



**OCCUPATIONAL & ENVIRONMENTAL HEALTH**

***Public Health Analysis of Road Closures at Golden Gate Park:  
Motor Vehicle Collisions and Injuries***

***April 2007***

The Board of Supervisors has proposed *Healthy Saturdays* as an initiative to close 1.7 miles of roads between the hours of 6:00am to 5:00pm to motor vehicles in Golden Gate Park on a six month trial basis. This report documents a comparative analysis motor vehicle collisions resulting in pedestrian or bicyclist injuries in and around Golden Gate Park on Saturdays and Sundays.

**Background**

Currently, Golden Gate Park is closed on Sundays to motor vehicle traffic on several roads. These road closures include John F. Kennedy Drive between Kezar Drive and Transverse Drive; Arguello Boulevard; Conservatory Drive East and Conservatory Drive West; 8th Avenue; Bowling Green Drive between John F. Kennedy Drive and Middle Drive East; and Stow lake Drive between Stow lake Drive East and John F. Kennedy Drive between the same time period.

A recent report conducted by the SFCTA and the MTA, *Golden Gate Park Transportation Access*, examined differences in the park use and access on Saturday and Sundays. The report found that while motor vehicle traffic outside the park was relatively stable both days, access to the park by walking and bicycling increased substantially. The increase in pedestrian and bike use suggests that the additional closure of roads on Saturdays would result in increased physical activity and recreational activity among some San Francisco residents. This could confer a significant population health benefit. Because traffic volumes remain stable, we can also infer that there will not be an increase in noise and air pollution on Sundays from the road closure. At the same time increased pedestrian and bike activity may result in effects on collisions with vehicles and consequent effects on injuries. The present analysis sought to answer this question.

**Methods**

Pedestrian and bicycle fatalities and injuries data was obtained from the Statewide Integrated Traffic Records System (SWITRS). This system is maintained by the California Highway Patrol (CHP), Caltrans, and the California Department of Motor Vehicles (DMV), and contains data on all reported vehicle collisions in California that occur on a public roadway.

The dataset for a five year period was cleaned and imported into GIS. The collision data was then geocoded (assigned an x and y coordinate to an address so it can be placed on a map) by using the intersection of the primary and secondary street. Using the travel mode, area, day and time, the data was divided into the following four data sets, 1) Pedestrian Injuries & Fatalities in Golden Gate Park; 2) Pedestrian Injuries & Fatalities around ¼ buffer of Golden Gate Park; 3) Bicycle Injuries & Fatalities in Golden Gate Park, and 4) Bicycle Injuries & Fatalities around ¼ buffer of Golden Gate Park.

We used these datasets to compare the relative frequency of motor vehicle collisions resulting in pedestrian and bicyclist injuries between Saturdays and Sundays between the hours of 6:00am and 5:00pm—the time of the park closure to motor vehicles.

## **Results**

### ***Bicycle Collisions at Golden Gate Park***

There were a total of 15 bicycle injuries in Golden Gate Park during the hours of 6:00am – 5:00pm from 2001 - 2006, and there were no fatalities. On average there were two bicycle injuries during the weekdays and four injuries on Saturday and three injuries on Sunday (Table 1). According to the *Golden Gate Park Transportation Access* report, walking, biking or skating increased by 116% on Sunday as compared to Saturday in Golden Gate Park. The bicycle injuries were located in the western part of Golden Gate Park (Figure 1 & 2), which is not part of the Sunday park closure, but likely receives higher volumes of throughput bicycle traffic.

**Based on the data examined, there appears to be a modest reduced risk of bicycle injury for bicyclists in Golden Gate Park on Sunday compared to Saturday.**

Table 1

<b>Bicycle Injuries and Fatal Collisions, 2001-2006</b>		
<b>Golden Park - 6:00am - 5:00pm</b>		
<b>Weekday</b>	<b>Non-Fatal Injury</b>	<b>Fatal Injury</b>
Weekday Avg (M-F)	2	0
Saturday	4	0
Sunday	3	0

