

2.0 TRAFFIC AND CRASH DATA

2.1 Traffic Analysis

A separate Traffic Analysis Report dated February 2007, has been prepared for this project, and is summarized here.

The Traffic Analysis Report evaluated the performance of SR 86 and thirteen intersections on SR 86 between Continental Road (MP 158.9) and Kinney Road (MP 166.58) based on current traffic conditions and on forecast traffic volumes for year 2030. Roadway and intersection improvements were recommended to meet the forecast demand and maintain Level of Service (LOS) criteria recommended in the ADOT Roadway Design Guidelines (RDG).

Subsequent to development of the Traffic Analysis Report the project was extended 2.02 miles to the west along SR 86 and now begins at MP 156.88, which is located just east of the intersection of Sandario Road and SR 86. The intersection of SR 86 and Sandario Road is not included in the project.

There are no major intersections or traffic generators along SR 86 between the new westerly end of the project at MP 156.88 and Continental Road. Therefore it was determined that the projected traffic volumes and the LOS calculations developed in the Traffic Analysis Report for the section of SR 86 from Continental Road to Valencia Road would apply to the section of SR 86 between the beginning of the project at MP 156.88 and Continental Road.

Postvale Road is a minor county road that intersects SR 86 at approximate MP 157.8. It serves several residential properties and has minimal traffic. The traffic volumes on Postvale Road are similar to the traffic volumes on Continental Road. Both Postvale Road and Continental Road will be channelized as minor "T" intersections. Median crossovers will be included along with left-turn lanes for traffic turning from eastbound SR 86 to northbound Postvale Road and Continental Road.

Firebird Avenue is shown as a county road that intersects SR 86 at approximate MP 158.3. However, Firebird Avenue is unimproved and carries no measurable traffic. Firebird Avenue will be treated as a turnout and no turning lanes will be provided.

Large residential/commercial developments are in the planning stages on the south side of SR 86 west of Ryan Airfield. It is anticipated that access to the developments will require extension of Postvale Road and Continental Road south of SR 86. It is likely that both of these

intersections with SR 86 will meet signalization warrants in the future as a result of the adjacent development. Modifications to these intersections, including realignment and signalization should be provided by the developers. During final design the status of adjacent development should be determined. If development is imminent agreements with the developers should be executed to provide funding of improvements by the developers.

2.1.1 Existing Conditions

The existing SR 86 roadway from the beginning of the study area, east of Sandario Road to Kinney Road is basically a 2-lane rural highway with 12-foot lanes. Existing paved shoulders are generally 8-foot wide except the shoulder width varies between 2-ft. to 4-ft. along the auxiliary lane between the entrance to the Tucson Water Treatment Plant and Sheridan Avenue and along the left turn and right turn lanes at major intersections. Shoulders were widened along the center left-turn lane from Aviator Lane to Valencia Road.

Just west of Kinney Road, SR 86 transitions from a 2-lane highway to a 4-lane divided highway that extends easterly into Tucson. Traffic at the intersection of SR 86 and Kinney Road is regulated by a traffic signal.

The intersection of SR 86 and Camino Verde was signalized in 2008. Prior to being signalized the intersection was regulated by stop signs on the minor street.

All other intersections within the study limits are regulated by stop signs on the minor street.

The project begins at MP 156.88, just east of Sandario Road, and extends easterly through the Kinney Road Intersection to MP 166.58.

The existing posted speed limits on SR 86 are:

- 65 mph from MP 156.88 to MP 163.8 near the intersection of SR 86 and San Joaquin Road.
- 55 mph from MP 163.8 to the end of project at MP 166.58.

Significant regional growth is expected along the SR 86 corridor in the suburban section just west of Tucson in the next 25 years, which will result in traffic volumes that are more than twice the current levels. Existing high traffic volumes on SR 86 are already affecting the safety of the highway, especially at some of the major intersections along the study area.

SR 86 has a functional classification as a Rural Minor Arterial from its beginning in Why, Arizona easterly to approximate MP 163.4, near the junction with San Joaquin Road. From MP 163.4 to the end of the project it is classified as an Urban Minor Arterial. Because of the expected increase in traffic volumes, the traffic analysis considers SR 86 to be a Fringe Urban Highway from the beginning of the project at MP 156.88 to San Joaquin Road. From San Joaquin Road through the end of the project the urban highway designation will be used.

