City of Bloomington

84th Street & Xerxes Avenue

Traffic & Intersection Control Study

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84th Street and Xerxes Avenue Traffic Study

Final Report

City of Bloomington, Minnesota

Prepared by:

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1.0 Study Process

1.1 Study Purpose and Approach

The 84th Street corridor between France Avenue and Penn Avenue has been identified for upcoming pavement maintenance. The segment from France Avenue to Xerxes Avenue is tentatively planned for reconstruction and the segment from Xerxes Avenue to Penn Avenue is tentatively planned for an overlay in the next few years. The purpose of this study is to evaluate the existing and future operations of the corridor to determine whether the existing striping configuration as a four-lane undivided roadway or intersection traffic control needs modifications to meet current and future needs.

The study focuses on two main components: intersection traffic control options for the Xerxes Avenue intersection and roadway options for the 84th Street corridor between France Avenue and Penn Avenue. In addition, City staff is working with the School District to address existing site circulation issues at Washburn Elementary School that are currently impacting the safety and operations of 84th Street. At this time, concepts have been developed and discussions are taking place to determine what concept, if any, could be implemented by the School District. These concepts are discussed later in the report.

1.2 Public Involvement

Public and agency participation are critical to developing a preliminary design that balances the needs of various stakeholders, each of which may view the roadway from a different perspective. An open and fair process was used to ensure that we build credibility with the residents and school representatives. The study process included a comprehensive public involvement program, including stakeholders group meetings, a neighborhood open house, City Council study sessions and a City Council public hearing. It was also important to keep the residents well informed with updated study information posted on the City's website.

The public involvement components for the study are described below:

Stakeholders Group Meetings

The stakeholders group played an important role in the study. Their responsibilities were to identify study issues and provide feedback on corridor and school-related improvements. Members of the stakeholders group included:

- Bloomington Public School District #271 Representatives
- Washburn Elementary School
- Northwestern Health Sciences University

- City of Bloomington Police
- City of Bloomington Fire
- City of Bloomington Engineering

There was a kick-off meeting for the stakeholders group at the front end of the study process to obtain feedback on corridor, intersection and school/university-related issues and concerns. Additional meetings were held with District and Washburn Elementary representatives to discuss possible options to improve drop-off/pick-up and pedestrian crossing issues.

Neighborhood Open Houses

A neighborhood open house was strategically integrated into our study process to solicit input from the public on study corridor issues, needs, corridor options and impacts.

Presentation materials included:

- Corridor Issues Map
- Corridor/Intersection Options (3)
- School Drop-Off/Pick-Up Options (4)

Summary comments received at the open house and via the website are included in Appendix A.

Meeting Schedule

The public involvement components, including the participation of the stakeholders group and open houses are listed below:

- Stakeholders Group Kick-Off Meeting – December 13, 2011
- Stakeholders Group Meeting #2 – January 20, 2012
- Bloomington City Council Study Session – February 27, 2012
- Neighborhood Open House – April 10, 2012
- Stakeholder Group Meeting #3 – May 11, 2012
- Bloomington City Council Study Session – May 21, 2012
- Bloomington City Council Public Hearing – June 25, 2012

Project Website

A link on the City's website was available to post study information at key points in the process. This provided residents and stakeholders with up-to-date study information, while offering another option to stay connected throughout the study process.

2.0 Current Transportation Problems & Issues

2.1 Data Collection Plan

SRF's data collection efforts focused on gathering and organizing a variety of information related to the study corridor, which is summarized below:

Daily Traffic Volumes

Existing daily traffic volumes were provided by City staff to evaluate segment capacity needs for vehicles along the corridor.

Peak Hour Turning Movement Counts

Peak hour turning movement counts at three major and three minor intersections were provided by City staff and collected by SRF to evaluate the current level of service, delays and queues. Three representative minor intersections were selected and used to determine side-street delays currently experienced by motorists wanting to enter the 84th Street corridor.

Corridor and Intersection Data

A variety of information such as existing roadway widths, segment and intersection geometrics, sidewalk/trail facilities, routes and connections, on-street parking, transit routes and stops, adjacent development along the corridor, existing right-of-way widths, speed limits, and overhead utilities was collected to complete a thorough analysis of existing conditions.

Crash Data

Segment and intersection crash data was obtained from Mn/DOT's database for the most current three-year period (2008 to 2010) to identify any safety concerns along the corridor and at key intersections.

Future Daily Traffic Forecasts

Future daily traffic forecasts from the City's updated Transportation Plan were used to evaluate segment capacity needs in year 2030. In addition, this data was used to project 2030 intersection volumes, to be used in the operations analysis for future conditions.

Speed Data

The study corridor of 84th Street is currently posted at 30 mph. Speed data collected in 2011 indicates a 85th percentile speed of 37 mph. The Bloomington police department acknowledges high speeds along the corridor and regularly provides the necessary speed enforcement.

The City's Alternative Transportation Plan

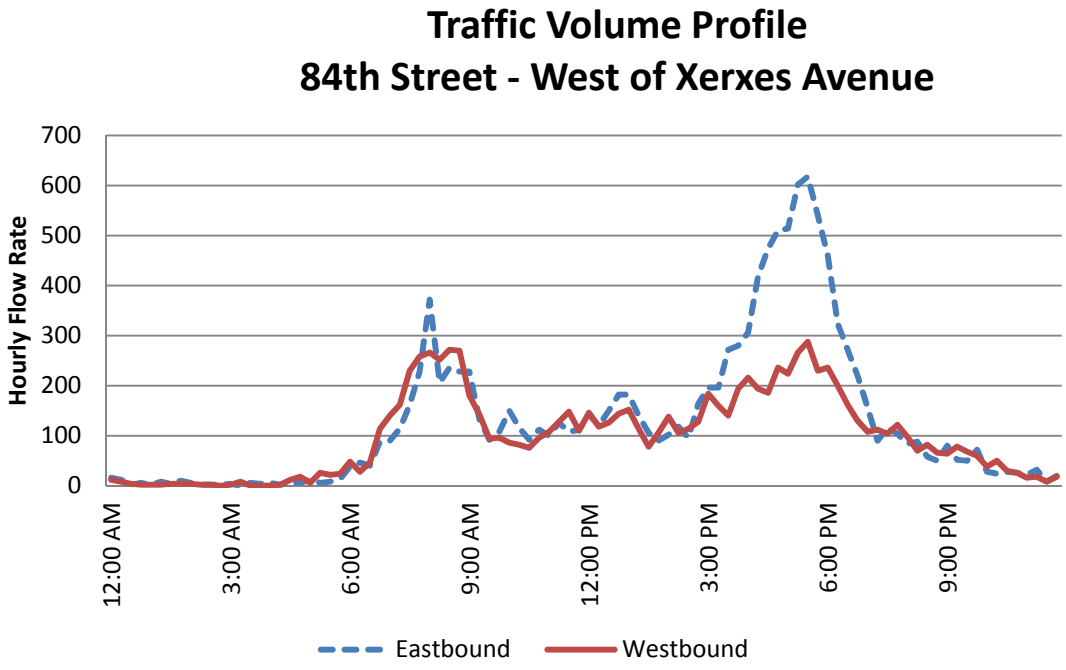
The City's Alternative Transportation Plan (ATP) includes important information that identifies existing and proposed trails, pedestrian-ways and on-road bikeways that collectively form the backbone of an integrated city-wide transportation system. The 84th Street corridor is not identified as an on-road bikeway in the ATP. However, it does identify Xerxes Avenue as a proposed on-road bikeway north and south of 84th Street.

