

Traffic Impact Analysis

TECHNICAL MEMORANDUM

South Halsted Bus Corridor Enhancement Project

October 2019

Prepared for:



Prepared by:



Table of Contents

Introduction	3
Methodology.....	6
Queue Jumps.....	9
Alternative 1.....	9
Impacts.....	9
Summary of Results	10
Alternative 2.....	11
Impacts.....	11
Summary of Results	11
Alternative 3.....	11
Impacts.....	11
Summary of Results	11
Conclusions	12
Next Steps	13

Figures

Figure 1: South Halsted Bus Enhancement Project Corridor	5
Figure 2: Map of Intersections Analyzed	8

Tables

Table 1: Summary of Alternatives for South Halsted Corridor	4
Table 2: Intersection Level of Service Standards	7
Table 3: Comparison of AM Peak Intersection Delay & LOS for Alternative 1, 2 & 3	14
Table 4: Comparison of PM Peak Intersection Delay & LOS for Alternative 1, 2 & 3	15

Introduction

The South Halsted Bus Corridor Enhancement Project spans approximately 11 miles along South Halsted Street, from 79th Street to the Pace Harvey Transportation Center at 154th Street. The project corridor, shown in Figure 1, also includes portions of 79th Street and 95th Street that serve as connectors between Halsted Street and the CTA 79th Street and 95th Street Red Line Stations. The project objective is to improve efficiency and reduce travel delays for CTA and Pace buses along this corridor. Transit improvement developed in this study include running way alternatives and the implementation of Pace's Pulse service south of 95th Street. All planned improvements would complement CTA's planned extension of the Red Line from 95th to 130th Street. The CTA has hired a Program Manager for the Red Line Extension project to oversee the final environmental review and preliminary engineering work necessary to seek federal funding for the project.

The proposed transit improvements for the South Halsted Bus Corridor Enhancement Project include three different running way improvements. Descriptions of each of alternatives are found below and summarized in Table 1.

- **Alternative 1** – Queue jumps are proposed at signalized intersections along South Halsted Street from 79th Street to 98th Street. Between 98th Street and 100th Street, one existing travel lane in each direction would be converted to a bus lane. A bus lane is proposed in this section because there are several closely spaced intersections where the queue jumps would be synchronized to function as a bus lane. At each signalized intersection between 100th Street and 129th Street, queue jumps would be implemented, accommodated by the removal of approximately 233 existing parking spaces.

At the intersections of 134th, 138th, 144th, and 147th Streets, queue jumps are proposed by converting existing dedicated left turn lanes to shared through-left turn lanes as the left turn volumes are low. An option would be to keep the left turn and widen the roadway to provide the queue jump lane. The former approach reduces the need for additional right-of-way and pavement. Additional analysis and safety review would be needed. On-street parking along 79th Street between Halsted Street and Lowe Avenue could be removed to create a dedicated bus lane for several blocks, as noted in the CTA Bus Slow Zone Study – CTA Route #79.

Queue jumps would be implemented at the intersections of Vincennes Avenue & 79th Street, Parnell Avenue & 95th Street, and Wentworth Avenue & 95th Street. In total, 314 on-street parking spaces at 28 intersections would need to be removed to accommodate all queue jumps.

