3.0 EXISTING AND FUTURE NO-BUILD CONDITIONS

To determine if there are deficiencies or problems with the existing highway a detailed analysis was completed looking at traffic volumes, highway geometrics, truck traffic, vehicle speeds, levels of service, crash rates, and other key issues. The analysis considered current and future traffic conditions assuming no changes to the current highway. In support of the analysis, highway and traffic data was collected from a variety of sources including:

- KYTC Highway Information System database;
- KYTC District 1 data sources;
- Study area field reviews;
- Peak hour turning movement traffic counts;
- 24-hour vehicle classification counts; and
- Field spot speed data collection.

3.1 US 51 Highway Characteristics and Average Daily Traffic Volumes

US 51 is the primary north-south highway in the study area. It is an undivided two-lane highway and is functionally classified as a Rural Principal Arterial. US 51 runs from Cairo, Illinois in the north, south through Wickliffe, Bardwell, and Arlington to Clinton. From Clinton it runs south to Fulton and into Tennessee.

In 2002, US 51 carried approximately 2,200 vehicles per day (vpd) north of Clinton and 2,500 vpd south of Clinton. In town, traffic peaks at approximately 7,100 vpd between Clay St. (KY 58 / KY 123) and Mayfield Road (KY 58). Figure 4 (Appendix B) shows average daily traffic volumes on US 51.

A summary of the highway characteristic data for US 51 is presented in Table 1 (Appendix A) and Figure 5 (Appendix B). The highway has adequate lane widths of approximately 11 feet in most portions of the study area. The shoulders are paved and average 4 feet north and south of town. Through town there are minimal shoulders and the curb heights are small (or missing) in some areas due to damaged curbs and pavement overlays. There are utility poles and other objects in close proximity to the highway in some areas. Refer to Figure 6 (Appendix B) for pictures.

The posted speed limit through Clinton ranges from 55 mph on the outskirts of town, to 25 mph in the center of town. The typical right-of-way (ROW) width through town is 50 feet with wider right-of-ways north and south of town as shown in Figure 5. Sidewalks are present on US 51 through much of the town. Some are in good condition, while others are in poor condition (see Figure 6).

There is parking along portions of US 51 in downtown Clinton. Most of the parking on US 51 is parallel parking with angled parking along the curb facing the courthouse. The parking restricts lane widths in some locations such as in front of the courthouse. The parking is also well used.

There are curves (horizontal curves) on US 51 both north and south of Clinton. There are also hills (vertical curves) at various locations north and south of town including just north of Cresap Street, south of Mayfield Road (known as Beeler Hill), immediately south of Martin Road, and near KY 780 (south). Sight distance is limited due to the vertical geometry at a number of these locations. There are two overhead flashing warning beacons on US 51 in the study area, one north of town at the curve near the jail and one south of town at the curve near the KY 780 (north) intersection.

There is one traffic signal on US 51 at the intersection with KY 58 / KY 123 (Clay St.). All other intersections are STOP controlled on the minor street approach. The US 51 / KY 58 (Mayfield Road) intersection is STOP controlled on KY 58, but the stop bar is set back due to the gas station driveway (refer to Figure 6).

Field observations indicate that trucks have a difficult time turning at the US 51 / KY 58 / KY 123 intersection. This is due to narrow travel lanes, inadequate corner radii, and the presence of on street parking on all legs of the intersection. On one occasion, vehicles on KY 58 were observed having to back up to provide adequate clearance for a truck turning from the northbound approach (US 51) onto KY 58. Reports have also been given that drivers have had to move parked cars to make room for an oversized vehicle turning at the intersection. At the US 51 / KY 58 / South St. intersection, the northeast corner does not have a curb and the turning radius is deficient.