2.2 Evaluation & Findings

Currently, the segment of 84th Street between France Avenue and Penn Avenue is a four-lane undivided roadway with sidewalk on both sides of the corridor. It has a 44-foot roadway width and speed limit of 30 mph. A majority of the roadway restricts parking on both sides, with some areas limited to morning and afternoon commuter peak period restrictions.

The intersection of 84th Street/Xerxes Avenue is a T-intersection currently controlled by an old span wire traffic signal that has reached the end of its service life and is due for replacement. In addition to the age of the traffic signal, steep grades west of the intersection create sight distance issues for motorists waiting on the south approach of Xerxes Avenue to enter 84th Street.

The 84th Street corridor between France Avenue and Penn Avenue experiences heavy directional (unbalanced) traffic volumes during the p.m. peak period. During the a.m. peak period, the westbound and eastbound traffic volumes are similar in magnitude. However, during the p.m. peak hour, the eastbound traffic volume is significantly larger than the westbound volume. This unbalanced traffic flow is due to additional vehicles that use this corridor during the p.m. peak period because of congested parallel routes in the area.



Based on the data collected for the 84th Street corridor, a comprehensive evaluation of current transportation problems and issues along the corridor was conducted. The results of the data collection task and the analysis of existing conditions are summarized below and in Appendix B, Figure 1.

Segment Capacity Analysis

Congestion on the roadway system is known to exist when the ratio of traffic volume to roadway capacity (v/c ratio) approaches or exceeds 1.0. The volume to capacity ratio provides a measure of congestion along a segment of roadway and can help determine the number of lanes necessary to accommodate existing and future traffic volumes. As a planning-level exercise, average daily traffic capacity ranges for different facility types were used to determine the roadway design options that can be considered for the 84th Street corridor. As listed below, these volume ranges are based on guidance from the Highway Capacity Manual, discussion with the Metropolitan Council and professional engineering judgment.

- Two-lane undivided urban – 8,000 to 10,000 vehicles per day
- Three-lane urban – 14,000 to 17,000 vehicles per day
- Four-lane undivided urban – 18,000 to 22,000 vehicles per day

Based on the current traffic volumes ranging from 6,000 to 7,000 vehicles per day, the existing four-lane section of 84th Street provides the necessary capacity for acceptable operations. Based on the future 2030 traffic forecasts ranging from 8,000 to 11,000 vehicles per day, there is the opportunity to reduce the capacity of the roadway to be in line with the future traffic it serves, allowing the space to accommodate other modes with a more complete streets approach. Since this is a planning-level exercise and does not provide a basis for determining the need for specific intersection geometrics, an operations analysis at the key intersections was conducted to determine if other proposed sections can handle future peak hour volumes. Results of this analysis are summarized in the Roadway and Intersection Layout Options section of the report.

Existing Intersection Operations Analysis

To determine how traffic is currently operating along the corridor, an operations analysis was conducted for the study intersections. All signalized intersections were analyzed using the Synchro/SimTraffic software. The unsignalized intersections were analyzed using the Highway Capacity Software. Capacity analysis results identify a Level of Service (LOS), which indicates the quality of traffic flow through an intersection. Intersections are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS F indicates an intersection where demand exceeds capacity, or a breakdown of traffic flow. LOS A through D are generally considered acceptable by drivers. LOS E indicates that an intersection is operating at, or very near its capacity and vehicles experience substantial delays.

The traffic operations at an unsignalized intersection with side-street stop control considers the overall intersection level of service that takes into account the total entering volume and the capability of the intersection to accommodate these

volumes. It also considers the level of service on the side-street approach. Since the mainline does not have to stop at a side-street stop controlled intersection, the majority of intersection delay can be attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high levels of delay on the side-street approaches (poor levels of service), but an acceptable overall intersection level of service during the peak hour periods. However, as the side-street delay increases, motorists tend to accept smaller gaps and/or take greater risks. These eventually could lead to safety problems.

As shown in Table 2.1, the results of the analysis indicate that all study intersections currently operate at an acceptable overall level of service during the a.m. and p.m. peak hours, with existing traffic controls and geometrics.

Table 2.1 Existing Conditions – Peak Hour Capacity Analysis Level of Service Results

84th Street Intersection	A.M. Peak Hour	Side-Street Delay	P.M. Peak Hour	Side-Street Delay
France Avenue	D	NA	D	NA
Xerxes Avenue	B	NA	B	NA
Washburn Avenue*	A/B	11 seconds	A/B	10 seconds
NHSU West Driveway*	A/B	14 seconds	A/C	21 seconds
Russell Avenue/NHSU East*	A/C	21 seconds	A/C	19 seconds
Penn Avenue	A	NA	B	NA

*Note: * Indicates the intersection is a side-street stop controlled intersection. The overall level of service is followed by the side-street approach level of service. Side-street delay is shown for the worst side-street approach.*

Safety Analysis

Mn/DOT's Crash Mapping Analysis Tool (MnCMAT) was used to review the most current three-year period (2008-2010) to identify safety concerns along the corridor and at the study intersections. In order to determine the significance of the reported crashes, the associated crash rate for the study intersections and segments were also calculated. Crash rates are numerical values that compare one particular intersection to intersections of similar characteristics. The results of the safety analysis are summarized below.

84th Street Segment

During the most recent three-year period (2008-2010), only three crashes occurred on 84th Street between France Avenue and Penn Avenue. This results in a calculated segment crash rate of 0.45 crashes per million vehicle miles (MVM), which is below Hennepin County's average crash rate for similar type roadways (1.85 crashes per MVM).

84th Street and France Avenue Intersection

During the same three-year period (2008-2010), 11 crashes occurred at the intersection of 84th Street/France Avenue. This results in a calculated intersection crash rate of 0.38 crashes per million entering vehicles (MEV), which is below Hennepin County's average crash rate for similar type intersections (0.45 crashes per MEV).

84th Street and Penn Avenue Intersection

During the same three-year period (2008-2010), eight crashes occurred at the intersection of 84th Street/Penn Avenue. This results in a calculated intersection crash rate of 0.46 crashes per million entering vehicles (MEV), which is above Hennepin County's average crash rate for similar type intersections (0.22 crashes per MEV).

