



## Zion National Park:

# Enhancing Visitor Experience Through Improved Transportation

**Jonathan Upchurch, P.E., P.T.O.E.**  
**Transportation Engineering Consultant**

**Tyler Hoskins, P.E.**  
**Southwest Consulting Services**

**ITE Western District Annual Meeting, July 2013, Phoenix**















**BANFF NATIONAL PARK, CANADA**





Image State of Utah

©2011 Google

Google earth

Imagery Date: 12/31/2005 1993

37° 12' 05.50" N 112° 56' 17.64" W elev. 3934 ft

Eye alt: 4787 ft



Imagery Date 12/31/2005 1993

37°11'59"22" N 112°59'23"70" W elev. 3920 ft

Eye alt 5526 ft

**468,860 VEHICLES IN ONE YEAR PERIOD**

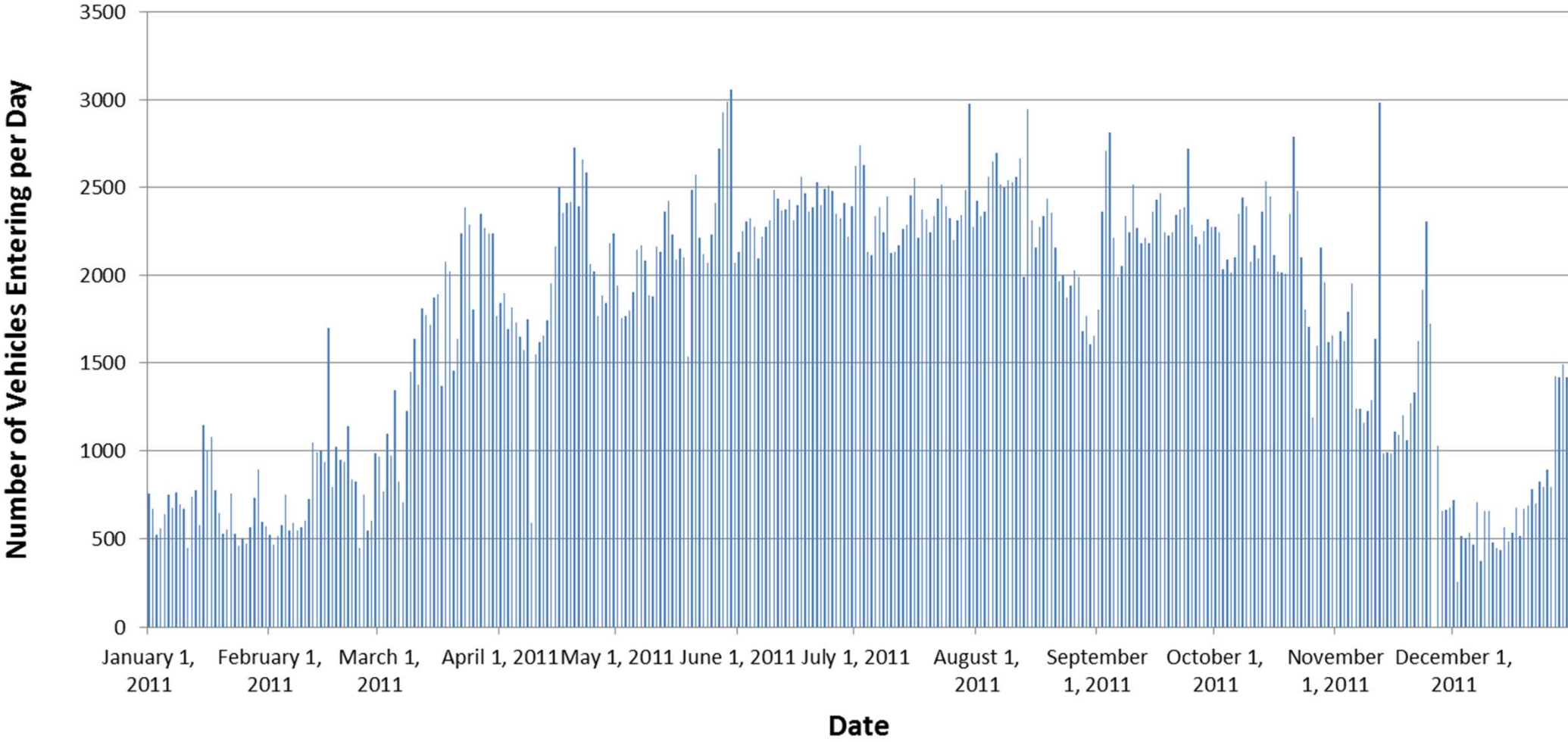
**DURING PEAK SEASON, LONG LINES ARE COMMON**

**DEMAND >> CAPACITY**

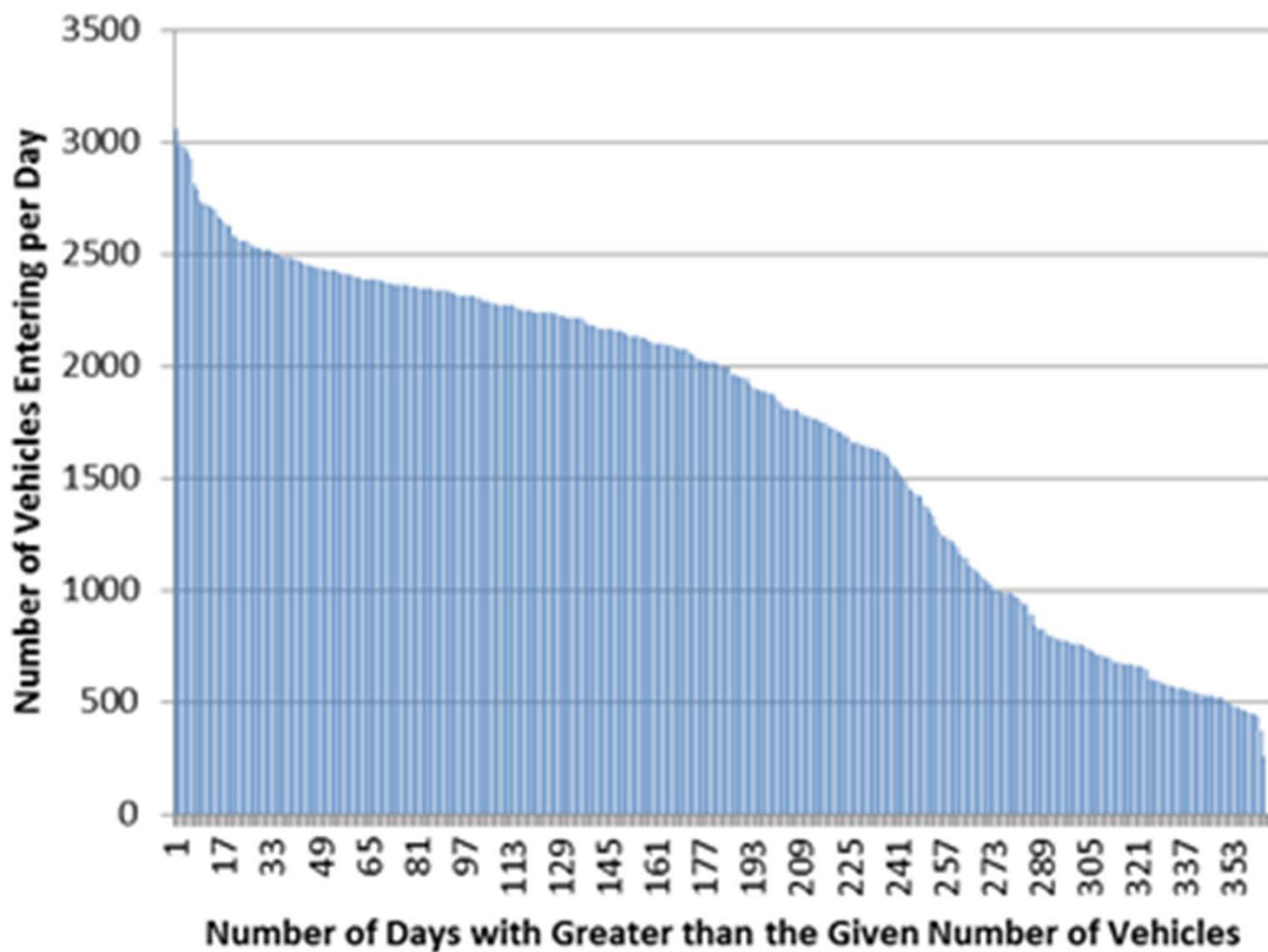




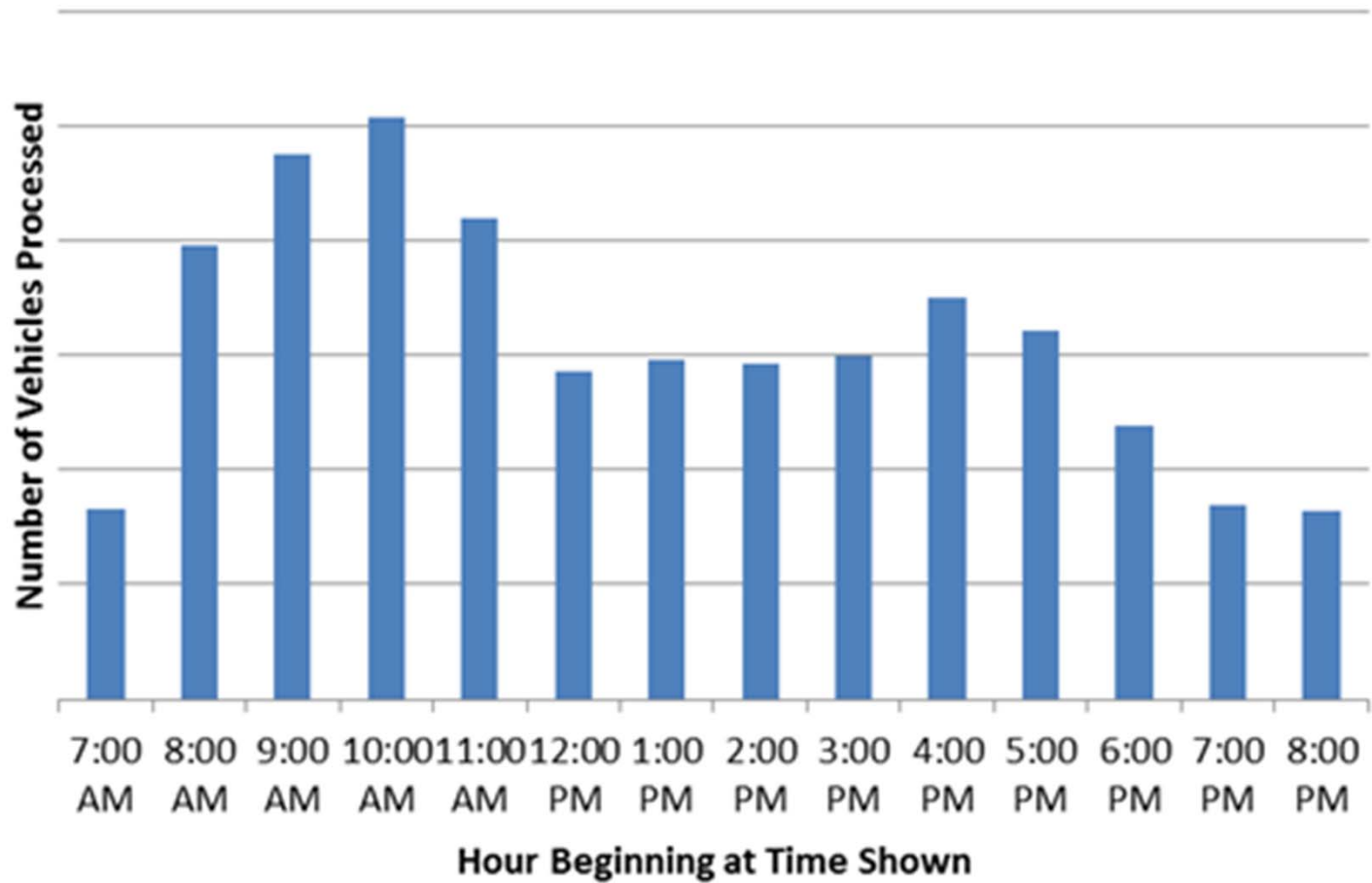
**Figure 1 - Zion South Entrance Station - Vehicle Counts by Day of the Year - 2011**



