

# Executive Summary

## Intersection Collision Analysis, 1998-2000

Public Works Department Traffic Engineering Division, City of Yakima Washington  
May 22, 2001

### Summary

The purpose of this report is to identify locations which raise to our attention safety improvement consideration. Prioritization of safety improvements can occur once the correct measures are determined.

Locations identified with possible safety concerns should be analyzed to determine appropriate remedial measures. Each location is unique and requires site-specific review. Reporting methodologies link all collisions to the closest intersection. Therefore, each field report must be read carefully to determine if the collision was actually related to a condition which exists at the intersection, or more related to a roadway condition. There are no public safety preventative measures for collisions which occur because of driver error. The City of Yakima Traffic Engineering Division has compiled three full years (1998 – 2000) of vehicle collision statistics from Police Accident Field Reports. A three year history of vehicle collisions is a requirement of most State and Federal road improvement grant programs and a standard timeline to evaluate safety issues.

### Un-signalized Intersection Priority List

A number of intersections have been identified for further safety review because they have a higher rate of collisions based upon the number of vehicles which drive through intersection. The rate of collisions are determined based upon the number of accidents per million vehicles entering the intersection (MEV). Causes for the collisions can be varied. The most appropriate safety remedy is not necessarily the installation of a traffic signal. In some cases, improved signing, better vision clearance at the intersection or installation of stop signs are more appropriate. Each of the following locations should be reviewed.

	Un-signalized Intersections Priority for Safety Review	Total # Accid.	Enter. ADT	Rate per MEV	Rear-End	Broad-side	Approach Turn	Side-swipe	Listed on 6-YR TIP?	Within CBD Signal Project?
<sup>1</sup>	6th St & B St	26	9,800	2.42	1	17	3	2	N	N
<sup>2</sup>	6th St & Pacific	21	10,200	1.88	1	18	0	0	N	N
<sup>3</sup>	8th St & Lincoln	20	10,400	1.76	1	10	6	2	N	N
<sup>4</sup>	8th St & B St	27	14,300	1.72	0	21	2	1	N	N

### Signalized Intersection Priority List

A number of street intersections with existing traffic signals had high rates of collisions compared to the volume of entering traffic. Causes for collisions at signalized intersections include high vehicle speeds, heavy traffic volumes, the presence of pedestrians, turning movements at the intersection, driveway traffic and signal phasing or timing issues. The following list of locations should be examined for possible safety improvements. Eight of these locations are scheduled to be upgraded as part of the (funded) CBD Signal Enhancement project, scheduled to begin in late 2001.

	Signalized Intersections Priority for Safety Review	Total # Accid.	Enter. ADT	Rate per MEV	Rear-End	Broad-side	Approach Turn	Side-swipe	Listed on 6-YR TIP?	Within CBD Signal Project?
1	18th St & Nob Hill	64	25,350	2.31	34	11	7	8	N	N
2	Front St & Yakima Ave	44	19,650	2.04	21	18	0	1	N	Y
3	1st St & Washington	67	36,550	1.67	36	11	6	7	N	N
4	56th Ave & Summitview	42	25,800	1.49	17	12	6	3	N	N
5	1st St & Nob Hill	62	39,950	1.42	38	5	5	8	N	N
6	40th Ave & Nob Hill	43	30,450	1.29	18	10	8	4	N	N
7	5th Ave & Walnut	25	18,850	1.21	2	9	6	3	N	Y
8	24th Ave & Nob Hill	42	31,900	1.20	15	9	10	4	N	N
9	1st St & Lincoln	36	28,400	1.16	4	15	7	6	N	Y
10	1st St & D	26	21,200	1.12	7	15	2	1	N	Y
11	3rd Ave & Nob Hill	51	41,700	1.12	15	16	3	8	N	N
12	1st St & Mead	35	30,700	1.04	15	1	6	7	N	N
13	40th Ave & Summitview	45	39,850	1.03	11	15	10	8	N	N
14	1st St & Arlington St	21	18,600	1.03	14	1	1	3	N	N
15	3rd Ave & Washington	34	30,850	1.01	8	8	11	4	N	N
16	5th Ave & Lincoln	29	26,400	1.00	9	7	7	5	N	N
17	16th Ave & Washington	30	27,500	1.00	4	7	10	2	N	N
18	Front St & Walnut	21	19,700	0.97	6	10	3	0	N	Y
19	3rd St & Yakima Ave	24	22,650	0.97	9	2	3	8	N	Y
20	6th Ave & Yakima	21	20,500	0.94	12	3	3	0	N	Y
21	1st & I St	29	28,400	0.93	12	5	4	3	N	N
22	1st St & Yakima Ave	33	33,600	0.90	19	3	1	5	N	Y
23	Fair Ave & Nob Hill	27	27,550	0.90	11	6	4	3	Y	N