Scattered residential and commercial establishments exist on either side of SR 86 between Continental Road and Kinney Road. Some of the establishments on SR 86 include:

- Ryan Airfield located on the north side of SR 86, just west of the Valencia Road intersection.
- A gas station/convenience store on the south side of SR 86 at the Tucson Estates Parkway intersection.
- The Tucson Water Treatment Plant on the north side of SR 86 east of the Tucson Estates Parkway intersection.
- The West Ajo Baptist Church/School, Old Town Feed & Supplies and Bishops Trailer Sales on the south side of SR 86 west of Sunset Blvd.
- Ajo Kinney Super Storage on the south side of SR 86 west of Kinney Road.
- A McDonalds Restaurant on the northeast quadrant and a convenience store/gas station on the southeast quadrant of the SR 86/ Kinney Road Intersection.

A Wal-Mart Center is planned adjacent to the northwest quadrant of the SR 86/Kinney Road intersection. Based on 2030 socioeconomic data from the Pima Association of Government's travel demand model, significant development, both residential and commercial, are planned along SR 86 between Continental Road and Kinney Road.

2.1.2 Traffic Data

Forty-eight hour daily vehicle classification counts were taken at three locations along SR 86 in the last week of October 2005 to obtain the number of vehicles per day (VPD);

- East of Valencia Road – 6,915 VPD.
- East of Camino Verde – 13,929 VPD.
- East of Kinney Road – 26,397 VPD.
- Percentage of trucks varied between 11 and 16 percent.
- K-factors ranged between 0.083 – 0.102.

Daily traffic forecasts for year 2030 were obtained from the Pima Association of Government's travel demand model. The year 2007 daily traffic volumes were estimated by interpolating existing 2005 count data and the 2030 traffic forecasts. The 2007 and 2030 traffic volumes are shown in Table 2-1.

**TABLE 2-1
SR 86 TRAFFIC VOLUMES BY ROADWAY SECTION
AND DESIGN YEAR**

Section	2007 ADT	2030 ADT
West of Valencia Road	10,734	28,950
Valencia Road to San Joaquin Road	8,000	20,483
San Joaquin Road to Camino Verde	11,104	22,628
Camino Verde to Kinney Road	15,859	38,059
East of Kinney Road	35,795	66,337

Turning movement counts were taken at the following thirteen intersections during the last week of October and the first week of November 2005 for two peak periods; 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM.

- Continental Road
- Aviator Lane
- Valencia Road/Airfield Drive
- West end of Old Ajo Highway
- San Joaquin Road
- Camino Verde
- East end of Old Ajo Highway
- Tucson Estates Parkway
- Entrance to Tucson Water Treatment Plant
- Entrance to West Ajo Baptist Church
- Sunset Boulevard
- Sheridan Avenue (north leg)
- Kinney Road

Peak-hour turn movement counts revealed the following traffic patterns.

- On SR 86, the peak direction of travel in the AM peak period is eastbound
- On SR 86, the peak direction of travel in the PM period is westbound.
- Traffic volumes to the west of Valencia Road are significantly higher than east of Valencia Road indicating that a significant amount of traffic uses Valencia Road as an alternate route to SR 86.

2.1.3 Capacity Analysis Methodology

Methodologies from the *Highway Capacity Manual 2000 (HCM)* were applied in evaluating existing and future conditions. Synchro 6 traffic analysis software was used to evaluate the performance of intersections.

Highway Capacity Software (HCS) was used to evaluate mid-block level of service (LOS) on SR 86.

Unsignalized intersections on SR 86 were evaluated for AM and PM peak-hour periods. Table 2-2 shows LOS criteria for stop sign controlled intersections. The performance of minor approaches at each intersection was categorized into LOS ranging from "A" to "F", where LOS A indicates least delay and LOS F indicates significant delay.

Signalized intersections in the study area were evaluated for AM and PM peak-hour periods. Table 2-3 shows LOS criteria for signal controlled intersections.

**TABLE 2-2
UNSIGNALIZED INTERSECTION LOS CRITERIA**

Level of Service	Average Control Delay (seconds/vehicle)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

**TABLE 2-3
SIGNALIZED INTERSECTION LOS CRITERIA**

Level of Service	Control Delay (seconds/vehicle)
A	0-10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

SR 86 is considered an urban / fringe urban highway for both year 2007 analyses and year 2030 analyses.

2.1.4 LOS Analysis for Year 2007 Traffic Volumes, with No Improvements

LOS of SR 86 Mainline With No Improvements:

The ADOT RDG requires an LOS C-D or better on urban / fringe urban highways. The mid-block, year 2007 LOS for SR 86 mainline with no improvements is shown in Table 2-4.