**Figure 5 - Distribution of Number of Vehicles Entering Zion South Entrance by Day**



**Figure 6 - Traffic Volume by Hour of the Day**





## ZION NATIONAL PARK

### ENTRANCE FEES

Private Vehicle	\$25
Motorcycle (per person)	\$12
Per Person (walk-in, bicycle)	\$12
Groups	INQUIRE

**TUNNEL ESCORT** \$15

### ANNUAL & LIFETIME PASSES

Zion Annual	\$50
Interagency Annual	\$80
Interagency Senior (US residents age 62)	\$10
Interagency Access (US residents permanently disabled)	INQUIRE

		<u>TIME (secs)</u>
AUTO 7-DAY PASS	CASH	47
AUTO 7-DAY PASS	CREDIT	52
INTERAGENCY PASS	CASH	101
INTERAGENCY PASS	CREDIT	98
SENIOR PASS	CASH	129
INTER-AGENCY PASS		29
SENIOR PASS		31
RETURN VISIT (7-DAY PASS)		14

# **AVERAGE SERVICE TIME**

**37 SECONDS**

# **CAPACITY**

**2 REGULAR LANES**

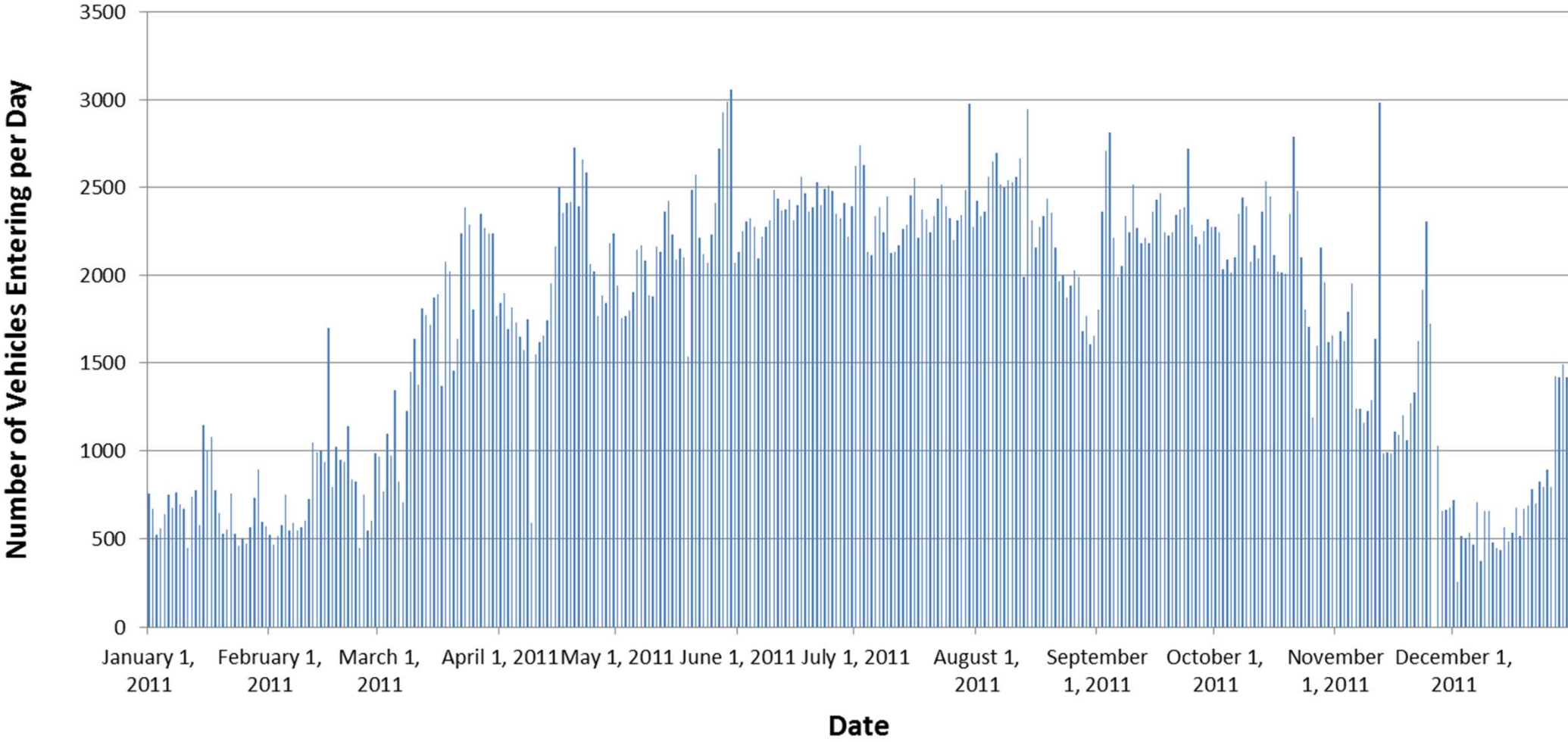
**194 VEHICLES PER HOUR**

# QUEUE LENGTHS AND WAITING TIMES



<u>Location</u>	<u>Distance (feet)</u>	<u>No. of vehicles</u>	<u>Waiting Time (min)</u>
THEATER SOUTH DRIVEWAY	1450	62	19
CAFÉ de SOLEIL	1800	72	22
LION BOULEVARD	3350	116	35

