

SALT LAKE ORGANIZING COMMITTEE FOR THE OLYMPIC WINTER GAMES OF 2002

AIR QUALITY PLAN



TABLE OF CONTENTS

I. Executive Summary.....	1
II. Objectives of the SLOC Air Quality Plan.....	2
The International Olympic Committee’s Recommendations	2
III. Transportation - Historical Perspectives of Olympic Games.....	3
1996 Atlanta Summer Olympics	3
1984 Los Angeles Summer Olympics	3
Summary	4
IV. Current Conditions of Air Quality in Utah.....	5
A. Overview of Wintertime Meteorology and its Effect on Air Pollutant Concentrations Along the Wasatch Front.....	5
B. Wintertime Air Pollutants Affecting the Wasatch Front.....	5
C. Air Quality Trends in Salt Lake City and Surrounding Areas	7
V. Established Wintertime Pollutant Control Strategies.....	9
VI. Accredited Transportation Systems	10
A. Sponsor Transportation System.....	10
B. General Spectator Transportation System.....	10
C. Volunteer Transportation System.....	11
D. Park & Ride/Walk Lots	11
VII. Overview of Impacts by Venue Site	12
A. Downtown Salt Lake City Events and Activities	13
A-1 Event Day Olympic Patronage	14
A-2 Parking Facilities	14
A-3 Anticipated Transportation Scenario for Salt Lake City.....	15
A-4 Air Quality and Downtown Salt Lake City	15
B. Utah Olympic Oval.....	16
B-1 Event Day Olympic Patronage.....	16
B-2 Parking Facilities	16
B-3 Estimated Vehicle Needs	17
B-4 Competition Times.....	17
B-5 Anticipated Scenario for Utah Olympic Oval.....	18
B-6 Air Quality and the Utah Olympic Oval	18
C. E Center.....	19
C-1 Event Day Olympic Patronage	19
C-2 Parking Facilities	19
C-3 Estimated Vehicle Needs	19
C-4 Competition Times.....	20
C-5 Anticipated Scenario for the E Center.....	21
C-6 Air Quality and the E Center.....	21
D. Snowbasin.....	22
D-1 Event Day Olympic Patronage	22
D-2 Parking Facilities	22
D-3 Estimated Vehicle Needs	22
D-4 Competition Times.....	23

D-5 Anticipated Scenario for Snowbasin.....	23
D-6 Air Quality and Snowbasin	24
E. Ice Sheet at Ogden.....	25
E-1 Event Day Olympic Patronage.....	25
E-2 Parking Facilities	25
E-3 Estimated Vehicle Needs	25
E-4 Competition Times.....	26
E-5 Anticipated Scenario for the Ice Sheet at Ogden.....	26
E-6 Air Quality and the Ice Sheet at Ogden.....	27
F. Peaks Ice Arena.....	27
F-1 Event Day Olympic Patronage.....	27
F-2 Parking Facilities.....	28
F-3 Estimated Vehicle Needs	28
F-4 Competition Times.....	29
F-5 Anticipated Scenario for the Peaks Ice Arena	29
F-6 Air Quality and the Peaks Ice Arena	30
G. Soldier Hollow.....	30
G-1 Event Day Olympic Patronage	30
G-2 Parking Facilities.....	30
G-3 Estimated Vehicle Needs	30
G-4 Competition Times	31
G-5 Anticipated Scenario for Soldier Hollow.....	32
G-6 Air Quality and Soldier Hollow.....	32
H. Utah Olympic Park	32
H-1 Event Day Olympic Patronage	32
H-2 Parking Facilities.....	33
H-3 Estimated Vehicle Needs	33
H-4 Competition Times	33
H-5 Anticipated Scenario for the Utah Olympic Park.....	34
I. Park City Mountain Resort	34
I-1 Event Day Olympic Patronage.....	35
I-2 Parking Facilities	35
I-3 Estimated Vehicle Needs	35
I-4 Competition Times.....	35
I-5 Anticipated Scenario for Park City Mountain Resort	36
J. Deer Valley Resort	37
J-1 Event Day Olympic Patronage	37
J-2 Parking Facilities.....	37
J-3 Estimated Vehicle Needs	37
J-4 Competition Times	38
J-5 Anticipated Scenario for Deer Valley Resort	38
J-6 Air Quality and Park City Events, Including Utah Olympic Park	39
III. Actions to Address Impacts	40
A. Planned Transportation Actions	40
Transportation Demand Management.....	40

Alternative Fuel Buses and Vehicles	41
Public Transit	42
Bus Service Centers	43
Idling Equipment	43
Website Information	43
Traffic Control	43
Route Modeling	44
B. Special Measures	45
IX. Additional Air Quality Enhancement Projects	46
Olympic Cleaner and Greener	46
Tree-planting Initiatives	47
X. Air Quality Metrics	48
XI. References	49
XII. Contacts	50
XIII. Appendix A: Emissions Calculations	51

I. Executive Summary

Environmental responsibility has been at the heart of the Olympic movement since 1994 when the International Olympic Committee adopted “environment” as the third principle of Olympism, along with “sport” and “culture.” The Salt Lake Organizing Committee’s (SLOC) goal is to protect and improve Utah’s environment while staging the Olympic Winter Games of 2002.

SLOC, in conjunction with the Division of Air Quality, Utah Department of Environmental Quality (DEQ), the United States Environmental Protection Agency, Region VIII (EPA), and the Utah Environmental and Public Health Alliance (EPHA), has developed a Games-time Air Quality Plan. This is the first air quality plan ever developed for an Olympic Games. This plan addresses SLOC’s transportation impacts and mitigation, as well as other programs which will improve air quality. SLOC’s goal is to realize a net decrease of pollution levels as a result of hosting the Games in Salt Lake City.

Staging the largest sporting event in Utah’s history will require the efficient movement of athletes, officials, volunteers and spectators to and from the venue locations along the Wasatch Front and in the Park City area. The SLOC transportation function is responsible for developing the operational transportation plan for both the Olympic and Paralympic Games. This document is released as a companion document to the Olympic Transportation Plan.

To complement the Air Quality Plan, SLOC will continue to work with the Transportation Management Association (TMA), Utah Transit Authority (UTA), the Wasatch Front Regional Council, and the Utah Department of Transportation (UDOT) to develop and implement an effective Transportation Demand Management (TDM) system to further reduce traffic congestion and mitigate any negative effects on air quality. The TDM will manage traffic in such a way as to reduce congestion and assist with mitigating air quality impacts.

II. Objectives of the SLOC Air Quality Plan

The plan discusses current air quality in Salt Lake City and surrounding areas, as well as current mitigation strategies, explains SLOC's methods for improving air quality, demonstrates the minimal environmental impact from SLOC activities, and highlights SLOC's commitment to improving Utah's environment. The main purpose of this plan is to identify the potential air impacts of transportation during the Games period and to identify, and in some cases quantify, air quality improvement strategies. This effort is important not only for the ease and comfort of those participating in Games activities, but also for those who will continue to work at and commute to non-Games jobs during that period. The plan looks at these impacts and determines their significance on both sectors in an effort to assure air quality protection and health, and identify mitigation strategies where possible.

Because this project is a collaborative effort, the plan has tried to address air quality issues from both public and private perspectives and needs. This partnership effort has been successful in jointly addressing needs of all the agencies involved and can, with hope serve as a model for planning other Games or large-sized events.

The International Olympic Committee's Recommendations

The International Olympic Committee (IOC) has published a Manual on Sport and the Environment¹ to guide bidding and host cities on addressing environmental issues. The IOC's recommendations for ecological transportation are as follows:

- Select specific transportation systems which minimize energy use and reduce pollution
- Encourage public transportation systems over private transportation
- Issue tickets for events that entitle the holders to free public transit rides
- Encourage access to facilities on foot
- Encourage the construction of bicycle routes and parking for bicycles near the sports facilities
- Encourage the use of collective transportation trips to meetings, tournaments and matches
- Organize training and competitions in such a way that as many participants as possible are able to take part without traveling by car
- Organize collective transportation where motor transport is necessary.

This plan coupled with SLOC's Transportation Plan has considered each of these recommendations and incorporated those which are appropriate and feasible.

III. Transportation - Historical Perspectives of Olympic Games

Many lessons can be learned from past Olympic host cities. Synopses of the result of transportation strategies including TDM measures are provided in this section for the 1996 Games in Atlanta and the 1984 Los Angeles Olympic Summer Games. Both host cities saw a reduction in traffic during the Olympic time period despite a significant increase in the number of visitors in the area.

A. 1996 Atlanta Summer Olympics

Action reports from Atlanta indicate that traffic congestion was almost non-existent during Games-time.² Traffic in the central Atlanta area and on surrounding roads and freeways flowed more smoothly than usual, particularly compared to normal rush-hour conditions. According to the reports, total daily traffic volumes decreased by five percent. Traffic at some locations decreased by up to 30 percent during the morning peak and up to 25 percent during the afternoon peak. Given the number of visitors to the Atlanta region in addition to the base level of travel by residents, the smooth operation of the transportation system was a considerable accomplishment.

The traffic data is evidence of the effectiveness of TDM strategies. Recommended TDM strategies included vacations, telecommuting, carpooling and vanpooling, mass transit, flextime and staggered work hours, a compressed work week, and altered delivery and pick-up schedules. Particular emphasis was placed on shifting travel demand out of the peak periods.

Atlanta experienced an improvement in air quality during the Olympic period. Raw ozone data from six Atlanta area monitoring sites indicated a 10 to 20 percent decrease in ozone. Officials hypothesized that a number of changes in traffic characteristics and favorable weather conditions could have caused both lower emission levels and lower monitored ozone levels.

A study completed by the Centers for Disease Control relates the relationship between acute asthma attacks and air quality during the Atlanta Games.³ The study found conclusively that acute asthma-related emergency room visits citywide declined by 19.1 percent during Games-time. The study attributed the decline in emergency room visits directly to the 27.9 percent metro Atlanta decrease in ozone concentrations during the Games. The city experienced significant reductions of carbon monoxide (18.5 percent decrease) and with PM₁₀ (16.1 percent decrease).

B. 1984 Los Angeles Summer Olympics

Action reports from Los Angeles indicate that traffic on Los Angeles freeways was surprisingly light during the Olympic period⁴. The 24-hour traffic volumes decreased by 2 to 3 percent. There was also a flattening of the rush-hour peaks and a 14 percent reduction in truck traffic during the peak commuting periods.

Recommended TDM strategies, including four-day workweeks, encouraging public transit, staggering start times for employees, vacations, minimizing non-essential business travel and changes in delivery schedules were very successful in reducing traffic during the Games.

C. Summary

Similar to other host cities, Salt Lake City is expected to experience an increase in the number of visitors to the area. Despite this anticipated increase in the number of people, like other host cities that have successfully promoted TDM strategies, SLOC anticipates that the Salt Lake area and surrounding venue areas will see a reduction in traffic during the Olympic Games period.

If no TDM strategies were promoted and daily vehicle miles traveled (VMT) along the Wasatch Front and Wasatch Back remained the same during the Olympic Games, Olympic related VMT for the 17-day period would add an additional 4 percent. The worst case scenario for air quality would occur if all vehicle traffic at venues was comprised of single occupancy vehicles. That scenario, which will not occur, would add an additional 16 percent to the daily VMT. Calculations are detailed in Appendix A.

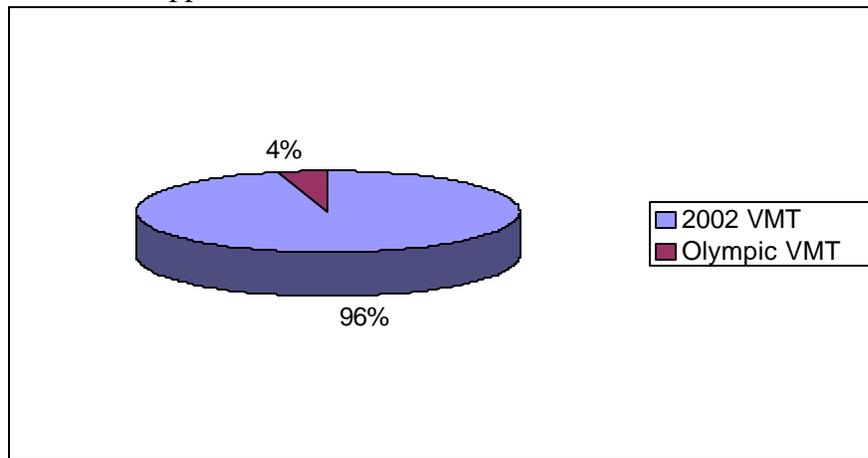


Illustration 1. 17-Day VMT Distribution with No TDM

The current transportation plans, which include accredited transportation systems (for sponsors, tour groups, IOC members and broadcast guests), Park & Ride lots and encouraging ticketholders to carpool, result in a 71 percent reduction from the worst case scenario of all single occupancy vehicles. Further reduction in Olympic-related VMT will be achieved by use of the general spectator system planned for the valley, which includes a significant enhancement to the existing public transit system.

TDM strategies will be promoted at each 2002 venue impact area. These strategies will be similar to those that have been successful for other host cities. Despite the increase in visitors to the area during the 2002 Olympic Winter Games, it is anticipated that overall vehicle miles traveled during that 17-day time period will decrease, even though some areas may experience localized short-term increases in VMT.

IV. Current Conditions of Air Quality in Utah

A. Overview of Wintertime Meteorology and its effect on Air Pollutant Concentrations Along the Wasatch Front

Winter along the Wasatch Front provides a variety of weather conditions. On any given day, the weather can vary from warm, calm and sunny with temperatures rising into the 50s, to a cold northwest wind with highs barely reaching the mid-teens. Fluctuations in weather conditions along the Wasatch Front are mostly controlled by water temperatures at different latitudes in the Pacific Ocean and the position of the two jet streams over the western states. Storm systems rolling in from the Pacific are more commonly fast moving and come in 3–5 day cycles. However, these systems tend to slow in the west when air masses move into the central plains region from either Canada or the Gulf of Mexico.