City of Yakima Washington  
Public Works Department Traffic Engineering Division  
**Intersection Collision Analysis, 1998-2000**

Vehicle collision information is reported to the City of Yakima Public Works Traffic Engineering Division via Police Accident Field Reports. These police reports include a broad range of data which is useful in determining appropriate safety improvements and identifying possible locations which may merit closer review.

This report will provide information about City of Yakima intersections and related collision data. Police Accident Field Reports correlate all collisions to the closest intersection for the purpose of data aggregation. The collisions reported by the Police Accident Field Reports represent only about 40% of the safety problems in the area. The “near misses” or less severe collisions which are not reported to the police are not reflected in these statistics. City of Yakima Police Department reports that total vehicle collisions have declined in recent years. Police Department statistics are displayed on Table 1 (below) which includes both field reports as well as citizen reports.

**Table 1: City of Yakima Police Department Collision Statistics Summary**

City of Yakima Vehicle Collisions	1998	1999	2000
Total Collisions (Police Estimate)	3,613	3,402	3,133
Police Accident Field Reports	1,789	1,729	1,688
Total Injuries Resulting from Collisions	1,071	1,012	833
Number of collisions which had at least one injury	721	670	583
Fatal Injuries from Collisions	5	4	2

The fifteen highest volume street intersections are listed below, with total collisions and Average Daily traffic volumes (ADT). Total number of reported collisions are listed for the last three years.

**Table 2: Intersections ranked by Highest Average Daily Traffic Volumes (ADT)**

	Location	1998-2000 Total # Collisions	Enter. ADT	Rate per MEV	1998 Total Coll.	1999 Total Coll.	2000 Total Coll.
1	16th Ave & Nob Hill	38	43,850	0.79	17	14	7
2	3rd Ave & Nob Hill	51	41,700	1.12	18	18	15
3	1st St & Nob Hill	62	39,950	1.42	23	23	16
4	40th Ave & Sumitview	45	39,850	1.03	13	21	11
5	16th Ave & Tieton	28	39,075	0.65	14	8	6
6	16th Ave & Lincoln	29	36,900	0.72	7	11	11
7	1st St & Washington	67	36,550	1.67	18	28	21

### Collisions by Location

Three years of collision data have been compiled to produce a listing of the 75 intersections with the highest number of reported collisions (Table 3, below). It may be noted that six of the top ten intersections are located along Nob Hill Boulevard, which is a heavily traveled arterial street.

However, a comparison between Table 2 (Intersections ranked by ADT) and Table 3 (Intersections with Highest Incident of Collisions) demonstrates that the number of collisions are not simply a function of the volume of traffic passing through an intersection. Other factors need to be evaluated to determine possible causes and preventative measures for collisions.

