Evaluation of Pedestrian & Bicycle Safety Improvement Strategies Within the Discovery Elementary and South Middle School Neighborhoods

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www.cpsengineering.net
Pedestrian Crossing Study - South Columbia Road and 47th Avenue South

City of Grand Forks, North Dakota
January 2018

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SECTION 1 - BACKGROUND

Safety concerns were expressed by various entities and citizens regarding pedestrian and bicycle safety at the intersection of Columbia Road and 40th Avenue South. A request was made to add a pedestrian underpass under Columbia Road at 40th Avenue South. An underpass at this location was found to be difficult to accommodate due to reasons that will be presented in Section 1.1 below.

A new request was made to construct an underpass under Columbia Road near 43rd Avenue South and a second near 47th Avenue South. Additional pedestrian underpasses were requested under 47th Avenue South between South 19th and 25th Streets and between Columbia Road and South 34th Street. These new requests triggered the need for a study at these new locations as well as look into additional strategies that could be used to improve pedestrian and bicycle safety.

1.1 Pedestrian Underpass at Columbia Road and 40th Avenue South

As discussed above, the original request to construct a pedestrian underpass at the intersection of Columbia Road and 40th Avenue South was found difficult to accommodate due to existing adjacent development, physical constraints, and existing utility impacts including:

- Below Grade Pedestrian Underpass: Due to existing development, existing infrastructure and proximity to the intersection; the pedestrian underpass would be required to be below grade. There are safety concerns associated with below grade pedestrian underpasses due to isolation and visibility when compared to an at-grade underpass; this could also have an impact on utilization. The most recent pedestrian crossings have been at grade with a raised roadway.
- Southend Drainway: The Southend Drainway (SED) is a major drainage channel for South Grand Forks. It crosses Columbia Road on the south side of 40th Avenue South. A pedestrian underpass would be difficult to construct due to this major drainage feature. Drainage issues would need to be carefully designed to minimize adverse drainage issues.
- Stormwater Pump Station: A small stormwater pump station would be required to dewater surface runoff and groundwater that would accumulate in the below grade underpass.
- Petroleum Pipeline: There is an existing petroleum pipeline located near the intersection that would require relocation if an underpass was constructed. Relocation cost of this pipeline would be costly and would require additional right-of-way from adjacent properties.
- Storm Sewer, Watermain, Sanitary Forcemain & Street Lights: A pedestrian underpass at this location would require relocation of existing segments of storm sewer, watermain, and a sanitary forcemain. Street lights would need to be relocated. Additional right-of-way would need to be acquired from adjacent properties to reroute utilities.
- High Voltage Electrical Transmission Line: There is a high voltage electrical transmission line located on the west side of Columbia Road. It would be very expensive to relocate this utility. A pedestrian underpass would need to be designed to avoid electrical structures, which would add to the cost of the pedestrian underpass.

Due to the constraints mentioned above, the pedestrian underpass under Columbia Road at 40th Avenue was dismissed by the City.

SECTION 2 - PURPOSE

The purpose of this study was to:

- Receive Public Input
  - Meet with citizens to openly discuss pedestrian and bicyclist safety issues and concerns.
  - Receive public input regarding need and willingness of neighborhood property owners to pay for pedestrian underpasses by special assessment.
- Develop strategies to improve pedestrian and bicycle safety along Columbia Road and 47th Avenue South in the vicinities of Discovery Elementary and South Middle schools.
- Determine impacts and cost estimates of several potential pedestrian underpass locations.
- Prepare a report that summarizes the findings and results of the study.
- Present findings of the study to City Leadership at the Committee of the Whole so that policymakers have the information in order to make decisions in regard to pedestrian facility policies.

An Advisory Group consisting of representatives of the City of Grand Forks, Grand Forks Public Schools, Safe Kids of Grand Forks, and CPS was assembled to discuss concerns and potential mitigation strategies. Advisory Group meetings were held on February 9 & 28, 2017. An adjacent private land owner attended the February 28, 2017 meeting.

SECTION 3 - TRAFFIC & PEDESTRIAN DATA

3.1 Vehicle Traffic Data

Recent vehicle traffic counts for the subject roadways are provided in Figure 3.1A.

Figure 3.1A: 2015 Vehicular Traffic Volumes (Source: NDDOT 2015 Traffic Volume Map for Grand Forks, ND)

2040 forecast traffic data for Columbia Road and 47th Avenue South is provided below:
- Columbia Road South of 40th Avenue South: 22,312 Vehicles Per Day
- 47th Avenue South East of Columbia Road: 6,180 Vehicles Per Day

The posted speed limits for Columbia Road between 40th and 47th Avenues South and 47th Avenue South between Washington Street and Columbia Road are both currently 40 mph.

3.2 47th Avenue South and South 20th Street

The City of Grand Forks provided traffic and pedestrian data counts taken on October 17, 2017, at the intersection of 47th Avenue South and South 20th Street. Counts began at 7:00 AM and concluded at 7:00 PM. All counts are total entering volume. Results of the traffic count are summarized below:
- Cars: 4,776
- Trucks: 175
- Pedestrians: 117
- Bicycles: 94

3.3 Columbia Road and 40th Avenue South

The City collected pedestrian and bicycle counts before and after school at the intersection of Columbia Road and 40th Avenue South on various dates in 2017. The duration of the counts were approximately 30 to 45 minutes each. The AM counts were taken between 7:45 AM and 8:30 AM (+/-) and the PM counts were taken between 2:45 PM and 3:30 PM (+/-). Results of the pedestrian and bicycle counts are provided in the chart below. The highest pedestrian and bicycle count was 42 taken during the afternoon of September 8, 2017. Counts shown on Chart 3.1A are total number of crossings for the entire intersection (all four legs). It should be noted that Columbia Road was closed to traffic from 40th to 47th Avenue South from May 8, 2017, to September 30, 2017, which could have an impact on counts.

Chart 3.1A: 2017 Pedestrian & Bicycle Counts at Columbia Road and 40th Avenue South
3.4 Neighborhood School Data

There are two schools within the study area. Discovery Elementary School is located at 3300 43rd Avenue South. The school has grades K-5 and a Fall 2017 enrollment of 505 students.

South Middle School is located at 1999 47th Avenue South. The school has grades 6-8 and a 2017 Fall enrollment of 565 students.

*Figure 3.4A: Location of Discovery Elementary and South Middle Schools*

3.5 Vehicle|Pedestrian-Bicycle Crashes

The Grand Forks Engineering Department provided city-wide vehicle|pedestrian-bicycle crash data for years 2014-2016. During this time period, there were 70 vehicle|pedestrian-bicycle crashes. The following charts provide statistics about the crashes:

*Chart 3.5A: Accident Location 2014-2016*

Of the 70 Vehicle | Pedestrian-Bicycle crashes from 2014-2016, there were 17 vehicle citations and 1 pedestrian-bike citation. Alcohol was involved in 5 of the crashes, where the pedestrian had consumed alcohol.
During the time period between January 1, 2014, and December 31, 2016, there was 1 vehicle|pedestrian crash at Columbia Road on 40th Avenue South (October 2016), and 0 at 47th Avenue South and South 20th Street. It should be noted that there was a vehicle|pedestrian crash at Columbia Road and 40th Avenue South in 2017, and that Discovery Elementary opened in 2015. Figure 3.5A shows the locations of reported city-wide vehicle|pedestrian accidents for years 2014-2016.