When an intersection is above the average crash rate for a similar intersection, the critical crash rate can be computed to determine the significance of the greater than average rate. For the intersection of 84th Street/Penn Avenue, the calculated crash rate of 0.46 crashes per MEV is above the critical crash rate of 0.43 crashes per MEV, indicating that there is a statistically significant crash issue at the intersection.

Further review of the types of crashes occurring at the intersection of 84th Street/Penn Avenue was conducted. Recent crash data does not indicate any specific trends, with a variety of crashes (rear end, sideswipe, left turn and right angle) occurring at this intersection. In addition, improvements recommended in this study will not impact the intersection at Penn Avenue. Since Penn Avenue is a County Road, this intersection is under the jurisdiction of Hennepin County. Therefore, the City should discuss this crash issue with the County to determine if any improvements could be made to this intersection to improve its overall safety.

Washburn Elementary School Issues

The Washburn Elementary School is located on the south side of the 84th Street corridor, approximately 400 feet east of Xerxes Avenue. Currently, there are two main issues that have been identified at the school. The first issue that needs to be addressed is the safety of school-aged pedestrians crossing 84th Street, especially from the northeast. Representatives from the school have indicated that it is difficult to get students from the east to walk past the school entrance, to cross at the signalized intersection of Xerxes Avenue.

The second issue involves the site circulation for parent drop-off and pick-up operations, and its impact on traffic on 84th Street. The narrow throat of the school driveway makes it difficult for vehicles to enter and exit at the same time. Currently, vehicles queues back out of the school parking lot onto 84th Street, during the morning arrival and afternoon pick-up periods. At times, vehicles making a left-turn movement into the site were waiting in the through lane on 84th Street before entering.

3.0 Roadway & Intersection Layout Options

3.1 84th Street/Xerxes Avenue Intersection

As previously mentioned, the intersection of 84th Street/Xerxes Avenue is a T-intersection currently controlled by an old span wire traffic signal that has reached the end of its usable life and is due for replacement. In addition to the age of the traffic signal, steep grades west of the intersection create sight distance issues for motorists waiting on the south approach of Xerxes Avenue. The evaluation of the 84th Street corridor includes traffic control options for the Xerxes Avenue intersection to determine the recommended intersection control. Although the existing traffic signal does not meet warrants, traffic signal control will still be one of the options considered.

Traffic control options considered at the 84th Street/Xerxes Avenue intersection include:

- Traffic Signal
- All-Way Stop
- Side-Street Stop
- Roundabout

3.2 84th Street Corridor

Currently, the segment of 84th Street between France Avenue and Penn Avenue is a four-lane undivided roadway with sidewalk on both sides of the corridor. It has a 44-foot roadway width and speed limit of 30 mph. A majority of the roadway restricts parking on both sides, with some areas limited to morning and afternoon commuter peak period restrictions. The following corridor options were considered:

- Four-Lane Roadway – this option maintains the existing roadway width of 44 feet. It will be striped to include two 11-foot travel lanes in each direction.

- Three-Lane Roadway – this option maintains the existing roadway width of 44 feet. It will be striped to include two 11-foot travel lanes, a 12-foot center left-turn lane and two five-foot shoulders. The existing on-street parking (time restricted) will be eliminated.

3.2 84th Street Corridor & Xerxes Avenue Intersection

In order to determine how the combined 84th Street corridor and Xerxes Avenue intersection options will accommodate current and future traffic volumes, an operations analysis was conducted for the a.m. and p.m. peak hours for the following combined options:

- Four-Lane with New Traffic Signal
- Four-Lane with All-Way Stop
- Four-Lane with Side-Street Stop
- Four-Lane with Multi-Lane Roundabout
- Three-Lane with New Traffic Signal
- Three-Lane with All-Way Stop
- Three-Lane with Side-Street Stop
- Three-Lane with Single-Lane Roundabout

Based on the operations analysis results (delays and queues), right-of-way impacts, and/or cost estimate, the following combined options were eliminated from further consideration:

- Four-Lane with Side-Street Stop
- Four-Lane with Multi-Lane Roundabout
- Three-Lane with All-Way Stop
- Three-Lane with Side-Street Stop
- Three-Lane with Single-Lane Roundabout

More detailed information can be found in Table 1 of Appendix B.

Based on the corridor evaluation and study findings, the stakeholders group selected three roadway and intersection layout options, to move forward to the neighborhood open house for public input. These options address the needs and issues identified through the data collection and existing conditions evaluation, while providing an improved transportation system that balances the multi-modal needs of the facility.

- Option 1 – Four-Lane with New Traffic Signal
- Option 2 – Four-Lane with All-Way Stop
- Option 3 – Three-Lane with New Traffic Signal

The results of the operations analysis for future 2030 conditions have been summarized in Table 3.1 (4-Lane Options) and Table 3.2 (3-Lane Option) for the three options presented at the open house. As shown in Tables 3.1 and 3.2, the results for the 84th Street/France Avenue and 84th Street/Penn Avenue intersections have the same level of service since no physical changes are being proposed as part of this study. For the 84th Street/Xerxes Avenue intersection, the level of service results in parentheses (Table 3.1) represents the four-lane option with all-way stop control. The remaining results for this intersection in Tables 3.1 and 3.2 represent the four-lane and three-lane options with a new traffic signal.

As shown below, the results of the analysis indicate that all study intersections are expected to operate at an overall acceptable level of service during the a.m. and p.m. peak hours. However, the operations analysis results of the three-lane roadway option indicate that significant queues will develop (approximately 1,300 feet) at Xerxes Avenue on eastbound 84th Street during the p.m. peak hour. Average and maximum queue lengths for key movements of the 3-lane option are shown in Appendix A.

Table 3.1 2030 Conditions 4-Lane Options – Peak Hour Capacity Analysis Level of Service Results

84th Street Intersection	A.M. Peak Hour	Side-Street Delay	P.M. Peak Hour	Side-Street Delay
France Avenue	D	NA	D	NA
Xerxes Avenue	B (B)	NA	B (C)	NA
Washburn Avenue [(1)]	A/B	12 seconds	A/B	12 seconds
NHSU West Driveway [(1)]	A/C	17 seconds	A/E	49 seconds
Russell Avenue/NHSU East*	A/D	28 seconds	A/E	39 seconds
Penn Avenue	B	NA	C	NA

Note: [(1)] Indicates the intersection is a side-street stop controlled intersection. The overall level of service is followed by the side-street approach level of service.

[(2)] The level of service results in parentheses represent the four-lane option with all-way stop control.

