

## Proposed Work Program

Source	Item	Expected Benefit	Estimated Cost	Estimated Timeline	Action By Whom	Other Comments
1998 SRF Study						
Section III.A.2	Review & revise left and right turn storage lengths	Remove through lane blockages			Mpls, Mn/Dot, Henn County	Hiaw @ 26th St X-street @ 38th, 46th St
Section III.C.3 & 5	Upgrade central control system software & intersection control equipment to allow 12 phase operation.	Reduced impact of pedestrian timing		No schedule for release date from Siemens	Siemens Corp Fortran Traffic Mpls	Existing NTCIP controller software - 12 phase version doesn't work. Req T2000C software upgrade to do 12-phase.
Section X.4	Consider an alternate central control system for added flexibility	Potential for reduced vehicle delay		2008-2009	Mpls	Funding being pursued to replace central control system
1999 Westwood Study						
Section 4.5.7	Instrument intersections for full actuated operation.	Reduced vehicle delay	\$10,000		Mn/Dot	Instrumentation Inplace along Hiaw except require mainline detection & push button additions at 26th St
Section 4.4	Street Geometric Modifications a. Lane use changes b. Roadway widening c. Left turn lane length increases	Reduced vehicle delay			Mpls, Mn/Dot, Henn County	Hiaw @ 26th St X-street @ 38th, 46th St
Section 4.3.2	Apply scheduling control on LRV arrivals at critical locations	Minimize impact of LRT preemptions on intersection operation			Metro Transit	Eliminate back to back arrivals at signalized locations on Hiaw. Maintain min separation betw same dir LRT vehs.
Section 4.3.3	Minimum LOS agreement for intersections betw. Agencies	Cooperative approach to improving degraded operation	\$0		Metro Transit, Mn/Dot, Mpls, Henn County	
2004 FHWA Study						
Recommendation #1	Minimize duration of Preempt Events	Minimize impact of LRT preemptions on intersection operation			Metro Transit	Implemented NEAR TERM item No. 1 (a-g)
Recommendation #2	Address emergency vehicle operation at 38th St	Minimize impact of LRT preemptions on emergency vehicle operation (see description below)			Mpls, Metro Transit	Implemented NEAR TERM item No. 1 (a-g)

Recommendation #3	Install Median Island or Curb - east leg of 38th St	remove grain truck blockage			Mpls	Elevator closures in future will remove problem
Recommendation #4	Revise pedestrian guidance & control at stations	Minimize potential for ped/LRT accidents			Metro Transit	Status unknown
Recommendation #5	Traffic control strategy improvements a. Add trackway signals to control LRT arrivals at signalized crossings b. Use common cycle time & headways that are multiples c. Allow emergency vehicles to PE LRT at 38th	Minimize impact of LRT preemptions on intersection & emergency vehicle operations			Mpls, Metro Transit	Metro Transit position on this is it is not an option.
Recommendation #6						
Other						
Near Term	1. Implement pkg of changes under consideration for modification of present operation					<b>COMPLETE</b>
	a. Relocation of LRT detection points	Minimize impact of LRT preemptions on intersection operation		Jan-05	LRT Contractor	<b>COMPLETE</b>
	b. Revision of station dwell time assumptions	Minimize impact of LRT preemptions on intersection operation		Jan-05	LRT Contractor	<b>COMPLETE</b>
	c. Addition of push buttons to main street phases	Intersection efficiency improvements		Jan-05	LRT Contractor	<b>COMPLETE</b>
	d. Addition of signalling system at stations to insure minimum dwell time adherence	Inadequate track clearance if early departure		Jan-05	LRT Contractor	<b>COMPLETE</b>
	e. Revise gate up operations to reduce delay to 5 seconds following LRT passage	Intersection efficiency improvements		Jan-05	LRT Contractor	<b>COMPLETE</b>
	f. Provide ability for LRT vehicles to cancel preempt calls at stations where currently can't do	Intersection efficiency improvements		Jan-05	LRT Contractor	<b>COMPLETE</b>
	g. Provide notification at control center when preempt exceeds threshold value	Intersection efficiency improvements		Jan-05	LRT Contractor	<b>COMPLETE</b>
	2. Add UPS battery backup systems to all signalized intersections w/gates & upgrade signal indications to all LED's	Safety improvement during power outages	\$10,000 to \$12,000 per location	2005	Mn/Dot, Metro Transit	Need to identify funding source
	3. Implement split phased operation at 46th St & revise Wbnd lane assignments	Intersection efficiency improvements	\$5,000	Dec/Jan-05	Mpls	<b>COMPLETE</b>
	4. Install count down ped timing indications for crosswalks at stations.	Improve pedestrian decision making		Summer 2005	Mpls	<b>COMPLETE</b>
Long Term	1. Reconstruct intersection of Hiaw & 26th St adding Sbnd dual left turn lane	Intersection efficiency improvements (see description below)			Mn/Dot	Jon-to do write up
	2. Reconstruct Wbnd approach of Hiaw & 46th St to provide 2-lt, 1-thru, 1-rt w/15' Ebnd lane	Intersection efficiency improvements (see description below)			Henn County	Discussed w/ County not currently in 5-yr program for recon of WB 46th St