**Figure 1 - Zion South Entrance Station - Vehicle Counts by Day of the Year - 2011**



**136 DAYS PER YEAR WHEN SIGNIFICANT QUEUING OCCURS**

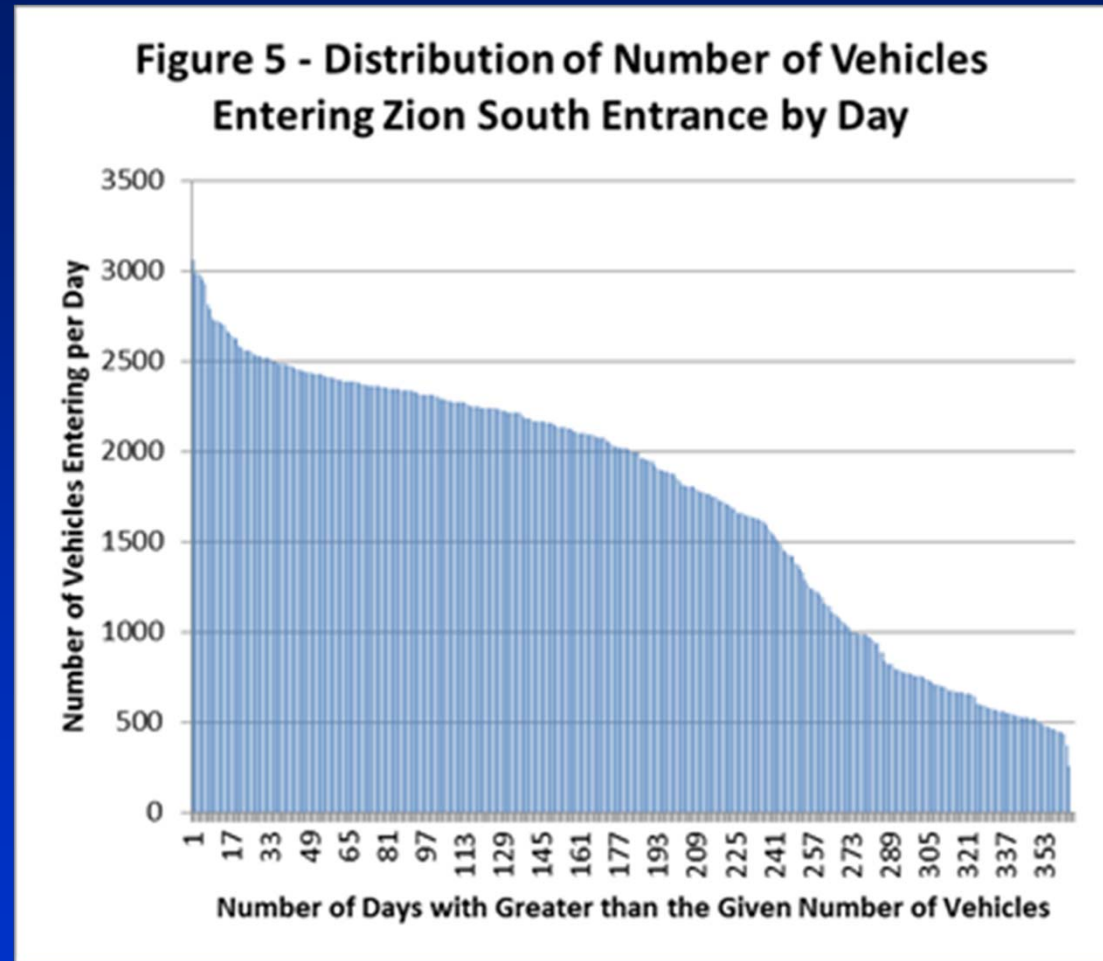
**FUTURE DEMAND**

**PEAK HOUR**



# FUTURE DEMAND

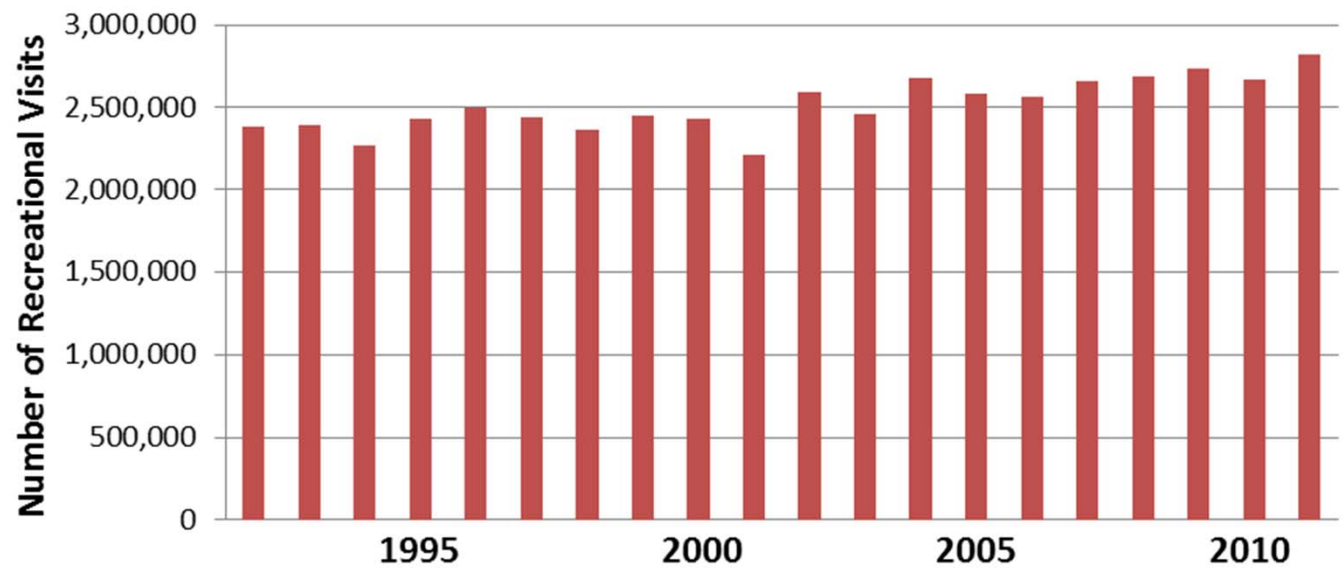
13<sup>th</sup> HIGHEST DAY



# FUTURE DEMAND

## 20 PERCENT INCREASE IN VISITATION

**Figure 8 - Zion Annual Visitation in Recreational Visits - 1992 to 2011**



# **FUTURE DEMAND**

**314 VEHICLES PER HOUR**

**INCREASE NUMBER OF LANES**

**LENGTHEN EMPLOYEE LANE**

**EXPRESS LANE**

**DISSEMINATION OF PRE-TRIP PLANNING INFORMATION**

**HIGHWAY ADVISORY RADIO**

**SALE OF ENTRY PERMITS AT REMOTE LOCATIONS**

**STACKED LANE**

## STACKED LANE



# ALTERNATIVES



Image State of Utah

©2005 Google

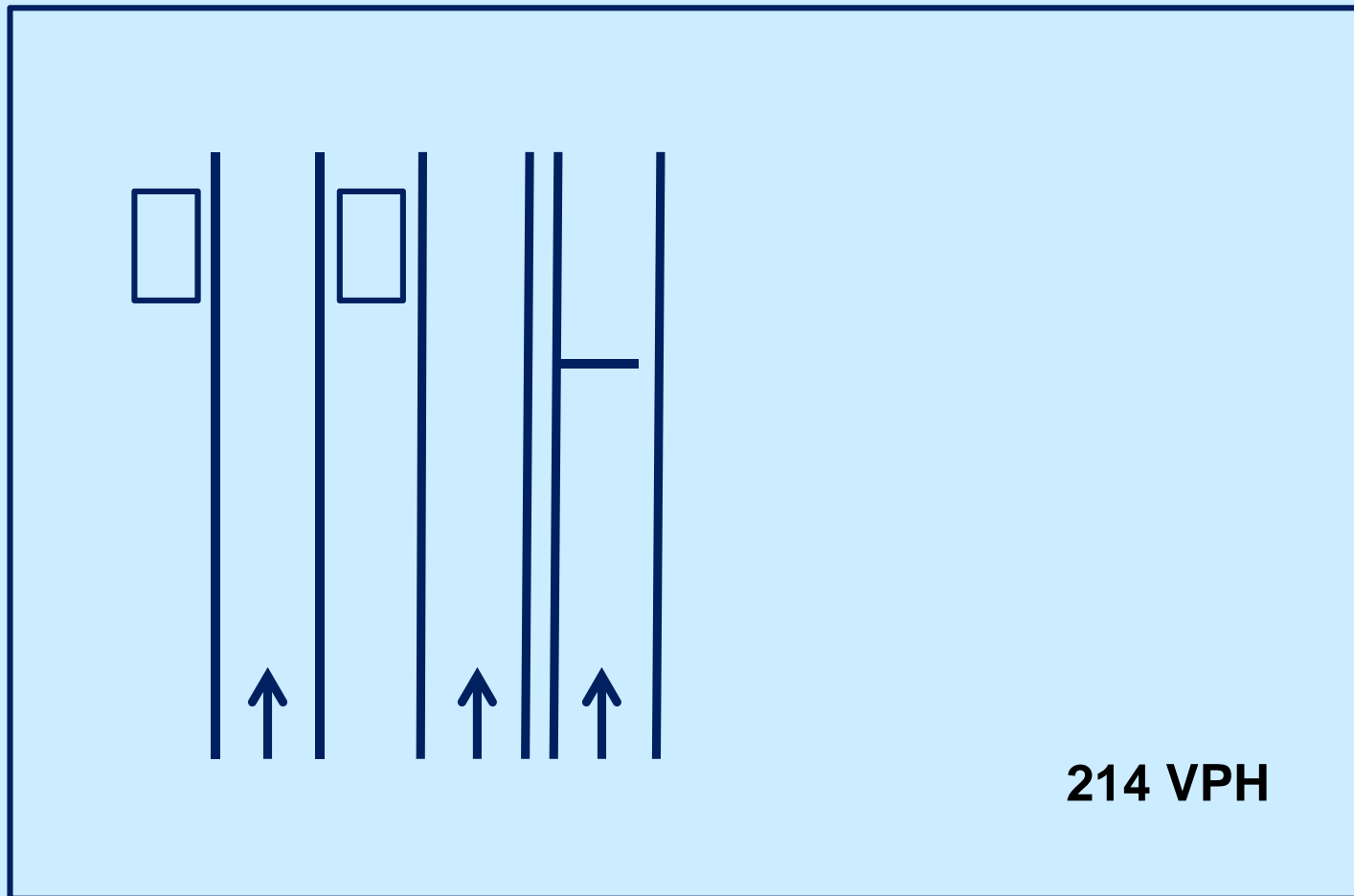
Google earth

Imagery Date: 12/31/2005 1993

37°12'05.50" N 112°56'17.54" W elev. 3934 ft

Elev. alt. 4787 ft

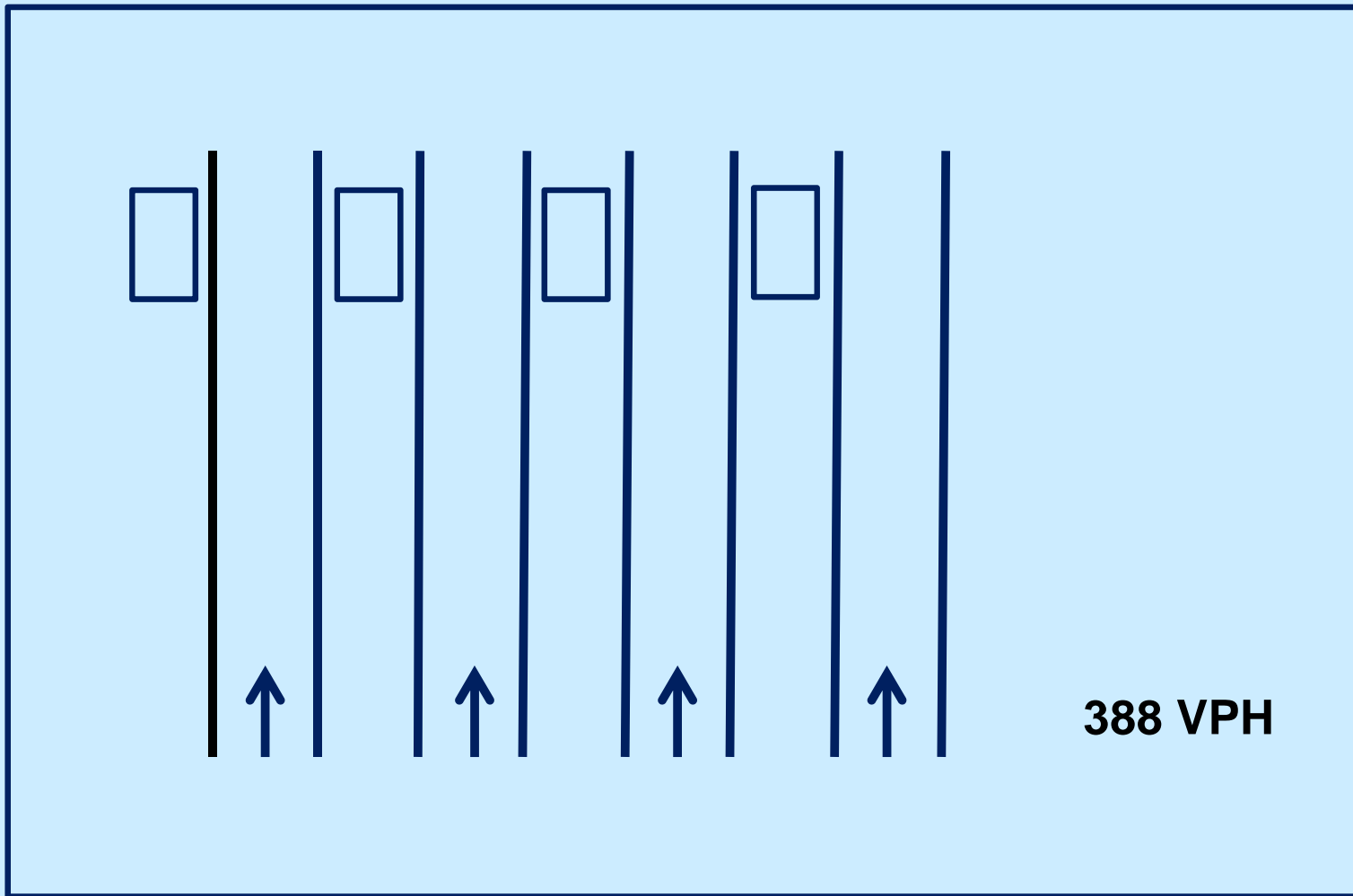
**ALTERNATIVE A – EXISTING CONDITIONS – DO NOTHING**



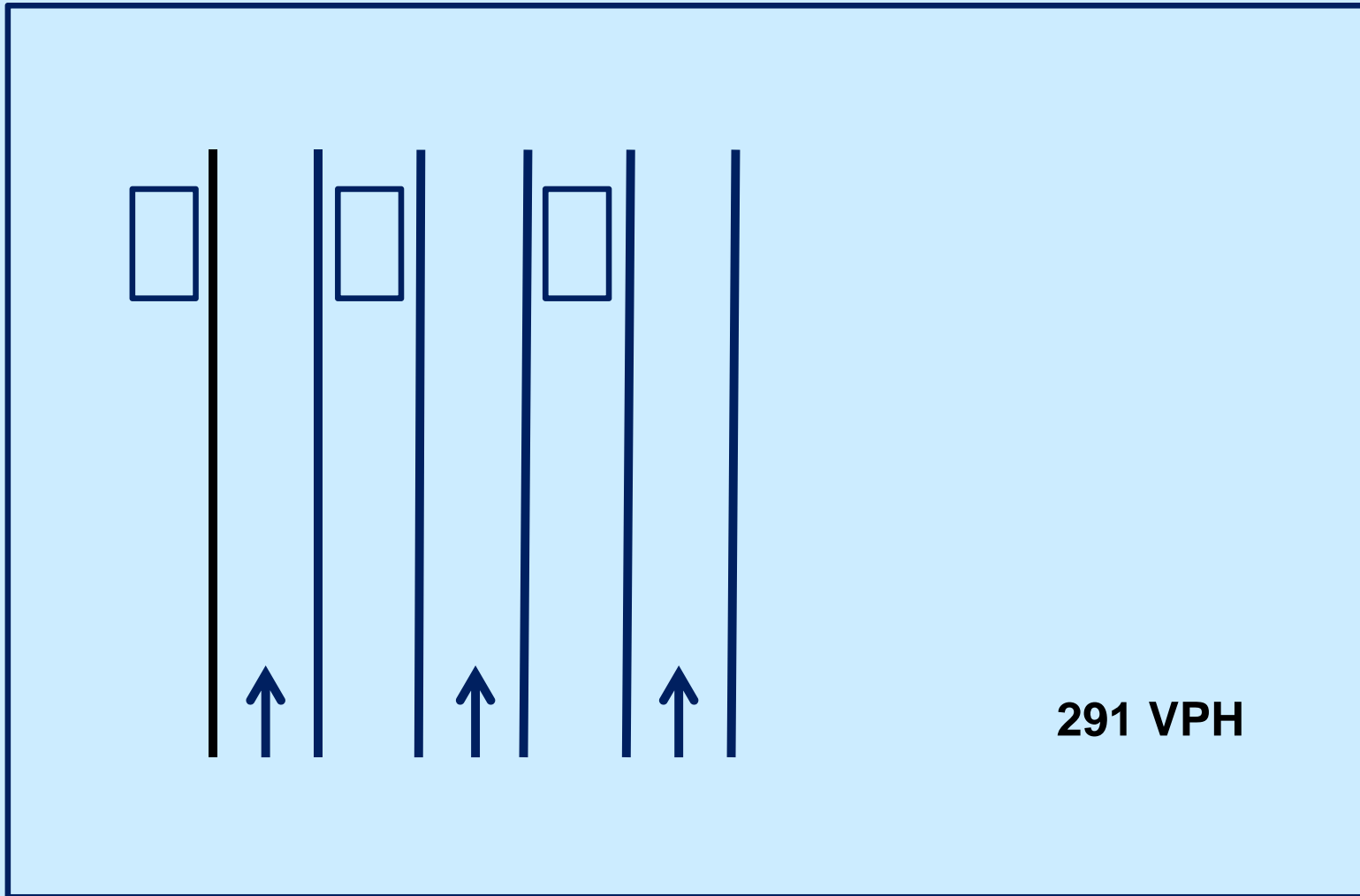
**2 Regular Lanes plus unstaffed Employee Lane**