Figure 1

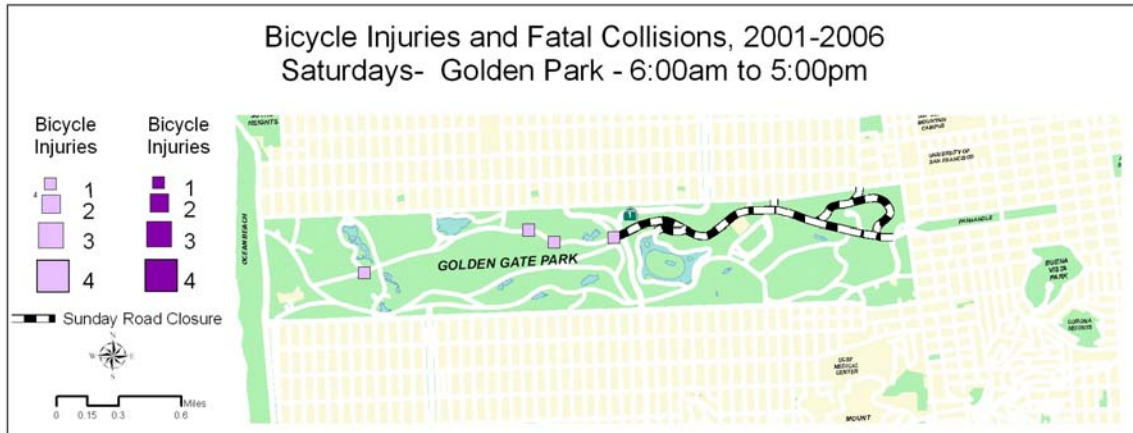
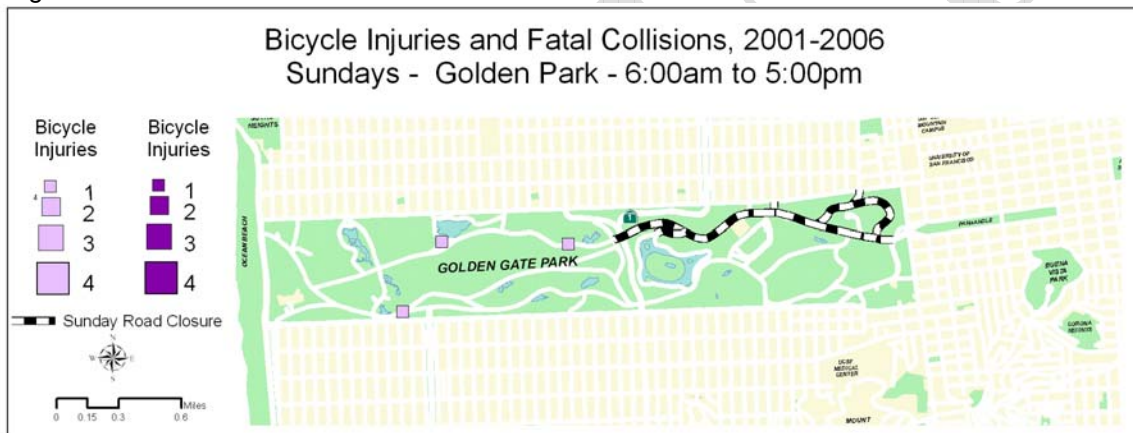


Figure 2



***Bicycle injuries in a ¼ Mile Buffer around Golden Gate Park***

There were a total of 40 bicycle injuries in the ¼ mile buffer around Golden Gate Park during the hours of 6:00am – 5:00pm from 2001 -2006, and there were no fatalities. On average there were six bicycle injuries during the weekdays and three injuries on Saturday and seven injuries on Sunday (Table 2). The majority of the injuries were in proximity to the eastern entrances to Golden Gate Park (Figure 3 & 4). According to the *Golden Gate Park Transportation Access* report, walking, biking or skating increased by 24% on Sunday as compared to Saturday in areas bordering Golden Gate Park. Although bicycle volume increases on Sunday, the increase in bicycle injuries from Saturday to Sunday is at a greater percentage than the increased volume.

Based on the data, there is an increased risk for bicycle injuries around the park on Sundays compared to Saturdays. However, none of the injuries have been fatal.