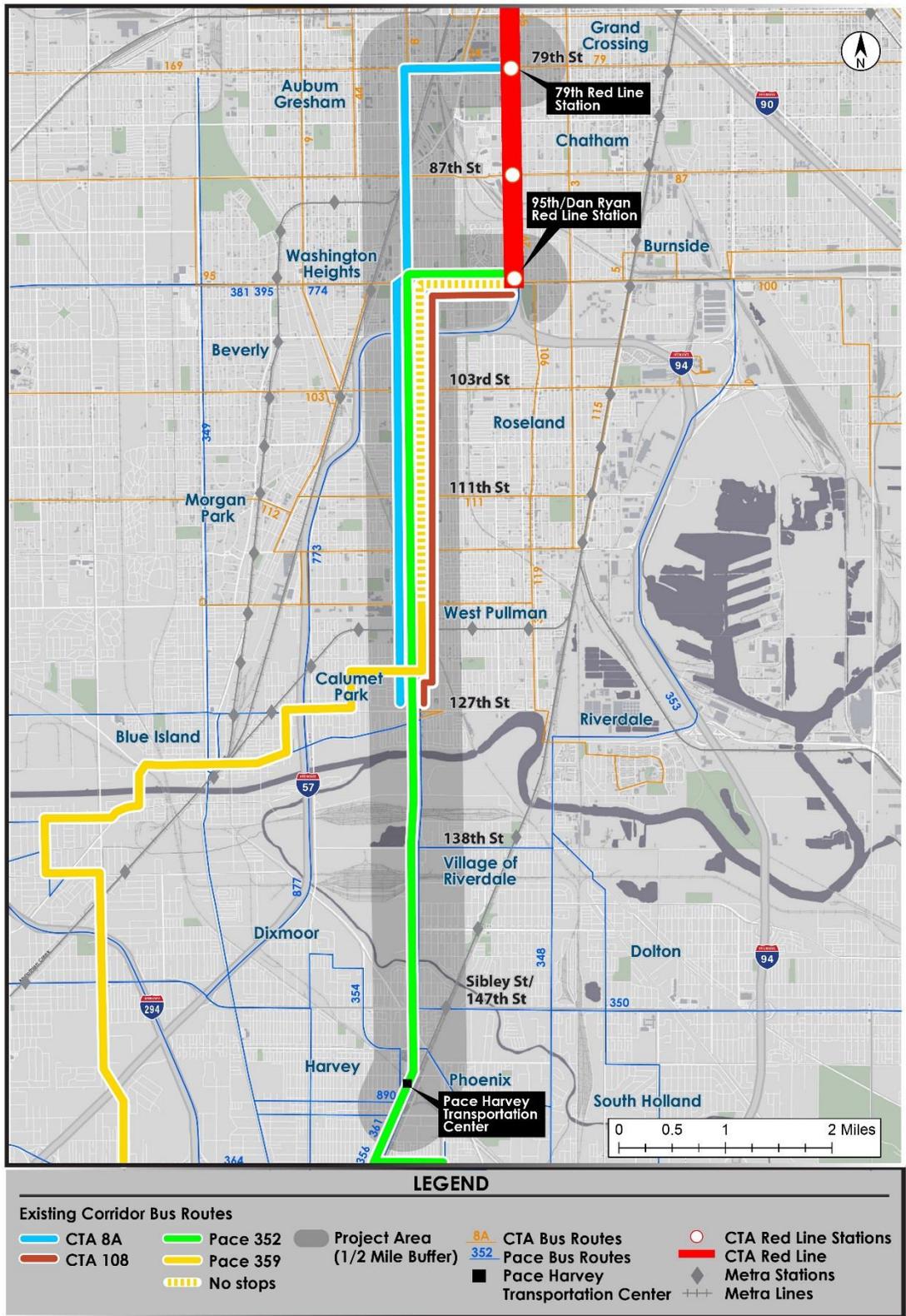
- **Alternative 2** – This alternative is the same as Alternative 1 along South Halsted Street from 79th Street through 129th Street and along both 79th Street and 95th Street. On the remaining portion of South Halsted Street from 129th Street to the Pace Harvey Transportation Center at 154th Street, one existing travel lane in each direction would be converted to a bus lane. The bus lane could operate as dedicated full time or only during peak hours. The same number of total parking spaces as Alternative 1 would need to be removed for this alternative.
- **Alternative 3** – This alternative is the same as Alternative 1 along Halsted Street from 79th Street to 100th Street and along both 79th Street and 95th Street. In addition to the 183 on-street parking spaces for queue jumps between 79th and 98th St (including 79th Street and 95th Street), approximately 970 parking spaces from 100th Street to 129th Place would need to be removed to create a bus lane that would allow right-turning vehicles. The on-street parking was considered

for conversion due to the many commercial parking lots in this segment and low utilization. The bus lane could operate as dedicated full time or only during peak hours. Similar to Alternative 2, one existing travel lane in each direction would be converted to a bus lane between 129th Place and the Pace Harvey Transportation Center at 154th Street. In total, 1,153 on-street parking spaces would need to be removed to accommodate the queue jumps and bus lanes.