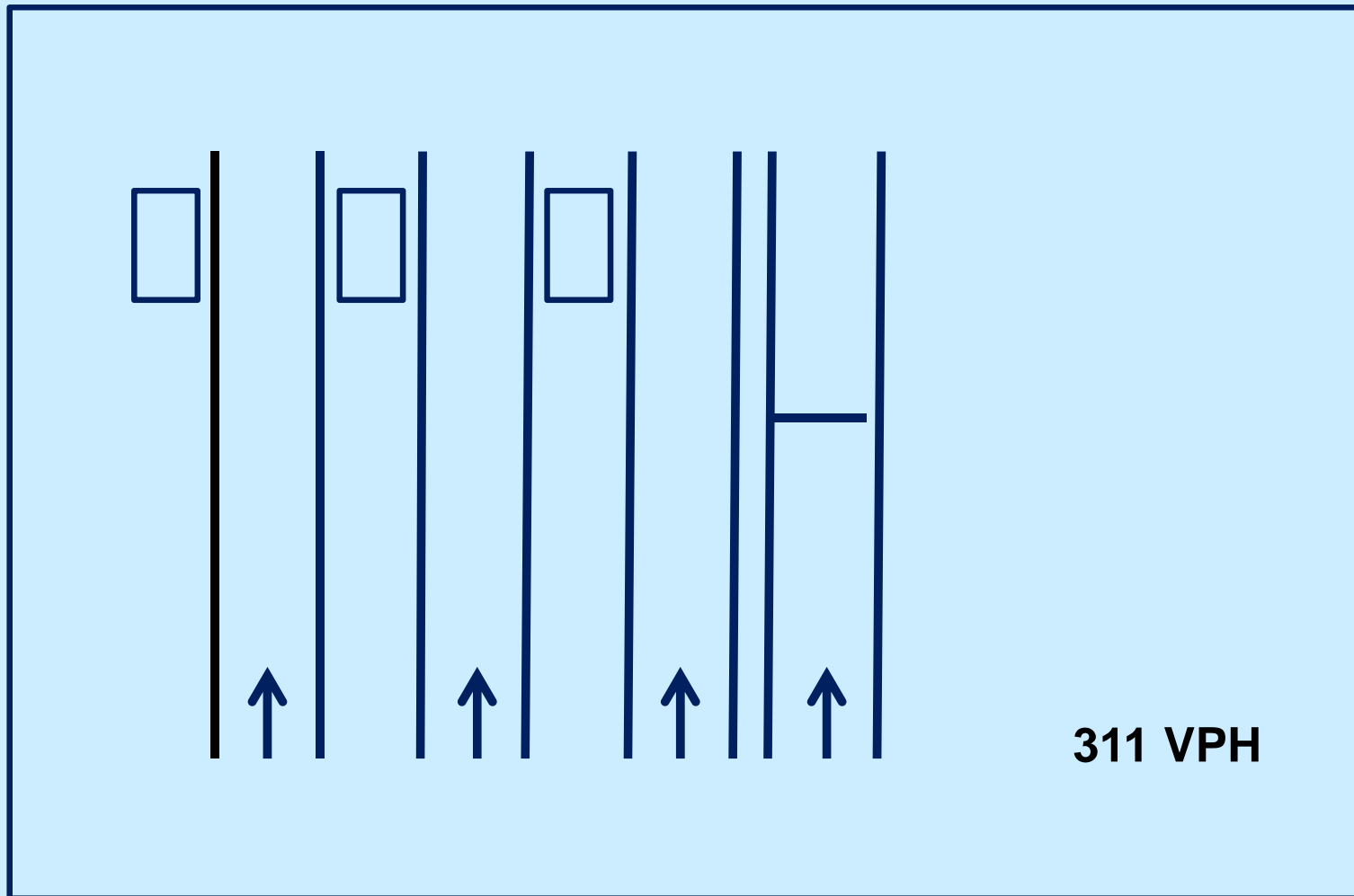
**ALTERNATIVE I – 4 REGULAR LANES**



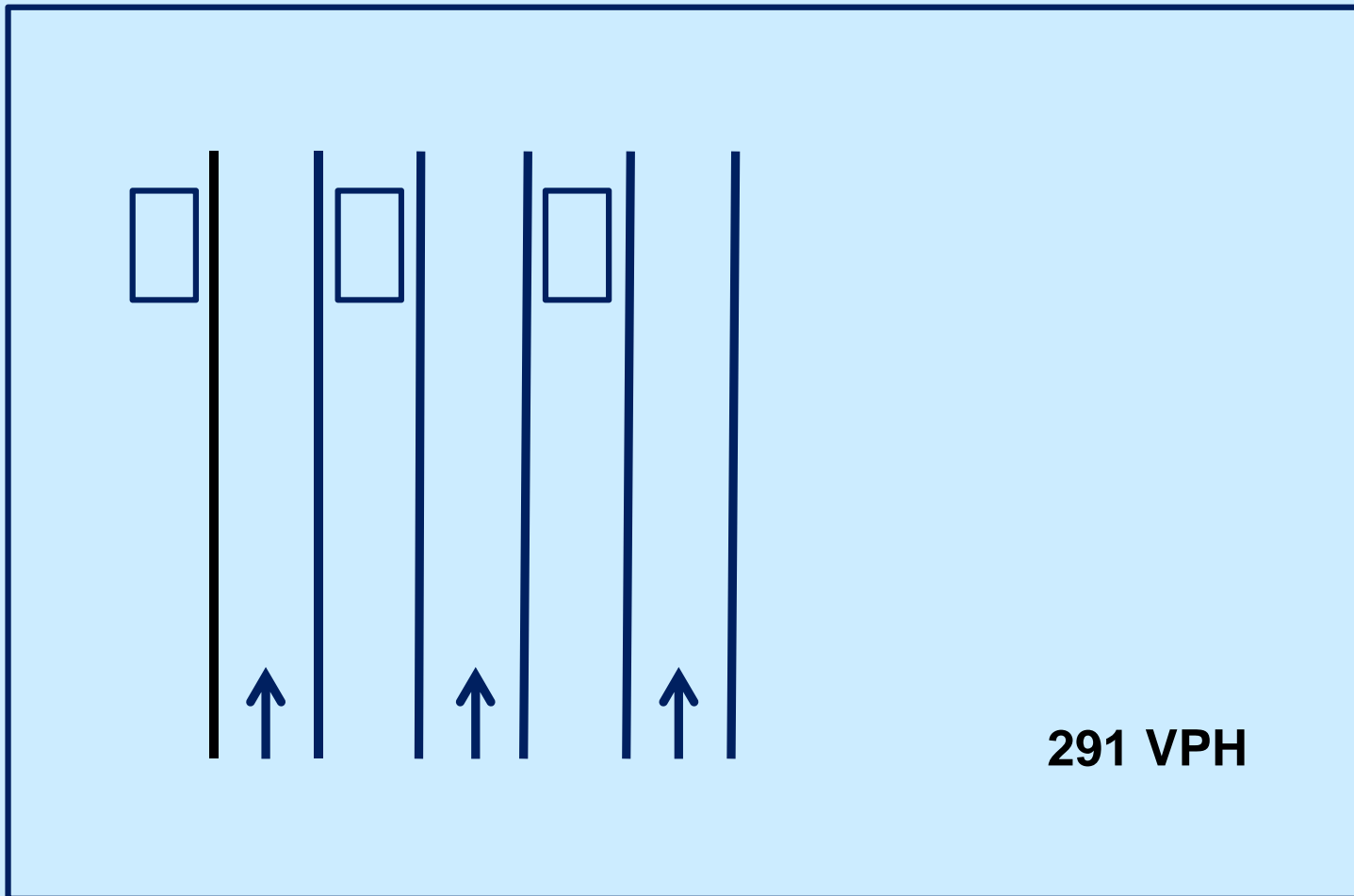
**ALTERNATIVE B – 3 REGULAR LANES AND NO EMPLOYEE LANE**