*Figure 3.5A: 2014-2016 Vehicle | Pedestrian-Bicycle Reported Crash Locations*
SECTION 4 - SAFETY STRATEGIES INVESTIGATED

Various structural and non-structural safety strategies were investigated as part of the study. Structural strategies include some type of construction or physical modification, whereas non-structural strategies are tactics that do not include physical construction.

4.1 Pedestrian Underpass Crossing

4.1.1 Typical Location Criteria

A Pedestrian Underpass Crossing (PUC) is a structural strategy built to provide pedestrians and bicyclists the ability to cross under a roadway. PUC’s are typically used at locations where heavy volumes of pedestrians and/or bicycle traffic cross a roadway with heavy vehicular traffic and higher vehicle speeds. Federal Highway Administration (FHWA) guideline criteria for PUC’s include:

- Number of Vehicles (for posted speeds not exceeding 40 MPH): More than 35,000 Average Daily Traffic.
- Pedestrian and Bicycle Volume (for posted speeds not exceeding 45 MPH): More than 300 in 4 Hours.
- Distance to Nearest Safe Crossing: 750 Feet or More. A traffic signal or Pedestrian Hybrid Beacon is considered a safe crossing under this guideline. Pedestrian Hybrid Beacons will be discussed in Section 4.2.4.
- Multi-Lane Roadway

Careful consideration must be given to siting PUC’s. Key siting issues are provided below:

- Heavy Vehicle and Pedestrian Traffic Volumes
- Vehicle Speeds
- Age of Pedestrians and Bicyclists
- Ineffectiveness of Less Costly Strategies
- Locations of Adjacent Crossings
- Located on a direct pedestrian or bicycle route with minimal elevation changes to pedestrians and bicyclists.
  - Studies indicate low utilization rate when a more convenient at-grade crossing is available, unless physical barriers are constructed.
- Available Right-of-Way

- Existing Infrastructure Conflicts
- Impacts to Adjacent Land Use

Important design considerations for PUC’s include but are not limited to the following:

- Lighting
- Drainage
- Maintenance
- ADA Accessibility
- Ventilation (if located below grade)
- Adequate Width for Two-Way Traffic and to Accommodate Pedestrians and Bicyclists
- Incorporation of pedestrian barriers to discourage pedestrian and bicycle traffic from utilizing at-grade crossings.
- Minimizing slopes and travel distances to encourage pedestrian and bicycle utilization.
- Security and Visibility
- Location of Street and Pedestrian Facility Intersections

4.1.2 Existing PUC’s in Grand Forks

There are existing PUC’s within Grand Forks at the following locations:

- South Washington Street
  Figure 4.1A: PUC Near the Intersection of Washington St. & 32nd Ave. S.

- Near 32nd Avenue South and Library Circle (Both of these locations are designed with a raised street and the underpass at approximately existing ground elevation)
  - Pedestrian underpasses were predominantly paid for by federal funding.
• Columbia Road  
  *Figure 4.1B: PUC at Columbia and 2nd Ave. N.*

  o 2nd Avenue North (Tunnel). The pedestrian underpass was constructed as a UND condition to provide land for the Columbia Road overpass. The underpass was constructed with predominantly federal funding.

• Gateway Drive  
  *Figure 4.1C: PUC at Gateway Drive & N. 3rd St.*

  o North 3rd Street (Tunnel)
    ▪ Predominantly paid for by federal funding

### 4.1.3 Potential PUC Locations Within Study Area

Four potential locations for PUC’s were identified as part of this study; see Figure 4.1D. These locations were considered based on the highest expected utilization rate. Table 4.1A summarizes key elements and overall estimated costs in 2017 dollars for each of the potential PUC locations identified in this report. The potential PUC locations shown on Figure 4.1D and estimates provided in Table 4.1A are based on an elevated roadway design similar to what was constructed on Washington Street near the intersection of 32nd Avenue South. This type of design is preferred by most and allows pedestrians to cross with minimal elevation changes while vehicles are required to go up over the pedestrian underpass. The design would require approximately 650 feet of elevated roadway from touchdown-point to touchdown-point.

The four locations considered for PUC’s do not currently meet FHWA guideline criteria for PUC’s due to low vehicle and pedestrian traffic volumes. This does not imply that a PUC cannot be located at any or all of these locations, but it may be difficult to justify federal and/or state cost participation. Additionally, installing PUC’s at any or all of these locations may establish a precedent for PUC installation at other locations throughout the City.

*Figure 4.1D: Potential PUC Locations Within The Study Area*

<table>
<thead>
<tr>
<th>PUC Location</th>
<th>PUC1</th>
<th>PUC2</th>
<th>PUC3</th>
<th>PUC4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right-of-Way Acquisition Cost</td>
<td>Major</td>
<td>$0</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>Utility Relocation Cost</td>
<td>Major</td>
<td>Moderate</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Roadway Reconstruction</td>
<td>650'</td>
<td>Not Included in Estimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Cost in Millions (2017 Dollars)</td>
<td>$3.8</td>
<td>$2.0</td>
<td>$1.3</td>
<td>$1.0</td>
</tr>
</tbody>
</table>
PUC1: Columbia Road near 43rd Avenue South

A PUC was considered under Columbia Road near the intersection of 43rd Avenue South. This location was considered due to:

- Quarter-mile spacing between pedestrian crossings along Columbia Road. Existing crossings are provided at 40th and 47th Avenues South as traffic signals with pedestrian phasing.
- Located directly east of Discovery Elementary School which could be a direct east-west pedestrian route between residential developments on the east and west sides of Columbia Road.
- There is existing right-of-way for 43rd Avenue South on the west side of Columbia Road. The undeveloped area to the east of Columbia Road does not have right-of-way for the extension of 43rd Avenue South. There have been discussions with the Developer on acquiring a sidewalk easement to provide a pedestrian connection east of Columbia Road to South 25th Street along the extension of 43rd Avenue South.

One of the locations considered was at the intersection of 43rd Avenue South. To avoid building an intersection significantly higher than the adjacent ground; 43rd Avenue South would need to terminate at South 30th Street and not extend to Columbia Road, or 43rd Avenue South would need to be aligned with a curve east of South 30th Street to avoid the underpass. 43rd Avenue South is currently platted from Columbia Road to South 34th Street. The developer/owner of the adjacent property is not in favor of this location due to adverse access impacts caused by the PUC and loss of developable land due to the need for additional right-of-way.

Two other locations were considered for the PUC along Columbia Road: 1) between 43rd Avenue South and Star Avenue, and 2) between 43rd and 45th Avenues South. These two locations would allow 43rd Avenue South to remain as platted west of Columbia Road, and would have less adverse access impacts than locating the PUC at 43rd Avenue South.

