for ITS applications. An initial task included reviewing previous traffic control plans, interviewing key personnel, and determining past problems. Next, they reviewed existing traffic management strategies to determine what worked well and what needed improvement. A stakeholder meeting was held during this process, which included representatives of ADOT, MCDOT, PIR, and M&M Parking. Finally, they developed a design concept that would result in the final traffic management plan.

Tools and Techniques

Because of the frequency of PIR events and the permanence of the venue, the tools and techniques deployed for special event planning and management could also become permanent.

Motorist Information

For motorists en route to an event or for nonevent motorists wanting to avoid the area, ADOT has both permanent and portable VMS along the primary access route, Interstate 10. Additional portable VMS also line the primary arterials leading to the venue. Sign messages are controlled from a central location—the PIR Command Center, MCDOT's Traffic Management Center, or ADOT's Traffic Operations Center, depending on the event's setup.

Three HAR stations are also strategically placed to provide continuously updated traffic conditions within a 3-mi radius of the speedway. In an effort to have more motorists tune in, a race driver recorded HAR messages. Driver interviews and track facts are also available to further encourage HAR use.

VMS and HAR messaging is complemented by the media. Several news stations in the region use helicopters for aerial surveillance and report traffic conditions to motorists by means of television and radio. Coordination among the various media sources had previously resulted in inconsistent and sometimes confusing information to drivers. The media would suggest routes that conflicted with routes suggested by personnel on the ground. Coordination has since been increased to avoid these conflicts.

Well in advance of any event, PIR officials use a preevent informational campaign to provide transportation information to season ticketholders and other patrons. The information is provided in the form of flyers that among other things encourage riders to use specific routes to reach the facility. A newsletter and website are also available to the public (Figures 8–10). Telephone numbers to obtain additional traffic information, such as the location of park-and-ride lots, or traveler tips, such as the HAR frequency, are also provided.

