



SUBJECT: Consideration of Glenbrook South High School access and circulation improvements

MEETING DATE: May 2, 2022

MEMORANDUM

TO: District 225 Facilities Committee

FROM: Jeff Brady, Director of Community Development (847) 904-4306

BACKGROUND:

Traffic Engineering Study

Stemming from ongoing complaints from parents and motorists traveling in the area about the traffic congestion and delays generated in the vicinity of Glenbrook South High School during peak traffic periods associated with the arrival and dismissal of the high school students, the Village commissioned a comprehensive traffic study (see Attachment 1) to evaluate opportunities to address the concerns. Village staff and District 225 staff have been reviewing and discussing the appropriateness of the various potential traffic improvements that could be implemented over the 2022 summer break and in the future.

District 225 Review

Village staff recently presented several proposed traffic circulation and access improvements (see Attachment 2) to the District 225 Board of Education during their meeting on April 25, 2022. Following consideration of the improvements and comments relayed by the Board, the matter was referred to the Facilities Committee for further review and discussion on the various alternatives. Staff will be presenting to the Committee updated designs that incorporate the Board's comments for additional review and discussion on the proposal details by the Committee. The improvements include revisions to the Robin Lane access road into Glenbrook South (see Attachment 3) and a revised circulation pattern through the District Administration Building parking lot (see attachment 4) to redirect some traffic away from the congested Pfingsten Road segment between East Lake and West Lake Avenues. The proposed improvements also include enhanced circulation patterns in the drop-off/pick-up area at the main GBS entrance to reduce congestion in the morning and afternoon.

Project Phasing

The proposed summer improvements are in addition to signal timing modifications to be implemented and funded by Cook County this fall. The signal timing for the stop lights at Robin/Lake, Pfingsten/East Lake, Pfingsten/West Lake, and Pfingsten/Hospital Drive would be adjusted to maximize the traffic movements through the area roadways during the peak travel times. The last phase of the proposed improvements is presently scheduled for 2025/2026 with the planned reconstruction of the West Lake Avenue and Pfingsten Road intersection to update the signals, enhance pedestrian movements, and add a northbound Pfingsten Road right turn lane to West Lake Avenue.

Project Timing

The proposed improvements to address the current congestion near the high school would be paid for by the State of Illinois through funding secured by Representative Jennifer Gong-Gershowitz. Upon coordination with DCEO, the Village would need to use the funds to construct the improvements on and near District 225 property during the summer break. Due to the compressed scheduling window for construction, some stages of the process may occur concurrently such as the approval of the proposed improvements, final design drawing work, bidding of the project, and approval of a contract awarding a construction firm the work. For the benefit of the high school and the Village roadway network around the Glenbrook South, Glenview staff is working to finalize any remaining details to be able to implement the funded improvements.

NEXT STEPS:

Village staff requests the Committee's review of the proposed circulation and access improvements planned for this summer and any feedback on the design. Following approval by the Board of Education and the Village of Glenview, through the typical development review process, Village staff would prepare an agreement for Glenview Village Board consideration of a contract award to construct the proposed improvements that would commence in June.

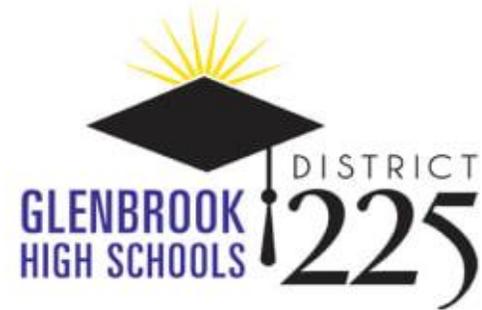
ATTACHMENTS:

1. April 25, 2022 Traffic Improvement Presentation
2. Traffic Analysis Report
3. Proposed Robin Lane Entrance Improvements
4. Proposed Main Entrance Improvements

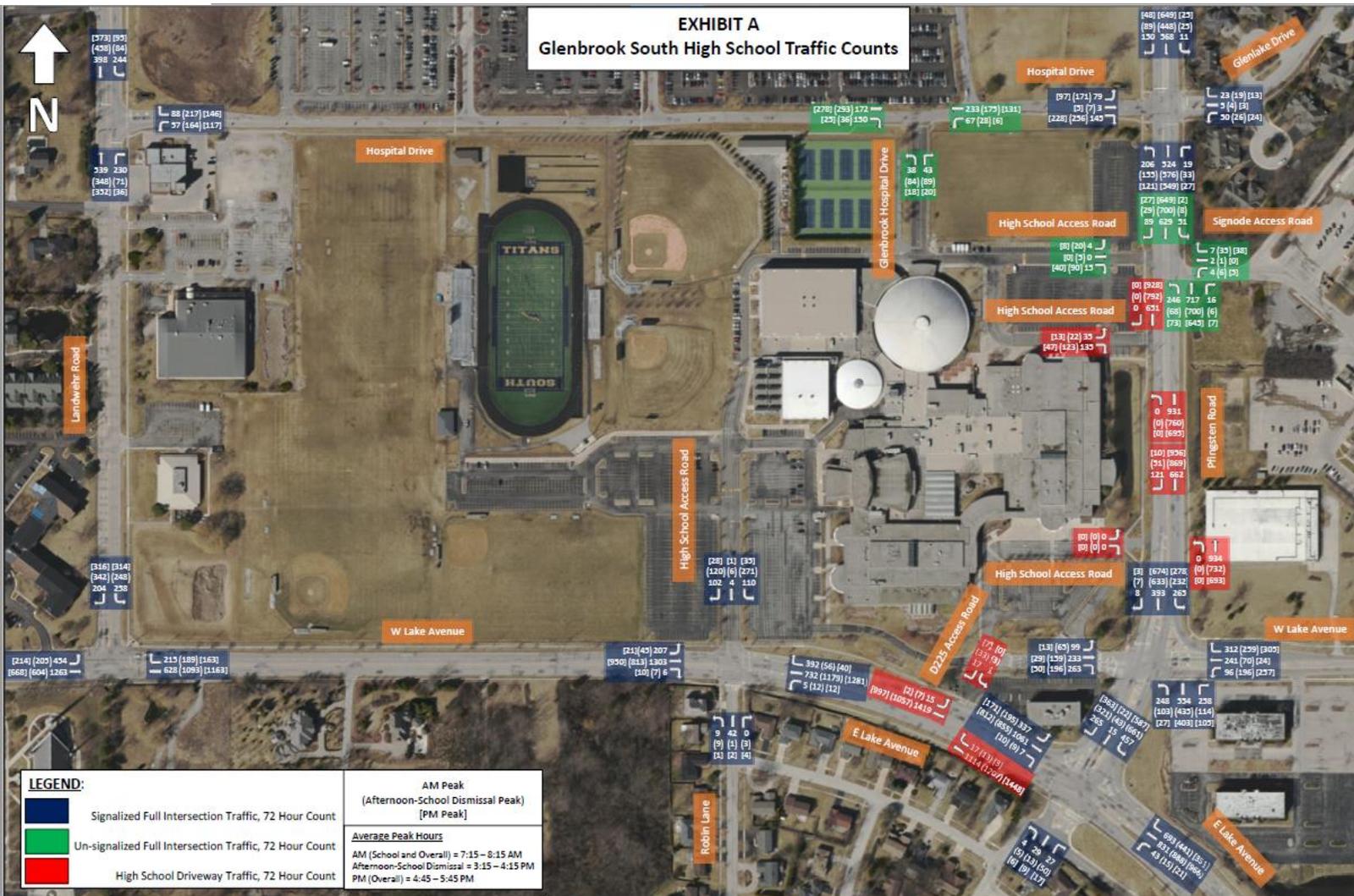
**Attachment 1 -
April 25, 2022 Traffic
Improvement Presentation**

GBS High School Traffic Improvements

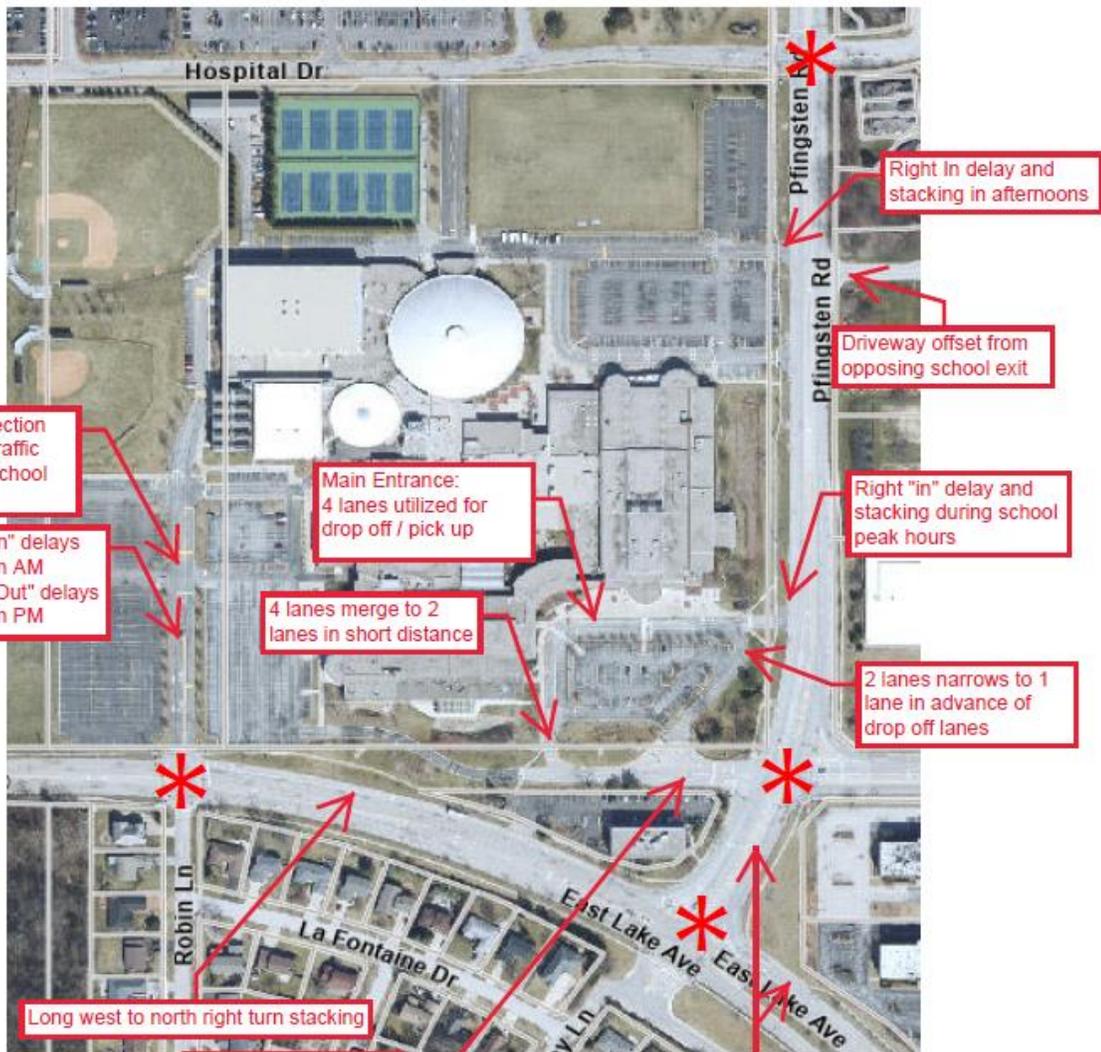
- Background & Existing Conditions
- Traffic Observations
- Phased Implementation of Improvements
- Proposed Improvements