**Table 3: Intersections with Highest Incident of Collisions, 1998-2000**

	Location	1998-2000 Total # Collisions	Enter. ADT	Rate per MEV	1998 Total Coll.	1999 Total Coll.	2000 Total Coll.
1	1st St & Washington	67	36,550	1.67	18	28	21
2	18th St & Nob Hill	64	25,350	2.31	22	26	16
3	1st St & Nob Hill	62	39,950	1.42	23	23	16
4	3rd Ave & Nob Hill	51	41,700	1.12	18	18	15
5	40th Ave & Summitview	45	39,850	1.03	13	21	11
6	Front St & Yakima Ave	44	19,650	2.04	15	11	18
7	40th Ave & Nob Hill	43	30,450	1.29	9	18	16
8	24th Ave & Nob Hill	42	31,900	1.20	17	7	18
9	56th Ave & Summitview	42	25,800	1.49	14	14	14
10	16th Ave & Nob Hill	38	43,850	0.79	17	14	7
11	1st St & Lincoln	36	28,400	1.16	18	10	8
12	1st St & Mead	35	30,700	1.04	11	9	15
13	3rd Ave & Washington	34	30,850	1.01	14	9	11
14	40th Ave & Tieton Dr	33	36,000	0.84	10	10	13
15	1st St & Yakima Ave	33	33,600	0.90	15	8	10
16	16th Ave & Englewood/Cherry	33	22,875	1.32	14	13	6
17	16th Ave & Washington	30	27,500	1.00	11	10	9
18	16th Ave & Lincoln	29	36,900	0.72	7	11	11
19	5th Ave & Yakima	29	32,250	0.82	13	9	7
20	1st & I St	29	28,400	0.93	10	10	9
21	5th Ave & Lincoln	29	26,400	1.00	11	6	12
22	1st St & Ranch Rite Rd	29	20,200	1.31	9	12	8
23	16th Ave & Tieton	28	39,075	0.65	14	8	6
24	Fair Ave & Nob Hill	27	27,550	0.90	10	10	7
25	16th Ave & River	27	17,900	1.38	11	8	8

	Location	1998-2000 Total # Collisions	Enter. ADT	Rate per MEV	1998 Total Coll.	1999 Total Coll.	2000 Total Coll.
34	5th Ave & D St	23	13,600	1.54	12	8	3
35	I-82 Off Ramp & Nob Hill	21	29,800	0.64	9	9	3
36	3rd Ave & Mead Ave	21	22,700	0.84	9	7	5
37	6th Ave & Yakima	21	20,500	0.94	7	5	9
38	Front St & Walnut	21	19,700	0.97	8	4	9
39	1st St & Arlington St	21	18,600	1.03	9	8	4
40	Custer Ave & Lincoln Ave	21	16,400	1.17	5	8	8
41	6th St & Pacific	21	10,200	1.88	3	8	10
42	40th Ave & Fruitvale Blvd	20	31,900	0.57	4	5	11
43	1st St & Walnut	20	31,050	0.59	8	5	7
44	8th St & Yakima Ave	20	27,400	0.67	5	7	8
45	5th Ave & B St	20	23,100	0.79	6	11	3
46	6th St & Nob Hill Blvd	20	22,850	0.80	6	7	7
47	48th Ave & Tieton Dr	20	21,700	0.84	11	3	6
48	8th St & Lincoln	20	10,400	1.76	6	6	8
49	I-82 Off Ramp & Yakima Ave	19	34,700	0.50	7	8	4
50	40th Ave & Lincoln	19	34,375	0.50	4	4	11
51	3rd Ave & Walnut	19	26,250	0.66	8	5	6
52	24th Ave & Lincoln	19	15,350	1.13	10	6	3
53	16th Ave & Summitview	18	35,100	0.47	9	7	2
54	40th Ave & Englewood	18	30,100	0.55	8	3	7
55	1st St & B St	18	28,300	0.58	6	5	7
56	4th Ave & Yakima Ave	18	19,600	0.84	4	6	8
57	24th Ave & Tieton	17	18,300	0.85	6	8	3
58	6th Ave & Lincoln	17	17,900	0.87	7	4	6
59	Front St & Lincoln	17	14,400	1.08	5	7	5
60	6th St & Lincoln Ave	17	10,650	1.46	3	7	7
61	Fair Ave Loop & Yakima Ave	16	27,800	0.53	7	4	5
62	40th Ave & Kern	16	26,350	0.55	6	2	8
63	6th St & Yakima	16	25,000	0.58	6	6	4
64	16th Ave & Chestnut	16	23,200	0.63	8	5	3
65	40th Ave & Chestnut	16	22,900	0.64	7	5	4
66	2nd St & Yakima Ave	16	22,300	0.66	4	4	8
67	Naches Ave & Yakima	16	21,100	0.69	7	2	7
68	16th Ave & Mead	16	18,425	0.79	7	4	5
69	40th Ave & Arlington	16	18,300	0.80	6	3	7
70	20th Ave & Lincoln	16	15,350	0.95	7	4	5

## Collision Rates

In order to compare the rate of collisions at different locations, the number of collisions per one million entering vehicles (MEV) is calculated. Statistically, any location which is over 1.0 collisions per MEV should be reviewed. The MEV is a measure of relative traffic volumes. The intersection of 6th Street and B Street takes 102 days to carry one million vehicles, while the intersection of 18<sup>th</sup> Street and Nob Hill Boulevard reaches one million vehicles every 39 days.