Table 3.2 2030 Conditions 3-Lane Option – Peak Hour Capacity Analysis Level of Service Results

84th Street Intersection	A.M. Peak Hour	Side-Street Delay	P.M. Peak Hour	Side-Street Delay
France Avenue	D	NA	D	NA
Xerxes Avenue	B	NA	D	NA
Washburn Avenue [(1)]	A/B	12 seconds	A/C	15 seconds
NHSU West Driveway [(1)]	A/B	14 seconds	A/D	31 seconds
Russell Avenue/NHSU East*	A/C	19 seconds	A/E	49 seconds
Penn Avenue	B	NA	C	NA

Note: [(1)] Indicates the intersection is a side-street stop controlled intersection. The overall level of service is followed by the side-street approach level of service.

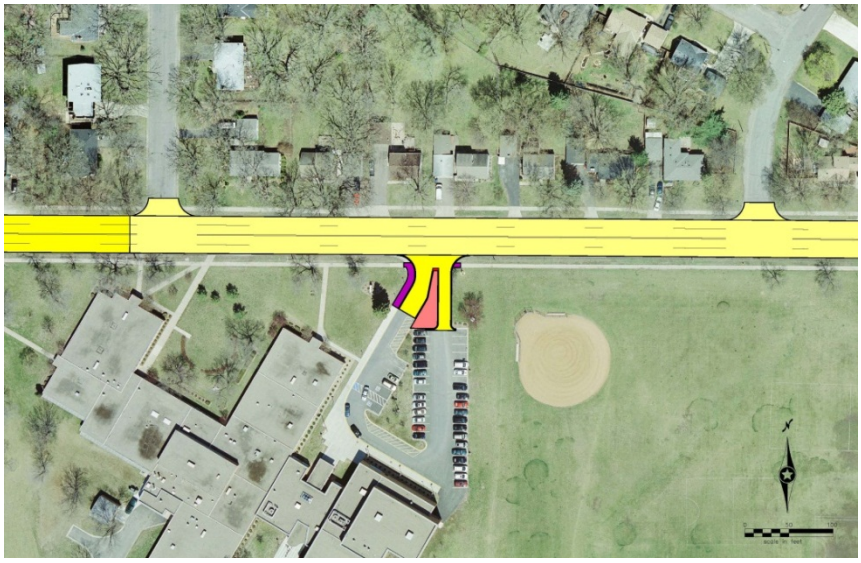
3.3 Washburn Elementary School Issues

As described earlier in the report, the two main issues associated with the Washburn Elementary School are the safety of school-aged pedestrians crossing 84th Street and the poor site circulation that creates a queuing problem that impacts 84th Street traffic. As previously mentioned, the on-site operations create delays for motorists entering the school parking lot. Vehicles making a left- or right-turn movement into the site are forced to wait in the through lanes on 84th Street. This creates a safety problem with conflicts between vehicles traveling along and those in a stopped condition on the 84th Street corridor.

In addition to the three roadway and intersection layout options, site improvements to address the issues at the Washburn Elementary School were developed. As summarized below, all options are expected to improve the flow of traffic in and out of the school parking lot, reducing the potential for entering queues to spill back onto 84th Street.

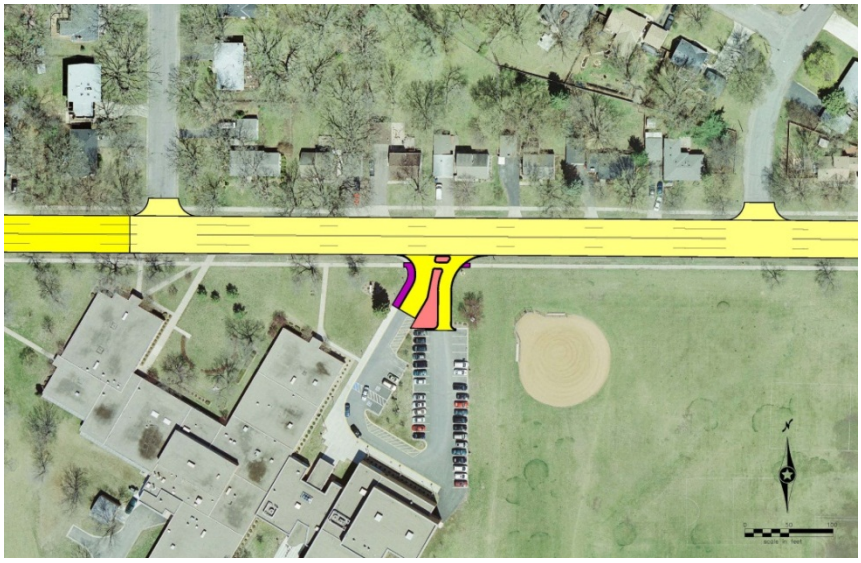
Option A

Option A widens the throat and adds a median to better direct inbound and outbound traffic.



Option B

Option B has some similarities to Option A, such as widening the throat and adding a median to better direct inbound and outbound traffic. However, this option limits the outbound traffic to a right-turn movement. This will simplify the intersection and reduce the potential for conflicts, but could result in the increase of u-turn movements east of the school on 84th Street.

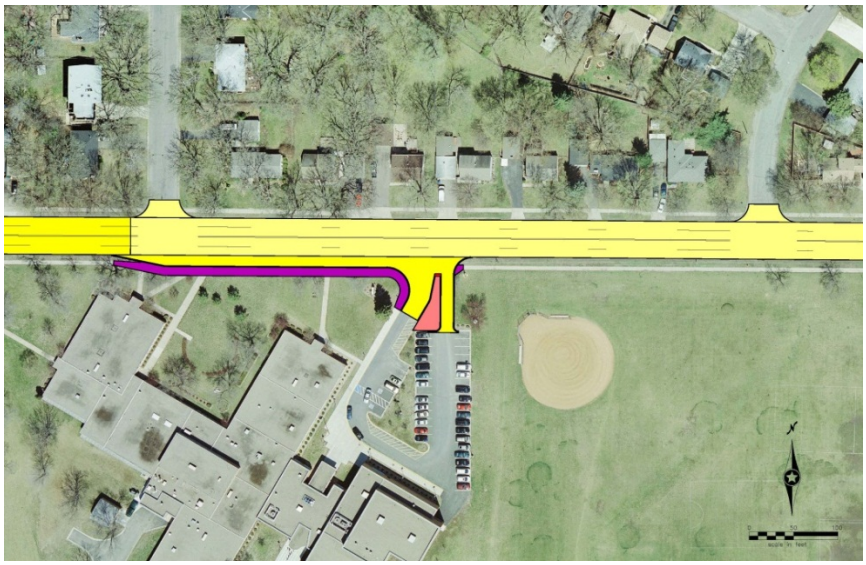


Option C

Option C separates the conflicting inbound and outbound traffic movements. This improvement will simplify the main parking lot driveway by relocating the outbound traffic further east. However, it will impact the green space east of the parking lot.