Air flow in the Salt Lake Valley is predominantly either out of the northwest, moving across the Great Salt Lake into the valley, or from the south moving up through the west central region of the state. Colder air draining into the valley from canyons along the east bench is common during the evening and night hours when there are periods of little to no cloud cover. This contributes to a rapid drop in air temperature shortly after sunset. The pooling of colder air near the surface pushes warmer air upward, resulting in a temperature inversion in the atmosphere that traps air pollutants close to the surface. Other factors contributing to the persistence of these surface temperature inversions are snow cover on the valley floor and a low wintertime sun angle, which minimize daytime surface heating and provide little or no cloud cover at night.

Wintertime inversions along the Wasatch Front are commonly associated with slow moving or stagnated high-pressure systems setting up over the region. During these events, airflow in the valley drops to a minimum. This inhibits the trapped air pollutants from washing out of the valley. If daytime solar heating is not significant enough to break up the previous evening's inversion, pollutant concentrations will continue to build up into the next day. Moisture trapped near the surface will condense into fog, and further reduce surface heating necessary to break up the inversion.

The depth of the inversion may vary from less than 100 feet up to 2000 or 3000 feet, depending on how quickly the temperature changes as one moves up in the atmosphere. However, it is most problematic for trapping pollutants and building high concentrations when the inversion is shallow. While the inversion conditions will generally affect all of Utah and Salt Lake Counties for a given episode, pollutant concentrations tend to be higher on the east side of the valleys since that is where the largest concentration of the population lives and works. In addition, airflow patterns in the valley also tend to push the pollutants easterly, trapping them up against the front range of the Wasatch Mountains.

B. Wintertime Air Pollutants Affecting the Wasatch Front

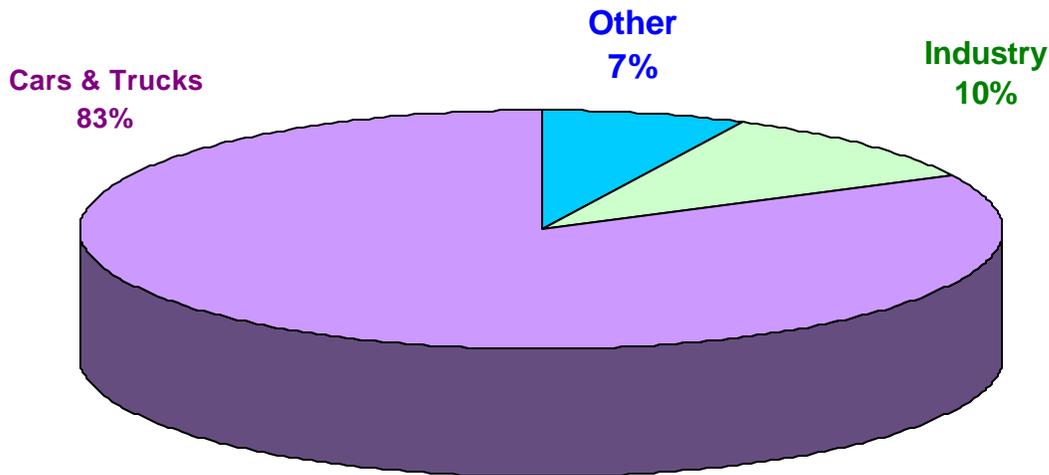
Air quality monitoring indicates that the Wasatch Front has historically been impacted by high concentrations of Carbon Monoxide (CO) and Particulate Matter (PM₁₀) during wintertime inversions. These concentrations can approach and even exceed the federal health standards for

these pollutants. In recent years, a combination of tight emissions controls on pollution sources and favorable weather conditions has kept monitored concentrations below the federal standards.

CO is a colorless, odorless, very toxic gas resulting from incomplete combustion; sources include vehicles, comfort heating and smokestack industries. CO is emitted directly into the atmosphere and tends to be most highly concentrated near the emission source. CO in sufficient quantities can reduce the oxygen content of the blood. It also causes dizziness, headaches, blurred vision, and slowed reactions.

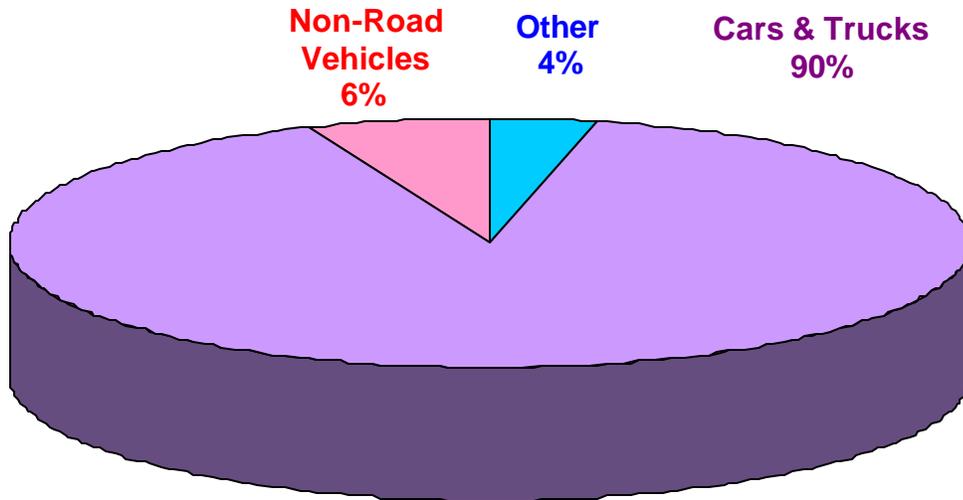
PM₁₀ is any solid or liquid particle less than 10 microns (10⁻⁶ m) in diameter suspended in the air. PM₁₀ can be emitted directly (referred to as primary emissions) or formed through atmospheric reactions of other gaseous pollutants (referred to as secondary emissions). Generally, the pollutants that react to form secondary PM₁₀ (referred to as precursors) are sulfur dioxide, nitrogen dioxide, organic compounds, and ammonia. Primary PM₁₀ tends to be most highly concentrated near the source while secondary PM₁₀, because of its slower formation time in the atmosphere, is more dispersed and removed from the emission point of the precursor gases. PM₁₀ can impair visibility and cause soiling of materials. PM₁₀ in sufficient quantities irritates the sensitive lung tissue and can block small airways causing reduced breathing capacity of the lungs.

WASATCH FRONT AIR POLLUTION SOURCES (Winter)



Particulate Matter (PM10) - Salt Lake/Davis Counties

Source: 1996 Utah Air Emissions Inventory - Utah Division of Air Quality



Carbon Monoxide (CO) - Salt Lake City
 Source: 1990 Utah Base Year Inventory - Utah Division of Air Quality

C. Air Quality Trends in Salt Lake City and Surrounding Areas

UDEQ currently operates 11 CO monitors, 19 fine particulate monitors, and 19 meteorological stations along the Wasatch Front. All monitors are operated under strict federal guidelines designed to ensure that the data collected at these sites is accurate, quality assured, and to the fullest extent possible, continuous and complete. This data provides UDEQ with the information it needs to assess meteorological trends and events, and the associate dispersion of locally generated air pollutants.

UDEQ uses EPA (Environmental Protection Agency) developed software and computer models and Utah Department of Transportation databases to provide estimates of mobile emissions and their environmental impact. The Mobile 5 emissions model and the CAL3QHC traffic model are the recommended EPA method for estimating mobile emissions and traffic impact, and are used by every state in the nation. The UDEQ frequently works with UDOT and other local agencies to prepare and review environmental impact analyses of traffic related projects along the Wasatch Front. The Urban Air Shed Model (UAM) is the EPA preferred method for estimating air quality impacts on an urban scale. UAM has been used to address impacts from CO in Utah County and is currently being used to address impacts from PM₁₀ along the entire Wasatch Front.

With respect to localized impacts from traffic, the UDEQ has relied on the CAL3QHC to assess possible environmental impacts along roadways and at intersections. The CAL3QHC model has consistently shown that the density and duration of high traffic volume are key controlling factors in determining whether or not an exceedance of the national health-based standards will occur. In almost every case, the model has shown that short periods of high traffic volume (one to three hours) will not result in an exceedance of the one or eight hour standards for CO, nor do roadside concentrations of CO begin to approach the one-hour standard level for CO. UDEQ's air monitors along the Wasatch Front have never monitored an exceedance of the 1-hour health

standard for CO. The UDEQ monitoring network has recorded violations and exceedences of the eight-hour standard for CO. The last violation of the standard in Salt Lake City was in 1987 with the last exceedence occurring in 1994. The last violation in Provo/Orem was in 1993, and the last exceedence was in 1994. Similar results are seen in the CAL3QHC model. When a high level of traffic volume is sustained for long periods of time (6 hours or more), the model indicated that roadside concentration could approach, and in some rare cases exceed the eight-hour standard for CO. Since Olympic activities occurring outside the downtown Salt Lake City area are unlikely to experience exceptionally high traffic volumes for periods of more than one to two hours before or after an event, the UDEQ does not feel that such events would threaten the one or eight hour standards for CO. In downtown Salt Lake City where traffic volumes are expected to remain high throughout the day, extended periods of air stagnation may result in sustained elevated levels of CO. Historically, UDEQ air monitors have confirmed this and similar results have been predicted in the CAL3QHC model demonstrations for projects in the downtown area. It is for this reason that the UDEQ feels that the greatest potential impact to air quality would be located in the downtown area.

V. Established Wintertime Pollutant Control Strategies

To help protect the public's health, the following control strategies are currently in place to attain the National Ambient Air Quality Standards (NAAQS) for wintertime pollutants:

- Motor Vehicle Inspection/Maintenance (I/M) programs in Davis, Salt Lake, Utah and Weber Counties reduce emissions from passenger cars and trucks.
- Federal Motor Vehicle Control Program requires vehicle manufacturers to certify that new vehicles meet federal vehicle emission standards. As newer vehicles with better controls replace older vehicles, significant reductions in vehicle emissions are obtained.
- Restrictions on road deicing materials to reduce residual materials left on roads after each storm and released into the air by traffic.
- A variety of pollution controls on industrial sources to reduce particulate emissions. These controls include wet scrubbers, electrostatic precipitators, cyclones and baghouses. Wet scrubbers control particulates, vapors and gases by passing the exhaust stream through a liquid solution. Electrostatic precipitators use static electricity to remove particles suspended in very hot gases. Cyclones whirl dust-laden gas inside a cylinder where the dust is collected and dropped into a hopper. Baghouses trap particles into a filter and send into a collection hopper.
- Additional controls also target particulate precursor emissions with low oxides of nitrogen (NO_x) burners, fuels switching to natural gas and sulfur recovery units at the largest industrial sources.
- Limits on visible soot released from residential heaters and fireplaces.
- Established clean fleet vehicle program to encourage the purchase of alternative fuel vehicles to reduce vehicle emissions.
- Wood burning restrictions enacted during increased pollution episodes. When pollution levels climb and the weather forecast is unfavorable, residents are encouraged or required to not use wood stoves, heaters or fireplaces, depending on the conditions with a "green," "yellow" or "red" burn condition alert disseminated through the media.
- Transportation Control Measures including transit improvements, trip reduction and computerization of traffic signals. Transit improvements include increased bus service and light rail. Voluntary trip reduction programs include ridesharing through car and vanpools, telecommuting, and Park & Ride lots.
- Established oxygenated fuels program in Utah County to reduce cold-start vehicle carbon monoxide emissions.

VI. Accredited Transportation Systems

The SLOC Transportation Department is responsible for the movement of all accredited groups including athletes, Olympic Family and media. Transportation systems are being developed for each of the accredited groups in an effort to increase the vehicle occupancy rate and reduce the number of vehicle miles traveled. The level of service to accommodate these groups is planned to be of high enough value as to reduce the number of constituents driving to the venue.

Athletes staying in the Olympic Village or other accredited alternate housing will be provided scheduled transportation service to practice and competition venues. Large 12-passenger vans, of which 60 percent (300 of 500) will be bi-fuel CNG, and buses will be the primary mode of transportation to the venues, increasing the vehicle occupancy rate and reducing the vehicle miles traveled each day.

Media staying in designated housing will be provided transportation to the Main Media Center and all venues for practice and competition. The primary mode of transportation will be coach buses, which will increase the vehicle occupancy rate and reduce the vehicle miles traveled each day.

Vehicles must be accredited to access venues. Limited media parking will be available at each venue; drivers must possess a parking permit and accreditation. There is an associated cost which, when considered with other requirements, will discourage individual athletes and media from trying to use private transportation.

A. Sponsor Transportation System

Sponsors will be transported from their accommodations to and from Olympic Venues and other sponsor activities by motor coaches, which will increase the vehicle occupancy rate and reduce the vehicle miles traveled each day. Motor coaches will be procured and operated by sponsors at their own expense. Destination Management Companies assist sponsors in this process.

B. General Spectator Transportation System

Spectators that are coming to the area for the Games will be provided with various transportation options. Personal vehicles will be able to access the Park & Ride or Park & Walk lots serving the competition venues. At the Park & Ride lots spectators will board transit buses for a shuttle ride to the venue. Spectators will also be able to use public transit and light rail to access valley venues. A white paper prepared by SLOC details a study conducted on the efficacy of providing long-haul transportation to the venues.⁵ The study found that only an estimated 5 to 10 percent of general spectators would utilize a long-haul transportation system. Private bus carriers from the region will be providing long haul transportation service to the mountain venues from the Salt Lake area. SLOC will coordinate with the private bus carriers to implement this service.

C. Volunteer Transportation System

Volunteers will be encouraged to carpool, as well as use public transit or light rail to access the venue when possible. Volunteers at mountain venues will be required to utilize the Park & Ride lots to access the venue. Bus drivers recruited for the spectator transit system will be housed near the area they are working. When possible, other volunteers will be assigned to venues near the areas where they reside. By assigning volunteers to the venue near their area of residence, SLOC will reduce vehicle miles traveled.

