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**MEMORANDUM**

TO: Hal Davidow, Chief Financial Officer  
William Penn Charter School

FROM: Andreas Heinrich, P.E., P.T.O.E.

DATE: March 25, 2022

RE: Updated Traffic Access Study  
Proposed Master Plan – William Penn Charter School (WPC)  
City of Philadelphia, PA

As requested, please accept the results of this updated Traffic Access Study for implementation of the Master Plan for the William Penn Charter School located between Schoolhouse Lane and Coulter Street in the City of Philadelphia, Pennsylvania. As part of the Master Plan, it is proposed to construct a new Lower School, construct a new fieldhouse, and expand/relocate several athletic fields/courts. Current (2022) enrollment at the William Penn Charter School totals 988 students (all grades). The projected enrollment is expected to remain relatively constant increasing somewhat to a total of 1,001 students (all grades) by the year 2026.

Access to the main campus of the William Penn Charter School is currently provided via four driveways – the main driveway that intersects Schoolhouse Lane at a point approximately 2,100 feet west of Wissahickon Avenue, the bus entrance driveway that intersects Schoolhouse Lane approximately 1,300 feet west of Wissahickon Avenue, the Fox Street driveway which is the fourth leg of the intersection of Fox Street and Coulter Street, and the Stokely Street bus exit driveway that intersects Coulter Street near Stokely Street. Access to the Strawbridge Campus situated along the north side of Schoolhouse Lane was provided via a driveway that intersects Schoolhouse Lane at a point approximately 1,655 feet west of Wissahickon Drive. In addition, the existing small parking lot at the Timmons House currently has access via a driveway that intersects The Oak Road; and, the William Penn Charter School Pre-K program is operated with the Memorial Church of the Good Shepherd facility also located along The Oak Road. As part of the Master Plan, it is proposed to realign the main driveway to intersect Schoolhouse Lane approximately 225 feet to the east of the existing location, eliminate the internal connection through the campus between the main driveway and the Fox Street driveway (emergency vehicle access through the campus will be maintained) and construct a new parking area at the Timmons House with access via the bus

entrance driveway. Access to the Strawbridge Campus has been realigned to intersect Schoolhouse Lane at a point directly opposite the realigned main driveway. All William Penn Charter School access to parking lots will be eliminated via The Oak Road. Off-street parking will be increased from about 264 marked parking spaces to about 327 marked parking spaces.

The purpose of this Traffic Access Study is to assess the potential traffic impact of access proposed as part of the Master Plan on the immediately adjacent roadways, and to comment on site access from the viewpoint of both traffic efficiency and safety. As such, our study has included:

- visits to the site to observe traffic conditions and to note existing physical characteristics of the adjacent highways;
- completion of Turning Movement Traffic Counts on a typical weekday from 6:30 AM to 9:30 AM and from 2:00 PM to 6:00 PM at the intersections listed below:
  - Schoolhouse Lane/Main Driveway/Cherry Lane
  - Schoolhouse Lane/Bus Entrance Driveway/Falls Village Driveway
  - Schoolhouse Lane/The Oak Road
  - Schoolhouse Lane/Strawbridge Campus Driveway
  - Schoolhouse Lane/Independence Plaza/Phila. Univ. Driveway
  - Fox Street/Coulter Street
  - Bus Exit Driveway/Stokely Street/Coulter Street;
- quantification of the traffic generation characteristics and potential travel patterns of existing and future traffic generated by the William Penn Charter School;
- completion of volume/capacity analyses of existing and future (2026) peak hour traffic after implementation of the proposed Master Plan including provision of two-way access along the northern section to Schoolhouse Lane for the Timmons House parking area;
- completion of volume/capacity analyses of future (2026) peak hour traffic after implementation of the proposed Master Plan assuming maintenance of one-way southbound traffic flow along the bus lane;
- review of proposed site access relative to the maintenance of safe and efficient access to the William Penn Charter School.

### **Existing Transportation Setting**

Schoolhouse Lane is a two-way, two-lane local street in the City of Philadelphia. Schoolhouse Lane is typically 30 feet wide curb-to-curb with one travel lane in each direction 11 feet wide, and a parking lane along the south side 8 feet wide. The posted speed limit along Schoolhouse Lane is 25 miles per hour with a school zone speed limit of 15 miles per hour

from a point approximately 140 feet east of the bus entrance driveway to a point 290 feet west of the existing main driveway.