Any of the locations described above would pose major challenges related to existing utilities and right-of-way. Most of these challenges were previously stated in Section 1 of this report; however, the proximity to the Southend Drainway issue would not apply.

Additional right-of-way would be needed for utility relocations, grading, and pedestrian facilities. If the alignment of 43rd Avenue South is changed on the west side of Columbia Road, more right-of-way would be required to accommodate the street and utilities.

Columbia Road was reconstructed between 40th and 47th Avenues South in 2017. If a PUC was constructed near 43rd Avenue South it would be necessary to reconstruct approximately 650 feet of Columbia Road. The roadway reconstruction cost was included in the cost estimate of the PUC. The estimate to construct a PUC at this location is provided in Table 4.1A.

PUC2: 47th Avenue South between South 19th and 20th Streets

Consideration was given to locating a PUC under 47th Avenue South between South 19th and 20th Streets. This location was selected based on its proximity to South Middle School, soccer and baseball fields, and existing residential and bicycle facilities along South 20th Street. It is expected that this location would maximize pedestrian usage when compared to other potential locations along the segment of 47th Avenue South between Washington Street and Columbia Road.

Additional right-of-way would be required to construct a PUC at this location. However, no cost for right-of-way acquisition was included in the cost estimate because it was assumed that the necessary right-of-way would be donated by the Grand Forks Park District on the north and Grand Forks Public Schools on the south. If right-of-way is not donated, the cost would be higher than estimated.

There would be utility relocations required if this PUC location was advanced for construction, such as watermain, storm sewer, sanitary forcemain, street lights and private utilities. The cost for utility relocation is considered to be relatively moderate.

Approximately 650 feet of 47th Avenue South would need to be reconstructed in order to provide adequate length for the roadway to go over the
pedestrian underpass and touch down between South 19th and 20th Streets. The cost for the reconstruction of 47th Avenue South was included in the cost estimate provided in Table 4.1A.

**PUC3: Columbia Road South of 47th Avenue South**

This location was considered as a potential location due its proximity to schools and future residential development to the west. This location would be further justified if an I-29 interchange is constructed at 47th Avenue South, due the additional pedestrian and bicycle traffic from the west side of I-29.

There would be some utility relocations required if a PUC is located here, but the costs of these relocations are expected to be relatively minor compared to the total infrastructure cost.

Additional right-of-way would be required on both the west and east sides of Columbia Road. No right-of-way cost was assumed for the east side of Columbia Road because it was assumed that the Grand Forks Park District would donate the needed right-of-way. The right-of-way on the west side of Columbia Road is currently undeveloped and used for agricultural purposes. The right-of-way needed on the west side was considered to be a moderate cost since the area is not developed yet. This cost would change significantly if right-of-way is acquired post-development and if the Grand Forks Park District does not donate the right-of-way.

There may be some challenges on the east side of Columbia Road due to the close proximity of the existing softball fields. Preliminary designs indicate that retaining walls would be required to minimize impacts to the softball fields.

This segment of Columbia Road is currently a two-lane rural section which will be reconstructed as an urban roadway in the future. Roadway reconstruction was not included in the estimate provided in Table 4.1A because it was assumed that an underpass would not be constructed until the roadway is reconstructed to an urban section with additional roadway capacity.

**PUC4: 47th Avenue South between South 32nd and 34th Streets**

A pedestrian underpass located under 47th Avenue South between South 32nd and 34th Streets was considered for a potential PUC based on its proximity to the existing schools. Like PUC3, this location could be further justified if an I-29 interchange were constructed at 47th Avenue South.

This segment of 47th Avenue South is currently a gravel road with no adjacent utilities. The cost estimate does not include any utility relocations or roadway reconstruction. It is assumed that an underpass would be constructed at the same time the roadway is rebuilt into an urban section, therefore no roadway reconstruction was included in the cost estimate.

Property on the north and south sides of 47th Avenue is currently used for agricultural purposes and the costs for additional right-of-way are considered to be moderate.

Table 4.1A provides construction and engineering cost estimates for this PUC.

### 4.2 Other Structural Strategies

#### 4.2.1 Signage & Pavement Marking

Appropriate signage and pavement markings have been and should continue to be incorporated to improve pedestrian safety. A marked crosswalk increases the visibility of the crossing and identifies to pedestrians and vehicles where pedestrians are expected to cross. At mid-block/non-signalized pedestrian crossings, vehicles have the right-of-way unless the crossing is marked. Advanced warning signs to identify crosswalks are also effective in making drivers aware of an upcoming crosswalk.

#### 4.2.2 Pedestrian Flashing Beacon

Pedestrian flashing beacons improve the visibility of crossings and driver awareness. They are typically used at crosswalks that are not controlled by YIELD or STOP signs, or at a traffic signal. Beacons can be pedestrian activated, continuous flashing,
or set up on a timer. The City currently has pedestrian flashing beacons at 31 pedestrian crossings, 23 of which are at schools.

The estimated construction cost for a pedestrian flashing beacon is $15K-45K depending on how it is mounted and operated.

4.2.3 Rectangular Rapid Flashing Beacon (RRFB)

Rectangular Rapid Flashing Beacons (RRFB) have been shown to improve driver awareness and compliance, thereby improving pedestrian safety. A RRFB has two alternatively flashing rectangular yellow indicator lights that are attached to a supplemental pedestrian crossing warning sign at a marked crosswalk. When activated manually by a pedestrian or passively by a pedestrian detection system, the beacon uses an irregular flashing pattern to increase driver awareness. The installation of a RRFB requires a unit on each side of the crossing. A third unit should be added if there is a median present.

The Federal Highway Administration (FHWA) performed a study to quantify the effectiveness of existing and new engineering countermeasures in improving safety and operations for pedestrians and bicyclists (document number FHWA-HRT-10-043). The FHWA study showed that RRFB’s have a 78 percent yielding compliance. It should be noted that RRFB’s are not currently approved by FHWA for use due to pending patents; however, existing installations may remain in-place. There are currently 3 RRFB’s within the city limits of Grand Forks.

Estimated construction costs for RRFB’s range from $15K for installation for two ground-mounted units (one on either side of the street) or $45K for an overhead-mounted system.

4.2.4 Pedestrian Hybrid Beacon (PHB)

A Pedestrian Hybrid Beacon (PHB) is a pedestrian-activated traffic control device that is used to stop vehicular traffic at unsignalized marked pedestrian crossings. A PHB is an alternative that can be used where a traffic or pedestrian signal is not warranted or is not considered to be an appropriate application.

PHB systems are typically located at mid-block pedestrian crossings; however, they have also been used at street intersections. A PHB located at the tee intersection of Columbia Road and 43rd Avenue South could be utilized in the interim until all four legs of the intersection are constructed and a traffic signal with pedestrian phasing is warranted.