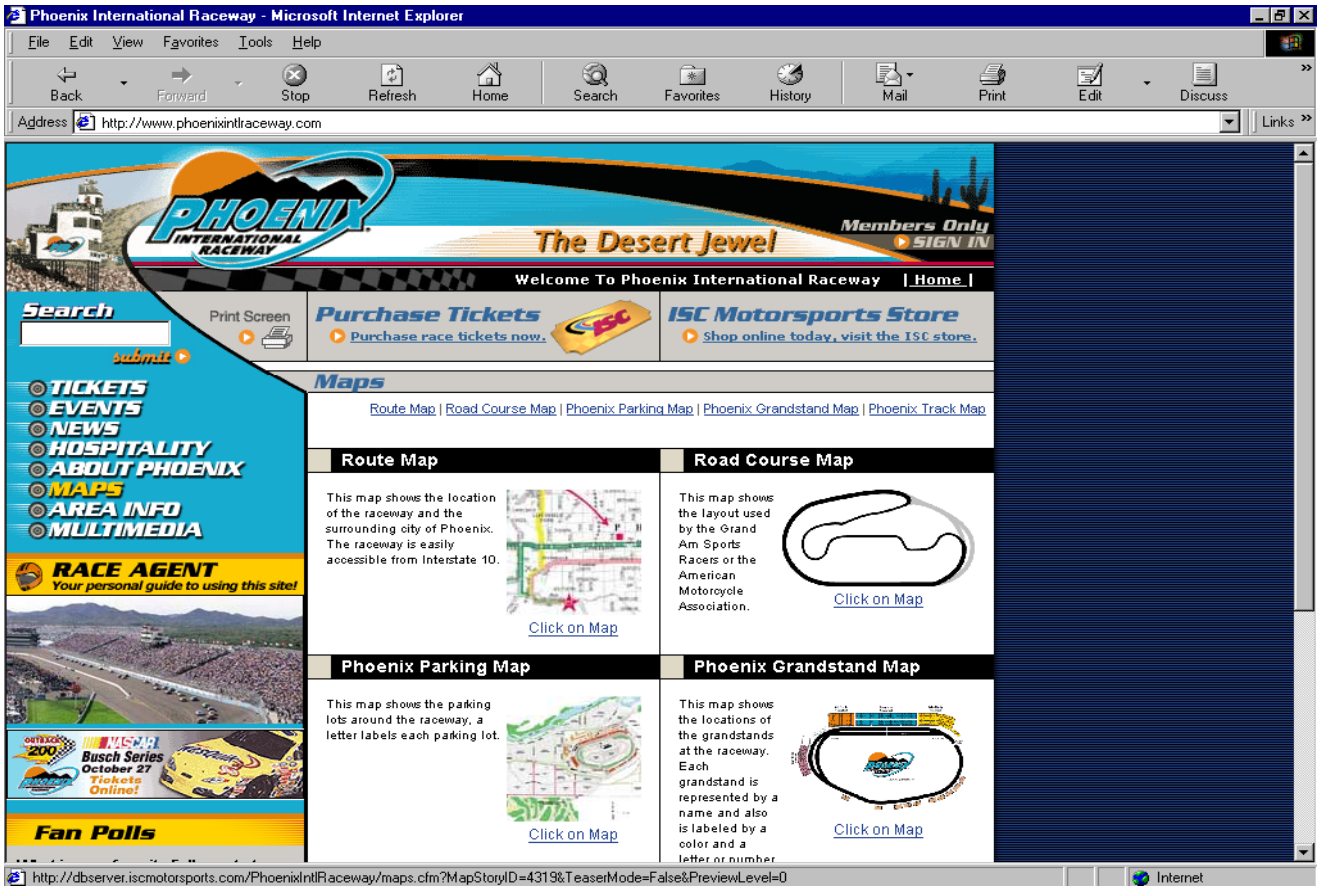

FIGURE 8 Internet site for Phoenix International Raceway with route and parking maps available (*Courtesy*: Phoenix International Raceway).

Traffic Management

The PIR Special Event Traffic Management System employs a variety of traffic management tools and techniques (Figure 11). Approximately 40 traffic control posts, staffed primarily by law enforcement teams from the Arizona Highway Patrol and the MCSO, are stationed at intersections near the racetrack during special events for both event ingress and egress. Local police and personnel from MCDOT and ADOT supplement these crews. Communication among traffic control post personnel occurs by means of radio and cellular phones distributed among key staff.

In addition to the extensive network of manual surveillance, three traffic management centers, the MCDOT Traffic Management Center, the ADOT Traffic Control Center, and PIR's Command Center, provide electronic surveillance. Both real-time and time-lapse CCTV cameras provide visual images of traffic conditions to each of the three centers. Additionally, a grid of vehicle detection stations is deployed on the roadway network to collect 15-min vehicle counts. These counts are currently used only for post-event evaluation purposes, but in the future may be updated to provide real-time counts to the traffic management centers for use in redistributing traffic. The three centers are connected with high-speed communications to allow exchange of real-time traffic information (Figure 12). Note the high level of coordination and information sharing among the three centers.

Changeable, electronic, remotely controlled "Trailblazer" signs that display directional arrows when illuminated were installed near intersections and other critical decision points along the arterials. These signs serve as the primary traffic control in the racetrack area. Lane control signals were installed on one of the arterials leading from the Interstate to PIR; reversible lanes will add additional capacity during times of both ingress and egress.

Finally, a fence along Indian Springs Road adjacent to the raceway forces pedestrians to use the tunnel under the roadway and discourages jaywalking across the road. This improves both the traffic flow along this route and pedestrian safety.