Table 2

Bicycle Injuries and Fatal Collisions, 2001-2006 1/4 Mile Buffer Around Golden Park - 6:00am - 5:00pm		
Weekday	Non-Fatal Injury	Fatal Injury
Weekday Avg (M-F)	6	0
Saturday	3	0
Sunday	7	0

Figure 3

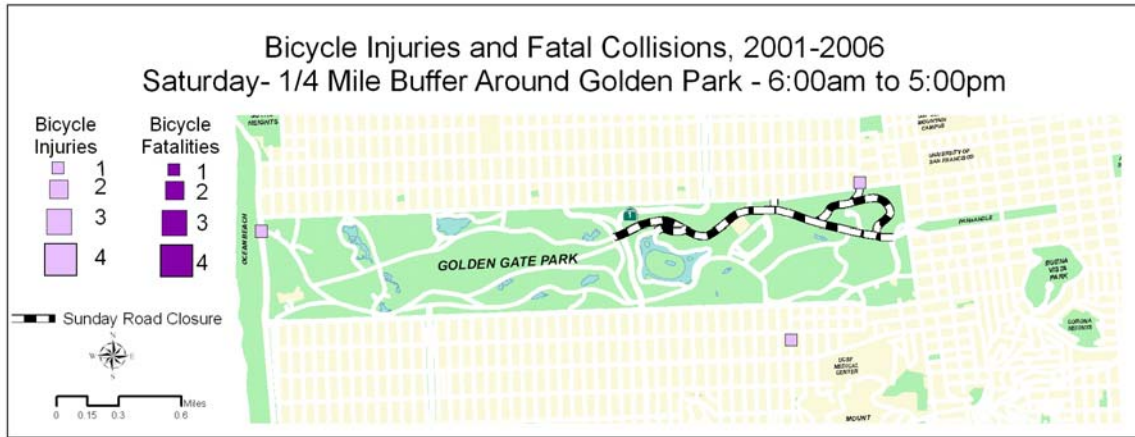
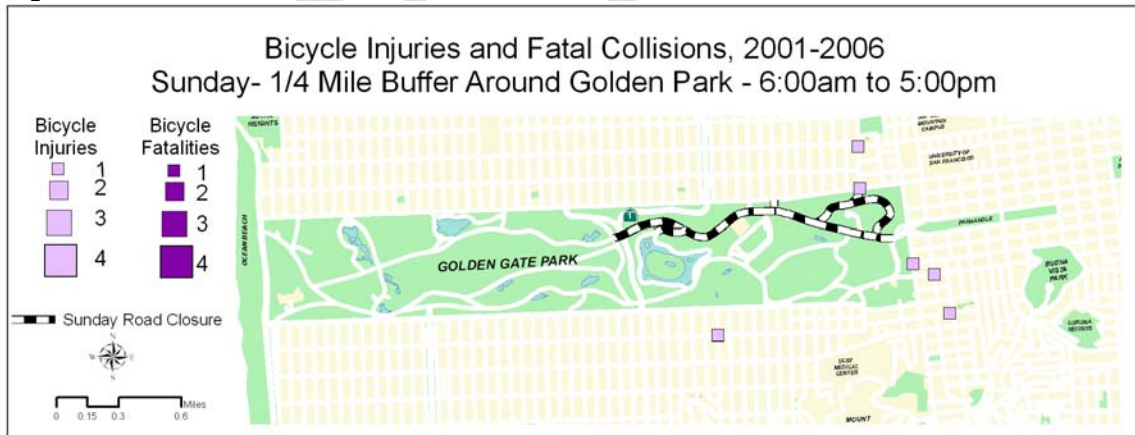


Figure 4



### ***Pedestrian Collisions at Golden Gate Park***

There were a total of 13 pedestrian injuries in Golden Gate Park during the hours of 6:00am – 5:00pm from 2001 - 2006 and there was one fatality. On average there were two pedestrian injuries during the weekdays and two injuries on

Saturday and none on Sunday (Table 3, Figure 5 & 6). As stated previously in this document, walking in the park increased by 116% on Sunday as compared to Saturday.