3.2 Other Study Area Roadways and Average Daily Traffic Volumes

Other important roadways in the study area include KY 58, KY 123, KY 703, and KY 780. Table 2 presents summary information for each highway. Current traffic volume data is shown in Figure 4 (Appendix B). **KY 58** is a major east-west highway through the study area. It is a two-lane undivided highway and is functionally classified as a Rural Major Collector. KY 58 enters Clinton from the east just south of the Courthouse Square and departs to the west just north of the Courthouse Square. It carries approximately 1,000 to 4,500 vehicles per day (vpd) in the study area. **KY 123** runs east-west through the study area. It is a two-lane undivided highway and is functionally classified as a Rural Major/Minor Collector (depending on location). It carries between 500 and 1,800 vpd through the study area. **KY 703** is a two-lane undivided Rural Minor Collector running northeast from Clinton, out of the study area toward KY 307. It carries less than 1,000 vpd in the study area. **KY 780** is a two-lane undivided Rural Local highway running through the southern portion of the study area. It intersects US 51 just south of Clinton. From this location it runs south and then east to cross US 51 near the southern boundary of the study area. This crossing includes two offset intersections. From that location, KY 780 continues east to intersect KY 58 (Mayfield Road). KY 780 carries less than 200 vehicles per day except at its northern end (near Greg's Supermarket) where it carries approximately 1,650 vehicles per day.

Table 2: Summary of Study Area Roadway Characteristics

ROUTE	FROM MP	TO MP	VEHICLE CLASS	ADT	R.O.W. (FT.)	LANE WIDTH (FT.)	NUMBER OF LANES	POSTED SPEED LIMIT MPH
KY 58	6.273	7.892	Rural Major Collector	920	60	10	2	55
	7.892	9.49	Rural Major Collector	1,010	60	10	2	55
	9.49	9.785	Rural Major Collector	2,170	55	10	2	45
	9.785	10.146	Rural Major Collector	4,430	55	12	2	25
	10.146	10.212	Rural Major Collector	3,270	60	12	2	35
	10.212	11.168	Rural Major Collector	2,450	60	11	2	45
	11.168	13.94	Rural Major Collector	1,600	60	11	2	55
KY 123	5.311	7.55	Rural Minor Collector	490	55	9	2	55
	7.55	7.853	Rural Minor Collector	1,330	35	12	2	35
	7.853	8.86	Rural Major Collector	850	60	10	2	55
	8.86	10.048	Rural Major Collector	1,810	60	10	2	55
KY 703	0	0.065	Rural Minor Collector	310	35	10	2	35
	0.065	0.828	Rural Minor Collector	950	45	10	2	55
	0.828	2.1	Rural Minor Collector	620	45	10	2	55
KY 780	0	0.29	Rural Local	1,650	55	9	2	55
	0.29	3.254	Rural Local	170	55	7	2	55
	3.254	4.096	Rural Local	60	55	8	2	55
	4.096	5.288	Rural Local	70	55	8	2	55
KY 1037	0	0.633	Rural Local	800	50	10	2	55
KY 1728	0	0.202	Rural Local	350	35	10	2	25
	0.202	0.836	Rural Local	130	40	9	2	55
KY 1731	0	0.12	Rural Local	470	35	8	2	25
	0.12	0.35	Rural Local	600	35	11	2	25
	0.35	0.634	Rural Local	950	35	9	2	25
KY 1745	0	0.065	Rural Local	1,480	45	13	2	35
	0.065	0.225	Rural Local	1,050	45	10	2	35
	0.225	0.538	Rural Local	360	45	9	2	35
KY 1826	2.686	4.166	Rural Local	270	45	9	2	55
	4.166	4.785	Rural Local	110	45	9	2	55
	4.785	4.942	Rural Local	770	45	9	2	25
	4.942	5.095	Rural Local	1,290	45	9	2	25
	5.095	5.147	Rural Local	600	35	9	2	25
KY 2206	0	3.337	Rural Local	170	50	9	2	55