Option D

Option D is an expansion of Option A, as it widens the throat and adds a median to better direct inbound and outbound traffic, and includes an exclusive eastbound right-turn lane for traffic entering the site. This will provide additional storage for motorists wanting to enter the school parking lot, while moving them out of the through traffic lane.



Other options were developed and considered to provide an ingress or egress to the parking lot onto a street other than 84th Street. However, these options were eliminated due to the increase in pedestrian conflicts that would be created within the school site.

It is important to note that the School District and City staff is currently discussing the four options and no decision has been made at this time. Although these options are independent of this study, it would be cost effective if school modifications were made during the 84th Street pavement maintenance projects.

4.0 Neighborhood Open House

A neighborhood open house was scheduled during the study process to solicit input from the public on study corridor/intersection issues, needs, options and impacts. The open house took place on April 10, 2012 at Washburn Elementary School. At the open house, residents were asked to rank the three selected options and fill out comment sheets. In addition, an online survey was set-up on the City's website to collect responses from residents that were unable to attend the open house. A summary of the open house comments received at the open house and via the website are summarized below.

Table 4.1 Summary Results

Option No.	Ranked #1	Ranked #2	Ranked #3
1 (4-lane with signal)	26	6	14
2 (4-lane with all-way stop control)	1	14	27
3 (3-lane with signal)	23	9	12

- Fifty-four people (representing 48 residences) attended the open house.
- Of residents adjacent to 84th Street, 10 of 13 selected Option 3 as their first choice. Assumes online comments.
- More detailed responses are shown in Appendix B.

Based on open house comments and results on the ranking exercise to identify the highest ranked option, there was approximately 50/50 split between the four-lane roadway with a new traffic signal and three-lane roadway with a new traffic signal. Both of these options have similar cost estimates and produce acceptable intersection levels of service under existing and 2030 conditions. However, the operations analysis results of the three-lane roadway option indicate that significant queues will develop (approximately 1,300 feet) on eastbound 84th Street during the p.m. peak hour. See Appendix C, Table 1 for more detailed analysis results.

5.0 Consultant Recommendation

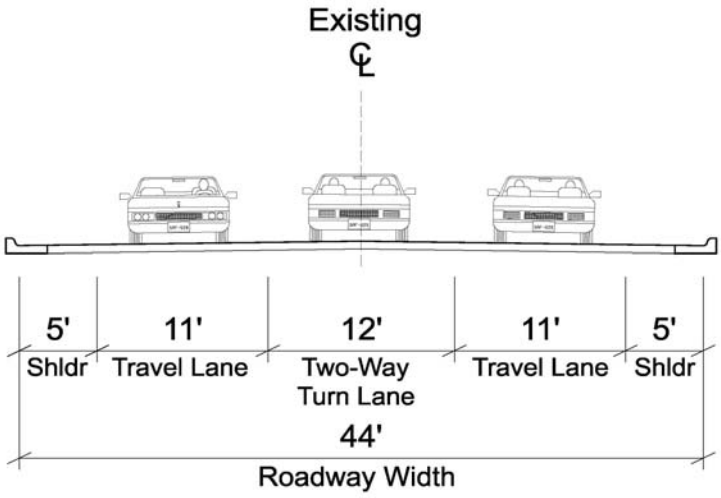
5.1 Stakeholders Group Discussions

Based on discussions with the project stakeholders, the three-lane with a new traffic signal option was preferred for the corridor because it addresses the main corridor issues:

- Pedestrian safety
- Vehicle speeds
- Existing signal at Xerxes Avenue (needs replacement)

5.2 Selection of the Preferred Option

Based on resident feedback, stakeholder's preferences, understanding of the City's goals and engineering judgment; SRF recommends the three-lane with a new traffic signal option.



This recommendation is based on the following:

- Improves pedestrian, bicycle and vehicular safety without the expansion of the existing curb-to-curb width (except at the school entrance)
- Provides a buffer between vehicles and pedestrians/bicyclists
- Provides speed reduction and uniform flow
- Supports adjacent land use and improved left-turn protection by providing a center left-turn lane on a roadway with numerous residential driveways
- Supports neighborhood context and promotes safe and convenient travel to and from the Washburn Elementary School
- Supports the City's functional classification system as a Major Collector roadway
- Low-cost implementation that does not preclude future modifications

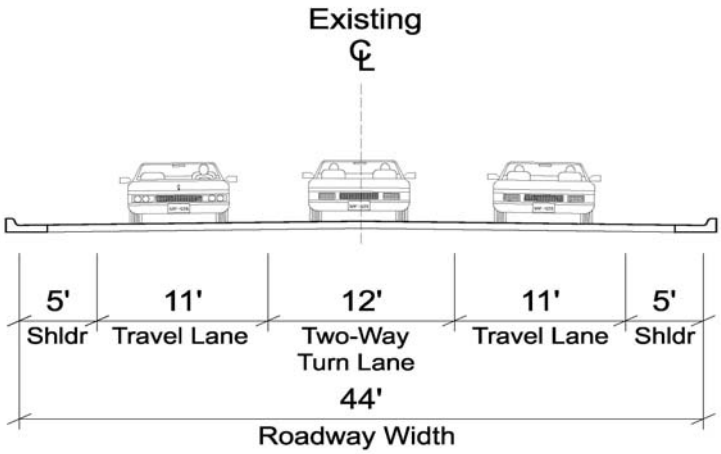
In addition to the preferred option, we recommend the following:

- A new crosswalk constructed near Thomas Avenue with pedestrian amenities (Amy to provide detail)
- An eastbound right-turn lane at the Washburn Elementary School driveway, to maintain a free-flow through lane during the morning and afternoon parent drop-off and pick-up times
- The three-lane option would function as a "share the road" between Xerxes Avenue and Washburn Avenue, since an on-road bikeway north and south of 84th Street is proposed in the ATP

6.0 City Council Recommendation

6.1 City Council – June 25, 2012

At the City Council Public Hearing on June 25, 2012, the Council approved Option 3, providing a three-lane segment of 84th Street between France Avenue and Penn Avenue with a new traffic signal at Xerxes Avenue and an enhanced pedestrian crossing at 84th Street and Thomas Avenue. With the opportunity for concerned residents to speak, the majority of the residents that spoke were in favor of Option 3.



