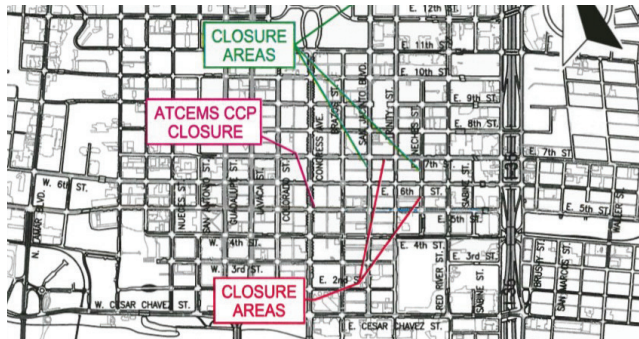


TEMPORARY TRAFFIC CONTROL METHODS TO IMPROVE SAFETY AT SPECIAL EVENTS

PREPARED UNDER CONTRACT BY RUTGERS UNIVERSITY (RU), KIMLEY-HORN, AND ROWAN UNIVERSITY





This case study booklet is based on a topic originally discussed during ATSSA's Circle of Innovation event held annually during ATSSA's Convention & Traffic Expo.

American Traffic Safety Services Association (ATSSA) Publication
Prepared Under Contract by Rutgers University (RU), Kimley-Horn, and Rowan University



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Overview

Planned Special Events (PSEs) can attract significant surges in travel demand and disturbance to the local transportation network. The special traffic patterns and temporary traffic control can cause severe traffic congestion, the loss of access, and egress of local traffic. Traffic control strategies are critical to ensuring the safety, mobility, and comfort of the event participants, the nearby communities, and major pass-through traffic in the event area.

PSEs include many different types and can result in different traffic impacts. PSE activities include parades, conferences, cultural festivals, sporting events, races, marathons, rallies, concerts, elections, and others. Their frequencies also vary from weekly (e.g., farmers market), monthly, seasonal, annual, to nonrecurrent events. The layouts of the events can be fixed-location off-street, fixed-location on-street, or moving events (such as parades and marathon events). Different layouts require different types of traffic control that will result in different types of impact on traffic flow. The number of participants also varies.

In the literature, most of the national and state guidelines focus more on large-scale events, such as the Super Bowl, the G-20 summit, GNC conventions, pope visits, etc., with significant resources, public-private collaboration, and long-

term planning and preparation periods. The focus of this study is to scan the best of practices related to small and medium-size events, which make up the vast majority of events that occur in cities around the United States.

Five small to medium events were studied to demonstrate the state of the practices in traffic control strategies related to PSEs:

- South by Southwest Events, Austin, Texas
- MESA-PHX Marathon, Mesa, Arizona
- St. Patrick's Day Celebration, Chicago, Illinois
- New Brunswick Ciclovía, New Brunswick, New Jersey
- Snowflake Lane at the Bellevue Collection, Bellevue, Washington

This report includes two parts. Part I summarizes the literature regarding traffic control strategies for planned special events. Part II provides detailed case-study results based on interviews with transportation and special-event agencies that manage the above-mentioned events. ■

Acknowledgements

This report was developed by Rutgers University (RU), Kimley-Horn, and Rowan University under contract with the American Traffic Safety Services Association (ATSSA). The research team conducted a synthesis of the literature on traffic control strategies related to PSEs and research for the development of the case-study examples from representative agencies around the U.S. ATSSA would like to recognize the principal researchers: Dr. Peter J. Jin (assistant professor, Department of Civil and Environmental Engineering, RU), Dr. Devajyoti Deka (assistant director of research, Alan M. Voorhees Transportation Center, RU), Yizhou Wang (doctoral graduate student, RU), Mr. Dennis (Dhanesh) Motiani (regional vice president, Kimley-Horn), Dr. Mohammad Jalayer (assistant professor, Department of Civil and Environmental Engineering, Rowan University).

We would like to express gratitude to the following organizers and officials from five participating companies or agencies for taking the interviews and sharing their years of experience in managing special events.

Ms. Judith Olvera
Engineering Associate, Transportation Department
City of Austin, Texas

Mr. Craig Brisbois
Traffic Barricading Supervisor
City of Mesa, Arizona

Mr. Manuel Castaneda
Director of Community Health
New Brunswick Tomorrow
City of New Brunswick, New Jersey

Mr. David Adams
Operations Manager and Parade Coordinator
Department of Cultural Affairs of Special Events (DCASE)
City of Chicago

Ms. Amy Schack
Marketing and Event Manager
The Bellevue Collection
City of Bellevue, Washington

In addition, we acknowledge the participation, support, and contributions of the U.S. Department of Transportation (DOT) and Federal Highway Administration (FHWA). Finally, we express our gratitude to the following individuals who served on the blue-ribbon panel to identify the case studies and provide technical reviews of the document:

Mr. Steve Haapala
Work Zone Engineer
Washington State Department of Transportation

Mr. Pat McCarty, P.E.
Director of Engineering
Area Wide Protective

Mr. Steve Hayes
Regional Manager
Trinity Highway Rentals, Inc.

Mr. Doug Coleman
Sr. Account Manager
Estimator/Sales
Utah Barricade Company

Mr. Scott M. McCanna, P.E.
SM2 Engineering
Owner/Principal Engineer ■

Part I: Literature Review

Elements of Traffic Control in PSEs

Event Types:

Planned Special Events (PSEs) can be categorized by a number of characteristics, including size, type of event (cultural, sporting, professional, etc.), time of day, duration, frequency, and impact to neighboring roadways. Frequent special events, such as sporting events and concerts, tend to have a specific venue. Infrequent events, such as parades or races, usually have higher attendance. The “Guide to Traffic and Transportation Management for Special Events” places events in four categories, based on the disruption to the surrounding roadways (Lee, 2006):

Class 1: Such events impact major traffic and transportation systems and have a significant disruption to non-event traffic;

Class 2: Such events impact local traffic and transportation systems and have a low-scale disruption to non-event traffic;

Class 3: Such events have minimum impact and negligible impact to nonevent traffic;

Class 4: Such events are conducted entirely under police control.

The Federal Highway Administration (FHWA) provides instructive guidance for transportation management during special events (Dunn, 2003). It defines five phases of managing travel for PSEs and identifies the following PSE types:

- Discrete/recurring event at a permanent venue;
- Continuous event;
- Street use event;
- Regional/multivenue event;
- Rural event.

The FHWA also divided PSEs into five groups based on the number of events and attendance in “Planned Special Events – Economic Role and Congestion Effects” (Skolnik, 2008):

- Professional team sports;
- College and high school sports;
- Individual professional sports;
- Concerts, expositions, and shows;
- Street and park events.

The FHWA estimates of average attendance for different types of events are summarized in Table 1.

Table 1.
National Estimates on the Scale of PSEs by Event Type

Event Category	Event Type	Average Attendance
Professional Team Sports	Football	48,962
	Baseball	29,990
	Basketball	17,642
	Ice Hockey	16,957
College Sports	Football	38,909
	Basketball	13,668
	Ice Hockey	10,898
Other Professional Sports	Auto Racing	58,160
	Horse Racing	17,345
	Golf	22,125
Street and Park Events	Marathons and Walkathons	30,180
	Parades	52,418
	Fairs	12,500
	Festivals	35,637
	Protests/Political Events	28,281
Shows & Concerts	Expositions & Shows	15,892
	Concerts	18,686

Community Impacts:

The “Managing Travel for Planned Special Events Handbook” from the FHWA discusses the impacts of PSEs on communities and provides the following recommendations about community impact assessment (Dunn, 2003):

- Need to consider potential impacts on commuter traffic, transit operations, businesses, and residents;
- Need to minimize impacts on access to businesses and residents;
- Need to identify ways to minimize community impacts and improve transportation system operations during future venue events;
- Need to consider parking restrictions or issuance of residence parking stickers, so that event patrons do not affect residences by parking on residential streets in the vicinity of the venue;
- Need to require adequate sidewalk passage area and fire lanes at all times;
- Need to consider the effect on access and parking of residents and businesses;
- Need to offset occurrence of ingress and egress times to minimize the effect on traffic, parking, resources and the community.

Advance Planning:

The “NCHRP Synthesis 309: Transportation Planning and Management for Special Events” identified regional planning and coordination and event-specific travel management issues regarding PSEs (Carson, 2003). Event-specific travel management issues require the following types of responses:

- Program planning that encompasses both advance planning activities completed months prior to a single target event and activities related to a series of future PSEs;
- Event operations planning that involves advance planning and resource coordination activities conducted for a specific PSE;
- Implementation activities that concern strategizing traffic management plan deployment in addition to conducting necessary equipment testing and personnel training activities;

- Day-of-event activities that refer to the daily implementation of the traffic management plan, in addition to traffic monitoring;
- Post-event activities that cover the evaluation of local and regional transportation operations, based on stakeholder debriefings and an analysis of traffic data collected during the event.

Communication:

According to “MDT Special Events Planning Synthesis,” the key to special-event management and planning is coordination with stakeholders (Sullivan, 2016). Survey respondents in the study indicated that the most frequent stakeholders include county/city/local roads transportation departments (91 percent), state departments of transportation (82 percent), local law enforcement (82 percent), media (73 percent), emergency medical services (73 percent), and highway patrol (64 percent). In addition to those, case study respondents indicated that city government, search and rescue agencies, transit companies, and business owners are very important as well.