Travel Demand Management

In an effort to decrease the number of automobiles accessing the raceway and to disperse the traffic more efficiently

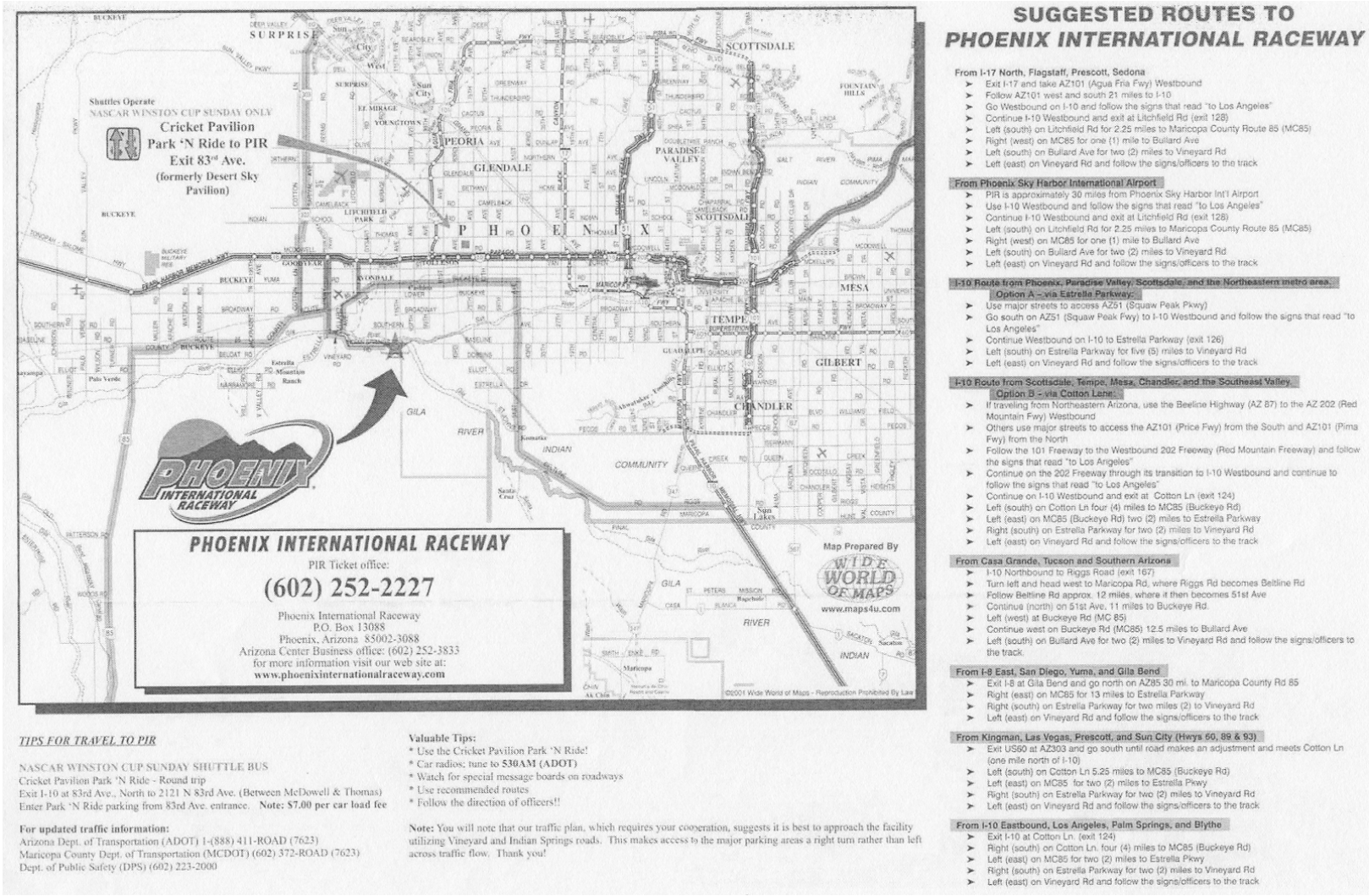

FIGURE 9 Driving directions map for Phoenix International Raceway (*Courtesy*: Phoenix International Raceway).