Source: KYTC Highway Information System

3.3 Truck Volumes

To determine the current truck volumes on US 51, directional 48-hour vehicle classification tube counts were conducted at three locations in the study area as shown on Figure 7 (Appendix B). The results, given in Table 3, indicate that 18 percent of the observed traffic north of Clinton is truck traffic (10 percent being semi-trailer traffic) and 14 percent of the traffic south of Clinton is truck traffic (7 percent being semi-trailer traffic). Counts were also taken on KY 58 east of Clinton. At this location, 17 percent of the traffic was truck traffic, but only 1.5 percent was semi-trailer traffic. Based on these counts, the truck percentage in the center of town was estimated at 7 percent with about half of that being semi-trailer traffic.

The range of 14 to 18 percent trucks on US 51 is somewhat higher than the statewide average for similar rural principal arterials, which is 13.4 percent.[1] Historic classification

[1] Traffic Forecasting Report 2002, KYTC Division of Multimodal Programs, August 2002, Page 20.

counts on US 51 were obtained to examine historic trends. Four classification counts were taken at mile point 8.00 between 1990 and 2001 as shown in Table 4. During that time, the average truck percentage at that location increased from 15.7 percent to 21.0 percent. The historical data combined with the current truck count numbers indicates that truck percentages may have increased over time. Regardless, it is clear that trucks make up a substantial portion of the traffic steam.

Table 3: 2002 Vehicle Classification Counts

Location	Total Vehicles Per Day	Cars, 2-Axle Trucks, and Motorcycles	Buses and Trucks with 3-4 Axles	Trucks with 5 or more axles (semi-trailers)	Total Truck %
Station 1: US 51 North of Clinton – Milepoint 9.1	2,649	2,164 (82%)	207 (8%)	278 (10%)	18
Station 2: Mayfield Rd. (KY 58) East of Clinton – Milepoint 10.7	2,542	2,116 (83%)	390 (15.5%)	36 (1.5%)	17
Station 3: US 51 South of Clinton – Milepoint 6.7	3,503	3,028 (86%)	246 (7%)	229 (7%)	14

Table 4: Historic Vehicle Classification Counts on US 51

Location	Year	Axles per Truck	Percent Trucks
US 51 at Cresap St. (Milepoint 8.0)	1990	4.023	15.7%
US 51 at Cresap St. (Milepoint 8.0)	1993	3.843	17.5%
US 51 at Cresap St. (Milepoint 8.0)	1994	4.401	12.4%
US 51 at Cresap St. (Milepoint 8.0)	1998	3.664	21.0%

Source: KYTC Multimodal Programs 2001 Vehicle Classification Database

3.4 Spot Speeds

Speed data was collected on US 51 to determine vehicle speeds relative to the posted speed limit. The data was collected manually by recording vehicle description and the time of passage at two points separated by a distance of 100 feet. Vehicle speeds were calculated by comparing the times the same vehicle passed each endpoint. Directional speed data were collected at two locations on US 51; one north and one south of Clinton as shown on Figure 7 (Appendix B). The posted speed limit on US 51 north and south of Clinton is 55 mph. As drivers approach the corporate limits, the speed limit drops to 45 mph, then 35 mph, and then again to 25 mph for a short stretch in downtown Clinton (see Figure 7 in Appendix B). The speed survey locations were just beyond the corporate limits where the speed limit changes from 55 mph to 45 mph north of Clinton and from 35 mph to 45 mph south of Clinton.

In speed studies the most significant statistic is the 85th percentile speed. The 85th percentile speed is the speed threshold at or below which 85 percent of the motorists travel. Generally, speed limits are set within five mph of the 85th percentile speed.

Table 5 presents a summary of the speed statistics for US 51. At Station 1 (north of Clinton), the northbound 85th percentile speed of 60 mph was five mph above the posted 55 mph speed limit. Southbound, the 85th percentile speed was 12 mph higher than the 45 mph posted speed limit. This is not unusual, as drivers often do not begin decelerating until after they have entered the lower speed zone. It should be noted that the 45 mph speed zone at this location is quite short, and located on a curve. At Station 2 (south of Clinton), the southbound 85th percentile speed was five mph less than the 45 mph posted speed limit, while the northbound 85th percentile speed was 8 mph above the posted 35 mph speed limit. Again, the observed speeds were not unusual for transition zones.