**Table 4: Intersections by Highest Collisions per Million Entering Vehicles (MEV)**

	Location	Total # Accid.	Enter. ADT	Rate per MEV	Signal?	Rear- End	Broad- side	Approach Turn	Side- swipe	Head- On	Fixed Object	Other
1	6th St & B St	26	9,800	2.42	N	1	17	3	2	0	0	3
2	18th St & Nob Hill	64	25,350	2.31	Y	34	11	7	8	1	0	3
3	Front St & Yakima Ave	44	19,650	2.04	Y	21	18	0	1	1	1	2
4	6th St & Pacific	21	10,200	1.88	N	1	18	0	0	0	0	2
5	8th St & Lincoln	20	10,400	1.76	N	1	10	6	2	0	0	1
6	8th St & B St	27	14,300	1.72	N	0	21	2	1	1	1	1
7	1st St & Washington	67	36,550	1.67	Y	36	11	6	7	0	1	6
8	5th Ave & D St	23	13,600	1.54	N	2	15	4	0	0	1	1
9	56th Ave & Summitview	42	25,800	1.49	Y	17	12	6	3	0	1	3
10	6th St & Lincoln Ave	17	10,650	1.46	N	1	10	3	2	0	0	1
11	1st St & Nob Hill	62	39,950	1.42	Y	38	5	5	8	0	3	3
12	16th Ave & River	27	17,900	1.38	N	8	5	7	3	0	3	1
13	16th Ave & Englewood/Cherry	33	22,875	1.32	N	12	6	10	0	0	1	3
14	1st St & Ranch Rite Rd	29	20,200	1.31	N	14	8	3	1	0	1	2
15	40th Ave & Nob Hill	43	30,450	1.29	Y	18	10	8	4	0	1	2
16	5th Ave & Walnut	25	18,850	1.21	Y	2	9	6	3	2	0	3
17	24th Ave & Nob Hill	42	31,900	1.20	Y	15	9	10	4	2	0	2
18	Custer Ave & Lincoln Ave	21	16,400	1.17	N	4	5	8	0	2	0	2
19	1st St & Lincoln	36	28,400	1.16	Y	4	15	7	6	1	1	2
20	24th Ave & Lincoln	19	15,350	1.13	N	1	10	6	1	0	1	0
21	1st St & D	26	21,200	1.12	Y	7	15	2	1	0	0	1
22	3rd Ave & Nob Hill	51	41,700	1.12	Y	15	16	3	8	0	1	8
23	Front St & Lincoln	17	14,400	1.08	N	6	4	2	4	0	0	1
24	1st St & Mead	35	30,700	1.04	Y	15	1	6	7	0	1	5
25	40th Ave & Sumitview	45	39,850	1.03	Y	11	15	10	8	0	0	1
26	1st St & Arlington St	21	18,600	1.03	Y	14	1	1	3	1	1	0