Background and Existing Conditions



- Significant congestion during drop-off & pick up times (15-30 mins.)
- 2019 - Traffic Study conducted
- 2020-2022 – Analysis of issues and recommended improvements from study / Coordination with D225 staff
- \$500,000 allocated in current IL State budget by Representative Gong-Gershowitz to address GBS congestion and traffic safety issues
- **Goals** - Improve traffic flow; Decrease delays; Reduce volumes on Pfingsten between East and West Lake Avenue



Traffic Observations

- Area operates like a concert venue during peak times
- Pfingsten (East & West Lake) segment congestion
- Stacking delays entering and exiting GBS access points
- Area traffic impacts intersection operations (northbound right onto West Lake Avenue from Pfingsten Road)
- Stoplight signal timing antiquated
- Pedestrian movements impacting vehicle access

* Existing traffic signal timings along East Lake Avenue and Pfingsten Road should be optimized to incorporate school traffic

Phased Implementation of Improvements



PHASE 1 - (2022 - May out to bid; Summer construction) - \$500k IL Funding

- Widening/Adding Traffic Lanes within GBS Campus (Summer 2022)
- Administration Building Driveway Relocation and Curb Cuts (Fall 2022)



PHASE 2 - (Fall 2022) – Cook County Funding

- Traffic Signal Optimization and Timing Adjustments
 - Hospital Drive/Pfingsten
 - East Lake/West Lake/Pfingsten
 - Robin/West Lake



PHASE 3 - (Summer 2023) – Other Funding Opportunities

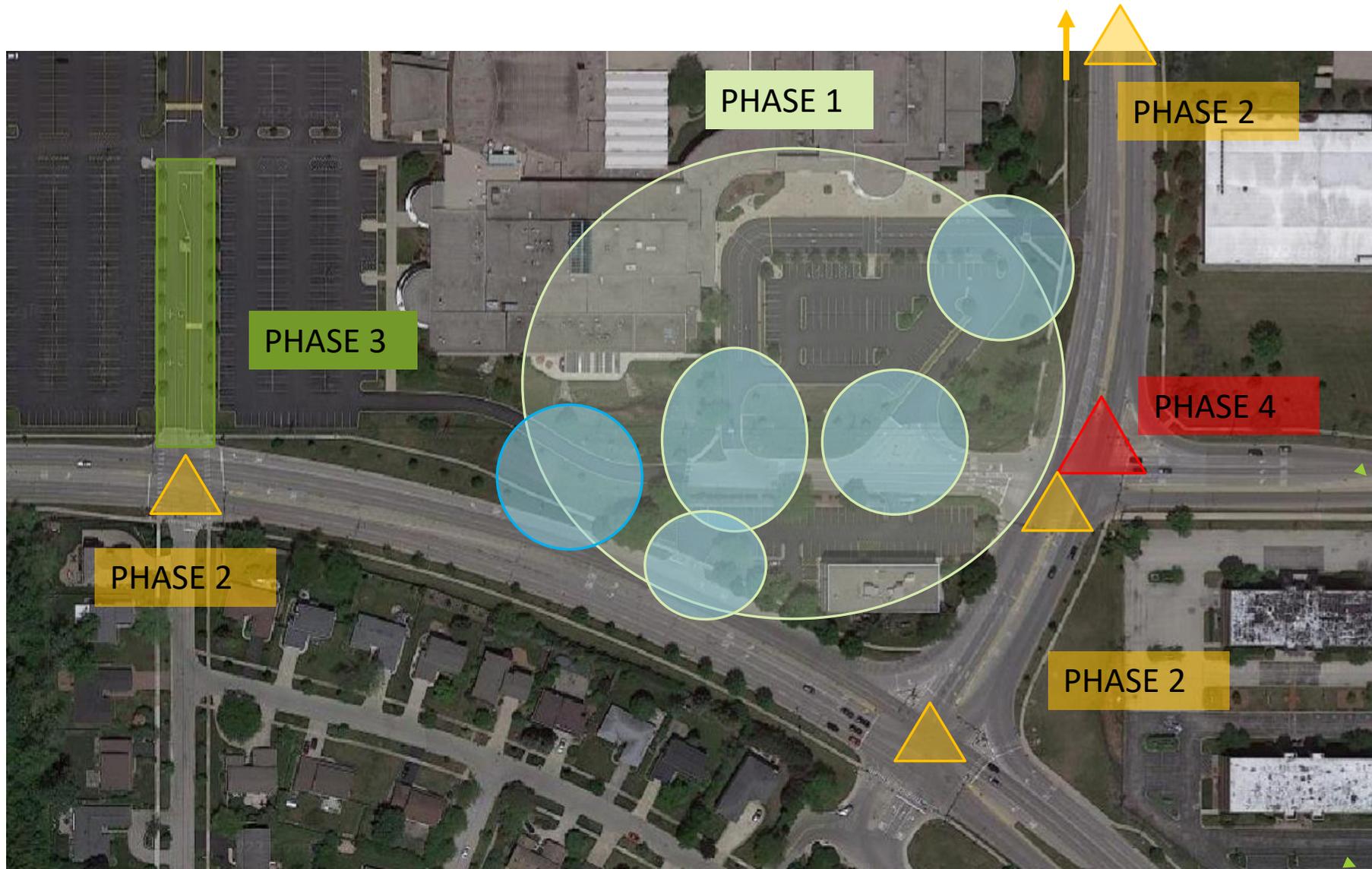
- Review impacts on GBS Robin entrance – potentially add new entrance lane



PHASE 4 - (2025/2026) - STP Funding; Invest in Cook Funding

- Pfingsten/West Lake/GBS entrance intersection improvements
- Review deceleration lanes at southbound entrances along Pfingsten Road

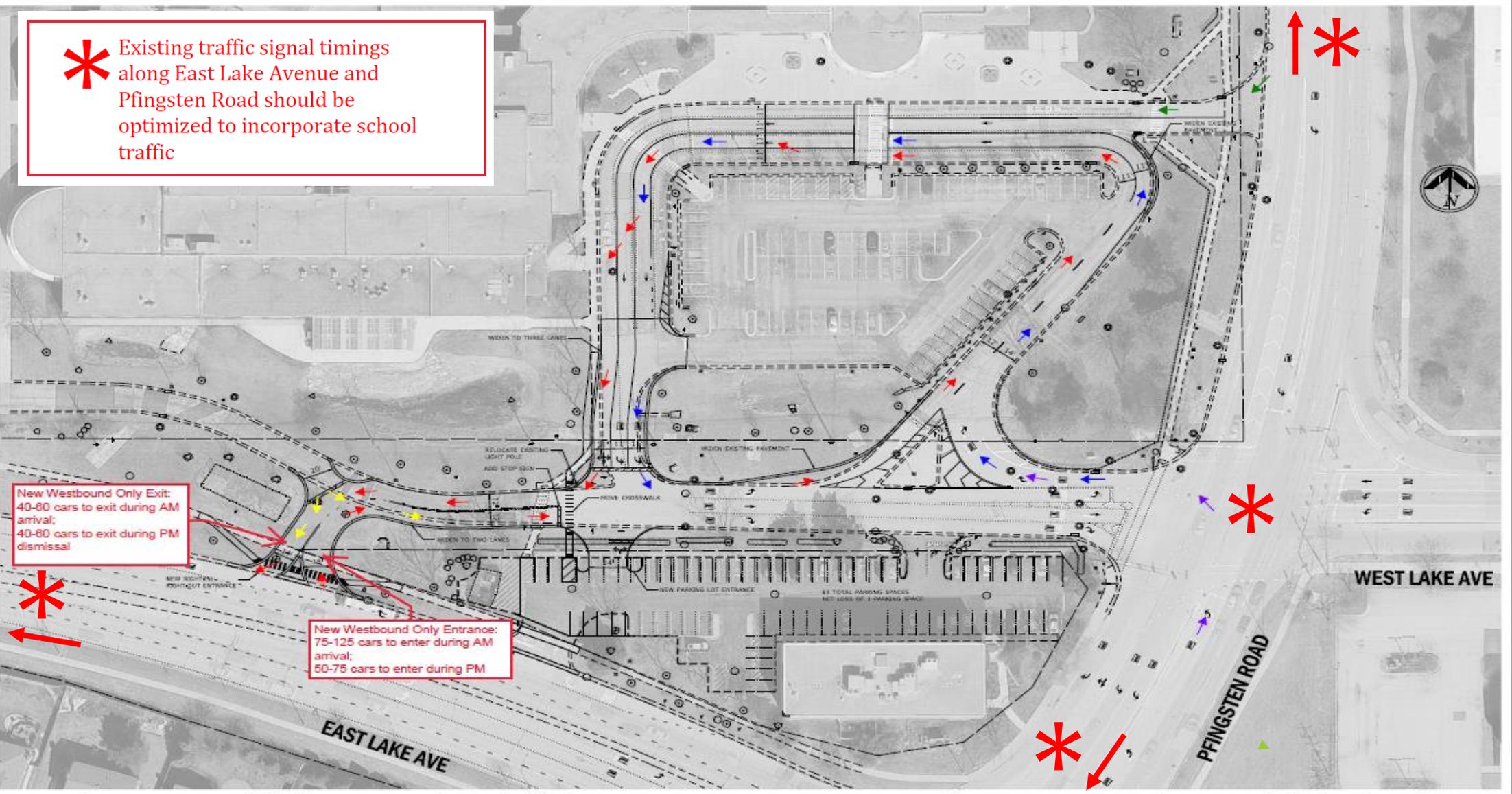
Map of Proposed Improvements



Parking Lot/Curb Cuts/Signal Timing



Existing traffic signal timings along East Lake Avenue and Pflugsten Road should be optimized to incorporate school traffic



New Westbound Only Exit:
40-60 cars to exit during AM arrival;
40-60 cars to exit during PM dismissal

New Westbound Only Entrance:
75-125 cars to enter during AM arrival;
50-75 cars to enter during PM

Attachment 2 - Traffic Analysis Report

DRAFT

Glenbrook South High School & Surrounding Roadways **Traffic Analysis Report**



Prepared by:

BAXTER & WOODMAN
Consulting Engineers

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Date: March 2021

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- Exhibit 1: Traffic Count Exhibit
- Exhibit 2: District 225 Driveway Relocation Concept A
- Exhibit 3: District 225 Driveway Relocation Concept B
- Exhibit 4: Signode Site Driveway Access Relocation Concept
- Exhibit 5: Pfingsten Road Southbound Right Turn Lane Concepts
- Exhibit 6: E Lake Ave and Robin Lane – North Lane Concept Improvements
- Exhibit 7: Reconfigured North Parking Lot, Drop Off/Pick Up Area, Circulation Concept

1. INTRODUCTION

1.1 Introduction

On behalf of the Village of Glenview, Baxter & Woodman has completed preliminary engineering analysis of the traffic patterns, capacity, and safety of the roadway network and driveways surrounding Glenbrook High School. This was done by observing existing traffic, collecting traffic counts, meeting with school district and Village staff, and developing alternatives that could improve the traffic patterns, congestion, and/or safety in this area. The concept alternatives are organized by short term, which are typically lower cost and can be implemented sooner, and long term, which are higher cost and require additional planning for engineering and funding.