PHB’s are comprised of a vehicle beacon with two side-by-side red lenses, a single amber lens below the red, and pedestrian signal heads with a WALK signal. The Beacons remain dark until pedestrian activated; then the following sequence is initiated:

- The beacon flashes a sequence of amber warning beacons,
- a red STOP beacon, and
- a flashing wig wag red that tells the motorists that they may proceed if the pedestrian crossing is clear.

If a PHB is installed on a street where the traffic signals are on a coordinated timing plan, the PHB would need to be coordinated with the traffic signals. This could result in a short lag time before the pedestrian would be allowed to cross.

A FHWA study showed a 69 percent reduction in vehicle-pedestrian crashes and a 29 percent decrease in all crashes at studied PHB locations.

Estimated construction costs for PHB systems range from $75K to $100K.
SRF Consulting Group, Inc. (SRF) completed a pedestrian traffic control assessment along South Columbia Road between 40th and 47th Avenues South. A copy of the study may be found in Appendix A of this report. Five enhanced pedestrian crossing options were considered as part of the SRF study:

- Striping and Signing Improvements
- Pedestrian Flashing Beacon
- Rectangular Rapid Flashing Beacon (RRFB)
- Pedestrian Hybrid Beacon (PHB)
- Pedestrian Traffic Signal

SRF’s recommendation was to install a HAWK system, which is very similar to a PHB, near the intersection of Columbia Road and 43rd Avenue South. The PHB justification is based on applicable guidelines from the 2009 Federal Manual on Uniform Traffic Control Devices.

4.2.5 Traffic Signal

Traffic signals assign right-of-way for various traffic movements at intersections. Traffic signals are typically focused on vehicle movements, but they do create gaps and right-of-way for pedestrians to cross. Unlike PHB’s, traffic signals may have long cycles and can have vehicle turning conflicts with pedestrians. Strategies used to promote safety of pedestrians and bicyclists at traffic signals include:

- Countdown timers or flashing timers installed with pedestrian indication lights with the number of seconds remaining during the pedestrian phase. The City is expected to have countdown pedestrian heads at all traffic signals with pedestrian phasing by the spring of 2018.
- Leading pedestrian interval to provide pedestrians 2 or 3 second leads ahead of vehicle green. This allows the pedestrian to have a head-start to right-turning vehicles that may conflict with pedestrians. The City currently has advanced pedestrian timing for approximately one-third of its traffic signals with pedestrian phasing. The City will continue to add advanced pedestrian timing as traffic signals are updated, replaced, and for new traffic signals with pedestrian phasing.
- Leading pedestrian intervals and pedestrian countdown timers are considered proven safety strategies because of their recent use and limited research. Studies have shown up to 60 percent reduction in vehicle-pedestrian crashes at intersections that use the leading pedestrian interval strategy (Transportation Research Board 2009).
- Restriction of right- and left-turn movements that may conflict with pedestrians when the pedestrian phase is activated.
- Utilization of separate left-turn phasing for motorists. During each signal cycle, motorists have a green left-turn arrow followed by a yellow turn arrow, while pedestrians have a steady “DON’T WALK” display. After the yellow left-turn arrow, left-turning motorists get a red left-turn arrow, while pedestrians get a “WALK” display.
- Incorporate custom LED displays that restrict vehicle movements when pedestrian push-button is activated. An example of this would be “NO TURN ON RED.” The City recently installed LED displays for the intersection of Columbia Road and 40th Avenue South.
- Modification of signal phasing to eliminate some or all of the exclusive or permitted vehicle phasing when a pedestrian activates the push button.
  - In the fall of 2017, the City modified the phasing at Columbia Road and 40th Avenue South so that all vehicle movements are stopped when a pedestrian activates the pedestrian phase at the intersection. This phasing increases vehicle delays but is considered safer for pedestrians.
- Modify signal phasing during special times of the day and seasons when pedestrian traffic is higher.

Consideration may be given to adding warranted traffic signals at key intersection locations such as Columbia Road and 43rd Avenue South, 47th Avenue South and South 20th Street, and 47th Avenue South and South 34th Street. Any new signals should incorporate specialty signing, lighting, and pavement marking as deemed appropriate. It should be noted that traffic signals at the aforementioned locations
are likely not warranted at the present time; however, a traffic warrant analysis has not been performed as of the writing of this document. A PHB system could be installed on an interim basis until a traffic signal is warranted.

Typical costs for various traffic signal strategies:

- **New Traffic Signal:**
  $300K to $400K.

- **Leading Pedestrian Interval, or Signal Phasing:**
  Labor cost to alter timing $3.5K per intersection. It should be noted that if the traffic signals are coordinated, each coordinated intersection would need to be done.

- **Pedestrian Countdown Timers:**
  $5K to $10K per intersection.

- **Right-Turn-On-Red Restrictions:**
  LED Sign $5K.

### 4.3 Non-Structural Strategies

#### 4.3.1 Education

Safe Kids of Grand Forks, in conjunction with Grand Forks Public Schools, educates elementary and middle school pupils on how to safely cross roadways. Parents and guardians also need to educate their children on how to safely cross roadways.

Motorists need to be reminded the rules of the road and the dangers of distracted driving.

#### 4.3.2 Crossing Guards

Studies have shown that there is a higher compliance rate for vehicles stopping at crosswalks when there is a crossing guard present. Crossing guards are typically used at designated school crossings.

Grand Forks Public Schools has crossing guards on-site at Discovery Elementary and South Middle schools, but currently none off-site.

Crossing guards could be implemented at a number of locations off school grounds to assist with crossings before and after school. It is important that crossing guards be educated and coordinated to provide consistent and proper crossing assistance. There is currently no funding source for paid off-school-grounds crossing guards. Safe Kids of Grand Forks, in conjunction with Grand Forks Public Schools, provides training for volunteers who are willing to be crossing guards. Interested parties can contact school principals to volunteer. Historically, it has been difficult to find volunteers to serve as crossing guards in Grand Forks. With the absence of volunteers and no current funded programs to hire crossing guards, implementation of crossing guards at key crossings is difficult.

#### 4.3.3 Neighborhood Solutions

Neighborhoods can work together to provide adult supervision for groups of children walking or biking together to get to and from school. Programs such as the *Walking School Bus* or the *Bicycle Train*, in which adults usher groups of pedestrians or bicyclists along a collective route, can be very effective in improving safety for children walking to and from school by demonstrating safe practices and minimizing vehicular conflict opportunities.

Information for those interested in starting a program like this is available from a number of sources including Grand Forks Public Schools, Safe Kids of Grand Forks, and [www.saferoutesinfo.org](http://www.saferoutesinfo.org).

Maps are also available from the Grand Forks – East Grand Forks Metropolitan Planning Organization showing currently designated Safe Routes to School. These maps can be downloaded at [www.theforksmpo.org](http://www.theforksmpo.org).

#### 4.3.4 Law Enforcement

The Grand Forks Police Department does a good job of keeping the streets safe and enforcing traffic laws. If resources permit, additional policing before and after school could have a positive impact on pedestrian and bicycle safety.