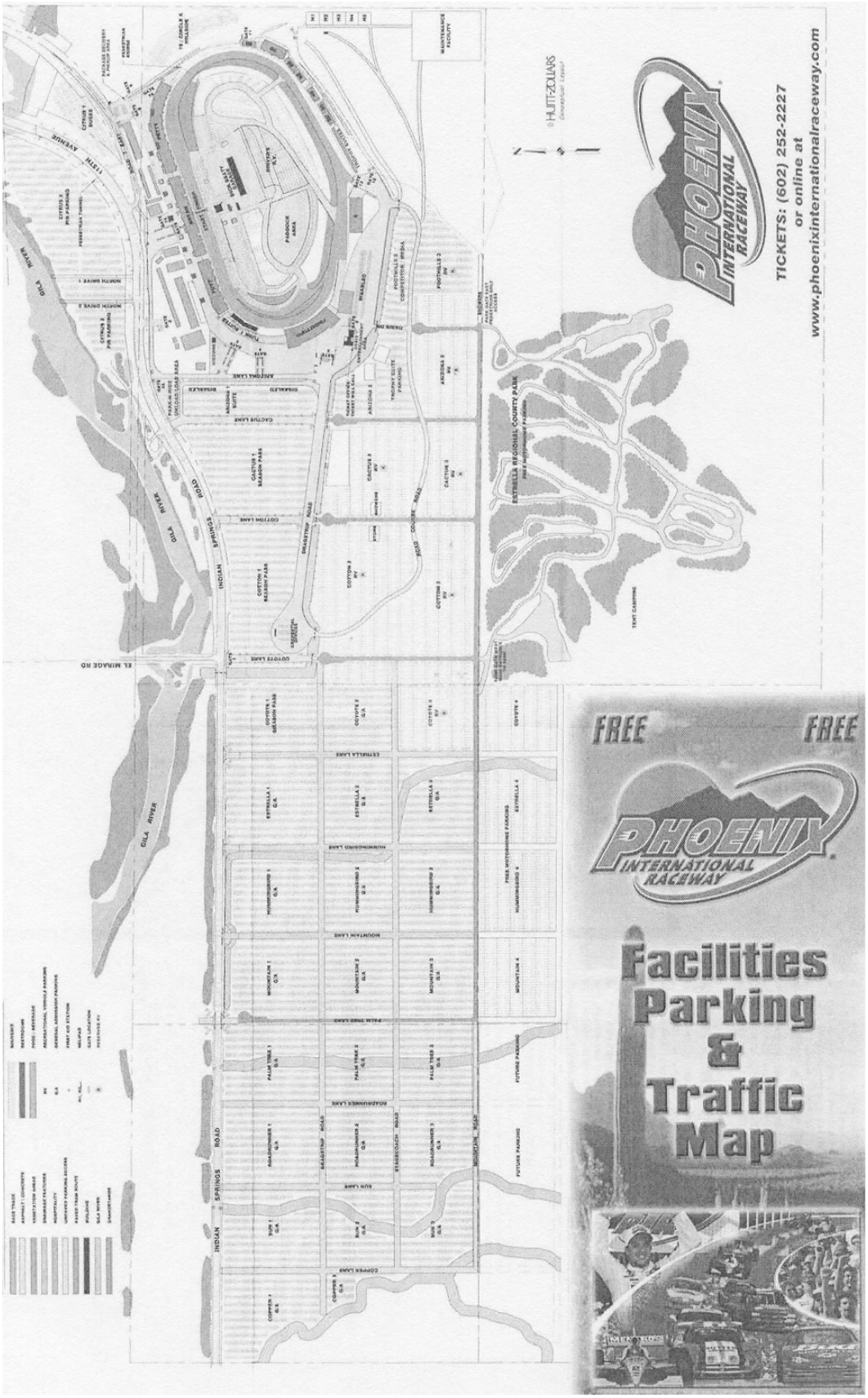

FIGURE 10 Parking map for Phoenix International Raceway (*Courtesy*: Phoenix International Raceway).

