6. Existing Plus Project Traffic Conditions

Once the project-related traffic is assigned to the existing street network and added to existing volumes, the traffic impact can be assessed. Figure 9 illustrates the existing plus project traffic conditions for the peak month.

Existing Plus Project Daily Traffic Volumes

Upon project completion and occupancy the expected daily two-way traffic volumes are as illustrated in Figure 9. Figure 9 shows expected peak month daily traffic volumes for existing plus project traffic conditions.

Existing Plus Project Peak Hour Turning Movement Volumes

Appendix C contains plots of the existing plus project peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Existing Plus Project Intersection Lanes

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing plus project intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Plus Project Intersection Delay

The Intersection Delay for the existing plus project traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Plus Project Level of Service

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS D or better for existing plus project peak hour traffic conditions, based on Delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. The project does not have a significant impact on this intersection based on the thresholds of significance described in Section 2. It therefore is not required to mitigate this deficiency.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Any design that does not meet Caltrans minimum Design Standards will need an "Exception to Design Standard" fact sheet.

Traffic Signal Warrants

Traffic signals will not be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. Rural Warrants are applicable for roadways with speeds over 40 miles per hour.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic.

Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

Table 5

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic - See Note 2)

Signal Warrant URBAN ..... RURAL.....XXXXX..... Use RURAL if critical speed equals or exceeds 40 MPH	Minimum Requirements Estimated Average Daily Traffic (EADT)	
1. Minimum Vehicular Satisfied YES (2025) Not Satisfied _____	Vehicles per day on major street (total of both approaches)	Vehicles per day on higher-volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach		
Major Street / Minor Street	Urban / Rural	Urban / Rural
1 ..... 1	8,000 / 5,600<<<<	2,400 / 1,680<<<<
2 or more 1	9,600 / 6,720	2,400 / 1,680
2 or more ..... 2 or more	9,600 / 6,720	3,200 / 2,240
1 ..... 2 or more	8,000 / 5,600	3,200 / 2,240
2. Interruption of Continuous Traffic Satisfied _____ Not Satisfied _____	Vehicles per day on major street (total of both approaches)	Vehicles per day on higher-volume minor-street approach (one direction only)
Number of lanes for moving traffic on each approach		
Major Street / Minor Street	Urban / Rural	Urban / Rural
1 ..... 1	12,000 / 8,400<<<<	1,200 / 850<<<<
2 or more 1	14,400 / 10,080	1,200 / 850
2 or more ..... 2 or more	14,400 / 10,080	1,600 / 1,120
1 ..... 2 or more	12,000 / 8,400	1,600 / 1,120
3. Combination Satisfied _____ Not Satisfied _____ No one warrant satisfied but following warrants fulfilled 80% or more ..... _____ 1 _____ 2	2 Warrants	2 Warrants