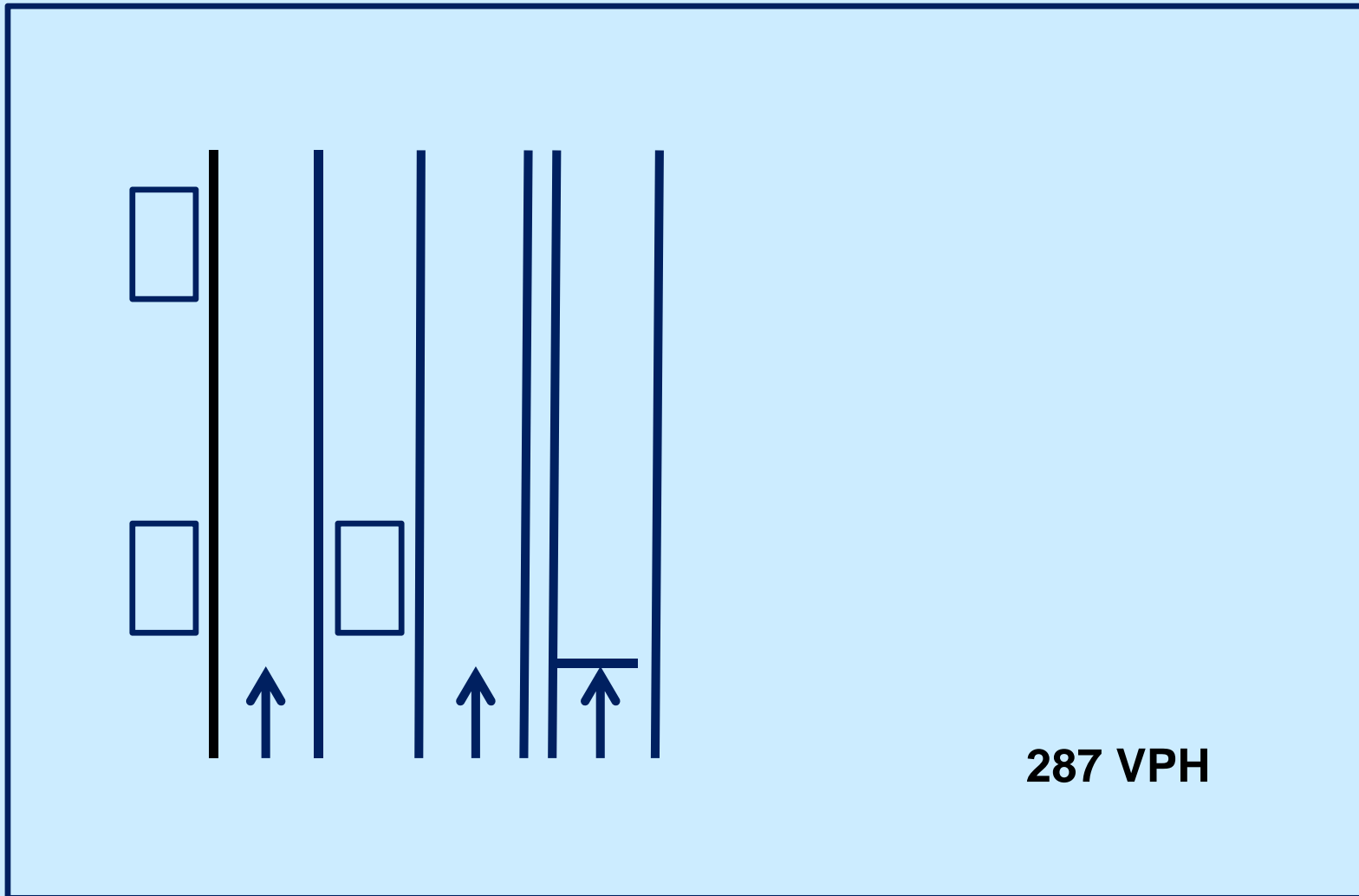
**ALTERNATIVE C – 3 REGULAR LANES PLUS EMPLOYEE LANE**