D. Park & Ride/Walk Lots

The Utah Department of Transportation (UDOT) and the Utah Transit Authority (UTA) are responsible for the acquisition and construction of Park & Ride lot improvements. Federal funds are being used for construction of the lots, which means that lots are subject to National Environmental Policy Act (NEPA) requirements. All necessary permits will be obtained.

Partial funding for the Park & Ride lots is anticipated to be in place in the next few months. SLOC has completed a preliminary environmental review of Park & Ride lot locations. Additionally, a plan for reclamation of temporary lots will be in place prior to the Games. Construction of the Park & Ride lots will take place in the 2000 and 2001 construction seasons.

In most cases, Park & Walk lots are located in existing parking lots. If required, temporary use permits will be obtained for these lots.

VII. Overview of Impacts by Venue Site

This section provides a draft Venue-by-Venue analysis for each competition site of the Salt Lake 2002 Olympic Winter Games.

In the following Venue-by-Venue analysis, the anticipated transportation scenario is presented. A worst case transportation scenario would result if all patron groups accessed each venue in a single occupancy vehicle. The anticipated transportation scenario for each venue reflects a reduction in vehicle numbers from the worst case transportation scenario due to use of various accredited transportation systems, public transit use and TDM measures.

Air quality impacts due to transportation activity from daily impacts and the Olympics are provided.

The general practices and assumptions described below will be implemented at each venue. In addition to the following outlined general practices, specific measures are being taken at each venue. These venue-specific measures will be outlined in the Venue-by-Venue analysis.

It is anticipated that the vehicle occupancy rate for general spectators accessing all venues will average 2.6 people per vehicle. Based on the worst case scenario of one person per vehicle, this will reduce the number of vehicles at the Park & Ride or Park & Walk location by 62 percent.

There will also be a reduction in the number of general spectator vehicles at each venue due to an allocation of tickets to school children, National Olympic Committee (NOC) groups and tour operators. Ticket allocations will also be given to Olympic Family members which include delegates from the IOC, Heads of State, and International Federations. These groups are anticipated to access the Park & Ride or Park & Walk facilities in buses, which will increase the vehicle occupancy rate and reduce the number of vehicles at the venue or Park & Ride location. The reduction in vehicles at each venue due to these groups will be determined as tickets are released for sale.

Sponsors will access the venue in motor coaches with an occupancy rate of 25 people per bus. The use of buses for sponsor travel will increase the vehicle occupancy and result in a significant reduction of vehicles at the venue or Park & Ride location. Based on the worst case transportation scenario of one person per vehicle, one sponsor bus replaces 25 cars.

The media system will service each venue by transporting media members in motor coaches from the Main Media Center (MMC) or other identified housing. The majority of media members are expected to use the designed system with a small percentage choosing to drive to the venue. SLOC anticipates an occupancy rate of 35 people per bus. The use of a media system will increase the vehicle occupancy rate and result in a significant reduction of vehicles at the venue or Park & Ride location. Based on the worst case transportation scenario of one person per vehicle, one media bus replaces 35 cars.

All transportation information provided in the following sections is subject to change. Venue specific transportation plans may be expected to change throughout the planning and operations process.

Additionally, the air quality analysis presented here is based in large part on past experience evaluating the impacts from large events and large parking areas along the Wasatch Front. Olympic Winter Games venues, when considered individually, are similar to many gatherings that routinely take place along the Wasatch Front, such as sport competitions, concerts and religious meetings. The impact of all of the Games events in concert is unknown, although significant information is available and has been presented relative to previous Olympic Games. Consequently, the following analysis, while based on performing quantitative impact analyses for comparable events in the past, is qualitative and should be used to identify only the potential, relative impacts of the different Games venues.

A. Downtown Salt Lake City and University of Utah Events and Activities

Downtown Salt Lake City is the site of several Olympic competition and non-competition venues. Venues located in the downtown vicinity include Rice-Eccles Olympic Stadium, Salt Lake Ice Center and Olympic Medals Plaza. The Main Media Center (MMC) and International Olympic Committee (IOC) Headquarters Hotel are located in the downtown area with the Olympic Village located on the University of Utah campus. Additional sites located throughout the downtown area will host arts and culture events during the duration of the Olympic Winter Games.

Rice-Eccles Olympic Stadium, located on the University of Utah campus, is the site of Opening and Closing Ceremonies.

The Salt Lake Ice Center is the site of figure skating and short track speed skating competitions. Thirteen days of competition and a figure skating exhibition are scheduled for this venue.

Olympic medals will be awarded at the Olympic Medals Plaza, which will operate on a nightly basis throughout the duration of the Games.

Arts and Cultural events will be taking place at various sites throughout the downtown area during the duration of the Games. Possible arts and culture sites may include, but are not limited to, Abravanel Hall, Capitol Theater, Rose Wagner Performing Arts Center, Temple Square and the Conference Center.

Downtown Salt Lake will also provide many dining and entertainment options during the Games. The exact increase in downtown visitation due to these ancillary activities is not known. SLOC has conducted studies to determine the anticipated number of people that will be in the downtown area during the Games. It is anticipated that normal daily activities in the downtown area will continue as usual. The downtown area will be heavily promoted for TDM, and normal work schedules will likely change. Classes will not be in session at the University of Utah during the Games, which should significantly reduce traffic near the campus and in the downtown area.

A-1 Event Day Olympic Patronage

The downtown spectator demand is anticipated to average between 65,000 and 75,000 persons per day. This estimate represents people who will come to the downtown area for Games events including competition at the Salt Lake Ice Center, nightly Olympic Medals Plaza awards, arts and culture events, and for other retail and entertainment.

The following table depicts the anticipated number of patrons in each user group that will be attending a competition at the Salt Lake Ice Center. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average attendance for each patron group. Gross capacity of the venue is 17,306.

Salt Lake Ice Center – Average Attendance

Patron Group	Persons
Olympic Family	380
NOC	860
Media	1160
Sponsors	5200
General Spectators	8000

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

The following table depicts the anticipated number of patrons in each user group that will be attending Opening and Closing Ceremonies for the Olympic Winter Games. The numbers reflect the projected average attendance for each patron group.

Rice-Eccles Olympic Stadium – Average Attendance

Patron Group	Persons
Olympic Family	2025
NOC	5000
Media	2040
Sponsors	12000
General Spectators	31000

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

A-2 Parking Facilities

Three types of parking facilities will be provided to general spectators coming to the downtown area and the University of Utah. These facilities include Park & Ride shuttle lots north and east of downtown, Park & Ride lots along the north/south TRAX light rail line and existing parking in the downtown area. Limited official parking will be provided at the Salt Lake Ice Center and Rice-Eccles Olympic Stadium venues.

Possible general spectator Park & Ride shuttle locations north of downtown include the LDS Regional Center in Bountiful and lots along 2300 North near I-15. Other possible Park & Ride shuttle locations include Sugarhouse Park, Liberty Park and University of Utah lots.

It is also anticipated that parking lots along the North/South light rail line will be expanded to accommodate general spectators taking light rail into downtown. There are currently 2000 parking spaces located along the light rail line. UTA may expand current lots and may secure agreements with private owners for shared use parking lots near light rail stations. This could provide an additional 2000 permanent spaces and up to 24,000 leased, temporary spaces.

A-3 Anticipated Transportation Scenario for Salt Lake City

Public transportation will play a critical and major role in downtown venue access. UTA has taken on the role of providing general spectator transportation into the downtown area for all competitions and events. The preliminary operating concept to accomplish this task includes the following transportation modes: North/South and the possible University TRAX light rail lines, potential express bus shuttles between Ogden, Provo and Salt Lake, Park & Ride shuttles from North Salt Lake, Liberty Park, Sugarhouse Park and University of Utah parking, and using existing parking downtown.

To accomplish this mode split, transit buses and light rail vehicles will be utilized. Light rail and shuttle buses will operate daily throughout the duration of the Games. This operation also includes weekend and Sunday service. UTA fixed-route service will remain the same during the Games.

TDM measures will be highly promoted in the downtown area to reduce possible traffic congestion. Employers and employees in the downtown area will be provided with information concerning peak event travel times into and out of the downtown area as well as possible street restrictions. Employers will be encouraged to allow employees to utilize recommended TDM measures. The University of Utah will not be in session during the Games. This will greatly reduce traffic around the campus and downtown Salt Lake City during Games-time.

A-4 Air Quality and Downtown Salt Lake City

Since the Salt Lake Valley is highly prone to inversion conditions, it is possible that an inversion could develop over the Salt Lake airshed at some point during the Games. Any time an inversion develops, the potential for an exceedance of NAAQS for CO and PM₁₀ exists. The degree of potential for an exceedance of NAAQS would depend on how long the inversion lasts and how deep of an inversion develops. Downtown Salt Lake City already monitors some of the highest CO and PM₁₀ values measured along the Wasatch Front during the winter months. Salt Lake County is designated as not in attainment of federal standards for PM₁₀ although the last violation of the standard was in 1996. Salt Lake City was previously a non-attainment area for carbon monoxide but has since attained the standard and is now a “maintenance area” for carbon monoxide.

While this area has not measured an exceedance of the NAAQS over the past few years, area monitors have frequently recorded concentration levels as high as 85 percent of the standards during winter inversions. Favorable weather patterns over the last few years associated with La Niña have not produced the long, deep inversions experienced in the Salt Lake Valley during the late 1980s and early 1990s.

Under normal weather conditions, air quality downtown is therefore expected to be fair to poor. Good air quality should only be expected following periods of high winds and/or precipitation events. However, as soon as conditions return to normal, ambient pollutant levels should be expected to rise again. In the event that a deep inversion were to develop over this area, it is not unrealistic to expect that the quality of the air in the downtown Salt Lake City area could deteriorate to a level where public health could be at risk.

B. Utah Olympic Oval

The Utah Olympic Oval, located in Kearns, is the site of men and women's long track speed skating competitions. Twelve days of competitive events are scheduled for this venue.

B-1 Event Day Olympic Patronage

The following table depicts the anticipated number of patrons in each user group that will be attending a competition at the Utah Olympic Oval. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each patron group. Gross capacity of the venue is 6113.

Utah Olympic Oval – Average Attendance

Patron Group	Persons
Olympic Family	240
NOC	640
Media	940
Sponsors	1600
General Spectators	1600

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

B-2 Parking Facilities

Parking facilities will be provided to general spectators in Park & Walk lots that will be adjacent to the venue. Limited official parking will be provided at the venue. Parking facilities will be in operation three hours before and two hours after a competition.

B-3 Estimated Vehicle Needs

Most general spectators will either drive vehicles to and from the Park & Walk lot or take UTA transit to access and egress the venue. Olympic Family and athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the projected average day anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

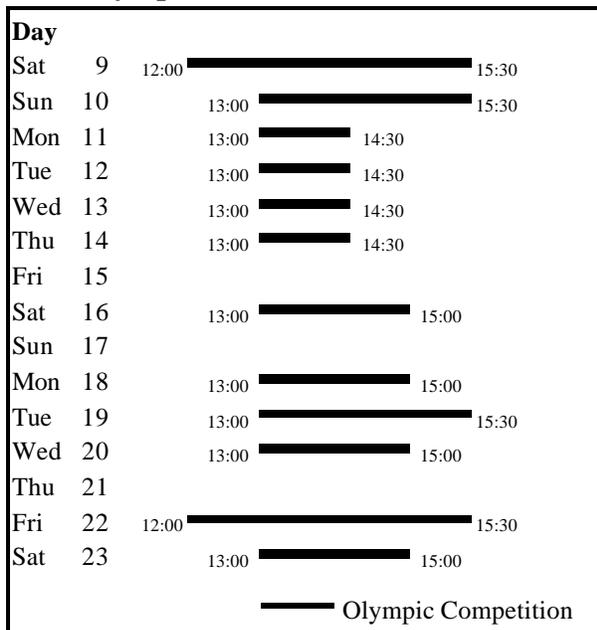
Utah Olympic Oval – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	160 cars
NOC	15 buses 64 cars
Media	16 buses 140 cars
Sponsors	65 buses
General Spectators	615 cars

B-4 Competition Times

The following chart details the scheduled competition times for Long Track Speed Skating events at Utah Olympic Oval.

Utah Olympic Oval – Schedule of Events



Source: Draft Olympic Schedule 5/25/2000

B-5 Anticipated Scenario for Utah Olympic Oval

The anticipated scenario, with numbers reflected in the Estimated Vehicle Needs section, is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also expected to lower the estimated number of vehicles in the area.

UTA and SLOC Transportation are currently developing the concept plan for the use of public transit buses and light rail service to this venue. UTA currently services Utah Olympic Oval with their regular transit service. SLOC anticipates this service to continue during Games-time. Light rail may also play a role in bringing spectators to this venue. Spectators may be able to take light rail to the 5300 South Murray Central station and then board buses to be transported to the venue. The plan, once completed, will include the percentage of general spectators that can be transported to the venue via public transit, which will result in the further reduction of the estimated vehicle needs for this venue.

TDM measures will also be promoted at each venue impact area to reduce possible traffic congestion in the area. Along with the possible reduction in overall traffic due to TDM measures, SLOC is working with other specific groups in the area. The LDS church has three church facilities in the area and is also considering the modification of weekly activities and Sunday services to avoid conflicts with Games related traffic.

B-6 Air Quality and the Utah Olympic Oval

Two areas may experience elevated pollutant levels at Games-time.

