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Century Elementary School Safety Study

Final Report

August 2004

Prepared for:

**Grand Forks/East Grand Forks
Metropolitan Council of Governments**

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1.0 INTRODUCTION

The Grand Forks School District, the City of Grand Forks, and the Grand Forks-East Grand Forks Metropolitan Planning Organization (MPO) have received several comments regarding children's safety at Century Elementary School. SAFE KIDS Grand Forks has convened a Pedestrian Safety Task Force to address safety issues regarding getting children to and from school safely. To improve the pedestrian safety around Century Elementary School, the Task Force wanted someone to observe the current conditions and offer specific recommendations.

2.0 OBJECTIVES

The purpose of this study is to review, assess and analyze existing conditions for the area surrounding Century Elementary School, identify issues, and propose methods for addressing these issues. Based on the gathered information, recommendations will be made and organized into both short- and long-term solutions. Cost estimations are provided when possible for these improvements. Some of the focus areas for the study include the following:

- School facilities (including parking areas)
- Bus and parent pick-up and drop-off locations
- Traffic and pedestrian circulation within and around the school property
- School crossings
- Traffic control

3.0 INPUT PROCESS

A meeting was held with the Pedestrian Safety Task Force, facilitated by SAFE KIDS Grand Forks, which includes representatives from the MPO, City of Grand Forks, Century school administration, and parent representatives. The meeting discussed concerns from several committee members and provided material related to school safety that has been distributed to both students and parents. In addition, results from a 2000 pedestrian safety study were discussed and reviewed. The study provided concerns and issues expressed by parents who have children attending Century Elementary School.

3.1 Pedestrian Safety Survey

A safety survey was performed in December 2003 for the Century school area. The survey was sponsored by Century Elementary School and Safe Kids Coalition of Grand Forks allowing parents to provide their views and concerns on pedestrian safety in the school area. Most of the parents' comments can be grouped into the following problem areas:

1. Speeding along 34th St. and 17th Ave. S.
2. Blocking or failing to yield at crosswalks
3. Traffic circulation within the north parking lot
4. Illegal parking along 34th St. and in the parking lots

Traffic safety areas are usually categorized into the following: engineering, education, and enforcement. Although engineering is commonly thought of as the most important group, education and enforcement are very important in providing safe and efficient transportation. Regarding Century's problem areas of most concern, categories 1, 2, and 4 primarily involve education and law enforcement groups, while engineering is more related to categories 3 and 4. These areas and others will be discussed in further detail in the following sections.

4.0 DESCRIPTION OF STUDY AREA

Century Elementary School is located at the intersection of 17th Ave. S. and 34th St. S., as shown in Figure 1. The school has approximately 475 students ranging from kindergarten to 5th grade. The school is bordered by residential properties on all sides except for the east side, which is owned by the Grand Forks Park District. A city-wide school crossing study was performed in the year 2000 and several enhancements to pedestrian safety have been made over the past few years.

4.1 Roadway Characteristics

Century School can be accessed from 34th St. or 17th Ave. S. Three access points are available from 34th St.; however, one is limited to school bus use only. The farthest south access point serves as an entrance and exit for the south parking lot. The next access to the north serves as an entrance to the school bus drop-off zone, while the furthest north access serves as an entrance for passenger vehicles and an exit for school buses. Thirty-fourth St. is a two-lane collector having an average daily traffic (ADT) of 5,700 traveling by the school. The northbound approach of 34th St. has a left, through, and right-turn lane while the southbound approach has a left-turn lane and a shared through/right-turn lane.



Baron Boulevard

17th Avenue South

Century Elementary School

34th Street

20th Avenue South

Figure 1: Century Elementary School and Surrounding Area.

The school has one exit on 17th Ave. S. that serves the north parking lot; however, the exit is also used as an entrance for accessing the park district facilities. Therefore, two-way traffic is allowed until the s-shaped curve starts west of the park district's parking lot. Seventh Ave. S. is a two-lane, minor arterial roadway having an ADT of 7,600. The west approach of 17th Ave. S. has a left, through, and right-turn lane while the east approach has a left-turn lane and a shared through/right-turn lane.