Communication with stakeholders is important both before and during events. Communication during events is most frequently conducted using a cellphone (82 percent), command center (36 percent), and radio (27 percent). Satellite phone, email, and in-person communications are also common. Prior to the event, the majority of respondents use traditional methods of public information including the Internet (91 percent), newspapers (73 percent), and television (55 percent) with other responses including radio, door to door, signage, and newsletters.

According to the study, communication with the public is also essential during the event. Approximately 73 percent of respondents stayed in contact with the media throughout the event to update the public on traffic. Another example of communication with the public during the event was handing out maps to those stopped at a closure.

Use of ITS Equipment/Advanced Technology:

FHWA encouraged the use of intelligent transportation systems (ITS) solutions such as existing transportation management centers and their associated detectors, changeable message signs (CMSs), Closed Circuit TV (CCTV) as well as portable Highway Advisory Radio (HAR), portable CMSs, portable traffic management systems (CCTV, detectors, CMSs), and mobile command posts (Dunn, 2003).

Wojtowicz et al. described the use of microsimulation (using TransModeler) for traffic management of special events, including evacuations and traffic incidents (Wojtowicz, 2010). The simulation, primarily for medium-size regions, is undertaken in conjunction with tabletop exercises to evaluate traffic management for PSEs.

Transportation Challenges:

According to “MDT Special Events Planning Synthesis,” to alleviate some of the transportation challenges that a special event causes, local and state governments generally adopt special event traffic management strategies to improve transportation options, to manage transportation resources, and to communicate with the traveling public (Sullivan, 2016). These strategies can include:

- Special transit, shuttle, and ridesharing services;
- Pedestrian and cycling improvements;
- Parking management and shared parking;
- Vehicle restrictions;
- Commute trip reduction programs;
- Marketing of alternative transportation options;
- Priority access for emergency, service, freight, and high-occupant vehicles in traffic and parking;
- Transportation planning that provides appropriate redundancies and efficiencies to accommodate special and unexpected demands.

Post-Event Actions:

According to “Managing Travel for Planned Special Events Handbook” (Dunn, 2003), post-event activities cover the evaluation of local and regional transportation operations based on stakeholder debriefings and the analysis of traffic data collected during the day of the event. These activities include:

- Compare plan specifications and resource allocations to actual day-of-event operations;
- Evaluate transportation system performance;
- Review traffic management team activity;
- Identify key successes and lessons learned;
- Facilitate iterative planning, operations, and evaluation processes.

To evaluate the performance of manual traffic control, Parr et al. developed a method to quantify the effect of manual traffic control on intersection operations and to develop a quantitative model to describe the decision making of police officers directing traffic for special events and emergencies (Parr, 2015).

Lessons Learned:

“MDT Special Events Planning Synthesis” summarized lessons learned from three aspects (Sullivan, 2016):

Planning for closures and detours:

- Turning movements for commercial vehicles, as some streets are too narrow to accommodate them and should not be used in the detour;
- Potential congestion that will occur if commuter traffic will be exiting the city as event traffic is entering; Impact to one-way streets (will people be able to access the businesses and residences necessary on the one-way streets when the closure is in place?)
- Needs of the local businesses, residences, and places of worship (where employees and customers should park, drive-thrus at banks, garages for on-call businesses, entrances to parking garages, etc.)
- Emergency service access;
- Needs of alternative modes (public transportation stops and routes, pedestrian access on public sidewalks must be maintained unless alternative options are provided, bicycle lanes, etc.)

Planning for race route:

- Use the trail network (off the road) to the greatest extent possible or residential streets (lower volume and fewer potential conflicts than an arterial);
- Talk to stakeholders about the potential course to identify possible challenges/conflicts, as local agencies know the street network the best;
- If the event coordinator is not from the community, connect with someone in the local running community, who knows the best routes and the challenges for runners in the area.

Traffic control strategies:

- Park-and-ride lots can be beneficial by alleviating parking shortages and also to increase revenue generation in the downtown area;

- Dynamic message signs on the interstate are useful to warn motorists of the traffic and the backups; stationing law enforcement at interstate exit ramps to help control turning traffic can alleviate backups on the interstate; presence of law enforcement can be sufficient to alleviate some challenges (e.g., pedestrians who do not obey the walk signals);
- Utilize barricades, cones, signage, and safety vests consistent with the FHWA's "Manual on Uniform Traffic Control Devices" (MUTCD) (FHWA, 2009) as it is a consistent format known to the public and minimizes their confusion during a street closure;
- During parades, consider the traffic signals and their timing (generally change them to flashing);
- Hand out detour maps to all stopped vehicular traffic;
- During races, station a police officer or county sheriff to conduct traffic control at intersections where traffic may be able to move when there are large gaps between groups of runners.

Traffic Control Devices for PSEs

According to the FHWA's MUTCD, traffic control devices shall be defined as all signs, signals, markings, and other devices used to regulate, warn, or guide road users, placed on, over, or adjacent to a street, highway, private roads open to public travel, pedestrian facility, or bikeway by authority of a public body or official having jurisdiction.

The MUTCD provides device types and recommends their sizes in different roadways. FHWA's policy requires that all roadside appurtenances such as traffic barriers, barrier terminals, crash cushions, bridge railings, sign, light pole supports, and work zone hardware used on the National Highway System meet the crashworthy performance criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350. Agencies are urged to establish a process to replace existing highway safety hardware that has not been successfully tested to NCHRP Report 350 or later criteria.

The American Association of State Highway and Transportation Officials (AASHTO) published the new "Manual for Assessing Safety Hardware" (MASH), encouraging consistency in testing and evaluation of roadside safety features (AASHTO, 2015) in 2015. It includes new crash testing standards for roadside safety hardware to be used for new and replacement installations. TCDs used in PSEs are often temporary work zone devices. If such devices are compliant to NCHRP Report 350 or 2009 edition of MASH, they may continue to be used throughout their normal service

lives (AASHTO and FHWA, 2015). New devices manufactured after December 31, 2019 must have been successfully tested to the 2015 edition of MASH (AASHTO and FHWA, 2015).

Some key standards of traffic control devices potentially used in PSEs are summarized based on the FHWA's MUTCD, the Texas Department of Transportation's (TxDOT) "Dynamic Message Sign Message Design and Display Manual" (Texas DOT, 2006), and the "Manual on Uniform Traffic Control Device" (Delaware DOT, 2009) that has minor modifications and extra descriptions to the FHWA's MUTCD, as follows:

Sign Placement:

- The minimum height, measured vertically from the bottom of the sign to the elevation of the near edge of the pavement, of signs installed at the side of the road in rural areas shall be 5 feet;
- The minimum height, measured vertically from the bottom of the sign to the top of the curb, or in the absence of curb, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way, of signs installed at the side of the road in business, commercial, or residential areas where parking or pedestrian movements are likely to occur, or where the view of the sign might be obstructed, shall be 7 feet;
- The minimum height, measured vertically from the bottom of the sign to the sidewalk, of signs installed above sidewalks shall be 7 feet;
- The bottom of a sign mounted on a barricade, or other portable support, shall be at least 1 foot above the traveled way.

One Lane Road Sign:

- The One Lane Road sign shall be used only in advance of that point where motor vehicle traffic in both directions must use a common single lane. It shall have the legend One Lane Road, XX Feet, XX Miles, or Ahead.

Lane(s) Closed Signs:

- The Lane(s) Closed sign shall be used in advance of that point where one or more through lanes of a multilane roadway are closed.
- For a single lane closure, the Lane Closed sign shall have the legend Right (Left) Lane Closed, XX Feet, XX Miles, or Ahead. Where two adjacent lanes are closed, the sign shall have the legend 2 Right (Left) Lanes Closed, XX Feet, XX Miles, or Ahead.

Portable Changeable Message Sign (PCMS) (Figure 1):

- PCMSs shall display only traffic operational, regulatory, warning, and guidance information and shall not be used for advertising messages;
- Techniques of the message display such as animation, rapid flashing, dissolving, exploding, scrolling, traveling horizontally or vertically across the face of the sign, or other dynamic elements shall not be used;
- To maintain legibility, PCMSs shall automatically adjust their brightness under varying light conditions;

- The mounting of PCMSs on a trailer, a large truck, or a service patrol truck shall be such that the bottom of the message sign shall be a minimum of 7 feet above the roadway in urban areas and 5 feet above the roadway in rural areas when it is in the operating mode;
- Audience for action (e.g., Fairpark) message element on the top line.



Figure 1. Portable Changeable Message Signs (PCMS). Retrieved from "Changeable Message Sign Guidelines" Caltrans, December 2013

Channelizing Devices (Figure 2):

- Channelizing devices include cones, tubular markers, vertical panels, drums, barricades, and temporary raised islands;
- Devices used to channelize pedestrians shall be detectable to users of long canes and visible to persons having low vision;
- Where channelizing devices are used to channelize pedestrians, there shall be the continuous detectable bottom and top surfaces to be detectable to users of long canes. The bottom of the bottom surface shall be no higher than 2 inches above the ground. The top of the top surface shall be no lower than 32 inches above the ground. The section 6D of the FHWA's MUTCD has detailed considerations for pedestrians;
- Spacing shall be no higher than the speed limit for taper channelizing;
- Spacing shall be no higher than the speed limit for tangent channelizing.