**Park closures on Sunday appear to create a protected environment for pedestrians and reduces relative injury risk.**

Table 3

Pedestrian Injuries and Fatal Collisions, 2001-2006			
Golden Park - 6:00am - 5:00pm			
Weekday	Non-Fatal Injury	Fatal Injury	
Weekday Avg (M-F)	2	0.2	
Saturday	2	0	
Sunday	0	0	

Figure 5

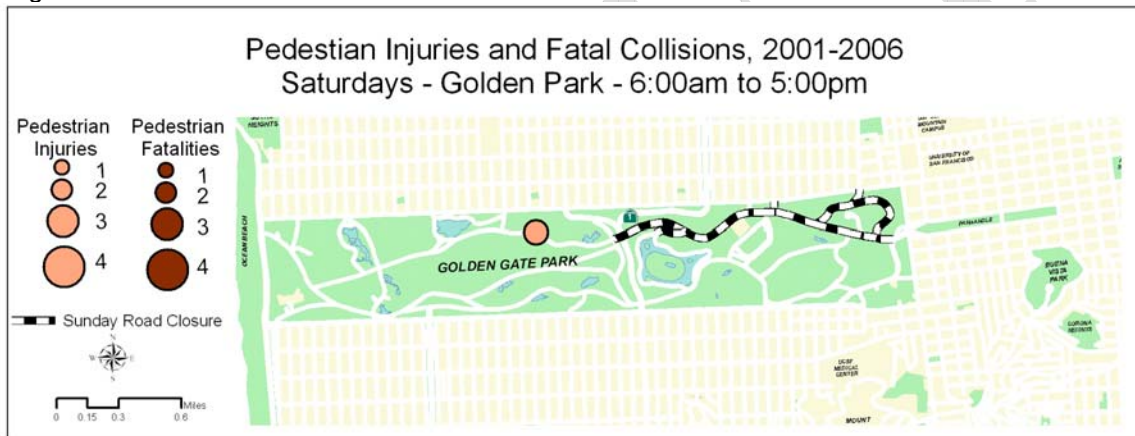
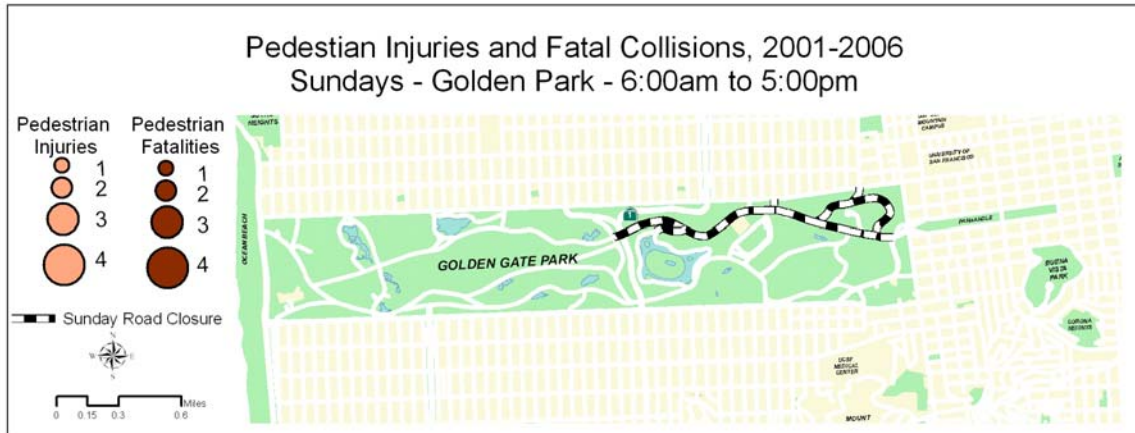


Figure 6



### ***Pedestrian Injuries in a ¼ Mile Buffer Around Golden Gate Park***

There were a total of 95 pedestrian injuries in the ¼ mile buffer around Golden Gate Park during the hours of 6:00am – 5:00pm from 2001 - 2006, and there were three fatalities. On average there were 12 injuries during the weekdays and ten injuries on Saturday and 9 injuries and one fatality on Sunday (Table 4). All of the injuries/fatalities were in proximity to the eastern entrances to Golden Gate Park (Figure 6 & 7). As stated previously, walking increased by 24% on Sunday as compared to Saturday in areas bordering Golden Gate Park. Pedestrian injuries remained stable and with the increased pedestrian use on Sunday,

**There is a decreased risk of pedestrian injuries on Sunday around the park compared to Saturdays.**

Table 4

<b>Pedestrian Injuries and Fatal Collisions, 2001-2006</b>		
<b>1/4 Mile Buffer Around Golden Park - 6:00am - 5:00pm</b>		
<b>Weekday</b>	<b>Non-Fatal Injury</b>	<b>Fatal Injury</b>
Weekday Avg (M-F)	12.2	0.2
Saturday	10	0
Sunday	9	1