**TABLE 2-4
SR 86 MAINLINE LOS FOR 2007 WITH NO IMPROVEMENTS**

Section	2007 LOS
Sandario Road to Valencia Road	D
Valencia Road to San Joaquin Road	C
San Joaquin Road to Camino Verde	D
Camino Verde to Tucson Estates Pwy.	D
Tucson Estates Pwy. to Kinney Road	E

The SR 86 mainline meets ADOT requirements of LOS C-D between Sandario Road and Tucson Estates Pwy., but does not meet ADOT requirements of LOS C-D between Tucson Estates Pwy. and Kinney Road for a fringe urban two-lane highway with the existing road configuration for 2007 traffic volumes.

LOS of SR 86 Intersections With No Improvements:

Existing roadway and traffic characteristics were coded in Synchro software. Existing signal timing data was received from the ADOT Traffic Engineering Operations Group for the SR 86/ Kinney Road intersection. LOS D is acceptable for overall intersection and individual approaches at each intersection. The LOS of each of the intersections for 2007 traffic with no improvements is shown in Table 2-6.

Unsignalized intersections at San Joaquin Road, the east end of Old Ajo Way, Tucson Estates Parkway, the entrance to Ajo Baptist Church, Sunset Blvd., and Sheridan Avenue fail to meet LOS requirements during AM or PM peak-hour periods with year 2007 traffic volumes and current intersection lane configurations. The signalized intersection at Kinney Road also fails to meet LOS requirements for 2007 traffic volumes and current intersection lane configuration. The intersection of SR 86 and Camino Verde was signalized in 2008.

2.1.5 Level of Service Analysis for Year 2007 Traffic Volumes with Improvements

LOS of SR 86 Mainline With Improvements:

The SR 86 mainline roadway was evaluated for LOS with improvements to a four-lane divided highway.

The mid-block, year 2007 LOS for SR 86 mainline with improvements is shown in Table 2-5.

**TABLE 2-5
SR 86 MAINLINE LOS FOR 2007 WITH IMPROVEMENTS**

Section	2007 LOS	
	EB (AM/PM)	WB (AM/PM)
Sandario Road to Valencia Road	A/A	A/A
Valencia Road to San Joaquin Road	A/A	A/A
San Joaquin Road to Camino Verde	A/A	A/A
Camino Verde to Tucson Estates Pwy.	B/A	A/A
Tucson Estates Pwy. to Kinney Road	B/A	A/A

The SR 86 mainline roadway will perform at the desired LOS C-D when improved to a four-lane divided highway.

LOS of SR 86 Intersections With Improvements:

The intersection improvements for Valencia Road, San Joaquin Road, Tucson Estates Parkway and Sunset Blvd. include signalization. Camino Verde intersection is currently signalized; however the signal

system will be relocated and modified for the proposed 4-lane roadway. Kinney Road intersection is currently signalized and will be further improved to increase capacity. Intersections planned for signalization will have to meet signal warrants prior to installation of signals.

The unsignalized intersections at Postvale Road and Continental Road will include the following auxiliary lanes:

- Left-turn lanes for traffic turning from eastbound SR 86 to northbound on the local roads.
- Right-turn deceleration lanes for traffic turning from westbound SR 86 to northbound on the local roads.
- Acceleration lanes on the outside of the westbound roadway for traffic turning right from the local roads to westbound SR 86.

The intersection of SR 86 and the Old Ajo Highway (East) is shown as being removed. Old Ajo Highway (East) will be terminated and a cul-de-sac will be provided near the SR 86 R/W.

The remaining intersections within the study limits will be right-in/right-out only. The LOS of each of the intersections for 2007 traffic with improvements is shown in Table 2-6.

2.1.6 Level of Service Analysis for Year 2030 Traffic Volumes with No Improvements

LOS of SR 86 Mainline With No Improvements:

The ADOT RDG requires a LOS C-D for urban/fringe urban highways. The mid-block, year 2030 LOS for SR 86 mainline with no improvements is shown in Table 2-7.

