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Monroe High School Traffic Impact Analysis

- School Driveway with 31st Avenue (no existing intersection)
- School Driveway with CTH KK (no existing intersection)
- School Driveway (8 ½ Street extension/connection) to 32nd Avenue (no existing traffic control)
- 13th Street with 31st Avenue (two-way stop sign control)
- 31st Avenue with 8 ½ Street (one-way stop sign control)
- 6th Street with 6 ½ Street (two-way stop sign control)
- 6th Street/STH 59 with STH 11 southbound ramps (one-way stop sign control)
- 6th Street/STH 59 with STH 11 northbound ramps (one-way stop sign control)
- CTH KK with STH 11 (two-way stop sign control)

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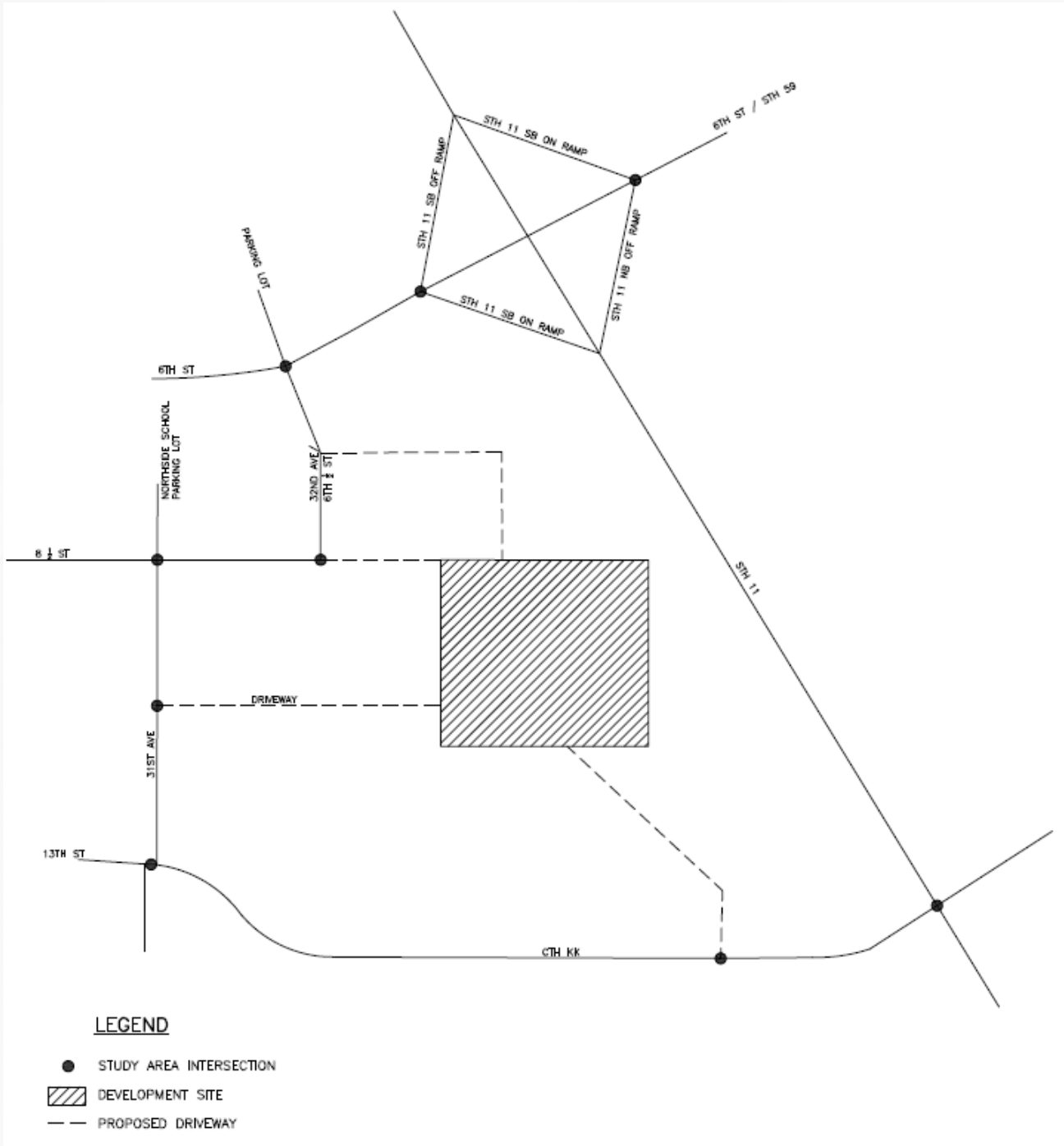