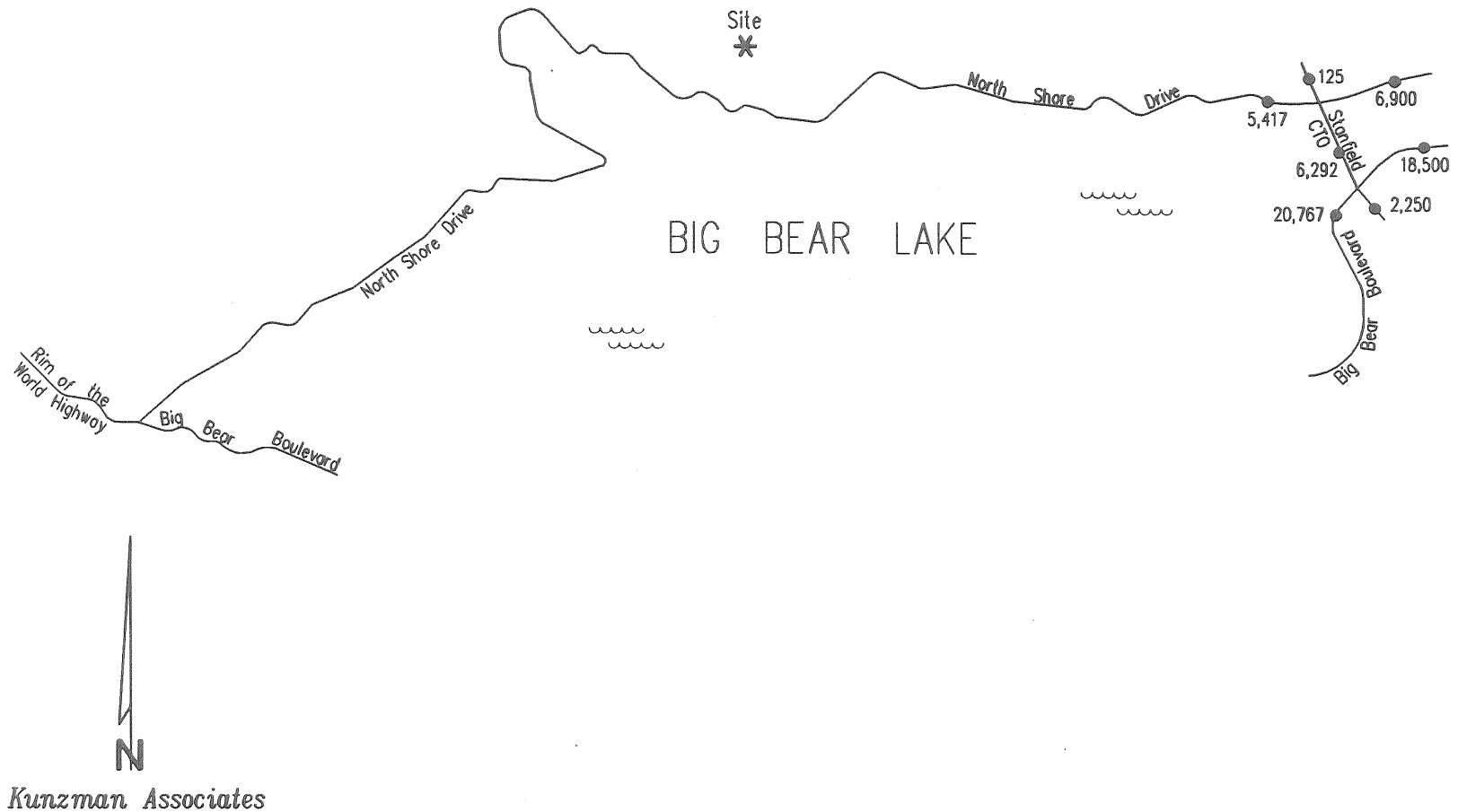
NOTE:

1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

Source: CalTrans, TRAFFIC MANUAL, page 9-8

<<<< These are the warrant volumes that apply to Stanfield Cutoff and North Shore Drive

Figure 9
Existing Plus Project Daily Traffic Volumes – Peak Month



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7. Existing Plus Other Development Traffic Conditions - Year 2006

After background traffic growth has been added to existing volumes, the traffic impact can be assessed. Figure 10 illustrates the existing plus other development traffic conditions for an average month and Figure 11 for a peak month. The time frame of projection is Year 2006.

Other Development Growth - Year 2006

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 5 years has been assumed. The total compounded growth over 5 years is 5 percent. The basis of this growth rate assumption is the County of San Bernardino.

Existing Plus Other Development Daily Traffic Volumes - Year 2006

For existing plus other development traffic conditions the expected daily two-way traffic volumes are as illustrated in Figure 10. See Table 6 for the calculation of intersection leg daily traffic volumes.

Existing Plus Other Development Peak Hour Turning Movement Volumes - Year 2006

Appendix C contains plots of the existing plus other development peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Existing Plus Other Development Intersection Lanes - Year 2006

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing plus other development intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Plus Other Development Intersection Delay - Year 2006

The Intersection Delay for the existing plus other development traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Plus Other Development Level of Service - Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Any design that does not meet Caltrans minimum Design Standards

will need an "Exception to Design Standard" fact sheet.

Traffic Signal Warrants - Year 2006

Traffic signals will not be warranted at the intersections of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Table 6