- **Local:** 5400 South and 6200 South are expected to operate within their design capacity. Traffic congestion may occur along these routes, especially later in the afternoon when area residents may return to their homes while event attendees are exiting the area. Such traffic congestion is likely to increase roadside CO concentration levels along these routes, and it is probable that roadside pollutant levels could be higher during periods of little or no wind. However, the absence of a dense pattern of major roads in the area suggests that any high levels of CO will be short in duration, and ambient levels of CO should return to normal as the traffic volume does the same. It is not anticipated that there would be a localized exceedance of the NAAQS for CO or PM₁₀.
- **Salt Lake County:** The area surrounding the Utah Olympic Oval is not supportive of Hotel accommodations. Therefore, the majority of event associated traffic will travel along Interstate 15, Interstate 215 or Bangerter Highway to get to the Oval, and its associated Park & Walk lots. It is anticipated that CO and PM₁₀ levels may be slightly elevated as a result of this event. However, ambient air monitoring on the west side of the Salt Lake Valley indicates that CO and PM₁₀ levels are low enough in this area to absorb the extra vehicle emissions under average winter conditions without exceeding the NAAQS in the Kearns area. Depending on the valley's wind flow patterns at the time of these events, some of the pollutants may be transported into the downtown and east bench areas of the Salt Lake

Valley. It is in these areas of the valley that previous air monitoring and modeling data indicate the greatest threat to air quality during extended periods of air stagnation. The staging of multiple Olympic events around the Salt Lake Valley on consecutive days over a two-week period may well result in elevated amounts of CO and PM₁₀ to the Salt Lake Valley airshed. Under average winter conditions, it is expected that ambient pollutant concentration levels will be above normal, but they are not expected to exceed the NAAQS. In the event that airflow in the valley becomes stagnant and an inversion develops, ambient pollutant concentrations could exceed the NAAQS level for CO and PM₁₀.

C. E Center

The E Center is the site of men’s ice hockey and a few women’s ice hockey competitions including the gold medal game. Sixteen days of competition are scheduled for this venue.

C-1 Event Day Olympic Patronage

The following table depicts the anticipated number of patrons in each user group that will be attending a competition at the E Center. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average attendance per day for each patron group. Gross capacity of the venue is 10, 451.

E Center – Average Attendance

Patron Group	Persons
Olympic Family	280
NOC	700
Media	1100
Sponsors	3000
General Spectators	3700

Source: Venue Capacity & Population Model 6/2/2000
 Numbers subject to change

C-2 Parking Facilities

Parking facilities will be provided to general spectators in a Park & Walk lot near the venue. Limited official parking will be provided at the venue. Parking facilities will be in operation three hours before and two hours after competition sessions for the event day.

C-3 Estimated Vehicle Needs

General spectators will drive vehicles to and from the parking lot and walk a short distance to the venue. Olympic Family and Athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

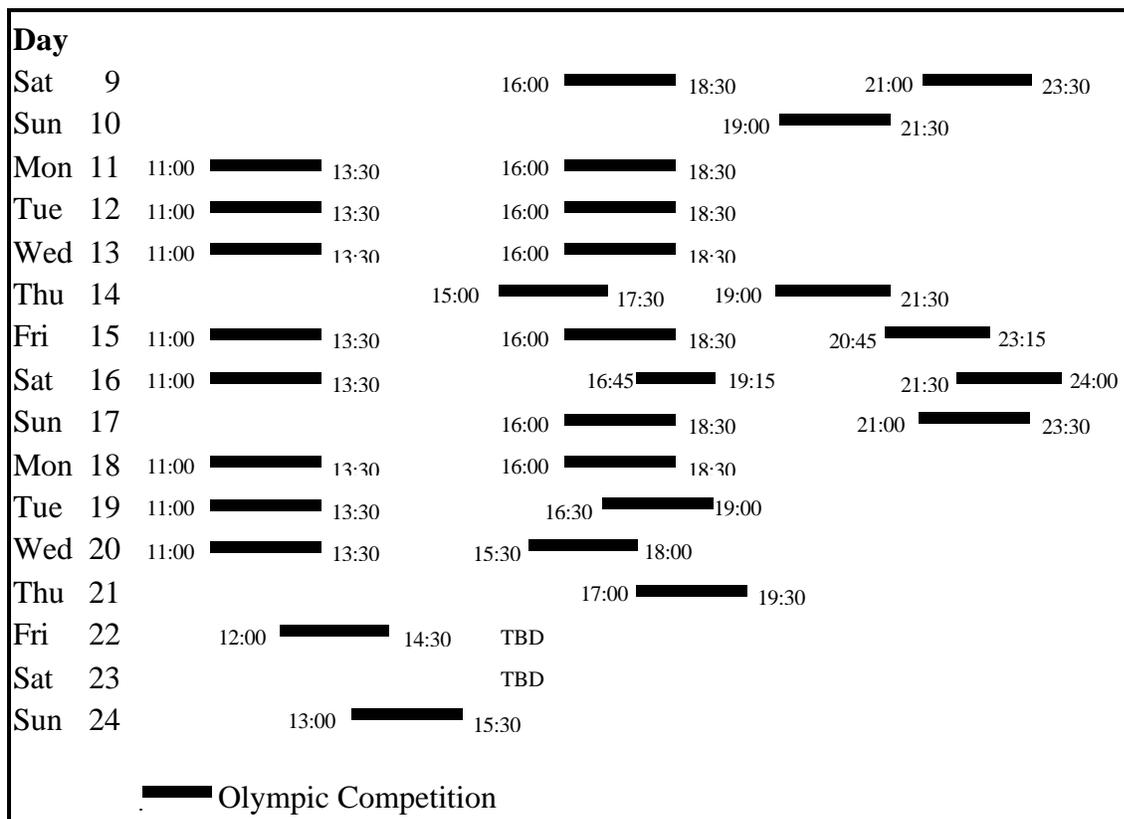
E Center – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	190 cars
NOC	16 buses 70 cars
Media	15 buses 165 cars
Sponsors	120 buses
General Spectators	1425 cars

C-4 Competition Times

The following chart details the scheduled competition times for Ice Hockey at the E Center. Most competition days there will have more than one ticketed event per day.

E Center – Schedule of Events



Source: Draft Olympic Schedule 5/25/00

C-5 Anticipated Scenario for E Center

The anticipated scenario (the numbers reflected in Estimated Vehicle Needs section) is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also expected to lower the estimated number of vehicles in the area.

UTA and SLOC Transportation are currently developing a concept plan for the use of public transit buses and light rail service to this venue. UTA currently services the E Center with their regular transit service and it is anticipated that this service will continue during Games-time. Likewise, spectators may be able to take light rail to the 3300 South Millcreek station and then board buses to be transported to the venue. The plan, once completed, will include the percentage of general spectators that can be transported to the venue via public transit, which will result in the further reduction of the estimated vehicle needs for this venue.

Transportation demand management measures will also be promoted at each venue impact area to reduce possible traffic congestion.

C-6 Air Quality and the E Center

There are two areas that could experience elevated pollutant levels at event time.

- **Local:** Events having at- or near-capacity crowds are not uncommon at the E Center. Access to the facility is designed to handle large volumes of traffic. However, some traffic congestion is expected along these routes, especially during the late afternoon when area residents may be returning to their homes while event attendees are entering or exiting the area. Traffic volumes at this level may increase roadside CO concentration levels along these routes, and it is probable that roadside pollutant levels could be substantial during periods of little or no wind. However, with few major roads in the area, any elevated CO concentrations will be short in duration, and ambient levels of CO should return to normal as the traffic volume tapers off. It is not anticipated that there would be a localized exceedance of the NAAQS for CO or PM₁₀.
- **Salt Lake County:** The area surrounding the E Center does support some hotel accommodations, however not to the capacity of the expected spectators and Olympic related personnel for this event. Therefore, the majority of patron traffic will travel along Interstate 15, Interstate 215, 2100 South, and 3500 South to get to the E Center parking area and its associated Park & Walk lots. It is anticipated that area CO and PM₁₀ levels will be elevated as a result of this event. Ambient air monitoring for this area of the valley indicates that pollutant levels are low enough to absorb the anticipated vehicle emissions under average winter conditions without exceeding the NAAQS. However, the potential impact to air quality in the downtown and east bench areas is similar to the impact for the Utah Olympic Oval. When addressing air quality impacts in the downtown area factors considered are the frequency and size of the event, airflow patterns during the staging of events, and the event's proximity to the downtown area.

D. Snowbasin

Snowbasin is the site of the men's and women's alpine competitions including the downhill, combined downhill, and super-G. Six days of competition are scheduled at this venue.

D-1 Event Day Olympic Patronage

The following table depicts the anticipated number of Olympic patrons in each user group that will be attending a competition at Snowbasin. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average attendance of each patron group per day. Gross capacity of the venue is 25,000. In addition to the Olympic Patronage, Snowbasin is projected to host 1500 skiers daily.

Snowbasin – Average Attendance

Patron Group	Persons
Olympic Family	285
NOC	1445
Media	860
Sponsors	4035
General Spectators	13700

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

D-2 Parking Facilities

Parking facilities will be provided to general spectators in Park & Ride locations at Cornia Drive, on US 89, and Interstate 84 near Mountain Green. Limited official parking will be provided at the venue. Parking facilities will be in operation three hours prior and two hours following a competition.

D-3 Estimated Vehicle Needs

Most general spectators will drive vehicles to and from the Park & Ride lots, board transit buses at the Park & Ride lot, and unload and load at the venue drop-off zone. General spectators coming from the east will utilize the Park & Ride lot on Interstate 84 near Mountain Green. General spectators coming from the north and west will utilize the Park & Ride lot on US 89. Olympic Family and Athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

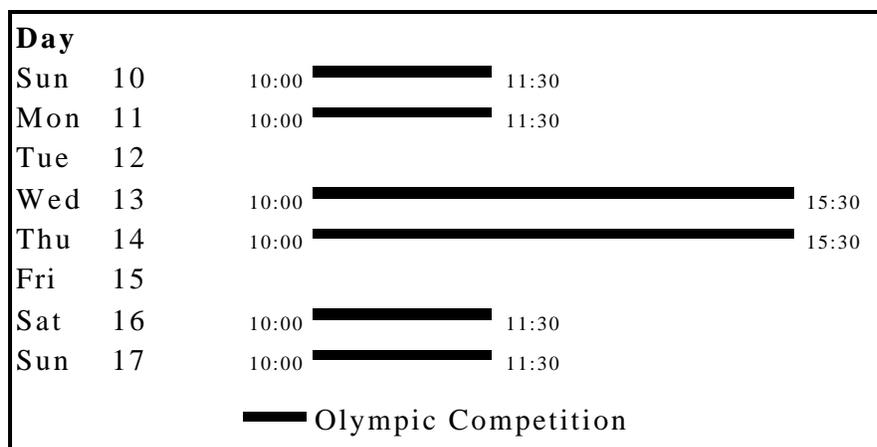
Snowbasin – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	335 cars
NOC	30 buses 100 cars
Media	17 buses 130 cars
Sponsors	210 buses
General Spectators	4845 cars

D-4 Competition Times

The following chart details the scheduled competition times for events at Snowbasin.

Snowbasin – Schedule of Events



Source: Draft Olympic Schedule 5/25/00

D-5 Anticipated Scenario for Snowbasin

The anticipated scenario (the numbers reflected in the Estimated Vehicle Needs section) is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also being developed.

Two Park & Ride lots are being proposed to service the Snowbasin venue. This will create a mode split and capture general spectators coming from the east in a separate lot from general spectators coming from the north, south and west. Transit buses will run from the Park & Ride lots to Snowbasin. The distance from the Park & Ride lot on US 89 to the venue is approximately 16 miles. The distance from the Park & Ride lot on Interstate 84 near Mountain Green to the venue is approximately 7 miles. Approximately 5 to 10 percent of general spectators are projected to travel to the Park & Ride lot on US 89 via long haul buses.

Transportation Demand Management (TDM) measures will be promoted at each venue impact area to reduce possible traffic congestion in the area. Likewise, interstate trucking companies are being informed of peak Game travel times, in anticipation that they will avoid the canyon areas.

D-6 Air Quality and Snowbasin

There are three areas that will potentially experience elevated pollutant levels at event time.

- **Pineview Reservoir Basin and the City of Huntsville:** This area sits at the base of Snowbasin. It is the lowest point of elevation in the area, and forms a basin covering approximately 25 square miles. Emissions from vehicles traveling along SR-39 and SR-266 are likely to settle in this basin area during periods of low wind speed and high pressure. Pollutant levels will likely be elevated by traffic flow prior to and after each event, with the highest concentration coming in the early evening. Under inversion conditions, levels may continue to rise into the early evening as the depth of the inversion layer decreases. Overall traffic volume does not appear to be significant enough to sustain high levels of CO for any extended period. There may be short term spikes in CO levels at major intersections and drop points during periods of peak traffic volume, but it is not anticipated that there would be an exceedance of the NAAQS for CO. PM₁₀ levels are also expected to be significantly elevated on event days, and may be the primary pollutant of concern should inversion conditions occur. Since the six competition events will take place over an eight-day period, the potential exists for pollutant levels to build up over several days, should long term stagnant conditions develop over the area. However, due to the relatively small size of this basin area, any short term wind event with wind speeds over 5 to 10 mph should decrease pollutant levels significantly in the basin over a short period of time.
- **Interstate 84 Corridor and the South Weber and Mountain Green Park & Rides:** Overall traffic volume does not appear to be significant enough along this corridor to sustain high levels of CO for long periods of time. There may be short-term spikes in airborne pollutant concentrations at major intersections, Park & Ride entrance and exit areas, and along areas of major congestion, but it is not anticipated that there would be an exceedance of the NAAQS for CO. Canyon wind flow patterns do not generally support long term stagnation, so pollutant build-up is unlikely along this route.
- **Davis and Weber Counties:** Since the majority of patron traffic will travel along Interstate 15 or US-89 up to the Snowbasin area, and its associated Park & Ride lots, it is anticipated that CO and PM₁₀ levels may be slightly elevated in these counties as a result of this event. However, ambient air monitoring in this area indicates that CO and PM₁₀ pollutant levels are low enough to absorb the extra vehicle emissions under average winter conditions without causing an exceeding the NAAQS in these counties.