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3. Off-Site Development Description

A residential subdivision containing 113 lots east of 32nd Avenue is proposed. The proposed development would only significantly affect the intersections of 6th Street with 6 ½ Street and 6th Street/STH 59 with STH 11. The Institute of Transportation Engineers' (ITE) trip generation web-based app was used to find the trip generation for the residential development.

4. Site Generated Traffic

The traffic volumes generated by the new high school location are expected to be equal to the current traffic volumes from the existing high school. Traffic turning movement counts at the existing high school access points/driveways for the weekday AM (morning) and PM (afternoon) peak hours were acquired. The morning arrival and afternoon dismissal peak hours were selected to capture/analyze the school's morning peak hour of parent drop-off, staff arrival, and bus drop-off (school arrival peak); the school's afternoon peak hour to capture the parent pick-up, bus activity and after school activity traffic (school dismissal peak).

Table 3. Vehicular Trip Distribution

	Driveway Entrance			
	31st Ave	6 ½ St	CTH KK	8 ½ St Extension
Scenario 1a	30%	70%	-	-
Scenario 1b	70%	30%	-	-
Scenario 2	45%	40%	15%	-
Scenario 3	35%	35%	15%	15%
Scenario 4a	70%	-	30%	-
Scenario 4b	30%	-	70%	-

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B. Traffic Volumes

The weekday morning and evening peak hours are expected to drive the improvements needed to adequately accommodate the proposed development, as they represent the highest trip generation for the site. The weekday morning (6:30 to 8:30 am), and the weekday evening (2:30 to 6:00 pm) turning movement counts were conducted at the existing study area intersections and at the intersections surrounding the existing school location in late September and early October of 2023. The traffic count data collected for each study intersection is in Appendix A.

Table 2. LOS Descriptions

LOS	Control Delay/Vehicle (sec/veh)	Unsignalized Intersection - Traffic Flow Description	Relative Delay
A	≤ 10	Free-flow traffic operations at average travel speeds. Vehicles completely unimpeded in ability to maneuver.	Short Delays
B	> 10 - 15	Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays.	
C	> 15 - 25	Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds.	
D	> 25 - 35	Increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, thus preventing excessive backups.	Moderate Delays
E	> 35 - 50	Significant delays. Travel speeds reduced to one-third of average free flow. Delays travel speed.	
F	> 50	Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections.	Long Delays

Source: Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

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Table 5. LOS with Proposed Traffic Volumes