#### 4.3.5 High Occupancy Vehicles

High Occupancy Vehicles (HOV’s) are a good way to bring students to and from school. Examples of HOV’s include busses and carpooling. In addition to reducing the potential for vehicular conflicts with pedestrians and bicycles, HOV’s also reduce traffic congestion at the destination schools.

Grand Forks Public Schools contracts with Dietrich Bus Service to provide school bussing at a current cost of $0.85 per ride. Bus routes are customized...
each year to accommodate regular users of the service. Bus route maps are available from the school or Dietrich Bus Service. Average ridership for the Fall 2017 semester at Discovery Elementary was 20 (4% of enrollment) in the morning and 35 (7% of enrollment) in the afternoon. South Middle school ridership was 90 (16% of enrollment) in the morning and 110 (20% of enrollment) in the afternoon.

4.4 Expected Strategy Crash Reduction Rates and Costs

Table 4.4A provides expected crash reduction rates and construction costs for various safety improvement strategies.

Table 4.4A: Expected Crash Reduction Rates & Costs

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Expected Crash Reduction</th>
<th>Typical Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crossing Guard</td>
<td>Higher Compliance</td>
<td>Cost of Clothing &amp; Training</td>
</tr>
<tr>
<td>Pedestrian Flashing Beacon</td>
<td>Data Not Available</td>
<td>$15K to $45K</td>
</tr>
<tr>
<td>Pedestrian Hybrid Beacon</td>
<td>60%</td>
<td>$75-100K</td>
</tr>
<tr>
<td>New Traffic Signal</td>
<td>60%</td>
<td>$300-400K</td>
</tr>
<tr>
<td>Pedestrian Underpass Crossing</td>
<td>80-90% in Fatal and Injury Crashes</td>
<td>$500K to $4M</td>
</tr>
</tbody>
</table>

SECTION 5 - FUNDING FOR IMPROVEMENTS

5.1 Funding

Table 5.1A summarizes potential/likely funding sources for various structural improvements discussed above.

Table 5.1A: Funding Sources for Strategies

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Estimated Cost (2017 $)</th>
<th>Possible Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signage &amp; Pavement Marking</td>
<td>Varies</td>
<td>City/State/Federal</td>
</tr>
<tr>
<td>Pedestrian Flashing Beacon</td>
<td>$15K to $45K</td>
<td></td>
</tr>
<tr>
<td>Pedestrian Hybrid Beacon</td>
<td>$75K to $100K</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Phasing/Timing Changes</td>
<td>Varies</td>
<td>City</td>
</tr>
<tr>
<td>Existing Traffic Signal Modifications</td>
<td>Varies</td>
<td></td>
</tr>
<tr>
<td>New Traffic Signal</td>
<td>$300K to $400K</td>
<td>City/State/Federal</td>
</tr>
<tr>
<td>Pedestrian Underpass Crossing</td>
<td>$1M to $4M</td>
<td>City/State/Federal In Absence of State and Federal Funding, Likely Source of Funding Would be Special Assessment.</td>
</tr>
</tbody>
</table>

5.2 Special Assessment Scenarios for PUC1

As of the writing of this document, potential funding sources had not been determined to pay for the construction of a PUC. A funding option may be to special assess all or part of the construction cost to benefiting properties. The City does not have a special assessment policy for the construction of pedestrian underpass crossings. In the absence of a specific policy, the City Engineering Department developed five possible scenarios to special assess a PUC located under Columbia Road near 43rd Avenue South (PUC1). Special assessment estimates provided herein are not considered to be accurate, but rather very preliminary estimates that may be higher or lower than the actual costs. Some of the unknown elements in determining estimated special assessment costs are provided below:

- Boundaries of the Special Assessment District to be Determined by Future City Council.
• A large portion of the special assessment district is not developed, so actual land use and corresponding lot areas are unknown at this time. Areas indicated are based on best available data at the present time.
• There is no current special assessment policy regarding PUC’s; therefore, assigning benefit to different land uses for each of the five scenarios is based on assumptions. Actual benefits would need to be determined by the Special Assessment Commission.
• The project has not been designed; therefore, cost estimates provided are very preliminary and may be higher or lower than the actual costs.

The following parameters were used in estimating the potential assessment costs:

- Special Assessment District: Area bounded by 32nd Avenue South, Washington Street, 47th Avenue South, and Interstate Highway 29 (see Figure 5.2A)
- PUC Location: PUC1, Under Columbia Road near 43rd Avenue South
- Land Usage Area
  - Single-Family: 210 Acres
  - Multi-Family: 200 Acres
  - Commercial: 470 Acres
  - Park: 55 Acres
  - City Pond/Drainway: 42 Acres
  - City Lift Stations: 1 Acre
  - Schools: 9 Acres
- Estimated Cost: $3.8M
- Special Assessment Markup: 19%
- Estimated Assessed Cost: $4,522,000

Five scenarios (Scenarios 1-5) were developed by the City Engineering Department to determine preliminary special assessment unit costs for various land uses within the district.

- Scenario 1 assumed that all land uses received the same benefit.
- Scenario 2 assumed that all land uses except for commercial properties receive the same benefit. Commercial properties were assigned a 0.5 benefit.
- Scenario 3 assumed all residential type land uses have a benefit of 1.0 and all other land uses have a benefit of 0.5.
- Scenario 4 assigned benefits only to residential type land uses.
- Scenario 5 has a mixture of benefits assigned to various land uses.

Table 5.2A summarizes the assigned benefit to various types of land usage for each of the five benefit scenarios. Table 5.2B tabulates what the special assessed cost would be for each of the five benefit scenarios. Table 5.2C provides a sample of what the special assessment cost would be for various properties within the potential special assessment district.

### Table 5.2A: PUC Special Assessment Benefits

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Benefit Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Single Family</td>
<td>1</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>1</td>
</tr>
<tr>
<td>Commercial</td>
<td>1</td>
</tr>
<tr>
<td>Park</td>
<td>1</td>
</tr>
<tr>
<td>City Pond/Drainway</td>
<td>1</td>
</tr>
<tr>
<td>City Lift Stations</td>
<td>1</td>
</tr>
<tr>
<td>Schools</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 5.2B: Special Assessment Unit Cost on a Square Footage Basis

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Unit Cost/SF</th>
<th>Scenario</th>
<th>Unit Cost/SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$0.10518</td>
<td>4</td>
<td>$0.25320</td>
</tr>
<tr>
<td>2</td>
<td>$0.13805</td>
<td>5</td>
<td>$0.15885</td>
</tr>
<tr>
<td>3</td>
<td>$0.14862</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5.2C: Special Assessment for Various Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Special Assessment Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family Home with 75’X130’ Lot (9,750 SF)</td>
<td></td>
</tr>
<tr>
<td>Scenario 1</td>
<td>$1,025</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>$1,346</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>$1,449</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>$2,469</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>$1,546</td>
</tr>
<tr>
<td>Lithia Ford (383,033 SF)</td>
<td></td>
</tr>
<tr>
<td>Scenario 1</td>
<td>$40,287</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>$26,438</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>$28,463</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>$15,183</td>
</tr>
<tr>
<td>Cardinal Point Apartments (435,622 SF)</td>
<td></td>
</tr>
<tr>
<td>Scenario 1</td>
<td>$45,818</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>$60,136</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>$64,742</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>$110,298</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>$103,602</td>
</tr>
<tr>
<td>Discovery Elementary School (392,043 SF)</td>
<td></td>
</tr>
<tr>
<td>Scenario 1</td>
<td>$41,234</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>$54,120</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>$29,133</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 5</td>
<td>$93,238</td>
</tr>
</tbody>
</table>

Two public input meetings were held in September 2017. The first meeting was hosted by South Middle School on September 12, 2017, and the second was hosted by Discovery Elementary School on September 14, 2017. Thirty-two people attended the September 12, 2017, meeting and forty-one attended the September 14, 2017, meeting. The attendee counts included 4 city staff members, 4 CPS representatives, and 1 Praxis representative at each of the meetings.