	Location	Total # Accid.	Enter. ADT	Rate per MEV	Signal?	Rear- End	Broad- side	Approach Turn	Side- swipe	Head- On	Fixed Object	Other
36	Fair Ave & Nob Hill	27	27,550	0.90	Y	11	6	4	3	1	0	2
37	6th Ave & Lincoln	17	17,900	0.87	N	2	9	0	2	0	3	1
38	24th Ave & Tieton	17	18,300	0.85	N	3	9	2	2	0	1	0
39	3rd Ave & Mead Ave	21	22,700	0.84	Y	2	5	10	3	0	0	1
40	48th Ave & Tieton Dr	20	21,700	0.84	Y	12	11	1	0	1	3	0
41	4th Ave & Yakima Ave	18	19,600	0.84	Y	9	3	3	2	0	0	1
42	40th Ave & Tieton Dr	33	36,000	0.84	Y	13	7	2	4	1	2	4
43	10th Ave & Nob Hill Blvd	23	25,450	0.83	Y	4	11	5	1	0	0	2
44	5th Ave & Yakima	29	32,250	0.82	Y	5	11	7	5	0	1	0
45	6th St & Nob Hill Blvd	20	22,850	0.80	N	4	10	3	2	0	0	1
46	40th Ave & Arlington	16	18,300	0.80	N	8	1	6	0	1	0	0
47	16th Ave & Mead	16	18,425	0.79	N	4	3	8	1	0	0	0
48	16th Ave & Nob Hill	38	43,850	0.79	Y	24	5	0	2	1	2	4
49	5th Ave & B St	20	23,100	0.79	Y	1	12	4	1	1	0	0
50	12th Ave & Tieton Dr	15	17,800	0.77	N	1	5	8	0	0	1	0
51	16th Ave & Fruitvale	26	31,200	0.76	Y	6	7	2	7	0	0	4
52	17th St & Yakima Ave	24	30,000	0.73	Y	14	2	5	2	0	0	1
53	11th Ave & Tieton Dr	14	17,800	0.72	Y	2	4	6	1	0	1	0
54	16th Ave & Lincoln	29	36,900	0.72	Y	16	4	2	3	0	1	3
55	3rd Ave & Lincoln	14	18,000	0.71	Y	1	7	1	5	0	0	0
56	Naches Ave & Yakima	16	21,100	0.69	Y	6	2	2	3	1	0	2
57	8th St & Yakima Ave	20	27,400	0.67	Y	1	4	5	10	0	0	0
58	3rd Ave & Walnut	19	26,250	0.66	Y	2	8	4	5	0	0	0
59	2nd St & Yakima Ave	16	22,300	0.66	Y	6	2	3	3	0	1	1
60	16th Ave & Tieton	28	39,075	0.65	Y	12	7	1	5	0	1	2
61	I-82 Off Ramp & Nob Hill	21	29,800	0.64	Y	11	5	4	1	0	0	0
62	40th Ave & Chestnut	16	22,900	0.64	N	2	9	4	0	0	1	0
63	16th Ave & Chestnut	16	23,200	0.63	N	4	4	5	0	1	2	0
64	1st St & Walnut	20	31,050	0.59	Y	13	4	2	0	0	0	1
65	6th St & Yakima	16	25,000	0.58	Y	4	6	2	2	0	0	2
66	1st St & B St	18	28,300	0.58	Y	4	4	4	2	1	1	2
67	40th Ave & Fruitvale Blvd	20	31,900	0.57	Y	11	0	4	2	0	1	1
68	16th Ave & Bonnie Doone	15	24,250	0.56	N	11	0	1	1	0	2	0
69	40th Ave & Kern	16	26,350	0.55	N	10	1	2	2	0	0	1
70	40th Ave & Englewood	18	30,100	0.55	Y	10	1	6	0	0	0	1
71	Fair Ave Loop & Yakima Ave	16	27,800	0.53	N	10	3	1	1	0	1	0
72	26th Ave & Nob Hill Blvd	14	25,300	0.51	N	6	7	1	0	0	0	0
73	40th Ave & Lincoln	19	34,375	0.50	Y	0	8	7	1	0	3	0
74	I-82 Off Ramp & Yakima	19	34,700	0.50	Y	10	7	1	1	0	0	0

### Accident Severity Rates

Accident severity methods identify and rank locations based on the distribution of accident severity. The US Department of Transportation and the American Association of Motor Vehicle Administrators commonly classify accidents into general classes, depending upon the extent of injuries. A common method to compare locations is to establish a value of vehicle accidents relative to Equivalent Property Damage Only (EPDO). Additional weight (rate of 9.5) is given to a very severe accident in which a fatality occurred or a disabling injury occurred. More moderate weight (rate of 3.5) is given to less severe accidents with non-disabling injuries. No additional weighting is given to accidents which are characterized by property damage only. The EPDO method has been used with regularity by State and Federal agencies since approximately 1991. The formula used is as follows:

$$\text{EPDO} = (\# \text{ of Fatal/Disabling Injuries} \times 9.5) + (\# \text{ of Non-disabling or Possible Injuries} \times 3.5) + \text{PDO Accidents}$$