Intersection	Approach	Existing (2024)		Scenario 1				Scenario 2		Scenario 3		Scenario 4			
				1a		1b						4a		4b	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EXISTING TRAFFIC CONTROL															
31st Ave & Entrance	West Bound	-	-	A	A	B	B	B	B	A	B	B	B	A	B
	North Bound	-	-	A	A	A	A	A	A	A	A	A	A	A	A
	South Bound	-	-	A	A	A	A	A	A	A	A	A	A	A	A
6 ½ St & 6th St	East Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	West Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	North Bound	B	A	C	C	C	C	B	B	B	B	B	B	B	B
	South Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
CTH KK & Entrance	East Bound	-	-	A	A	A	A	A	A	A	A	A	A	A	A
	West Bound	-	-	A	A	A	A	A	A	A	A	A	A	A	A
	South Bound	-	-	-	-	-	-	B	B	B	B	B	B	B	B
8 ½ St & 32nd Ave	East Bound	-	-	A	A	A	A	A	A	A	A	A	A	A	A
	West Bound	-	-	-	-	-	-	-	-	A	A	-	-	-	-
	South Bound	-	-	A	A	A	A	A	A	A	A	A	A	A	A
31st Ave & 8 ½ St	East Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	West Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	North Bound	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	South Bound	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6th St & STH 11 SB Ramp	NE Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SW Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	NW Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
6th St & STH 11 NB Ramp	NE Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SW Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	NW Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
CTH KK & STH 11	NE Bound	A	B	B	B	B	B	A	A	A	A	A	B	B	B
	SW Bound	B	A	C	C	C	C	C	C	B	B	C	B	C	B
	NW Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	SE Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
13th St & 31st Ave (TWSC)	East Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	West Bound	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	North Bound	B	D	B	D	B	E	C	F	C	F	C	F	C	F
	South Bound	B	E	B	F	C	F	C	F	C	F	C	F	B	F

Intersection	Approach	Existing (2024)	Scenario 1		Scenario 2	Scenario 3	Scenario 4	
			1a	1b			4a	4b
SPECIAL EVENT TRAFFIC								
CTH KK & Entrance (Event Traffic)	East Bound	-	-	-	-	-	-	A
	West Bound	-	-	-	-	-	-	A
	South Bound	-	-	-	-	-	-	B
CTH KK & STH 11 (Event Traffic)	NE Bound	-	-	-	-	-	-	A
	SW Bound	-	-	-	-	-	-	A
	NW Bound	-	-	-	-	-	-	B
	SE Bound	-	-	-	-	-	-	A

PROPOSED TRAFFIC CONTROL CHANGE															
13th St & 31st Ave (AWSC)	East Bound	A	C	A	C	B	D	B	D	B	D	B	E	B	E
	West Bound	A	C	A	C	A	E	A	D	A	D	A	D	A	E
	North Bound	A	B	A	B	A	B	A	B	A	B	A	B	A	C
	South Bound	A	C	A	C	A	C	A	C	A	C	A	C	A	C
13th St & 31st Ave (AWSC with left turn lanes)	East Bound	-	-	-	-	-	-	-	-	-	-	-	-	A	C
	West Bound	-	-	-	-	-	-	-	-	-	-	-	-	A	B
	North Bound	-	-	-	-	-	-	-	-	-	-	-	-	A	B
	South Bound	-	-	-	-	-	-	-	-	-	-	-	-	A	B

Table 3. Vehicular Trip Distribution

	Driveway Entrance			
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Scenario 4a	70%	-	30%	-
Scenario 4b	30%	-	70%	-

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6. Recommended Improvements

The 6th Street with 6 ½ Street intersection main entrance and the 31st Avenue secondary entrance (Scenario 1a) to the new school location are recommended to accommodate traffic based on the assumptions outlined in the Abbreviated TIA. The inclusion of the CTH KK entrance and 8 ½ Street entrance is not necessary and would negatively impact the intersection of 13th Street and 31st Avenue.

The intersection of 13th Street and 31st Avenue is recommended to be converted from a two-way stop controlled (TWSC) intersection to an all-way stop controlled (AWSC) intersection in all scenarios.

In the event the 31st Avenue, 6th Street and 6 ½ Street, and CTH KK entrances are used (Scenario 2), all intersections can operate at a LOS D or higher. This would still require the conversion of 13th Street and 31st Avenue to an AWSC intersection. The inclusion of the 8 ½ Street entrance (Scenario 3) would not reduce the LOSs.

In the event the 6th Street & 6 ½ Street entrance cannot be used, using the CTH KK entrance as the main entrance and the 31st Avenue entrance as the secondary entrance (Scenario 4b) is recommended. This scenario would require the school to add left turn lanes along 13th Street to the 31st Avenue and 13th Street intersection to maintain adequate LOSs.

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Questions

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Thank You.