The format of the meetings consisted of a presentation from representatives of the City of Grand Forks Engineering Department, CPS, and Praxis. Meeting presentation slides are provided in Appendix B of this document. Throughout the presentation, there were multiple opportunities to engage the audience and receive input by real-time meeting polling and individual questions and discussion. Results of the meeting polling are provided on the meeting presentation slides.

6.2 On-Line Questionnaire

6.2.1 General Information About Questionnaire

An online questionnaire was used to collect public input regarding perceptions of pedestrian safety in general and in the target neighborhood in South Grand Forks. Not randomly sampled, the questionnaire was open to all interested parties.

The questionnaire was promoted in several ways:

- Direct mailings to approximately 1100 residents in the target neighborhoods.
- Social media outlets operated by the City of Grand Forks, Grand Forks Public Schools, Grand Forks Safe Kids, and the general public.
- Direct emails and text alerts to parents with children in either Discovery Elementary or South Middle schools.
- Media coverage in the Grand Forks Herald.
- At the public input meetings, both verbally and in take-home handouts.

The questionnaire used cookies to limit the number of times a user could populate the questionnaire, and collected IP addresses of all respondents to minimize attempts to skew results. The questionnaire consisted of 16 multiple-choice and open-ended questions closely aligned with the content discussed during the face-to-face public input sessions. Seven of the questions were asked only to respondents from specific target areas.
neighborhoods bordered by 32nd Avenue South, South Columbia Road, 62nd Avenue South and Interstate 29. The questionnaire collected a total of 378 responses between September 1 and 29, 2017.

Respondents to the questionnaire were disproportionately homeowners with children at home. Of the 378 total respondents, 250 indicated residence inside the target neighborhood. Respondents were primarily homeowners. Of those from within the target neighborhood, 99.6% indicated home ownership and 83.2% of respondents from outside the target neighborhood were home owners.

From inside the target neighborhood, 69.2% of respondents report having children in the household (58.8% with children mostly under age 12), and 61.4% of those outside the neighborhood reported having children present in the household (49.5% mostly under age 12).

6.2.2 Perceptions from the Target Neighborhood

The primary goals of the questionnaire were to understand the perceptions of pedestrian safety, gauge if there is a need for PUC’s and willingness to be special assessed for PUC’s, and to assess the neighborhood’s responses to potential safety improvements.

The majority of residents (56.6%) in the target neighborhood view the neighborhood to be safe for pedestrians. Roughly one-third view it as unsafe and another 10% neither safe nor unsafe. Chart 6.2A shows the distribution of responses in regard to pedestrian and bicycle safety in responders’ neighborhoods.

About two-thirds (65%) of residents indicated that they would allow a child to walk to school in their neighborhood. Impressions of age appropriateness of walking to school varied widely, with most residents feeling comfortable at various ages beginning between 8 and 12. Many residents felt the distance to the school was too great to allow children to walk, while others mentioned safety problems crossing major roadways and general fears of lack of safety.

Residents identified the following safety concerns in the target neighborhood:

- Problems crossing at the Columbia Road and 40th Avenue South intersection, such as excessive distance across multiple lanes of Columbia Road and pedestrian conflicts with vehicles making turns at the intersection.
- Excessive vehicular speeds, particularly on 40th Avenue South and South 20th Street. Some residents reported excessive speed on long, straight residential streets.
- Inability to cross South 20th Street and 40th Avenue South between stop-controlled intersections.
- Drivers are generally inattentive, disregarding crosswalks, or otherwise distracted.
- High traffic in multiple lanes at the four-way stop in front of South Middle School at South 20th Street and 47th Avenue South impeding pedestrian crossing.
- Pedestrians and bicyclists disregarding traffic and using unsafe crossing practices.
- Trouble crossing at four-way stop at 40th Avenue South and South 20th Street, particularly when recent road construction funneled more traffic through that intersection.

6.2.3 Implementing Future Improvements

Based on a five-point scale of very unimportant (1 point) to very important (5 points), residents in the target neighborhood feel the city should place highest priority on school-time walkability improvements and cost as factors to consider when making improvements to the neighborhood. Residents rated beauty and aesthetics and impact to traffic as less important factors to consider as
improvements are made. Results are shown in Chart 6.2B.

Respondents in the target neighborhood agreed in large majority (72%) that human crossing guards would make pedestrian crossings to schools safer. Fewer than two percent indicated that human crossing guards would make them less likely to allow a child to walk to school in the neighborhood.

When questioned about the perceived effectiveness and safety of underpasses at South Columbia Road and/or 47th Avenue South, target neighborhood residents were more divided. Roughly one-quarter of respondents felt that a pedestrian underpass at either location would make them less likely to allow children to walk to school, many citing perceived concerns about crime and safety inside a passage under the roadway.

About 40% of target neighborhood residents said that an underpass on South Columbia Road would increase likeliness to allow children to walk, whereas 29% were more likely when asked the same question about an underpass on 47th Avenue South.

Nearly half of target neighborhood residents felt that traffic signals at South Columbia Road and 43rd Street South (46%) and 47th Avenue South and South 20th Street (42%) would have no impact on their opinion of safety for school-bound children. Chart 6.2E shows the results of the questionnaire.
Respondents offered several ideas to improve pedestrian and bicycle safety in the neighborhood following a few key themes:

- Slow down vehicle traffic in the neighborhood, particularly on 40th Avenue South and South 20th Street. Specific recommendations included:
  o Increase police enforcement to reduce speeding violations, distracted driving, and failure to stop at crosswalks.
  o Install speed bumps, stop signs, or other traffic calming measures.
  o Make improvements to increase crossing safety, such as:
    ▪ Pedestrian underpasses.
    ▪ Crosswalk improvements, including more signage and pavement markings.
    ▪ Limits to parking near intersections to improve visibility.
    ▪ Pedestrian-activated crossing signals.
  o Increase the use of human crossing guards at key times.
  o Better educate drivers and pedestrians about rules of the road.
  o Refrain from siting schools and designing neighborhoods that require children to cross major roadways to get to school.