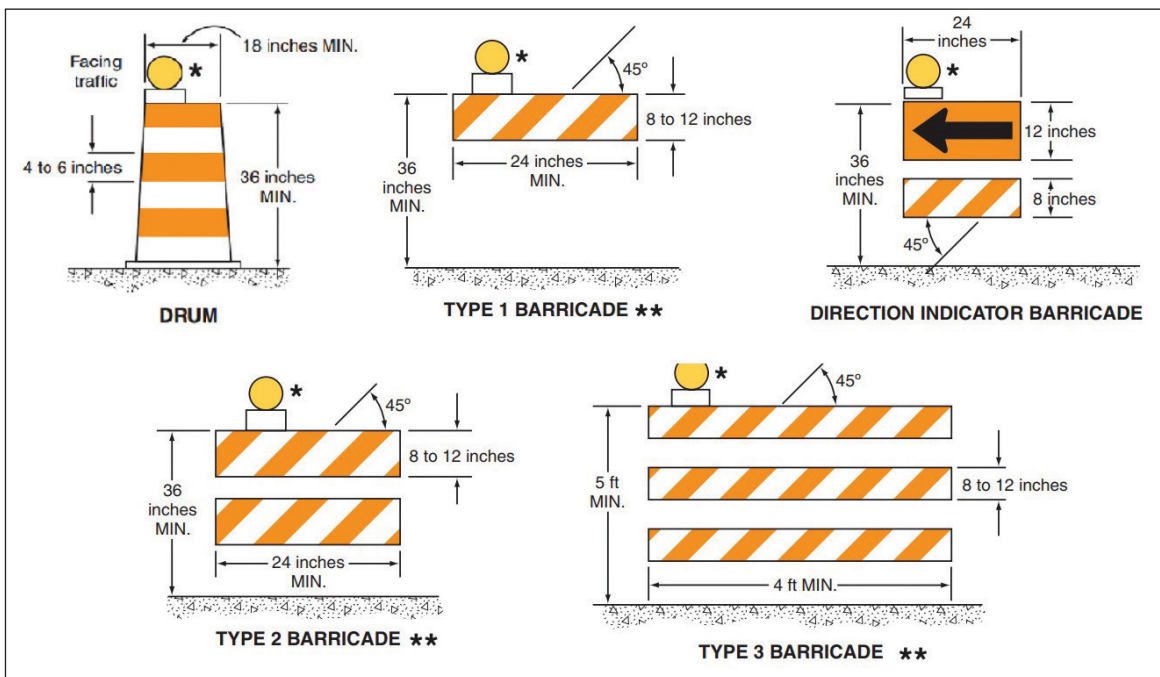


Figure 2. Channelizing Devices. Retrieved from MUTCD, FHWA, 2009

Cones (Figure 3):

- Cones shall be predominantly orange and shall be made of a material that can be struck without causing damage to the impacting vehicle. For daytime and low-speed roadways, cones shall be not less than 18 inches in height. When cones are used on freeways and other high-speed highways or at night on all highways, or when more conspicuous guidance is needed, cones shall have reflective bands and a minimum of 28 inches in height;
- For nighttime use, cones shall be retroreflectorized or equipped with lighting devices for maximum visibility.

Tubular Markers (Figure 4):

- Tubular markers shall be predominantly orange and shall be not less than 18 inches high and 2 inches wide facing road users. They shall be made of a material that can be struck without causing damage to the impacting vehicle;
- Tubular markers shall be a minimum of 28 inches in height when they are used on freeways and other high-speed highways, on all highways during nighttime, or whenever more conspicuous guidance is needed;
- For nighttime use, tubular markers shall be retroreflectorized.

Temporary Raised Islands:

- Temporary raised islands may be used to separate vehicular traffic;
- Vehicular traffic volume in the range of 4,000 to 15,000 Average Daily Traffic (ADT) for roadways;
- Vehicular traffic volume in the range of 22,000 to 60,000 ADT for freeways.

Temporary Pavement Markings:

- Temporary pavement markings should not be in place for more than two weeks;
- Broken-line pavement markings shall use the same length as permanent markings and no smaller than 2 feet. ■

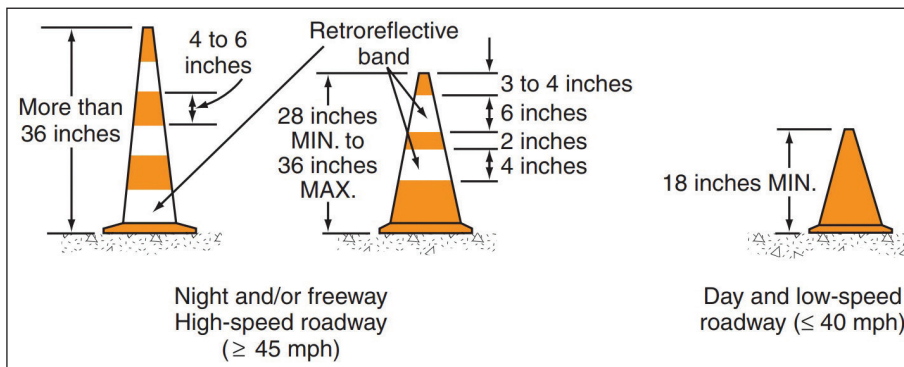


Figure 3. Cones. Retrieved from MUTCD, FHWA, 2009

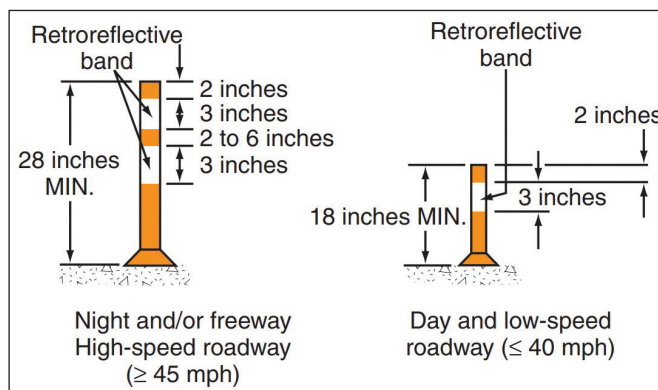


Figure 4. Tubular Markers. Retrieved from MUTCD, FHWA, 2009

Part II: Case Studies

Case 1. The Austin Case Study

The Interview

The interview was conducted with Judith Olvera of the city of Austin on Oct. 18, 2018. Olvera is an engineering associate with the transportation department of the city. She has 11 years of experience in designing traffic control plans for the city of Austin for various types of events, including public and private events as well as University of Texas Austin sporting events. She has often collaborated with the National Security Agency and the Austin Police Department regarding special events. Olvera is responsible for making recommendations for road closures and setting up temporary traffic control devices. She collaborates with six engineers belonging to different divisions. She has the authority to make on-the-spot decisions about traffic control for special events.

The City: Austin, Texas

Austin is the capital of Texas and the seat of Travis County. With a population of approximately one million, it is the fourth most populous city of Texas (U.S. Census Bureau, 2010). Between 100 and 180 special events take place in the city of Austin in a given year. Approximately 80 percent of these events take place once a year, but smaller events like farmer's markets take place on a weekly basis. Millions of people come to the city to participate in these events.

The South by Southwest Event (SXSW)

SXSW is one of the largest and most popular events in Austin and Texas. The event began in 1987 and has grown in size and scope over the years. The event is hosted once every year and lasts for 15 days. The SXSW events include film, music (concerts), comedy, gaming, and conferences. Most of the SWSX events take place in downtown Austin, but some events also take place to the east and west of downtown. The SXSW events usually occur during spring breaks. In 2019, this event will be held before the spring break for the first time. With the change of schedule, the agency expects different traffic patterns and potentially more severe impacts as college students frequent the nearby downtown destinations.

Participants

More than 200,000 people converge on the city of Austin for SXSW each year. The event organizers estimate the number of participants and revelers from aerial photographs. For other types of events, the number can also be obtained from tickets sold, and alcohol or beverage stamps. The number of participants and revelers varies by type of event.

Event Budget

The annual budget for the City of Austin Office of Special Events is around \$900,000. However, for most of the private events, traffic control is paid for by the event organizers instead of the city. The city pays for only the co-sponsored events, for which the total budget is about \$180,000. SXSW consumes about \$70,000 of that amount, or approximately 40 percent of the total/annual budget. The rest of the budget is allocated to other co-sponsored events such as the Martin Luther King parade, New Year's Celebration, Pride Parade, etc.

Event Registration

The Office of Special Events for the city of Austin requires an application for a special event at least 180 days before the event application if the event is larger than two blocks. The application form includes information regarding the type of event, date range, location, number of participants, parking options, tickets, floor plan/maps of the events, and timing. Most applications of recurrent events contain most of the required information and can be processed quickly, while new events usually require multiple rounds of communication with event organizers to confirm all the details.

