CE 467 / 567 Highway Safety and Operations
Homework 4 Solutions

Problem 1

(a) Collision diagram is on the last page.

(b) There are a number of interesting safety issues, mostly related to rear-ends from the southbound traffic on Kolb and angle and left-turn crashes in the middle of the intersection. Failure to yield right-of-way, speed, and inattention all were involved.

Problem 2

All the graphs appear together on the next page. Note that the Pima County fatalities seem to show the most variation over time, as you might expect for a smaller geographic area. Nonetheless, the level of variability for Pima County is pretty high.

General trends for fatalities are up, but the rates (per 100 MVM or 100,000 population) seem to trend down. This is because we have controlled for the level of exposure, represented by the size of the population and/or the number of vehicle-miles traveled in the state. This means that risks per person or per mile traveled are down, but the overall numbers are up.

Problem 3

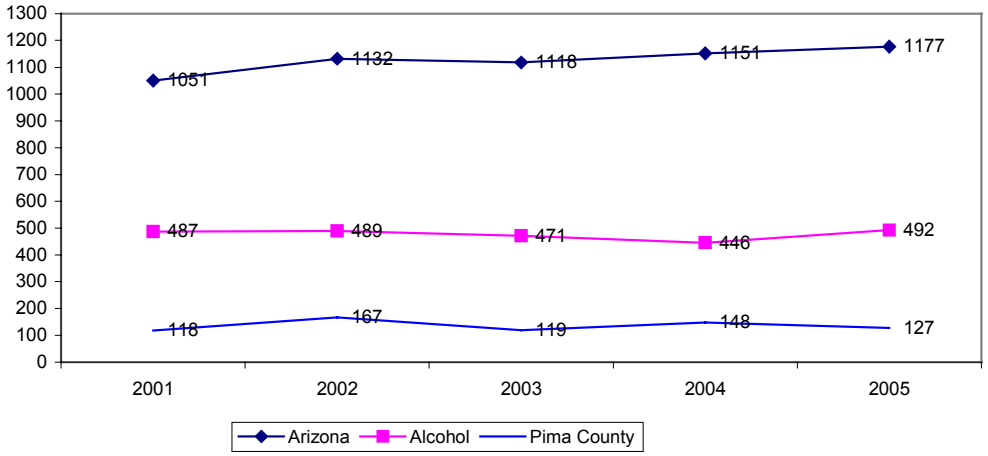
(a)-(b) The top five intersections are:

Rank	Crashes	Crash Rate	Severity Index	Priority Index
1	Ina and La Cholla	Los Reales and Mark	Drexel and Hildreth	La Cholla and River
2	Kolb and Valencia	Kinney and Sandario	Escalante and Old Spanish Trail	Irvington and Mission
3	La Cholla and River	Catalina Hwy and Snyder	Camino de Oeste and Jeffrey	Ina and Shannon
4	Sunrise and Swan	Kolb and Valencia	Calle Barril and Craycroft	Ina and La Canada
5	Ajo and Palo Verde	Freeman and Old Spanish Trail	Sandbrook and Shannon	La Canada and Orange Grove

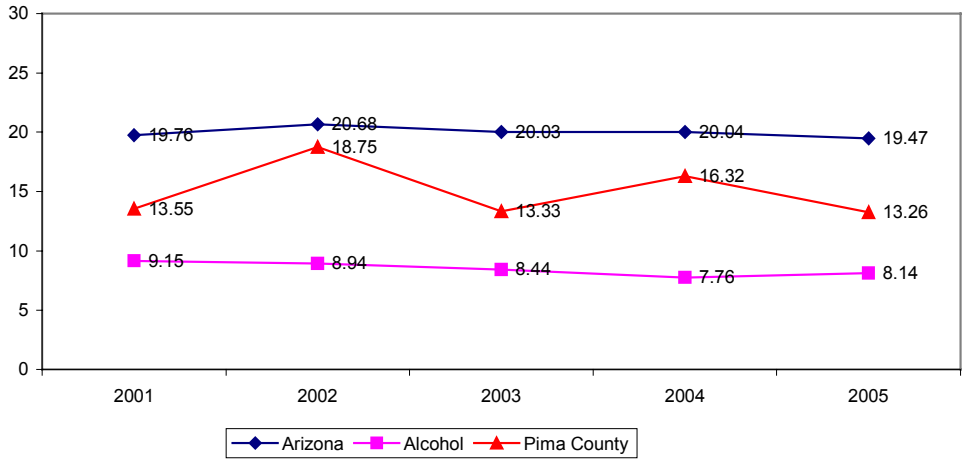
These do vary considerably, depending on the safety measure. What I would expect to see as important would be the larger intersections (e.g., the ones in crashes and the priority index). The crashes per million entering vehicles and/or the severity index may be more skewed by single accidents of high severity, for intersections with few entering vehicles.