Table 1: Summary of Alternatives for South Halsted Corridor

Halsted Street Segment	Alternative 1	Alternative 2	Alternative 3
79 th Street to 98 th Street (2.4 miles)	Queue Jumps (Repurpose parking)		
98 th Street to 100 th Street (0.25 miles)	Proposed Bus Lane (Repurpose travel lane)		
100 th Street to 129 th Place (3.7 miles)	Queue Jumps (Repurpose parking)		Proposed Bus Lane (Repurpose parking)
129 th Place to 154 th Street (3.4 miles)	Queue Jumps (Convert left turn lane to shared through-left lane)	Proposed Bus Lane (Repurpose travel lane)	
79 th Street (1.0 mile)	Queue Jumps (Repurpose parking)		
95 th Street (1.0s mile)	Queue Jumps (Repurpose parking)		

Figure 1: South Halsted Bus Enhancement Project Corridor



Methodology

The traffic impacts for the South Halsted Bus Corridor Enhancement Project were analyzed using Synchro as a screening tool. Synchro is a traffic analysis and signal optimization program created by Trafficware. Synchro is designed to approximate travel conditions at signalized intersections, unsignalized intersections, and roundabouts. Users input existing or proposed roadway geometry and signal layout along with observed turning movement counts and traffic volume data. Synchro then estimates the average travel delay expected at the intersection. All Synchro models were created with a design year of 2019, and existing CDOT and IDOT traffic signals were optimized for the existing volumes in each of the three alternatives. The modelling performed with Synchro examined the addition or removal of approach lanes. The analysis did not account for TSP which would require other modelling tools nor did the analysis examine impacts to cross streets. The results provide a general indication of how the signalized intersections would operate under the different alternatives. Maps indicating existing volume inputs are found in Appendix A.

Turning movement counts and traffic volume data collected for previous studies were used where available from CDOT. Supplemental traffic turning movement counts were conducted using a video-based system on April 10, 2018 from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. at the following locations:

- Vincennes Avenue & 79th Street
- Lafayette Avenue & 79th Street
- Parnell Avenue & 95th Street
- Wentworth Avenue & 95th Street
- Halsted Street & 81st Street
- Halsted Street & 83rd Street
- Halsted Street & 91st Street
- Halsted Street & 98th Street
- Halsted Street & 101st Street
- Halsted Street & 107th Street
- Halsted Street & 114th Street
- Halsted Street & 115th Street
- Halsted Street & 119th Street
- Halsted Street & 120th Street
- Halsted Street & 123rd Street
- Halsted Street & Vermont Street
- Halsted Street & 134th Street
- Halsted Street & 138th Street
- Halsted Street & 144th Street
- Halsted Street & 147th Street
- Halsted Street & 149th Street
- Morgan Street & 149th Street
- Morgan Street & 150th Street
- Park Avenue & 154th Street

Signalized intersection level of service (LOS) is described in terms of the average observed delay for the intersection. LOS of A, B, or C indicates an intersection that is performing well, while LOS of D is used as the minimum acceptable design standard. Intersections with LOS of E are considered as performing poorly, and intersections with LOS of F as failing. Table 2 summarizes the LOS criteria for signalized intersections as defined by the Highway Capacity Manual (2016).

Table 2: Intersection Level of Service Standards

Level of Service	Delay	Performance
A	≤ 10 seconds	Well
B	10-20 seconds	
C	20-35 seconds	
D	35-55 seconds	Acceptable
E	55-80 seconds	Poor
F	> 80 seconds	Failure

Source: Highway Capacity Manual, 6th Edition, Transportation Research Board, 2016

The following signalized intersections along Halsted Street were analyzed in Synchro under existing conditions, as well as the roadway configurations associated with each of the three alternatives:

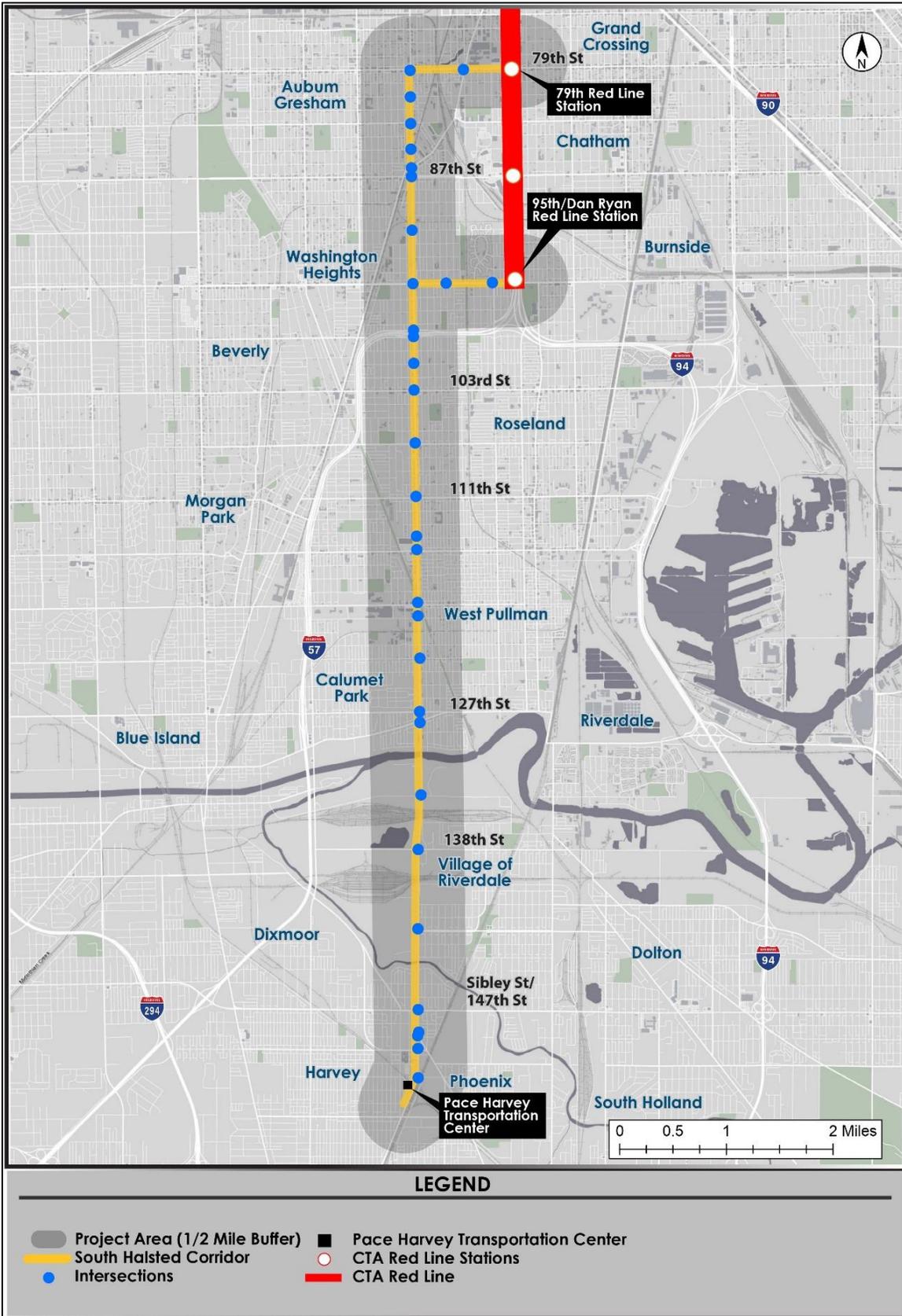
- Halsted Street & 79th Street
- Halsted Street & 81st Street
- Halsted Street & 83rd Street
- Halsted Street & 85th Street & Summit Avenue
- Halsted Street & Vincennes Avenue
- Halsted Street & 87th Street
- Halsted Street & 91st Street
- Halsted Street & 95th Street
- Halsted Street & 98th Place
- Halsted Street & 99th Street
- Halsted Street & 101st Street
- Halsted Street & 103rd Street
- Halsted Street & 107th Street
- Halsted Street & 111th Street
- Halsted Street & 114th Street
- Halsted Street & 115th Street
- Halsted Street & 119th Street
- Halsted Street & 120th Street
- Halsted Street & 123rd Street
- Halsted Street & 127th Street
- Halsted Street & Vermont Street
- Halsted Street & 134th Street
- Halsted Street & 138th Street
- Halsted Street & 144th Street
- Halsted Street & 147th Street
- Halsted Street & 149th Street
- Morgan Street & 149th Street
- Morgan Street & 150th Street
- Park Avenue & 154th Street

The following intersections along 79th Street and 95th Street were analyzed in Synchro under existing conditions, as well as the roadway configurations associated with each of the three alternatives:

- Vincennes Avenue & 79th Street
- Parnell Avenue & 95th Street
- Wentworth Avenue & 95th Street

Figure 2 shows the location of all intersections that were analyzed.