DAILY LEG VOLUME CALCULATIONS

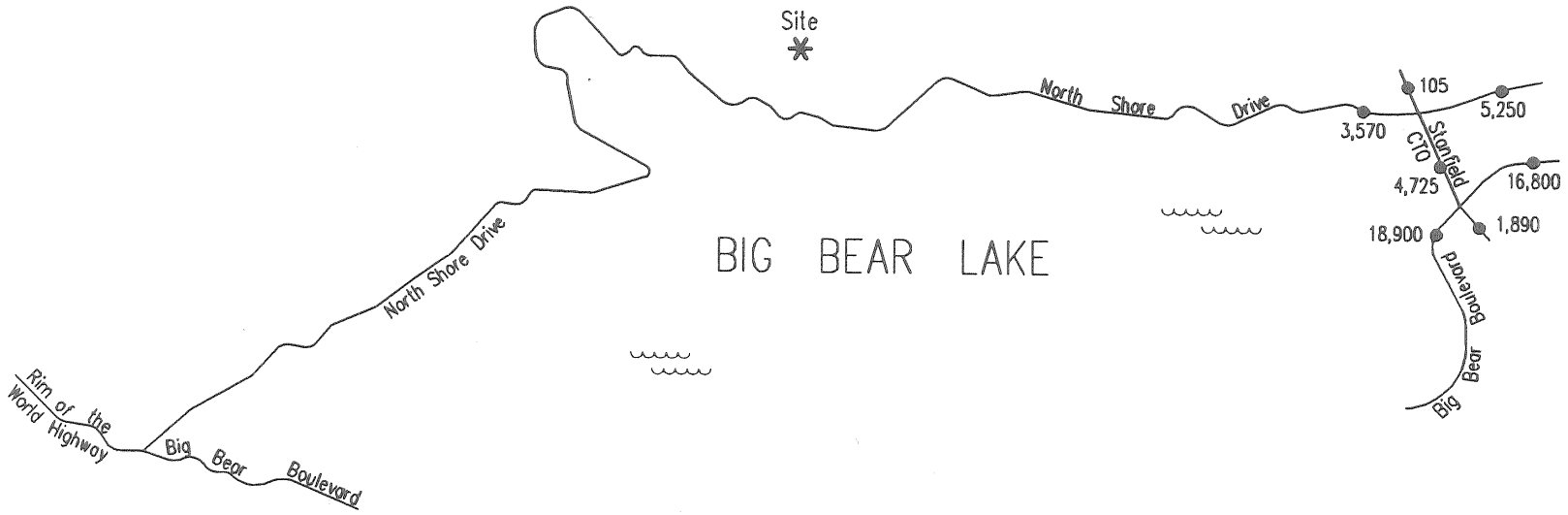
Intersection	Inter-section Leg	Project Added Daily Leg Volume	Existing Year 2001		Year 2006		Year 2025	
			Existing Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes
1. Stanfield Cutoff (NS) and North Shore Drive (EW)	North	0	100	100	105	105	124	124
	South	667	4,500	5,167	4,725	5,392	5,580	6,247
	East	0	4,500	4,500	4,725	4,725	5,580	5,580
Average Month	West	667	2,100	2,767	2,205	2,872	2,604	3,271
2. Stanfield Cutoff (NS) and Big Bear Boulevard (EW)	North	667	4,500	5,167	4,725	5,392	5,580	6,247
	South	0	1,800	1,800	1,890	1,890	2,232	2,232
	East	400	13,800	14,200	14,490	14,890	17,112	17,512
Average Month	West	267	16,900	17,167	17,745	18,012	20,956	21,223
1. Stanfield Cutoff (NS) and North Shore Drive (EW)	North	0	125	125	131	131	155	155
	South	667	6,000	6,667	6,300	6,967	7,440	8,107
	East	0	6,000	6,000	6,300	6,300	7,440	7,440
Peak Month	West	667	2,700	3,367	2,835	3,502	3,348	4,015
2. Stanfield Cutoff (NS) and Big Bear Boulevard (EW)	North	667	6,000	6,667	6,300	6,967	7,440	8,107
	South	0	2,200	2,200	2,310	2,310	2,728	2,728
	East	400	17,300	17,700	18,165	18,565	21,452	21,852
Peak Morth	West	267	21,100	21,367	22,155	22,422	26,164	26,431

NOTE: Background Growth Rate is assumed to be as follows in percent: 1.000

From Year 2001 to Year 2006 is 5 years. The calculated simple growth factor is: 1.050

From Year 2001 to Year 2025 is 24 years. The calculated simple growth factor is: 1.240