The posted speed limits for 34th St. and 17th Ave. S. prior to entering the school zone are both 25 mph. However, the speeds are reduced to 20 mph along 17th Ave. S. and 15 mph along 34th St. while school is starting and ending.

Street parking surrounding Century is limited. Parking is not allowed in either direction along 17th Ave. S. Parking is allowed on the west side of 34th St. for the southbound traffic which serves the residences in the multi-family dwellings. However, parking is not permitted along the east side of 34th St. It should be noted that 34th St. does have adequate width to accommodate parking on both sides.

4.2 Traffic Control and Pavement Markings

Major traffic control devices in the vicinity of Century Elementary School include two-way stop control and a traffic signal. The traffic signal is located at the intersection of 34th St. and 17th Ave. S. and incorporates permissive left-turns except for the westbound left turns, which is protected/permissive left-turn operation. In addition, pedestrian phases are push-button activated at the intersection. Due to the high pedestrian activity, right turns on red are prohibited. The school's two main parking lot exits operate under stop control.

Pavement markings around the area are in fairly good condition for this time of year. The lane markings along 34th St. and 17th Ave. S. near Century were clearly visible; however the crosswalks were showing signs of wear. In addition, the crosswalks at the intersection of 34th St. and 20th Ave. S. were faded.

The City of Grand Forks has installed two school crossings that include flashing beacons, which are used during the school's start and end times. The flashing beacons are located at 34th St. & 20th Ave. S. and Baron Blvd. & 17th Ave. S. The beacons are an additional measure to remind motorists of the school children activity in terms of speed enforcement and yielding to pedestrians. A bicycle crossing also exists east of the school on 17th Ave. N., near English Coulee. This crossing will have overhead flashing beacons installed in 2004.

4.3 Parking Characteristics

Century Elementary School has two parking lots to accommodate employees and visitors. The south parking lot serves most of the parking needs by providing approximately 89 spaces of 90-degree parking. The lot provides a truck loading/unloading area for the school, which includes a turnaround area for service vehicles. Most of the parking lot is used by staff; however, several spaces are available for visitors at the southwest entrance. The north parking lot consists of 26 spaces that are used by employees as well as visitors. Currently, a total of 90 parking spaces are used by employees between both parking lots.

4.4 Pedestrian Activity

Pedestrian activity is high in and around the Century school. The most heavily used pedestrian crossing areas include the intersections of 34th St. & 17th Ave. S., Baron Blvd. & 17th Ave. S., and 34th St. & 20th Ave. S. Based on site observations, the sidewalk along the east side of 34th St. had the most pedestrian activity.

5.0 OPERATIONAL CHARACTERISTICS

The traffic characteristics for the school area were observed by ATAC staff on May 17th, 2004. In addition, ATAC's Traffic Data Collection System (TDCS) was used to collect video data at key locations during the morning and afternoon peaks starting May 17th and ending on May 19th. The following sections will discuss the key issues and observations for the school area.

5.1 Traffic Circulation

As part of the site visit, several ATAC staff were located at various crosswalks, parking lots, and access points to observe the current traffic operations at the school. The weather was very nice so many students were walking and biking in the school area. Therefore, the vehicle traffic accessing the school was probably less than on a typical day, especially during the winter months. However, it was possible to determine how vehicles and pedestrians flowed and interacted.

Based on the observations, it appeared that most of the problems were related to parents picking-up and dropping-off their own children. Improper driving behavior was observed frequently at numerous access points, adjacent streets, and within the school parking area. The following sections will discuss key areas/locations in more detail.

5.1.1 34th Street (South of 17th Ave. S.)