E. Ice Sheet at Ogden

The Ice Sheet at Ogden is located on the campus of Weber State University and is the site of men's and women's curling events. Eleven days of competition and one day for possible tiebreakers are scheduled with three ticketed events per day.

E-1 Event Day Olympic Patronage

The following table depicts the anticipated number of Games patrons in each user group that will be attending a competition at the Ice Sheet at Ogden. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each patron group. Gross capacity of the venue is 1949.

Ice Sheet at Ogden – Average Attendance

Patron Group	Persons
Olympic Family	70
NOC	100
Media	500
Sponsors	460
General Spectators	750

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

E-2 Parking Facilities

Parking facilities will be provided to general spectators in a Park & Walk lot on-site. Limited official parking will be provided at the venue. Parking facilities will be in operation 3 hours prior and 2 hours following a competition.

E-3 Estimated Vehicle Needs

General spectators will drive vehicles to and from the parking lot and walk a short distance to and from the venue. Olympic Family and athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

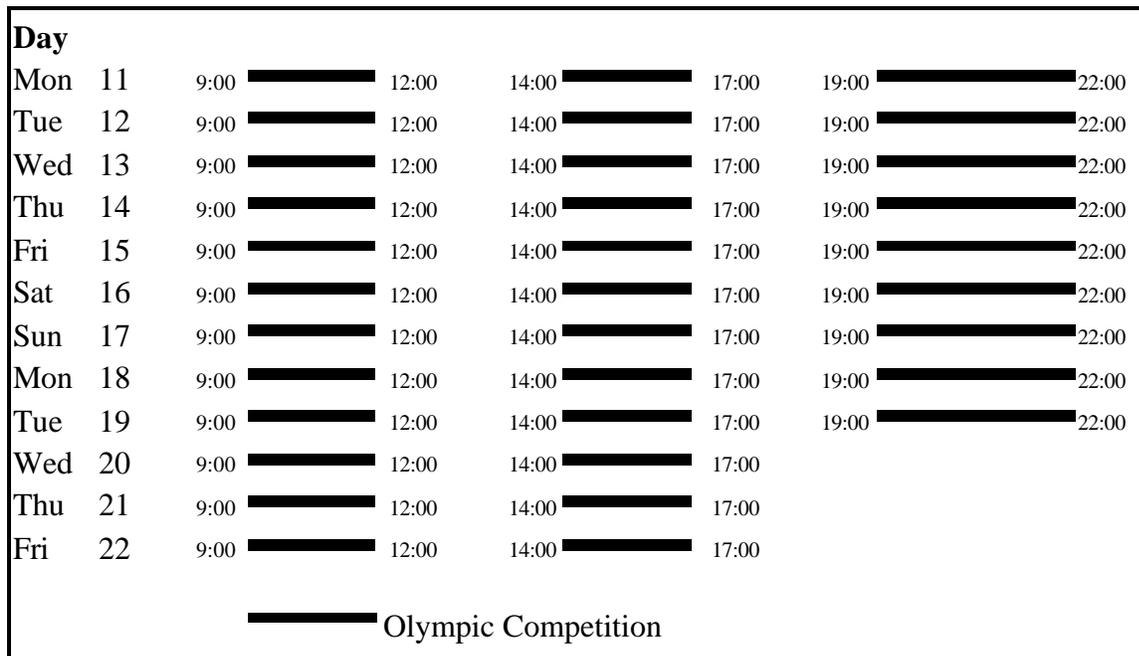
Ice Sheet at Ogden – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	50 cars
NOC	2 buses
	10 cars
Media	8 buses
	75 cars
Sponsors	20 buses
General Spectators	290 cars

E-4 Competition Times

The following chart details the scheduled competition times for curling at the Ice Sheet at Ogden. The majority of competition days are scheduled with three ticketed events per day.

Ice Sheet at Ogden – Schedule of Events



Source: Draft Olympic Schedule 5/25/00

E-5 Anticipated Scenario for the Ice Sheet at Ogden

The anticipated scenario (the numbers reflected in the Estimated Vehicle Needs section) is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also expected to lower the estimated number of vehicles in the area.

UTA currently services the area near the Ogden Ice Sheet with their regular transit service. It is anticipated that this service will continue during Games-time.

Transportation Demand Management (TDM) measures will also be promoted at each venue impact area to reduce possible traffic congestion in the area. Along with the possible reduction in overall traffic due to TDM measures, school will not be in session at Weber State University. This will result in a significant reduction of vehicles near the area.

E-6 Air Quality and the Ice Sheet at Ogden

Two areas will potentially experience elevated pollutant levels at event time:

- Roads that service this venue are designed to handle this event’s anticipated volume of traffic. While some traffic congestion may be expected, few major roads in the area suggests that any elevated CO levels will be short in duration, and ambient levels of CO should return to normal as the traffic volume does the same. It is not anticipated that there would be a localized exceedance of the NAAQS for CO or PM₁₀.
- Davis and Weber Counties: Since the majority of event-attending traffic will travel along Interstate 15 or US-89 to and from the Ogden area, it is anticipated that CO and PM₁₀ levels may be slightly elevated in these counties. However, ambient air monitoring in this area indicates that CO and PM₁₀ pollutant levels are low enough to absorb the extra vehicle emissions under average winter conditions without exceeding the NAAQS in these counties.

F. Peaks Ice Arena

The Peaks Ice Arena is located adjacent to Seven Peaks Water Park and is the site of women’s ice hockey. A few men’s preliminary hockey competitions will also take place at the Peaks Ice Arena. Thirteen days of competition are scheduled for this venue.

F-1 Event Day Olympic Patronage

The following table depicts the anticipated number of Olympic patrons in each user group that will be attending a competition at the Peaks Ice Arena. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each patron group. Gross capacity of the venue is 8048.

Peaks Ice Arena – Average Attendance

Patron Group	Persons
Olympic Family	140
NOC	450
Media	760
Sponsors	1700
General Spectators	3500

Source: Venue Capacity & Population Model 6/2/2000
 Numbers subject to change

F-2 Parking Facilities

Parking facilities will be provided to general spectators in a Park & Ride lot off-site near the Brigham Young University Stadium. Limited official parking will be provided at the venue. Parking facilities will be in operation three hours before and two hours after a competition.

F-3 Estimated Vehicle Needs

Most general spectators will drive vehicles to and from the Park & Ride lot, board buses at the Park & Ride lot, and unload and load at the venue drop-off zone. Olympic Family and athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the anticipated average number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

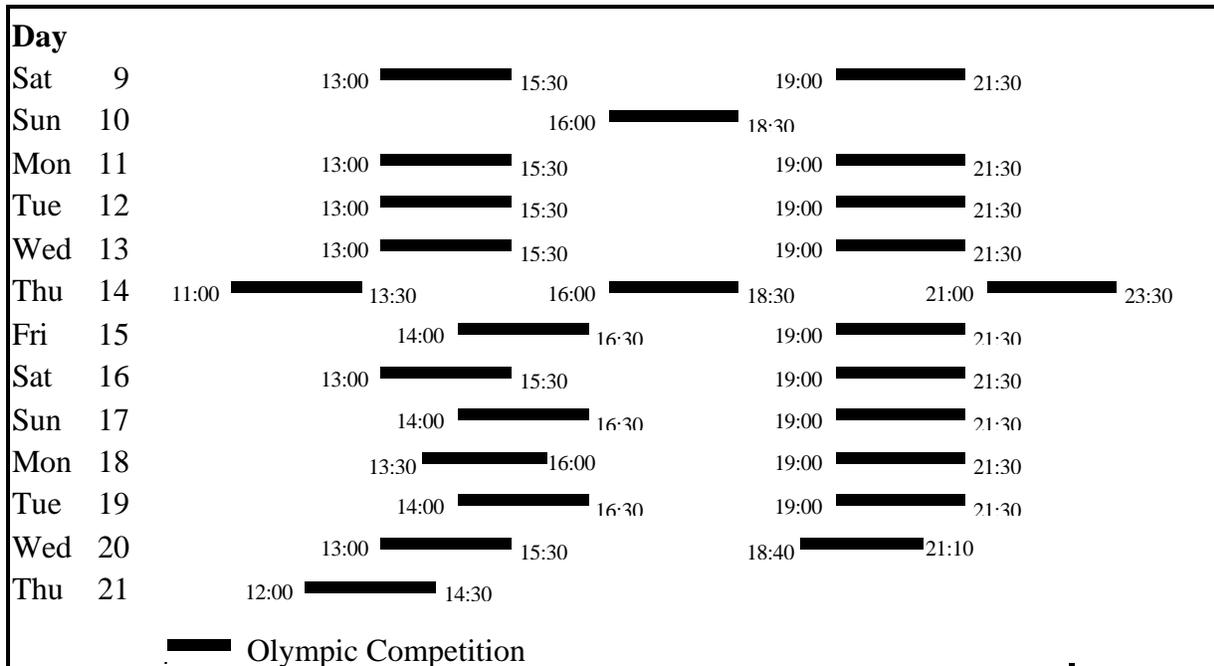
Peaks Ice Arena – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	95 cars
NOC	11 buses 45 cars
Media	12 buses 115 cars
Sponsors	70 buses
General Spectators	1350 cars

F-4 Competition Times

The following chart details the scheduled competition times for hockey at the Peaks Ice Arena. The majority of competition days there will be more than one ticketed event per day.

Peaks Ice Arena – Schedule of Events



Source: Draft Olympic Schedule 5/25/00

F-5 Anticipated Scenario at the Peaks Ice Arena

The anticipated scenario is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also being developed.

From the proposed Park & Ride lot general spectators will be transported to the venue on transit buses. The distance to the venue from the Park & Ride lot is approximately 3 miles.

UTA and SLOC Transportation are currently developing the concept plan for the use of public transit buses to this venue. UTA currently services the Peaks Ice Arena with their regular transit service. It is anticipated that this service will continue during Games-time. Transportation demand management measures will also be promoted at each venue impact area to reduce possible traffic congestion in the area.

F-6 Air Quality and the Peaks Ice Arena

There are two areas that will potentially experience elevated pollutant levels at event time.

- Local: It is anticipated that most roads servicing this venue are designed or will be modified to handle this event’s anticipated volume of traffic. While some traffic congestion may be expected, under average winter conditions, any elevated CO levels will be short in duration,

and ambient levels of CO should return to normal as the traffic volume tapers off. It is not anticipated that there would be a localized exceedance of the NAAQS for CO or PM₁₀.

- Provo and Orem Cities: The cities of Orem and Provo are designated as not in attainment of the NAAQS for CO. Ambient air monitoring in the area indicates that CO concentrations frequently approach the NAAQS during winter stagnant conditions, however an exceedance of the NAAQS for CO has not been recorded since 1994. In the event that airflow in the valley becomes stagnant and an inversion develops, any excess vehicle emissions could elevate ambient concentrations to a level where the NAAQS for CO may be exceeded. Under inversion conditions, PM₁₀ would also be expected to be elevated. However, to what extent the NAAQS for PM₁₀ might be threatened would depend on the amount of activity taking place in the area, and the duration and strength of the inversion.

G. Soldier Hollow

Soldier Hollow is the site of men’s and women’s cross-country, biathlon, and nordic combined events. Sixteen days of competition are scheduled for this venue.

G-1 Event Day Olympic Patronage

The following table depicts the number of patrons in each user group that will be attending a competition at Soldier Hollow. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each patron group. Gross capacity of the venue of 20,000.

Soldier Hollow – Average Attendance

Patron Group	Persons
Olympic Family	320
NOC	1800
Media	750
Sponsors	4900
General Spectators	12600

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

G-2 Parking Facilities

Multiple properties are currently being explored for usability. All properties are within 4 miles of the venue. Limited official parking will be provided at the venue. Parking facilities will be in operation 3 hours prior and 2 hours following a competition.

G-3 Estimated Vehicle Needs

Most general spectators will drive vehicles to and from the Park & Ride lot, board buses at the Park & Ride lot, and unload and load at the venue drop-off zone. The Olympic Family and

athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

Soldier Hollow – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	210 cars
NOC	42 buses 180 cars
Media	11 buses 115 cars
Sponsors	195 buses
General Spectators	4850 cars

G-4 Competition Times

The following chart details the scheduled competition times for events at Soldier Hollow. Only one ticket is needed for admittance to all events for a given day.

Soldier Hollow – Schedule of Events

Sat	9*	9:00	13:15
Sun	10	9:30	10:30
Mon	11*	11:00	15:30
Tue	12*	9:00	13:30
Wed	13*	10:30	14:30
Thu	14*	9:00	14:30
Fri	15*	9:00	14:00
Sat	16*	10:00	14:00
Sun	17	9:00	11:00
Mon	18	11:30	13:30
Tue	19*	9:00	15:00
Wed	20	11:00	13:00
Thu	21	10:00	11:30
Fri	22	9:00	10:30
Sat	23	9:30	13:00
Sun	24	9:30	12:00
* Multiple events single ticket			

Source: Draft Olympic Schedule 5/25/00

G-5 Anticipated Scenario for Soldier Hollow

The anticipated scenario, whose numbers are reflected in the Estimated Vehicle Needs section, is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also being developed.

From the proposed Park & Ride lot, general spectators will be transported to the venue on transit buses. The distance to the venue from the Park & Ride lot is approximately 4 miles. Approximately 5 to 10 percent of general spectators are projected to travel to Soldier Hollow via long haul buses.

Transportation Demand Management (TDM) measures will also be promoted at each venue impact area to reduce possible traffic congestion in the area. Along with the possible reduction in overall traffic due to TDM measures, the interstate trucking companies are being informed of peak Games travel times. It is anticipated that they will avoid Provo canyon during these times.