Appendix A. 3-Lane Option Queuing Results

Table A-1

84th Street and Xerxes Avenue Intersection Analysis

Year 2030 Queuing Results for the 3-Lane Option

November 2012

Intersection/Movement	AM Peak Hour				PM Peak Hour			
	Left Turn		Right Turn		Left Turn		Right Turn	
	Average Queue (ft)	Maximum Queue (ft)	Average Queue (ft)	Maximum Queue (ft)	Average Queue (ft)	Maximum Queue (ft)	Average Queue (ft)	Maximum Queue (ft)
Westbound 84th Street at France Avenue	95	340	145	240	70	265	115	225
Westbound 84th Street at Xerxes Avenue	25	90	N/A	N/A	70	130	N/A	N/A
Eastbound 84th Street at Washburn Elementry Driveway	Maximum queue occurs for the eastbound right turn movement during morning drop-off and afternoon pick-up periods. Based on observations, this queue reaches up to 200 feet.							
Eastbound 84th Street at Penn Avenue	70	145	10	40	240	390	190	360

Appendix B. Open House Summary Comments

84th Street & Xerxes Avenue Traffic Study - Resident Comments as of 5/17/12						
			Xerxes to Penn			
Name	Address	Type of Response	Option 1	Option 2	Option 3	Comments
Kristi Lueth	3400 W 84th St	Open House - Comment Card	3	3	1	Please, please, please make 84th St a 3-lane (option 3)! This option has many advantages: extra safety for pedestrians on the sidewalks to get them away from the fast moving traffic, offering a bike lane to encourage safe biking options for commuters and school children. This option would also have the potential to slow down traffic, which might average 37mph at your traffic point but frequently hits 50+ mph at the bottom of the hill by Beard Rd! The 3 lane option works great on 86th and 90th. Please put it on 84th St.!
Gerry & Peg Opatz	3508 W 84th St	Open House - Comment Card	3	3	1	no comment
Vollie Sanders	3653 Towndale Dr	Open House - Comment Card	1	3	2	Option #3 Three lanes create a traffic issue during heavy traffic times. * Incorporate turn lane into school in option #1 "Stop signs" in option 2 tends to back traffic up and 84 carries a heavy traffic load during busy times.
Kathy Wienke	3100 Forest Crest Dr	Open House - Comment Card	1	3	1	I do not like the idea of a signal light at the school entrance & then a 3-Way "stop "sign where the existing light is now. I'm wondering if there could be a better configuration for traffic on school property.
David W. Nelson	2606 W 84th St	Open House - Comment Card	1	3	3	Retain current traffic patterns with new light. WB left turns hit loops at Xerxes and trigger green. Investigate slurry seal for repaving streets. It fills in cracks that chip & seal does not. For the school, Option D is best.
Jeff McCabe	8249 Beard Rd	Open House - Comment Card	1	3	2	no comment
John Servais	8549 Zenith Rd	Open House - Comment Card	1	2	3	84th Street if efficient now - Option 1 is virtually the same - Good! Option 3 will not handle the rush hour traffic nearly as well.
Patty Nail	3225 W 84th St	Open House - Comment Card	3	2	1	There is too much commuter traffic traveling way too fast. The only way to reduce the volume is to cut out half the lanes. Having the turn lane in the middle eliminates the possibility/probability of being rear-ended while trying to turn into your driveway.
William Brown & Amber Cain	3121 W 84th St	Open House - Comment Card	3	2	1	Need to slow traffic down. Need to have turn lanes. Need to have more cops during pre rush hours.
Steve Groen	8649 Thomas Ave	Open House - Comment Card	1	2	3	With school Access Option D.
Carole McLachlan	8256 Xerxes Ave	Open House - Comment Card	2	3	1	I like this better because of the long turn lane coming into the school. I also feel school access options should be D coming into the parking lot and C leaving the parking lot. Cars need the room to make safe turns.
Duane Brinkman	8149 Abbott Ave	Open House - Comment Card	1	3	2	Thank you for having or providing this opportunity for seeing & hearing comments. 3 lane might be safer for school walkers. 4 lane will move the traffic better. Tough decision, but you will do the right thing.
Nikki Farrington	8628 Zenith Rd	Open House - Comment Card	3	2	1	3 - Lane conversion preferred - Like the 5' shoulder because it provides a little buffer between travel lane & sidewalk!
Glen Paulsen	2925 W 87th St	Open House - Comment Card	1	3	2	Left turn control west bound.
Joan Johnson	8440 Xerxes So	Open House - Comment Card	3			Westbound on 84th needs a left turn signal at Xerxes. Right now it is dangerous as you cannot see oncoming traffic coming over the hill.
Ed Connelly	8233 York Ave	Open House - Comment Card	1	3	2	

84th Street & Xerxes Avenue Traffic Study - Resident Comments as of 5/17/12

Name	Address	Type of Response	Xerxes to Penn			Comments
			Option 1	Option 2	Option 3	
Marlin Miller	2900 W 84th St	Open House - Comment Card/E-Mail	3	3	1	Option 3/w Option C as one way in and one way out. Since living right across from school, speed and limit of traffic #1 Concern. / I talked to you at the meeting Tuesday evening regarding the Upcoming street renovation. I wanted you to see first hand what I deal with trying to leave my driveway every afternoon trying to leave to go to work. This was actually pretty light for a Friday. As you can see cars parked everywhere... Something has to change.!!! (Staff: See picture labeled Marlin Miller.jpg)
Dorine Connelly	8233 York Ave	Open House - Comment Card			1	There does not appear to be any real benefit in option 1 - Just a huge cost factor.
Andrew & Eva Timmons	8613 Xerxes Ave	Open House - Comment Card	3	2	1	School option D is my 1st choice. School option C is my second choice. Thank you very much.
Linda Williams	8224 Zenith Ave	Open House - Comment Card	2	3	1	Really like the center turn lanes & updated signal. Without the signal, I'm afraid those coming up the hill heading East on 84th may not see the stop sign. Signals seem much safer. Thank You!
Dale McLachlan	8256 Xerxes Ave	Open House - Comment Card	2	3	1	Option D - Option 3
No name	No address	Open House - Comment Card	1	3	1	C looks OK! As long as no stop signs! Lights OK
John & Laura Tiemann	3530 W 84th St	Open House - Comment Card	3	3	1	Option 3 moves traffic away from the curb which is important. Try walking your dog or kids ride bike with traffic going by at high speeds currently. I like school option C. For egress & ingress. But all school options improve conditions.
Marilyn Wurdeman	8401 Zenith Rd	Open House - Comment Card	3	3	1	The street now does not work!! A turning lane would work great. People would be able to get out of the streets on Zenith & Chowan, because they are collector streets in themselves. Maybe we should think about the kids walking to school instead of cars from other communities traveling through. The sidewalks are next to the street no boulevard for barrier. It would be nice to have the children in the neighborhood be able to walk to the play ground at Washburn to play. Think of the children instead of someone that has to take a little more time at a stop sign. Move the sidewalk away from the streets when you fix the first phase. Have the police have their speed point at Beard or Zenith Rd. instead of just on the N.W. Chowen
No name	No address	Open House -	3	2	1	We need some kind of pedestrian stop at the school. Thanks Jon Mitterluyer
Jim & Betty Settle	8500 Xerxes Ave	Open House - Comment Card	1	3	3	Most Important is left-turn signal to turn left (South) onto Xerxes from 84th. + Warning signs on 84th (W. of Xerxes) of "Signal Ahead"
Ron Nail	3225 W 84th St	Open House - Comment Card	3	3	1	In my opinion the problem is that 84th St. has been made too inviting to commuting traffic. Go with a two lane plan, to maintain 4 lanes will only encourage more traffic. Please reduce green light time for (5-10 seconds) east bound 84th at France Ave during rush hour. To me this has contributed to the congestion.
Tom Dokken	8540 Russell Ave	Open House - Comment Card	1	3	2	Stop light with emergency vehicle flashers is essential.
John McNearney	8337 Russell Ave	Open House - Comment Card	1	2	3	Constructing the traffic flow when the traffic count has to go up is a very poor option. The Traffic count will continue to grow with the population and work force increase that the City is constantly striving for. Option C is the safest and smartest for the parking lot.

