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School Safety Study for Lewis & Clark, West, and New Heights Elementary Schools

Final Report

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Prepared for:
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Planning Organization

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1.0 INTRODUCTION

The Grand Forks – East Grand Forks metropolitan area has seen an increase in safety concerns at area schools. To address some of these concerns, the Grand Forks-East Grand Forks Metropolitan Planning Organization has provided funding for school safety studies. The Advanced Traffic Analysis Center (ATAC) was contacted to conduct pedestrian safety and traffic circulation evaluations at three schools: Lewis & Clark Elementary School, West Elementary School, and New Heights Elementary School.

2.0 OBJECTIVES

The main objectives of this study are to evaluate pedestrian safety and traffic circulation at each school and provide short and long-term improvements. Areas of analysis include, traffic control (pavement markings and signage), pedestrian activity, parking issues, and pick-up/drop-off areas. Site visits will be conducted at each school to document the existing conditions, and observe the pedestrian/vehicle activity.

3.0 DESCRIPTION OF STUDY AREAS

This study will analyze the vehicle and pedestrian movements in and around the three schools. The following sections provide a description of the school locations and the surrounding areas. The criteria observed for each school include the roadway characteristics, traffic control and pavement markings, parking characteristics, and pedestrian activity.

3.1 Lewis and Clark Elementary School

Lewis and Clark Elementary School is located in a fully-developed residential area and is adjacent to a large city park and pool facility (Figure 3.1). The school is bordered to the south by 13th Ave. S., S. 12th St. to the west, and 12th Ave. S. to the north. The enrollment at Lewis and Clark Elementary is approximately 184 students (kindergarten through 5th grade) and is supported by approximately 45 faculty and staff.

3.1.1 Roadway Characteristics

Lewis and Clark Elementary school is bordered by roads on three sides, with a staff parking lot located on the west side of the school. The parking lot has a driveway which provides access to S. 12th St. South 12th St. is a two-lane local street which runs north-south on the west side of the school, and carries an average daily traffic volume (ADT) of 1,725 vehicles (2005 traffic counts). South 12th St. terminates at the intersection with 13th Ave. S., on the southwest side of the school. Thirteenth Ave. S. is located on the south side of the school, and is a two-lane collector which has a 2005 ADT of 4,750 vehicles. The roadway which borders the north side of the school is 12th Ave. S., which is only one block in length. The intersection of S.12th St. and 12th Ave. S. is a T-intersection, where 12th Ave. S. terminates. The east side of 12th Ave. S. joins into S.11th St. via a 90° turn to the north. The ADT for 12th Ave. S. was not available, but due to the location and orientation of the roadway, the traffic volumes should be relatively low in comparison with surrounding roadways. To the south of the school, 13th



Lewis & Clark Elementary: Existing Conditions

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Ave. S. intersects with S. 11th St. at a T-intersection, at which S. 11th St. terminates. It should be noted that South Washington St., which is a major north-south arterial having an ADT of 26,800 vehicles, is located one block west of Lewis and Clark Elementary.

The posted speed limits around Lewis and Clark Elementary School vary from 15 mph to 25 mph. The speed limit on 13th Ave. S. is 25 mph which is reduced to 20 mph via an advanced school warning sign. The speed limit is reduced again to 15 mph at the intersection of 13th Ave. S. and S. 11th St., which uses an overhead sign and flashing beacon assembly that is activated during school arrival and dismissal times. The speed limits on S. 12th St. and S. 11th St. are also 25 mph, which are reduced to 20 mph using advanced school zone warning signs.

A variety of parking regulations exist which limit the on-street parking around the school. Parking along the south side of 13th Ave. S. is only permitted directly across from the school between S. 12th St. and S. 11th St. The remainder of the street has 'No Parking' signs posted for eastbound traffic. Parking is prohibited along the north side of 13th Ave. S. during school hours. Parking adjacent to the school along S. 12th St. is also prohibited, but is allowed on the opposite side of the street. Parking on 12th Ave. S. to the north of the school is allowed on both sides of the street, with the exception of a "No Parking Any Time" sign located next to a City of Grand Forks recycling bin at the corner of 12th Ave. S. and S. 11th St.

3.1.2 Traffic Control and Pavement Markings

Many types of traffic control devices are being used in the vicinity of Lewis and Clark Elementary School. All of the intersections adjacent to the school are T-intersections which are controlled by stop signs located on the minor (terminating) streets. The intersection of 13th Ave. S. and S. 11th St. on the south side of the school is controlled by a stop sign for the northbound traffic. Traffic on 13th Ave. S. is uninhibited until the signalized intersection with South Washington St. one block west of the school. The southbound traffic on S. 12th St. is controlled by a stop sign at the intersection with 13th Ave. S., and the westbound traffic on 12th Ave. S. is controlled by a stop sign at the intersection with S. 12th St.

Several crosswalks exist adjacent to the school, which consist primarily of transverse lines (continental). One crosswalk is located on the north side of the school at the intersection of 12th Ave. S. and S. 11th St. Crosswalks also exist at the intersection of 12th Ave. S. and S. 12th St. to the northwest of the school. Pedestrian crossings are located on 13th Ave. S. at the intersections with S. 12th St. and S. 11th St. on the south side of the school. A pedestrian crossing also exists at the entrance to the staff parking lot, consisting of two yellow lines delineating the sidewalk. It should be noted that all of the crosswalks showed significant signs of wear, and in some cases were barely visible.

3.1.3 Parking Characteristics

One parking lot is adjacent to the school, which is used for full-time faculty and staff parking needs. Due to capacity issues, overflow parking for staff is located on the west side of S. 12th St. which is adjacent to the parking lot. It should be noted that a parking

lot for the Elk's Park swimming pool is located approximately one block to the east of the school.

3.1.4 Pedestrian Activity

A majority of the students at Lewis and Clark Elementary School are dismissed out of the main doors on the southeast side of the school. School staff members serve as crossing guards to monitor the pedestrian and vehicle movements at the intersection of 13th Ave. S. and S. 11th St., which is adjacent to the main doors. Students are also dismissed from the north doors to 12th Ave. S., where staff members are located to serve as crossing guards. In addition, a small number of students are dismissed from the west doors, next to the staff parking lot.