	3. Install median in east leg of Hiaw & 46th to limit left turn conflicts into driveways	Intersection efficiency improvements			Henn County	Discussed w/ County not currently in 5-yr program for recon of WB 46th St
	4. Upgrade NTCIP software in traffic signal controllers to remember ped calls occurring during preempt	Intersection efficiency improvements		Spring 2005	Mpls	Work around solution implemented w/ hardware
	5. Upgrade NTCIP software in traffic signal controllers to operate in 12-phase mode	Intersection efficiency improvements		No schedule for release date from Siemens	Siemens Corp Fortran Traffic Mpls	Existing NTCIP controller software - 12 phase version doesn't work. Req T2000C software upgrade to do 12-phase.
	6. Replace central control system for Hiawatha signals w/ an alternate system	Potential intersection efficiency improvements		2008-2009	Mpls	Funding being pursued
	7. Install ped bridges to remove ped timing req from intersection operations	Intersection efficiency improvements			Mn/Dot, Mpls, Henn County, Metro Transit	?
	8. Provide upgrade to central control system software to install identified improvements a. Provide full actuated coordinated control b. Allow disabling of offset correction c. Implement TOD scheduling of certain control parameters d. Develop control strategy that services skipped phases at next opportunity	Potential intersection efficiency improvements	Estimated Cost Developed following items a. \$100,000 b. \$50,000 c. unknown d. unknown		Mn/Dot, Mpls, Henn County, Metro Transit	Need to identify funding source if central system not replaced.

#### Long Term Revisions

At each of the signalized intersections along the corridor protected only left turn movements were installed for turn movements off of Hiawatha Avenue. The protected only operation is a necessity for those turn movements across the LRT tracks, and are required for the opposing movement when operating in the current mode of leading southbound and lagging northbound left turns to avoid a left turn trap situation. The operation of the intersections was changed from standard leading left turns to the lead/lag mode during the early stages of initial operation of the light rail system after numerous complaints from motorists who were northbound and desired to turn across the tracks. The complaint was that their movement was frequently skipped, sometimes for several cycles. Many of the complaints received today are delays to southbound left turning vehicles being held by a protected turn on arrow only display when there are many opportunities to turn across opposing traffic. An operational change could be considered to return to the leading left turns for Hiawatha traffic and permitting left turns on green as well.

#### A- Hiawatha Ave & 46<sup>th</sup> Street

Discussions are underway with Hennepin County regarding various options available to improve the operating characteristics of the westbound leg of the intersection (CSAH 46). There are a number of driveways between Snelling Ave & Hiawatha Ave along 46<sup>th</sup> Street which produce numerous vehicle conflicts between entering and exiting vehicles and through traffic flow along this portion of 46<sup>th</sup> Street which will be addressed in the resulting recommendations. Inadequate left turn lane storage lengths, and large commercial vehicle movements are an additional concern. Complete separation of pedestrian movements crossing Hiawatha Ave from vehicle traffic may also be a consideration.

#### B- Hiawatha Ave & 38<sup>th</sup> Street

B- Hiawatha Ave & 38<sup>th</sup> Street

Conflicts between the need for schedule maintenance for LRT vehicles and minimal delay for emergency operations of fire department vehicles have not been mitigated by the recent operational changes implemented for LRT movements through the area. It will take a comprehensive cooperative discussion of operating philosophies between Metro Transit and Mpls Fire officials of the options available to reduce light rail impacts on fire department response times to produce recommendations for future modifications.

The activity of commercial vehicles accessing the driveways into the mill area will also need to be reviewed to insure that 38<sup>th</sup> Street is not blocked by stopped or parked commercial vehicles awaiting entrance into the plant.

An evaluation of lane designation and appropriate useage should also be performed on the westbound 38<sup>th</sup> Street approach to the intersection to determine if operational improvements would result from such revisions. Complete separation of pedestrian movements crossing Hiawatha Ave from vehicle traffic may also be a consideration.

C- Hiawatha Ave & 26<sup>th</sup> Street

Operating improvements for this intersection will require the involvement and cooperation of the Mn/DOT. The need for a change in roadway configuration/geometry must be presented to DOT officials while recognizing that modification and right-of-way acquisition will most likely be required on the westbound 26<sup>th</sup> Street approach as well. Potential improvements that could be considered include creating a dual southbound left turn movement combined with a widening of the eastbound roadway away from the intersection to accommodate the dual left turn. Consideration could also be given to making the westbound approach into a dual right or dual left if an evaluation showed that an improvement in operation would result.