Table 5: US 51 Speed Data Summary

Statistics	Station 1		Station 2	
	Northbound	***Southbound***	***Northbound***	***Southbound***
Location (Milepoint)	8.57	8.57	7.28	7.28
Number of Observations	43	40	49	50
Minimum Speed (mph)	38	36	29	24
Maximum Speed (mph)	78	80	48	86
Mean (mph)	53	49	38	36
50th Percentile (mph)	53	48	37	36
85th Percentile (mph)	60	57	43	40
Posted Speed Limit (mph)	55	45	35	45
Difference (85th – Posted)	+5	+12	+8	-5

3.5 Traffic Analysis Methodology

Study Intersections and Highway Segments

The US 51 study in Clinton focused on critical intersections and highway segments in the study area. Specifically, traffic operations were examined at the following locations:

Intersections

- US 51 at KY 58 / KY 123 (Clay Street) - Signalized
- US 51 at KY 58 (South Street/Mayfield Road) - Unsignalized

Highway Segments

- US 51 south of Clinton
- US 51 north of Clinton

Intersection Analysis

For this analysis the Highway Capacity Software package (HCS 2000) was used to assess the morning and afternoon (AM and PM) peak hour traffic operating conditions for both current and future years. This software package implements the Highway Capacity Manual intersection analysis method. For each study intersection, average vehicle delays were calculated as well as the resulting levels of service.

Level of service (LOS) is a qualitative measure of expected traffic conflicts, delay, driver discomfort, and congestion. Levels of service are described according to a letter rating system ranging from LOS A (free flow, minimal or no delays – best conditions) to LOS F (stop and go conditions, very long delays – worst conditions). For intersections the Highway Capacity Manual defines levels of service based on the average delay due to signal or STOP control as shown in Table 6.

Table 6: LOS Criteria for Intersections

LOS	Signalized Intersections Control Delay (seconds/vehicle)	Unsignalized Intersections Control Delay (seconds/vehicle)
A	≤ 10	≤ 10
B	>10 – 20	>10 – 15
C	>20 – 35	>15 – 25
D	>35 – 55	>25 – 35
E	>55 – 80	>35 – 50
F	>80	>50

Source: Highway Capacity Manual (2000)

In general terms, a facility is considered to have reached its physical capacity at LOS E. However, for rural conditions, LOS C is often considered the threshold for desirable traffic conditions. In this study, levels of service below this threshold are noted as undesirable and warrant improvement. LOS C corresponds to ≤ 35 seconds of delay per vehicle at a signalized intersection and ≤ 25 seconds of delay at an unsignalized intersection.

Rural Two-Lane Highway Analysis

A peak hour traffic operations analysis was prepared for segments of US 51 north and south of town using the Highway Capacity Software two-lane road analysis package. This is based on the 2000 Highway Capacity Manual (Chapter 20) methodology. For this method, there are two classes of roadways: Class I highways include higher speed arterials and daily commuter routes, while Class II highways include lower speed collector roadways and roads primary designed to provide access. Driver expectations regarding speed and flow are important in determining a highway's class. US 51, as the main arterial and as the major through-route, is a Class I highway.

Levels of service for Class I highways are based on the estimated average travel speeds and percent time vehicles spend following other vehicles as shown in Table 7. Again, LOS C is the threshold used for desirable traffic operations in this study. Operations below this threshold are noted as undesirable and warrant improvement. For Class I highways, LOS C corresponds to an average travel speed of >45 miles per hour with ≤65 percent of the time spent following another vehicle.