Every Tuesday, the Austin Center for Events hosts a joint meeting to discuss event planning and approvals. The participating agencies include the Office of Special Events (OSE), Right of Way Management, health department, code department, parking department from the city, Environmental Protection Agency (EPA), Emergency Medical Services (EMS), state office, event organizers, and promoters. Event organizers and promoters need to provide all the details about the event during the meeting. The OSE has the last say on the proposed events, but other departments can also decline to approve events. At present, the city of Austin does not allow any new events in the downtown area due to the ongoing construction. The downtown area is only available for traditional events running for more than 10 years.

Planning for Events

Event organizers will mail notifications to anyone living within 500 feet of the road closures related to an event. With moving events such as races and parades, signs are placed to indicate the opening and closing time of a road. For SXSW, the organizers used 13 permanent message boards in the city to inform citizens when the event will begin. Message boards on arterials were used to display information on closing locations and time periods.

The OSE holds many event planning and coordination meetings with event organizers and public agencies including Capital Metro, ridesharing companies (e.g., Lyft, Uber), the right of way management, EPA, EMS, state office, code, health, parking, and the Parks and Recreation Department. For complicated traffic control plans, they also hold meetings before the event with a barricade company to go through the traffic control plans. The Austin Police Department has a group of officers designated for coordination with the OSE.

Informing the Public

Information about events is disseminated by various methods. There is a Public Information Office to provide all the information to TV and other media. The city's department of transportation uses its Facebook page to provide constant information to followers in English and Spanish. Social media has made a significant improvement. The city of Austin website is used to inform the public about special events. Maps are provided to show closures, with information on date and time of closures. Geographic information system plugins are used with Google. Travelers can see the closures on Google Maps during the SXSW event.

Traffic Planning and Traffic Control Measures

Figure 5 shows the traffic control plan of SXSW in 2018 (Austin DOT, 2018). Seven traffic control plans were needed to achieve all road closures for different locations and times of the festival. The information for these traffic control plans consists of:

- Traffic control device locations;
- Officer locations;
- Device types and counts;
- Setup and pickup times of traffic control devices;
- Suggested maximum spacing of devices;
- Other additional requirements and notes.

The setup for SXSW started three days before the event. Parking lanes and alleys were also used for loading big trucks to reduce the impact on regular traffic.

Types of traffic control measures include water barriers, 42-inch street drums, 76-inch PCMSs standing with permanent signs. Most of the signs are 28-by 28-inch and 36-by 36-inch. The setup of emergency lanes was also considered during the traffic planning. Instead of 18-inch cones recommended by FHWA's MUTCD, 42-inch cones are recommended for closures, because the visibility is much better, and the maintenance cost is lower. Small cones may lose their locations quickly, which cause more troubles for maintaining driving patterns.

Based on the interviewee's experiences, when there are no runners or pedestrians, 42-inch cones are recommended if the speed limit is over 30 mph, and 28-inch cones are recommended if the speed limit is less than 30 mph. When there are runners or pedestrians, a combination of 42-inch and 28-inch cones with 8-foot spacing is recommended if the speed limit is over 30 mph.

The key principle in implementing traffic control measures is safety first, followed by mobility. Access to properties is also important. A police officer at each barricade checks ID to ensure that only local residents can cross road closures.

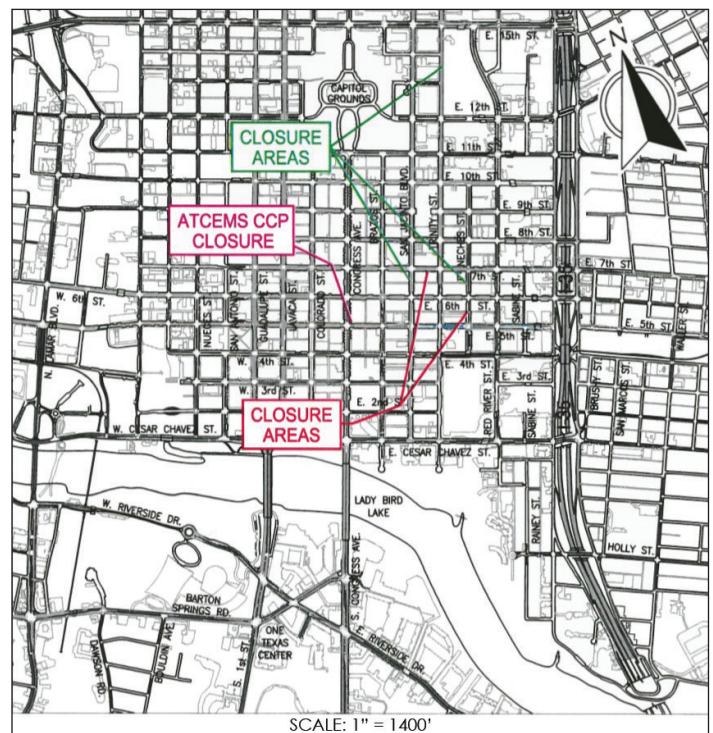


Figure 5. Safety Closures of SXSW 2018. Retrieved from "Traffic Control Plan of SXSW 2018 Music Festival," Austin Transportation Department, January 2018

Contractors of barricade companies oversee installing barricades with coordination with the police department. The police department maintains their inventory.

Among barriers, Type 3 high-intensity barricades and drums are preferred. The events used 42-inch, 30-lb street drums to improve the visibility of drivers. The Parks and Recreation Department of Austin used balloons to illuminate the park, but they are not used for traffic control.

Transportation planning and design tools include AutoCAD and ArcGIS. Traffic simulation is not currently undertaken but is included in the agency's wish list. Simulation software should evaluate the sign locations, barricade channels, lane closure times and durations, and the resulting traffic impact and control strategies.

Accommodating Emergency Vehicles and Evacuation

The city fire department requires 25-foot clearance for fire engines when establishing traffic control plans. One lane that is at least 25 feet wide must be kept clear with no obstructions at any time. The fire department also requires a number of illuminated exits from the event sites to handle inclement weather or terrorist attacks. Evacuation plans are established to ensure that a large number of people will need to escape from downtown to distant locations. Emergency management involves the Department of Public Safety (DPS) and Homeland Security. Alternative evacuation plans are prepared so that there are multiple ways of evacuation.

Lessons Learned

The event traffic control plan is different from the traffic control for work zones because of the shorter duration of the events. Sometimes events are of shorter duration than the time taken to set up all the traffic control devices. Traffic control measures vary by duration of events. For longer events, traffic control measures have higher safety priority than for shorter events.

- All events are different and need different measures and considerations. In general, many indoor events do not need any traffic control, but on-street events will require various traffic control measures;
- Adjusting traffic signals can make events safer and more coordinated based on the special traffic patterns near events;
- The traffic management center will have one or more engineers monitoring the traffic conditions by camera.
- Emergency lesson: A vehicle ran into a barricade, leading to six fatalities. Now the city of Austin moves more law enforcement vehicles behind the barricades. The city of Austin utilizes water barriers instead of Type 3 barricades.

Information on Other Agencies and Guidelines for Special Event Traffic Control

The interviewee also suggested some agencies and organizations that have done exemplary work regarding traffic safety management for special events, including C3 Presents, Austin City Limits (ACL), Circuit of the Americas, and HighFive.

There was a major traffic accident during the event. Four ramps were closed at I-35 out to downtown. Accidents occurred at the same time in the northbound and southbound lanes. The city transportation department tried to flush the traffic and reopen the ramps. ■

Case 2. Mesa-Phoenix Marathon Case Study

The Interview

An interview was conducted with Craig Brisbois on Oct. 16, 2018. Brisbois is the traffic barricading supervisor from the city of Mesa, Arizona, with more than 100 events completed in his eight years of experience.

The City: Mesa, Arizona

Mesa is a city east of Phoenix in Arizona. Mesa is the third-largest city in Arizona and is home to 439,041 people as of 2010, according to the Census Bureau (U.S. Census Bureau, 2010). Mesa is home to numerous higher education facilities including the Polytechnic campus of Arizona State University.

Mesa-Phoenix Marathon

As shown in Figure 6, the Mesa-Phoenix Marathon is an annual 26-mile running event with three levels, including full, half, and 10K. The Mesa-Phoenix Marathon has a race route that begins on Utery Mountain. Marathon runners will experience nearly 1,000 feet of net elevation loss in the marathon. The race has thousands of parking spots available around the finish at a large shopping center in Mesa. In 2018, more than 50,000 people attended the Mesa-Phoenix Marathon.

Event Budget

In most cases all costs, including the payments to officer/fire/medical staffs, are paid by the organizers. The Mesa-Phoenix Marathon had around 150 officers who cost \$54,000. Fire and medical staffs cost an additional \$40,000. Organizers also paid traffic control costs of \$120,000. Organizers did not pay transit/transportation agencies, but staff from these agencies spent around 100 hours (at \$90/hour), including preplanning time and time during the event.

Event Registration

To register for the event, organizers download the application form and submit the completed document to the licensing department of the city. After the submission, all related documents need to be filed within 10 days to respective departments. The application form requires information such as the potential crowd size, event information, traffic impacts, types of entertainment, etc.