Figure 2: Map of Intersections Analyzed



Traffic operations at each signalized intersection were analyzed under the four following scenarios:

- AM peak with existing signal timings for existing conditions
- AM peak with optimized signal timings and proposed alternative geometric changes
- PM peak with existing signal timings for existing conditions
- PM peak with optimized signal timings and proposed alternative geometric changes

Queue Jumps

Queue jumps allow buses to move ahead of vehicles queued at an intersection. The bus uses a dedicated or shared bus/right turn lane and an advanced green signal to get a head start before general traffic in the through lane can enter the intersection. Queue jump application with a shared bus/right turn lane is suitable for locations where right turn volumes and queue lengths are small.

For the analysis conducted as part of this preliminary screening study, queue jumps are placed at locations where right turn volumes are low, queue lengths for a right turn movement are less than 100 feet or approximately four car lengths, and geometrical restraints are minimal. Synchro modeling helped identify the following intersections with queue lengths for right turn movements of 100 feet or less 95% of the time:

- Halsted Street & 79th Street
- Halsted Street & 81st Street
- Halsted Street & 83rd Street
- Halsted Street & 91st Street
- Halsted Street & 95th Street
- Halsted Street & 101st Street
- Halsted Street & 103rd Street
- Halsted Street & 107th Street
- Halsted Street & 111th Street
- Halsted Street & 114th Street
- Halsted Street & 115th Street
- Halsted Street & 119th Street
- Halsted Street & 120th Street
- Halsted Street & 123rd Street
- Halsted Street & 134th Street
- Halsted Street & 138th Street
- Halsted Street & 144th Street
- Halsted Street & 147th Street
- Vincennes Avenue & 79th Street
- Parnell Avenue & 95th Street
- Wentworth Avenue & 95th Street

Queue jumps at the locations below are also included in the analysis and recommendations as part of this study, however, further study would be required to confirm the feasibility of each intersection.

- Halsted Street & Vincennes Avenue
- Halsted Street & 87th Street
- Halsted Street & 98th Street
- Halsted Street & 99th Street
- Halsted Street & 127th Street
- Halsted Street & Vermont Street
- Lafayette Avenue & 95th Street

Alternative 1

Impacts

Overall, the LOS of intersections throughout the corridor remained largely unchanged during the AM peak hour when comparing existing conditions to those of Alternative 1, with 27 of 32 intersections

remaining at their existing LOS. The AM peak hour LOS deteriorates at two intersections, from C to D at South Halsted Street & 99th Street, and from A to B at Morgan & 149th Street. With the proposed changes, the LOS improves from E to C at two intersections, those being South Halsted Street & 103rd Street and South Halsted Street & 111th Street. This may be a result of allowing right turning vehicles into the queue jump lane. Additionally, the LOS at South Halsted Street & 107th Street improves from C to B during the AM peak hour. This also may be a result of allowing right turning vehicles into the queue jump lane. The resulting AM peak hour intersection delay and level of service (LOS) for each of the intersections analyzed for Alternative 1 are shown in Table 3.

During the PM peak hour, 21 of 32 intersections within the corridor remain at their existing LOS when comparing existing conditions to those of Alternative 1. At two intersections, South Halsted Street & 87th Street and South Halsted Street & 98th Place, the PM peak hour LOS deteriorates from D to E, and from C to D, respectively. The unique geometry and high traffic volumes at 87th Street, along with the reduction in through lanes to accommodate the geometry necessary for queue jumps, contribute to this reduction in LOS. The proposed inclusion of a dedicated bus lane at 98th Place, where many vehicles are entering and exiting I-57, affects the LOS of the intersection. The resulting PM peak hour intersection delay and LOS for each of the intersections analyzed for Alternative 1 are shown in Table 4.