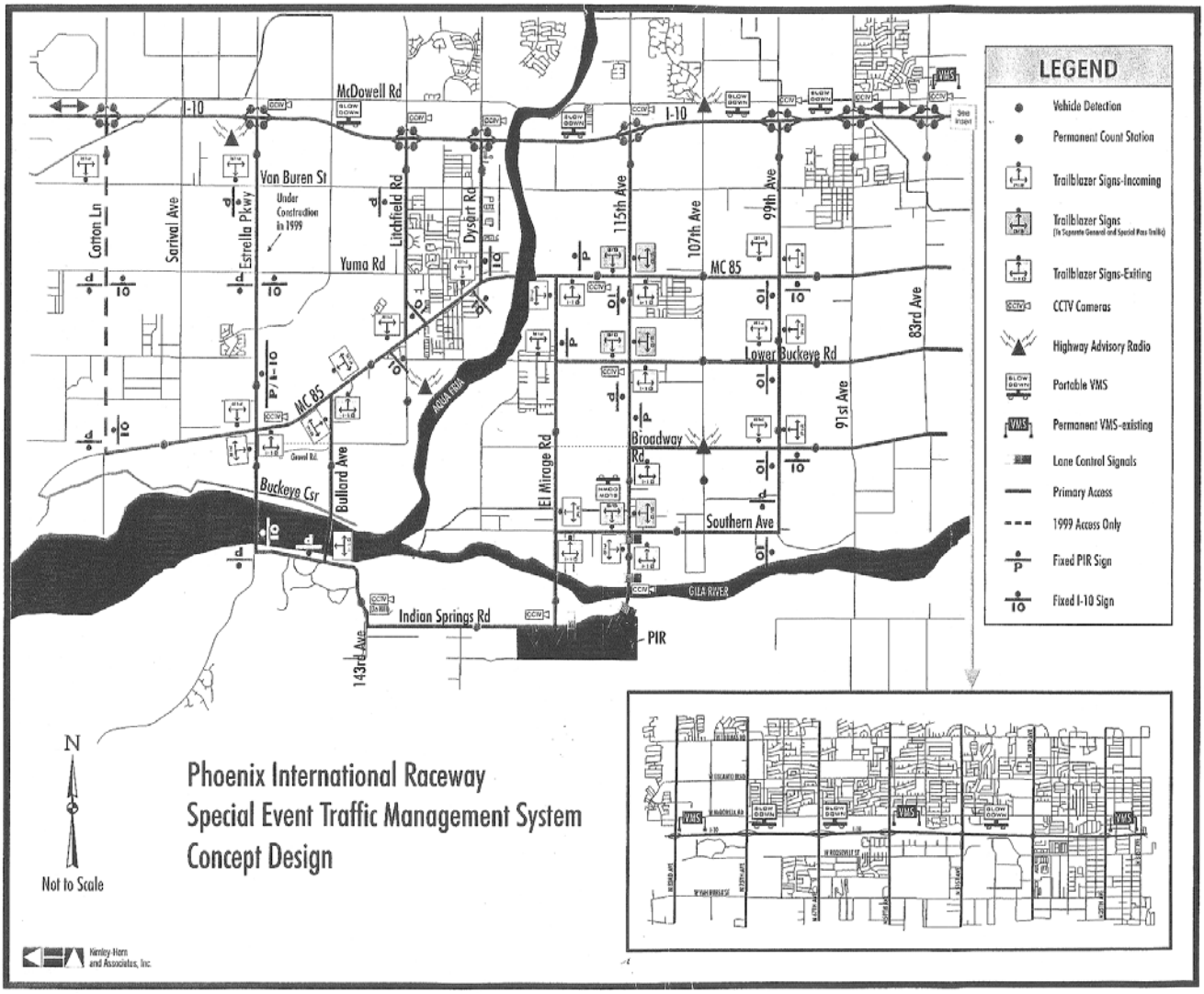

FIGURE 11 Intelligent transportation systems layout for Phoenix International Raceway (*Courtesy*: Kimley–Horn and Associates).

across the roadway network, PIR has implemented several TDM strategies.

To reduce demand on the primary roadways serving PIR, drivers are encouraged to enter the raceway using a variety of routes. Maps depict access points by means of written instructions and color-coded schemes. Through active promotion about the many alternative routes, the traffic demand is dispersed along the roadway network.

For the largest PIR event, the NASCAR Winston Cup Race, a dedicated park-and-ride facility is established. The lot can accommodate 5,500 vehicles. Thirty buses carry fans to PIR before the race and 50 buses return them to the lot afterward.

