



Memorandum

To: Mike Schulte, Public Works Director

From: Justin Jackson, P.E.
Mark A. Perington, P.E., PTOE *MAP*

Date: October 17, 2012

RE: W Broadway Street Traffic Study
City of Polk City
S&A Project Number: 112.0767

Location: West Broadway Street from 3rd Street to Tournament Club Way

Citizen Request/Concern: At the request of citizens and staff, the Council directed the Engineer to review and evaluate current traffic operations, safety, signing, markings, sidewalks and intersection traffic control within the corridor.

Traffic Control Devices/Markings:

Geometry: W Broadway St is a curbed two lane minor arterial roadway with marked bike lanes.

Speed Limit: 25 mph from 3rd St to S 5th St
35 mph from S 5th St to north of Tournament Club Way

Traffic Control: W Broadway St is STOP controlled at 3rd St with an all way stop. The minor approaches on W Broadway St are STOP controlled for the entire length of the study corridor. A temporary STOP sign is placed at the marked pedestrian crossing at Oakwood Dr, during school arrival/dismissal times.

Pedestrian Facilities: W Broadway St has sidewalk along the southside from 3rd St to Tournament Club Way but does not have sidewalk on the northside and few of the intersecting streets have sidewalk north of Broadway St. Two pedestrian marked crosswalks are located at Parker Blvd and Tournament Club Way and one marked school crossing is located on the west leg of the intersection of Oakwood Dr. The current marked crosswalks connect the sidewalk along the southside of Broadway to the northside but the northside does not have sidewalk and the intersecting streets do not have sidewalk north of Broadway St that lead to any homes.

Sight Distance: Sight distance at the intersection with Parker Blvd was evaluated due to the retaining wall in the southeast quadrant of the intersection per AASHTO *Green Book 2011*, design standards for urban streets. The departure sight triangle for vehicles stopped on the Parker Blvd making a left turn is shown in the figure below. The intersection sight distance for a left turning vehicle on Parker Blvd is 390 feet. Adequate sight distance is provided for the recommended set back from the edge of roadway of 14.5 feet which could also be reduced to the minimum of 8 feet.

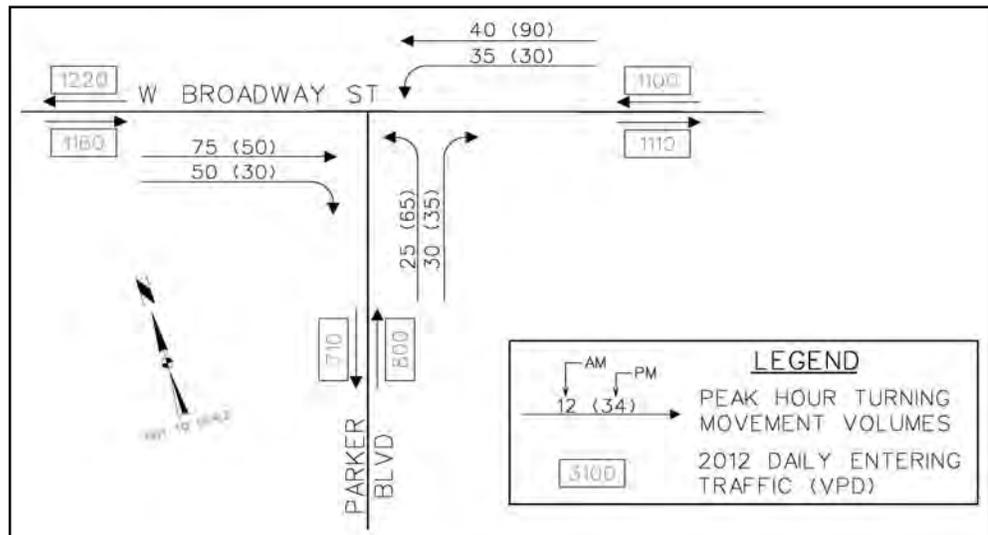


Traffic Volumes: The Engineer collected 24-hour tube counts on west leg of the intersection of Parker Blvd and W Broadway St. This count supplemented the manual turning movement counts that were collected at the intersection by the DOT in July. Both the inbound and outbound traffic volumes were recorded. The daily traffic volume from the road tube counts were 35 vehicles higher than the DOT count shown in the figure below. The peak hour traffic volumes of the road tube counts were approximately equal when compared to the DOT counts performed in July. The detailed breakdown of the counts are attached.