Summary of Results

Implementation of Alternative 1 would result in improved operations at the two intersections with an existing LOS of E during the AM peak hour (103rd and 111th Street) because of right turning vehicles being allowed to use the queue jump lane. During the AM peak hour, only Halsted Street & 99th Street and Parnell Avenue & 95th Street experience a reduction in LOS, from C to D and from A to B, respectively.

During the PM peak hour, implementation of Alternative 1 would result in seven intersections improving their LOS at least one letter grade because of right turning vehicles allowed to use the queue jump lane. Furthermore, implementation of Alternative 1 would result in LOS D or better for all but one intersection. The proposed changes under Alternative 1 at the intersection of Halsted Street & 87th Street result in a deterioration from LOS D to LOS E. With the benefits to transit riders and the increased volume of people being moved through the intersection via transit, a LOS of E may be considered acceptable. This intersection would potentially benefit from additional modifications to help improve traffic flow and minimize delay due to the unique geometry and high traffic volumes present at the intersection. Further analysis utilizing other traffic simulation software such as Vissim (a more advanced traffic modeling tool) will take place during the next phase of the project and may help to explore other operational improvements. The roadway treatment proposed as part of Alternative 1 are estimated to have a transit travel time benefit of approximately 5%.¹

¹ TCRP Report 118, BRT Practitioner's Guide, Page S-9, Exhibit S-3

Alternative 2

Impacts

Alternative 2 Synchro analysis results are similar to Alternative 1 results between 79th Street and Vermont Street along South Halsted Street in that the resulting vehicle delays and levels of service at these intersections are the same in both alternatives. The vehicle delay and level of service for the eight remaining intersections impacted by the proposed changes of Alternative 2 during the AM and PM peak hours are shown in Table 3 and Table 4, respectively.

At the intersections of South Halsted Street & 134th Street and Morgan Street & 149th Street, the AM peak hour LOS deteriorates from A to B. At the intersection of South Halsted Street & 147th Street, the PM peak hour LOS deteriorates from D to E. This reduction in level of service is due to the conversion of a through lane to an exclusive bus lane in both directions along Halsted Street.

Summary of Results

South of 129th Place, where bus lanes are provided in Alternative 2, the level of service at all signalized intersections maintain LOS D or better during the AM peak hour. During the PM peak hour, all intersections maintain acceptable LOS of D or better except for Halsted Street & 147th Street, which reduces from D to E. Due to the increased volume of people being moved through the intersection via transit, a LOS of E may be acceptable. The roadway treatments proposed as part of Alternative 2 are estimated to have a transit travel time benefit of approximately 8%.²

Alternative 3

Impacts

Alternative 3 Synchro analysis results are similar to the Alternative 1 results between 79th Street and 100th Street along South Halsted Street and Alternative 2 results between 129th Place and the Harvey Pace Transportation Center at 154th Street. Therefore, the vehicle delay and LOS results at these locations are the same as previously reported for Alternatives 1 and 2. The vehicle delay and level of service for the 11 remaining intersections of Alternative 3 during the AM and PM peak hours are shown in Table 3 and Table 4, respectively.

With the proposed changes, the LOS at Halsted Street & 103rd Street and Halsted Street & 111th Street, improves from E to C during the AM peak hour, due to the addition of a bus lane that allows right turning vehicles. Additionally, all 11 intersections maintain LOS C or better during both the AM and PM peak period.

Summary of Results

Between 101st Street and Vermont Street, where Alternative 3 proposes a bus lane that allows right turning vehicles, all signalized intersections maintain LOS C or better during the AM and PM peak hour. In addition to the LOS improvement at Halsted Street & 103rd Street and Halsted Street & 111th Street, all other intersections maintain their existing LOS or improve. The 11 intersections exhibit similar delay and LOS to those found in Alternative 1, where queue jumps are used in place of the addition of a

² TCRP Report 118, BRT Practitioner's Guide, Page S-9, Exhibit S-3

dedicated bus lane as described in Alternative 3. The roadway treatments proposed as part of Alternative 3 are estimated to have a transit travel time benefit of approximately 10%.³

Conclusions

Each alternative proposes possible changes to maximize transit operations while attempting to maintain existing levels of service for all traffic within the corridor. Alternative 1 proposes queue jumps at signalized intersections throughout much of the corridor, along with a bus lane between 98th Street and 100th Street. The queue jumps would allow buses to “jump” ahead of general traffic, reducing delays and improving timeliness.