Table 7: LOS Criteria for Two-Lane Highways

LOS	Class I Highways	
	Percent Time Spent Following	Average Travel Speed
A	≤ 35	>55
B	>35 - 50	>50 – 55
C	>50 - 65	>45 – 50
D	>65 – 80	>40 - 45
E	>80	≤40
F	LOS F applies whenever the flow rate exceeds the capacity	

Source: Highway Capacity Manual (2000)

3.6 Existing Traffic Operating Conditions

Intersection Level of Service and Delay

In order to evaluate the current traffic conditions at the two study intersections, a.m. and p.m. peak period turning movement counts were conducted at each location. Figure 8 (Appendix B) shows the intersection controls, geometrics, and turning movement volumes. The approaches to all intersections are single lane approaches (i.e. there are no turn lanes). The resulting 2002 levels of service during the peak hours counted are LOS B or better for both locations as shown in Table 8. Figure 9 (Appendix B) illustrates the levels of service graphically. On Figure 9, the LOS displayed for the unsignalized intersection is that of the stop-controlled approach with the highest delay (the HCM method does not calculate whole intersection levels of service for unsignalized intersections).

Table 8: 2002 Intersection LOS Summary

Int. No.	Intersection	Type	LOS AM	LOS PM
1	US 51 (Washington St.) / KY 58 / KY 123 (Clay St.)	Signal	B	B
2	US 51 / KY 58 (Mayfield Road)*	2-Way STOP	B	B

* LOS is for the intersection approach with the highest delay.
Note: LOS analysis is based on the peak hour count data

Two-Lane Highway Level of Service and Delay

The current traffic volumes and roadway characteristics were used to evaluate operating conditions on US 51 north and south of Clinton. The analysis showed that both highway segments are currently operating at LOS C or better with average travel speeds of 49 to 51 mph and a percent time-spent following ranging from 36 to 51 percent. This indicates that the roadways north and south of Clinton are functioning in an acceptable manner. The segment levels of service are illustrated on Figure 9 (Appendix B).

3.7 Future No-Build Traffic Operating Conditions

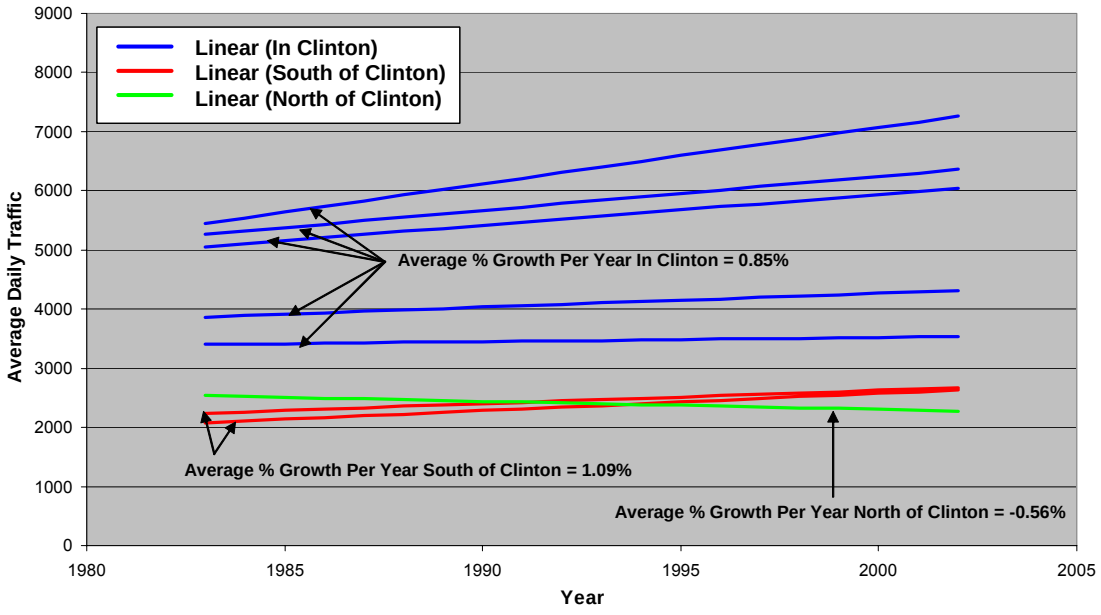
Traffic projections were developed for 2010, 2020, and 2030 to determine how the highway system would function if no improvements (beyond normal maintenance) were made during that time period. This scenario is referred to as the No-Build Scenario. The No-Build Scenario provides a snapshot of future traffic conditions, highlighting expected problems and deficiencies. It also provides a baseline for developing and evaluating possible build alternatives. Typically, projects that are under construction or planned for construction in the KYTC Six-Year Plan are taken into account in this analysis. However, in this study area there are no significant planned projects that would affect the future No-Build traffic conditions. (For further discussion of planned projects refer to Chapter 5.)