**Table 5: Locations Ranked by Severity, using Equivalent Property Damage Only (EPDO) Method**

	Location	1998-2000 Total # Collisions	Enter. ADT	Rate per MEV	Fatal or Disabling Injuries	Non- Disabl. or Possible injury	Property Damage Only Accident	Equivalent Property Damage Only
1	1st St & Washington	67	36,550	1.67	3	31	39	176
2	1st St & Nob Hill	62	39,950	1.42	2	33	38	172.5
3	18th St & Nob Hill	64	25,350	2.31	0	27	42	136.5
4	3rd Ave & Nob Hill	51	41,700	1.12	0	27	27	121.5
5	3rd Ave & Washington	34	30,850	1.01	3	20	18	116.5
6	56th Ave & Summitview	42	25,800	1.49	1	22	24	110.5
7	1st St & Mead	35	30,700	1.04	2	21	15	107.5
8	24th Ave & Nob Hill	42	31,900	1.20	0	23	24	104.5
9	Front St & Yakima Ave	44	19,650	2.04	0	19	31	97.5
10	16th Ave & Lincoln	29	36,900	0.72	0	24	11	95
11	40th Ave & Nob Hill	43	30,450	1.29	1	16	29	94.5
12	17th St & Yakima Ave	24	30,000	0.73	1	21	8	91
13	16th Ave & Nob Hill	38	43,850	0.79	0	18	25	88
14	16th Ave & Washington	30	27,500	1.00	3	11	20	87
15	40th Ave & Summitview	45	39,850	1.03	1	12	33	84.5
16	16th Ave & Englewood/Cherry	33	22,875	1.32	1	15	20	82
17	40th Ave & Tieton Dr	33	36,000	0.84	0	18	18	81
18	16th Ave & Tieton	28	39,075	0.65	0	19	14	80.5
19	1st St & Yakima Ave	33	33,600	0.90	0	14	22	71
20	16th Ave & River	27	17,900	1.38	1	12	16	67.5
21	Custer Ave & Lincoln Ave	21	16,400	1.17	0	17	8	67.5



	Location	1998-2000 Total # Collisions	Enter. ADT	Rate per MEV	Fatal or Disabling Injuries	Non- Disabl. or Possible injury	Property Damage Only Accident	Equivalent Property Damage Only
31	Front St & Walnut	21	19,700	0.97	2	8	15	62
32	5th Ave & B St	20	23,100	0.79	2	9	11	61.5
33	3rd Ave & Walnut	19	26,250	0.66	0	15	8	60.5
34	1st St & D	26	21,200	1.12	0	12	17	59
35	Fair Ave & Nob Hill	27	27,550	0.90	1	9	18	59
36	3rd Ave & Mead Ave	21	22,700	0.84	0	12	13	55
37	6th Ave & Lincoln	17	17,900	0.87	2	7	11	54.5
38	1st St & Ranch Rite Rd	29	20,200	1.31	0	10	19	54
39	1st St & Lincoln	36	28,400	1.16	0	7	29	53.5
40	48th Ave & Tieton Dr	20	21,700	0.84	0	12	11	53
41	5th Ave & D St	23	13,600	1.54	0	11	13	51.5
42	3rd St & Yakima Ave	24	22,650	0.97	0	11	13	51.5
43	I-82 Off Ramp & Nob Hill	21	29,800	0.64	1	8	14	51.5
44	40th Ave & Englewood	18	30,100	0.55	1	9	10	51
45	6th St & B St	26	9,800	2.42	0	9	18	49.5
46	6th St & Yakima	16	25,000	0.58	0	12	7	49
47	16th Ave & Summitview	18	35,100	0.47	0	11	9	47.5
48	8th St & Yakima Ave	20	27,400	0.67	0	10	12	47
49	6th St & Lincoln Ave	17	10,650	1.46	0	11	8	46.5
50	1st St & Arlington St	21	18,600	1.03	1	6	16	46.5
51	24th Ave & Tieton	17	18,300	0.85	0	11	8	46.5
52	3rd Ave & Lincoln	14	18,000	0.71	2	5	9	45.5
53	40th Ave & Chestnut	16	22,900	0.64	0	11	7	45.5
54	4th Ave & Yakima Ave	18	19,600	0.84	0	10	10	45
55	16th Ave & Bonnie Doone	15	24,250	0.56	0	11	6	44.5
56	Naches Ave & Yakima	16	21,100	0.69	0	10	9	44
57	Front St & Lincoln	17	14,400	1.08	1	7	9	43
58	6th Ave & Yakima	21	20,500	0.94	0	8	14	42
59	40th Ave & Fruitvale Blvd	20	31,900	0.57	1	5	15	42
60	40th Ave & Kern	16	26,350	0.55	0	9	10	41.5
61	8th St & Lincoln	20	10,400	1.76	0	7	16	40.5
62	40th Ave & Lincoln	19	34,375	0.50	0	7	14	38.5
63	6th St & Nob Hill Blvd	20	22,850	0.80	0	7	13	37.5
64	40th Ave & Arlington	16	18,300	0.80	0	8	9	37
65	1st St & B St	18	28,300	0.58	0	7	12	36.5
66	20th Ave & Lincoln	16	15,350	0.95	0	8	8	36