**TABLE 2-7
SR 86 MAINLINE LOS FOR 2030 WITH NO IMPROVEMENTS**

Section	2030 LOS
Sandario Road to Valencia Road	F
Valencia Road to San Joaquin Road	E
San Joaquin Road to Camino Verde	F
Camino Verde to Tucson Estates Pwy.	F
Tucson Estates Pwy. to Kinney Road	F

The SR 86 mainline does not meet ADOT requirements of LOS C-D for an urban/fringe urban highway with the existing road configuration for 2030 traffic volumes. SR 86 performs at or near LOS F as a two-lane highway with year 2030 traffic volumes.

LOS of SR 86 Intersections With No Improvements:

The LOS of each of the intersections for 2030 traffic with no improvements is shown in Table 2-8.

All unsignalized intersections between Postvale Road and Kinney Road fail to meet LOS requirements during both the AM and PM peak-hour periods with the existing intersection configurations and 2030 traffic volume conditions. The signalized intersection at Kinney Road also

TABLE 2-6: INTERSECTION LOS - 2007 TRAFFIC WITH & WITHOUT IMPROVEMENTS

Intersection	2007 Traffic – No Improvements				2007 Traffic – With Improvements				
	Control	LOS (AM/PM) Peak Hr.			Control	LOS (AM/PM) Peak Hr.			Overall I/S
		Left	Through	Right		Left	Through	Right	
Postvale Road	Stop	No Data			Stop	No Data			
Continental Road									
SB	Stop	C/C	-	C/A	Stop	C/C		B/B	
Aviator Lane									
SB	Stop	C/C	-	A/C	Stop	None**			
WB	No Control				No Control	None**			
EB	No Control				N/A	None**			
Valencia Rd./Airfield Dr.									A/A
SB	Stop	A/C	C/C	A/C	Signal	A/B	B/B*		
NB	Stop	D/D	D/D	D/D	Signal	B/C	A/B*		
WB	No Control				Signal	A/A	A/A*		
EB	No Control				Signal	A/A	A/A	A/A	
Old Ajo Highway (West)									
SB	Stop	A/C	-	B/A	Stop	None**	-	A/A	
San Joaquin Road									A/A
SB	Stop	F/C	-	F/C	Signal	B/B	-	A/A	
WB	No Control				Signal	-	A/A	A/A	
EB	No Control				Signal	A/A	A/A	-	
Camino Verde Road	SR 86/Camino Verde was signalized in 2008								B/A
SB	Signal				Signal	B/B	B/B*		
NB	Signal				Signal	B/B	B/B	B/A	
WB	Signal				Signal	B/B	A/A	A/A	
EB	Signal				Signal	A/A	A/A	A/A	
Old Ajo Highway (East)	Intersection to be closed								
SB	Stop	F/E	-	A/A					
Tucson Estates Pwy.									A/A
SB	Stop	F/F	F/F	F/F	Signal	D/C	B/B*		
NB	Stop	E/D	E/D	E/D	Signal	D/C	B/B*		
WB	No Control				Signal	A/A	A/A*		
EB	No Control				Signal	A/A	A/A		
Water Treatment Plant									
SB	Stop	D/D	-	D/D	Stop	None**	-	A/B	
W. Ajo Baptist Church									
NB	Stop	E/D	-	E/D	Stop	None**	-	B/B	
Sunset Blvd.									A/A
NB	Stop	F/F	-	F/F	Signal	C/C	-	B/B	
WB	No Control				Signal	A/A	A/A		
EB	No Control				Signal		A/A	A/A	
Sheridan Avenue									
SB	Stop	E/D	-	E/D	Stop	None**	-	B/B	
Kinney Road									C/B
SB	Signal	F/F	C/B*		Signal	D/D	B/B	A/A	
NB	Signal	B/B	B/B*		Signal	B/B	E/D	C/B	
WB	Signal	E/B	B/C	A/F	Signal	E/B	C/C	A/A	
EB	Signal	B/D	C/B	A/A	Signal	C/D	C/B	A/A	

* Shared through plus right-turn lane.

** Right-in/right-out Intersection.

fails to meet LOS requirements for 2030 traffic volumes and current intersection lane configuration.

2.1.7 Level of Service Analysis for Year 2030 Traffic Volumes with Improvements

LOS of SR 86 Mainline With Improvements:

The SR 86 mainline roadway was evaluated for LOS with improvements to a four-lane divided highway between Sandario Road and Sunset Blvd. From Sunset Blvd. through Kinney Road the eastbound mainline roadway will be three lanes. The westbound roadway will be three lanes through the Kinney Road intersection westerly to Sheridan Avenue. The mid-block, year 2030 LOS for the SR 86 mainline with improvements is shown in Table 2-9.