The Oak Road is a two-way, two-lane local street in the City of Philadelphia. The Oak Road is typically 26 feet wide curb-to-curb with on-street parking allowed along both sides of the street. Traffic on The Oak Road is Stop-sign controlled at the intersection with Schoolhouse Lane. There is no posted speed limit along The Oak Road.

Fox Street is a two-way, two-lane local street in the City of Philadelphia. Fox Street is typically 34 feet wide curb-to-curb with on-street parking allowed along both sides of the street. The extension of Fox Street north of Coulter Street serves as an access driveway for the William Penn Charter School. The WPC driveway is 20 feet wide curb-to-curb. Traffic at the intersection of Fox Street and Coulter Street is regulated by multi-way Stop-signs on all four approaches to the intersection. There is no posted speed limit along Fox Street.

Coulter Street is a two-way, two-lane local street in the City of Philadelphia. Coulter Street is typically 34 feet wide curb-to-curb with on-street parking allowed along both sides of the street. Traffic at the intersection of Fox Street and Coulter Street is regulated by multi-way Stop-signs on all four approaches to the intersection. The posted speed limit along Coulter Street is 25 miles per hour.

Stokely Street is a two-way, two-lane local street in the City of Philadelphia. Stokely Street is typically 34 feet wide curb-to-curb with on-street parking allowed along both sides of the street. There is no posted speed limit along Stokely Street.

The WPC Main Driveway is a two-way, two-lane access road 22 feet wide curb-to-curb. The Bus Driveway is a one-way southbound access road 15 to 16 feet wide curb-to-curb with the entrance intersecting Schoolhouse Lane and the exit intersecting Coulter Street near Stokely Street. The Strawbridge Campus Driveway is a two-way, two-lane access road 20 feet wide.

Existing highway travel demand and traffic patterns in the vicinity of the WPC were determined from completion of a Turning Movement Traffic Counts on a typical weekday from 6:30 AM to 9:30 AM and from 2:00 PM to 6:00 PM at the intersections listed below:

- Schoolhouse Lane/Main Driveway/Cherry Lane
- Schoolhouse Lane/Bus Entrance Driveway/Falls Village Driveway
- Schoolhouse Lane/The Oak Road
- Schoolhouse Lane/Strawbridge Campus Driveway
- Schoolhouse Lane/Independence Plaza/Phila. Univ. Driveway
- Fox Street/Coulter Street
- Bus Exit Driveway/Stokely Street/Coulter Street.

The Intersection Turning Movement Counts were completed in February 2018. The traffic volume data along Schoolhouse Lane was compared with traffic count data available from the PennDOT Traffic Information Repository website (TIRE). This comparison showed that the February 2018 count data was 12% to 20% greater than the PennDOT data collected

in May 2018. Accordingly, to provide a conservatively high analysis, the February 2018 count data was used with no adjustment. Figures 1, 2 and 3 summarize existing (2018) weekday morning peak, weekday afternoon school peak, and weekday afternoon street peak hour traffic, respectively, at the study area intersections. A copy of the Traffic Count Summary Data sheets is attached.

### **Pedestrian Facilities**

Existing pedestrian facilities are provided throughout the study area with sidewalks provided along both sides of every street in the study area. A mid-block raised crosswalk is constructed across Schoolhouse Lane approximately 160 feet west of the Bus Lane Driveway. The raised crosswalk connects the athletic fields on the William Penn Charter School main campus on the south side of Schoolhouse Lane with the athletic fields/courts on the Strawbridge Campus on the north side of Schoolhouse Lane. ADA compliant curb ramps with Detectable Warning Surfaces (DWS) are provided on both ends of the raised crosswalk. A pedestrian-actuated Rectangular Rapid Flashing Beacon (RRFB) is installed at the raised crosswalk to warn motorists that a pedestrian is in the raised crosswalk.

### **Public Transportation**

There is no public transportation immediately adjacent to the William Penn Charter School Campus. The nearest available public transportation is provided via S.E.P.T.A. regularly scheduled bus service along Henry Avenue (Route 32 Bus), at the intersection of Wissahickon Avenue and Schoolhouse Lane (Route J Bus), and at the intersection of Midvale Avenue and Fox Street (Routes K and R Bus).