Planning for Events

The Mesa-Phoenix Marathon is a 26-mile running event, with directional closures on arterial roadways that result in many challenges in maintaining residential and business access. There are some small soccer events along the marathon corridor, which need additional traffic planning to

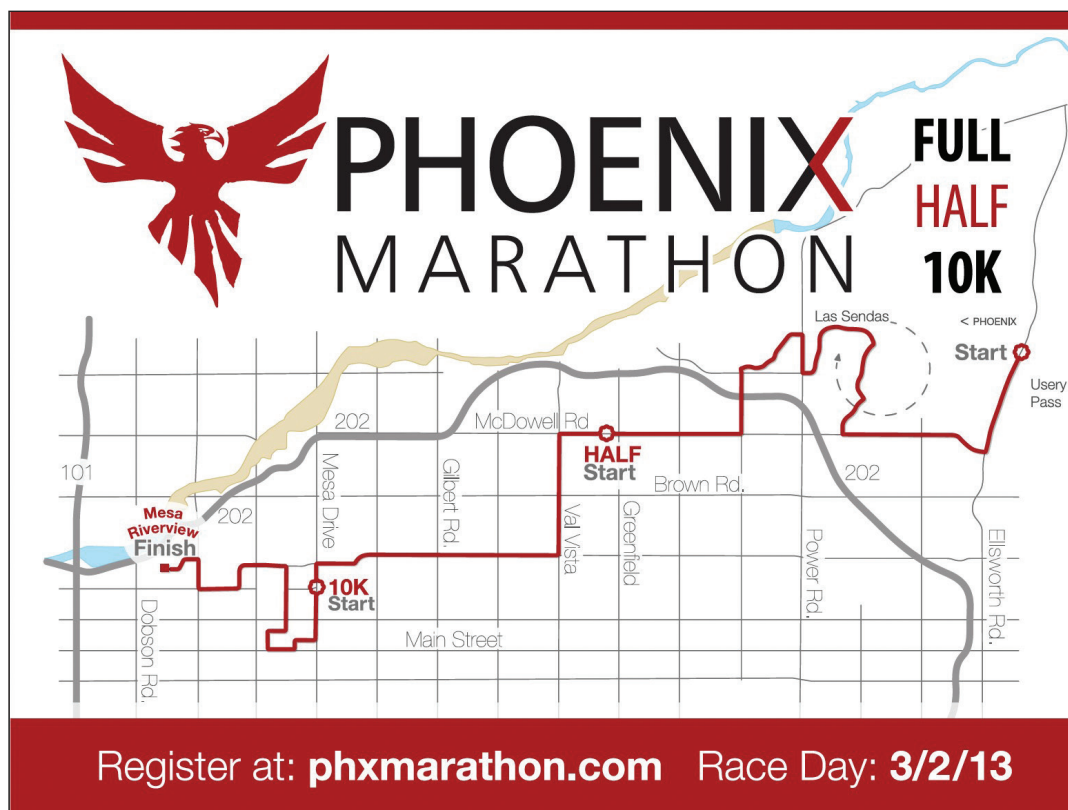


Figure 6. Race Route of Mesa-Phoenix Marathon

guarantee small events' accesses. The route from the 10K point to the finish line, which is in the downtown area, stays closed for 10 hours. Moreover, it affects the people who park and ride to get to the light rail system. The route from start point to half point stays closed for four hours, starting at 4 a.m.

The city requires organizers to notify the city departments 90 days in advance for normal events. For a big event like the Mesa-Phoenix Marathon, notice is needed six months in advance.

Traffic Control Setup

A unified central command is located at the finish line, with representatives from every participating agency including, the city department, event organizer, security, etc. The unified central command is the hub for event communication, which is located at a shopping mall suite with large screen monitors.

Event Coordination

The event coordination process needs to create consistent, constant communication, in partnership with marathon organizers, providing high-visibility information about race-day road restrictions to Mesa residents starting 30 days prior to race day. Informational resources target residents looking to bypass race-day congestion (Mesa DOT, 2017).

Several objectives are established during the coordination process to reach all people around the race route:

1. Inform residents (proactively) along race route of closures;
2. Alert citywide drivers prior to race day of scheduled closures;
3. Provide informational resources to drivers for rerouting;
4. Empower residents to participate in the race event.

The audience for the public notifications includes: residents along the race route, affected drivers within the city, media, marathon participants, and city staff. An integrated communication plan incorporates different tactics to reach different audiences, as listed below:

1. Leverage local media support to disseminate marathon closure information via earned media;
2. Post story on MesaNow.org, Mesa's online newsroom;

3. Social media content pushed multiplatform and channel;
4. Create easily shareable videos with fast facts to get residents excited and informed about the race;
5. Neighborhood targeting (door hangers and postcard mail drop) (Figure 7);
6. Provide ready-to-post newsletter article on race-day detour resources that Homeowner's Associations (HOAs) can include in newsletters;
7. Post banner to rotate on mesaaz.gov home page that clicks through to news story posted on mesanow.org;
8. Post red "emergency" banner notification on top of home page with reroute resources;
9. Run banner on public building monitors for all city administrative buildings (Mesa city plaza, public libraries, customer service, etc.);



Figure 7. Door Hanger

10. Utility bill insert advertisement with contacts (Figure 8);
11. Utilize city-owned Portable Changeable Message Signs (PCMSs) (Figure 9);
12. City of Mesa employee outreach via intranet posts directing city employees to resources available to the public (post both seven days prior and last working day before race).

As shown in Table 2, the Mesa-Phoenix Marathon was a huge success regarding public outreach, with a significantly reduced number of complaints.

Related Agencies

Additional departments and agencies were coordinated by the city transportation department:

1. Solid waste: coordinate with department for areas affected by closures for regular trash/recycling pickup;
2. 9-1-1 dispatch: develop interactive Google Map for dispatch route assistance for emergency vehicles;

3. Arizona Department of Transportation (ADOT): traffic engineering collaborates with ADOT to put messaging on variable message signs on freeways;
4. Transit: transportation staff provides copies of the approved plans for the transit department to work with Valley Metro on planned bus stop route closures, detours, and transit stop closures;
5. Field operations: work with pavement maintenance specialists to review the route a week in advance of the event to ensure there are no pavement issues that could be problematic for the event participants;
6. Police: continued coordination in person and via email providing key locations along the route for off-duty officers needed during the event;
7. Transportation ITS Staff: coordinate with ITS Staff to review all traffic signal locations a week in advance of the event to ensure there will be no cabinet access issues for off-duty officers to access the traffic signal cabinets to manually control traffic signal locations along the route;



Figure 8. Utility Bill Insert (Postcard)



Figure 9. Road Dynamic Message Signs

Table 2.
Public Outreach Statistics of 2017 and 2018

2017	2018
35 voice mail complaints received	2 voice mail complaints received
1 one-on-one reroute provided	153 one-on-one reroutes provided
0 postcards mailed to residents	3,000 postcard notifications mailed
No interactive route map	98,098 interactive route map web hits
6 social media posts on city channels	108 social media posts across all city channels

8. Water department: provide a map of the course to the supervisor over emergency services to inform them of the road closures and how to get around the event;
9. Energy resources department: provide a map of the course to the supervisor over emergency services to inform them of the road closures and how to get around the event;
10. Public information office: reach council members so that council members can reach representatives of their areas;
11. Traffic control companies: the department works with hired traffic control companies;
12. Council member offices: in the city of Mesa, communication with council member offices for each district is important, as many citizens communicate with their council member on any right-of-way impacts.

Coordination Meetings

For event planning and coordination, there is a special event committee, which conducts biweekly meetings to discuss the event issues. Moreover, coordination meetings with council members from various districts impacted by the event — city management (including the mayor), large shopping complexes, city parks (as mentioned above), public utilities (phone, cable, gas, electric, etc.), and city departments providing public services such as solid waste and water — are critical during the planning process.

For a large event like the Mesa-Phoenix Marathon, the city agency takes more control of the event planning to guarantee safety and mobility. For a small event, the city collects all information but may play a lesser role in the actual event planning.

Traffic Control Operations

The city transportation department gives traffic control companies an eight-hour window prior to the beginning of the event to set up soft or hard closures. Staff from the transportation department arrive two hours before the beginning of the event to go through all locations and address issues of traffic control measures. During the event, there is one transportation staff member in the unified central command and three other staff members out on the race route to assist with issues.

Mesa recently utilized drones on some large-scale events. The use of drones aided transportation professionals in getting a better view of problematic areas in the event.

Traffic Planning and Traffic Control Measures

The traffic egress plan is to flush the traffic out as soon as possible by distributing traffic evenly using key routes around the event location. For the Mesa-Phoenix Marathon, the plan has four directional movements from the event area to direct traffic out much quicker.

Measures such as road closures, detours, barricades, channelizing devices, PCMSs (in high-traffic areas), signage, and manual control of traffic signals were used for the Mesa-Phoenix Marathon.

Organizers also used other devices such as cones, vertical panels, longitudinal channeling devices at key locations, and crowd control fence at the finish line. The longitudinal channeling devices and crowd control fence were deployed at key locations to guarantee safety.

Figure 10 shows examples of traffic control plans of the 2018 Mesa-Phoenix Marathon. Thirty-six traffic control plans were approved to cover all closures along the race route. These traffic control plans consist of the following information:

- Traffic control device locations;
- Messages on PCMSs;
- Officers and race marshal locations;
- Setup times of traffic control devices;
- Suggested spacing of cones;
- Street closure list with information about direction, traffic control plan number, detour signing, supplemental plaque, and notes;
- Roadway speed limits;
- Other additional requirements and notes.