3.2 West Elementary School

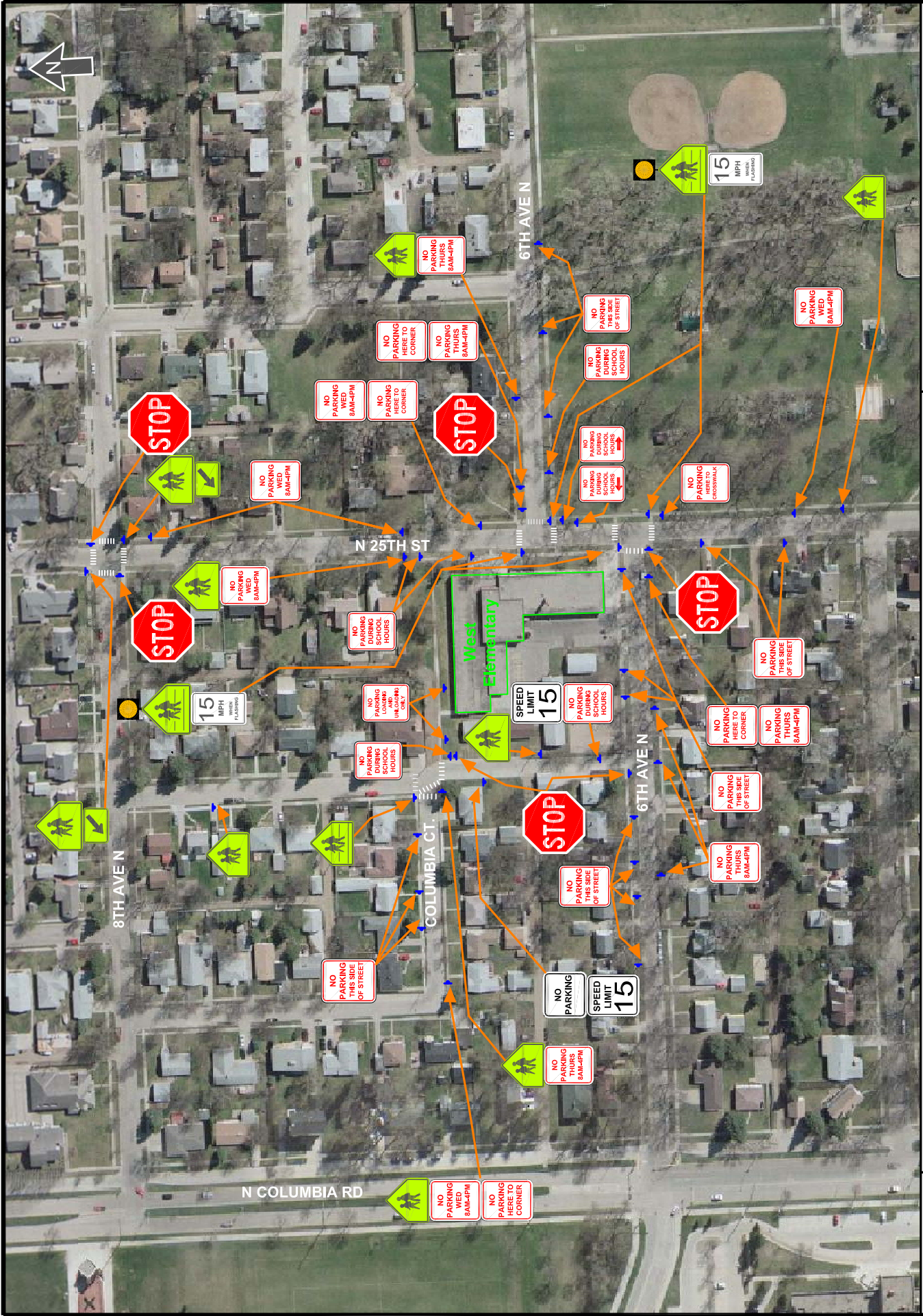
West Elementary School is located at the intersection of 6th Ave. N. and N. 25th St. in a developed residential area approximately three blocks east from the University of North Dakota campus (Figure 3.2). The school is bordered by 6th Ave. N. to the south, N. 25th St. to the east, and a paved alleyway to the west. Approximately 281 students are enrolled in kindergarten through 5th grade, and 41 faculty and staff are employed at West Elementary School. University Park, which is a large Grand Forks park facility, is located across the street to the east of the school.

3.2.1 Roadway Characteristics

The main roadway to the east of the school is N. 25th St., which is a two-lane local street running north-south, having a 2005 ADT of 1,400 vehicles. Sixth Ave. N. is also a two-lane local street which intersects N. 25th St. via T-intersections at the southeast corner of the school and directly east of the school, due to an offset of approximately one-half block. The 2005 ADT of 6th Ave. N. is 1,200 vehicles. A paved two-way alley exists to the west of the school serving as a connection between 6th Ave. N. and Columbia Ct. Columbia Ct. is a two-way residential street which loops off 8th Ave. N. The directional change from east-west to north-south occurs at the intersection with the alley on the west side of the school. To the north of the school is an unpaved alley which terminates at the intersection with Columbia Ct.

The 25 mph speed limit for N. 25th St. is reduced to 15 mph at the intersection with 6th Ave. N. via a speed limit sign and a single post-mounted flashing beacon. The default speed limit along 6th Ave. N. is 25 mph, although no posted speed limits exist along either section of 6th Ave. N. In addition, no speed reduction signs exist in the vicinity of the school along 6th Ave. N. The paved alley to the west of the school has a posted speed limit of 15 mph. However, no posted speed limits exist on the unpaved alley to the north of the school. Columbia Ct. also has no posted speed limit sign.

Several parking restrictions are in place around West Elementary School. Parking to the north of the school, along both sides of N. 25th St., is restricted on Wednesdays. Parking is restricted on the near side of the school during school hours, and is restricted on the opposite side of N. 25th St. due to the intersection with 6th Ave. N. To the south of the school, parking is restricted along the west side of N. 25th St., and restricted on



West Elementary: Existing Conditions

Figure 3.2

School Safety Study for Lewis & Clark, West, and New Heights



Wednesdays on the east side of the street. Parking along 6th Ave. N., to the south of the school, is restricted on the north side of the street, and restricted on Thursdays along the south side of the street. To the east of the school, parking is restricted along the south side of 6th Ave. N., and restricted on Thursdays for the north side of the street. The paved alley to the west of the school has parking restrictions in place along the east side of the alley during school hours, and is signed for no parking along the west side. The unpaved alley to the north of the school has signs indicating a loading and unloading zone on the near side of the roadway. The parking restrictions along Columbia Ct. indicate that no parking is allowed on the north side of the street, and is restricted on Wednesdays along the south side of the street.

3.2.2 Traffic Control and Pavement Markings

The intersections in the vicinity of West Elementary School are primarily controlled by stop signs. Eastbound and westbound traffic along 6th Ave. N. yields the right-of-way to traffic on N. 25th St., via stop signs at both intersections. Traffic along N. 25th St. is uninhibited until the intersection with 8th Ave. N., at which it yields to east-west traffic via stop signs. Traffic along the alley to the west of the school is controlled by stop signs at the exit to 6th Ave. S. and the intersection with Columbia Ct.

Pedestrian crossings are located at three of the surrounding intersections adjacent to the school. The intersection of 6th Ave. S. and N. 25th St., on the southeast side of the school, has crosswalks on all three approaches. Two crosswalks are located outside the main doors on the east side of the school, which span N. 25th St. on the north and south approaches of the intersection. The intersection of Columbia Ct. and the paved alley to the west of the school has four pedestrian crossings, two are located on the west approach of the intersection, and one on the north and south approaches. All of the pedestrian crossings at the school were significantly worn and a few were barely visible.

3.2.3 Parking Characteristics

One parking lot is available for West Elementary staff. Although there is a large paved area, approximately half is utilized as a playground. The parking lot has a capacity of approximately 20 vehicles, with two parking spaces reserved for handicapped parking. The only access to the parking lot is from 6th Ave. N. on the south side of the school. Additional (overflow) parking has been occurring in the unpaved area on the north side of the school. Access to this area is from the unpaved alley to the north of the school property.

3.2.4 Pedestrian Activity

The pedestrian activity from the school is generated from the main entrance on the east side of the school, the entrance on the south side of the school, and the west entrance to the school. Students dismissed from the main doors on the east side of the school are monitored by a staff member, and are guided to one of the pedestrian crossings in the vicinity. One staff member serves as a crossing guard at each intersection of 6th Ave. N. and N. 25th St. Students dismissed to the north of the school are monitored by a staff member who serves as a crossing guard at the intersection of Columbia Ct. and the alley to the west of the school.

3.3 New Heights Elementary School

New Heights Elementary School is a relatively new school located in a residential part of East Grand Forks, MN. The school is located just to the east of the Red River, and is approximately 4 blocks north of Gateway Dr./US-2 (Figure 3.3). New Heights Elementary School is bordered by 15th St. NW. to the north, 6th Ave. NW. to the east, and 8th Ave. NW. to the west. The East Grand Forks School District bus garage is located directly south of the school, and shares an access road with the school. The enrollment at New Heights Elementary is approximately 391 students, which range from kindergarten through 2nd grade. In addition, approximately 58 faculty/staff members are employed at the school.