Date of Count: DOT Turning Movement July 24, 2012; 24-hour tubes October 9-11, 2012

Location of Count: Parker Blvd and W Broadway St

Peak Hour & Average Daily Volumes:
 (per IDOT)



Speed: The Engineer performed a speed study on W Broadway St west of the intersection of Parker Blvd. Speeds were collected for both eastbound and westbound vehicles with the tube counter. The average, and 85th percentile speeds are listed for combined eastbound and westbound vehicles. The speed data report is attached.

Date of Study: October 9-11, 2012

Average Speed: 33 mph

85th %tile Speed: 38 mph

Other: 93% of all vehicles were less than 40 mph and 99.5% of vehicles drove less than 45 mph.

Gap:
(defined as the time duration between two vehicles traveling same or opposite directions)

The Engineer performed a gap study on W Broadway at the intersection of Oakwood Dr. The study was performed during vehicle peak hour and arrival/dismissal of North Polk West Elementary School to determine the number of adequate gaps in the traffic stream for a pedestrian to safely cross Broadway St. During school dismissal one adult and five children crossed Broadway St at Oakwood Dr and two children crossed Broadway St at Juliana Ct. During school arrival one adult and one child crossed Broadway St at Oakwood Dr. No other pedestrian were observed crossing Broadway St during the study.

Date of Study: October 11, 2012 (3:00-3:00 PM & 4:45-5:15 PM) & October 12, 2012 (7:45 -8:30 AM)

Adequate Gaps: Based on the street width, walking speed and reaction time an adequate gap to cross Broadway Street at the marked pedestrian crossing at Oakwood Dr is 13 seconds. The table below lists the number gaps greater than 13 seconds per 15 minute time period during the study.

Time	Gaps >13 Seconds	Total # Gaps	Average Gap
7:45 AM	50	114	12-13 seconds
8:00 AM	35	68	16-17 seconds
8:15 AM	42	77	14-15 seconds
3:00 PM	47	79	16-17 seconds
3:15 PM	45	57	28-29 seconds
4:45 PM	59	109	16-17 seconds
5:00 PM	52	104	14-15 seconds

Collision History: Crash reports were analyzed from the Iowa DOT crash database for reported crashes from January 2007 to December 2011. The City Police Department provided crash reports from January 2012 to present for the corridor. Eleven crashes were reported during the 5.75 year period, with the following breakdown of crash severities/types:

- 1 major injury (recent pedestrian crash @ Parker)
- 1 minor injury (failure to yield at 3rd St)
- 9 property damage only
 - (3 rear end at driveways, 2 weather related, 1 animal, 2 left turn at intersections, and 1 single vehicle left road during construction)

One crash near the intersection of Parker Blvd involved a pedestrian. The nature, frequency, and locations of crashes do not conclude there is a safety deficiency or a correctable measure.

Area Growth: Recent proposed development along the study corridor includes TCI Pod K, southeast of Tradition Dr; Broadway Estates, north of Tournament Club Way; and north of Jester Park Rd. TCI Pod K includes a 65 room hotel, 28 unit townhomes and 8 single unit family homes. Broadway Estates includes 8 single unit family homes. The development north of Jester Park Rd includes 168 single unit family homes.