(c) The crash priority index is a simple sum of rankings from the four criteria of volumes, crashes, crash rate, and severity index. Since volume is included, this may explain why the larger intersections tend to percolate to the top of the priority list.

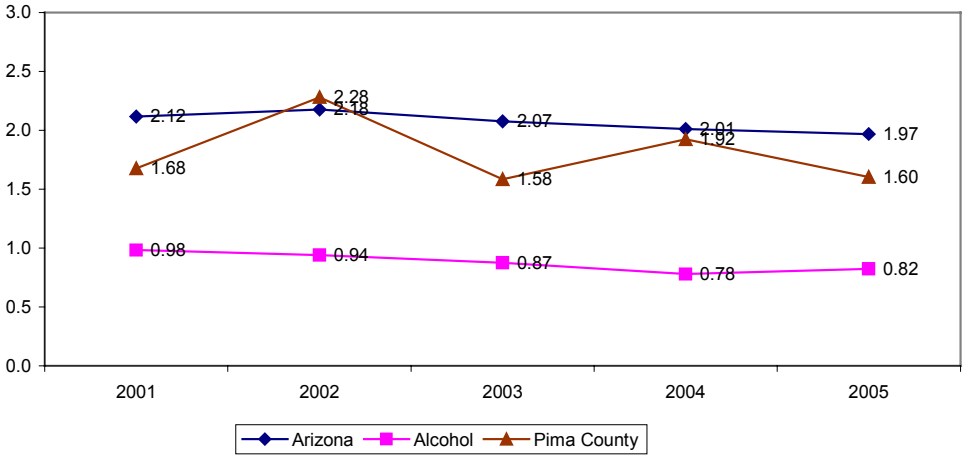
Fatalities

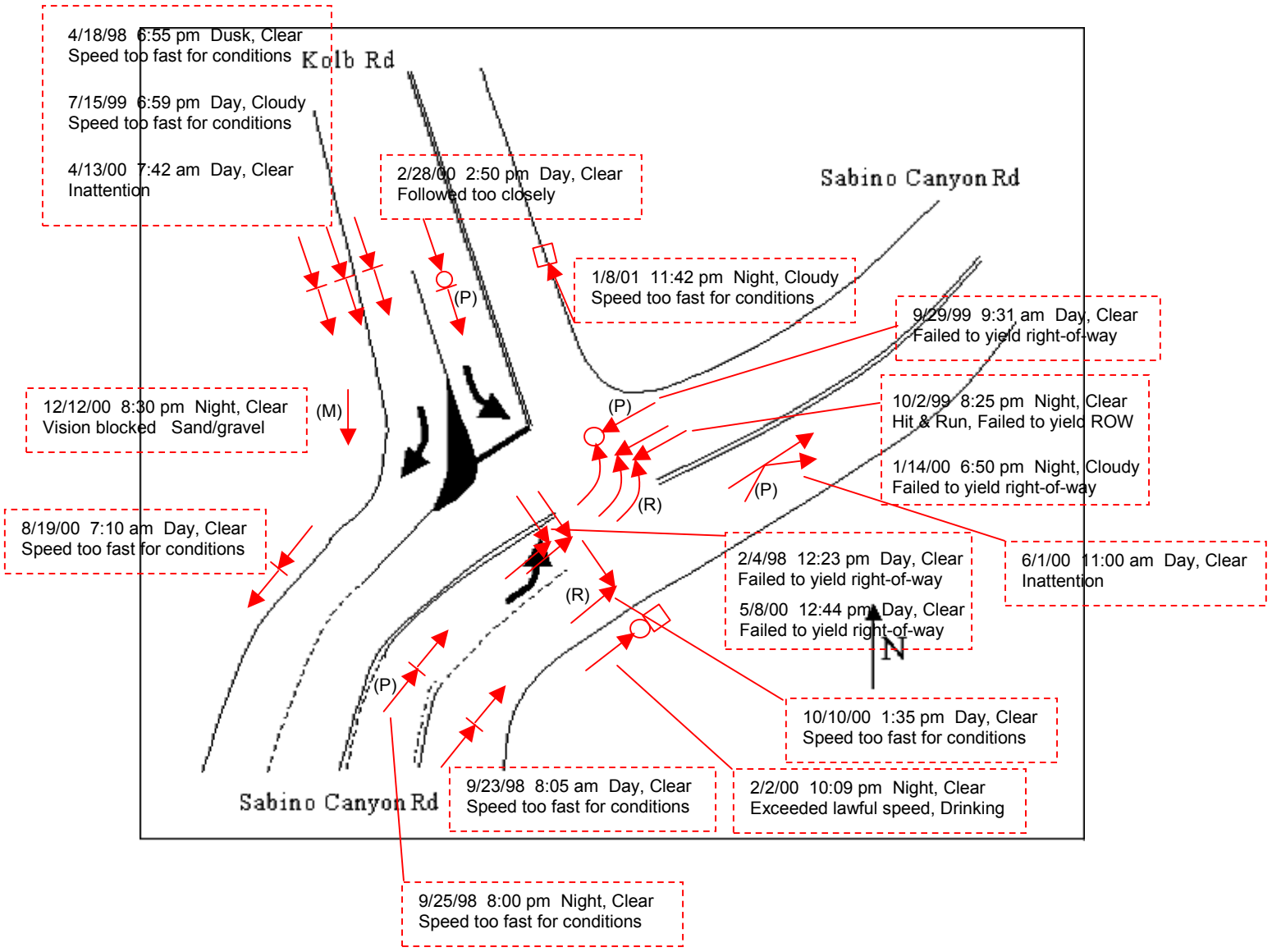


Fatalities per 100,000 Persons



Fatalities per 100 Million Veh Miles




4/18/98 6:55 pm Dusk, Clear
Speed too fast for conditions
7/15/99 6:59 pm Day, Cloudy
Speed too fast for conditions
4/13/00 7:42 am Day, Clear
Inattention
Kolb Rd
2/28/00 2:50 pm Day, Clear
Followed too closely
Sabino Canyon Rd
1/8/01 11:42 pm Night, Cloudy
Speed too fast for conditions
9/29/99 9:31 am Day, Clear
Failed to yield right-of-way
12/12/00 8:30 pm Night, Clear
Vision blocked Sand/gravel
10/2/99 8:25 pm Night, Clear
Hit & Run, Failed to yield ROW
1/14/00 6:50 pm Night, Cloudy
Failed to yield right-of-way
8/19/00 7:10 am Day, Clear
Speed too fast for conditions
6/1/00 11:00 am Day, Clear
Inattention
2/4/98 12:23 pm Day, Clear
Failed to yield right-of-way
5/8/00 12:44 pm Day, Clear
Failed to yield right-of-way
N
10/10/00 1:35 pm Day, Clear
Speed too fast for conditions
9/23/98 8:05 am Day, Clear
Speed too fast for conditions
2/2/00 10:09 pm Night, Clear
Exceeded lawful speed, Drinking
Sabino Canyon Rd
9/25/98 8:00 pm Night, Clear
Speed too fast for conditions
(P)
(M)
(P)
(R)
(P)
(R)
(P)