**TABLE 2-9
SR 86 MAINLINE LOS FOR 2030 WITH IMPROVEMENT**

Section	2030 LOS	
	EB (AM/PM)	WB (AM/PM)
Sandario Road to Valencia Road	C/A	B/B
Valencia Road to San Joaquin Road	B/A	A/A
San Joaquin Road to Camino Verde	B/A	A/B
Camino Verde to Tucson Estates Pwy.	D/B	B/C
Tucson Estates Pwy. to Kinney Road	D/B	B/C

The SR 86 mainline between Sandario Road and Kinney Road meets ADOT requirements of LOS C-D for an urban/fringe urban highway when improved to a four-lane divided highway between Sandario Road and Sunset Blvd. From Sunset Blvd. and Kinney Road the eastbound mainline roadway will be three lanes. The westbound roadway will be three lanes through the Kinney Road intersection westerly to Sheridan Avenue.

LOS of SR 86 Intersections With Improvements:

The ADOT Traffic Engineering Policies, Guidelines and Procedures states that in urban areas with population over 50,000, LOS D is acceptable. Since SR 86 through the limits of this project is considered to be a Fringe Urban facility the requirement for LOS D for the overall intersection will apply.

The intersection improvements for Valencia Road, San Joaquin Road, Tucson Estates Parkway and Sunset Blvd. include signalization. Camino Verde intersection is currently signalized. Kinney Road intersection is currently signalized and will be further improved to increase capacity.

The unsignalized intersections at Postvale Road and Continental Road will include the following auxiliary lanes:

- Left-turn lanes for traffic turning from eastbound SR 86 to northbound on the local roads.

TABLE 2-8: INTERSECTION LOS - 2030 TRAFFIC WITH & WITHOUT IMPROVEMENTS

Intersection	2030 Traffic – No Improvements				2030 Traffic – With Improvements				
	Control	LOS (AM/PM) Peak Hr.			Control	LOS (AM/PM) Peak Hr.			
		Left	Through	Right		Left	Through	Right	Overall I/S
Postvale Road	No Data				No Data				
Continental Road									
SB	Stop	F/F	-	F/A	Stop	F/F		B/A	
Aviator Lane									
SB	Stop	F/F	-	A/F	Stop	None**			
WB	No Control				No Control	None**			
EB	No Control				N/A	None**			
Valencia Rd./Airfield Dr.									B/B
NB	Stop	F/F	F/F	F/F	Signal	D/C	B/B	A/A	
WB	No Control				Signal	A/B	A/B*		
EB	No Control				Signal	A/A	C/B	A/A	
SB	Stop	A/F	F/F	A/F	Signal	A/C	C/C*		
Old Ajo Highway (West)									
SB	Stop	A/E	-	C/A	Stop	None**	-	B/B	
San Joaquin Road									A/A
SB	Stop	F/F	-	F/F	Signal	C/B	-	A/A	
WB	No Control				Signal	-	A/A	A/A	
EB	No Control				Signal	A/A	A/A	-	
Camino Verde	SR 86/Camino Verde was signalized in 2008.								C/B
SB	Signal				Signal	D/C	D/C*		
NB	Signal				Signal	C/C	C/C	B/A	
WB	Signal				Signal	E/C	A/A	A/A	
EB	Signal				Signal	B/C	D/C	A/A	
Old Ajo Highway (East)					Intersection to be closed				
SB	Stop	F/F	-	A/A					
Tucson Estates Pwy.									C/A
SB	Stop	F/F	F/F	F/F	Signal	E/C	D/C	A/A	
NB	Stop	F/F	F/F	F/F	Signal	D/C	D/C	A/A	
WB	No Control				Signal	A/A	A/A	A/A	
EB	No Control				Signal	A/C	D/A	A/A	
Water Treatment Plant									
SB	Stop	F/F	-	F/F	Stop	None**	-	B/C	
W. Ajo Baptist Church									
NB	Stop	F/F	-	F/F	Stop	None**	-	F/B	
Sunset Blvd.									D/B
NB	Stop	F/F	-	F/F	Signal	F/D	-	A/A	
WB	No Control				Signal	E/C	A/A		
EB	No Control				Signal		D/C	A/A	
Sheridan Avenue									
SB	Stop	F/F	-	F/F	Stop	None**	-	B/C	
Kinney Road***									E/B
SB	Signal	F/F	C/B*		Signal	F/C	D/C	B/B	
NB	Signal	B/B	B/C*		Signal	D/C	F/C	A/A	
WB	Signal	F/F	C/F	A/F	Signal	C/C	B/B	B/B	
EB	Signal	F/D	F/C	B/A	Signal	D/C	D/B	A/A	

* Shared through plus right-turn lane.