3.3.1 Roadway Characteristics

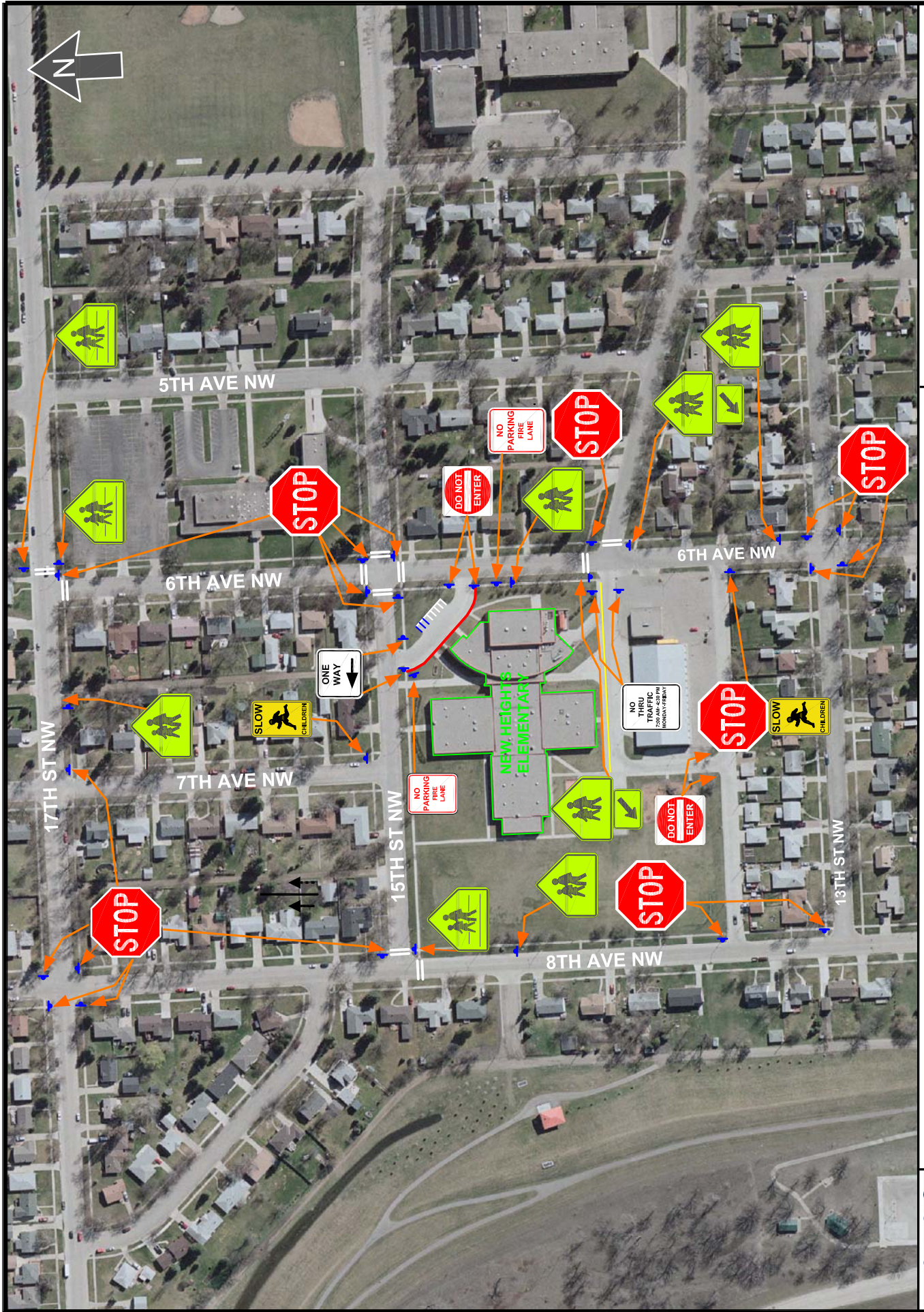
Several roads provide access to the school. Fifteenth St. NW. is a two-way, local street which terminates at a T-intersection with 8th Ave. NW. Currently, ADT information is not available for the roadways accessing New Heights Elementary. Sixth Ave. NW. is a two-way local roadway which runs north-south along the east side of the school, and serves two access points to the school. Eighth Ave. NW., which lies to the west of the school, operates as a two-way, two-lane collector street. To the southeast of the school, 14th St. NW. intersects with 6th Ave. NW. and continues to the west serving as the drive-through/bus loading zone on the south side of the school. This road also serves as an access to the bus garage on the south side of the school. A student pick-up/drop-off area is located to the north of the school, which consists of a one-way, southbound, drive-through connecting 15th St. NW. and 6th Ave. NW. This drive-through is approximately three lanes wide, and has a small parking area with a capacity for six vehicles, two of which are signed for handicapped parking. To the south of the school is another drive-through, which is a continuation of 14th St. NW. This access road operates as a westbound one-way street, and is approximately two lanes wide. A paved alleyway to the south of the bus garage connects 6th Ave. NW. and 8th Ave. NW., as well as the drive through access road.

Currently, no posted speed limits are on any of the streets surrounding the New Heights Elementary School (school speed zones or otherwise). However, the default speed limit on East Grand Forks city streets is 30 mph.

Parking restrictions around New Heights Elementary School are limited to the drive-through access road on the north side of the school and the west side of 6th Ave. NW. east of the school. Both locations have temporary signs in place which restrict parking due to a fire lane designation. Parking is allowed on all other streets in the vicinity of the school, as there are no other restricted parking signs in the area.

3.3.2 Traffic Control and Pavement Markings

All of the intersections adjacent to the school are controlled by stop signs. The intersection of 6th Ave. NW. and 15th St. NW. is controlled by an all-way stop. The T-intersection of 6th Ave. NW. and 14th St. NW. is controlled by a stop sign on the westbound approach, which gives north-south traffic the right of way. The alley to the south of the school and bus garage has stop signs at both the east and west ends,



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which yields the right-of-way to traffic on 6th Ave. NW. and 8th Ave. NW., respectively. The intersection of 8th Ave. NW. and 15th St. NW., to the northwest of the school, is controlled by a stop sign on the westbound approach of the T-intersection.

Several types of pavement markings exist around New Heights Elementary School. Pedestrian crossings are located on all four approaches at the intersection of 6th Ave. NW. and 15th St. NW., which are delineated by two longitudinal lines. Two crosswalks exist to the east of the school at the intersection of 6th Ave. NW. and 14th St. NW. Two crosswalks also exist at the intersection of 8th Ave. NW. and 15th St. NW. All of the crosswalks in the vicinity of the school show significant signs of wear. The curb of the drive-through on the north side of the school is painted red to indicate the fire lane designation of that location (along with the sign). The bus loading/unloading area to the south of the school has a yellow line on the sidewalk which serves as a boundary for students to remain clear of the busses during arrival and dismissal.

3.3.3 Parking Characteristics

One small parking area is located on the north side of the school with a capacity of approximately six vehicles (two are designated as handicapped parking). Additional parking is available on the south side of the school, adjacent to the north side of the bus garage.

3.3.4 Pedestrian Activity

Two entrances/exits are used at New Heights Elementary School for accessing the school. One entrance is located to the north, in the vicinity of 15th Ave. NW. and the drive-through area, while the second entrance to the south is adjacent to the bus loading/unloading area. Students are dismissed primarily to the south of the school, and a majority are bussed home after dismissal. Currently, no crossing guards/monitors are used during the arrival/dismissal times.

4.0 OPERATIONAL CHARACTERISTICS

This section discusses the operational characteristics observed at Lewis and Clark Elementary School, West Elementary School, and New Heights Elementary School. On March 19, 2009, ATAC staff conducted site visits at Lewis and Clark and West Elementary Schools to document existing signs, pavement markings, and roadway and parking characteristics. In addition, ATAC staff monitored the school dismissal process to observe the dismissal procedures, vehicle parking characteristics, pedestrian/vehicle interactions, and potential safety issues. The site visit of New Heights Elementary School took place on April 9, 2009, and observed the pedestrian/vehicle interactions during the start of school. The following sections will discuss the characteristics of each school and the preliminary observations that were noted.

4.1 Lewis and Clark Elementary School

Although a majority of students are dismissed to the south via the main doors, only a few parents were parked along 13th Ave. S. approximately 10 minutes prior to dismissal (Figure 4.1). Several vehicles were parked along S. 12th St. adjacent to the staff

parking lot, however, a majority of them were unoccupied (Figure 4.2). In addition, only a few vehicles parked on S. 11th St., south of the main doors of the school, prior to dismissal.



Figure 4.1. Parking on 13th Ave. S. prior to dismissal



Figure 4.2. Parking on S. 12th St. prior to dismissal

During dismissal, the number of vehicles along 13th Ave. S. increased, but vehicle flow remained unimpeded. During the dismissal time, the flashing beacons at the pedestrian crossings were activated, which served as a reminder to motorists that the speed limit was reduced due to increased pedestrian activity (Figure 4.3).



Figure 4.3. Parking on 13th Ave. S. during dismissal

The pedestrians in the vicinity of the main doors on the south side of the school were monitored by staff members, and the pedestrians crossing 13th Ave. S. and S. 11th St. were monitored by two staff members serving as crossing guards (Figure 4.4).



Figure 4.4. Pedestrian crossing on 13th Ave. S.