6.2.4 Funding for Improvements in the Target Neighborhood

A majority of residents responding to the questionnaire from the target neighborhood are against funding a pedestrian underpass facility using special assessments. Asked what they would be willing to pay for a South Columbia Road or 47th Avenue South underpass, 52% would be unwilling to pay for a South Columbia Road facility and 58% were unwilling to fund a 47th Avenue South underpass using special assessments. Overall, responding residents were slightly more favorable to special assessments for a South Columbia Road underpass compared to 47th Avenue South, but just 16% would be willing to pay more than $250 per year in assessments for 25 years for South Columbia Road and just 12% for a 47th Avenue South underpass. Chart 6.2F provides the results of the questionnaire in regard to special assessments.

Based on comments collected regarding funding methods and costs, there is a significant portion of residents in the target neighborhood resistant to any form of special assessment funding structure for safety improvements. However, many residents are amenable to intermediate safety improvements not requiring neighborhood cost share such as increased enforcement, less expensive pedestrian-activated signals, and human crossing guards. Residents identified excessive vehicle speed and inattentive drivers as the primary pedestrian safety problem in the neighborhood, an issue that could potentially be improved using intermediate, less costly measures.

6.3 Comments from the Community at Large

Another 101 residents living outside the target neighborhood completed the input questionnaire. Of those, 83% live within the city of Grand Forks. These respondents were generally more likely to say that their neighborhood is unsafe for pedestrians (44% versus 34% of residents in the target neighborhood) and to value walkability and bicycling ahead of costs when evaluating pedestrian safety improvements. This is likely because those who highly value walkability and safety as a community issue could be more likely to respond to a public call for input on the topic.
These residents from across the community raised a number of general safety concerns:

- Excessive speed of vehicles in residential areas and inattentive driving.
- Excessive speed of vehicles near elementary schools.
- Conflicts with vehicles parked near elementary schools at 3 PM.
- Lack of helmets and lack of adherence to proper rules of the road by bicycling children.
- Fading lines at various crosswalks.
- Drivers disregarding existing safety infrastructure, such as flashing lights, crosswalks, and reduced speed in school zones.
- A general perception of lack of enforcement of speed limits in residential areas such as Belmont Road.

Several respondents also pointed out specific safety issues that could be evaluated by City staff:

- Blind spot where bikeway crosses Cherry Street near Evergreen Drive.
- Drivers failing to yield to pedestrians during flashing lights at bikeway crossings of Washington Street between 48th and 55th Avenue South. Perception of a lack of safety at these intersections is preventing some parents from allowing children to walk to school.
- Lack of safe crossings or crossing infrastructure along 55th Avenue South, Belmont Road, and Cherry Street.

- Add more signage advising trail users to walk on the left and ride on the right.
- Timely construction of sidewalks in developing neighborhoods.
- Consider replacing time-scheduled flashing lights at crosswalks with flashing lights initiated by pedestrians. Drivers have become desensitized to frequently-flashing crosswalk lights.
- Adjust traffic signal at 42nd Street and Demers to allow pedestrian crossings of Demers while trains are preempting the signal.

Several residents expressed appreciation for the chance to voice concerns to the city about safety issues in their neighborhoods. The community’s feedback comprised several major themes:

- A general desire to increase enforcement and reduce vehicle speeds in residential areas.
- Support for continued education of both drivers and pedestrians about best safety practices.
- The need to balance costs to homeowners (particularly if applied via special assessments) with the need to make safety improvements in residential neighborhoods bordered by arterial roadways.
- Support for intermediate measures such as crosswalk improvements, human crossing guards, pedestrian-initiated flashing lights, completed sidewalks, and traffic signal adjustments.

All comments received from the on-line questionnaire are provided in Appendix C.

**SECTION 7 - OTHER CITIES**

The City of Grand Forks solicited other cities in regard to pedestrian and bicycle facilities for schools constructed in the last 10 years. The following questions were asked:

- How many elementary, middle, and high schools have been built in your area in recent years?
- Did the school boundary require students to cross a 5-lane street?
- If so, was a pedestrian underpass installed and what criteria/warrants did you use?
- Were any intersections signalized?
- In general, has your agency/company installed any pedestrian underpass(es).

Responses were received from the cities of Bismarck, Dickinson, Fargo, Moorhead, and West Fargo. Table 7.1A summarizes the responses received.
Table 7.1A: Regional City Responses to City of Grand Forks Solicitation

<table>
<thead>
<tr>
<th>Question</th>
<th>Bismarck</th>
<th>Dickinson</th>
<th>Fargo</th>
<th>Moorhead</th>
<th>West Fargo</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Boundary Not Requiring Crossing 4-6 Lane Roadways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle School</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>School Boundaries Crossing 4-6 Lane Roadways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1*</td>
<td>2</td>
</tr>
<tr>
<td>Middle School</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Traffic Control</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Ped. Underpass</td>
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<td></td>
<td></td>
<td>1**</td>
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<tr>
<td>Traffic Signal</td>
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<tr>
<td>Signing/Beacon</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* School is under construction.
** School was built near an existing pedestrian underpass.

Cities also responded in regard to pedestrian underpasses:

- **Bismarck**
  - An underpass was considered for an elementary school, but a traffic signal was installed instead.

- **Fargo**
  - 1 Underpass and 1 Overpass Installed Decades Ago.

- **Moorhead**
  - Underpass Installed in 2009 Under Highway 75. Future ADT 66,000 and Received Partial Federal Funding

**SECTION 8 - RECOMMENDATIONS**

**8.1 Pedestrian Underpasses**

At the present time, it is not recommended to install pedestrian underpasses under 47th Avenue South or Columbia Road within the school districts of Discovery Elementary and South Middle schools. This recommendation is based on the following reasons:

- Vehicle and pedestrian traffic volumes do not meet FHWA guideline criteria for the installation of a pedestrian underpass. It should be noted that FHWA guidelines are not required to be met before a pedestrian underpass is constructed, but the guidelines provide installation criteria in the absence of a local or state policy.
- Input received during the Public Input meetings and the on-line questionnaire indicated that neighborhoods are not willing to pay for the underpass if it were special assessed. Special assessments would be necessary in the absence of other funding sources.
- It is recommended that no pedestrian underpasses be constructed until a City pedestrian underpass policy is made in regard to location, design criteria, and funding.
- Additional study would be required before new pedestrian underpasses are constructed.

**8.1.1 Columbia Rd. Pedestrian Crossing at 43rd Avenue South**

Based on the traffic operations study prepared by SRF Consulting Group (see Appendix A), current vehicle and pedestrian volumes, and cost; CPS recommends that a PHB system be installed near the intersection of Columbia Road and 43rd Avenue South.

The PHB would work at the tee intersection. If this intersection becomes a 4-legged intersection, the PHB may need to be converted to a traffic signal with pedestrian phasing if/when warranted and deemed appropriate by an engineering study. Another option could be to install an interim traffic signal that would function primarily as a pedestrian signal until which time it is converted to a full traffic signal when conditions warrant and determined appropriate to do so.