Parking management strategies are also in place for large events at PIR. The raceway has three levels of parking: (1) special pass owners, (2) general admission, and (3) PIR employees. On one of the arterials near the raceway, special pass owners use the left traffic lanes, whereas the general admission motorists are directed to the right lanes. Special pass owners are given distinctive colored window stickers as a way to ensure proper identification.

A phased deployment of these tools and techniques was undertaken allowing PIR to (1) spread the cost over time, (2) test various segments for performance against desired objectives, and (3) evaluate changes in traffic patterns in the vicinity of the racetrack and adjust the strategies accordingly. Systems deployed in this phased manner allow for easier determination of which system components have the greatest benefit to the entire system.

Supporting Guidance Documentation

PIR special event planning and management activities are also formally documented in a traffic control plan. This

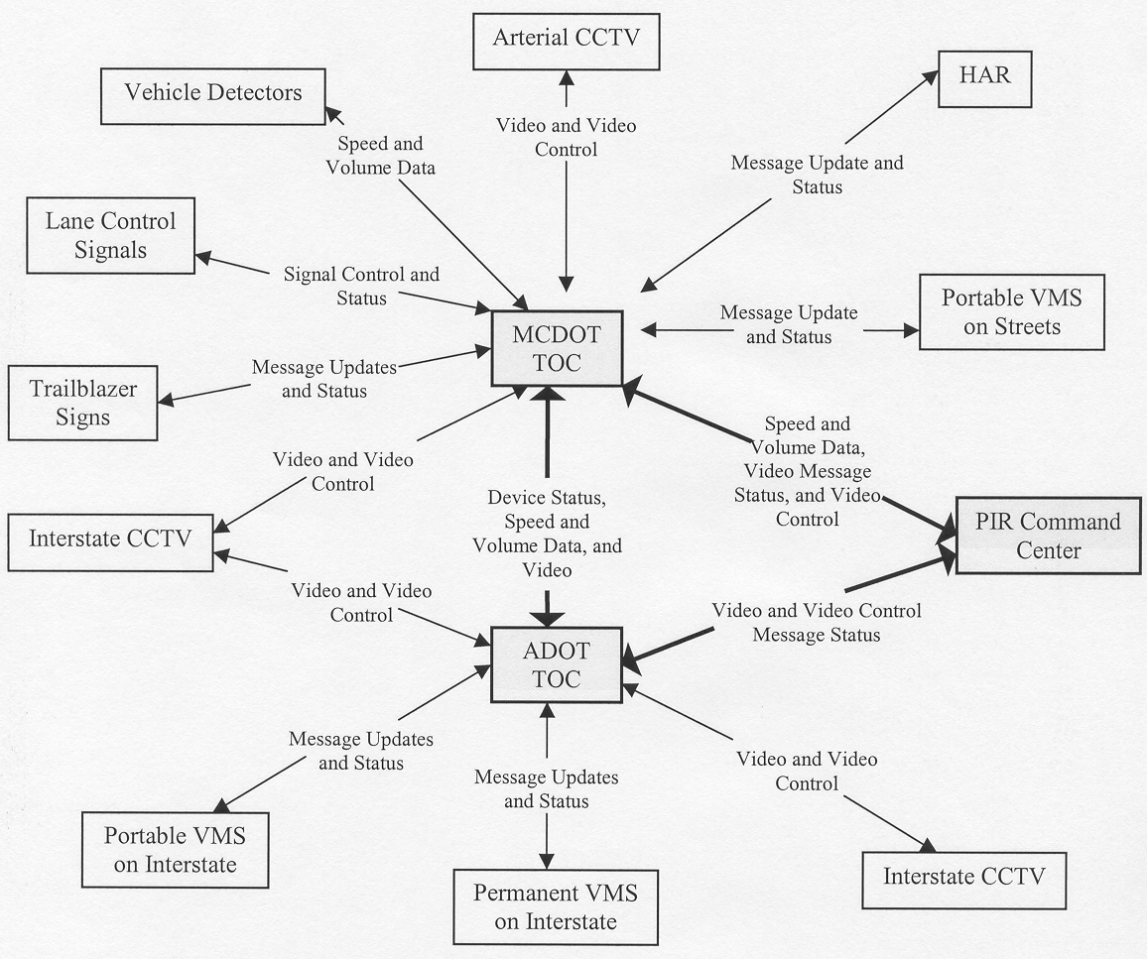

FIGURE 12 Information flow diagram for Phoenix International Raceway (*Courtesy*: Kimley–Horn Associates).