Several negative driving maneuvers were observed along 34th St. Vehicles blocking lanes/crosswalks and parking violations were among the most frequent problems. Examples of blocking violations include vehicles performing southbound left turns that would block the northbound through traffic at both the north and south parking lot accesses (as shown in Figure 2). In addition, a few vehicles leaving the south parking lot onto 34th St. did not yield to the pedestrians in the crosswalk (as shown in Figures 3 and 4).



Figure 2. Left turning vehicle blocking through traffic.



Figure 3. Vehicle blocking crosswalk leaving the south parking lot.



Figure 4. Vehicles blocking crosswalk leaving the south parking lot.

Improper or illegal parking along 34th St. was also observed. Some parents picking up children parked very close to the intersection of 34th St. and 17th Ave. S. thus partially blocking vehicles to travel southbound while vehicles were making a northbound left turn. An example of the illegal parking is shown in Figure 5.



Figure 5. Illegal parking on 34th St. in close proximity to 17th Ave. S.

Parking on the west side of 34th St. makes parents and children cross the street at random locations without using a crosswalk. This occurrence increases the number of vehicle/pedestrian conflicts, which then increases near misses and accident risks (note Figures 6 and 7). Parking on the east side of 34th St. is not permitted; several vehicles use that side during the afternoon dismissal period. During our observation, vehicles parking on the east side of 34th St. queued from north parking lot to the south parking lot.



Figure 6. Unsafe crossing of 34th St.



Figure 7. Unsafe crossing of 34th St.

5.1.2 Intersection of 34th St. and 17th Ave. S.

The vehicle traffic and pedestrian flow at 34th St. and 17th Ave. S was decent overall during our observations. Typically, students waited at the crosswalk until the pedestrian phase displayed WALK (pedestrian image) and motorists did not park in the crosswalk. Supplemental markings guide students to safely cross the

street, which were provided by the SAFE KIDS Walk This Way Campaign (Figure 8). Students were observed running across the street on several occurrences when they were provided the WALK indication. This may be due to the anxiousness to get home or they felt they only were able to cross the street during WALK indication (Figure 9).



Figure 8. Guidance for safe street crossing.



Figure 9. Students crossing 17th Ave. S.

5.1.3 North Parking Lot

The north parking lot and access road serves as the primary pick-up and drop-off point for parents. The area in front of the school becomes heavily congested during the school peak periods, which lasts 10-15 minutes. The access road has parallel parking on the north side, 90-degree parking on the south side, and a through lane which is wide enough to accommodate two lanes of traffic. Therefore, vehicles sometimes are stacked three wide in addition to the perpendicular parking, which makes it difficult for vehicles to leave the spaces (Figure 10). Several vehicles are left unattended at various locations that prevent other vehicles from exiting the parking lot.



Figure 10. Vehicles picking up children in the north parking lot.

A crosswalk runs across the access road directly from the main school doors. Numerous vehicles were parked in such a manner which blocked the crosswalk and others failed to yield for pedestrians in the crosswalk.

Vehicle traffic leaving the north parking lot/access road queues back from 17th Ave. S. due to having only one exiting lane and a high number of left-turning vehicles.

5.2 Vehicle/Pedestrian Conflicts

The interaction of vehicles and pedestrians, especially young children, can be an unsafe situation. Young children may not be aware of all the potential dangers

and behaviors of motorists. However, during the site visit, it appeared that the children's behavior was superior to those of the motorists. Most of the time, the children properly crossed the streets and used the crosswalks when available. Some children on bicycles even dismounted and walked their bike across the crosswalk.

Driving behavior during the morning and afternoon peak periods was troubling at times. Although most of the parents entering the school drove in a safe and proper manner, numerous parents performed maneuvers that were unsafe for school children and other motorists, which include the following:

- Blocking crosswalks while parking at and leaving the school
- Blocking opposing through traffic while entering the parking lots
- Parking improperly at unsafe locations (close to the intersection, school access points, etc.)

6.0 IMPROVEMENT STRATEGIES

Several concerns and issues have been discussed regarding pedestrian safety for Century Elementary School. Many of these concerns are common at most schools; however, several enhancements may be made to improve the current safety around Century school.