This report summarizes the existing conditions of the study area, provides three preferred short term alternatives, one preferred long term alternative, and summarizes the other alternatives that were considered for the study area.

2. EXISTING CONDITIONS

2.1 Existing Conditions

24-hour traffic counts were taken within the study limits at the intersections surrounding the high school in order to determine the existing traffic volumes. These traffic counts were taken between November 12 and 14, 2019 and thus prior to the Covid-19 pandemic. The project limits for the traffic counts at Glenbrook South High School are bordered by East Lake Avenue (Cook County route), Pfingsten Road (IDOT route), Landwehr Road (Cook County route), and Hospital Drive (Village of Glenview route).

The traffic counts were then organized and evaluated to determine the “peak hours” of traffic occurring during a typical day. Peak hour traffic is then evaluated and modeled to determine vehicle delay during the hours of heaviest travel within the study area.

The peak hours of the overall vehicle traffic within the study limits are found to be as follows:

- Morning Peak Hour = 7:15 – 8:15am (8:00am school start time)
- Afternoon Peak Hour = 3:15-4:15pm (3:15pm school dismissal time)
- Evening Peak Hour = 4:45-5:45pm

The peak hour traffic data of the study area is summarized in Exhibit 1 found at the end of this report.

A summary of the intersections in which traffic counts were performed is as follows:

2.1.1 High School North Lot/North Drive & Hospital Drive

The intersection Hospital Drive and the North High School Access is a three-leg intersection. The traffic on Hospital Drive is free flow and the traffic on North School Access Drive is stop controlled. This intersection is located on the north side of the campus.

2.1.2 Hospital Drive/Glenlake Drive and Pfungsten Road

The intersection of Hospital Drive/Glenlake Drive and Pfungsten Road is located on the northeast side of the campus. This is a four-leg signalized intersection.

2.1.3 High School Access/Signode Access and Pfungsten Road

The intersection of the High School Access/Signode Access and Pfungsten Road is located on the northeast side of the campus. Both access roads are stop controlled, while Pfungsten Road is free flow. The two access roads do not align opposite of each other.

2.1.4 High School North Lot/South Exit Drive and Pfungsten Road

The intersection of the North High School Access and Pfungsten Road is located on the east side of the campus. This is a three-legged intersection. The high school access driveway is exit only and is stop controlled, while Pfungsten Road is free flow.



2.1.5 Southeast High School Access and Pfingsten Road

The intersection of the South High School Access and Pfingsten Road is located on the east side of the campus. This is a three-leg intersection. The high school access is an entrance-only with access to the southeast parking lot and drop off area. The traffic on Pfingsten Road is free flow.

2.1.6 W Lake Avenue and Pfingsten Road

The intersection of W Lake Avenue and Pfingsten Road is located on the southeast side of the campus. This is a four-leg signalized intersection. The west leg of the intersection is the primary exit for the southeast school parking lot/drop off area.

2.1.7 E Lake Avenue and Pfingsten Road

The intersection of E Lake Avenue and Pfingsten Road is located on the southeast side of the campus. This is a four-leg signalized intersection of two arterial roadways.

2.1.8 District 225 Driveway Access and East Lake Avenue

The intersection of E Lake Avenue and the District 225 Access is a three-leg intersection. The traffic on E Lake Avenue is free flow, and the District 225 Access is right in and right out only access to the D225 administration building parking area. The exiting traffic is stop controlled. This intersection is located on the southeast side of the campus. There is a transversable median separating the eastbound and westbound traffic on E Lake Avenue.



2.1.9 High School Access/Robin Lane and E Lake Avenue

The intersection of E Lake Avenue and the High School Access/Robin Lane is a four-leg signalized intersection. This intersection is located on the southwest side of the campus. The north leg of the intersection provides entrance/exit to the schools west parking area including student/staff parking.

2.1.10 East Lake Avenue and Landwehr Road (see Exhibit 1)

The intersection of E Lake Avenue and Landwehr Road is a three-leg signalized intersection. It is located on the southwest of the campus.

2.1.11 Landwehr Road and Hospital Drive (see Exhibit 1)

The intersection of Landwehr Road and Hospital Drive is a three-leg signalized intersection. It is located northwest side of the campus.

Glenbrook South High School Traffic – General Observations:

- The total morning peak hour traffic is 58% higher volume than the afternoon peak hour traffic. This difference could be attributed to after school activities or staff after school departure times.
- Morning traffic entering the school is relatively evenly distributed amongst the site quadrants (north, southeast, southwest). However, AM traffic exiting the school is significantly higher at the southeast quadrant at the primary student drop off area.
- School district staff have indicated existing site parking is fully utilized, and additional parking is needed on site. Staff indicated any improvements to benefit adjacent traffic conditions should not negatively impact parking or green space being used by the school.

Roadway Network Traffic Observations

- The intersection spacing between the signalized intersections of West Lake Avenue/Pfingsten Road and East Lake Avenue/Pfingsten Road is only 300 feet. Signalized intersections of this magnitude are recommended to be spaced at a minimum of ¼ mile for optimal traffic operations. Traffic operations along Pfingsten Road (delay, vehicle queues, traffic merging/weaving) is currently and will remain significantly hindered at these locations by this intersection spacing.
- Optimal intersection traffic signal timings and signal interconnection is critical to the traffic operations along these regional roadways. Existing signal timings have been obtained from the Illinois Department of Transportation along Pfingsten Road and East Lake Avenue. These timings have been evaluated for improvements (See Short Term Alternates).

3. ALTERNATIVES ANALYSIS

Using the existing traffic data, Baxter & Woodman has developed an existing traffic model for this roadway network. A video simulation of the existing conditions traffic model can be found in the Alternative section found below.

As expected, traffic delay and long vehicle queues exist along Pfungsten Road, primarily between the intersections of West Lake Avenue and Pfungsten Road. These delays and lack of available space for vehicle queues impacts both regional, local, and school traffic. For example, in the morning rush hour, school traffic attempting to enter the school entrance at the intersection of West Lake Avenue and Pfungsten Road experience significant northbound Pfungsten Road traffic delay and queues that do not allow northbound cars to access the northbound left turn lane.

Alternatives (short term and long term) have been developed below for these various identified problem areas.

3.1 Short Term Traffic Alternatives

3.1.1 Re-optimize the Existing Traffic Signal Timings and Cycle Lengths

The traffic signals included in this re-optimization network include the intersections of Pfungsten Road and Hospital Drive, Pfungsten Road and W Lake Avenue, Pfungsten Road and E Lake Avenue, E Lake Avenue and Robin Lane, E Lake Avenue and Landwehr Road, and Landwehr Road and Hospital Drive.

Purpose and Need: This alternative addresses existing traffic queuing, in particular between the intersections of West Lake Avenue and Pfungsten Road, and East Lake Avenue and Pfungsten Road. This queuing is the worst in the morning peak hour during school drop-off time for northbound and westbound traffic. Vehicles have trouble entering the school via Pfungsten Road's northbound left turn lane.

The existing cycle length at each intersection within this network is default 130 seconds in length. The cycle length refers to the time it takes for the intersection to complete all vehicle movements in each direction. Longer cycle lengths are required for roadways with high traffic volumes, to ensure traffic is given time to clear in all directions. However, cycle lengths that are excessive can result in overall increased delay for the overall roadway network. By simply revising and shortening the traffic signal cycle lengths and optimized the green signal timings for the various traffic movements at each intersection, vehicle delay and backups can be reduced. The cycle length selected must consider all intersection in the interconnected system, not just one intersection alone. The existing cycle length of 130 seconds and a shortened 90 second cycle length is shown in the video exhibits below.

Pros:

- Low cost
- No physical construction impacts
- Decreases vehicle delay

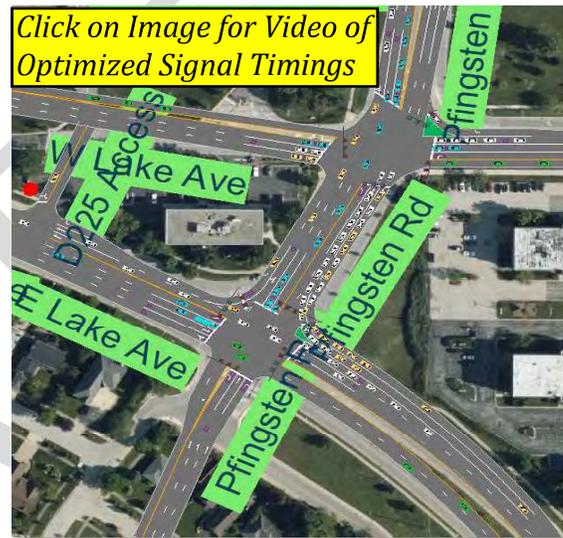
Cons:

- Does not address additional geometric issues that also impact vehicle queuing
- IDOT and Cook County approval of any signal timing revisions would be required

Conceptual Construction Cost Estimate: \$25,000



AM - Existing Signal Timings & 130 second cycle length



AM - Proposed signal timings & 90 second cycle length

3.1.2 District 225 at East Lake Avenue Right In/Out Driveway Re-Configuration

Purpose and Need: This alternative addresses existing traffic queuing, in particular between the intersections of West Lake Avenue and Pfingsten Road, and East Lake Avenue and Pfingsten Road. This queuing is the worst in the morning peak hour during school drop-off time for northbound and westbound traffic. Vehicles have trouble entering the school via Pfingsten Road's northbound left turn lane.

The Concept Plan exhibits below show revisions to the geometry of the East Lake Avenue driveway for the District 225 administration building and parking lot. (See Exhibit 2 and 3 below) By re-configuring this driveway and the parking lot, a percentage of vehicles can utilize this location to enter the southeast quadrant primary school drop off area. This would reduce traffic on Pfingsten Road at West Lake Avenue and benefit the overall traffic delay along Pfingsten Road. In Concept A, the East Lake Avenue driveway remains in its existing locations, and in Concept B the driveway is moved further west to reduce the impact to site parking. A relocated driveway location as shown in Concept B will require review and design variance approval by the Cook County Department of Transportation for revisions to existing/proposed deceleration distances at both Robin Lane & the D225 driveway.