G-6 Air Quality and Soldier Hollow

Most of the local streets and roads that will be used to access the Soldier Hollow event area and Park & Ride lots are not currently designed to handle large volumes of traffic. Major routes are principal arteries into the area. Highway US 189 will be re-stripped, adding in a reversible lane for use during peak load periods. Traffic congestion may occur along these routes and is likely to increase roadside CO concentration levels. It is also probable that roadside pollutant levels could be substantial during period of little or no wind. However, the absence of a dense population in the area suggests that any high CO levels will be short in duration, and ambient levels of CO should return to normal as the traffic volume tapers off. It is not anticipated that CO or PM₁₀ would exceed the NAAQS.

H. Utah Olympic Park

The Utah Olympic Park is the site for men's and women's bobsleigh, luge and skeleton, ski jumping, and nordic combined (jumping) events. Fifteen days of competitive events are scheduled for this venue.

H-1 Event Day Olympic Patronage

The following table depicts the anticipated number of Games patrons in each user group that will be attending a competition at the Utah Olympic Park. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each user group. Gross capacity of the venue is 21,000 (ski jumping) and 15,600 (bobsleigh).

Utah Olympic Park – Average Attendance

Patron Group	Persons
Olympic Family	220
NOC	1000
Media	980
Sponsors	2900
General Spectators	11200

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

H-2 Parking Facilities

Parking Facilities will be provided to general spectators in a Park & Walk facility on SR 224. Limited official parking will be provided at the venue. Parking facilities will be in operation 3 hours prior and 2 hours following a competition.

H-3 Estimated Vehicle Needs

Most general spectators will drive vehicles to and from the Park & Walk lot and walk to the venue. The Olympic Family and Athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

Utah Olympic Park – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	145 cars
NOC	25 buses 100 cars
Media	13 buses 150 cars
Sponsors	145 buses
General Spectators	4300 cars

H-4 Competition Times

The following chart details the scheduled competition times for events at Utah Olympic Park. Multiple ticketed events will take place on 12–13 February 2002.

I-1 Event Day Olympic Patronage

The following table depicts the anticipated number of Games patrons in each user group that will be attending a competition at Park City Mountain Resort. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each patron group. Gross capacity of the venue is 17,000.

Park City Mountain Resort – Average Attendance

Patron Group	Persons
Olympic Family	400
NOC	1300
Media	850
Sponsors	5900
General Spectators	9000

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

I-2 Parking Facilities

Parking facilities will be provided to general spectators in a Park & Ride facility east of US 40. Limited official parking will be provided at the venue. Parking facilities will be in operation three hours before and two hours after a competition.

I-3 Estimated Vehicle Needs

Most general spectators will drive vehicles to and from the Park & Ride lot, board buses at the Park & Ride lot, and unload and load at the venue drop-off zone. Olympic Family and Athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each patron group. Projected numbers of vehicles vary for each patron group by competition day.

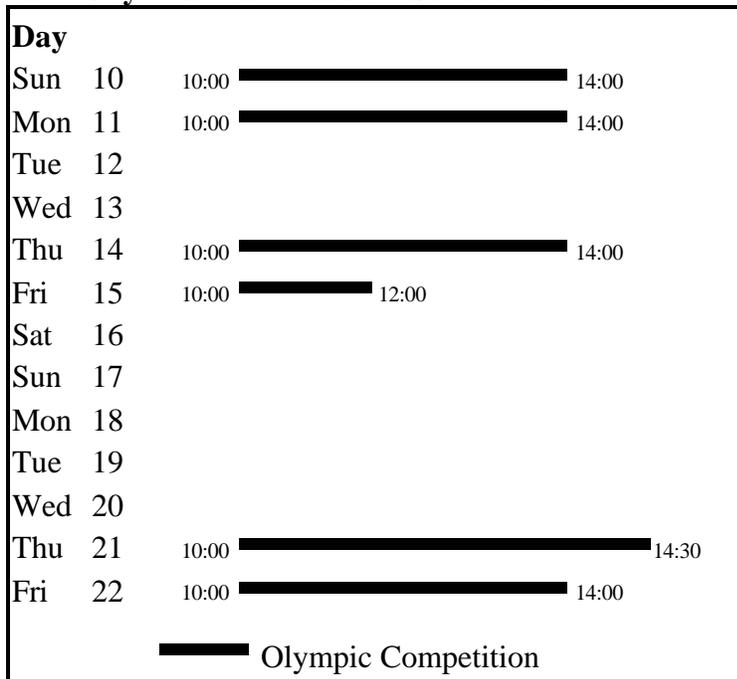
Park City Mountain Resort – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	270 cars
NOC	30 buses 130 cars
Media	15 buses 130 cars
Sponsors	235 buses
General Spectators	3460 cars

I-4 Competition Times

The following chart details the scheduled competition times for Park City Mountain Resort.

Park City Mountain Resort – Schedule of Events



Source: Draft Olympic Schedule 5/25/00

I-5 Anticipated Scenario for Park City Events

The anticipated scenario, whose numbers are reflected in the Estimated Vehicle Needs section, is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also being developed.

From the proposed Park & Ride lot general spectators will be transported to the venue on transit buses. The distance to the venue from the Park & Ride lot will be less than 4 miles. Approximately 5 to 10 percent of general spectators are projected to travel to Park City Mountain Resort via long haul buses.

The concept of using Park City Public Transit buses to this venue is being developed. Park City Transit currently services the area near this venue with their regular transit service and it is anticipated that this service will continue with additional service added if needed during Games-time. General spectators staying in Park City are anticipated to use public transit or walk to access the venue. Park City Transit will also be used to transport people into downtown Park City for events after competition. An estimated 10 percent of general spectators may use this service.

Transportation demand management measures will also be promoted at each venue impact area to reduce possible traffic congestion in the area. Along with the possible reduction in overall traffic due to TDM measures, the interstate trucking companies are being informed of peak

Olympic travel times. It is anticipated that trucking companies will avoid the canyon areas during peak Olympic travel times.

J. Deer Valley Resort

Deer Valley Resort is the site for the men's and women's alpine slalom, combined slalom, freestyle moguls, and freestyle aerials. Seven days of competitive events are scheduled for this venue.

J-1 Event Day Olympic Patronage

The following table depicts the anticipated number of Games patrons in each user group that will be attending a competition at Deer Valley Resort. Projected attendance numbers vary for each patron group by competition day. The numbers reflect the projected average day attendance for each user group. Gross capacity of the venue is 13,052.

Deer Valley Resort – Average Attendance

Patron Group	Persons
Olympic Family	220
NOC	900
Media	850
Sponsors	3700
General Spectators	7300

Source: Venue Capacity & Population Model 6/2/2000
Numbers subject to change

J-2 Parking Facilities

Parking facilities will be provided to general spectators in a Park & Ride lot east of US 40. Limited official parking will be provided at the venue. Parking facilities will be in operation three hours before and two hours after a competition.

J-3 Estimated Vehicle Needs

General spectators will drive vehicles to and from the Park & Ride lot, board buses at the Park & Ride lot, and unload and load at the venue drop-off zone.

The Olympic Family and Athletes will be transported by official vehicles and vans. Media will use coach buses, vans and sedans. Sponsors will use coach buses.

The following chart reflects the average anticipated number of vehicles that will be used by each user group. Projected numbers of vehicles vary for each patron group by competition day.

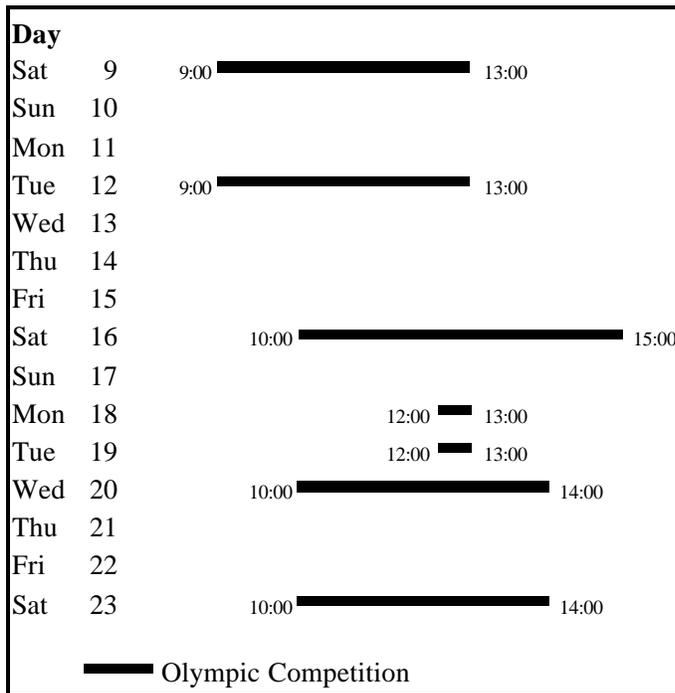
Deer Valley Resort – Average Vehicle Numbers

Patron Group	Vehicles
Olympic Family	145 cars
NOC	21 buses 90 cars
Media	15 buses 130 cars
Sponsors	150 buses
General Spectators	2800 cars

J-4 Competition Times

The following chart details the scheduled competition times for events at Deer Valley Resort.

Deer Valley Resort – Schedule of Events



Source: Draft Olympic Schedule 5/25/00

J-5 Anticipated Scenario for Deer Valley

The anticipated scenario (the numbers reflected in the Estimated Vehicle Needs section) is a result of the general practices and assumptions outlined in the Venue-by-Venue Analysis Summary. The following venue specific measures are also being developed.

From the proposed Park & Ride lot general spectators will be transported to the venue on transit buses. The distance to the venue from the Park & Ride lot is approximately 4.25 miles.

Approximately 5 to 10 percent of general spectators are projected to travel to Deer Valley Resort via long haul buses.

The concept of using Park City Public Transit buses to this venue is being developed. Park City Transit currently services the area near this venue with their regular transit service, and it is anticipated that this service will continue with additional service added if needed during Games-time. General spectators staying in Park City are anticipated to use public transit or walk to access the venue. An estimated 10 percent of general spectators will use Park City Transit to go to downtown Park City for events after competitions.

Transportation demand management measures will also be promoted at each venue impact area to reduce possible traffic congestion in the area. Along with the possible reduction in overall traffic due to TDM measures, the interstate trucking companies are being informed of peak Games travel times in hopes they will avoid the canyon areas during these times.

J-6 Air Quality and Park City Events, Including Utah Olympic Park

There are three venues in the Park City area that will host Olympic events.

- Men's and women's bobsleigh, luge and skeleton, ski jumping, and nordic combined at the Utah Olympic Park with competition scheduled to occur on 15 days varying between the hours of 8:30 and 17:30.
- Men's and women's snowboarding and giant slalom at the Park City Mountain Resort with competition scheduled to occur on six days varying between the hours of 10:00 and 15:00.
- Men's and women's alpine and combined and freestyle moguls and aerials the Deer Valley Resort with competition scheduled to occur on seven days varying between the hours of 9:00 and 14:30.

All venues will share the same travel routes, public transportation system and Park & Ride lots. Park City will also act as a hosting city with many of the out-of-town visitors either staying or visiting the area on a daily basis. The Park City area is prone to wintertime inversions, mostly in the early morning hours, but these inversions are generally weak in nature, and break up by late morning. Ambient levels of CO and PM₁₀ are expected to be higher during the Olympics due to the extra activity in the area at the time. All routes used by spectators will be interstate or arterial highways. All are multiple lane or have shoulders that can be used as lanes during high usage periods. All highways are expected to operate within their design capacity. High roadside CO concentration levels may be anticipated, especially during periods of little or no wind. In addition, increased levels of PM₁₀ may result from wood burning stoves if inversions occur in the high mountain valleys of Summit and Wasatch Counties. Such inversions are typically short-lived compared to those in the Wasatch Front, but visibility and sensitive individuals could be affected. However, any high levels of CO should be short in duration, and return to normal as the traffic tapers off. It is not anticipated that there would be a localized exceedance of the NAAQS for CO or PM₁₀.

VIII. Actions to Address Impacts

A. Planned Transportation Actions

During the Salt Lake 2002 Olympic Winter Games many people will be transported daily to the various Olympic venues. This task will be accomplished by utilizing approximately 1200 borrowed transit buses for general spectators, as well as UTA buses, light rail transit and Park City Transit buses. To reduce possible impacts, the following general practices will be implemented by the Salt Lake Olympic Organizing Committee (SLOC) Transportation Department and its partners during the Olympic Winter Games of 2002.

Transportation Demand Management

Transportation Demand Management (TDM) is a strategic communications program, aimed at specific audiences, to encourage the smooth flow of traffic throughout the entire Salt Lake Region. Its long-range purpose is to encourage alternative travel habits of residents and commuters not only during the Olympic Winter Games period, but also for the future.

An integral part of the effort will include the services of a communications/media specialist firm to develop and help implement a structured communications plan to bring the message to the target audiences.

The Monitoring of the TDM effort will be done by the TDM subgroup of the Olympic Transportation Working Group (OTWG). This subgroup will provide advice, guidance and marketing expertise to the program.

The executive director of the Transportation Management Association of Utah (TMA) chairs the Olympic TDM subcommittee. An executive Board, consisting of four members, advises the chair. Committee members come from a wide variety of public agencies, private agencies, and major employers.

Committee members have created a draft concept plan, dividing the committee into four groups: Administrative Planning, Regional TDM, Venue TDM, and Community Outreach. Each committee is lead by co-chairs and team leaders.

The draft concept plan outlines objectives for each of the groups and details strategies to carry out these objectives. It is a community effort that follows the mission statement of developing a plan that will have long-term benefits after the Games are over.

The role of Administrative Planning is to establish the level of involvement, authority, and the functional role of the subcommittee with regard to SLOC. The group's objective is to clearly define program roles, responsibilities and resource requirements, and to establish reporting functions.

The role of Regional TDM is to coordinate a regional TDM program that will measurably improve the general transportation system performance during the Games period and provide longer-term community benefits.

Regional TDM also includes long-haul trucking and intermodal operations. The committee's objective is to promote the effective transport and transfer of goods during the Games period while minimizing potential disruptions and hazards.