Future Traffic Volumes

Traffic growth on US 51 in Clinton has varied over the last 19 years with an average growth rate of 0.74% per year at the eight study area count stations from 1983 to 2002. Since the beginning of the study, new traffic counts were taken for 2003, indicating

traffic may not be growing as fast as previously indicated. However, as a result of consolidation of the count stations, the new data for 2003 is not directly comparable to the previous analysis and was not included. Based on data from 1983 to 2002, traffic volumes on US 51 have increased in town and south of town by about 20 percent since 1983, but decreased north of town by about 10 percent since 1983. This decline in traffic volumes north of town could be due in part to traffic shifting to Interstate 55 in Missouri. For comparison purposes, historic data for the eight count stations was examined for 1983 to 2002 using linear interpolation. The stations were grouped by location (in town, north of town, and south of town) to show traffic trends over the last 19 years. These results are shown in Figure 10. Traffic growth at the five in town count stations had a modest growth rate, averaging 0.85% annually. Growth south of town showed the highest increase at 1.09% per year. Traffic actually decreased north of town at a rate of -0.56% per year. However, for purposes of this study a 1.5% traffic growth rate was applied to evaluate how traffic conditions would change if the growth rate were higher. Figure 11 (Appendix B) shows average daily traffic volumes (ADT) on US 51 for 2010, 2020, and 2030 using this higher 1.5% growth rate. Traffic volumes for 2002 are included for comparison purposes.

Figure 10: US 51 Historic Traffic Volumes (1983 to 2002)



Intersection Level of Service and Delay

No-Build Scenario levels of service for the two key intersections on US 51 were evaluated using the projected traffic volumes. As mentioned previously, both intersections currently operate at LOS B based on the 2002 peak hour count volumes. Table 9 provides a summary of the future year levels of service for each intersection. Figure 12 (Appendix B) illustrates the 2030 intersection LOS for both of these intersections, giving the worst approach LOS for the unsignalized intersection.

In 2010, the existing signal at US 51 / KY 58 / KY 123 (Clay Street) will operate at a good LOS by maintaining appropriate signal timing. However, based on the projected design

hour volumes, the eastbound and northbound approaches to US 51 / KY 58 / KY 123 may begin to operate poorly in 2020. Based on the assumed traffic growth, the LOS at this intersection will degrade further in the future, and in 2030 the intersection operates at LOS E overall. However, if traffic does not increase in the future at the assumed 1.5 percent per year growth rate, these levels of service may be better than are shown.

For the intersection of US 51 and Mayfield Road (KY 58) the side street approaches may begin to experience undesirable delays in 2010 as shown in Table 9. The side street approaches continue to decline over the next 20 years and operate at LOS F in 2030. The poor levels of service are related to delays for vehicles turning left to / from US 51.