**Right-in/Right-out Intersection.

***Kinney Road LOS Analysis With improvements is with County Road By-Pass

- Right-turn deceleration lanes for traffic turning from westbound SR 86 to northbound on the local roads.

The intersection of SR 86 and the Old Ajo Highway (East) is shown as being removed. Old Ajo Highway (East) will be realigned and connected to Fred Avenue by Pima County.

The remaining intersections within the study limits will be right-in/right-out only. The LOS of each of the intersections for 2030 traffic with improvements is shown in **Table 2-8**. Where the highway will operate at LOS C or better the intersection is required to operate at LOS C except in urban areas with a population over 50,000 LOS D may be acceptable with the concurrence of the affected local jurisdiction.

A short acceleration lane will be needed on the outside of the eastbound roadway for traffic turning right from the West Ajo Baptist Church to eastbound SR 86.

The signalized intersections at Valencia Road, San Joaquin Road, Camino Verde, Tucson Estates Pwy. and Sunset Blvd. will function with an acceptable LOS with the lane improvements. However, individual movements at Continental Rd., Camino Verde, Tucson Estates Parkway, Sunset Blvd. and Kinney Rd. will have less than desirable LOS as shown in **Table 2-8**.

It will be necessary to widen eastbound SR 86 to three through lanes between Sunset Blvd. and Kinney Road, and to widen westbound SR 86 to three through lanes between Kinney Road and Sheridan Ave. The signalized intersection at Kinney Road will function at an acceptable LOS with a By-Pass road in place that is being planned by Pima County and will be required when the property on the northeast quadrant of SR 86 and Kinney Rd. is developed. The By-Pass road will begin at an intersection with Kinney Road north of SR 86 and will tie into SR 86 opposite the existing intersection of SR 86 and Camino de Oeste. It is outside the limits of this project. The schedule of construction is not known at this time.

2.2 Crash Analysis

2.2.1 Analysis

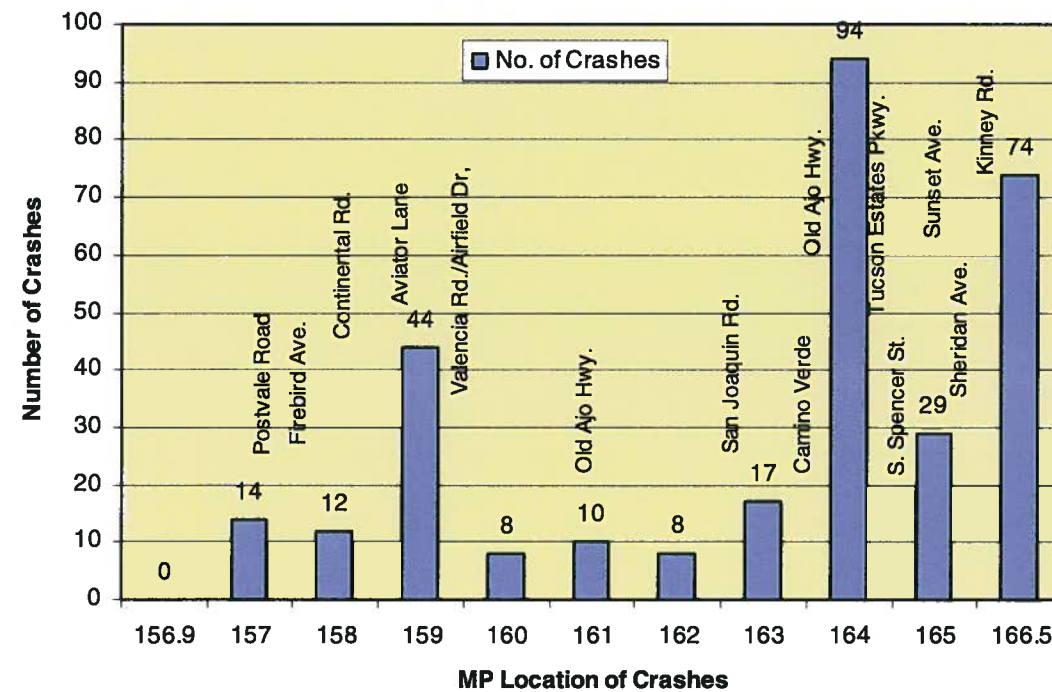
This analysis includes crash data for the period between April 1, 2001 and March 31, 2006, within the study limits of SR 86 between MP 156.88 to MP 166.58. The data was provided by the Crash Records Branch of the Traffic Engineering Section, Arizona Department of Transportation.