6.1 Short-Term Improvements

Short-term solutions are those that can be implemented in a short time period and with minimal funds. Four strategies are discussed in the following sections.

6.1.1 Safety Education

Education is a continuous process for both parents and children. Most of ATAC's observations found most of the unsafe acts around the school area were performed by parents. The school administration and SAFE KIDS program have been very active in promoting safety; however, more needs to be done in this area, especially for parents. To assist in this process, presentations showing the video and images gathered by ATAC could be made to the school community. The presentations can point out some of the major safety concerns and discuss the potential dangers of continuing the current practices. This safety dissemination can be coordinated with the school's fall open house. School administration has indicated that students will be taken into the field to discuss pedestrian safety around the school.

6.1.2 Increased Enforcement

To assist with speed compliance, yielding to pedestrians in crosswalks, and parking, a greater police presence would benefit the school area. Although it may be difficult to provide police personnel at the school, requests should be made to enforce safety measures.

6.1.3 Pedestrian Crosswalks

The pedestrian phases at 34th St. and 17th Ave. S. have created some confusion for children and parents. An additional sign stating what the WALK and DON'T WALK indicators mean could be installed. The available guidance sign for pedestrian phases is shown below:



Figure 11. Pedestrian Crossing Sign (R10-3d).

Since the school crosswalk in the north parking lot receives a high amount of pedestrian and vehicle traffic, the crosswalk needs to be given more visibility. Repainting the crosswalk and providing School Crosswalk Warning Signs would make the crosswalk more defined.

Crossing guards are typically used at Century school during the first two-weeks of the school year. Crossing guards are an effective way to safeguard children by finding adequate gaps in traffic, or when necessary, creating gaps to help children cross the roadway. The crossing guards should wear highly-visible retroreflective clothing and use a STOP paddle. Since the start and dismissal peak for the school are only 15 minutes, the time requirement for the crossing guards are minimal (45-60 minutes per day).

6.1.4 Allow pick-up and drop-off parking along the east side of 34th St.

Since the north parking lot can be very congested during the peak periods, many motorists currently park along 34th St. to pick-up and drop-off their children. Although parking is permitted along the west side of the street, a school pick-up/drop-off zone along the east side would provide a safer alternative for parents picking up their children from school. The school loading zone could be used as

a temporary measure until the north parking lot is redesigned (Figure 12). It is recommended to only allow parking on the east side of 34th St. between the existing bus entrance and the passenger car entrance to the north parking lot. Prohibiting parking south of the bus entrance would improve the safety of vehicles leaving the south parking lot by allowing better field of view (sight distance). In addition, it is recommended to remove the two closest parking spaces to 34th St. to also improve sight distance.



Figure 12. Loading/Unloading Zone Parking

6.2 Long-Term Improvements

The long-term improvements involve more resources and require more time to implement. If the short-term improvements are not improving the pedestrian safety and traffic circulation, these long-term improvements can be implemented in various combinations depending on availability of funds.

6.2.1 *Modify North Parking Lot Access and Bus Loading Area*

The current geometry of the pick-up/drop-off area in the north parking lot can have vehicles parking three wide in addition to the 90-degree parking. If the geometry was modified to restrict the pavement width and move the 90-degree parking away from the pick-up/drop-off area, more efficient and safer traffic circulation would occur. The current north parking lot access can be closed since the access creates problems due to the close proximity to 17th Ave. S. The current bus access would be changed to only allow passenger cars and would create more storage space for the pick-up/drop-off activities (Figure 13). The school access would provide one lane for parking and one lane for traveling through the area.

To accommodate the buses and vans, a bus loading zone would be setup in the south parking lot. The zone would have the same storage that currently exists and the buses would have an easier time maneuvering. This alternative would eliminate a total of 37 parking spaces: 26 from the north parking lot and 11 from the south parking lot. An additional parking lot could make up the lost spaces.