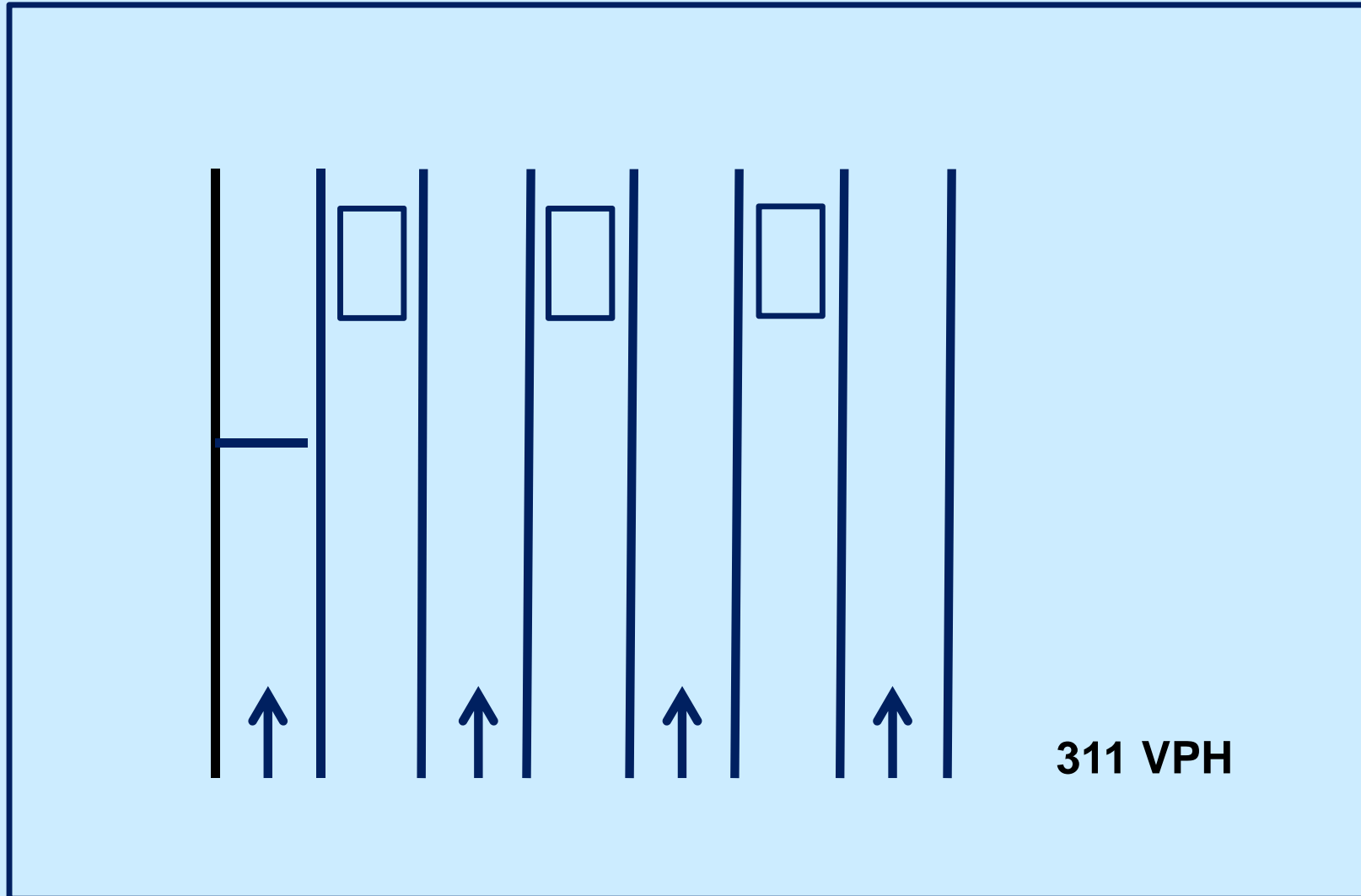
**ALTERNATIVE D – 2 REGULAR LANES PLUS STAFFED EXPRESS  
AND EMPLOYEE LANE**



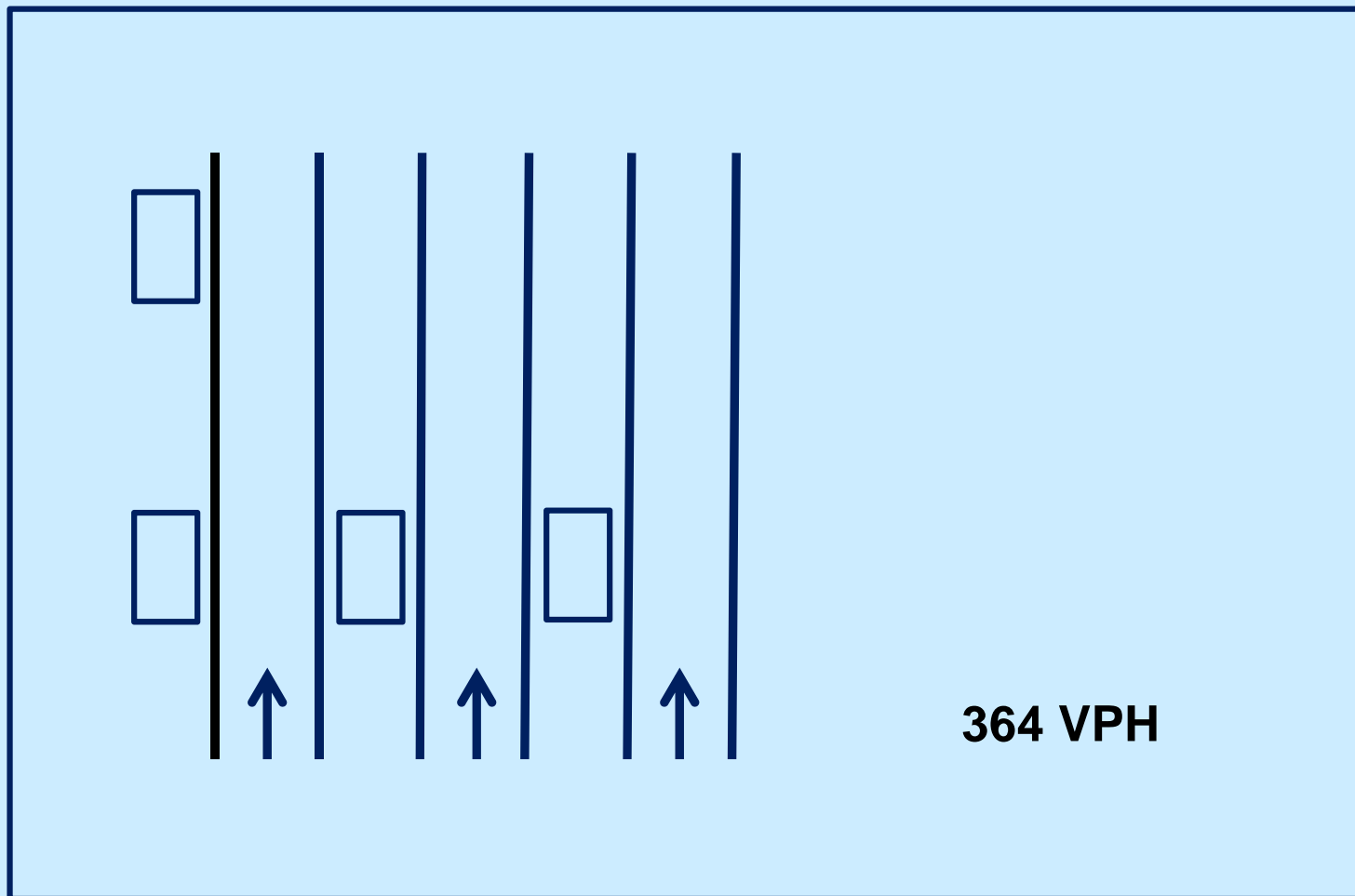
**ALTERNATIVE E – 1 STACKED LANE PLUS ONE REGULAR LANE  
PLUS EMPLOYEE LANE**



# ALTERNATIVE K – SEPARATE EMPLOYEE AND EXPRESS LANES



**ALTERNATIVE G – 1 STACKED LANE PLUS 1 REGULAR LANE  
PLUS STAFFED EXPRESS AND EMPLOYEE LANE**









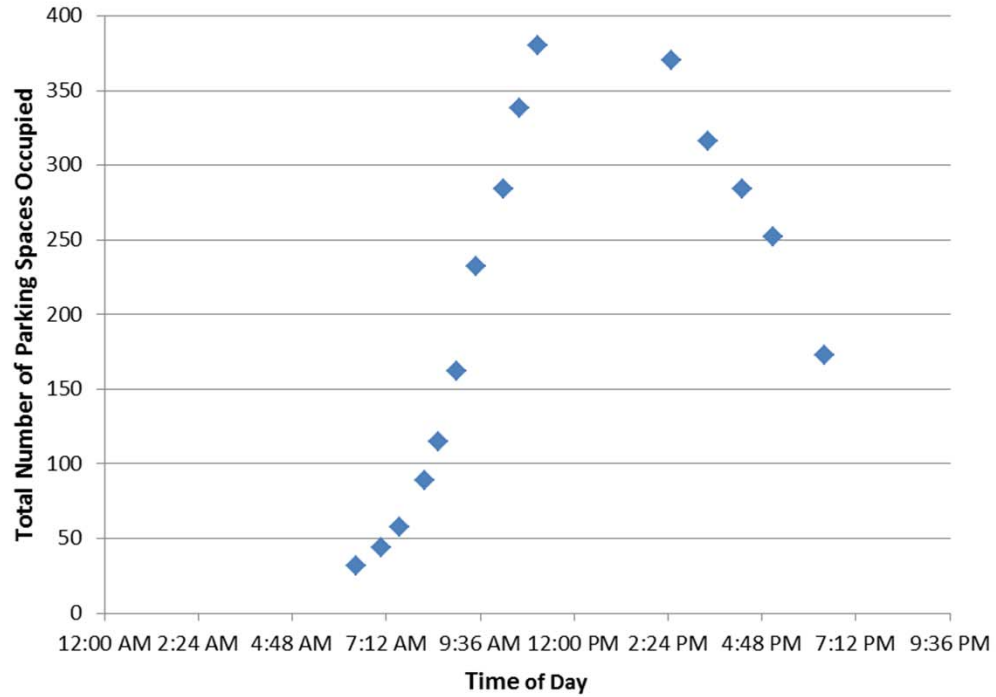




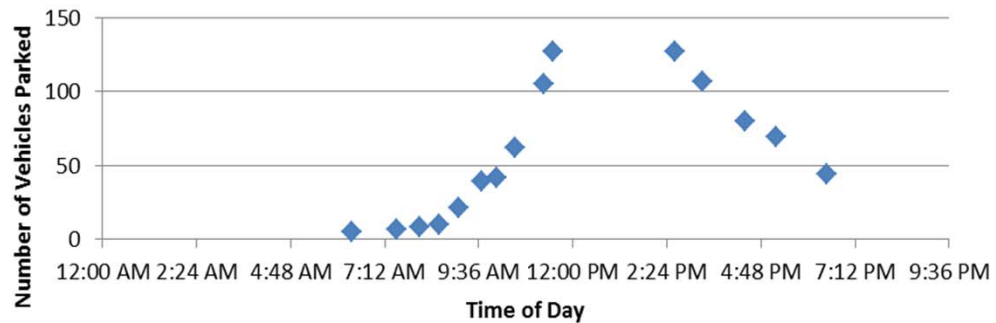




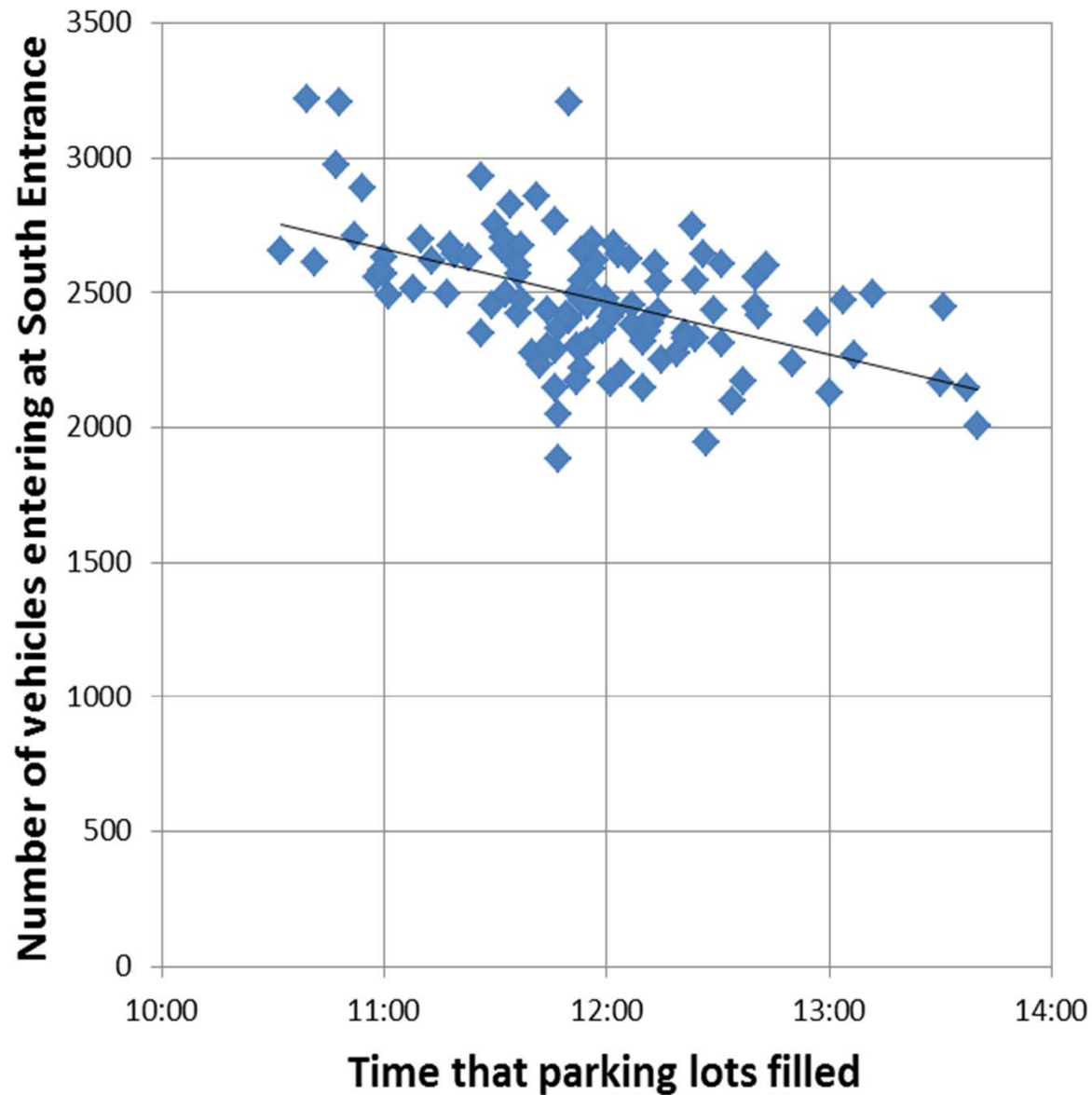
### Visitor Center Main Parking Lot Occupancy - July 27, 2012