For the 2018 Mesa-Phoenix Marathon, the city transportation department required more than 90 4-foot by 5-foot static signs to be placed on the perimeter of the event route 30 days in advance of the roadway restrictions for public notification. Ten days before the event, about 21 PCMSs were required to be placed at key impact locations providing information about the roadway restrictions for the event. On the race day, the event used about six to eight state message signs on the surrounding freeway system with additional guidance for the public.

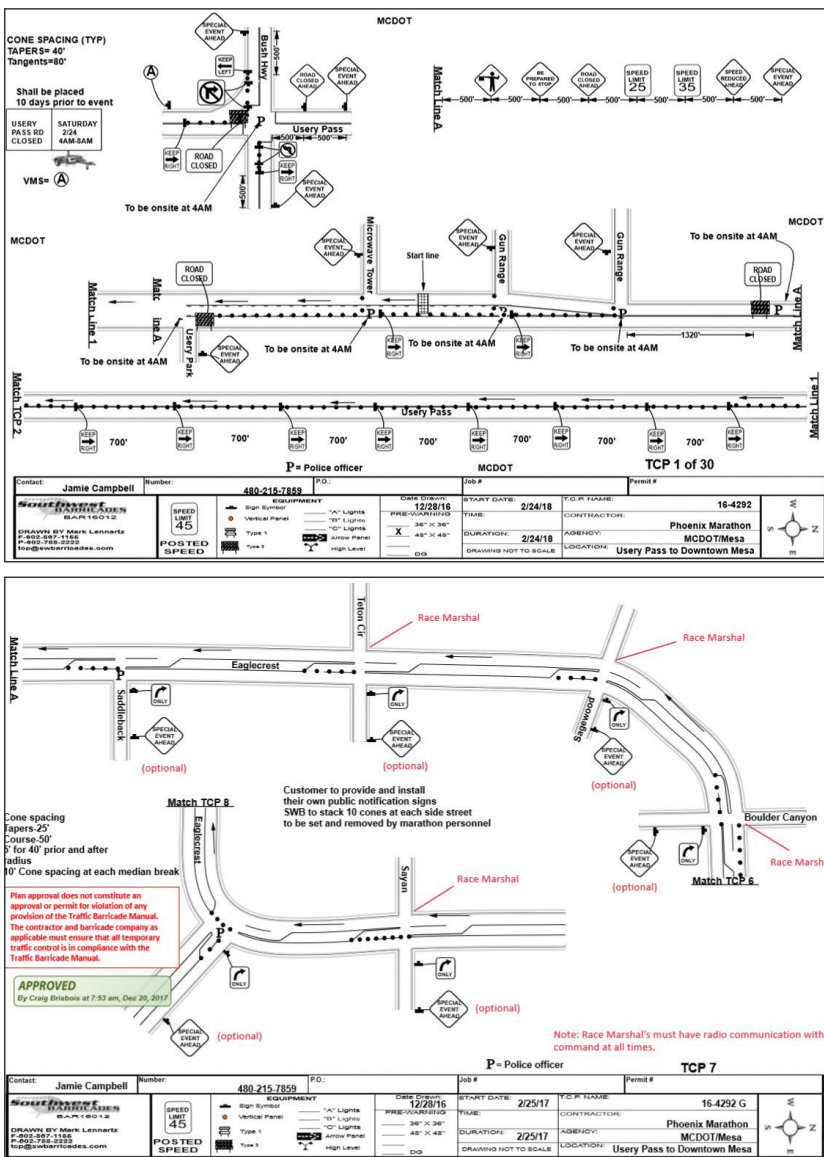


Figure 10. Traffic Control Plans of Mesa-Phoenix Marathon 2018. Retrieved from “Traffic Control Plan of Phoenix Marathon,” Mesa Transportation Department, December 2017

Coordination with Traffic Management Centers

There was a city Traffic Management Center (TMC) located southwest of the start point. It was a large room with four computers and 20 to 30 large screens. Two staff members were working at the TMC monitoring over 440 traffic signal locations throughout the city to adjust signal timing and monitoring CCTV camera views for identifying problematic areas. The event also had state agency representatives in the unified central command at the finish line.

Accommodating Emergency Vehicles and Evacuation

As described in the city operation manual, emergency lanes and access points need to be provided based on locations. There are also backup plans for emergencies for the Mesa-Phoenix Marathon, which could be implemented

according to recommendations from the command center. Some fire and medical units were located at several locations during the Mesa-Phoenix Marathon. Medical staff on bicycles could also respond to emergencies on the race route. And there was a medical tent at the finish line.

The use of drones aided police and fire/medical staff in responding to emergencies by providing a high-altitude view.

Lessons Learned

- The level of importance of public outreach. The public was not informed in the initial years, causing backlash. The past couple of years of the event, one-on-one communication with residents showing how to navigate around the race route significantly reduced the level of complaints received;
- The public outreach was driven by the transportation department but also received input from organizers;
- Continued communication with all stakeholders impacted by the event;
- Social media improved the performance of outreach;
- Distributing detour maps by police on-site was attempted on the Mesa-Phoenix Marathon in 2016, but was found to be ineffective. The police officers were too preoccupied with the task of managing and controlling traffic that they did not have enough time to stop drivers to distribute maps or provide directions and driving assistance. On-site distribution may be more suitable for low-volume roadways.

Information on Other Agencies and Guidelines for Special Events Traffic Control

The interviewee suggested some other agencies and organizations that have done exemplary work regarding traffic safety management for special events, including the city of Phoenix, which conducted a rock-and-roll music marathon with three times the attendees of the Mesa-Phoenix Marathon, and the city of Glendale, responsible for Super Bowl events.

In addition, the interviewee recommended some related documentation used by organizations that would be beneficial to our research, including the traffic barricade manual from the city of Phoenix, the traffic control manual from the city of Mesa, and the traffic control manual from Maricopa County. ■

Case 3. New Brunswick Ciclovía Case Study

The Interview

The interview with Manuel Castañeda was conducted on Oct. 15, 2018. Castañeda is the director of community health for New Brunswick Tomorrow. The interview questionnaire was provided to Castañeda several days before the interview.

The City: New Brunswick, New Jersey

New Brunswick is the county seat for Middlesex County, located at the center of New Jersey. The racially and ethnically diverse city's current population is approximately 57,000. Its primary employers are Rutgers University, Johnson & Johnson, Robert Wood Johnson University Hospital, and St. Peter's Hospital. NJ Transit's Northeast Corridor line between Trenton and New York City runs through New Brunswick with the rail station at the heart of the city. The city hosts primarily small, day-long events such as half marathons, 5K walks, and on-street music events.



Figure 11. The Long Route of Ciclovía (used twice a year). Retrieved from nbciclovía.com, October 2018

New Brunswick Ciclovía

Ciclovía is an event when local roads are closed to cars for several blocks so that people can walk, bicycle, or exercise on the road. New Brunswick Ciclovía has been organized for five years, including 2018. Each year, three Ciclovía events are organized: one in April, one in June, and one in October. Routes for the April and October events are longer than the route for the June Ciclovía. The April and October events are held on Sundays whereas the June event is held on a Saturday. Figure 11 shows the long route, and Figure 12 shows the short route for the latest year, 2018. The Ciclovía route has changed slightly over the years. In the early years, the route extended the entire length of College Avenue, but because of lower usage of the section that runs through the Rutgers University-New Brunswick campus, that section was eliminated by focusing on neighborhood roads. County and state roads are not included.

The New Brunswick Ciclovía is organized by New Brunswick Tomorrow (a non-government agency), the city of New Brunswick, Rutgers University, Jonson & Johnson, and Robert Wood Johnson University Hospital. Between 30 and 40 other community organizations support the event. Ciclovía was introduced by the organizers with two primary objectives: (a) active living, and (b) community cohesion.



Figure 12. The Short Route of New Brunswick Ciclovía (used once a year). Retrieved from nbciclovía.com, October 2018

October 2016 Ciclovía Attendee Zip Codes

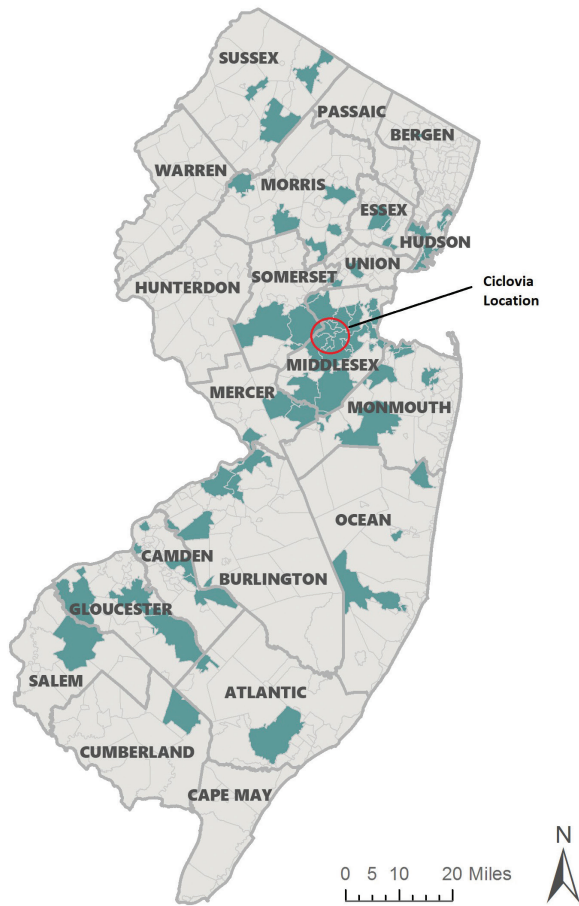


Figure 13. ZIP codes of New Brunswick Ciclovía participants

Participants

Between 10,000 and 16,000 people participate in the New Brunswick Ciclovía. A survey conducted by the Alan M. Voorhees Transportation Center in 2016 revealed that 38 percent of the Ciclovía participants are from New Brunswick, whereas the other 58 percent come from places outside New Brunswick. As Figure 13 shows, many participants come from distant parts of New Jersey.