The PHB should be installed in conjunction with the proposed pedestrian facilities along Columbia Road and sidewalks constructed along 43rd Avenue South between Columbia Road and South 30th Street. Consideration should also be given to adding a crossing guard before and after school during school months of higher pedestrian and bicycle activity. The intersection should continue to be monitored.
8.1.2 47th Avenue South Crossing at South 20th Street

The intersection at 47th Avenue South and South 20th Street is currently controlled by a 4-way STOP. This intersection is the primary access into South Middle School. Before and after school, there is short-duration when heavy vehicle traffic and pedestrian traffic exist during mild weather school months. Vehicle and pedestrian traffic does not meet or exceed FHWA guidelines criteria to install a pedestrian underpass. At this time, it is recommended that the four-way STOP control be left as-is and that continued monitoring of the intersection be implemented. It is recommended that a crossing guard be stationed at the intersection during the milder weather school months.

Consideration should also be given to changing the existing STOP signs to LED edge lit signs that have the LED lights flash when a pedestrian activates a push-button to cross. This would be similar to the one located near Phoenix Elementary school.

8.2 Columbia Road at 40th Avenue South

There have been two vehicle|pedestrian accidents at the intersection of Columbia Road and 40th Avenue South from 2014 to 2017. In response to the accidents the City has modified the signal phasing so that all vehicle movements are restricted when the pedestrian phase is activated, and have added LED "NO TURN ON RED" displays when the pedestrian phase is activated. All of the actions taken by the City thus far are expected to improve pedestrian and bicycle safety and are deemed appropriate. It is recommended that this intersection continue to be monitored.

8.3 Columbia Road at 47th Avenue South

A traffic signal was constructed at the intersection of Columbia Road and 47th Avenue South as part of the recently completed reconstruction of South Columbia Road. At the present time, there are no sidewalks or shared use paths at this intersection. A shared use path is planned to be constructed in 2018 as part of the 47th Avenue reconstruction project between South 20th Street and Columbia Road. It is recommended that similar pedestrian signage and phasing be incorporated into the traffic signal as was done to the Columbia Road and 40th Avenue South intersection.

8.4 Sidewalks and Shared Use Paths

8.4.1 Columbia Road Between 40th and 47th Avenues South

Pedestrian facilities in the form of sidewalks and Shared Use Paths (SUP’s) have not been constructed along the segment of Columbia Road between 40th and 47th Avenues South. Provisions were made for these pedestrian facilities as part of the recently completed Columbia Road reconstruction project in the form of right-of-way, grading and ADA accessible ramps. A future project will construct a SUP on the west side of Columbia Road and a sidewalk on the east side.

Several years ago, a gravel pedestrian trail was constructed on the south side of the Southend Drainway from Columbia Road east to the intersection of South 25th Street and Star Avenue; see Figure 8.4A. The purpose of this trail was to provide pedestrian access from the east Southern Estates Development to Columbia Road, primarily for children walking or bicycling to and from Discovery Elementary and South Middle schools. It is recommended that this trail be reconstructed and paved to serve as a SUP, and the necessary right-of-way acquired for a permanent pedestrian way.
45th Avenue South from South 25th Street to Columbia Road is currently under construction. Sidewalks will be installed on the north and south sides of 45th Avenue as this area develops. Once constructed, this will provide another connection to the proposed pedestrian facilities along Columbia Road.

Consideration should be given to constructing a sidewalk or SUP between South 25th and 30th Streets along 43rd Avenue South (see Figure 8.4B). Presently, there is street right of way for 43rd Avenue South between Columbia Road and South 30th Street; however, there is no existing right-of-way to construct the east leg. Construction of the east segment would require an easement or fee title from the property owner. Sidewalks between South 30th and 32nd Streets will be constructed as homes are constructed.

**Figure 8.4A: Gravel Pedestrian Trail**

8.4.2 47th Avenue South between South 19th and 34th Streets

There is an existing SUP on the south side of 47th Avenue South between Washington and South 20th Streets. The SUP is expected to be extended west from South 20th Street to Columbia Road in 2018, and is recommended to be extended farther west as development occurs along the 47th Avenue South corridor.

It is recommended that sidewalks be constructed along the full length of 47th Avenue South on the north side as development occurs. These sidewalks could be added by either special assessment or privately funded for lots that have already been developed.

8.5 Education

Grand Forks Public Schools and Safe Kids of Grand Forks provide education to students in regard to safety when walking and biking to and from school. Education has a positive impact on safety and we commend both entities in their efforts to educate students.

One key element regarding safety is educating motorists on the rules of the road and consequences of distracted driving. We recommend that information and reminders continue to be aired through television public announcements and articles or videos on social media platforms.

8.6 Crossing Guards

It is recommended that crossing guards be provided before and after school at high-traffic intersections along an elementary or middle school’s Safe Route to School. This recommendation especially applies during the milder school months when children walking and biking to school is more prevalent.

There is currently no funding available for paid crossing guards; however, there were persons at the Public Input Meetings who indicated willingness to volunteer their time for this effort. It is recommended that all crossing guards be trained properly before they begin their duties.
8.7 Enforcement

The City of Grand Forks police department is responsible for enforcing traffic regulations within the city. They do the best job they can with available resources. It is recommended that enforcement efforts continue to be made to reduce motorist traffic violations and distracted driving.

8.8 Siting of New Schools or Consolidation of Schools

Prior to selecting new school sites, or when consolidating schools, a traffic and pedestrian study should be performed to assist decision makers in determining associated impact to traffic and pedestrians. The study should include at least the following:

- School District Boundaries and the Number of Students the School Will Serve
- Impacts to Existing Infrastructure and its Ability to Serve the New School or Consolidation of Schools
- Review Existing and Planned High Traffic Areas and Multi-Lane Arterials
- Established or New Pedestrian and Bicycle School Routes
- Distance Students Would Walk or Bike to School
- Unique or Costly Pedestrian Facilities for the New School or Consolidated School, and Funding Source for Such Special Facilities
- Parking and Student Drop-Off/Pickup Areas at School and Overflows Onto City Streets

8.9 Pedestrian Facilities Policy

Information contained in this report is intended to assist policy makers in developing a city policy regarding pedestrian facilities. However, additional work and study will be necessary to develop the policy. In developing a policy it is recommended that the following factors be included in the decision making:

- Safe Routes to School
- Impacts of New Schools and Other Facilities that Generate Significant Pedestrian, Bicycle, and Vehicle Traffic
- City Bikeway Map
- Vehicle, Pedestrian, and Bicycle Traffic Volumes

- Costs and Funding
- Public Input
- Existing and Proposed Developments
- Type of Current and Expected Development
- Locations of High Pedestrian and Bicycle Traffic
- Age of Pedestrians and Bicyclists
- Seasonal Variations in Pedestrian, Bicycle, and Vehicle Traffic
- City Land Use Plan

SECTION 9 - NEXT STEPS

The next step for the City is to determine what strategies to pursue. Depending on the strategies selected, additional study may be necessary. Non-structural strategies may be implemented at little or no cost. Structural strategies with lower costs could be implemented with current and future City budgets; however, the more costly strategies would need to have a funding source identified.