### **Traffic Generation Characteristics**

As described previously, as part of the Master Plan, it is proposed to construct a new Lower School, construct a new fieldhouse, and expand/relocate several athletic fields/courts. Current (2022) enrollment at the William Penn Charter School totals 988 students (all grades). The projected enrollment is expected to remain relatively constant increasing somewhat to a total of 1,001 students (all grades) by the year 2026. Accordingly, trip generation is expected to remain relatively constant over the next eight years or so. With changes to access and internal vehicular circulation, traffic patterns exhibited by the WPC will change. A summary of existing (2018) trip generation quantified by 15-minute time intervals and by access location is provided in Table 1. Table 1 also summarizes the total peak hour trip generation for the morning peak hour (7:15 AM to 8:15 AM), the afternoon school peak hour (2:30 PM to 3:30 PM), and the afternoon street peak hour (4:30 PM to 5:30 PM).

It should be noted that the calculated trip generation rates for the William Penn Charter School compare favorably with trip generation rates for a Private School (K-12) published in the Trip Generation Manual <sup>(1)</sup> by the Institute of Transportation Engineers. The calculated trip generation during the morning peak hour is 0.83 trips per student versus 0.80 to

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(1) Trip Generation Manual, 10<sup>th</sup> Edition, Institute of Transportation Engineers, Washington, D.C., 2017.

**TABLE 1**

**TRAFFIC GENERATION CHARACTERISTICS  
WILLIAM PENN CHARTER SCHOOL  
CITY OF PHILADELPHIA, PENNSYLVANIA**

**FEBRUARY, 2018**

<u>Time Period</u>	<u>Main Driveway</u>	<u>Bus Driveway</u>	<u>Fox St. Driveway</u>	<u>Stokely St. Driveway</u>	<u>Total Inbound</u>	<u>Main Driveway</u>	<u>Bus Driveway</u>	<u>Fox St. Driveway</u>	<u>Stokely St. Driveway</u>	<u>Total Outbound</u>	<u>TOTAL</u>
6:30 to 6:45 AM	2	0	4	0	6	1	0	0	0	1	7
6:45 to 7:00 AM	6	0	10	0	16	1	0	6	0	7	23
7:00 to 7:15 AM	29	0	13	0	42	10	0	4	0	14	56
7:15 to 7:30 AM	56	2	26	0	84	14	0	21	1	36	120
7:30 to 7:45 AM	52	6	35	0	93	16	0	42	7	65	158
7:45 to 8:00 AM	78	12	59	0	149	26	0	42	11	79	228
8:00 to 8:15 AM	75	5	74	2	156	46	0	73	6	125	281
8:15 to 8:30 AM	27	1	10	0	38	28	0	31	1	60	98
8:30 to 8:45 AM	10	1	0	0	11	5	0	2	1	8	19
8:45 to 9:00 AM	13	2	3	0	18	3	1	2	1	7	25
9:00 to 9:15 AM	7	0	5	0	12	6	2	4	0	12	24
9:15 to 9:30 AM	3	1	3	0	7	2	0	2	0	4	11
<b>Morning Peak Hour 7:15 to 8:15 AM</b>	<b>261</b>	<b>25</b>	<b>194</b>	<b>2</b>	<b>482</b>	<b>102</b>	<b>0</b>	<b>178</b>	<b>25</b>	<b>305</b>	<b>787</b>

TABLE 1 (Continued)