## Rear End Collisions

Rear End collisions are the most frequent type of reported accidents, often with many contributing factors. Streets with no left turn pockets are often characterized by rear end collisions as vehicles stop in traffic to make a turn. Likewise, pedestrians crossing at an intersection may be undetected by drivers who are not stopped at the crosswalk. The drivers behind the initial stopped vehicle may begin advancing their vehicle before the first car in the queue has moved, thereby causing a rear end collision. Other factors of rear end collisions include poor visibility of stop signs, vehicle speeds too fast, or large volumes of turning movements.

**Table 6: Intersections with Highest Rear End Collision Rates**

Location	Total # Accid.	Enter. ADT	Rate per MEV	Rear- End
1st St & Nob Hill	62	39,950	1.42	38
1st St & Washington	67	36,550	1.67	36
18th St & Nob Hill	64	25,350	2.31	34
16th Ave & Nob Hill	38	43,850	0.79	24
Front St & Yakima Ave	44	19,650	2.04	21
1st St & Yakima Ave	33	33,600	0.90	19
40th Ave & Nob Hill	43	30,450	1.29	18
56th Ave & Summitview	42	25,800	1.49	17
16th Ave & Lincoln	29	36,900	0.72	16
24th Ave & Nob Hill	42	31,900	1.20	15
3rd Ave & Nob Hill	51	41,700	1.12	15
1st St & Mead	35	30,700	1.04	15
1st St & Ranch Rite Rd	29	20,200	1.31	14
1st St & Arlington St	21	18,600	1.03	14
17th St & Yakima Ave	24	30,000	0.73	14
40th Ave & Tieton Dr	33	36,000	0.84	13
1st St & Walnut	20	31,050	0.59	13
16th Ave & Englewood/Cherry	33	22,875	1.32	12
6th Ave & Yakima	21	20,500	0.94	12
1st & I St	29	28,400	0.93	12
48th Ave & Tieton Dr	20	21,700	0.84	12
16th Ave & Tieton	28	39,075	0.65	12

Of those intersections listed above only two of the locations are un-signalized intersections: First Street and Ranch Rite Road; and 16<sup>th</sup> Avenue and Englewood. These two locations should be

**Broadside Collisions at Signalized Intersections**

Right –angle collisions at signalized intersections can be attributed to a number of causes and there are also several possible safety enhancements. In collecting this data, there is sometimes a cross-over in the reporting of broadside collisions with approach turns. If a vehicle involved in a collision is attempting to make a turn through the intersection, it will be considered as an approach turn.

<b>Causes</b>	<b>Safety Enhancements</b>
Poor visibility of signals	Install warning devices Install visors Install back Plates Reduce speed limit on approaches Remove sight obstructions Add additional signal head Install 12 inch lenses Improve location of signal heads Install overhead signals
Inadequate signal timing	Adjust amber phase Provide all-red clearance phases Add Multi-dial controller Install signal actuation Retime signal Provide progression through a set of locations

**Table 7: Signalized Intersections with Highest Broadside Collision Rates**

<b>Location</b>	<b>Total # Accid.</b>	<b>Enter. ADT</b>	<b>Rate per MEV</b>	<b>Broad-side</b>
Front St & Yakima Ave	44	19,650	2.04	18
3rd Ave & Nob Hill	51	41,700	1.12	16
1st St & Lincoln	36	28,400	1.16	15
1st St & D	26	21,200	1.12	15
40th Ave & Summitview	45	39,850	1.03	15
56th Ave & Summitview	42	25,800	1.49	12
5th Ave & B St	20	23,100	0.79	12
18th St & Nob Hill	64	25,350	2.31	11
1st St & Washington	67	36,550	1.67	11

**Broadside Collisions at Un-signalized Intersections**

Right angle collisions at un-signalized intersections have some different characteristics than those collisions at signalized locations. Possible causes and safety remedies are listed below. The intersections identified below will also be examined for approach turn conflicts. Data collection in 1998-99 may not have adequately classified the approach turns from right angle collisions. Future data collection will separate all broadside collisions from those which involve turning movements.