Several parents parked along S. 11th St., to the south of the school. The pedestrian activity as a result of loading children into the vehicles at this location caused temporary lane blockages (Figure 4.5). However, the volume of traffic using S. 11th St. was reasonably low and no significant safety issues were observed.



Figure 4.5. Parking on S. 11th St. during dismissal

On the north side of the school, a few vehicles parked adjacent to the school approximately 10 minutes prior to dismissal. During the dismissal, vehicles were lined up along the curb adjacent to the school on 12th Ave. S. In addition, several vehicles were parked adjacent to the compost collection site at the intersection of 12th Ave. S. and S. 11th St. (Figures 4.6 and 4.7). It should be noted that parking is restricted at all times in front of the compost collection site.



Figure 4.6. Bus loading on 12th Ave. S.



Figure 4.7. Parking in front of the compost collection site

Pedestrian activity on the north side of the school primarily consisted of parents walking into the school and walking out with their children. Traffic flow along 12th Ave. S. was significantly increased during the dismissal, and flow was impeded due to both the number of vehicles in the vicinity and the location of the school bus, which was present after dismissal. A school staff member served as a crossing guard, and monitored the pedestrian and vehicle movements at the intersection of 12th Ave. N. and S. 11th St. The presence of the crossing guard was beneficial to making drivers aware of the crossing, and giving pedestrians a safe place to cross 12th Ave. N. (Figure 4.8).



Figure 4.8. Pedestrian crossing on 12th Ave. S.

Parents were also observed parking in the Elks Pool parking lot to the east of the school (Figure 4.9). According to school officials, this location is a recommended parking area for parents picking up students during dismissal. This allows a safe access to the school since there are no streets to cross, and is relatively close to the school.



Figure 4.9. Parking in the Elks Pool parking lot

4.2 West Elementary School

Students at West Elementary School are dismissed from three locations around the school: 1) the main doors to the east of the school; 2) the south side of the school adjacent to the staff parking lot; and 3) the west side of the school adjacent to the alley on the north side of the school. Prior to dismissal, parents were parked at various locations around the school, primarily along the alley to the west of the school and N. 25th St. on the east side of the school (Figures 4.10 and 4.11).



Figure 4.10. Parking in the west alley prior to dismissal



Figure 4.11. Parking on N. 25th St. prior to dismissal

The operational characteristics in the west alley and Columbia Ct. were observed during the dismissal process, due to some safety concerns by staff and parents. Although the west alleyway is designed for two-way operations, parents use it as a one-way roadway (northbound) during dismissal. In addition, parents were observed parking along both the east and west side of the alley, which caused an impedance for northbound vehicles (Figure 4.12). It should be noted that no vehicles were observed driving southbound in the alleyway during dismissal.



Figure 4.12 Parking in the west alley during dismissal

Several vehicles were parked along Columbia Ct., and the unpaved alley to the north of the school during dismissal. Traffic entering the unpaved alley from the west parked along the north side of the school, and after picking up the students, continued to the north. No observed issues occurred with the traffic movement on the north side of the school, although the alleyway was muddy due to melting snow (Figure 4.13).



Figure 4.13. Parking in the north alley during dismissal

Several vehicles were parked along Columbia Ct., both to the west and north of the intersection. Upon dismissal, students used the crosswalks located at the intersection to get to the vehicles that were waiting for them. Two staff members served as crossing guards for the intersection of Columbia Ct. and the alleyways. The presence of crossing guards was beneficial to maintaining safe operations, and aiding in the visibility and awareness of pedestrians at the intersection, especially with vehicles parking in close proximity to the crossings (Figure 4.14).



Figure 4.14. Crossing guard at Columbia Ct.

The operational characteristics on the east side of West Elementary School were also observed during the dismissal process. To the north of the school, several vehicles were parked along both sides of N. 25th St. In addition, a few vehicles were parked on the east side N. 25th St., across from the school (Figure 4.15).



Figure 4.15. Parking on N. 25th St. prior to dismissal

During school dismissal, the vehicle traffic increased slightly and the vehicles parking on both sides of N. 25th St. created a significant increase in congestion due to the narrowed roadway. Although the vehicle traffic increased, a few staff members were present as crossing guards to monitor the pedestrian activity. Crossing guards were located at both intersections of N. 25th St. and 6th Ave. N. (Figure 4.16). In addition, several pedestrian warning signs with flashing beacons were activated during the dismissal.



Figure 4.16. Crossing guards on N. 25th St.

One school bus was observed at the school during the dismissal. The bus loading took place on 6th Ave. N. on the south side of the school. The presence of the bus caused the street to be temporarily restricted to one lane (Figure 4.17).



Figure 4.17. Bus loading on 6th Ave. N.

4.3 New Heights Elementary School

The dismissal process was not observed at New Heights Elementary School due to a request by school officials to instead observe the morning drop-off period. Concerns were expressed that the morning drop-off period was the busiest time of the day for

school related traffic, which is due to parents dropping off children on their way to work. The operational characteristics were observed on both the north and south sides of the school to collect data on any potential safety issues.

Prior to the school start time, several teachers were observed parking along both sides of 15th St. NW., directly north of the school. Parents were observed dropping off their children via the drive-through on the north side of the school (Figure 4.18).



Figure 4.18. Early arrivals on the north side of the school

As more parents began dropping off their children, operational deficiencies began to emerge. The operational issues that were observed in the drive-through area were a result of parents parking and leaving their vehicles unattended. During the peak period, parents were parking three-wide in the drive-through, thereby blocking vehicles behind them. In addition, parents were observed parking in the approach, which blocked the sidewalk (Figure 4.19). As a result of the congestion in the drive-through, some spillback was observed on 15th St. NW. due to vehicles waiting to turn into the drive-through. On one occasion, drivers were observed honking at each other in frustration of being boxed in. In addition to using the drive-through, several parents were observed parking along 15th St. NW. and walking their children into the school (Figure 4.20).



Figure 4.19. Parking in the drive-through



Figure 4.20. Parking along 15th St. NW.

The arrival process on the south side of the school was relatively efficient, and no issues were observed. The primary activity on the south side consisted of busses unloading students (Figure 4.21). In addition, several parents dropped off their children at the south door.



Figure 4.21. Bus unloading on the south side of the school

5.0 IMPROVEMENT STRATEGIES

To improve safety around the schools, three main criteria need to be addressed: education, enforcement, and engineering enhancements. Based on previous experience, a critical aspect is educating both pedestrians (school children) and drivers (parents) on practicing safety and awareness in and around school property. Enforcement strategies primarily use a police presence to deter unsafe driving behavior. Engineering enhancements assist in improving the safety and efficiency of pedestrian and vehicle traffic, and provide a means of organizing the operational characteristics at schools. A combination of education, enforcement, and engineering enhancements is essential for long-lasting school safety.

Educational strategies for improving safety around schools need to be focused on both students and parents. Students need to be informed of safe practices when crossing streets and parking lots. However, the majority of the education needs to be directed at the parents who pick up/drop off children. It may be beneficial to discuss the issues with parents during parent-teacher meetings. Parents need to be aware of the issues observed at the schools, as well as the traffic control devices which are implemented as a result of this study.

The enforcement strategies should place an emphasis on communication with parents when issues are observed. If recurring issues occur, requests can be made to law enforcement officials. Although it may be difficult for police to provide an increased presence, they will at least be made aware of the issues. Two of the schools in this study (Lewis and Clark, and West Elementary) have been taking a proactive approach to enforcement and safety awareness through the implementation of crossing guards/monitors. The continuation of this practice is highly recommended as it provides additional awareness to drivers during school dismissal. It is also advised that all staff members monitoring the crossings wear fluorescent safety vests to improve visibility.

Engineering enhancements include the pavement markings, traffic control signs, and geometrical changes which can be implemented at each of the schools. Although education and enforcement strategies are important, the recommendations provided in this study focus on engineering enhancements.

Based on data collected during the initial meeting with the project's stakeholders and subsequent site visits, ATAC staff has developed improvement strategies for each of the schools in this study. The improvement strategies can be categorized into two groups: short/medium-term improvements and long-term improvements. In addition, the recommended improvements for each school coincide with a study completed by Ulteig Engineers, Inc., which looked at the application of school traffic control strategies (pavement markings, traffic control signs, and flashing beacons) for the City of Grand Forks.