Event Budget

The event budget varies from year to year. A specific dollar amount is not available.

Event Registration

All special events in the city of New Brunswick require approval from the city council. For recurring events such as the Ciclovía, approval is required but not difficult to obtain.

Informing the Public

Participants do not have to register for the events. Anyone from anywhere can participate. Because of the event's focus on active living, the organizers emphasize informing school children. High school students from the area are informed by listserv, and fliers are sent to the area's middle and elementary schools. The local public radio announces the events. Rutgers University also sends emails to students and staff about the events.

Planning for Events

Preparation for each Ciclovía event takes approximately two months. During this time, coordination occurs between the event organizers and other stakeholders, including the city of New Brunswick Public Works Department, New Brunswick Police, and Rutgers University Police. From experience gained through the years, the organizers are now settled on a process involving all stakeholders. However, each event requires permission from the New Brunswick City Council.

Traffic Planning and Traffic Control Measures

To inform travelers about Ciclovía, the event organizers use Waze (www.waze.com/en/events). Rutgers University Police has an account that is used for informing people about the event. Emails by Rutgers University to students and staff also help in letting people know that there will be road closures.

A few days before each Ciclovía event, members of the committee, including New Brunswick Police and Rutgers University Police, meet to determine which roads will be closed at what location and with what measure. Google Maps are used to identify locations for road closures. Instead of preparing formal maps showing road closures, members of the group use hand-drawn markers for locations. These maps are for internal use of the group only and thus not shared with the public or motorists.

Roadside parking on closed roads are eliminated on the morning of the event. Cars are towed if necessary. Organizers adhere to both soft and hard closure of roads. Metal barricades are used for hard closures, and cones are used for soft closures. Police are present at intersections involving hard closures. The barricades and cones used at the events belong to the city of New Brunswick Public Works Department and Rutgers Police.

Although the organizers were not certain about the location of road closures in the initial years, from the years of experience they are now more aware of people's mobility needs, especially access to neighborhoods, hospitals, etc. The organizers are aware that free access to the city's two major hospitals is a necessity. Therefore, no roads are closed that may affect access to the hospitals. There have been no issues during the past five years with access of emergency vehicles to the event site. The presence of police helps smooth flow of emergency vehicles.

The Ciclovía route intersects with a state road (Rt. 27), but activities do not encroach on the state road. However, the local road intersecting with the state road, George Street, is blocked off at the state road intersection. Other intersections of the state road near that intersection remain open for vehicular traffic.

Accommodating Emergency Vehicles and Evacuation

The event organizers do not have to deal with emergency management agencies. The organizers also do not conduct any traffic simulation for ingress/egress to/from the event site.

Lessons Learned

The organizers have learned from the initial years of experience which roads and intersections to close and how. The key is to understand the nuances and local interests. The organizers have learned that sometimes solutions are not black and white.

Other Notes of Interest

The organizers would like to expand the event area to include Livingston Avenue. However, they have been unable to do so because it is a county road. ■

Case 4. Chicago St. Patrick's Day Celebration Case Study

The Interview

The interview with David Adams was conducted on Oct. 25, 2018. Adams is the operations manager and parade coordinator for the city of Chicago Department of Cultural Affairs and Special Events (DCASE), with 29 years of experience in organizing PSEs.

The City: Chicago, Illinois

The city of Chicago is located on the shores of freshwater Lake Michigan and is the third most populated city in the United States. As of the 2010 census, Chicago has a population of 2.7 million, which makes it the most populated city in both the state of Illinois and the Midwestern United States (U.S. Census Bureau, 2010).

Chicago St. Patrick's Day Celebration

The Chicago St. Patrick's Day annual celebration consists of two main events: a parade and a river dyeing (Figure 14).

The river dyeing (Figure 15) starts at 9 a.m. at the Chicago River, with the Chicago River turning an emerald green. The dyeing of the river has been a tradition for more than 50 years.

The Chicago St. Patrick's Day Parade (Figure 16) begins at 1 p.m. The parade begins on Columbus Drive and moves north through Grant Park for roughly three hours, beginning at Balbo Drive and ending at Monroe Drive.

Participants

The river dyeing draws nearly 400,000 spectators downtown, eager to catch a glimpse before taking part in the parade that follows (Choose Chicago, 2018).

Event Budget

A specific dollar amount is not available.

Event Registration

For parades, a parade application form must be submitted to the Chicago Department of Transportation 15 business days before the event if public roadways will be used. Once the department receives the form, it should set up a meeting at least two weeks before the parade. There is a special procedure for parades considered to have traditional status, which are designated by holding the same route for five years or more. All traditional parades planned during the next year can submit applications during the special window of Dec. 1 to Dec. 15 in the prior year. Each year, about 20-25 out of 30 parade applications are received during the December special window.

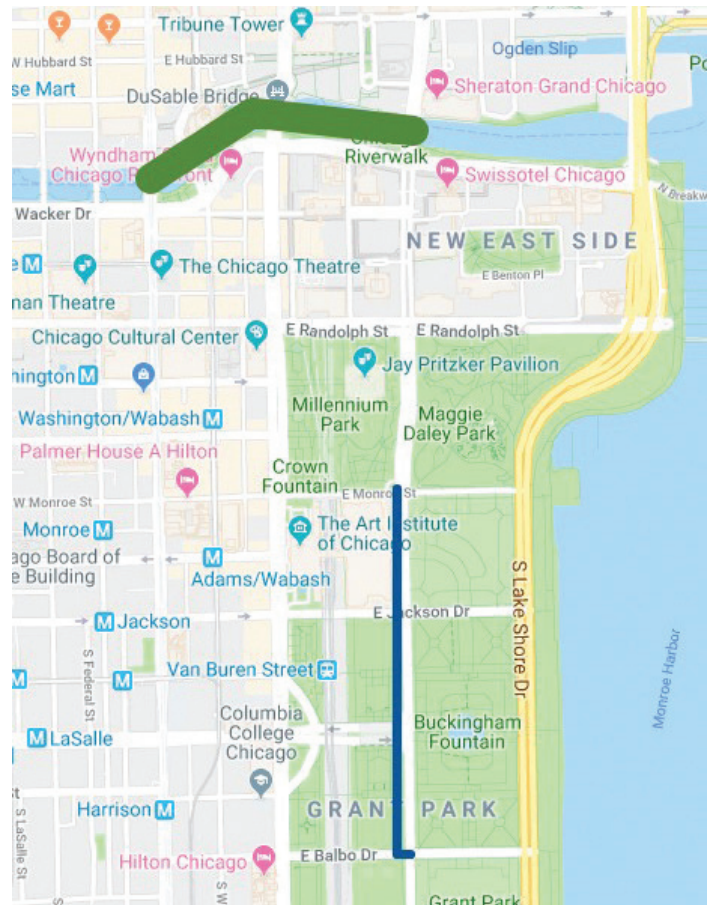


Figure 14. Parade Route (blue line) and River Dyeing Location (green line)



Figure 15. St. Patrick's Day River Dyeing. Retrieved from thrillist.com, October 2018



Figure 16. St. Patrick's Day Parade. Retrieved from christmas-wish.com, October 2018

The reasons for police rejecting parades can vary. They may be related to traffic safety, conflicts with other parades, or for insufficient resources allocated for parades.

Informing the Public

The public relations and marketing department provides event information to media, including the time of the events, lane or street closures, etc. For major events, DCASE works with 50 aldermen to reach out to the public through their websites. Parades have the same process: the alderman's office shares the event information through social media. A few days before the parade, parade organizers send flyers to two blocks of the side streets around the parade and let people know about closures and parking changes. Only minimal complaints are received for these events.

Planning for Events

For parades, DCASE usually requires two to three weeks' advance notice to make sure all affected parties are comfortable with the event.

For DCASE-produced events, like Taste of Chicago, organizers probably have four months in advance. DCASE will start to have periodical meetings once every two weeks. When it becomes close to the event, DCASE has weekly meetings.

With crowd size numbers from previous years, DCASE anticipates the current year's estimates for planning purposes.

Traffic Planning and Traffic Control Measures

Given the location of the entrances, DCASE anticipates how the traffic flow will be. DCASE can anticipate where the most traffic will come from. The public generally comes by train, bus, foot, or bicycle (temporary bicycle parking facilities are available).