Figure 7

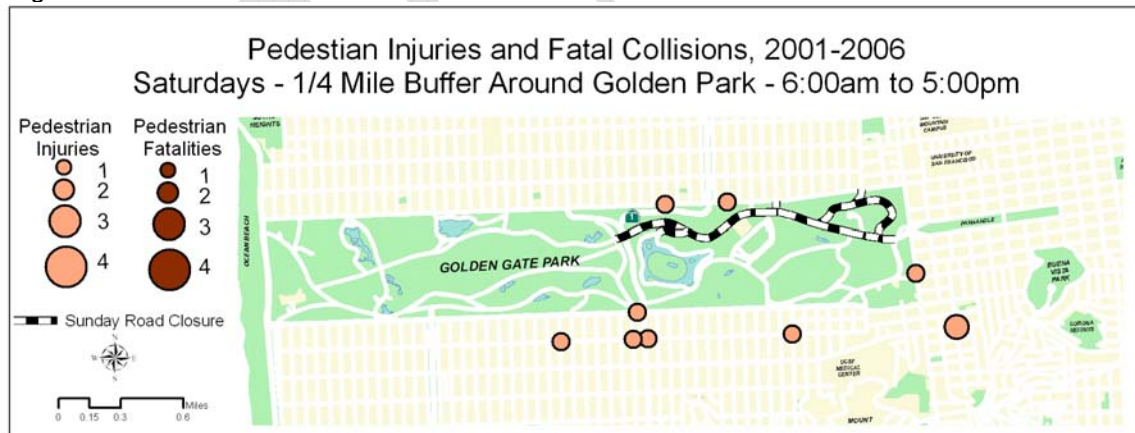
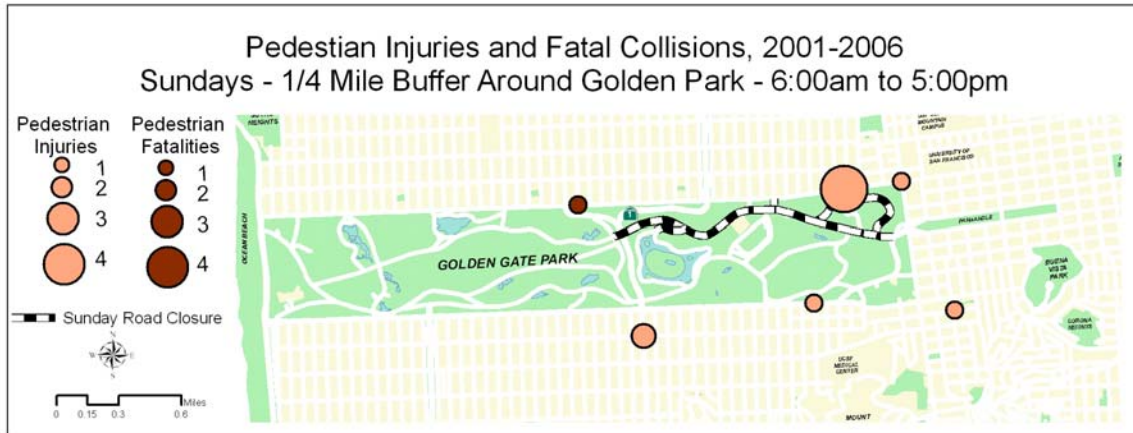


Figure 8



### **Summary and Recommendations**

Sunday road closures attract more non-motorized traffic to Golden Gate Park, increasing health beneficial physical activity and reducing the risk of pedestrian and bicycle injuries within the park.

There also a slight decline in risk of pedestrian injury in the 1/4 mile buffer around the park on Sundays compared to Saturdays. Although there is not an increased risk for pedestrians walking into the park on Sunday, it is particularly important to decrease traffic speeds via traffic calming in order to create a safe street environment that promotes pedestrian safety with increasing volumes of pedestrians.

There is an increased risk for bicycle injuries in the 1/4 mile buffer around the park on Sundays compared to Saturdays. Measures such as well-marked crossing and slowing down traffic around park would help reduce injuries with bicycle usage increasing in the bordering neighborhoods on Sundays.