**TRAFFIC GENERATION CHARACTERISTICS  
WILLIAM PENN CHARTER SCHOOL  
CITY OF PHILADELPHIA, PENNSYLVANIA**

**FEBRUARY, 2018**

Time Period	Main Driveway	Bus Driveway	Fox St. Driveway	Stokely St. Driveway	Total Inbound	Main Driveway	Bus Driveway	Fox St. Driveway	Stokely St. Driveway	Total Outbound	TOTAL
2:00 to 2:15 PM	9	1	2	0	12	2	0	5	0	7	19
2:15 to 2:30 PM	20	2	10	1	33	9	0	6	1	16	49
2:30 to 2:45 PM	31	5	38	2	76	32	0	17	0	49	125
2:45 to 3:00 PM	36	1	27	3	67	24	0	28	1	53	120
3:00 to 3:15 PM	11	2	13	1	27	32	0	50	2	84	111
3:15 to 3:30 PM	16	1	8	0	25	36	0	24	11	71	96
3:30 to 3:45 PM	9	4	10	0	23	14	0	12	8	34	57
3:45 to 4:00 PM	9	0	13	0	22	16	0	18	0	34	56
4:00 to 4:15 PM	16	0	16	0	32	23	0	24	0	47	79
4:15 to 4:30 PM	10	2	9	0	21	23	1	20	0	44	65
4:30 to 4:45 PM	14	0	13	0	27	25	0	15	0	40	67
4:45 to 5:00 PM	12	0	16	1	29	23	0	26	0	49	78
5:00 to 5:15 PM	13	0	14	0	27	21	0	18	0	39	66
5:15 to 5:30 PM	10	0	19	0	29	11	1	14	0	26	55
5:30 to 5:45 PM	9	0	8	0	17	14	0	12	2	28	45
5:45 to 6:00 PM	11	1	11	1	24	13	0	12	1	26	50
Afternoon School Peak Hour 2:30 to 3:30 PM	94	9	86	6	195	124	0	119	14	257	452
Afternoon Street Peak Hour 4:30 to 5:30 PM	49	0	62	1	112	80	1	73	0	154	266

0.81 trips per student in the Trip Generation Manual. The calculated trip generation during the afternoon school peak hour is 0.48 trips per student versus 0.58 trips per student in the Trip Generation Manual. The calculated trip generation during the afternoon street peak hour is 0.28 trips per student versus 0.21 trips per student in the Trip Generation Manual.

Specifically, virtually all of the available off-street parking at the WPC can be currently accessed via either the main driveway that intersects Schoolhouse Lane or via the Fox Street access driveway. With proposed internal changes to parking and circulation, only 54 parking spaces will be accessible via the Fox Street driveway, 181 parking spaces will be accessible via the Main Driveway that intersects Schoolhouse Lane, 51 new parking spaces will be accessible via the bus entrance driveway that intersects Schoolhouse Lane, and 41 new parking spaces will be provided at the Strawbridge Campus. Based on these changes, it is anticipated that the main driveway via Schoolhouse Lane will experience an increase in trip generation of almost 55% (i.e., 181 future parking spaces divided by 117 existing parking spaces); the Fox Street driveway will experience a decrease in trip generation of almost 62.0% (i.e., 87 existing parking spaces lost divided by 141 existing parking spaces); the new parking area with access via the bus entrance driveway will see almost a five-fold increase in activity compared to the current use of bus entrance driveway; and, the new parking area at the Strawbridge Campus will be subject to some minor parking demand essentially making up the differences in the calculations described for the main parking areas. The re-assignment of trip generation for the revised access as part of the Master Plan, including a modest increase in total trip generation of about 5.7% due to increased enrollment, is presented in Figure 4.

### Volume/Capacity Analysis

While traffic volumes provide a measure of activity on the area road system, it is also important to calculate the ability of the road system to adequately accommodate the traffic demand. This involves a comparison of peak hour traffic demand with available roadway or intersection capacity. Intersections and driveways are usually the critical points in any road network. At intersections, conflicts occur between through, crossing and turning traffic. It is at intersections where congestion is most likely to occur.

A volume/capacity analysis was completed for the unsignalized intersections and driveways in the study area based upon the peak hour traffic volumes illustrated in Figures 1, 2 and 3. The volume/capacity analysis was completed in accordance with the standard procedures contained in the "Highway Capacity Manual"<sup>(2)</sup>. By definition, vehicle capacity represents "the maximum number of vehicles that can pass a given point during a specified period under prevailing roadway, traffic and control conditions". The level of functioning of an intersection or a uniform section of lane or roadway can be expressed in terms of levels of service. A level of service is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. Such measures include speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

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(2) "Highway Capacity Manual", 6<sup>th</sup> Edition, Transportation Research Board of the National Academies, Washington, D.C., 2016..

In calculating the capacity of an unsignalized intersection, it is assumed that the through movements on the major street and the right turns from the major street are unimpeded and have the right-of-way over all minor street traffic and left turns from the major street. All other movements in the intersection cross, merge with, or are affected by other flows. For each movement, all conflicting flows are summed and a "critical gap" is determined. The control delay of a critical movement includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Since operation at capacity is usually unsatisfactory to most drivers, a descriptive mechanism has been developed which relates capacity with the expected traffic delay. This is known as Level of Service (LOS). Level of service for a two-way stop-controlled intersection, or a multi-way Stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service for a signalized intersection is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Table 2 provides the correlation between levels of service and the average total delay at unsignalized intersections.