The *Grand Forks School Traffic Control Device Strategy Study*, completed by Ulteig Engineers, Inc., contained several recommendations for improving pavement markings, traffic control signs, and flashing beacons around school locations [1]. The following recommended changes, which are in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) 2003 Edition, apply to at least one of the three schools [2]:

- Pavement Markings
 - The major street should only be crossed once and the minor street may be crossed once or twice.
 - Existing crossings will have to be analyzed based on the ADT of the roadway and the number of pedestrians using the crossing.
- Traffic Control Signs
 - All 15 mph school speed limit signs located within a 20 mph school speed limit zone must be removed.
 - Out-dated School Crossing signs need to be replaced (by 2011).
 - School Crosswalk Warning Assembly must be used in conjunction with a School Advance Warning Assembly.
 - Speed limit signs should be used to indicate the end of a school speed limit zone.
- Flashing Beacons
 - All existing flashing beacons should be analyzed to determine if they are warranted based on several pre-determined factors.

In addition to the changes recommended by the Ulteig Engineers, Inc. study, several other issues were observed related to the traffic control devices at each of the three schools. The main issue was not having consistency among the types of signs being used (parking, speed limits, pedestrian crossings). In some cases, no speed limit signs were posted to designate either the start or end of the school speed limit zone. Also, several instances occurred in which a crosswalk was marked without the use of a sign.

The correct orientation/placement of school warning signs, speed limit signs, and school crosswalk warning signs in relation to each other are illustrated in Figure 7B-3 in the 2003 MUTCD. The specified sequence is listed as follows:

1. Advanced warning assembly

2. School speed limit
3. School crossing assembly
4. End school zone/standard speed limit sign

The following sections will discuss the characteristics of each school along with proposed recommendations. The short/medium-term recommendations will discuss proposed changes to the signage and pavement markings at each of the schools. The long-term recommendation will provide geometric enhancements to improve the operations at each school. Approximate cost data for each of the alternatives will also be provided. The cost estimates were taken from the RS Means Building and Construction Cost Data Book [3].

5.1 Lewis and Clark Elementary School

During the initial stakeholder meeting and subsequent site surveillance, data were collected on the operational efficiency (or perceived lack thereof) at Lewis and Clark Elementary School. Although there were no glaring safety issues observed at the school during the site visit, this study does provide some suggestions for improvements that can be made at the school.

5.1.1 Short/Medium-Term Strategies

The parking restrictions currently in place around the school are consistent, however, 12th Ave. S. does not have any posted parking signs. During the site visit, no vehicles were observed parking along the north side of the street, but there could potentially be an issue if vehicles park along both the north and south side of 12th Ave. S. It is recommended that “no parking” signs be placed on the north side of 12th Ave. S. Concerns were brought up regarding the location of the compost collection site at 12th Ave. S., which causes additional congestion/parking issues when it is accessed during school arrival/dismissal times. It is recommended that the compost collection site be moved to a more feasible location to eliminate excess traffic in the area. The recommended changes to signs and pavement markings are shown in Figure 5.1. The approximate cost for updating the signs and pavement markings around the school is \$5,600 [3].

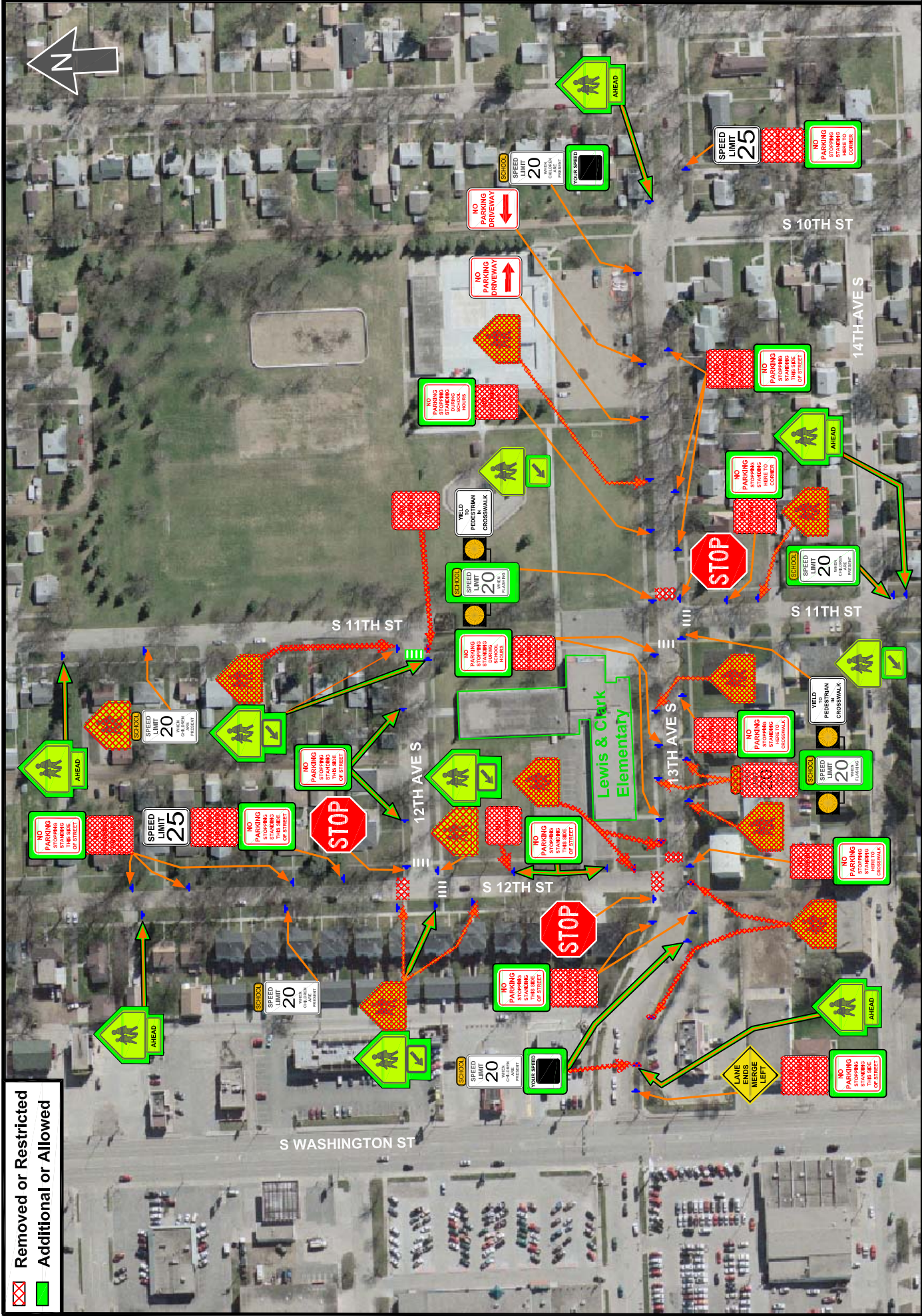
During the site visit, it was observed that all of the crosswalks in the vicinity of the school showed significant signs of wear, and most of them were not visible. Although wearing of the pavement markings is expected, it is important to keep them maintained to help increase drivers’ awareness of pedestrians. In addition, the updated school crossing assembly signs should be placed at all of the current pedestrian crossings. One suggestion for crosswalk pavement markings is to use retro-reflective thermoplastic tape, which has a much longer life-span than paint.

Current dismissal practices at Lewis and Clark Elementary School involve the use of three exits around the school. To minimize the dispersion of students, it is recommended that dismissal from the west door be discontinued. Eliminating the dismissal from the west doors will improve safety, as there are currently no crossing guards located to the west of the school. In addition, it is recommended that school

officials continue to encourage parents to use the parking lot at the Elks Pool. The use of this parking lot has several advantages such as, eliminating the need for students to cross a street, potentially removing a significant number of vehicles from the school grounds, and providing relatively easy access to the school.

During the initial meeting, concerns were brought up regarding vehicle speeds on 13th Ave. S. Efforts have already been made to address these concerns by the installation of speed-radar signs adjacent to the school. The installation of these signs should be beneficial to the safety of students by providing an additional means of speed awareness. If speeding continues to be an issue at this location, it is recommended that law enforcement be contacted to provide some visibility to drivers during school dismissal.