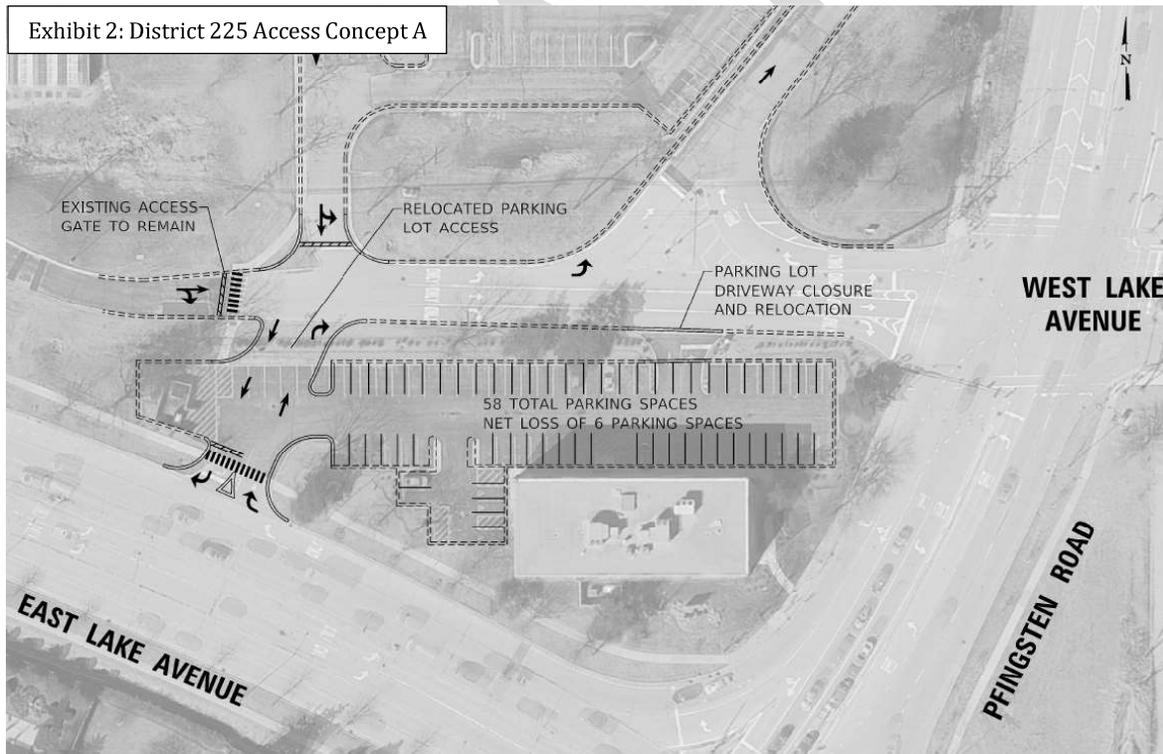
Pros:

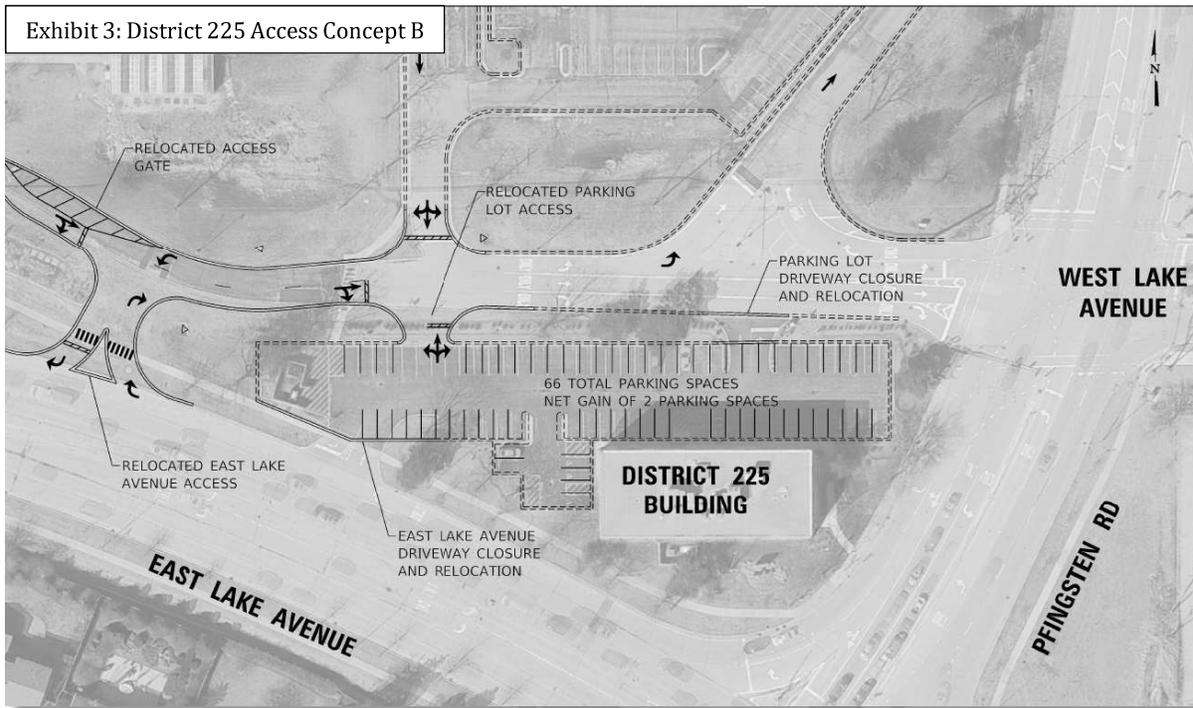
- Provides a secondary school entrance and potentially decreases northbound queuing at the intersection of West Lake Avenue and Pfingsten Road
 - ◆ In the Morning Peak hour, our analysis assumes 100 vehicles enter and 50 vehicles exit using this new driveway
 - ◆ In the Afternoon Peak hour our analysis assumes 50 vehicles enter and 20 vehicles exit using this new driveway
- Lower cost
- No impact to regional roadways or existing traffic signal infrastructure

Cons:

- Concept A results in a net loss of six parking spaces within D225 administration parking lot
- Coordination/permitting/approval is necessary with Cook County
- Concept A results in added vehicle traffic to be routed through a parking lot area
- Concept B requires additional construction cost for relocation of existing driveway access to the west.

Conceptual Cost Estimate: \$100,000-\$200,000





3.1.3 Signode at Pfingsten Road Driveway Realignment

Purpose and Need: Currently the driveways for the Signode property and the High School Access Driveway do not align across from each other. This can cause challenges for proper sight lines and turning conflicts of opposing vehicles trying to turn left into the different properties using the same bidirectional left turn lane or from exiting the properties.

The properly aligned driveways will improve safety, improve sight distances, and avoid vehicle conflicts for this left turn movements. (See Exhibit 4 below).

Pros:

- Increases safety
- No impact to Pfingsten Road or adjacent intersections or traffic signals

Cons:

- Work required on private property
- Tree Impacts
- Coordination, approval, cost sharing w/ Signode or future owner
- Does not address primary Pfingsten Road traffic issues
- Need to coordinate/permit approval from IDOT

Conceptual Cost Estimate: \$ 50,000-\$75,000 (To be installed by Signode as part of site redevelopment)

Exhibit 4: Signode Access



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3.2 Long Term Traffic Alternatives

3.2.1 West Lake Avenue at Pfingsten Road Intersection Improvements

Purpose and Need: Insufficient spacing, high traffic volumes, and lengthy traffic signal timings between the intersections of W Lake Avenue/Pfingsten Road and E Lake Avenue/Pfingsten Road contributes to significant local and regional traffic delay and vehicle queuing between the intersections. This queuing is the worst in the Morning Peak hour that coincides with school drop-off time. Vehicles experience significant delays overall, and school traffic is impacted when entering and exiting the school at this location.

The following long term intersection improvement alternatives were evaluated and modeled for traffic capacity (vehicle delay and queuing) improvements:

1. Construction of a new northbound right turn lane
2. Construct new northbound and southbound DUAL left turn lanes to replace existing single left turn lanes
3. Construction of an additional through lane for northbound and southbound to establish three through lanes for northbound and southbound traffic
4. Construction of an additional through lane for northbound only to establish three through lanes for northbound traffic
5. Realign/Relocate the intersection (existing lanes) north by approximately 200 feet.

The following table summarizes the anticipated vehicle delay/level of service for the intersection for each alternative, and also provides high level overview of potential for land acquisition of each option, and ranks projects in order of anticipated construction costs.

TABLE 1
Anticipated Vehicle Delay/Level of Services

Peak Hour	Intersection	Scenario	Intersection Delay (Seconds)	Level of Service	Land Acquisition Potential? (Yes/No)	Construction Cost (Ranked Low to High)
AM	W Lake & Pfingsten	<i>Existing</i>	<i>40.3</i>	<i>D</i>		
		<i>Optimized (Short Term)</i>	<i>24.6</i>	<i>C</i>	<i>No</i>	<i>1</i>
		Optimized + NB Right Turn Lane (Long Term)	21.0	C	No	2
		Optimized + NB & SB Dual Lefts	27.0	C	Yes	4-A
		Optimized + NB & SB 3 Thru Lanes	29.4	C	Yes	4-B
		Optimized + 3 NBT & EX Dual WBL	29.2	C	No	3
		Optimized + Intersection Realignment	23.3	C	Yes	5

3.2.2 Preferred Alternative - Pfingsten Road New Northbound Right Turn Lane

This alternative includes the geometric changes in addition to the short term alternative for traffic signal timing optimization.

Of the above noted intersection alternatives, this option provides the best intersection capacity (vehicle delay) improvement, while also being the lowest cost long term alternative considered, and does not require any expected land acquisition.

A new right turn lane would add capacity, reduce delay and vehicle queues to the northbound approach overall. The proposed intersection traffic model for this proposed improvement is linked below. A primary reason this alternative achieves the lowest intersection vehicle delay is due to not requiring protected only (red arrow) left turns, which would negatively impact traffic flow/delay/queues of all approaches. A Protected left turns (red arrow) condition is required for dual left turn lanes, and for any single left turn lane that crosses three lanes of opposing traffic.

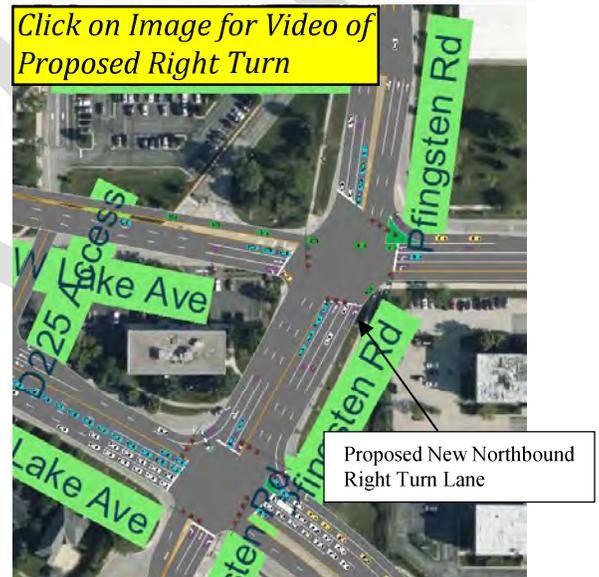
Pros:

- This solution effectively reduces northbound through lane queuing, and the reduced queuing allows for northbound school traffic to efficiently enter the existing left turn lane
- There is adequate open space and existing Right of Way for this option
- This option is an ideal solution as the new right turn lane does not negatively impact the opposing left turn lane cycle, nor does it require changing the northbound and southbound left turns to protected only
- Decreases intersection delay
- Decreases northbound traffic queueing
- More lanes to accommodate traffic
- Lower cost option when compared to other intersection improvements alternatives

Cons:

- IDOT Coordination/Permit Approval required
- Higher cost when compared to Short Term Alternatives

Conceptual Cost: \$1,200,000 to \$1,500,000 (Add Turn Lane, new traffic signals, resurfacing)

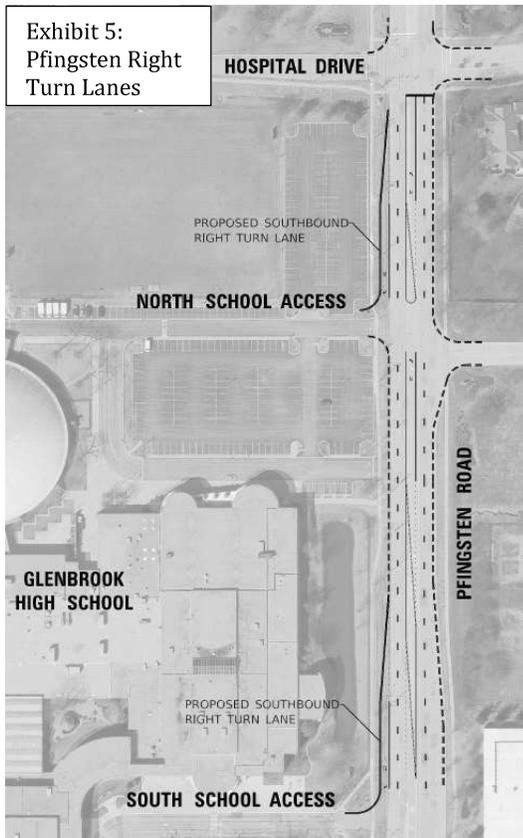


3.3 Other Alternatives to be Considered

3.3.1 Pfingsten Road - Southbound Right Turn Lanes at North and South High School Entrance Driveways

Purpose and Need: During school drop-off and pick-up time, vehicles have potential to queue in the southbound Pfingsten Road through lanes waiting to turn into the high school. This blocks through traffic and adds to potential rear end conflicts.