### Visitor Center Overflow Parking Lot Occupancy - July 27, 2012



## Time Parking Lots Filled versus Number of Vehicles Entering Park



**703 PARKING SPACES  
NEEDED**

**VS.**

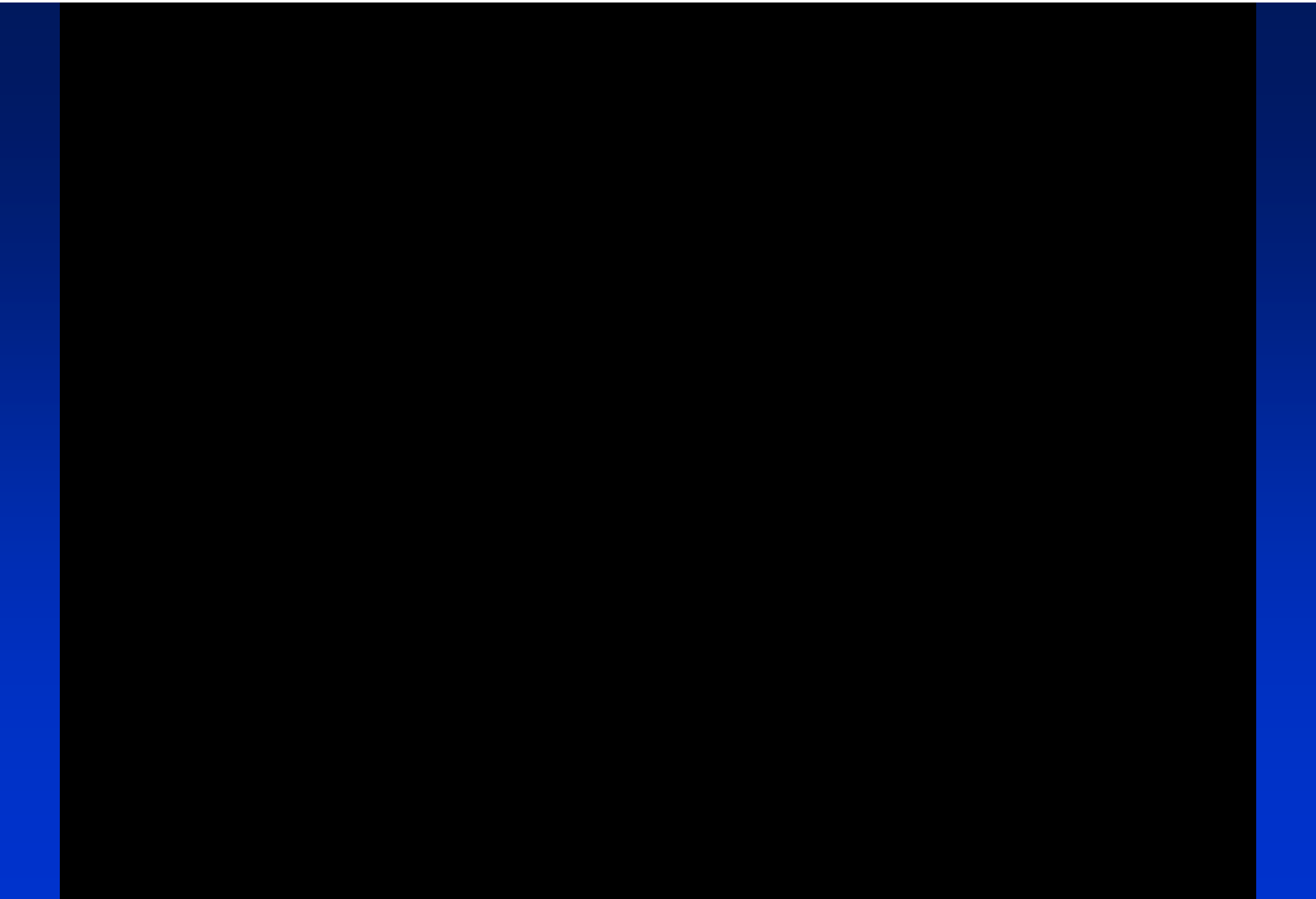
**514 EXISTING  
PARKING SPACES**

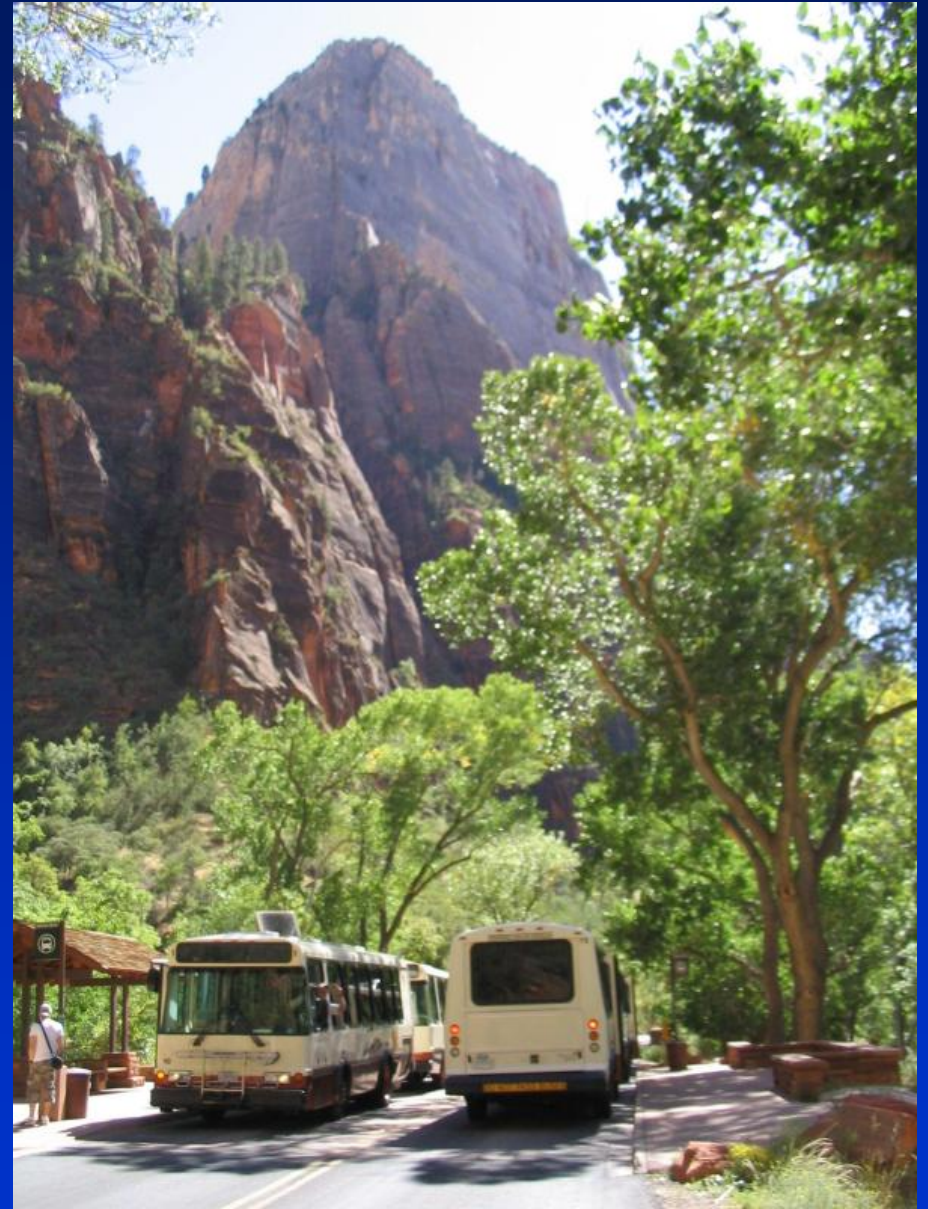
## **ADDITIONAL ISSUES**





# **ANIMATION USING MICROSIMULATION MODEL**

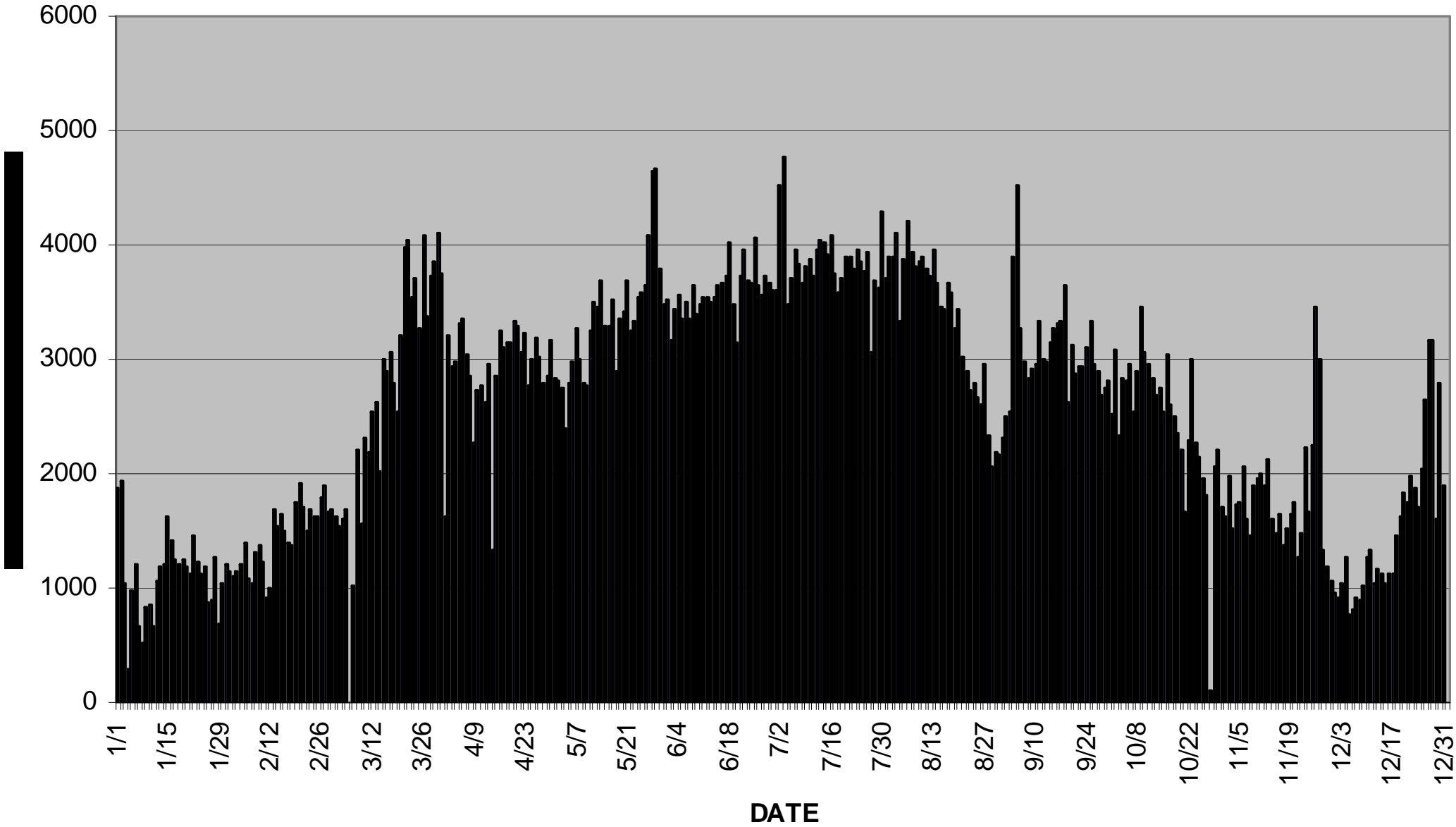








**FIGURE 5 -  
NUMBER OF VEHICLES ENTERING GRAND CANYON SOUTH ENTRANCE STATION BY DAY**



# NUMBER OF VEHICLES ENTERING ARCHES NATIONAL PARK BY DAY - 2003

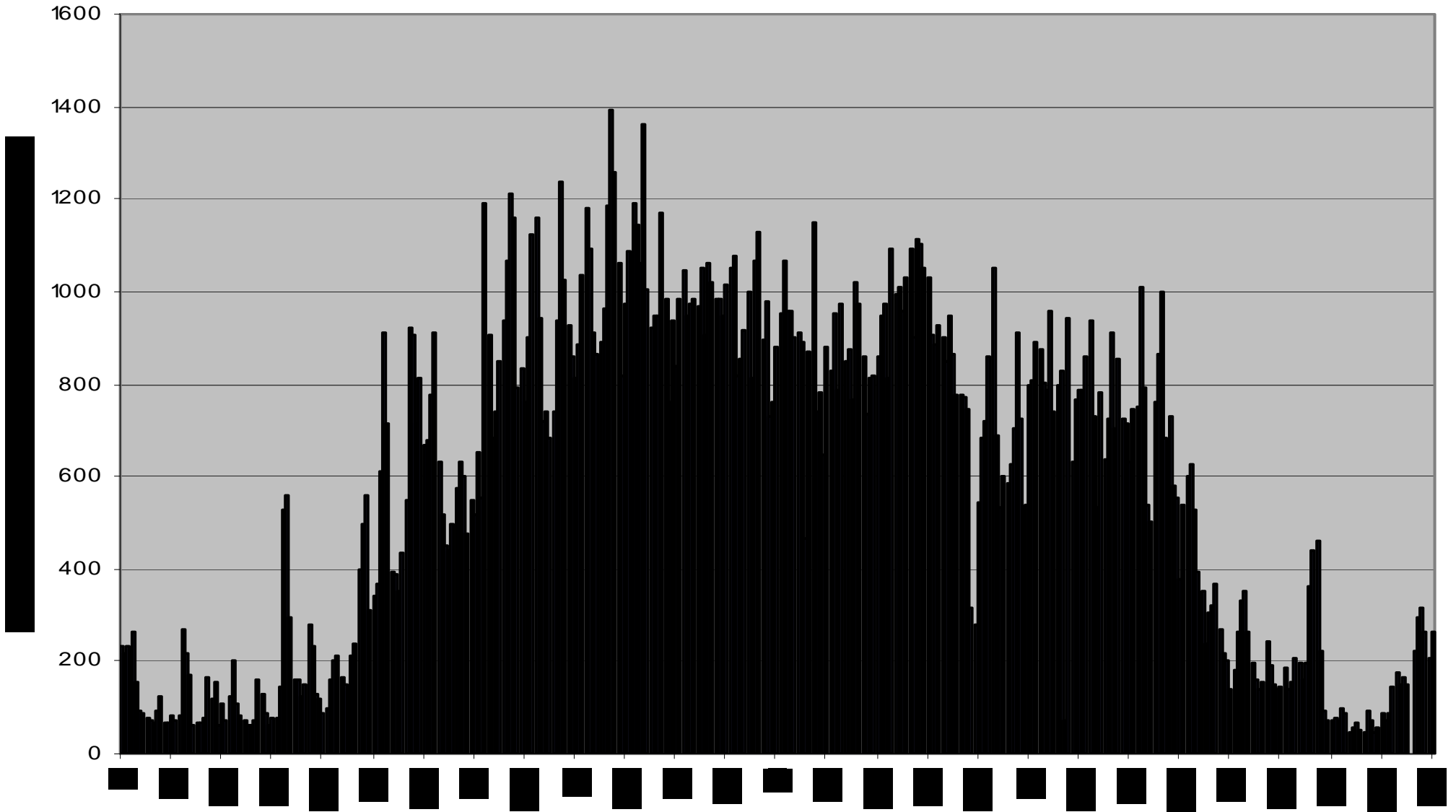
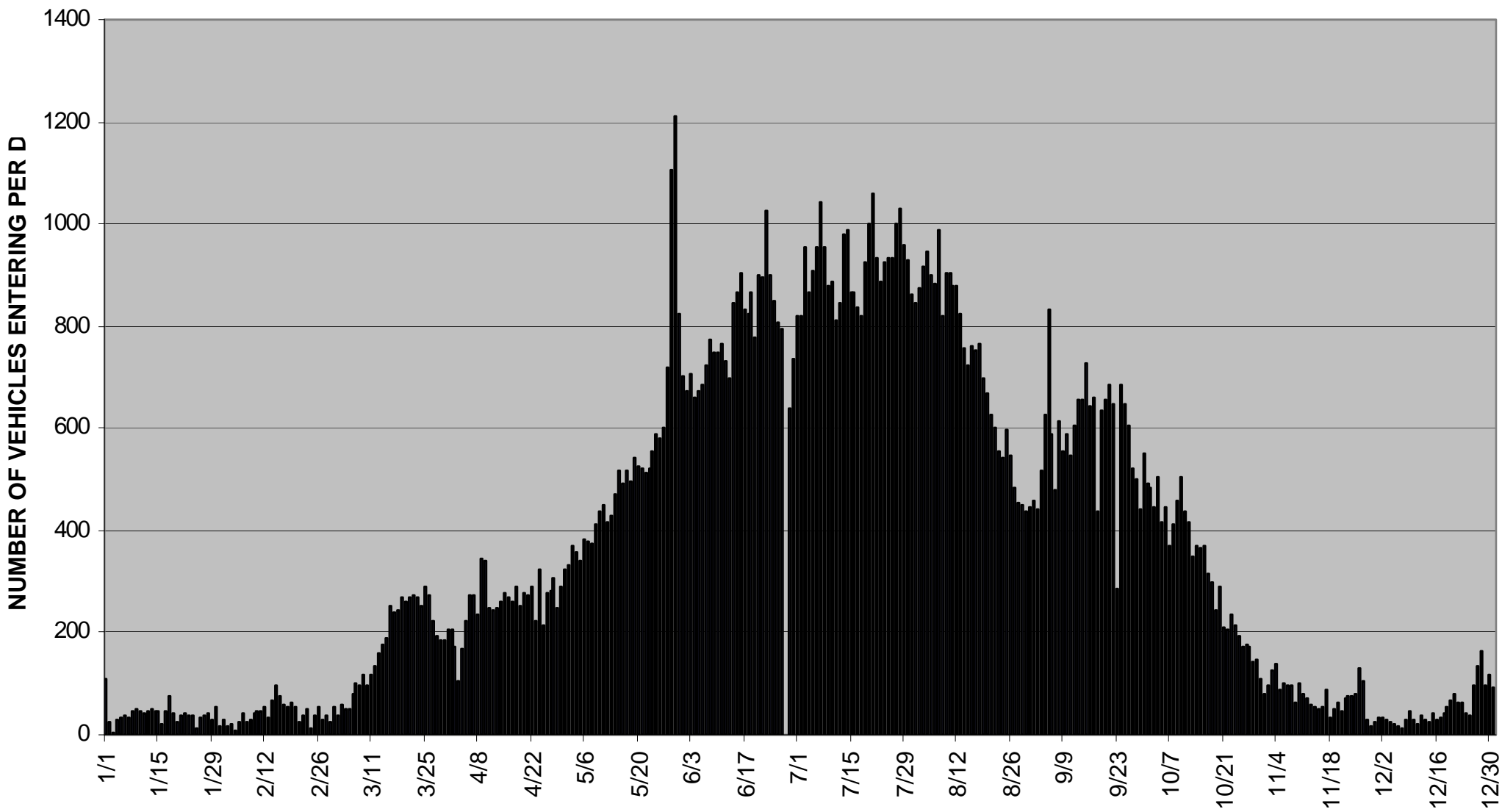
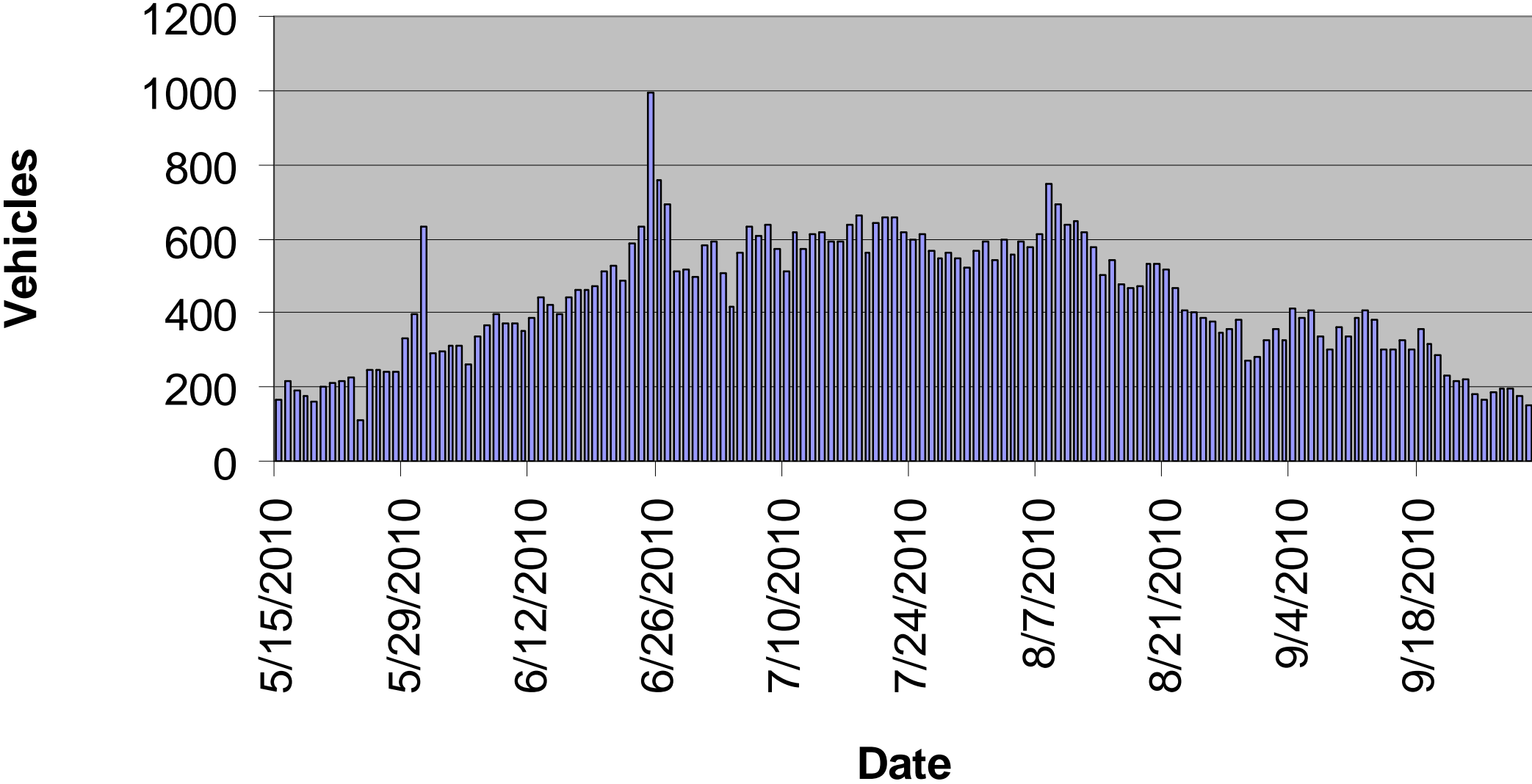




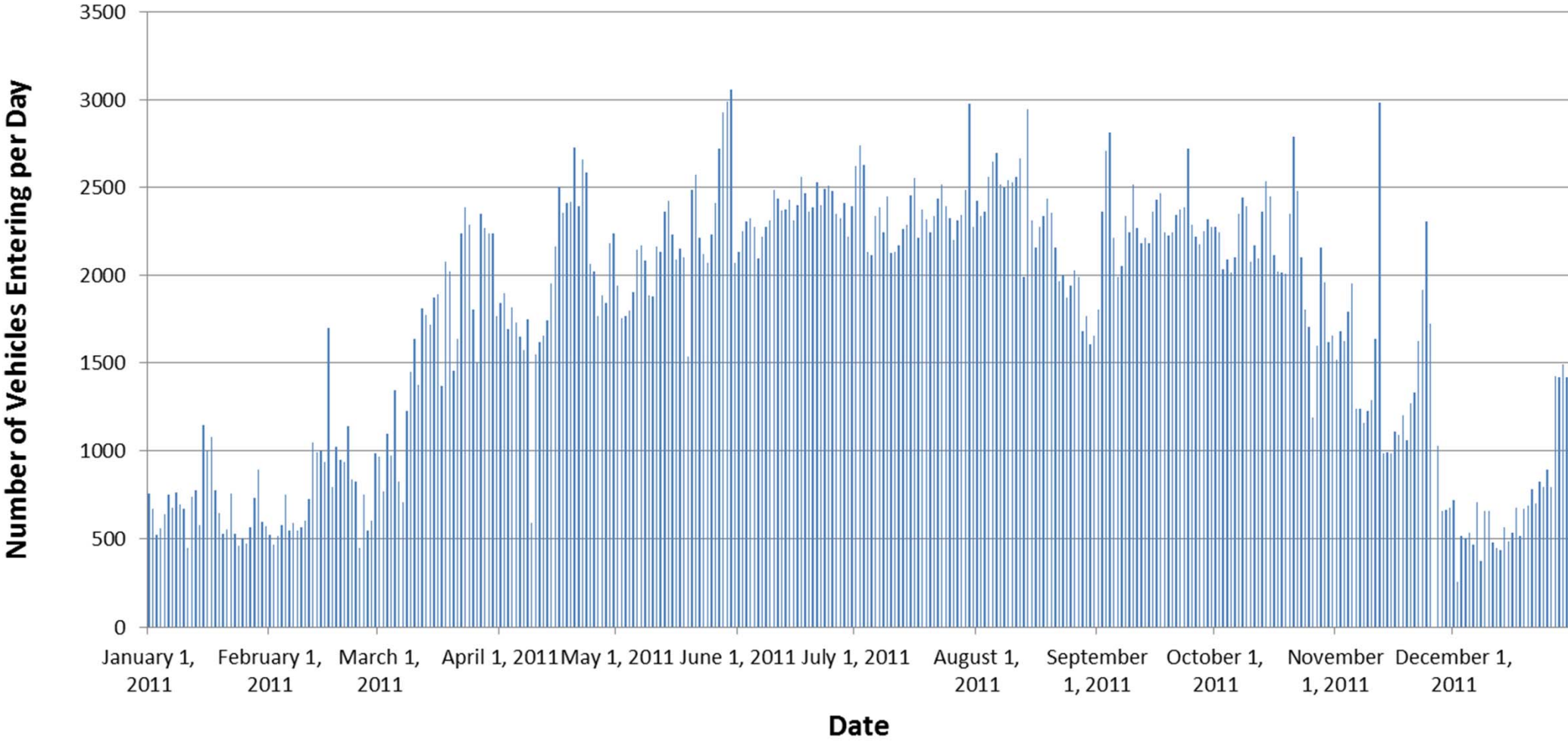
FIGURE 2 - NUMBER OF VEHICLES ENTERING MESA VERDE NATIONAL PARK BY DAY - 2004