During the site visit, it was observed that several staff members serve as crossing guards during dismissal. This practice is extremely beneficial to the safety of students, and should be continued. Both crossing guards at the intersection of 13th Ave. S. and S. 11th St. were wearing fluorescent safety vests, and carried stop signs to warn oncoming vehicles of pedestrian activity. On the north side of the school, the crossing guard also had a stop sign, but was not wearing a safety vest. It is recommended that all crossing guards at the school wear reflective, fluorescent, safety vests to increase their visibility to oncoming traffic.



5.1.2 Long-Term Strategies

Due to the location and boundaries of the school, limitations exist related to potential geometric changes. After analyzing the data and looking at various alternatives, two geometric changes can be incorporated at the school (Figure 5.2). First, the staff parking lot can be expanded to increase capacity. Increasing the capacity will free up the parking space along the streets, which is currently being used by staff members. Along with the expansion of the parking lot, a second driveway was added to provide better access. To keep vehicle flow uniform in the parking lot, the driveways utilize one-way operations. A second geometric change is to provide a drive-through area around the perimeter of the staff parking lot, with a raised curb to separate the parking lot from the drive-through. This would provide a loading and unloading area for parents, and would alleviate the parking on 12th Ave. S. The cost estimates for implementing the long-term strategies range from \$189,400 to \$247,100 (Table 5.1).

Table 5.1. Cost Estimates for Long-Term Strategies

Parking Lot with Drive-through	
Asphalt	\$189,400
Concrete	\$247,100



Figure 5.2

School Safety Study for Lewis & Clark, West, and New Heights



5.2 West Elementary School

In addition to complying with the recommendations made in the Ulteig Engineers, Inc. study, several recommendations are provided in this report regarding West Elementary School. These recommendations are based on discussions from the initial stakeholder meeting, and subsequent site visits and surveillance. The following sections provide discussion on both the short/medium-term strategies and the long-term strategies for the school.

5.2.1 Short/Medium-Term Strategies

During the site visit, it was noticed that several types of parking restrictions are in place around West Elementary School. Currently, no parking is allowed on any of the near-side curbs adjacent to the school. In addition, parking is restricted on Thursdays for east-west streets, and on Wednesdays for north-south streets. It was also noticed that there is a lack of consistency among the types of parking restriction signage that is being used. This can potentially cause some confusion for drivers, and may cause drivers to ignore parking restrictions. Along with meeting compliance with the 2003 MUTCD regarding speed limits and school warning/crossing signs, recommended changes are shown in Figure 5.3.

Four pedestrian crossings exist on N. 25th St. to the east of the school. Although each crossing has an associated flashing beacon, the number of crossings is excessive. In addition, a flashing beacon is incorporated at alternating crosswalks. This is potentially a dangerous situation, as drivers' attention will be focused on the two crossings that they see the flashing beacons on, rather than all four. It is recommended that the south crossing on each intersection of 6th Ave. N. and N. 25th St. be eliminated, and the flashing beacons and signs be situated on both sides of a single crossing (one for each direction of oncoming traffic).

During the discussions with the stakeholders, several concerns were raised about pedestrian behavior around the school, primarily due to students exiting/entering vehicles on the traffic side of the vehicle rather than the curb side. This occurs in the winter months as a result of snow accumulation along the curbs. It is recommended that school officials communicate and work with the city to identify areas in need of snow removal.

Although pavement markings are expected to wear off, the use of sand during the winter months significantly speeds up the wearing process. This can become a safety issue when crosswalks are worn off. One alternative to painting the pavement markings is the use of retro-reflective thermoplastic tape. The use of thermoplastic tape increases the life span of the pavement markings, and can potentially improve the visibility and safety of crosswalks around schools. It is recommended that tape be used in place of paint for the crosswalk markings.

Several crosswalks exist at the intersection of Columbia Ct. and alleys to the west and the north of the school. Two crosswalks are located on the west approach (Figure 5.4). One of the crosswalks is perpendicular to the road, and the second angles to the southeast. During the site visit and observation of the dismissal activity, it was noticed that only the angled crosswalk was used by pedestrians. Drivers appeared to disregard the second (perpendicular) crosswalk, and in several instances parked on it (Figure 4.14).



Figure 5.4. Multiple crosswalks on Columbia Ct.

During the initial stakeholder meeting, the location of the bus loading area was indicated as being on the east side of the school on N. 25th St. However, during the site visit the bus loading was observed along the south side of the school on 6th Ave. N. (Figure 4.17). It is recommended that the bus loading be located on the east side of the school (using signs and curb markings), adjacent to the main doors on the north side of the intersection of 6th Ave. N. and N. 25th St. This location provides the most ideal safety conditions with regard to pedestrians and passing vehicles.

The City of Grand Forks conducted a traffic investigation report of the intersection of 8th Ave. N. and N. 25th St. in 2007. [4,5] This report looked at the operation of the intersection and evaluated whether a 4-way stop control was warranted. The report found that the current 2-way stop control was sufficient. Due to the number of students/pedestrians along N. 25th St., it was recommended that crosswalks be added to the intersection. Providing crosswalks and the associated signs is a proactive approach to improving the safety of students, and encourages pedestrian traffic. The approximate cost for implementing the changes to signs and pavement markings is approximately \$7,800.