By constructing new southbound right turn lanes, vehicles will queue in right turn lanes versus the Pfingsten Road through lanes. This also allows for vehicle deceleration and turning from the safety of a right turn lane during other hours of the day (See Exhibit 5).



Pros:

- Decreases occasional traffic queuing and traffic flow impacts in the Pfingsten Road through lanes
- No impact to adjacent traffic signals
- Improves safety and avoids rear end conflicts for right turning movements

Cons:

- Does not address primary roadway traffic capacity concerns
- Loss of green space
- Reduced separation from road and sidewalk
- Coordination/permit approval required from IDOT

Conceptual Cost Estimate (total for two turn lanes):
\$500,000 to \$750,000

3.3.2 Adaptive Traffic Signals

Along with optimizing the traffic signal system, the Village of Glenview is also looking to future adaptive traffic signal system options in this area. Adaptive traffic signals would include installation of live video camera feeds that could be monitored by Village staff, and real time signal timing adjustment capabilities if traffic delays are excessive. A future adaptive traffic signal network will require significant planning and advance regional infrastructure improvements, such as traffic signal modifications and new fiber optic infrastructure between the project site and centralized control locations in order to be implemented. Coordination and planning with owners of various rights of way and roadways within the Village including the Illinois Department of Transportation and Cook County are also required. This section is included in this report for reference purposes only.

3.3.3 East Lake Avenue at Robin Lane/West High School Access - Added Southbound Right Turn Lane

This alternative includes the geometric changes in addition to the short term alternative for traffic signal timing optimization.

Purpose and Need: During afternoon dismissal time, there are a high number of vehicles exiting the high school. This results in peak traffic queueing at the intersection of E Lake Avenue and Robin Lane. The two existing southbound lanes are converted to dual left turn lanes to allow for improved traffic flow.

This proposed alternative would add an additional southbound right turn lane, in addition to the existing through lane and left turn lane. Three southbound lanes will allow for improved traffic flow exiting the school during dismissal.

This concept is shown below. This improvement will result in a net loss of approximately 30 high school parking spaces, which does not meet the criteria presented by the School District. Therefore, this is currently not a recommended alternative.

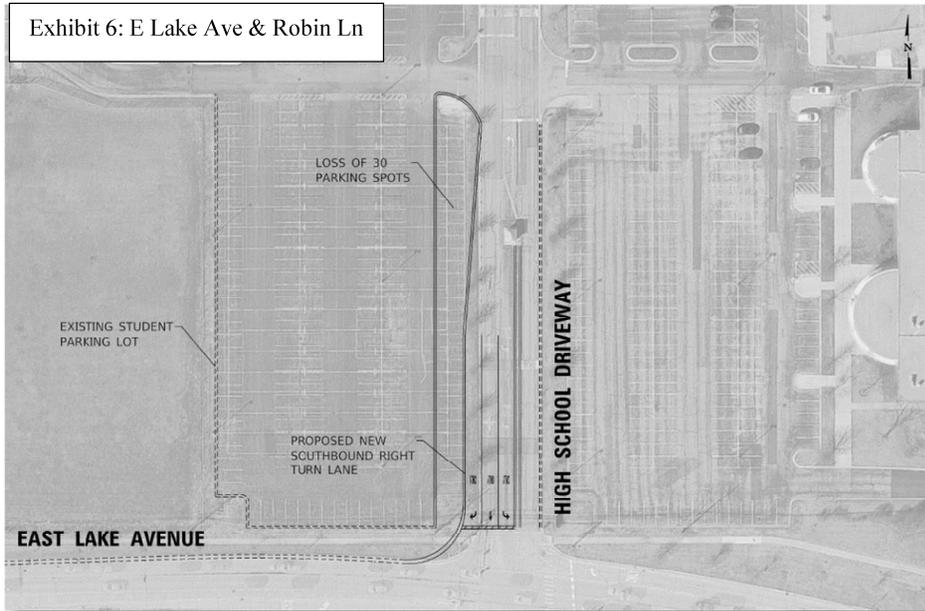
Pros:

- Decrease overall intersection delay
- Added lane benefits afternoon dismissal traffic flow

Cons:

- Net loss of approximately 30 parking spaces
- Higher Cost
- Cook County Coordination and Permitting required for East Lake Avenue Improvements

Conceptual Cost: \$900,000 to \$1,200,000 (Add Turn Lane, new traffic signals, resurfacing, parking lot alterations)



3.3.4 Glenbrook South High School –Relocate Primary Student Drop off area to the Northeast Parking Lot

Purpose and Need: Approximately 600 vehicles enter and exit the Glenbrook High School main entrance via the intersection of West Lake Avenue and Pfingsten Road during the morning and afternoon peak hours. As noted in previous sections, insufficient spacing, high traffic volumes, and lengthy traffic signal timings between the intersections of West Lake Avenue /Pfingsten Road and East Lake Avenue/Pfingsten Road contributes to significant local and regional traffic delay and vehicle queuing between the intersections. This queuing is the worst in the Morning Peak hour, which coincides with school drop-off time. Vehicles experience significant delays overall, and school traffic is impacted when entering and exiting the school at the West Lake Avenue/Pfingsten Road location.

Relocating the primary entrance and drop off/pick up area for the high school to the north parking lot would reduce both turning vehicle traffic and the overall traffic volume at the West Lake Avenue/Pfingsten Road intersection. The primary entrance on the north side of the building could be accessed by multiple driveways from Pfingsten Road and Hospital Drive via the signalized intersection of Pfingsten Road at Hospital Drive.

However, this increased traffic volume in the north parking lot will require significant reconfiguration of the north lot, widening of the Hospital Drive driveway, and potential intersection improvements at Pfingsten Road/Hospital Drive. These necessary parking lot changes will result in

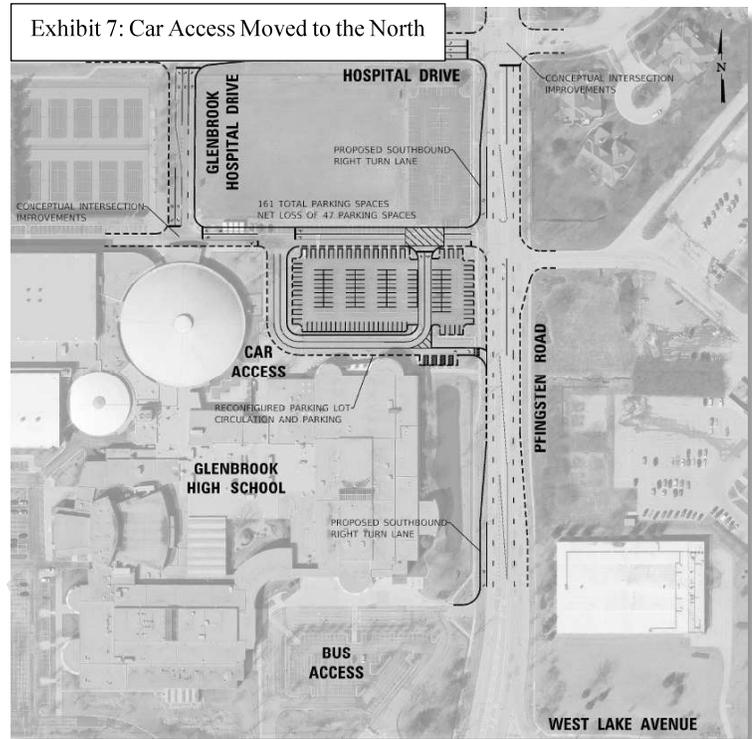
loss of significant parking spaces and open green space, which does not meet the School District criteria for alternative analysis. Therefore, this is currently not a recommended alternative.

Pros:

- Improves traffic on Pfingsten Road and traffic flow in and out of the school by moving traffic away from the overcapacity intersection of W Lake Avenue and Pfingsten Road to the under capacity intersection of Hospital Drive and Pfingsten Road

Cons:

- Net loss of approx. 47 parking spaces in the High School parking lots
- Intersection and roadway improvements needed along Hospital Drive including new southbound right turn lane at Pfingsten Road
- Impact to open green spaces (practice soccer field)
- Traffic queues are expected within the north parking lot
- Cost



Conceptual Cost: \$1,500,000 to \$2,000,000 total improvement cost including intersection improvements at Pfingsten Road/Hospital Drive and High School Site Improvements

4. CONCLUSION

Various traffic flow improvement alternatives have been evaluated and detailed in the report and shown in the Exhibits. Both short term and long term alternatives were presented. We recommend the Village and School District review and proceed with these alternatives as budget allows, in order to improve traffic flow and safety along the roadway network surrounding Glenbrook South High School. Below is a summary of the alternatives:

