Map provided by Google Maps

Figure 4 – Average Daily Traffic Volumes

Existing Corridor Level of Service

The quality of vehicle operation throughout a corridor can be quantified through a capacity analysis. This analysis is outlined in Chapter 21 of the Highway Capacity Manual, and provides a grade for operation known as Level of Service (LOS). Level of service consists of a grade assignment "A" through "F", with "A" the best and "F" the poorest, based upon vehicle delay during the commuter peak period. Analysis of the traffic volume data suggests a maximum peak hour traffic flow rate of approximately 800 vehicles per hour, with a maximum lane peak hour traffic flow rate of approximately 500 vehicles per hour. The data also indicated an average vehicular speed between 35-38 mph. Analyzing the data using Exhibit 21-3 from the Highway Capacity Manual pictured in Figure 5, the existing roadway operates at level of service B, which is a good level of service.

Highway Capacity Manual 2000

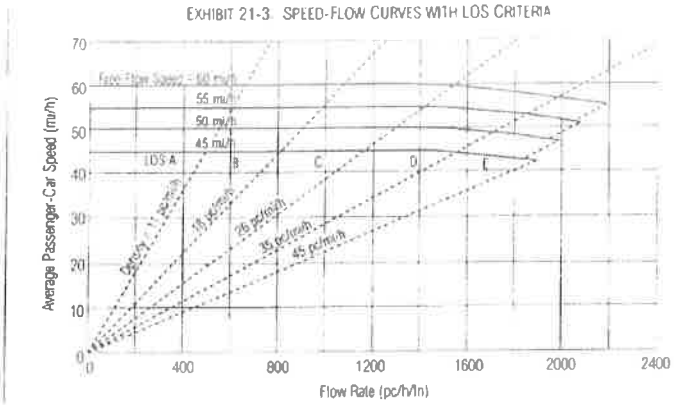

Figure 5 – Speed-Flow Curve with LOS Criteria

The KCMO travel demand model for the year 2030 has forecast a daily traffic volume for NE 72nd Street on the existing four lane streets section of about 20,000 vehicles. It should be noted here that elsewhere in the KCMO model where major streets have been modeled both as a four lane road and also as a three lane road, that the three lane road forecast is more than 20 percent less than the four lane projection. Applied to NE 72nd Street, that would mean a 2030 daily traffic volume on a three lane road of about 16,500 vehicles per day. Those projections could reduce the level of service in the corridor to LOS D by 2030. However, a 20 year forecast should not be relied upon too heavily, in that changes in transportation paradigms, such as increasing fuel prices, greater availability of pedestrian and bicycle facilities, and changes in land use patterns all can cause a significant reduction in traffic volumes.

Crash Analysis

The City compiled crash reports for a one year period between January 1, 2008 and December 31, 2008. Fifty crashes were recorded on 72nd Street between North Broadway and North Antioch. Of those fifty, nine crashes were attributed to improper change of lanes between the two through lanes in each direction. Providing only one through lane in each direction would have eliminated those nine crashes, or nearly twenty percent of the crashes.

There are benefits of the alternative street section. Implementing the proposed street section would provide an additional five feet of separation between pedestrians and vehicular traffic. The reduction in average speed would potentially offer more pedestrian and bicycle friendly attributes.

Signalized Intersection Capacity Analysis

Signalized intersections are typically the controlling locations in the capacity of a corridor to carry traffic, because the available time to move traffic must be shared with cross street traffic. BWR analyzed the capacity at the signalized intersections along NE 72nd Street using the methodology contained in the Highway Capacity Manual. The method for calculating intersection LOS is different than the method for determining corridor LOS. The criteria for defining LOS for signalized intersections is based on average vehicle delay for all vehicles entering the intersection during the peak hour. Table A identifies the thresholds for each LOS.

Table A - Level of Service Criteria

LOS	Signalized Intersection Avg. Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Signalized intersection capacity analysis was performed using the traffic analysis software Synchro 7.0 and reported using the Highway Capacity Manual signalized reports. The raw turning movement traffic counts have been included in the appendix.

Capacity analysis was completed for existing conditions along the corridor for the following intersections:

- NE 72nd Street and North Broadway
- NE 72nd Street and North Oak Trafficway
- NE 72nd Street and Troost Avenue
- NE 72nd Street and Euclid
- NE 72nd Street and Missouri Route 1

The results of the capacity analysis for the peak hours of existing traffic are summarized in Table B.

Table B - Capacity Analysis for Existing Conditions

Intersection	PM	
	Delay (sec/veh)	LOS
NE 72nd Street and North Broadway	9.3	A
NE 72nd Street and North Oak Trafficway	44.2	D
NE 72nd Street and Troost Avenue	26.8	C
NE 72nd Street and Euclid	25.2	C
NE 72nd Street and Missouri Route 1	73.4	E

The proposed street section would provide improved LOS at the intersections of Troost Avenue and Euclid with NE 72nd Street. This improvement would be a result of modifying the traffic signal phasing to allow east/west traffic to operate simultaneously. This is because the left-turning vehicles would be able to utilize the TWLTL at the intersections as a left turn lane. The improved operation at these intersections would also promote improved operations throughout the corridor. The capacity analysis results for all intersections during the peak hour for the proposed alternative typical street sections are summarized in Table C.

Table C - Capacity Analysis for Alternative Conditions

Intersection	PM	
	Delay (sec/veh)	LOS
72nd Street and North Broadway	9.3	A
72nd Street and North Oak Trafficway	42.6	D
72nd Street and North Troost Avenue	12.7	B
72nd Street and Euclid	13.7	B
72nd Street and Missouri Route 1	73.5	E

The resultant change in the carbon footprint for the peak hour analysis period for the five signalized intersections combined can be evaluated by comparing the change in fuel consumption and emissions as summarized in Table D. The analysis shows that the conversion from 4 lanes to 3 lanes plus bike lanes will reduce fuel consumption and emissions by about 7 percent.