Figure 10
2006* Daily Traffic Volumes – Average Month



* Year 2006 volumes are assumed to be 5 percent higher than Year 2001 volumes

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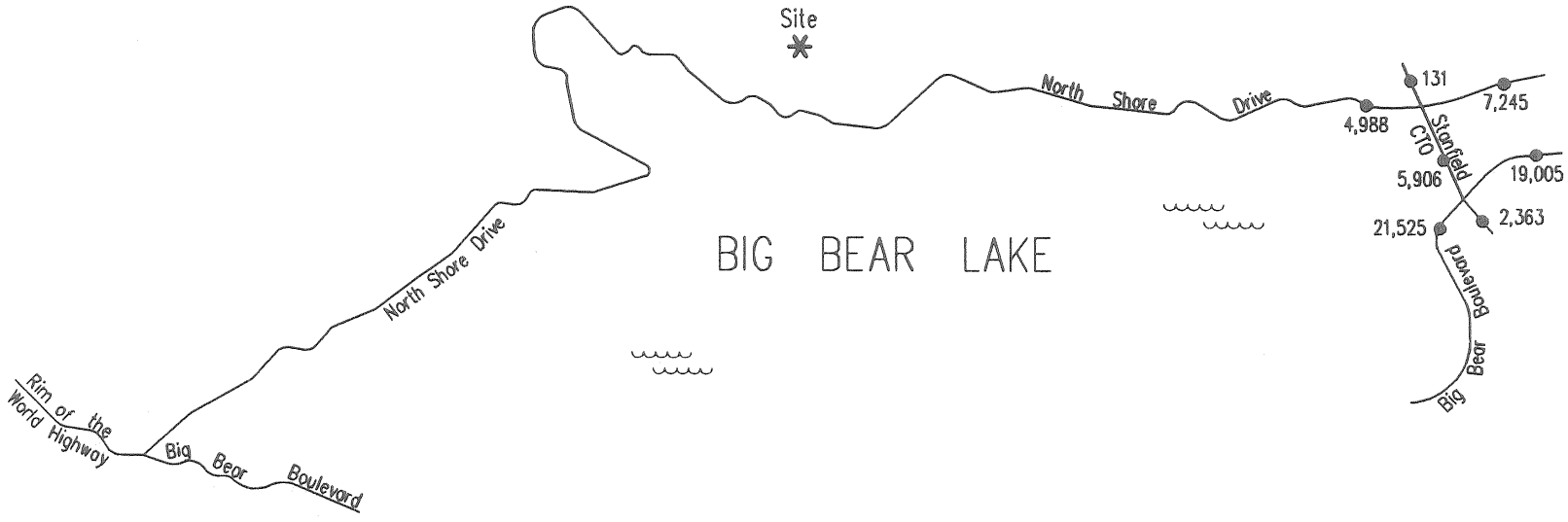
Figure 11
Year 2006 Daily Traffic Volumes – Peak Month*



* Peak month volumes are assumed to be 25 percent higher than average month

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8. Existing + Project + Other Development Traffic Conditions - Year 2006

Substantial additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Figure 12 illustrates traffic conditions including other planned development with the project.

Other Development Growth - Year 2006

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 5 years has been assumed. The total compounded growth over 5 years is 5 percent. The basis of this growth rate assumption is the County of San Bernardino.

Cumulative Conditions Daily Traffic Volumes - Year 2006

Figure 12 displays the cumulative traffic volumes that exist in the peak month when the project traffic volumes and other future development traffic volumes are added to existing traffic volumes. See Table 6 for the calculation of intersection leg daily traffic volumes.

Cumulative Conditions Peak Hour Turning Movement Volumes - Year 2006

Appendix C contains plots of the cumulative conditions peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Cumulative Conditions Intersection Lanes - Year 2006

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of cumulative conditions intersection through and turning movement lanes. The lanes are also listed in Table 1.

Cumulative Conditions Intersection Delay - Year 2006

The Intersection Delay for the cumulative traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Cumulative Conditions Level of Service - Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS F or better for cumulative peak hour traffic conditions based on delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. The project does not have a significant impact on this intersection based on the thresholds of significance described in Section 2. It therefore is not required to mitigate this deficiency.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.