The role of Venue TDM is to effectively manage the transportation of people to, from and around Games venues, non-venue Games-related activities, and affected businesses and homes.

Venue TDM includes Freight Management at Venue or Event-Related Sites.

The role of Community Outreach is to coordinate an effective community outreach program designed to maximize participation by businesses, educational institutions, government agencies, religious organizations and the general public.

The Community Outreach campaign includes special events and opportunities and a community awareness campaign.

The TDM group will help promote programs such as ride share, telecommuting, flex scheduling, compressed work schedule and UTA transit/light rail use. The public, near impact areas, will also be educated and provided information concerning peak Olympic travel times, street restrictions and event routes, so that commuting schedules may be adjusted, if necessary, and alternative methods of travel chosen. To date successful results include the University of Utah and Weber State University's initiative to close classes over the Games period and Park City School District's involvement.

Alternative Fuel Buses and Vehicles

In order to transport the anticipated number of general spectators during the Olympic Winter Games, SLOC has launched the Borrowed Bus Program. The Borrowed Bus Program has been established to obtain transit buses that will be needed to transport spectators from Park & Ride lots to the venues. These transit buses will be borrowed from transit agencies around the country. The program has been designed as a showcase of transit and a parade of cities that have contributed buses to the Olympic Games. Since it will be a parade of transit agencies and their representative cities, it is anticipated that the transit agencies will send their newer equipment. All buses will be inspected and will meet Utah bus requirements.

Approximately 10 percent or 120 of the transit buses for the spectator system acquired from the Borrowed Bus Program are expected to be fueled by compressed natural gas (CNG). The CNG buses will be used primarily for transportation needs in the Salt Lake Valley where air quality impacts are of greatest concern and lower altitude allows for better bus performance.

It is expected the CNG buses will be used to transport spectators from designated Park & Ride lots into the downtown area for competitions at the Salt Lake Ice Center, Olympic Medals Plaza

ceremonies and other cultural events. The buses will also transport spectators from Park & Ride lots to the Rice-Eccles Olympic Stadium for Opening and Closing Ceremonies.

SLOC Transportation Department personnel and General Motors Alternative Fuel Division personnel are working together in the development of an alternative fuel vehicle program for the Games. General Motors will be showcasing their models of alternate fuel vehicles during Games-time, as well as during Pre-Games-time.

It is anticipated that approximately 5 to 10 percent of the Pre-Games motorpool will be comprised of bi-fuel CNG vehicles. Approximately 60 percent of the vehicles used for the athlete system during Games-time will be bi-fuel CNG. All drivers of the alternative fuel vehicles will be trained on CNG fueling and locations of fueling stations.

SLOC Transportation Department personnel are also working with local GM dealerships and representatives from other local organizations to develop an after use program for the alternative fuel vehicles used in the Olympic motorpool. The after use program explores various techniques for keeping the alternative fuel vehicles in Utah once they have been used by SLOC and returned to local dealerships for sale.

All General Motors vehicles used in the Pre-Games and Games motorpool are new with approximately 35 percent of the fleet comprised of LEV (low emission vehicle) certified vehicles. All vehicles in the Pre-Games motorpool are driven for approximately three months at which time they are returned to the dealerships and a new replacement vehicle is received. The Games-time motorpool will also be comprised of new and LEV certified vehicles.

Public Transit

Each ticket-holder will be sent an information packet accompanying their 2002 Games event tickets. Included in this packet will be transportation information regarding locations of Park & Ride lots and routes that should be used to access the venues. UTA information regarding bus routes and light rail service to specific venues will also be included. Spectators will be encouraged to use public transit to access the venues where service is available.

In conjunction with the draft Venue Transportation Operations Plans, UTA and SLOC are developing a draft spectator system plan for the downtown area and other valley venues. The plan begins to detail Park & Ride facilities that will be used to transport general spectators into the downtown area for various events and to what extent light rail can be used to move event and background traffic during the Games. The light rail will be primarily utilized for bringing spectators from the south into the downtown area for competitions at the Salt Lake Ice Center, Olympic Medals Plaza ceremonies and other cultural evening events. It is also anticipated that general spectators will be able to use light rail to access other valley venues such as E Center and Utah Olympic Oval. Bus service will be provided from specified light rail stations to the venues.

UTA has provided SLOC with a loaned employee who is helping create the spectator system for the valley venues as well as providing insight into ways that the current public transit system can be used to move spectators to venue sites.

Volunteers will be encouraged to car pool, as well as use public transit or light rail to access the venue when possible. Volunteers at the mountain venues will be required to utilize the Park & Ride lots to access the venue. Bus drivers recruited for the spectator transit system will be housed near the area they are working. When feasible, other volunteers will be assigned to venues near the areas where they reside. By assigning volunteers to the venue near their area of residence, vehicle miles traveled can be reduced.

Bus Service Centers

Three bus service centers located in Salt Lake County, Summit County and Weber County will be developed to house and operate the borrowed bus fleet. A fourth existing facility located in Orem will also be used. A percentage of the total transit buses for the spectator system will be kept at each of these service centers. Transit buses will not be traveling back and forth to Salt Lake County but instead will be kept at the service centers near the venue they serve. This will greatly reduce the number of transit bus trips in the Salt Lake Valley air shed.

Idling Equipment

During competitions at the venues, under normal conditions buses will not be allowed to be left idling. Associated with each venue is a designated location for bus staging. In the vicinity of the bus staging area, a drivers lounge will be provided. During training, supervisors and bus drivers will be informed of SLOC's policy against idling and encouraged to use the lounge. The lounge is designed as a place where the bus drivers can wait until they are needed to begin the egress service at the venues.

Website Information

SLOC has established a website that provides updated information to the general public concerning the Olympic Winter Games. A weather information link will be included on the SLOC website. The weather page, along with providing up to date information on weather conditions at the venue and Park & Ride sites, will contain a link to the DEQ website where the public can access updated air quality information. By accessing the website, the public will be informed of air quality conditions and warned if an air quality problem arises.

Traffic Control

Parking attendants will be employed at each Park & Ride and Park & Walk lot. Attendants will control the access/egress movements within the parking lot and thereby permit rapid and orderly traffic flow and parking operations.

SLOC transportation personnel have been working in conjunction with the Utah Olympic Public Safety Command (UOPSC) traffic work group and UDOT. The traffic work group is developing a comprehensive traffic control and management plan around venue sites and related road systems. Traffic plans are being developed to ensure a smooth flow of traffic.

UDOT has also embarked on a four year Intelligent Transportation System (ITS) deployment program in conjunction with the reconstruction of I-15 in the Salt Lake Valley which will culminate in connecting over 550 signals, 57 Highway Variable Message Signs and 190 camera positions with UDOT's Traffic Operations Center (TOC) and traffic control centers in Salt Lake City, Salt Lake County and UTA. In addition, freeway detectors spaced every kilometer will provide traffic flow data that will be used for real-time congestion mapping and traveler advisory information. All of these systems will aid in managing congestion problems and allow for the smooth and efficient flow of traffic during Games-time.

Upon completion of the ITS systems, goals are to reduce crashes by 20 percent, freeway delay by 30 percent and signal stops by 20 percent. It is also anticipated that speeds on surface roads will increase by fifteen percent.

Real time traffic information will also be available to travelers. Traffic conditions will be broadcast on the radio, TV, pagers and listed on the website. By utilizing these available systems, general spectators can be made aware if traffic problems arise.

During the Olympic Winter Games, the TOC will be a strategic location for coordination of Games transportation and UOPSC personnel.

At the TOC, personnel will monitor for traffic congestion, roadway weather conditions, accidents and breakdowns on major traffic routes to all of the venues. Hazardous Material software is also available to allow improved response to HazMat crashes for train and motor carrier accidents.

Traffic signal coordination will be a tool utilized by TOC personnel. Signal timing may be adjusted to help facilitate traffic flow and mitigate possible traffic congestion in certain areas.

The TOC Roadway Weather Information System will be used to detect and notify maintenance stations of pavement conditions in their area. This system will help efficiently manage snowplow operations. The Utah Department of Public Safety dispatching is located at the TOC. TOC operators and dispatchers currently work together to identify incidents and get a response unit to the incident scene quicker. This system will continue to operate during Games-time to reduce time to clear incidents and to manage traffic flow and safety.

TOC personnel will be in contact with key Games transportation personnel such as the Athlete Dispatchers at the Village, Media Dispatchers at the Main Media Center, Venue Transportation Managers (VTM's) and the Main Operations Center (MOC). TOC personnel will be able to notify Games Transportation Dispatchers if routes need to be changed. The communication between TOC personnel and Games transportation personnel will be critical.

Route Modeling

Fehr and Peers, a transportation consulting firm, was hired to model traffic on roadways that will be used by patrons to access each venue. The model calculates hourly travel based on both assumed Olympic Winter Games travel routes and background traffic.

SLOC transportation personnel are using the model to validate travel routes and identify possible traffic congestion areas. The model can be used to determine roadways where various methods such as traffic control and signal timing should be used.

B. Special Measures

As has already been discussed, a major factor governing the air quality along the Wasatch Front is meteorology. Inversions will be a major concern with weather and air quality during the Games. If an inversion is severe enough and continues for several days, it is likely that visibility will be impaired and may be possible that health standards could be exceeded. In order to mitigate such effects, a program of voluntary special measures will be established to reduce pollution from vehicles and other sources.

1. **Special Transportation Measures.** In conjunction with the Transportation Demand Management (TDM) measures being developed by the TDM Subcommittee of the Olympic Transportation Working Group, there will be an opportunity for organizations to participate at a higher level during periods of poor air quality. These measures could consist of increased ride sharing, telecommuting, or any other methods of reducing vehicle pollution.

2. **Other Special Measures.** It may be possible to adjust other non-transportation activities contributing to pollution that would improve air quality during inversions. Although specific measures would be the choice of the individual business or organization, examples might include reduced energy use, reduced or rescheduled production activity, or other practices. Specific details would be developed between now and Games-time.

3. **Implementation of Special Measures.** There is already a system in place to alert the public about air quality using the national Air Quality Index system and a simple “green,” “yellow,” “red” alert. “No-burn” or “Red-burn” days are declared by the UDEQ’s Division of Air Quality as air approaches unhealthy levels. Since visibility normally deteriorates well before the air becomes unhealthy, special measures would probably need to be invoked at the “yellow” level to head off more serious problems. Wasatch and Summit Counties are also considering voluntary wood burning cessation programs. The print and broadcast media provide extensive coverage of air quality alerts and this could be augmented with direct notifications to participants in the special measures program.

IX. Additional Air Quality Enhancement Projects

Olympic Cleaner and Greener

SLOC has taken two major steps in fulfilling its environmental mission by signing up for certification by the Cleaner and Greenersm Environment Program of its achievements in reducing the air emissions caused by energy use and by setting the goal of making the Salt Lake 2002 Olympic Winter Games, the first Olympics with zero net air emissions. These steps demonstrate the commitment of the Salt Lake 2002 Olympic Winter Games to achieve its environmental goals.

Together SLOC and the Cleaner and Greenersm Environment Program will work toward making the Salt Lake 2002 Olympic Winter Games the first Olympics with zero net air emissions. To support these achievements the Cleaner and Greenersm Program is working with Salt Lake 2002 Olympic Winter Games to do the following:

- Determine the total emissions of significant air pollutants caused by energy use at the Salt Lake 2002 Olympic Winter Games
- Determine the emission reductions achieved by increased energy efficiency and renewable energy measures that are being implemented
- Help identify and capture additional opportunities to further reduce environmental emissions caused by energy use at the Salt Lake 2002 Olympic Winter Games
- Work toward offsetting the remaining emissions by gathering and retiring donations of emission reductions from energy efficiency and renewable energy projects implemented in facilities owned by schools, businesses and other organizations in Utah, other states in the USA and in other countries participating in the Games. This outreach to schools, businesses and other organizations will encourage them to follow the environmental leadership of these Games by setting emissions reduction goals for their own organizations and by donating some of their emission reductions to offset emission caused by the 2002 Games
- Provide third party review of Salt Lake 2002 Olympic Winter Games' air emissions from energy use, emission reductions and net emissions
- Certify Salt Lake 2002 Olympic Winter Games' net environmental emissions and emission reduction achievements

The Cleaner and Greenersm Environment Certification Program helps organizations, businesses, families and individuals increase their environmental stewardship by keeping score on what actions participating organizations and businesses take to reduce environmental emissions from energy use. This certification provides a way for participating organizations and businesses to clarify their objectives internally and to communicate their achievements to their consumers or constituencies in the marketplace.

The results of this program will be quantified and publicized as the program proceeds.

Tree-planting Initiatives

As part of its mission to improve the environment in Utah and internationally, SLOC has undertaken a large-scale urban forestry project. Through six different programs designed to reach a variety of audiences, SLOC will plant 100,000 trees in Utah by Games-time. SLOC will also launch an international urban forestry advocacy program during the summer of 2000 which will encourage tree planting in international markets.

SLOC has partnered with the Utah Office of Energy Services to use data generated by National Aeronautics and Space Administration (NASA) to determine where to plant trees for the most benefit. The data was generated as part of the Urban Heat Island project. As part of that project, information will be generated on what air quality gains can be seen by planting a certain percent increase in urban tree cover in Salt Lake. SLOC will use that data to quantify the air pollution benefits from tree planting such as carbon sequestering and the reduction of city heat. This information will be released as it is developed over the next few months.

X. Air Quality Metrics

The DEQ (Division of Air Quality) measures air quality using an extensive network of monitors throughout the state. The system consists of 28 monitoring and meteorological stations that collect data on seven pollutants and weather conditions. Along the Wasatch Front there are 11 monitors for carbon monoxide, 19 for fine particulate matter and 19 meteorological stations. All monitors are operated under strict federal guidelines designed to ensure that the data collected at these sites is accurate, quality assured, and to the fullest extent possible, continuous and complete. The UDEQ operated system will provide all the data needed to assess air quality during the period of the Games so no other monitoring is anticipated at this time.