**Possible Cause**

Restricted sight distance

Large total intersection volumes

High approach speed

**Safety Enhancement**

Remove obstructions

Install stop or yield signs

Restrict parking near corners

Reduce speed limits

Install/ improve street lighting

Install signal

Channelize intersection

Install signal

Reduce speed limit on approach

**Table 8: Un-signalized Intersections with Hiest Broadside Collision Rates**

<b>Location</b>	<b>Total # Accid.</b>	<b>Enter. ADT</b>	<b>Rate per MEV</b>	<b>Broad-side</b>
8th St & B St	27	14,300	1.72	21
6th St & Pacific	21	10,200	1.88	18
6th St & B St	26	9,800	2.42	17
5th Ave & D St	23	13,600	1.54	15
8th St & Lincoln	20	10,400	1.76	10
6th St & Lincoln Ave	17	10,650	1.46	10
24th Ave & Lincoln	19	15,350	1.13	10

**Intersections by Sideswipe or Head-On Collisions**

Vehicular accidents from sideswipe or head-on collisions have similar possible causes and safety enhancements as noted below.

**Possible Cause**

Inadequate road design/maintenance

Inadequate shoulders

Excessive vehicle speeds

Inadequate pavement parking

Inadequate signing

**Safety Enhancements**

Repair road surface

Improve alignment or grade

Provide wider travel lane

Sign, mark, improve passing area

Improve shoulders

Reduce speed limit

Install/improve centerlines, lanelines and edge lines

Install reflectorized markers

Provide advance direction and warning signs

Add illuminated name signs

**Table 9: Intersections with Highest Sideswipe or Head-On Collisions**

Location	Total # Accid.	Enter. ADT	Rate per MEV	Side-swipe	Head-On
8th St & Yakima Ave	20	27,400	0.67	10	0
18th St & Nob Hill	64	25,350	2.31	8	1
1st St & Nob Hill	62	39,950	1.42	8	0
3rd Ave & Nob Hill	51	41,700	1.12	8	0
40th Ave & Summitview	45	39,850	1.03	8	0
3rd St & Yakima Ave	24	22,650	0.97	8	0
1st St & Washington	67	36,550	1.67	7	0
1st St & Mead	35	30,700	1.04	7	0
16th Ave & Fruitvale	26	31,200	0.76	7	0
1st St & Lincoln	36	28,400	1.16	6	1
5th Ave & Lincoln	29	26,400	1.00	5	0
1st St & Yakima Ave	33	33,600	0.90	5	0
5th Ave & Yakima	29	32,250	0.82	5	0
3rd Ave & Lincoln	14	18,000	0.71	5	0
3rd Ave & Walnut	19	26,250	0.66	5	0
16th Ave & Tieton	28	39,075	0.65	5	0
24th Ave & Nob Hill	42	31,900	1.20	4	2
40th Ave & Tieton Dr	33	36,000	0.84	4	1
40th Ave & Nob Hill	43	30,450	1.29	4	0

### **Bicycle and Pedestrian Collisions with Vehicles**

During the three years between 1998 and 2000, there were a total of 188 vehicle collisions which involved either a pedestrian or a bicycle. While the locations of these collisions were distributed throughout the City of Yakima, 15 intersections experienced both collisions with pedestrians and bicycles. Below is a list of locations which had more than one reported collision with a vehicle and either a pedestrian or a bicycle.

Location	Pedestrian Collision	Bike Collision	Total Ped. or Bike Collision
1st & Washington	2	2	4
1st St & Yakima Ave	0	3	3
32nd Ave & Nob Hill	0	2	2
16th Ave & Lincoln	0	2	2
16th Ave & Prasch	0	2	2
44th Ave & Nob Hill	0	2	2
5th Ave & Walnut	0	2	2
6th St & Walnut	0	2	2
3rd Ave & Nob Hill	3	0	3
10th Ave & Baker St	2	0	2
1st St & B St	2	0	2
3rd Ave & Washington	2	1	3
42nd Ave & Arlington	2	0	2
5th Ave & Nob Hill	2	0	2
6th St & Yakima Ave	2	0	2