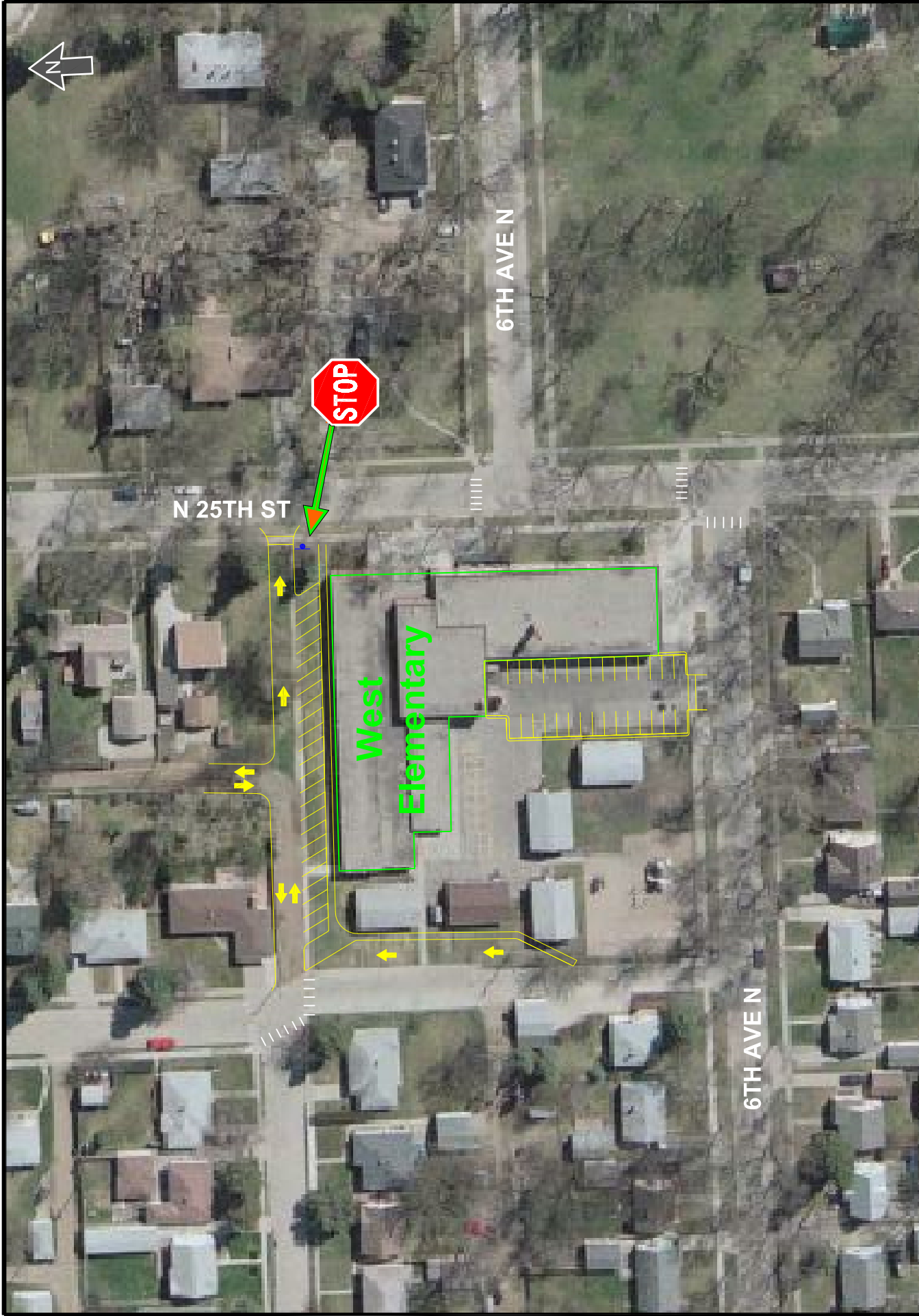
5.2.2 Long-Term Strategies

The proposed geometrical enhancements are primarily related to the movement and accessibility of vehicles around the school, thereby improving the safety for students. The first recommendation is to increase the capacity of the staff parking lot on the south side of the school. (Figure 5.5) According to school officials, the current parking lot capacity is insufficient for the number of staff at the school, and the overflow parking for staff is scattered among the surrounding streets. Expanding the parking lot to the west will provide sufficient parking for all staff, which will improve the parking capacity in the streets. In addition, adding a curb/border to the parking lot will help in maintaining a separation between the parking lot and the adjacent playground (which shares the same paved area).

The second recommendation addresses the issues observed in the west alley and the north side of the school. Since the school property extends to include the east-west portion of the unpaved alley on the north side of the school, it is recommended that the alley be paved, and a one-way access road be constructed along the north side of the school. This extension will provide additional access to N. 25th St., and will serve as an alternative to the alleyway which extends to the north. The one-way operation will help to maintain efficient traffic flow around the school. In addition, diagonal parking is proposed along the north side of the school, accessed by the new roadway. This will provide additional parking for school faculty and staff. A bus turn-out lane was also added to the alleyway on the west side of the school. The re-location of the bus loading to the west side of the school creates a safer environment for students, as the busses are removed from surrounding roadways. Cost estimates for each of the long-term recommendations range from \$16,100 to \$78,900 (Table 5.2).

Table 5.2. Cost Estimates for Long-Term Strategies

Paving North Alleyway and North Side Parking	
Asphalt	\$56,100
Concrete	\$78,900
South Parking Lot Extension	
Asphalt	\$32,700
Concrete	\$47,900
Bus Turn-out in West Alleyway	
Asphalt	\$16,100
Concrete	\$22,500



5.3 New Heights Elementary School

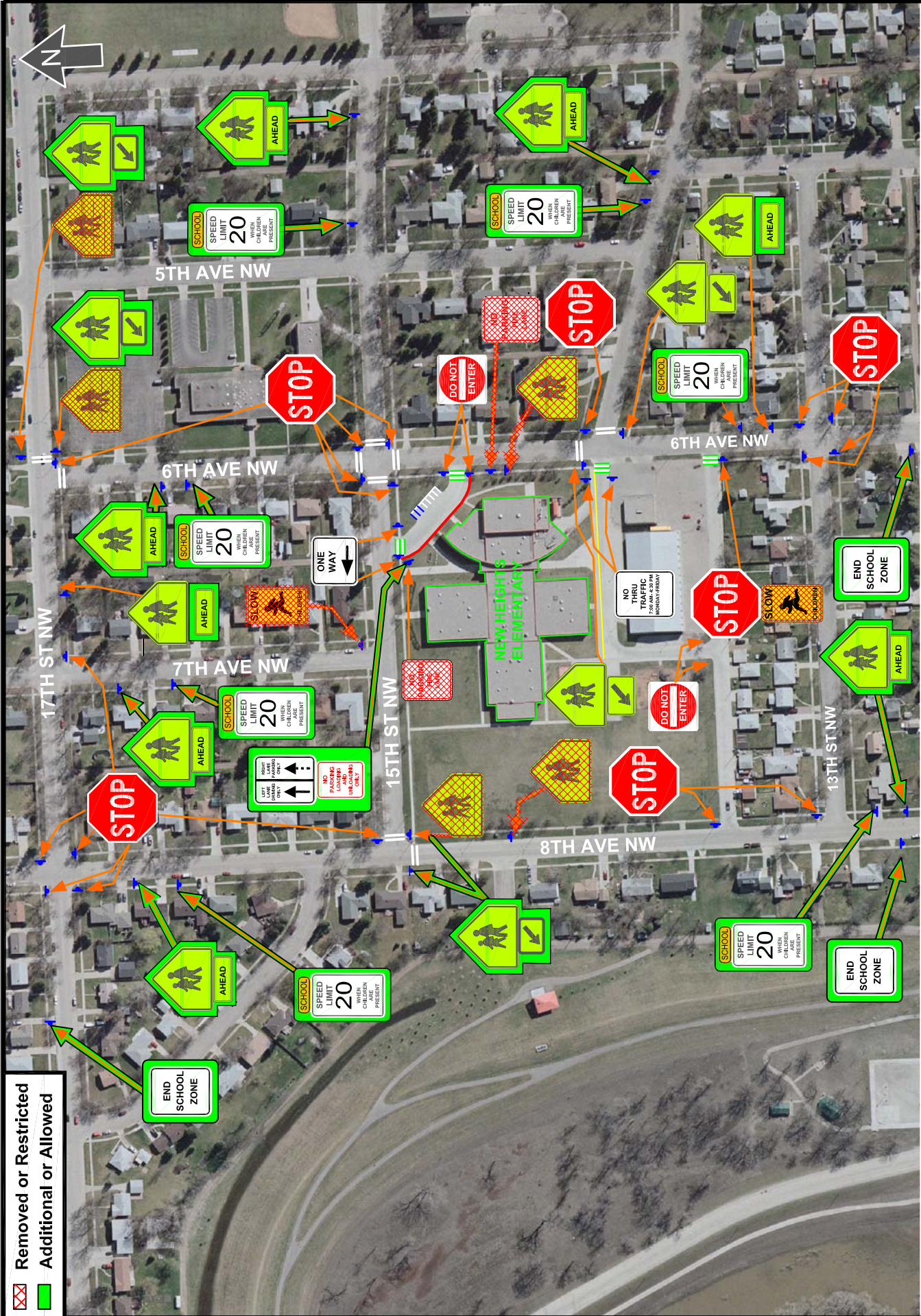
Similar to the other schools, compliance with the recommendations in the Ulteig Engineers, Inc. study should be maintained around New Heights Elementary School. In addition, several recommendations as a result of this study are made in the following sections. It should be noted that although the site visit occurred during a flood event, traffic around the school was operating normally and there were no road closures in the vicinity of the school. In addition, during the discussions with the school administration, it was pointed out that next year the current bussing situation could change (bussing might not be available to all students). Also, next year the school will add a pre-school. If there are significant changes to the current operations, a future study may be needed.

5.3.1 Short/Medium-Term Strategies

During the site visit, it was observed that the number of signs in use was significantly lower than the two other schools. For example, there were only two parking restriction signs found within a one-block radius of the school, and they were both temporary signs on school property. In addition, no speed limit signs were found in the vicinity of the school. To maintain compliance with the 2003 MUTCD, several signs need to be installed around the school. The required signs are speed limit signs, advanced school warning signs, and school crossing signs. Although several school crossing signs are in place, there was a variation between the outdated and updated crossing signs. The proposed changes to signs and pavement markings are shown in Figure 5.6.

During the morning drop-off period, the drive-through area on the north side of the school saw a fairly significant amount of traffic. A couple of issues were noticed with parents double and triple-parking, and exiting their cars. In addition, parents were observed parking in the approach to the drive-through and blocking the sidewalk. In order to maintain efficient operations in the drive-through, parents should be reminded to not block the driving lane. In addition, it is recommended that the sidewalk be outlined at the entrance and exit of the drive-through to increase the visibility, and to remind parents that parking on a sidewalk is unacceptable. Another option to alleviate the congestion on the north side of the school is to encourage more parents to drop off their children on the south side of the school, and instruct school faculty/staff to park on 8th Ave. NW. and the west end of 15th St. NW. This would free-up a significant amount of curb space on the east end of 15th St. NW., particularly around the entrance to the drive-through area. It was observed during the site visit that the operations on the south side were much smoother than the north side due to a significantly fewer number of parents using the south side.