Alternative 2 proposes the converting of a travel lane to a bus lane south of 129th Place, while maintaining the proposed changes found in Alternative 1 north of 129th Place. A bus lane would provide a crucial link to the Pace Harvey Transportation Center at the southern terminus of the South Halsted Street corridor. Further, conversion of a travel lane to a bus lane would allow the dedicated left turns at the intersections of 134th, 138th, 144th, and 147th Street to operate without additional right-of-way (ROW). This feature provides added safety over Alternate 1.

Alternative 3 proposes to convert the existing parking lane to a bus lane that also allows for right-turning vehicles between 98th Street and 129th Place, in addition to the bus lane south of 129th proposed in Alternative 2. This allows for a continuous bus lane along more than seven miles of Halsted Street which will improve transit speed and reliability. In all three alternatives, the impact to traffic is minimal, with a large number of intersections maintaining their levels of service. A detailed summary of LOS and delay for each approach for all analyzed intersections is found in Appendix B.

With a proposed bus lane running from 98th Street to the Pace Harvey Transportation Center at Park Avenue & 154th Street, Alternative 3 provides the greatest opportunity for improvements to transit service and person throughput. In addition to the benefits to transit performance, Alternative 3 has limited impacts on the existing traffic throughout the corridor similar to those found in the other two alternatives. With an increased volume of people being moved through the corridor via transit, any reduction in the level of service may be considered an acceptable trade off. None of the intersections would operate at LOS F. As the project moves forward, further detailed analysis and continued stakeholder input is necessary.

³ TCRP Report 118, BRT Practitioner’s Guide, Page S-9, Exhibit S-3

Next Steps

As the South Halsted Bus Corridor Enhancement project advances into NEPA, advanced traffic analyses will be performed, including but not limited to the following:

- More detailed analysis using Vissim to review the impact that the proposed alternatives would have on CTA and Pace bus operations at key locations (e.g. 87th Street and 100th Street). This may include effects on bus timeliness and connectivity between other nearby transit options, such as the CTA Red Line.
- Further exploration into overall access for pedestrian and bicyclists from the proposed changes to geometry and signal timings.
- Transit signal priority is currently being studied as a part of separate project along this corridor. The result of that study should be accounted for in the next phase of study.
- Queue jump locations determined through this preliminary screening study need to be further evaluated during the next phase for signal phasing suitability especially for side streets, queue length, and safety considerations.
- Geometric modifications need to be examined in detail once topographic survey is provided.
- Detailed crash analysis.
- Signal timing at each individual intersection were optimized as a part of the study. The system-wide progression of green lights through the corridor and possibly interconnection of the signal system should be evaluated further.
- Detailed traffic analysis using the Highway Safety Manual methodology for each proposed cross-section.
- As part of the recommendations in this study, bus lanes are accommodated south of 129th Place by removing a travel lane. Further road diet analysis south of 129th Place is recommended, including the impact of removing travel lanes and/or turning lanes on queue management. IDOT has previously developed methods for analyzing road diets, including the effects of queuing in areas where travel lanes and turn lanes are narrowed or removed. Successful implementations of road diets, such as those found in Geneva along Route 31 and in Chicago along Sheridan Road, might serve as an appropriate blueprint for analysis on the South Halsted Corridor.
- Continue to gather input from stakeholders along the corridor including local businesses, neighborhood groups, and transit riders.