Figure 2-1 shows the number of crashes by milepost location. Crash rates by milepost location are depicted on **Figure 2-2**. Crash rates were calculated by milepost based on the number of reported crashes within each mile section and the historical traffic volumes at that location.

The crash rate for the SR 86 corridor from MP 156.88 to 166.58 is calculated to be 1.57 crashes per million vehicle miles of travel per

year. This compares to a crash rate for a typical two-lane rural highway in Arizona of 0.79 crashes per million vehicle miles of travel per year.

**FIGURE 2-1
NUMBER OF CRASHES BY MILEPOST LOCATION
2001 – 2006**



**FIGURE 2-2
CRASH RATE BY MILEPOST LOCATION
2001 – 2006**

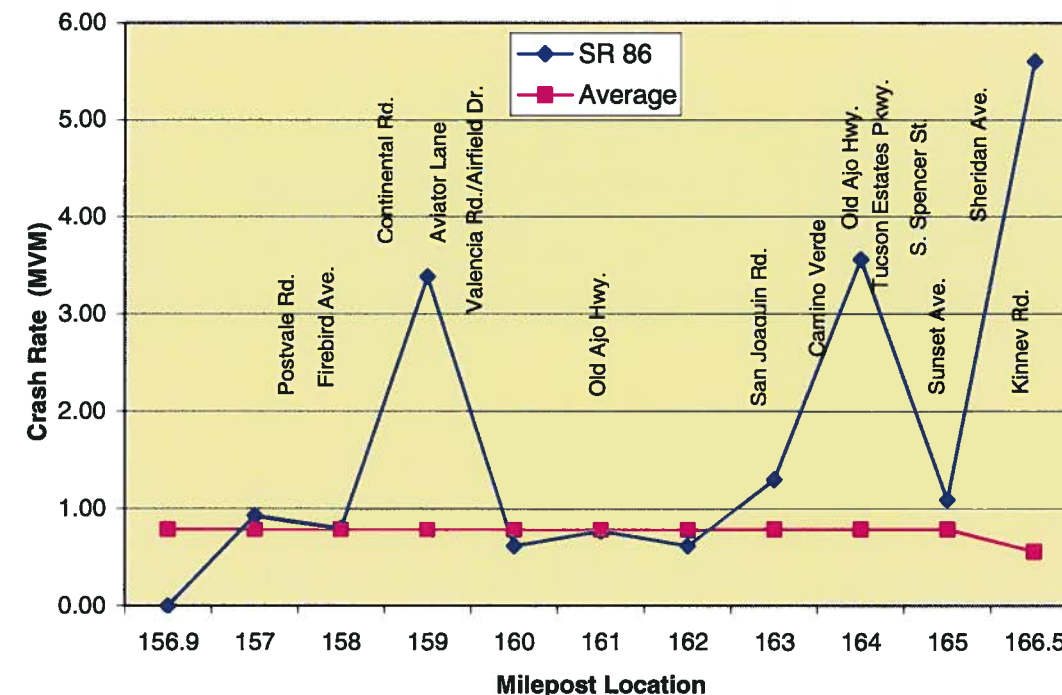


Figure 2-2 illustrates that there are several locations where the crash rate is above the State average for a similar kind of facility. Three of the locations, including the Ryan Airfield/Valencia Road area, the Camino Verde/Tucson Estates Parkway area, and the Kinney Road area are substantially above the average crash rate. Two of the areas include intersections that were unsignalized when the crash data was gathered. However, the Camino Verde intersection has since been signalized. The third location includes Kinney Road intersection, which is currently signalized but has high volumes of traffic on both SR 86 and Kinney Road.

A total of 310 crashes were reported within the study limits over a period of five years from April 1, 2001 to March 31, 2006. **Table 2-10** shows the crash severity. The percentage of Property Damage Only (PDO), Injury and Fatal crashes to the total number of crashes reported were 56.8%, 39.4% and 3.9% respectively.

There were twelve fatal crashes within the project limits.