plan is updated each year and, in some cases, modified before an event, depending on anticipated attendance, weather conditions, and other factors. This plan was developed and is used by all of the stakeholders.

Effectiveness of Current Efforts

In addition to using vehicle detectors to evaluate the success of the traffic management system at PIR, other measures of effectiveness include travel and departure times. In 1998, the average travel time to PIR from Phoenix was 2 to 3 h. Travel times were reduced to less than 45 min in 1999 and to between 20 and 30 min in 2000. In 1998, 5.5 h on average were required to clear the parking lot following a major event. By 2000, that had been reduced to approximately 3.5 h. These significant improvements in traffic flow have occurred despite a noted increase in overall traffic volumes. Total traffic volumes increased from 85,744 in 1998 to 133,185 in 2000.

Qualitatively, feedback from the general public has improved as well. Before improvements to the special event planning and management process, PIR would receive approximately 300 instances of negative feedback each year. With the new plan, they received approximately 200 instances of *positive* feedback instead.

Funding

The PIR Special Event Traffic Management System was cooperatively funded through a public–private partnership. MCDOT and ADOT reached an agreement with two ITS vendors to supply time-lapsed cameras and Trailblazer directional signs, connecting them to the PIR Command Center and to the MCDOT Traffic Management Center. This partnership allowed PIR to test the technologies at minimal cost, as well as for the vendors to demonstrate the technologies and supply their expertise in support of the ITS technologies.

Lessons Learned

During the development of the PIR Special Event Traffic Management System, a number of lessons were learned,

resulting in the following recommendations (Wall et al. 2000):

- Actively involve a third party, such as a consultant, to help facilitate a higher level of collaboration and cooperation.
- Recall that ITS can be an effective tool to enhance agency traffic management efforts, but that it does not replace the experienced judgment of traffic management personnel.
- Partner with technology vendors and coordinate with them early to explore options for demonstrating equipment before purchasing.
- Use messaging technologies to provide clear, understandable directions to motorists. Motorists will obey VMS and Trailblazers if the information is consistent and does not contradict other messages being broadcast.
- Involve public safety personnel early in the process. Large-scale event management often relies on multiple public safety agencies. Their input, consensus, and participation are vital to the success of any strategies implemented.
- Begin a public outreach campaign several weeks before the event. Distribute information to event patrons by means of mailings, newsletters, websites, and other resources. Conduct press conferences before the event and develop strong relationships with local media to help disseminate accurate and consistent information.
- Conduct regular, scheduled meetings among all involved agencies (public and private) to ensure that everyone is up-to-date on the latest plans of action.
- Collect baseline data before implementing any strategies as a means of measuring the effectiveness of the overall plan.
- Plan a post-race weekend meeting with all of the partner agencies. This will allow for a productive working session of what worked, what did not, and what should be improved for the next event.

SWEET PEA FESTIVAL

The Sweet Pea Festival of the Arts is held annually in Bozeman, Montana, during the first full weekend of August. The weekend consists of outdoor concerts, theatre, juried arts and crafts shows, food tasting, and a large parade. The festival is held each year in Lindley Park near downtown Bozeman. Attendance in 2001 was approximately 19,800, whereas the 2001 population of Bozeman was approximately 29,000. A parade is held on Saturday morning that traverses 1.6 km (1 mi) along Main Street. Although Main Street is within city limits, it is a designated state highway with moderate truck traffic.