The table below lists the trip generation potential (inbound & outbound) per each development by daily, AM peak hour, and PM peak hour. All developments will be serviced by Broadway St and the number of trips will be added to existing traffic volumes and follow the same distribution. Of the 1,690 trips generated from Broadway Estates and Jester Park Rd Development, one-third of trips will use Parker Blvd to/from their destinations adding to the Parker Blvd traffic volume. Construction on TCI Pod K and Broadway Estates will start this fall with the start of Jester park Rd development starting next year. During the construction of these developments, traffic generated from the construction can be as great or greater than the number of trips generated from the development once construction is completed.

Land Use	Size	Trips Generated		
		Daily	AM	PM
TCI Pod K				
Suites Hotel	65 Room	320	25	25
Town Home Unit	28 Unit	160	10	15
Single Family Unit	8 Unit	80	5	10
Broadway Estates				
Single Family Unit	8 Unit	80	5	10
Jester Park Rd				
Single Family Unit	168 Unit	1610	125	170

Thus following 100% development of these new projects, it is possible for traffic on Broadway west of Parker to increase to the 4,000 vehicles per day range, however a two lane roadway like Broadway has the potential to adequately serve traffic in the 8,000 to 10,000 vehicles per day range.

Recommendations: Sidewalk continuity should be provided along the northside of Broadway St between the few places that sidewalk is installed along the northside and all marked crosswalks. When sidewalk is installed curb ramps should be provided with truncated dome panels per SUDAS specifications. In order to provide sidewalk along the entire length of Broadway St, priorities and timeframes are suggested for installing sidewalk.

The first phase of sidewalk to be installed, should be included in the Booth St trail project from Booth St to the Kum n Go property. A marked trail crossing at Booth St should be provided allowing pedestrians and trail users to cross Broadway St and provide pedestrian access to Juliana Ct residents. This phase is expected to be completed by the end of the next construction season.

The second phase of sidewalk is from Booth St to King's Pl. Some portions of this sidewalk will be installed with TCI Pod K developments but the majority of sidewalk will be installed on occupied residential lots. The sidewalk along TCI Pod K will be installed within the next three years. A marked school crossing should be provided at the east school entrance, between the school entrance and King's Pl. The new marked school crossing should match the existing school crossing. The school advance crossing assemblies east of the new crossing will need to be relocated 550' east. Temporary STOP signs should also be installed at the crossing and used in the same manner as the existing marked school crossing if the City believes it is beneficial in the crossing activity. Although temporary STOP signs are not allowed per MUTCD, but allowed per Iowa Code, they should mimic as closely as possible the MUTCD guidelines with respect to mounting height and position from the roadway to command driver respect and attention.

The third phase of sidewalk installation is from King's Pl to Tournament Club Way. Approximately half the properties along this portion are undeveloped and should require sidewalk as part of the construction of the site. The remaining properties are occupied.

With the first phase of sidewalk part of the Booth St trail project, the second phase of sidewalk should be constructed within the next three years. This will provide TCI Pod K development connectivity via sidewalks and also provide pedestrian access to the school for residents from King's Place to 3rd St. Depending on the number of school aged children attending West Elementary School and residing north of Broadway St, Safe Routes to School Funding may be an alternative method to provide funding for the sidewalks not included in the developments. A long term goal which will be dependent on the number of housing units constructed north of Tournament Club Way, is the sidewalk connection from King's Pl to the west.

Additional recommendations to the study corridor include signing and traffic control. The intersection of Parker Blvd and Broadway St was evaluated for All-Way STOP control. Based on the traffic volume, side street delay, adequate gaps in Broadway St traffic, crash history and adequate sight distance provided, an All-Way STOP control is not recommended. To reduce visual clutter for motorists, unnecessary signage should be removed by City or County. All horizontal alignment (curve) warning signs should be removed since the posted speed limit and advisory speed is within 10 mph difference. The STOP AHEAD warning sign on Broadway St for eastbound traffic for the intersection with 3rd St should be removed.