84th Street & Xerxes Avenue Traffic Study - Resident Comments as of 5/17/12						
			Xerxes to Penn			
Name	Address	Type of Response	Option 1	Option 2	Option 3	Comments
Scott Van Havermaet	2306 W 84th St	Open House - Comment Card	1	2	3	Consider a pedestrian crossing light a fair distance from the Xerxes signal but still in front of the school…. More sidewalk needed to get kids from the door across the parking lot to crossing?
Craig Matson	3209 W 85th St	Open House - Comment Card	1	2	3	I recall some discussion at a meeting at Poplar Bridge where it was voted to keep stop signs as opposed to traffic lights for speed limit issues. This seems less of an issue east of France Ave due to 84th St ending at Penn Ave. A 3-lane section would seem to impede traffic flow quite a bit during peak use hours as it does just south on 90th St. between Penn and France.
James Disch	8506 Zenith Rd	Open House - Comment Card	1	3	3	1. Concerns for Zenith traffic - traffic cuts through whenever there is a back-up at Xerxes. (EB) No changes to increase backup. 2. During construction, concerns traffic on Zenith would increase.
Chad Ford	8612 Thomas Ave	Open House - Comment Card	1	3	2	I think the stop sign option will prove to be a problem with traffic rolling through on 84th. It would be a safety concern for kids crossing to & from the school. A new traffic signal is my main concern, so opt. 1 or 3 is preferable. I think a 3 lane option will breakup traffic and could cause delays.
Don Nash	3724 W 84th St	Phone			1	Speeding is the number one concern on this roadway. Prefers the 3-lane configuration, as a self-enforcing method for speed reduction. Also prefers the 3-way stop at Xerxes, believing it would be safer for the school, would slow traffic on the corridor and is working on 84th Street near the other school (Poplar Bridge).
John & Rita Lesch	8725 Logan Ave	E-Mail/Phone	1			In regard to public input on changes to 84th st. traffic lanes: we line on 87st and do not like what has happened on the 86thst changes. We think that just as on 90th St, it is a waste of space where a second lane could exist. Drive on 90th St for Penn to France and beyond and ask what are those lanes with arrows going nowhere for? Please do not reconfigure 84th st as a 3 lane road. There is not enough bicycle traffic as opposed to the inconvenience for cars to justify this, Thank You

84th Street & Xerxes Avenue Traffic Study - Resident Comments as of 5/17/12						
			Xerxes to Penn			
Name	Address	Type of Response	Option 1	Option 2	Option 3	Comments
Todd Angus	8608 Xerxes Ave	E-Mail	1			Just my two cents about this project. I live at 8608 Xerxes in Bloomington and I am also a volunteer firefighter that responds to Fire station 4 at 84th and Irwin. As a Firefighter for the past 15 years driving to some 200+ fire calls a year I have used this intersection often and at all times of the day and night. I feel strongly that the 84th and Xerxes intersection remain signalized. However the signal really should stay 'traffic activated". I don't know if that is the term for it but the light usually stays green on 84th st. but when a car from Xerxes pulls up it turns green quickly. I think the all way stop option would restrict what seems to be a fairly good traffic flow as it is now. Also, drivers not familiar with the intersection may not notice the stop sign as readily as a signal light. It is important to note the elevation of the intersection compared to the road. A car taking a left turn heading West on 84th from Xerxes really cannot see oncoming traffic from East bound 84th and vice versa. Regarding the lane configurations, as it is now with 4 lanes, due to the condition of the outside lanes, drivers tend to not use them unless it is a heavy traffic time. When the road is resurfaced I think 4 lanes would work fine. Rarely is there a problem with left turning traffic in either direction. I think the 4 lane configuration should remain. Thank you for your efforts towards these street improvements.
Jim Meredyk	8328 Ewing Rd	Online Survey	1	2	3	Changing to a 3 Lane from 4 Lane would be a huge mistake for this high traffic area
Steve Wolfe	3800 W 84th St	Online Survey	1	2	3	The street and intersection are just fine as they are. Option 1 is the best. Option 3 should be avoided at all costs as it is a huge waste of resources. The inefficiency of the 3 Lane system is terribly wasteful and should be abandoned. The utopian bike riding fantasy just doesn't work in reality.
Steven Gitelis	9541 Oxborough Crv	Online Survey	1	1	3	84th Street is a major arterial for Bloomington in this area. The comment about "speeding" is misguided. Every street in Bloomington has speeding! To restrict traffic on yet another East-West Arterial is not in the City's best interest. There is just too much commercial traffic to restrict this area to only two lanes. The use of stop signs at Xerxes IS appropriate and is a sufficient "traffic calming" method
Marcia Averbook	3816 W 84th St	Online Survey	3	2	1	How will this affect the 84th and France intersection? This was just redone a couple of years ago. 84th Street traffic is terrible and France Ave. traffic is even worse. Whatever is done should be done with discouraging 84th Street traffic. Slowing it is not enough.
Joan Winters	8025 Xerxes Ave	Online Survey	1	3	2	Biggest concern is drivers blowing through the stop sign when traveling east on 84th. We have enough problems now with drivers not noticing the stop light soon enough due to impaired sight lines. The stop light is much more visible than a stop sign. Reducing to 3 lanes is a nightmare. I have friends off of 90th street that I will no longer pickup or drop off because I can wait well over 15 minutes to make a turn back onto 90th. The cars are single file and spaced so close there is no way to pull out without cutting someone off. The same thing will happen with parents trying to pull out of the elementary school parking lot.
Robert Mead	2610 W 87 1/2 St	Online Survey	1	2	3	On 86th and 90th st, we lost a driving lane for hundreds of cars in each direction for a dozen bicyclists. No one can get around a slow driver.