Table 9: PM Peak Hour Intersection Levels of Service for No-Build Scenario

Int. No	Intersection	Type	Approach	2002		2010		2020		2030	
				Ave. Delay	LOS	Ave. Delay	LOS	Ave. Delay	LOS	Ave. Delay	LOS
1	US 51 / KY 58 / KY 123 (Clay Street)	Signal	Eastbound	13.8	B	33.7	C	62.8	E	145.5	F
			Westbound	12.9	B	20.0	C	26.0	C	33.3	C
			Northbound	17.0	B	32.1	C	53.3	D	61.5	E
			Southbound	15.9	B	16.0	B	16.7	B	15.1	B
			Whole Int.	15.7	B	26.6	C	41.5	D	61.6	E
2	US 51 / KY 58 (Mayfield Road)	2-Way STOP	Eastbound	14.0	B	45.3	E	138.1	F	*	F
			Westbound	14.9	B	39.8	E	329.8	F	*	F
			Northbound	7.9	A	8.0	A	8.1	A	8.2	A
			Southbound	7.8	A	9.1	A	9.7	A	10.3	B

Notes: Only the p.m. peak is shown, as it represents the higher of the two peak periods.
The 2000 Highway Capacity Manual analysis methods were used (implemented by HCS 2000).
2002 LOS analysis employed the peak hour count data collected for the study.
2010-2030 LOS analyses used projected ADT with design hour and directional distribution factors and the turn percentages from 2002 turning movement counts; 2010 and 2020 ADT were based on linear growth.
For 2010, 2020, and 2030 the signal timing was optimized.
Average delay is in seconds per vehicle.

Installation of a traffic signal at the intersection of US 51 and Mayfield Road was evaluated based on the poor operating conditions for the side street approaches in the future. According to the Manual on Uniform Traffic Control Devices (MUTCD), a traffic control signal should not be installed unless one or more of the warrants detailed in the manual are met. For this intersection, the estimated 2010 traffic volumes are just above the minimum vehicular volume threshold for the Eight-Hour warrant, indicating that a signal may be warranted in 2010.[2] The 2020 volumes are higher still, indicating that a signal is even more likely to be warranted by 2020. According to this analysis and assuming traffic grows at 1.5 percent per year, a traffic signal could be installed as early as 2010, however, other issues should be considered in this evaluation, including the additional delay to through traffic on US 51 and the delay to all motorists during non-peak periods.

[2] The 70% value was used because the community is an isolated community with a population of < 10,000.

Two-Lane Highway Level of Service and Delay

The two-lane highway methodology was used to assess the future traffic conditions on US 51 outside of town. As shown on Table 10, all four study segments will continue to operate acceptably at LOS C through 2030 without improvements. Figure 12 (Appendix B) illustrates the year 2030 segment LOS results.

Table 10: PM Peak Hour Two-Lane Levels of Service for No-Build Scenario

Segment	2002	2010	2020	2030
KY 1728 to KY 1540	C	C	C	C
KY 1540 to KY 288	B	B	B	C
KY 1529 to KY 780	C	C	C	C
Fulton Co. Line to KY 1529	B	C	C	C

Note: Only the p.m. peak is shown, as it represents the higher of the two peak periods.

3.8 Crash Analysis

The Kentucky Transportation Cabinet provided crash data for a three and one half-year period from January 1, 1998 through June 30, 2001. During this period, 21 crashes occurred on US 51 within the study area (between mileposts 4.508 and 9.871).

Crash rates were computed for five specific segments of US 51 within the study area. Segment crash rates are typically expressed in terms of crashes per 100 million vehicle-miles to take into account the amount of traffic on a particular highway segment. A segment's crash rate is then compared to a statewide critical crash rate for the same type of roadway to identify high crash locations. Highway sections with a crash rate higher than the critical crash rate are considered high crash locations and are potential candidates for safety improvements.

For the segments of US 51 studied, none of the observed crash rates exceeded the critical rate for that roadway type. The observed crash rate to critical crash rate ratios ranged from 0.11 to 0.67, indicating that all segments are below the critical crash rate. Table 11 shows the crash statistics for the segments analyzed.