34th Street



Legend



Eliminated From Existing Conditions

Bus Loading Zone



Figure 13: Modified Access and Bus Loading Area.

6.2.2 Construct New North Parking Lot

Since 26 parking spaces would be eliminated with the modification of the north parking lot access, two parking lot alternatives were designed to restore the displaced parking spaces. Based on the number of total parking spaces for the school, 5 handicapped-accessible parking stalls required. Two parking stalls could be located in the north parking lot, while the remaining three stalls could be in the south parking lot. The final parking lot design will have to follow the guidelines described in the ADA Accessibility Guidelines for Buildings and Facilities (ADAAG) document.

6.2.2.1 Alternative 1: 60-Degree Parking

One possible parking lot alternative incorporates 60-degree parking stalls with 1 entrance and 2 exits (Figure 14). This alternative provides 38 spaces and is designed to provide one-way aisle circulation, which reduces the pedestrian/vehicle conflicts. However, the multiple parking lot entrances/exits are not ideal for this location

6.2.2.2 Alternative 2: 90-Degree Parking

The 90-degree parking alternative provides 36 spaces and two entrances/exits (Figure 15). Although this alternative provides two fewer spaces compared to Alternative 1, the lower number of entrances/exits is more beneficial at this location.

6.2.2.3 Construct Additional Exit Lane for North Access

The current design of the north exit at 17th Ave. S. provides one lane each for entering and exiting. Considerable queues occur when motorists leave the school. The addition of another lane exiting the parking lot would reduce delays when accessing 17th Ave. S. (Figure 16).



Figure 14. Alternative 1: 60-Degree Parking Lot.



Figure 15. Alternative 2: 90-Degree Parking Lot.



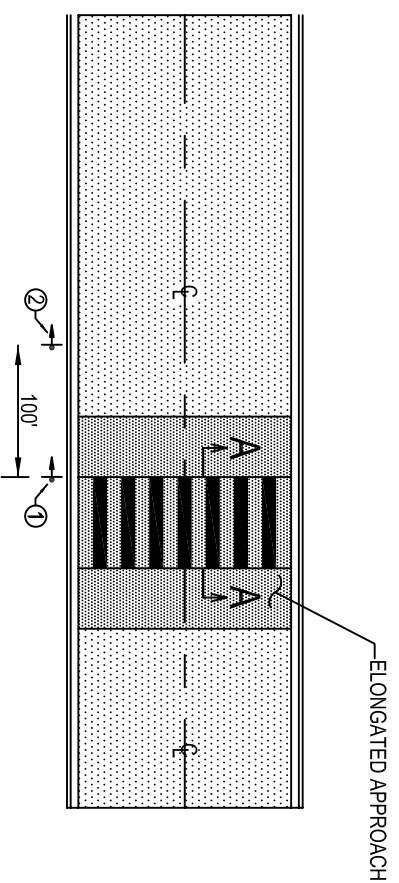
Figure 16: Construct Additional Exit Lane for North Access.

6.2.3 *Raised Crosswalk for North Loading/Unloading Area*

Raised crosswalks are used to improve pedestrian safety by providing a more visible crossing area and a control device that will ensure speed compliance. Raised crosswalks are basically elongated speed humps with a pedestrian crosswalk (Figure 17). The construction of raised crosswalk for the school's main entrance could make a safer crossing for pedestrians by reducing speeds and deterring parking over the crosswalk. A detailed drawing of a raised crosswalk is illustrated in Figure 18.