As mentioned previously, two parking restrictions were in place at the school. Both signs were “no parking fire lane” signs, and were located on the north side of the school (Figure 5.7). However, the signs appeared to be mounted on a temporary/portable base. It is recommended that the signs be placed permanently, and be replaced with “no parking loading and unloading only” signs. The approximate cost for updating the signs and pavement markings is \$4,900.



X Removed or Restricted
 Additional or Allowed

School Safety Study for Lewis & Clark, West, and New Heights





Figure 5.7. Parking restriction at New Heights Elementary

5.3.2 Long-Term Strategies

Long-term improvement suggestions for New Heights Elementary School involve the addition of a staff parking lot on the northwest side of the school (Figure 5.8). Current staff parking is limited to the surrounding streets and adjacent to the bus garage on the south side of the school. The addition of a staff parking lot will significantly improve the parking capacity on the surrounding streets, primarily along the near-side curb on 15th St. NW. This will allow parents increased access to the school during pick-up and drop-off activities, and could potentially reduce the number of vehicles using the drive-through area. The estimated cost of the parking lot ranges from \$125,600 to \$169,800 (Table 5.3).

Table 5.3. Cost Estimates for Long-Term Strategies

Staff Parking Lot	
Asphalt	\$125,600
Concrete	\$169,800

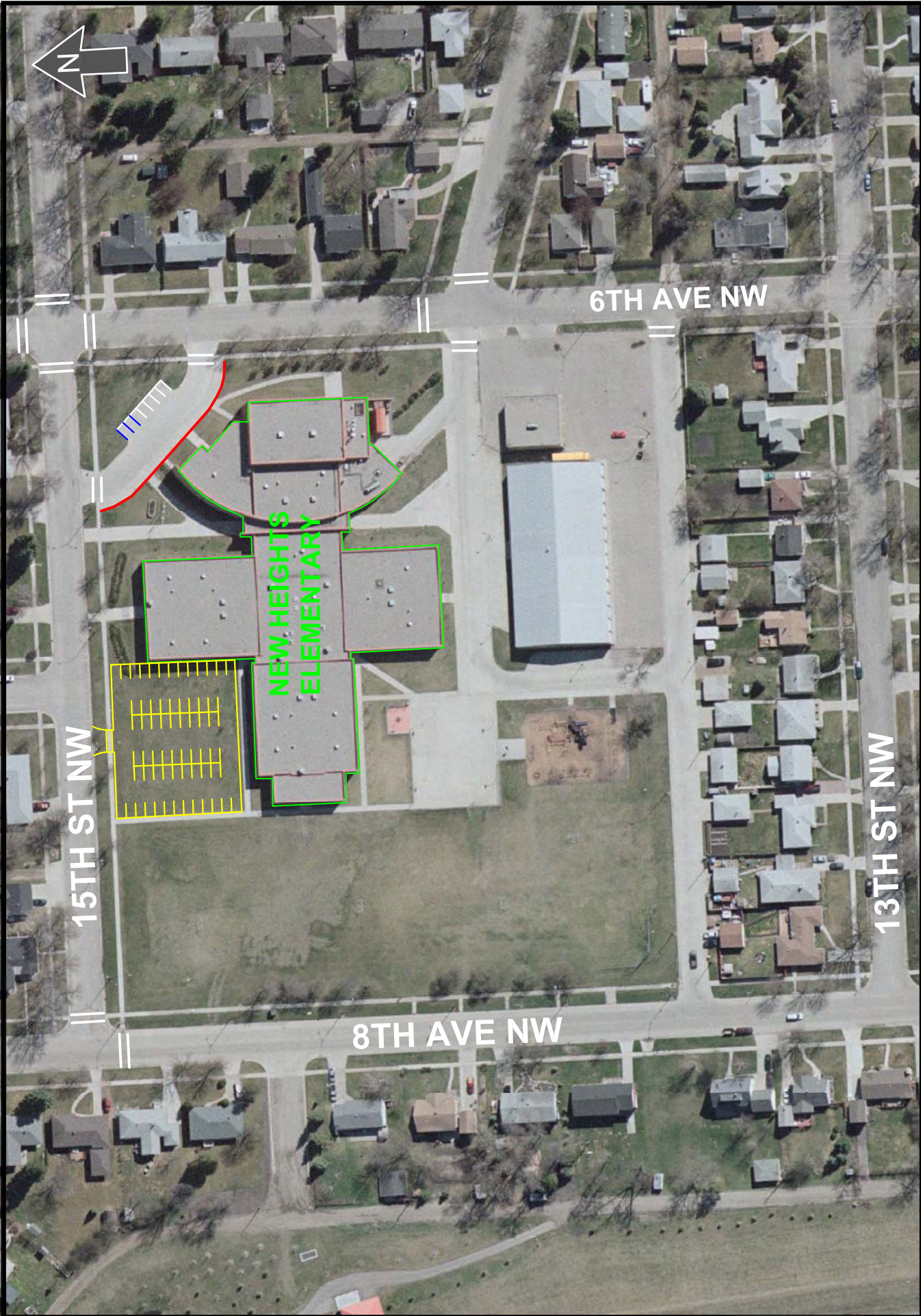


Figure 5.8

School Safety Study for Lewis & Clark, West, and New Heights



6.0 SUMMARY AND CONCLUSION

This study focused on pedestrian safety and traffic circulation for Lewis and Clark Elementary School, West Elementary School, and New Heights Elementary School. The stakeholders for this study include school administrators from each of the three schools, as well as parent-teacher organizations, the City of Grand Forks, the Grand Forks-East Grand Forks Metropolitan Planning Organization (MPO), the Grand Forks Public School District, and Safe Kids Grand Forks. Data regarding the three schools were obtained at an initial stakeholder meeting and at subsequent site visits, which were conducted by ATAC staff.

This study primarily focused on proposed engineering improvements to the three schools. The engineering improvements outlined in this study must be supplemented with education and enforcement initiatives. A summary of the changes along with the cost estimates proposed in this study are shown below.

6.1 Lewis and Clark Elementary School

- Update signs and pavement markings as specified (short-term, \$5,600)
- Encourage all staff serving as crossing guards to wear reflective, fluorescent safety vests (short-term)
- Eliminate dismissal from the west doors (short-term)
- Encourage the use of the Elks Pool parking lot (short-term)
- Increase the capacity of the staff parking lot, with a drive-through lane around the perimeter (medium/long-term, \$189,400 - \$247,100)

6.2 West Elementary School

- Update signs and pavement markings as specified (short-term, \$7,800)
- Remove the extra crosswalk in Columbia Ct. (short-term)
- Move the bus loading zone to the east side of the school (short-term)
- Increase the capacity of the current staff parking lot (medium/long-term, \$32,700 - \$47,900)
- Pave the east-west section of the alleyway on the north side of the school and extend to the east as an access road to N. 25th St., with parking along the north side of the school (medium/long-term, \$56,100 - \$78,900)
- Add a bus turn-out lane in the west alley for loading/unloading (medium/long-term, \$16,100 - \$22,500)

6.3 New Heights Elementary School

- Update signs and pavement markings as specified (short-term, \$4,900)
- Discuss proper parking procedures with parents using the north drive-through (short-term)
- Encourage parents to use the south side of the school for pick-up/drop-off (short-term)
- Shift faculty/staff parking to the west (8th Ave. NW. & west end of 15th St. NW.) (short-term)
- Add a staff parking lot to the northwest side of the school (medium/long-term, \$125,600 - \$169,800)

7.0 REFERENCES

1. Ulteig Engineers, Inc., Grand Forks School Traffic Safety Device Strategy Study, April 2008.
2. Federal Highway Administration, Manual on Uniform Traffic Control Devices 2003 Edition, November 2003.
3. Babbit, et. all, Building Construction Cost Data 67th Annual Edition, RS Means, September 2008.
4. Williams, Jane L. Traffic Investigation Report – Intersection of 8th Avenue at North 25th Street. City of Grand Forks, April 2007.
5. Williams, Jane L. Traffic Investigation Report – Intersection of 8th Avenue North at 25th Street Follow-up. City of Grand Forks, September 2007.