XI. References

1. Manual on Sport and the Environment, International Olympic Committee, 1997
2. Atlanta After Action Report, Atlanta Committee for the Olympic Games,
3. The Impact of Changes in Transportation and Commuting Behaviors During the 1996 Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma Centers for Disease Control and Prevention.
4. Los Angeles After Action Report
5. SLOC White Paper on Long Haul Transportation Issues

XII. Contacts

Listed below are the agencies and their representative who assisted and provided information to SLOC in the development of this transportation air quality plan. This collaborative effort was coordinated as a partnership project between SLOC and the Utah Environmental and Public Health Alliance (EPHA).

Amber Gillette
Transportation Department
Salt Lake Organizing Committee
(801) 212-2269

David Workman
Environmental Department
Salt Lake Organizing Committee
(801) 212-2306

Diane Conrad
Director, Environmental Programs
Salt Lake Organizing Committee
(801) 212-2160

Richard Valentine
Salt Lake Valley Health
Environmental Health
(801) 313-6677

Richard Sprott
Co-Chair, EPHA Air Quality Workgroup
Utah Department of Environmental Quality
Division of Air Quality
(801) 536-4151

Royal DeLegge
Co-Chair, EPHA Air Quality
Salt Lake Valley Health
Environmental Health
(801) 313-6600

Delane McGarvey
Davis County Health Department
(801) 451-3296

Bob Swenson
Summit County Health Department
(435) 336-3278

Terry Beebe
Utah County Health Department
(801) 370-8780

Barre Draper
Weber/Morgan Health Department
(801) 399-8381

Karen Keller
Utah Department of Health
(801) 538-6191

Dean Gillam
US EPA, Region VIII
(303) 312-6432

Sonja F. Wallace
Utah Department of Environmental Quality
Olympic Coordination
(801) 536-4477

Laverne Snow
Utah EPHA
Olympic Coordination
(801) 313-6649

XIII. Appendix A: Emissions Calculations

VMT Calculation Methodology

Olympic Winter Games related vehicle miles traveled (VMT) were calculated for the 17-day event period. Findings were compared with the projected 2002 vehicle miles traveled along the Wasatch Front and Wasatch Back in order to determine the possible Games related impact. The methodology for this comparison, assumptions and findings are detailed below.

The roundtrip distance was calculated from downtown Salt Lake City to each venue and Park & Ride/Walk lot. It was assumed that the distance from downtown to each venue and Park & Ride/Walk lot represented the average roundtrip distance that Olympic related traffic would be traveling.

Venue statistics on attendance numbers, as outlined in Section VII, were used in the calculation. The numbers reflect the projected average attendance for each patron group at each venue.

The VMT for patron groups at each venue was calculated based on the assumed average roundtrip distance of travel, average day attendance and anticipated mode of travel. Auto and bus components were calculated. This VMT was multiplied by the number of days the venue would be operating to obtain the total VMT associated with each venue. The total VMT for each venue was added to obtain the anticipated 17-day Olympic Period impact.

The VMT for the worst case scenario at each venue was also calculated in a similar manner. The worst case scenario would result in all patron groups driving single occupancy vehicles to each venue.

The following results are based on data collected by UDOT on vehicle miles traveled by county for the Wasatch Front and Wasatch Back. Data from UDOT on the annual average daily VMT was used to project anticipated 2002 numbers. The daily VMT for counties located along the Wasatch Front and Wasatch Back was multiplied by the number of days of competition to obtain the total non-Games VMT over the Games Period.

The calculated Games VMT was then compared to the calculated non-Games VMT for the 17 days of Olympic Winter Games competition. Results are summarized in the following chart.

Calculated VMT for 17 Day Games Period

Non-Olympic VMT	769,394,826
Worse Case VMT	119,334,288
Olympic VMT	34,134,139
Worse Case Impact	16%
Olympic Impact	4%

Results indicated that Games related traffic would add an additional 4 percent to the existing VMT if no other measures for traffic reduction were taken.

The current transportation plans of accredited transportation systems, Park & Ride lots and encouraging ticketholders to carpool results in a 71 percent reduction in comparison of the anticipated Games impact and the worst case scenario. Further reduction in Games related VMT will be achieved as the general spectator system for the valley is completed.

Following are excel spreadsheets with the individual patron group VMT calculations.

VMT Comparison

Olympic Period (17 Days) VMT Comparison

County	Olym. Period VMT	Olympic Patron Groups	Oly. Period VMT	Worse Case Scenario	Oly. Period VMT	Olympic Period VMT Summary	
Davis	110,733,001	Athletes	104,523		119,334,288		
Morgan	5,481,188	Olympic Family	970,304			% Olympic Increase in Daily VMT	4%
Salt Lake	368,111,816	Media	877,821			% Worse Case Increase in Daily VMT	16%
Summit	32,421,787	Sponsors	800,464				
Utah	164,121,816	General Spectators	26,859,648			% Reduction from Worse Case Scenario	71%
Wasatch	12,895,326	NOC	4,521,379				
Weber	75,629,891						
Sum of Counties	769,394,826	Sum Olympic Groups	34,134,139	Sum Worse Case	119,334,288		

Athletes

Venue

Park and Walk	Ave. Dist. (miles) (downtown to venue)	Athletes (people)	VMT (autos)	VMT (buses)	Comp. (days)	# Comps (per day)	Oly. Period VMT (autos)	Oly. Period VMT (buses)
Utah Olympic Oval	13.9	190	755		12		9,055	
E Center	8.7	295	587	68	15	2		1,027
Ogden Ice Sheet	36.7	140	4,404		12	3	52,848	
Utah Olympic Park	28.3	120	970		13		12,614	
Park and Ride								
Snowbasin	44.1	80	1,008		6		6,048	
Soldier Hollow	15	110	471		15		7,071	
Deer Valley Resort	35.8	80	818		7		5,728	
Park City Mountain Resort	36.3	110	1,141		6		6,845	
Peaks Ice Arena	42.8	240	2,348	274	12	2		3,287
							100,209	4,314
						Total	104,523	

Olympic Family

Venue

Park and Walk	Ave. Dist. (miles) (downtown to venue)	Olympic Family (people)	VMT (autos)	Comp. (days)	# Comps (per day)	Oly. Period VMT (autos)
Oquirrh Park	13.9	240	4,448	12		53,376
E Center	8.7	275	3,190	15	2	47,850
Ice Sheet at Ogden	36.7	70	3,425	12	3	41,104
Winter Sports Park	28.3	215	8,113	13		105,465
Park and Ride						
Snowbasin	44.1	285	16,758	6		100,548
Soldier Hollow	53.4	315	22,428	15		336,420
Deer Valley	35.8	220	10,501	7		73,509
Park City	36.3	400	19,360	6		116,160
Ice Arena at Provo	42.8	140	7,989	12	2	95,872
Total						970,304

Media

Park and Walk	Average Distance (downtown to venue)	Media (people)	Media (autos)	VMT (autos)	VMT (buses)	Competition (days)	# Comps (per day)	Olympic VMT (autos)	Olympic VMT (buses)
Utah Olympic Oval	13.9	940	141	3,920	672	12		47,038	8,064
E Center	8.7	1100	165	2,871	492	15	2	43,065	7,383
Ogden Ice Sheet	36.7	500	75	5,505	944	12	3	66,060	11,325
Utah Olympic Park	28.3	980	147	8,320	1,426	13		108,163	18,542
Park and Ride									
Snowbasin	44.1	860	129	11,378	1,950	6		68,267	11,703
Soldier Hollow	53.4	750	113	12,015	2,060	15		180,225	30,896
Deer Valley Resort	35.8	850	128	9,129	1,565	7		63,903	10,955
Park City Mountain Resort	36.3	850	128	9,257	1,587	6		55,539	9,521
Peaks Ice Arena	42.8	760	114	9,758	1,673	12	2	117,101	20,074
Total								749,360	128,462
Total								877,821	

Sponsors

Venue

Park and Walk	Ave. Dist. (miles) (downtown to venue)	Sponsor (people)	VMT (buses)	Comp. (days)	# Comps (per day)	Oly. Period VMT (buses)
Utah Olympic Oval	13.9	1600	1,779	12		21,350
E Center	8.7	3000	2,088	15	2	31,320.00
Ogden Ice Sheet	36.7	460	1,351	12	3	16,206.72
Utah Olympic Park	28.3	2900	6,566	13		85,353
Park and Ride						
Snowbasin	44.1	4035	14,235	6		85,413
Soldier Hollow	53.4	4900	20,933	15		313,992
Deer Valley Resort	35.8	3700	10,597	7		74,178
Park City Mountain Resort	36.3	5900	17,134	6		102,802
Peaks Ice Arena	42.8	1700	5,821	12	2	69,849.60
Total						800,464

NOC

Venue

Park and Walk	Ave. Dist. (miles) (downtown to venue)	NOC's (people)	VMT (autos)	VMT (buses)	Comp. (days)	# Comps (per day)	Oly. Period VMT (autos)	Oly. Period VMT (buses)
Utah Olympic Oval	13.9	640	1,779	415	12		49,462	11,541
E Center	8.7	700	1,218	284	15	2	42,386	9,890
Ogden Ice Sheet	36.7	100	734	171	12	3	161,627	37,713
Utah Olympic Park	28.3	1000	5,660	1,321	13		320,356	74,750
Park and Ride								
Snowbasin	44.1	1445	12,745	2,974	6		1,124,100	262,290
Soldier Hollow	15	1800	5,400	1,260	15		162,000	37,800
Deer Valley Resort	35.8	900	6,444	1,504	7		461,390	107,658
Park City Mountain Resort	36.3	1300	9,438	2,202	6		685,199	159,880
Peaks Ice Arena	42.8	450	3,852	899	12	2	659,462	153,875
Total							4,521,379	855,396

General Spectators

Park and Walk	Ave. Dist. (miles) (downtown to venue)	P & R Dist. (miles) (lot to venue dz)	Gen Specs (people)	Gen Specs (autos)	Daily VMT (autos)	Daily VMT (buses)	Comp. (days)	# Comps (per day)	Oly. Period VMT (autos)	Oly. Period VMT (buses)
Utah Olympic Oval	13.9		1600	615	17,108		12		205,292	
E Center	8.7		3700	1423	49,523		15	2	742,846	
Ogden Ice Sheet	36.7		750	288	63,519		12	3	762,231	
Utah Olympic Park	28.3		11200	4308	243,815		13		3,169,600	
Park and Ride										
Snowbasin (Cornia)	44.1	16	11508	4426	248,750	7,365	6		1,492,499	44,191
Snowbasin (Mt. Green)*	30	8.75	2192	843	35,831	767	6		214,985	4,603
Soldier Hollow	53.4	3.75	12600	4846	481,223	1,890	15		7,218,346	28,350
Deer Valley Resort	35.8	6.75	7300	2808	163,127	1,971	7		1,141,888	13,797
Park City Mountain Resort	36.3	5	9000	3462	216,692	1,800	6		1,300,154	10,800
Peaks Ice Arena	42.8	3	3500	1346	214,308	420	12	2	2,571,692	5,040
Downtown	10		70000	23333	466,667		17		7,933,333	
* ave distance from the east									26,752,867	106,781
									Total	26,859,648

Worst Case Scenario

Venue

Park and Walk	Ave. Dist. (miles) (downtown to venue)	Worse Case (people)	VMT (autos)	Comp. (days)	# Comps. (per day)	Olympic VMT (autos)
Utah Olympic Oval	13.9	4243	117,955	12		1,415,465
E Center	8.7	8023	279,200	15	2	4,188,006
Ice Sheet at Ogden	36.7	1485	326,997	12	3	3,923,964
Utah Olympic Park	28.3	20885	1,182,091	13		15,367,183
Park and Ride						
Snowbasin Ski Area	44.1	23415	2,065,203	6		12,391,218
Soldier Hollow	53.4	19940	2,129,592	15		31,943,880
Deer Valley Resort	35.8	12967	928,437	7		6,499,060
Park City Mountain Resort	36.3	16915	1,228,029	6		7,368,174
Peaks Ice Arena	42.8	6054	1,036,445	12	2	12,437,338
Downtown	10	70000	1,400,000	17		23,800,000

Emissions Calculation Methodology

Total 119,334,288

Olympic related VMT was used to calculate the possible emission rates for HC, CO and Nox pollutants. Results are based on projected 2002 Salt Lake area emission rates. The projected data was received from Wasatch Front Regional Council (WFRC).

Projected emission rates were given in grams per mile. Based on the calculated auto and bus VMT for the 17-day Games period the total grams for each pollutant was calculated. A conversion factor of 453.5 grams equals one pound was used to calculate pounds of each pollutant. Tons of each pollutant for the 17-day period was then calculated. The total was then broken up and reported in an average possible tons per day of each pollutant. Findings are detailed below.

User Group	Auto VMT (17 day Total)	Bus VMT (17 day Total)
Athletes	100,209	4,314
Olympic Family	970,304	
Media	749,360	128,462
Sponsors		800,464
General Spectators	26,752,867	106,781
Total	28,572,740	1,040,020

2002 Emission Rates		
Pollutant (grams/mile)	Cars	Buses
HC	1.199	3.084
CO	14.212	10.361
Nox	1.558	7.119

17 Day Olympic Contribution

Pollutant (grams)		
HC	34,258,715	3,207,422
CO	406,075,781	10,775,649
Nox	44,516,329	7,403,904

Pollutant (lbs)		
HC	75,543	7,073
CO	895,426	23,761
Nox	98,162	16,326

Pollutant (tons)		
HC	37.77	3.54
CO	447.71	11.88
Nox	49.08	8.16

Pollutant (tons/day)	Cars	Buses
HC	2.22	0.21
CO	26.34	0.70
Nox	2.89	0.48