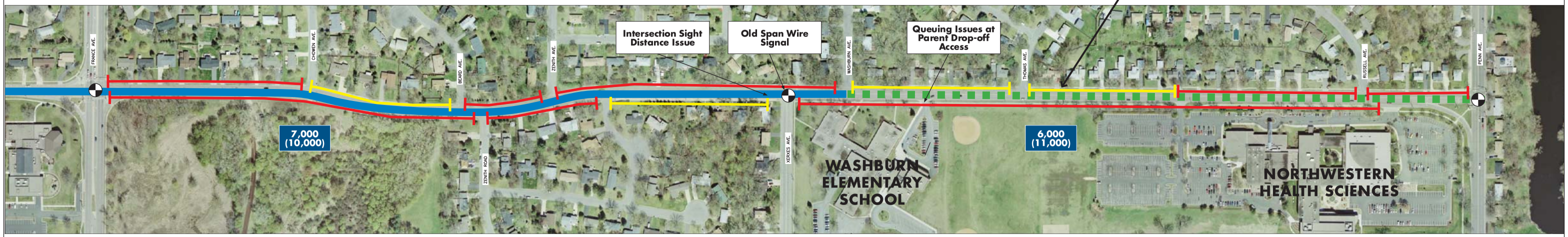
84th Street & Xerxes Avenue Traffic Study - Resident Comments as of 5/17/12						
			Xerxes to Penn			
Name	Address	Type of Response	Option 1	Option 2	Option 3	Comments
James Robasse	8548 Xerxes Ave	Online Survey	1	3	2	
Robert Moncur	2931 W 87th St	Online Survey	2	3	1	Why would it be necessary to install a new traffic signal in options 1 and 3? Wouldn't the existing signal be adequate?
Rick Miller	2900 W 84th St	Online Survey	3	3	1	None seem to work. Option 3 seens to be ok. Yet no additional options seem to be in the works for the school drop/pick up
Sean Hayfor Oleary	7229 2nd Ave Richfield	Online Survey	2	3	1	
Karen Diller	8433 York	Online Survey	2	3	1	Like option 3 because of ability to use shoulder as bike lane
Margart Aldrich	8212 Russell Ave S	Phone	1			Wants the roadway to remain 4 lanes

Appendix C. Study Figure & Table

EXISTING CONDITIONS - FRANCE AVENUE TO PENN AVENUE

- Curb to curb width is 44 feet
- Four-lane undivided roadway
- Speed limit is 30 mph
- Sidewalk on both sides of the corridor
- Transit service throughout corridor
- Overhead utilities primarily on the south side
- Washburn Elementary and Northwestern Health Sciences University located between Xerxes Avenue and Penn Avenue
- Key intersections operate acceptably during peak periods

Year 2011 Speed Data
- Average Speed: 32 mph
- 85th Percentile Speed: 37 mph
- 80 percent of vehicles exceed 30 mph



Legend

- = Key Signalized Intersection
- = No Parking
- = No Parking 7-9 AM & 3-6 PM
- = 2013 Reconstruction
- = 2014 Overlay
- XXX = Year 2007 Daily Traffic Volumes*
- (XXX) = Year 2030 Daily Traffic Volumes*

*Source: Comprehensive Plan 2008

CITY OF BLOOMINGTON MINNESOTA

SRF

Corridor Issues

Table B-1
Segment/Intersection Combinations Summary
84th Street and Xerxes Avenue Traffic Study
May 14, 2012

Segment/Intersection Combinations	84th Street and Xerxes Avenue 2011 Intersection Operations		84th Street and Xerxes Avenue 2030 Intersection Operations		Improvements	Additional Costs*	Comments
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour			
Four-Lane with Signal	LOS A	LOS B	LOS B	LOS B	Traffic Signal	$350,000	Current roadway configuration with a new traffic signal at Xerxes Avenue. Estimated right-of-way costs of $75,000 included.
Four-Lane with All-Way Stop	LOS A	LOS B	LOS B	LOS C	Pedestrian Signal	$75,000	Similar to all-way stops on 84th at Quinn Road and Morris Avenue. A pedestrian signal will be needed for the elementary school.
Four-Lane with Side-Street Stop	LOS A/B	LOS A/D	LOS A/B	LOS A/E	Grade Work and Pedestrian Signal	$575,000 to $1,000,000	A reduction in the vertical grade of 84th Street is needed west of Xerxes Avenue to meet sight distance standards. A pedestrian signal will be needed for the elementary school.
Four-Lane with Multi-Lane Roundabout	Under Capacity	Under Capacity	Under Capacity	Under Capacity	Roundabout and Pedestrian Signal	$1,275,000	Significant right-of-way impacts at Xerxes Avenue. A pedestrian signal will be needed for the elementary school.
Three-Lane with Signal	LOS A	LOS B [(1)]	LOS B	LOS D [(3)]	Traffic Signal and Right-Turn Lane at School	$400,000	By year 2030, significant queues (1,300 feet) are expected to develop on 84th Street during the p.m. peak hour. An eastbound right-turn lane will be needed at the elementary school parent drop-off driveway. Estimated right-of-way costs of $75,000 included.
Three-Lane with All-Way Stop	LOS B	**LOS F [(2)]**	LOS B	**LOS F [(4)]**	Pedestrian Signal and Right-Turn Lane at School	$125,000	Significant traffic delays are expected during the p.m. peak hour. An eastbound right-turn lane will be needed at the elementary school parent drop-off driveway.
Three-Lane with Side-Street Stop	LOS A/B	LOS A/C	LOS A/C	**LOS F/F [(5)]**	Grade Work, Pedestrian Signal and Right-Turn Lane at School	$625,000 to $1,050,000	Significant traffic delays are expected during the p.m. peak hour. A reduction in the vertical grade of 84th Street is needed west of Xerxes Avenue to meet sight distance standards. An eastbound right-turn lane will be needed at the elementary school parent drop-off driveway.
Three-Lane with Single Lane Roundabout	Under Capacity	Under Capacity	Under Capacity	**Over Capacity**	Roundabout, Pedestrian Signal and Right-Turn Lane at School	$825,000	Right-of-way impacts at Xerxes Avenue. A pedestrian signal will be needed for the elementary school. An eastbound right-turn lane will be needed at the elementary school parent drop-off driveway.

* Costs do not include reconstruction of 84th Street west of Xerxes Avenue and overlay east of Xerxes Avenue.
[(1)] Eastbound queues are expected to reach 600 feet during the p.m. peak hour.
[(2)] Overall delay is expected to be one minute per vehicle. Eastbound queues are expected to reach 1200 feet during the p.m. peak hour.
[(3)] Eastbound queues are expected to reach 1300 feet during the p.m. peak hour.
[(4)] Overall delay is expected to be three minutes per vehicle. Eastbound queues are expected to reach 1/2 mile, spilling back to France Avenue.
[(5)] Overall delay is expected to be one minute per vehicle with the northbound approach exceeding ten minutes per vehicle.