The more space an event takes, the bigger the traffic control plans needed. DCASE must prepare to close off streets and check bags for public safety. However, depending on the event, the planning process changes.

For traffic control plans, DCASE reaches a final consensus and then brings other departments (police, fire, and Office of Emergency Management & Communications (OEMC)) to see if they are comfortable.

The Department of Streets and Sanitation (DSS) provides a worksheet to their staff with information on the location of barricades and cones at the parade. DSS drops off traffic control devices a day or two before the event. Private contractors drop off and set up Type 3 barricades by the side of the streets a day or two before the event. Parade setup and event setup are usually different. Taste of Chicago shares the same location as the St. Patrick's Day Parade, which makes it a good case to compare the differences between parade setup and event setup.

For the St. Patrick's Day Parade, the city closes the area with salt trucks and cones, and the TMC reroutes traffic in Grant Park. For the river dyeing event, traffic is open without any closures. There are spectators along the bridge and river edges, where they stand on the sidewalk to watch the river.

Related Agencies

The role of the police department varies. Police can ensure public safety. Uniformed and undercover officers patrol the events. They are also outside of the events to identify suspicious activities. They also watch public transportation systems. Police are present at the site beforehand to check the cones and barricades. Traffic aides close inbound traffic first, then close outbound.

OEMC manages other organizations and agencies. There are trailers managed by police traffic management. OEMC has access to all visuals from command centers at events.

Accommodating Emergency Vehicles and Evacuation

Salt trucks with plows will be deployed on the front of the event and angled. The trucks are filled with sand and positioned 100-150 feet away from the parade route or event. ■

Case 5. Snowflake Lane Case Study

The Interview

An interview was conducted with Amy Schack on Oct. 26, 2018. Schack is the marketing and event manager in the Bellevue Collection from the city of Bellevue, Washington, with eight years of experience in this capacity, including all event programming. The Bellevue Collection, owned by Kemper Development Co. and its affiliates, is located on Bellevue Way between NE 4th and NE 10th streets in downtown Bellevue, just across Lake Washington from Seattle. The Bellevue Collection includes Bellevue Square, Bellevue Place, and Lincoln Square. Bellevue Square is a super-regional fashionable shopping center. Bellevue Place is a mixed-use property including small boutiques and the Hyatt Regency Bellevue. Lincoln Square includes the Lincoln Square Cinemas, home furnishings, restaurants, and the Westin Bellevue hotel.

The City: Bellevue, Washington

Bellevue is a city in King County with a population around 122,000 as of 2010 (U.S. Census Bureau). It is located across Lake Washington from Seattle. It is the third largest city in the Seattle metropolitan area. The downtown area of Bellevue is ranked as the second largest city center in Washington State.

Snowflake Lane

Snowflake Lane is an annual free nightly regional holiday performance in downtown Bellevue. It starts the day after Thanksgiving and continues each night until Christmas Eve. Each night, Bellevue Way is changed into a winter wonderland. In this event, the participants experience the wonder of falling snow, colorful lights, festive music, characters (e.g., princess, queen, toy soldier), toy drummers and dancers, and delightful costumed and adorned characters. The event takes place on the sidewalks between Bellevue Square and Lincoln Square from NE 4th to NE 8th streets. Figure 17 depicts the route map of Snowflake Lane. During the event, local roads are closed off to cars for several blocks so that people can walk and enjoy the event.

Participants

This event attracts between 5,000 and 10,000 spectators each night to the area. Around 250 of the region's most talented teen performers are selected to become the show's stars. To prepare for this nightly event, this group of performers rehearses from late October through November. Moreover, around 250 paid staff work during this event to make sure the event runs smoothly, safely, and successfully.

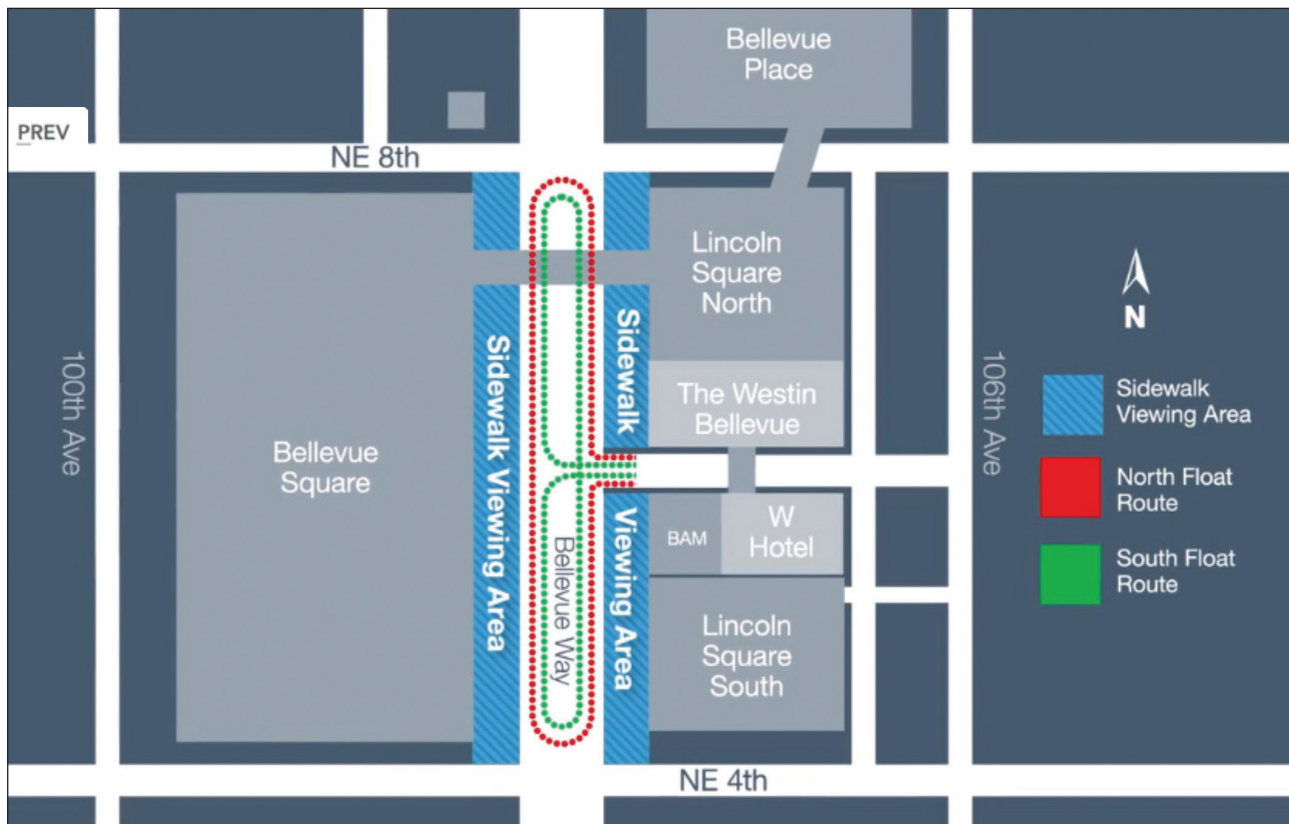


Figure 17. The Route of Snowflake Lane. Retrieved from snowflakelane.com, October 2018

Event Budget

A specific dollar amount is not available.

Informing the Public

Anyone may participate in the event and registration is not necessary. The event is announced through the event website (www.snowflakelane.com), on-site advertisements, TV, newspapers, local news, and social media.

Planning for Events

The preparation for each Snowflake Lane event starts on Dec. 20, approximately one year before the event. Over the years, the event has grown from just a sidewalk show to a street show due to the city's requirement for the permit. The event coordinator needs to secure a permit through the city of Bellevue. During this time, coordination occurs between the event organizers and other stakeholders such as the city of Bellevue, Police Department, Security Department, and Fire Department and they have meetings to go through the plan and see what requirements need to be met. The event organizer also is required to submit a certificate of insurance to the city. The event participants can use the parking facilities available along the NE 4th to NE 8th streets. The event organizer also works with several private companies to set up venues and surroundings with lighting, snow machine, and show production.

Traffic Planning and Traffic Control Measures

The event coordinator works with subcontractor to help with the road closures and provide temporary traffic control devices for the event such as cones, barricades, channelizing devices, and portable barriers. According to the city's requirements, both NE 4th and NE 8th streets should be blocked with trucks, and barriers should be placed on sidewalks to prevent any cars from entering the street. The event coordinator works closely with the City Traffic Department on traffic signal timing for the event at nearby intersections. The Security Department takes care of the closure plan for the event and works closely with the Police Department. The closure plans are for internal use of the group and are not shared with the public or motorists. The Security Department has L-shaped brackets that are used to prevent vehicles from entering into the closed streets.

Accommodating Emergency Vehicles and Evacuation

The event organizers do not have to deal with emergency management agencies. Each night, there is one ambulance covering the event. The organizers also do not conduct any traffic simulation for ingress/egress to/from the event site. The organizers have not experienced any safety and security issues associated with this event such as traffic accidents.

Lessons Learned

The organizers have learned from their past experience that safety is the top priority for them. The organizers have also learned that sometimes it is hard to have every involved entity on the same page. They always try to create something that is not found anywhere else during the holiday period. ■

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