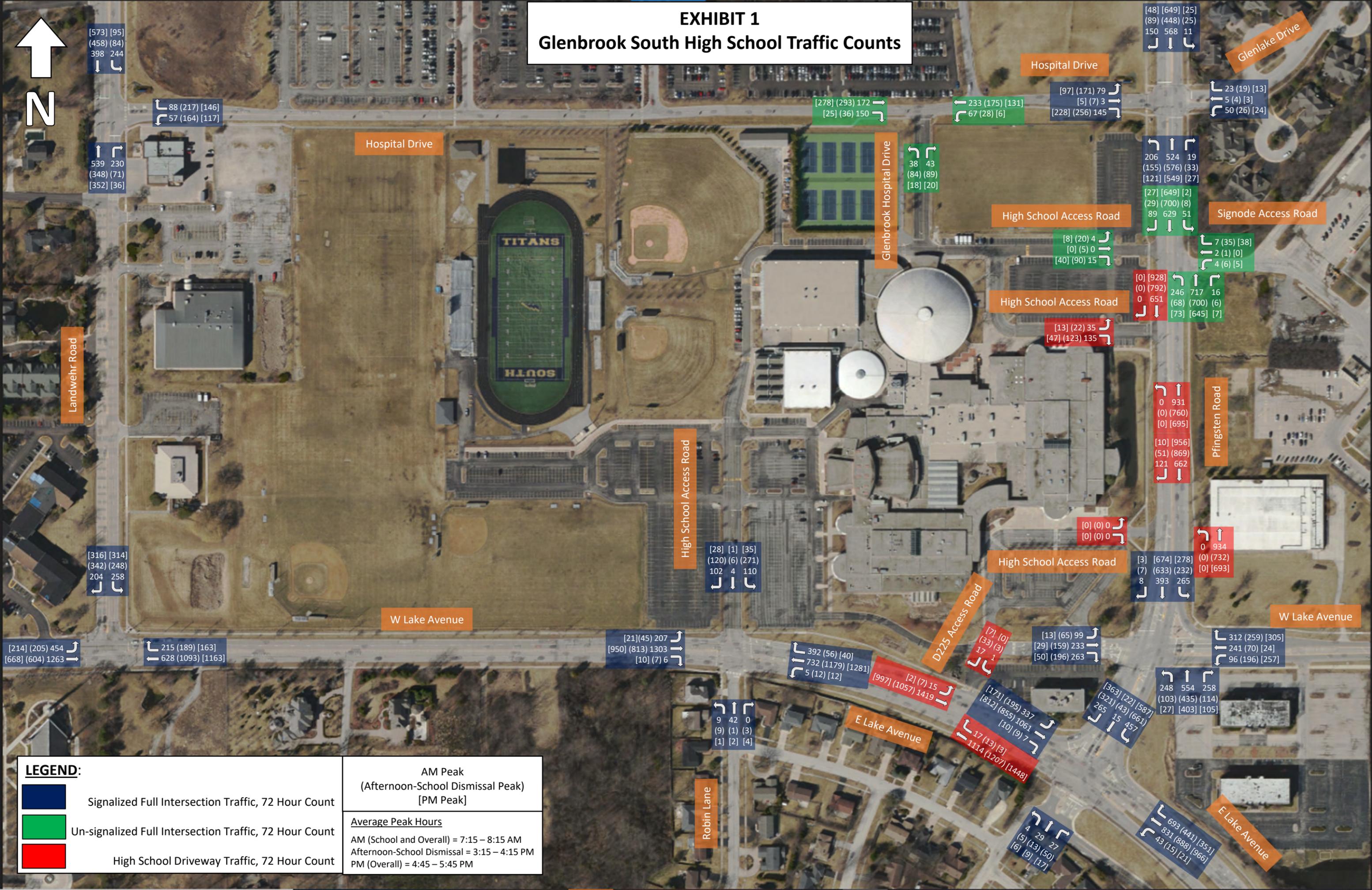
Short Term Alternatives

- Re-optimize the existing traffic signal timings and cycle length
- Reconfigure the District 225 East Lake Avenue Access Driveway for secondary access to the primary student drop off area
 - ◆ Concepts A & B presented for consideration of driveway location options
- Realign the Signode driveway on the east side of Pfingsten Road for improved sight distances and turning movement alignment
 - ◆ Potential coordination with future Signode sight re-development

Long Term Alternatives

- Intersection Improvements at the intersection of West Lake Avenue and Pfingsten Road
 - ◆ Add a new northbound right turn at the intersection to improve traffic flow and reduce vehicle queues between West Lake Avenue and East Lake Avenue

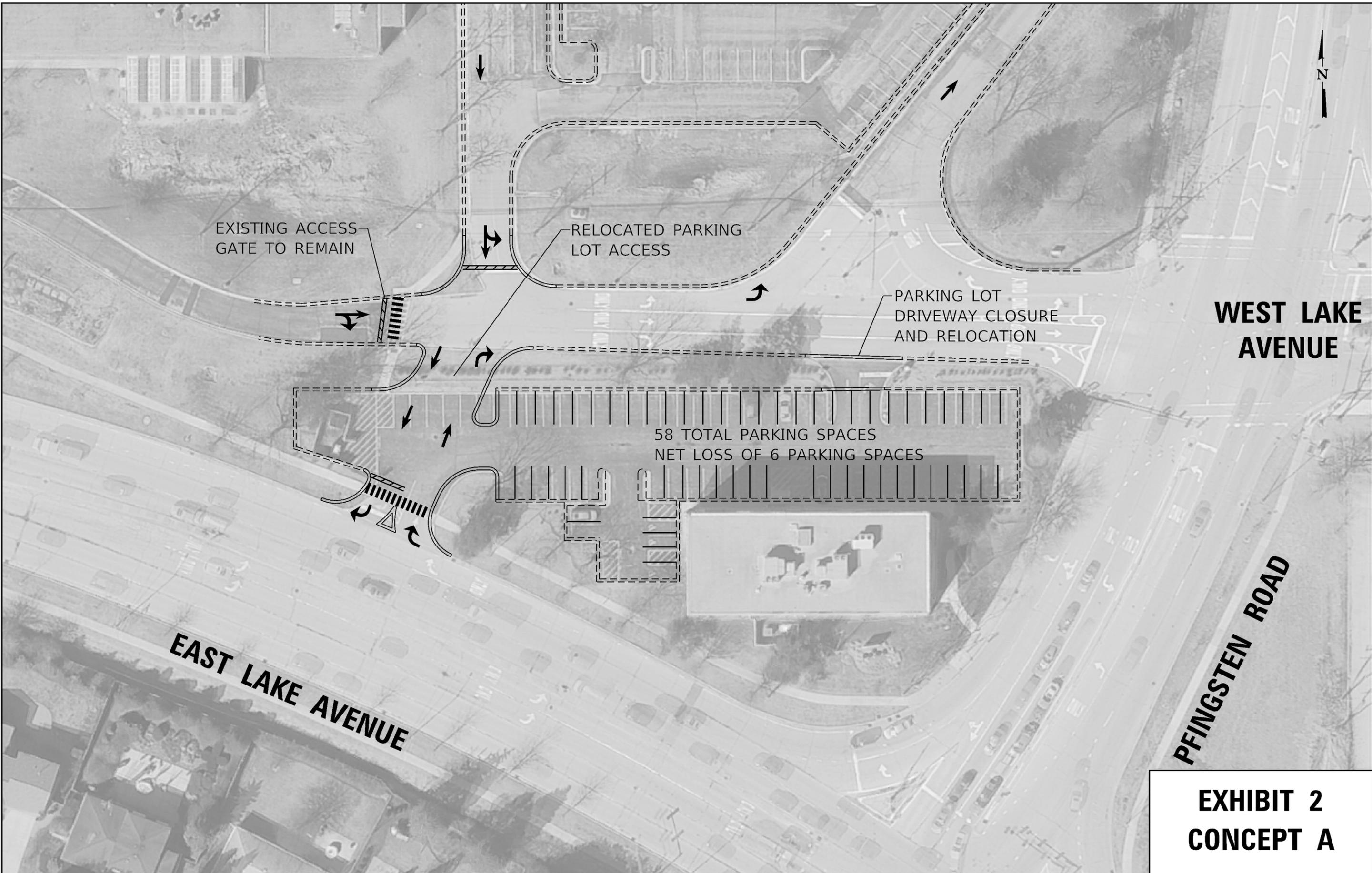
EXHIBIT 1 Glenbrook South High School Traffic Counts



LEGEND:

	Signalized Full Intersection Traffic, 72 Hour Count
	Un-signalized Full Intersection Traffic, 72 Hour Count
	High School Driveway Traffic, 72 Hour Count

AM Peak (Afternoon-School Dismissal Peak) [PM Peak]
<u>Average Peak Hours</u> AM (School and Overall) = 7:15 – 8:15 AM Afternoon-School Dismissal = 3:15 – 4:15 PM PM (Overall) = 4:45 – 5:45 PM



WEST LAKE AVENUE

EAST LAKE AVENUE

PFINGSTEN ROAD

58 TOTAL PARKING SPACES
NET LOSS OF 6 PARKING SPACES

**EXHIBIT 2
CONCEPT A**

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#PLOTBY\$ #DATE\$ #TIME\$ #FILE\$



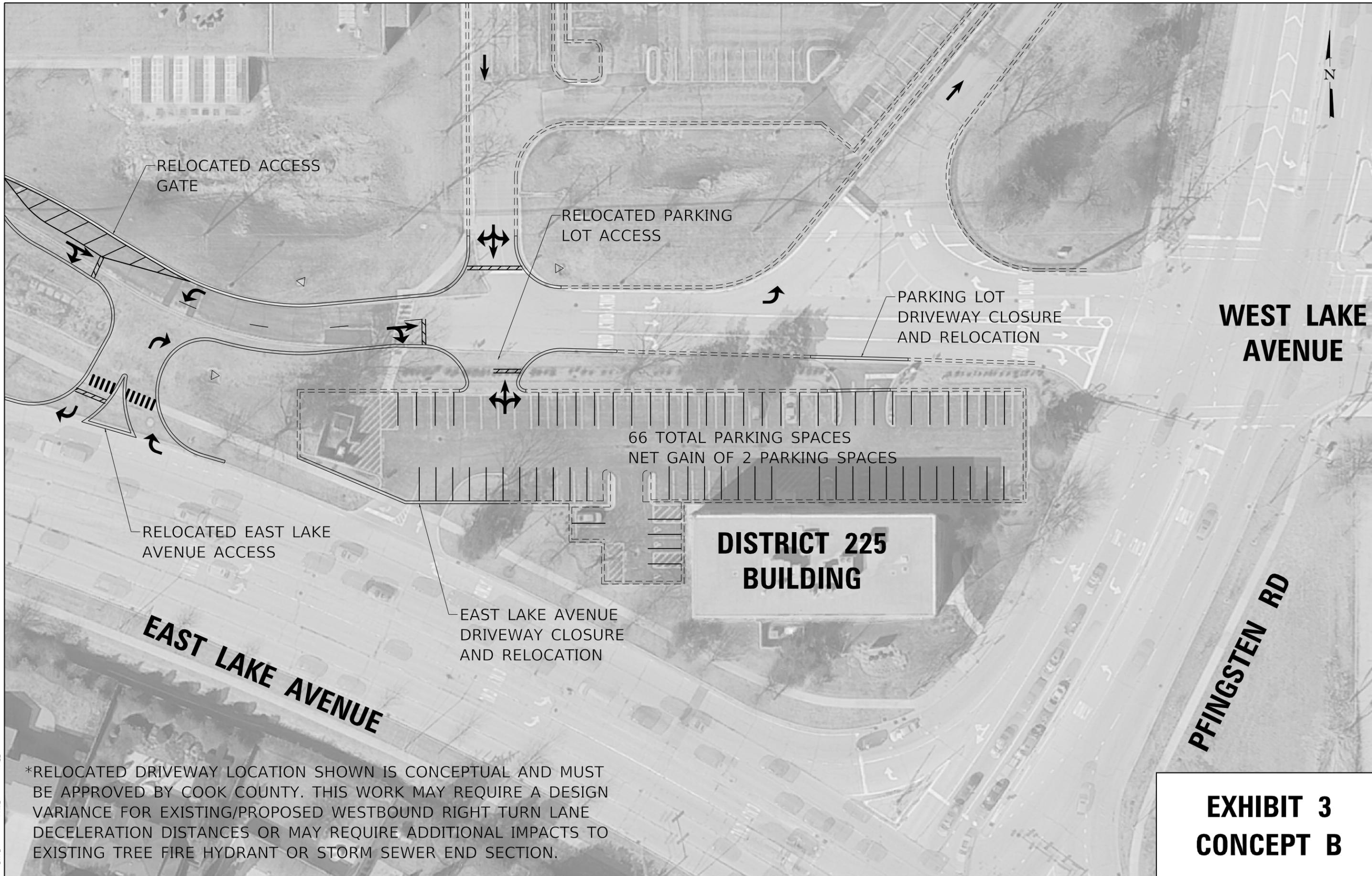
DESIGNED -	SAM	REVISED -	
DRAWN -	SAM	REVISED -	
CHECKED -	TLH	REVISED -	
DATE -	8/5/2020	FILE -	\$FILE\$\$