Traffic Signal Warrants - Year 2006

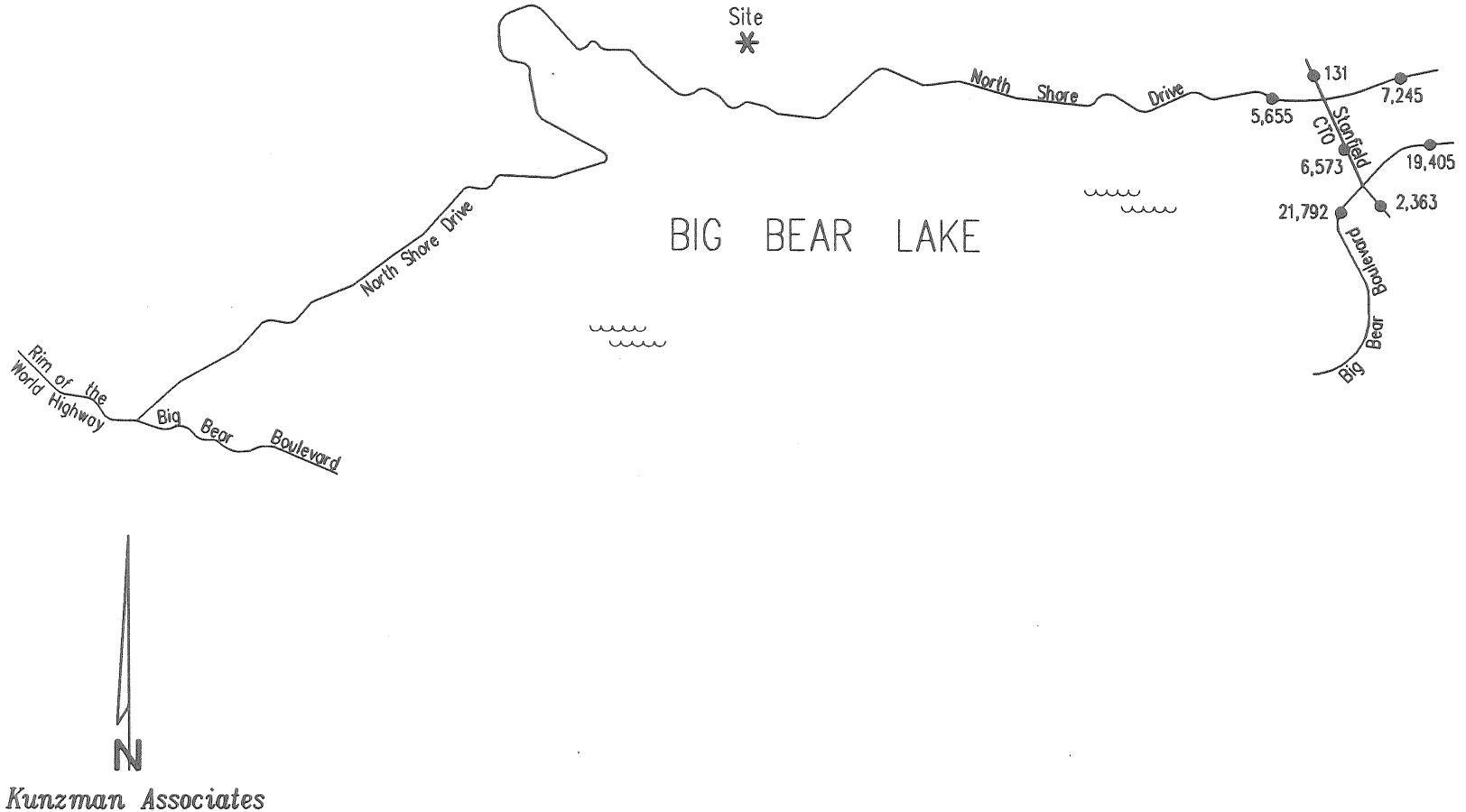
Traffic signals will not be be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Figure 12
Year 2006 Plus Project Daily Traffic Volumes – Peak Month



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9. Existing Plus Other Development Traffic Conditions - Year 2025

After background traffic growth has been added to existing volumes, the traffic impact can be assessed. Figure 13 illustrates the existing plus other development traffic conditions for an average month and Figure 14 for a peak month. The time frame of projection is Year 2025.

Other Development Growth - Year 2025

To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for 24 years has been assumed. The total compounded growth over 24 years is 24 percent. The basis of this growth rate assumption is the County of San Bernardino.

Existing Plus Other Development Daily Traffic Volumes - Year 2025

For existing plus other development traffic conditions the expected daily two-way traffic volumes are as illustrated in Figure 13. See Table 6 for the calculation of intersection leg daily traffic volumes.

Existing Plus Other Development Peak Hour Turning Movement Volumes - Year 2025

Appendix C contains plots of the existing plus other development peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Existing Plus Other Development Intersection Lanes - Year 2025

The Appendix C plots of peak hour turning movement volumes for each intersection also show the number of existing plus other development intersection through and turning movement lanes. The lanes are also listed in Table 1.

Existing Plus Other Development Intersection Delay - Year 2025

The Intersection Delay for the existing plus other development traffic conditions have been calculated and are shown in Table 1.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Existing Plus Other Development Level of Service - Year 2025

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 1, it can be seen that all intersections in the vicinity of the site operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

The eastbound right turn lane needs to be converted to a through lane, and that this will require widening and may require additional right of way. The widening and additional right of way may be needed before or after the intersection, or both. And whether widening and a take of right of way is required at all depends on lane widths and taper lengths required by Caltrans.

The available right of way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino. The traffic study documents the need for the lane and the possible need for widening and right of way. Whether widening and right of way is needed is a function of the design criteria that Caltrans requires. This traffic study is not a design study, and this mitigation measure is not needed by this project. The project has no significant impact on this intersection, and the traffic study merely points out that it is needed to accommodate existing and future traffic volumes.