# LIBI Entrance Station Counts 2010



**Figure 1 - Zion South Entrance Station - Vehicle Counts by Day of the Year - 2011**



# ENTRANCE STATIONS



**GRAND TETON NATIONAL PARK**



**ZION NATIONAL PARK**



**MESA VERDE NATIONAL PARK**



**ARCHES NATIONAL PARK**

# ENTRANCE STATIONS



**MT. RAINIER NATIONAL PARK**



**GLACIER NATIONAL PARK**



**YELLOWSTONE NATIONAL PARK**



**WHITE SANDS NAT'L. MON.**

**ONE TYPE** (INTERAGENCY PASS)

**> 1/4 OF ENTRIES**

**71 PERCENT OF ENTRIES ALREADY HAVE AN ENTRY CREDENTIAL**

**EMPLOYEE LANE**

**WAVING PRE-PAID VEHICLES THROUGH  
THE EMPLOYEE LANE**

**“ROVING” THE LINE**

**SALE OF ENTRY PERMITS AT REMOTE  
LOCATIONS**

**EXPRESS LANE**

**AUTOMATED LANE**





Imagery Date: 12/31/2005 1993

Image State of Utah

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37° 12' 00.47" N 112° 59' 16.33" W elev 3904 ft

Google earth

Eye alt 5665 ft