**GLENBROOK HIGH SCHOOL
TRAFFIC STUDY**

DISTRICT 225 DRIVEWAY RELOCATION CONCEPTS

SCALE: _____ STA. _____ TO STA. _____

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
\$FAU	\$SEC	\$CO	\$TOT	
			CONTRACT NO.	
FED. ROAD DIST. NO.		ILLINOIS	FED. AID PROJECT	



*RELOCATED DRIVEWAY LOCATION SHOWN IS CONCEPTUAL AND MUST BE APPROVED BY COOK COUNTY. THIS WORK MAY REQUIRE A DESIGN VARIANCE FOR EXISTING/PROPOSED WESTBOUND RIGHT TURN LANE DECELERATION DISTANCES OR MAY REQUIRE ADDITIONAL IMPACTS TO EXISTING TREE FIRE HYDRANT OR STORM SEWER END SECTION.

**EXHIBIT 3
CONCEPT B**

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BAXTER & WOODMAN Consulting Engineers	DESIGNED - SAM	REVISED -
	DRAWN - SAM	REVISED -
	CHECKED - TLH	REVISED -
	DATE - 8/5/2020	FILE - \$FILES\$

**GLENBROOK HIGH SCHOOL
TRAFFIC STUDY**

DISTRICT 225 DRIVEWAY RELOCATION CONCEPTS

SCALE: _____ STA. _____ TO STA. _____

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
\$FAU	\$SEC	\$CO	\$TOT	
FED. ROAD DIST. NO.			ILLINOIS FED. AID PROJECT	
CONTRACT NO.				



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 LICENSE NO. - 184-001121 - EXPIRES 4/30/2020 #PENTBLA4
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Consulting Engineers

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DRAWN -	SAM	REVISED -	
CHECKED -	TLH	REVISED -	
DATE -	8/5/2020	FILE -	\$FILES\$

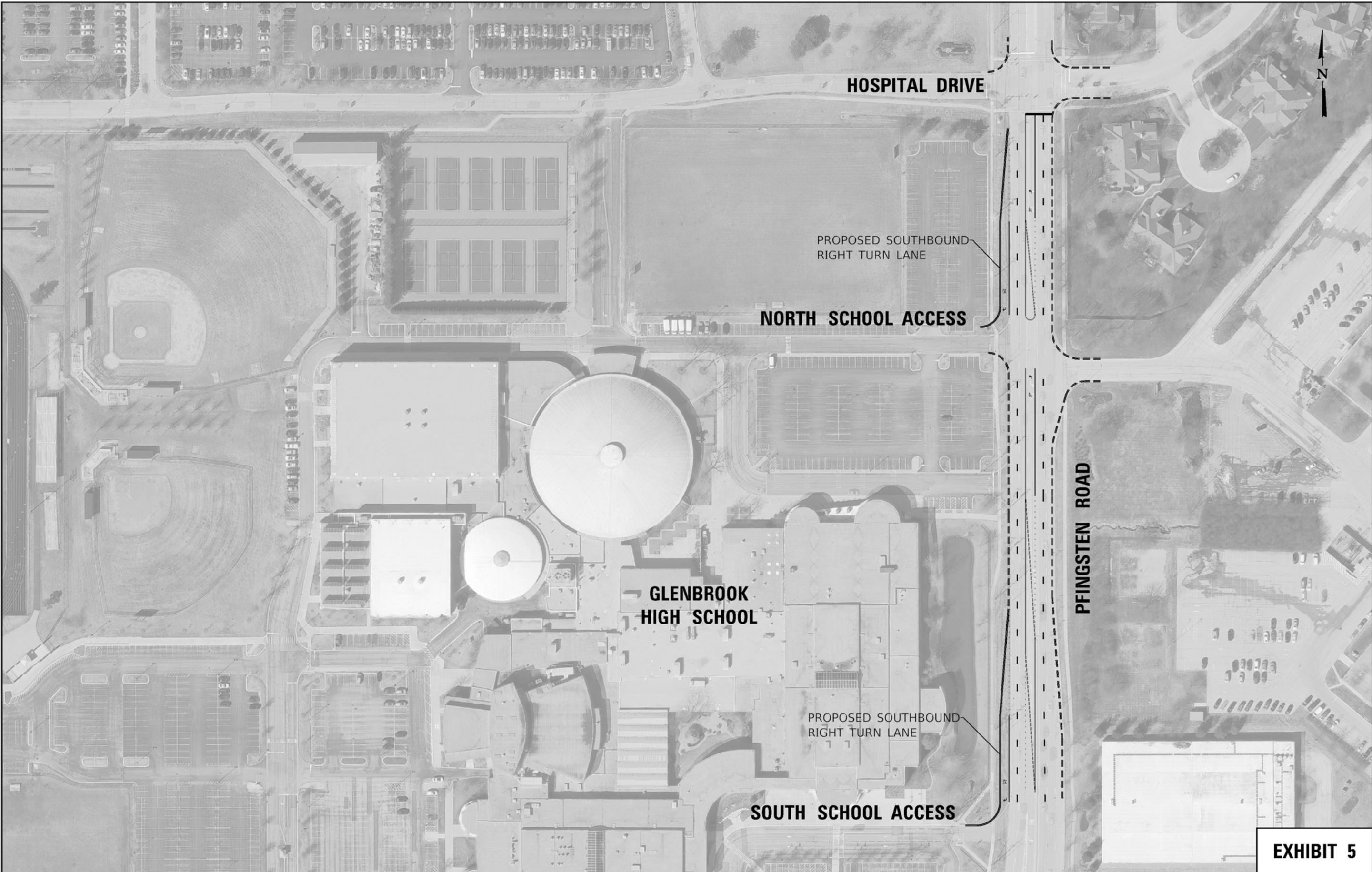
**GLENBROOK HIGH SCHOOL
TRAFFIC STUDY**

**SIGNODE SITE DRIVEWAY ACCESS
RELOCATION CONCEPT**

SCALE: STA. TO STA.

EXHIBIT 4

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
\$FAU	\$SEC	\$CO	\$TOT	
CONTRACT NO.				
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		



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 #DATE# #TIME# #FILE#
 #PLOTBY#

BAXTER & WOODMAN <small>Consulting Engineers</small>	DESIGNED - SAM	REVISED -
	DRAWN - SAM	REVISED -
	CHECKED - TLH	REVISED -
	DATE - 8/5/2020	FILE - \$FILES\$

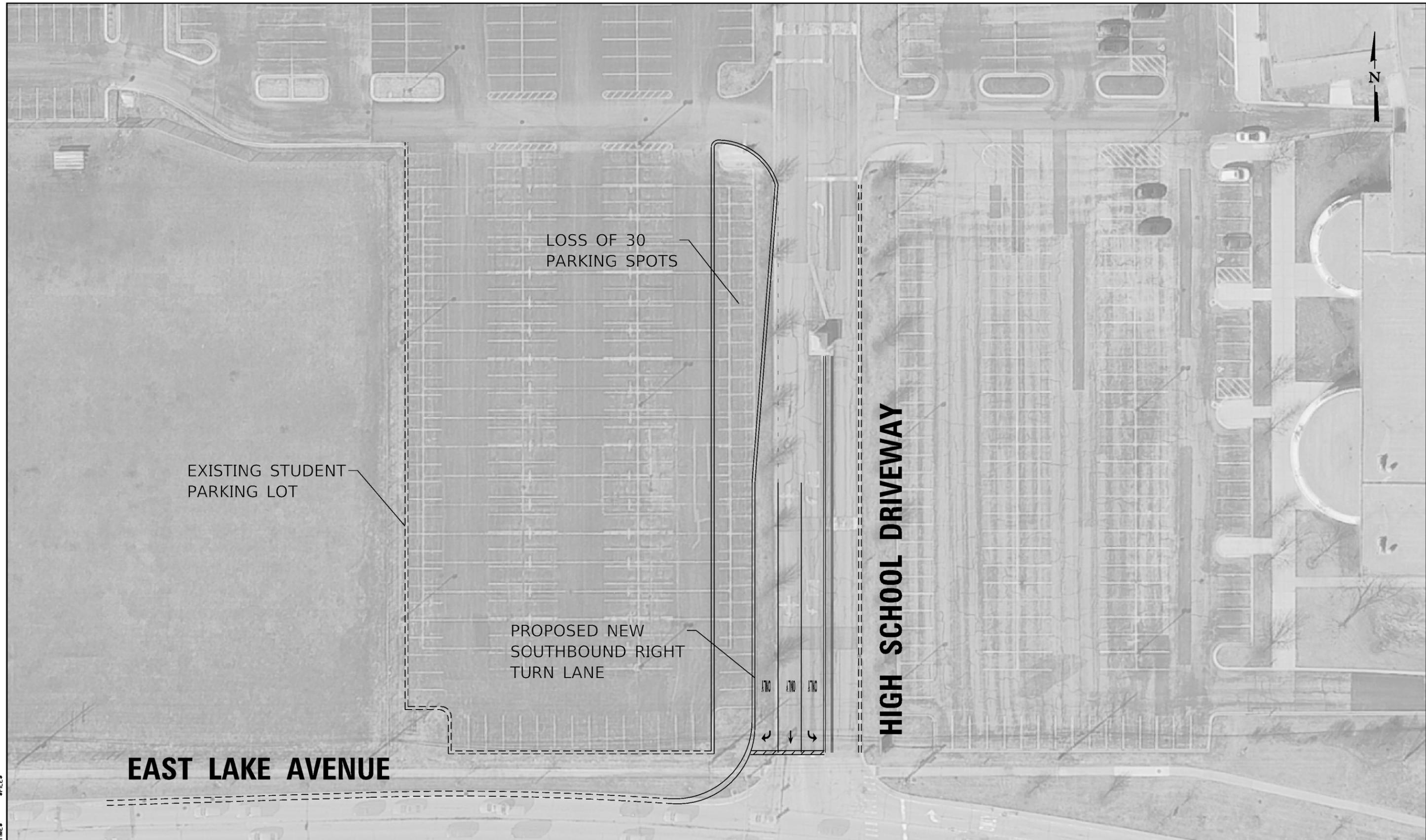
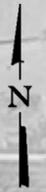
GLENBROOK HIGH SCHOOL TRAFFIC STUDY

PFINGSTEN ROAD SOUTHBOUND RIGHT TURN LANE CONCEPTS

SCALE: _____ STA. _____ TO STA. _____

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
\$FAU	\$SEC	\$CO	\$TOT	
FED. ROAD DIST. NO.			ILLINOIS FED. AID PROJECT	
CONTRACT NO.				