- Ten of the twelve were collisions with other vehicles.
- One was a single vehicle overturning crash.
- One was a collision with a pedestrian.
- Eight of the ten multi-vehicle fatal crashes and the one pedestrian fatal crash occurred near intersections; five were angle crashes, two were left-turn crashes and one was a rear-end crash.
- One multi-vehicle fatal crash was a sideswipe in opposite directions.
- One multi-vehicle fatal crash was a head-on collision.
- The drivers of the vehicles causing seven of the crashes had been drinking. The drivers of the other vehicles had no apparent impairment.

Two hundred forty eight of the 310 crashes were collisions with other vehicles (See **Table 2-11**). Of the 248 multi-vehicle crashes, 208 involved either turning movements or rear-end crashes.

2.2.2 Conclusions

The average crash rate on SR 86 through the project limits from Sandario Road to Kinney Road is above the Arizona average for a similar facility. Crashes involving turning movements and rear-end collisions are by far the most prevalent through the project area. The concentration of crashes at intersections indicates there are inadequate

opportunities for turning vehicles with the two lane configuration of SR 86. The growth of the area and the increasing volume of traffic entering and leaving SR 86 indicate that additional capacity is needed on SR 86.

Even with increased capacity, however, it will be necessary to provide left and right turn channelization at the major intersections. Signalization of several of the intersections that are now functioning with stop signs will be necessary to assign right-of-way for vehicles entering and leaving SR 86.

**TABLE 2-10
CRASH SEVERITY
4/01/01 TO 3/31/06**

Location	No. of Crashes	Fatal	Injury	Prop. Dam.
MP 156.88 to MP 157.0	0	0	0	0
MP 157.0 to MP 158.0 Postvale Rd. 157.85	14	1	8	5
MP 158.0 to MP 159.0 Firebird Ave. 158.30 Continental Rd. 158.96	12	1	4	7
MP 159.0 to MP 160.0 Aviator Lane 159.6 Valencia Rd. 159.8	44	1	23	20
MP 160.0 to MP 161.0	8	0	5	3
MP 161.0 to MP 162.0 Old Ajo Hwy. 161.4	10	0	3	7
MP 162.0 to MP 163.0	8	0	4	4
MP 163.0 to MP 164.0 San Joaquin Rd. 163.4	17	1	6	10
MP 164.0 to MP 165.0 Camino Verde 164.02 Old Ajo Hwy. 164.54 Tucson Estates Pwy. 164.68	94	5	38	51
MP 165.0 to MP 166.0 S. Spencer St. 165.21 Sunset Ave. 165.49 Sheridan Ave. 165.75	29	2	10	17
MP 166.0 to MP 166.58 Kinney Rd. 166.22	74	1	21	52
Total	310	12	122	176

It is recommended that additional lanes be added to SR 86 to provide a four-lane highway with two lanes in each direction from the beginning of the project east of Sandario Rd. to Sunset Blvd.; three eastbound lanes from Sunset Blvd. through the Kinney Rd. intersection, and three westbound lanes from Sheridan Avenue through the Kinney Rd. intersection. Channelization and signalization of major intersections should be included with the roadway expansion.

**TABLE 2-11
COLLISION MANNER
4/01/01 TO 3/31/06**

Collision Manner	Location (MP - MP)											Total
	156.88 157.0	157.0 158.0	158.0- 159.0	159.0- 160.0	160.0- 161.0	161.0- 162.0	162.0- 163.0	163.0- 164.0	164.0- 165.0	165.0- 166.0	166.0- 166.58	
Collision/w Other Vehicle:												
• Angle				19	1	1	1	6	46	6	16	96
• Sideswipe (opposite)		2	1	2				1	3	1	6	16
• Sideswipe (same)			1	2				1	6		4	14
• Rear-End		3	2	8		4	1	4	19	7	25	73
• Left-Turn				3	1				6	4	14	28
• U-Turn						1			3	1		5
• Head-on			2		1				2		1	6
• Backing				1						1		2
• Other		1	1	1			1	1	2		1	8
Single Vehicle:												
• Overturn		1	1	1	1	3	2		2	3		14
• Collision w/Fixed Object		4	1	3	1		2	1	2	4	4	22
• Collision w/Parked Veh.		2		1								3
• Collision w/Bicyclist			1									1
• Collision w/Ped.									1		2	3
• Collision w/Wild Game			1		2	1					1	5
• Collision w/Other Animal								1		1		2
• Other		1	1	3	1		1	2	2	1		12
Total	0	14	12	44	8	10	8	17	94	29	74	310