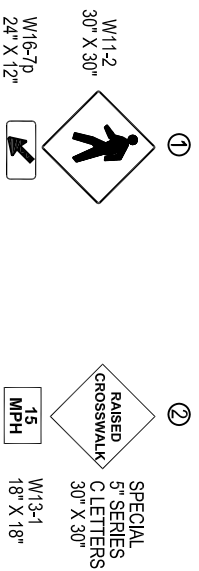


Figure 17. Example of raised crosswalk



SIGNING PLACEMENT

NOT TO SCALE

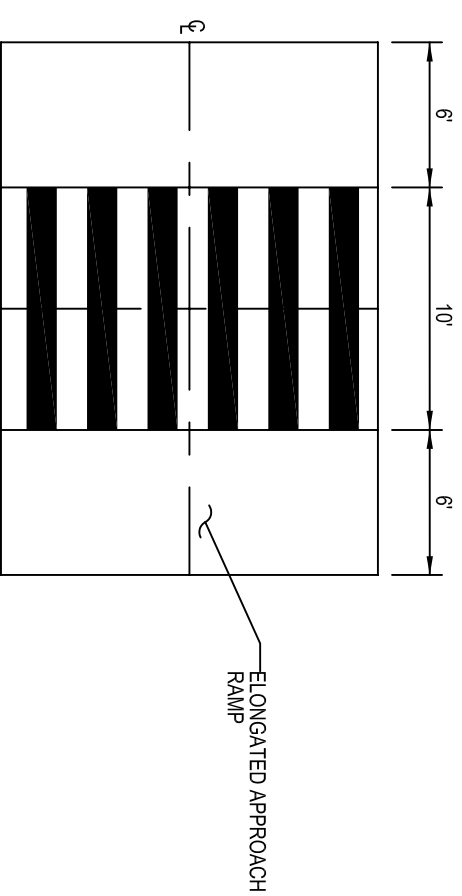


NOTES:

1. SIGNS HAVE FLUORESCENT YELLOW-GREEN BACKGROUND WITH BLACK LEGEND AND BORDER.

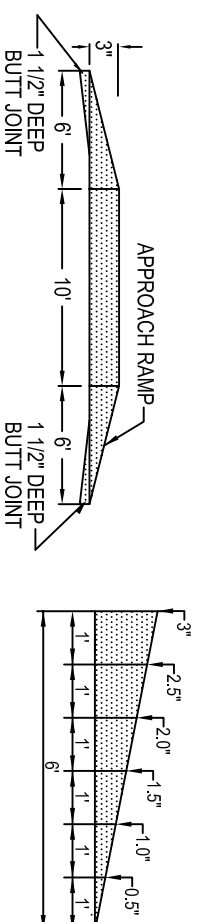
SIGNING DETAIL

NOT TO SCALE



MARKING DETAIL

NOT TO SCALE



SECTION A-A

NOT TO SCALE

APPROACH RAMP DETAIL

NOT TO SCALE

Figure 18: Design Detail of a Raised Crosswalk.

7.0 SUMMARY AND CONCLUSION

School safety is an important issue for many cities. It is impossible to make a school zone completely safe and claims of unsafe behavior may be overstated by parents due to concerns of their children's safety. However, Century Elementary School does have some issues that create unsafe traffic circulation, which may be compounded in the winter months.

The unsafe and illegal maneuvers performed by some parents could be reduced if a more streamlined design of the north access was implemented. As previously discussed, engineering solutions are only one component of a transportation facility, especially a school zone. Law enforcement and educational information are essential in providing a safer school zone.

Several short- and long-term improvements were discussed in this report. The short-term improvements may be implemented immediately and generally constitute enforcement and education, in addition to some small engineering improvements. The long-term improvements include the enforcement and education aspects; however, major engineering changes will need to be implemented. The recommended transportation design modifications are shown in Figure 19 and include the following:

- Modify north access and bus loading area (\$10,000 - \$15,000)
- Construct new north parking lot (\$40,000 - \$50,000)
- Construct additional exit lane for north access (\$5,000 - \$10,000)
- Construct a raised crosswalk for the main school entrance (\$5,000-\$10,000)

The total cost of implementing all of the solutions is approximately \$50,000 - \$85,000, which is based on the RS Means construction costs. The components of the overall design can be implemented in various stages when funds become available.



Figure 19: Recommended Design Changes for Century School.