Stakeholders

The Sweet Pea Festival is planned and managed by committee and approximately 2,000 volunteers. The Parade Committee—responsible for Main Street during the parade—and the Physical Arrangements Committee—responsible for the pedestrian crossing area at Lindley Park and the shuttle bus service—are the most directly responsible for traffic management during the event. Each committee deploys traffic control and provides volunteers for the manned posts.

A host of other agencies also have a role in the event. The Montana DOT (MDT) has jurisdiction over Main Street and is responsible for detouring highway traffic, particularly commercial vehicle traffic, around the Main Street closure during the parade. Because the event falls under their jurisdiction, the event organizer is required to initially send a letter to the MDT informing them of the event. MDT reviews the proposed traffic control plan and then, with permission of the city, posts appropriate detour signs. The city of Bozeman Sign Department provides and places some of the traffic control devices.

The Bozeman Police Department does not provide traffic control, but is responsible for public safety and therefore needs to be made aware of all activities occurring throughout the weekend. This is an annual event; therefore, communication with the police department is informal, consisting of only a phone call to discuss the exact event dates and any minor changes from the previous year.

Finally, because they are required to approve the parade permit applications, the Bozeman Fire Department, Street Department, Public Works Department, City Attorney, and City Manager must be included as stakeholders.

Tools and Techniques

The tools and techniques used for the Sweet Pea Festival are significantly more limited than for those of the two previous example case studies.

Motorist Information

Because this is an annual event, Bozeman residents are familiar with the festival and the associated transportation challenges. For this reason, providing motorists with information is not a priority. Limited information related to parking and the event shuttle bus is provided in the festival program, which is distributed at businesses and other venues well in advance of and during the event.

Traffic Management

Two teams are used in the management of event traffic. First, before and during the parade, all cross streets along the parade route are blocked with cones and barricades. Because some motorists do not obey these control measures, festival volunteers are posted at all cross streets to prevent motorists from encroaching on the parade route.

The second traffic management team is situated at the pedestrian crossing at Lindley Park. Previous efforts to reduce driver speeds in this area have failed; volunteers wearing orange vests and signaling with paddles assist pedestrian access and safety by temporarily stopping traffic.

Other traffic management tools include traffic cones that are used to outline the crosswalks at Lindley Park and the cross streets during the parade, static signs warning drivers of road closures from both directions on Main Street and subsequent detours, and dynamic pedestrian signs near the Lindley Park crossing. The dynamic signs consist of the standard pedestrian crossing sign highlighted with dual flashing beacons. To discourage parking along the parade route, messages on temporary signs request that motorists avoid parking on Main Street at specific times.

Travel Demand Management

Bozeman Deaconess Hospital is located approximately 1.6 km (1 mi) from Lindley Park. During this special event weekend permission has been granted to use hospital parking as a festival park-and-ride lot. Static signs (and the festival program) direct attendees to this lot. From there they can catch a free shuttle bus that runs continuously, with short headways, during festival hours. For pedestrians there is a direct trail from the park-and-ride lot to Lindley Park. To disperse parking throughout the downtown area and away from Lindley Park, a free shuttle bus runs down the two one-way streets that parallel Main Street. The bus runs during most of the festival hours with a headway of approximately 30 min. Because the city of Bozeman does not have a regular transit system, temporary shuttle bus stops are marked along the two one-way streets with signs reading “Sweet Pea Bus Stop.”

Effectiveness of Current Efforts

Although no formal assessment of special event planning and management activities has been undertaken, there are plans to survey a selected portion of the attendees to get their perception of the festival, including the transportation services offered.

Lessons Learned

The primary challenge faced by the Festival Committee in the special event planning and management process is a lack of expertise. The city of Bozeman requires that the event organizer to be responsible for all aspects of delivering transportation services during special events, including the provision of equipment and personnel.

Funding

Funding for nearly all of the transportation services for the Sweet Pea Festival comes from revenues generated from the festival itself. The shuttle buses are provided free to event patrons from festival proceeds. Bozeman is reimbursed for sign use, vehicle use, and personnel wages and benefits, also from festival proceeds. The city also receives funds from the $100 parade permit fee. The MDT covers its expense internally.