EXHIBIT 5



EXISTING STUDENT
PARKING LOT

LOSS OF 30
PARKING SPOTS

PROPOSED NEW
SOUTHBOUND RIGHT
TURN LANE

HIGH SCHOOL DRIVEWAY

EAST LAKE AVENUE

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DATE - 8/5/2020

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REVISED -
REVISED -
FILE - \$FILE\$

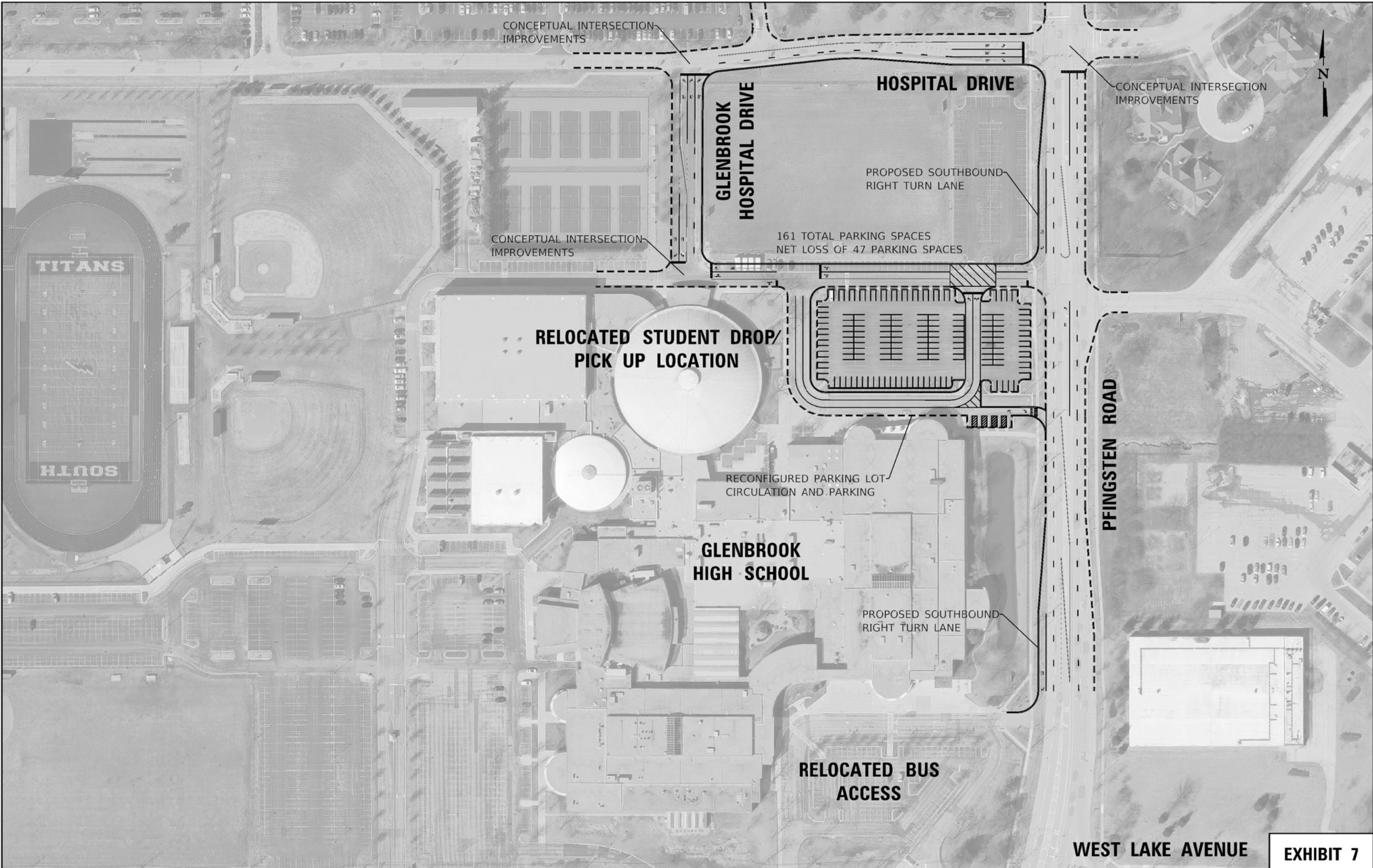
**GLENBROOK HIGH SCHOOL
TRAFFIC STUDY**

**EAST LAKE AVE AND ROBIN LANE
NORTH LEG CONCEPT IMPROVEMENTS**

SCALE: TO STA. TO STA.

EXHIBIT 6

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
\$FAU	\$SEC	\$CO	\$TOT	
CONTRACT NO.				
FED. ROAD DIST. NO. ILLINOIS FED. AID PROJECT				



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Consulting Engineers

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DATE -	8/5/2020	FILE -	\$FILE\$\$

**GLENBROOK HIGH SCHOOL
TRAFFIC STUDY**

**RECONFIGURED NORTH PARKING LOT DROP OFF/
PICK UP AREA CIRCULATION CONCEPT**

SCALE: _____ STA. _____ TO STA. _____

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
\$FAU	\$SEC	\$CO	\$TOT	
CONTRACT NO.				
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

EXHIBIT 7

**Attachment 3 –
Proposed Robin Lane Entrance
Improvements**



EXISTING TURN LANE STORAGE: 1 CAR
PROPOSED TURN LANE STORAGE: 8 CARS

20'



ONLY

REMOVE GUARD SHACK

EXTEND STORAGE FOR
SOUTHBOUND LANES
(ADDITIONAL 3 CARS/LANE)

NEW CURB AND GUTTER

12.5' 11.5'

EXISTING TREES TO
REMAIN (TYP)

11' 11'

REMOVE EXISTING SPEED BUMP

ONLY

WIDEN TO 2 LANES
(4' OF PAVEMENT WIDENING)

EXISTING ONE
NORTHBOUND LANE
TO REMAIN AT INTERSECTION

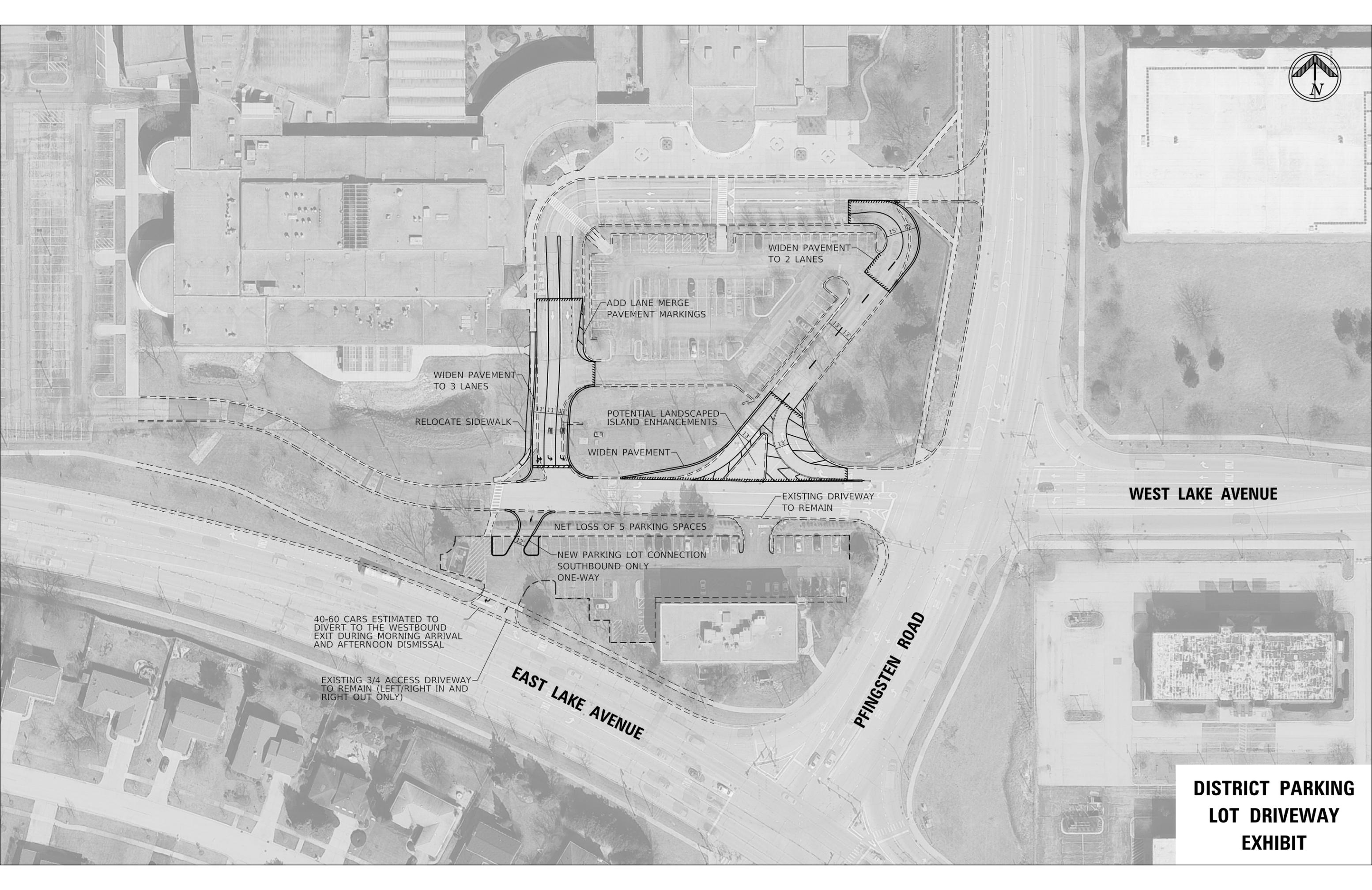
14'

EXISTING TRAFFIC SIGNAL
MAST ARM TO REMAIN

EAST LAKE AVENUE

**WEST PARKING LOT
DRIVEWAY CONCEPT
EXHIBIT**

Attachment 4 – Proposed Main Entrance Improvements



WIDEN PAVEMENT TO 3 LANES

RELOCATE SIDEWALK

ADD LANE MERGE PAVEMENT MARKINGS

WIDEN PAVEMENT TO 2 LANES

POTENTIAL LANDSCAPED ISLAND ENHANCEMENTS

WIDEN PAVEMENT

EXISTING DRIVEWAY TO REMAIN

NET LOSS OF 5 PARKING SPACES

NEW PARKING LOT CONNECTION SOUTHBOUND ONLY ONE-WAY

40-60 CARS ESTIMATED TO DIVERT TO THE WESTBOUND EXIT DURING MORNING ARRIVAL AND AFTERNOON DISMISSAL

EXISTING 3/4 ACCESS DRIVEWAY TO REMAIN (LEFT/RIGHT IN AND RIGHT OUT ONLY)

WEST LAKE AVENUE

EAST LAKE AVENUE

PFINGSTEN ROAD

DISTRICT PARKING LOT DRIVEWAY EXHIBIT