Table 3: Comparison of AM Peak Intersection Delay & LOS for Alternative 1, 2 & 3

Intersection	AM Peak							
	Existing LOS		Alternative 1		Alternative 2		Alternative 3	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Halsted St & 79th St	29.9	C	30.4	C	See Alternative 1		See Alternative 1	
Halsted St & 81st St	17.8	B	12.5	B				
Halsted St & 83rd St	12.2	B	15.7	B				
Halsted St & 85th St & Summit Ave	22.3	C	20.9	C				
Halsted St & Vincennes Ave	28.0	C	20.8	C				
Halsted St & 87th St	43.2	D	44.4	D				
Halsted St & 91st St	9.8	A	5.8	A				
Halsted St & 95th St	40.6	D	36.9	D				
Halsted St & 98th Pl	47.4	D	39.3	D				
Halsted St & 99th St	32.3	C	36.7	D				
Halsted St & 101st St	13.9	B	11.1	B			11.2	B
Halsted St & 103rd St	63.8	E	28.0	C			31.9	C
Halsted St & 107th St	25.2	C	17.7	B			18.9	B
Halsted St & 111th St	62.9	E	20.6	C			24.1	C
Halsted St & 114th St	9.3	A	7.2	A			8.2	A
Halsted St & 115th St	17.7	B	15.4	B			14.9	B
Halsted St & 119th St	22.0	C	20.6	C			21.4	C
Halsted St & 120th St	14.9	B	10.3	B			10.5	B
Halsted St & 123rd St	16.9	B	12.3	B			10.1	B
Halsted St & 127th St	29.1	C	28.1	C			28.5	C
Halsted St & Vermont St	10.9	B	10.2	B	10.2	B		
Halsted St & 134th St	9.4	A	4.9	A	10.5	B	See Alternative 2	
Halsted St & 138th St	21.9	C	23.3	C	25.1	C		
Halsted St & 144th St	11.0	B	12.2	B	11.9	B		
Halsted St & 147th St	38.7	D	37.0	D	48.0	D		
Halsted St & 149th St	50.4	D	44.0	D	44.5	D		
Morgan St & 149th St	9.6	A	13.3	B	14.1	B		
Morgan St & 150th St	17.2	B	17.9	B	18.5	B		
Park Ave & 154th St	15.7	B	15.7	B	15.7	B		
Vincennes Ave & 79 th Street	21.1	C	34.4	C	See Alternative 1	See Alternative 1		
Parnell Ave & 95 th Street	9.9	A	19.6	B				
Wentworth Ave & 95 th Street	12.1	B	19.6	B				

Table 4: Comparison of PM Peak Intersection Delay & LOS for Alternative 1, 2 & 3

Intersection	PM Peak							
	Existing LOS		Alternative 1		Alternative 2		Alternative 3	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Halsted St & 79th St	36.9	D	34.2	C	See Alternative 1		See Alternative 1	
Halsted St & 81st St	11.0	B	11.6	B				
Halsted St & 83rd St	14.5	B	14.7	B				
Halsted St & 85th St & Summit Ave	36.5	D	17.2	B				
Halsted St & Vincennes Ave	45.0	D	30.5	C				
Halsted St & 87th St	43.4	D	63.6	E				
Halsted St & 91st St	10.1	B	4.4	A				
Halsted St & 95th St	52.6	D	47.3	D				
Halsted St & 98th Pl	33.2	C	42.0	D				
Halsted St & 99th St	27.9	C	27.9	C				
Halsted St & 101st St	12.7	B	10.8	B			12.4	B
Halsted St & 103rd St	26.6	C	25.6	C			25.6	C
Halsted St & 107th St	23.3	C	20.5	C			21.7	C
Halsted St & 111th St	20.4	C	18.3	B			20.8	C
Halsted St & 114th St	12.9	B	6.8	A			14.6	B
Halsted St & 115th St	18.1	B	16.5	B			16.3	B
Halsted St & 119th St	24.3	C	21.2	C			23.3	C
Halsted St & 120th St	15.9	B	9.2	A			11.0	B
Halsted St & 123rd St	10.1	B	9.3	A			8.2	A
Halsted St & 127th St	31.0	C	28.8	C			29.9	C
Halsted St & Vermont St	11.8	B	10.5	B	11.1	B		
Halsted St & 134th St	7.9	A	5.1	A	8.9	A	See Alternative 2	
Halsted St & 138th St	22.0	C	22.3	C	24.3	C		
Halsted St & 144th St	10.8	B	19.0	B	10.9	B		
Halsted St & 147th St	41.4	D	40.6	D	57.2	E		
Halsted St & 149th St	47.2	D	41.6	D	40.7	D		
Morgan St & 149th St	13.2	B	13.9	B	17.3	B		
Morgan St & 150th St	19.6	B	19.2	B	19.4	B		
Park Ave & 154th St	7.7	A	7.6	A	7.6	A		
Vincennes Ave & 79 th Street	22.3	C	33.7	C	See Alternative 1	See Alternative 1		
Parnell Ave & 95 th Street	11.0	B	16.0	B				
Wentworth Ave & 95 th Street	11.0	B	14.4	B				