Table 11: Segment Crash Analysis

Section	Description	Total Crashes	ADT	Section Length (miles)	Statewide Average Crash Rate	Section Crash Rate	Section Critical Rate	Critical Crash Rate Factor
1	MP 4.508 to 5.38	6	2650	0.872	131	203	303	0.67
2	MP 5.38 to 6.65	5	2630	1.27	131	117	274	0.43
3	MP 6.65 to 7.65	6	5500	1	131	85	242	0.35
4	MP 7.65 to 8.88	3	5460	1.23	131	35	232	0.15
5	MP 8.88 to 9.871	1	2400	0.991	131	33	300	0.11

Notes: Crash data for January 1, 1998 to June 30, 2001
Rates are in crashes per 100 million vehicle-miles.
Critical crash rate factor is the section crash rate divided by the section's critical crash rate.

A crash cluster analysis was also conducted for the study area. Two crash clusters were identified: one near US 51 and Martin Road and a second near US 51 and KY 780 (south) as shown on Figure 13 (Appendix B). A spot crash analysis was conducted to determine how the crash rates at these two "spots" compared to the critical spot crash rates for similar facilities (refer to Table 12).

Table 12: Spot Crash Analysis

Location	Begin MP	End MP	No. of Crashes	Analysis Period (Years)	Average ADT	Spot Crash Rate*	Critical Crash Rate*	Ratio of Spot Rate to Critical Rate
US 51 at Martin Rd.	6.5	6.8	6	3.5	4,100	1.15	1.69	0.68
US 51 at KY 780 (South)	5.1	5.4	3	3.5	2,700	0.87	1.89	0.46

* Crashes per million vehicles

As indicated in the table, the spot crash rate observed on US 51 at Martin Road was lower than the critical crash rate. A review of the crash data showed that all six crashes were non-injury. The spot crash rate observed on US 51 at KY 780 South was also lower than the critical crash rate. Two of the three observed crashes were non-injury. The crash analysis also showed that one fatal crash was recorded at US 51 and KY 780 North. Details for the spot crashes are shown in Tables 13 through 15 (Appendix A).

3.9 Pedestrian and Bicycle Facilities

There are no marked bicycle routes in Clinton. There are sidewalks on portions of US 51 in Clinton, as well as on some side streets. Some segments of US 51 in Clinton do not have sidewalks and there are no sidewalks outside of the town. The condition of the existing segments ranges from good to poor with much of the current sidewalk system in poor condition. Two specific locations in town with deficient sidewalks are at Cresap Street and at North Street. At these locations, there are gas stations / markets with full-width curb cuts and no sidewalks. There are no striped crosswalks or pedestrian signals on US 51. Also, there are no school warning signals or crossing guards.

3.10 Existing and Future No-Build Traffic and Highway Conditions Summary

An analysis of the existing and future No-Build traffic and highway conditions on US 51 in the Clinton area was performed considering the following items: average daily traffic volumes, vehicle classification information, speed data, levels of service, highway geometry, pedestrian facilities, and crash data. US 51 currently carries between 2,000 and 7,000 vehicles per day with 7 to 18 percent truck traffic. Traffic growth in the study area has been modest (0.74%) over the last 19 years (however a conservatively high growth rate of 1.5% was employed in the study). There are a number of geometric issues that were identified such as limited shoulders, missing curb sections, inadequate clear zones, intersections with deficient turning radii, and deteriorated sidewalks. The speed data did not show any clear problems, though vehicle speeds entering the town in the transition zones are higher than the posted speed limits. The current (2002) levels of service are generally LOS C or better for all intersections and road segments,

indicating little vehicle delay and good traffic operation conditions from a capacity standpoint. However, in the future the level of service for some of the intersections will drop below LOS C because of poor operating conditions generally associated with the left turn movements to and from the minor streets onto US 51. The crash analysis did not reveal a crash problem on US 51 in the study area when compared to the statewide critical crash rates for similar roadways.