The resultant levels of service calculated from the volume/capacity analysis of existing (2018) peak hour traffic conditions are illustrated in Figure 5 (volume/capacity analysis worksheets attached). The results of the analysis of existing peak hour traffic conditions reveal that all critical movements at the existing unsignalized intersections and driveways in the vicinity of the campus are currently operating at an acceptable Level of Service (LOS C or better) during all three peak hours.

### **Future (2026) Conditions**

New traffic patterns for traffic generated by the WPC was then applied to existing (2018) peak hour traffic volumes. No adjustments were made to existing (2018) peak hour traffic to account for background traffic growth. The background traffic growth rate for Philadelphia obtained from the Pennsylvania Department of Transportation Bureau of Planning and Research for the period August 2017 to July 2021 is 0.0%. Further, much of the peak hour traffic volume along Schoolhouse Lane, Coulter Street, Fox Street and Stokely Street is related to traffic generated by schools in the area. Any realistic increase in peak hour traffic along these streets will be related to an expansion of student enrollment, which is accounted for in the increased trip generation.

Future (2026) peak hour traffic volume after implementation of the Master Plan is presented in Figures 6, 7 and 8. To accommodate traffic entering and exiting from the new Timmons House parking lot, this analysis assumes the bus lane will be maintained for one-way southbound traffic flow (i.e., all traffic entering the proposed Timmons House parking lot will do so via Schoolhouse Lane while all traffic exiting the proposed Timmons House parking lot will do so via Stokely Street. The resultant levels of service calculated from the volume/capacity analysis of future (2026) peak hour traffic conditions are illustrated in Figure 9 (volume/capacity analysis worksheets attached). The results of the analysis of future



**TABLE 2**

**LEVEL OF SERVICE**

**UNSIGNALIZED INTERSECTIONS**

At unsignalized intersections the criteria used to evaluate the quality of flow is the measure of the adequacy of the number of acceptable gaps in the through traffic stream for drivers facing a STOP or YIELD condition. Variables affecting the gaps are the distribution or arrival of vehicles in the through traffic stream, percentage of trucks, grades, and the amount of time it requires to enter the traffic stream from a stop position (critical gap size). The control delay of a critical movement includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

As a result, the following criteria has been established:

<u>Level of Service</u>	<u>Control Delay Range (sec./veh/)</u>
A	less than 10
B	10 to 15
C	15 to 25
D	25 to 35
E	35 to 50
F	more than 50 and/or volume-to- capacity ratio greater than 1.0

(2026) peak hour traffic conditions, with one-way southbound traffic along the bus lane, reveal left turn exiting traffic from the main driveway at Schoolhouse Lane will continue to operate at LOS E during the morning peak hour. Otherwise, all critical movements at the unsignalized intersections and driveways in the vicinity of the campus will continue to operate at an acceptable Level of Service (LOS C or better) during all three peak hours. It may become advisable to station a traffic control officer at the driveway location during school arrival/dismissal time periods to direct traffic into and out of the main school driveway.

It should be noted that the alternative whereby all traffic to/from the proposed Timmons House parking lot would enter and exit via Schoolhouse Lane was studied. From an operational point of view, whether the bus lane is configured for two-way traffic to Schoolhouse Lane or is maintained for one-way southbound traffic along its entire length, acceptable levels of service are expected under both alternatives. While more traffic will exit via Stokely Street by maintaining one-way southbound traffic, total peak hour traffic volumes along Coulter Street, Stokely Street and Fox Street will still be reduced compared to existing (2018) conditions due to closure of the cross-connection through the WPC Campus. Accordingly, the current one-way southbound traffic pattern along the Bus Lane was deemed the better solution for both WPC operations and for neighboring traffic patterns.

#### **Lower School Parent Drop-off/Pick-up**

Currently, parent drop-off/pick-up operations occur at two locations during the morning arrival and afternoon dismissal time periods. Because of the location of the existing Lower School together with the magnitude of the drop-off/pick-up queuing that occurs, drop-off/pick-up for certain grades occurs via the Fox Street driveway, while drop-off/pick-up for the remaining grades occurs via the Schoolhouse Lane driveway.

Queuing can vary from day-to-day, and it is my understanding that queuing is increased on days when there are no after-school activities scheduled. Based on observations on Wednesday January 26, 2022 and Wednesday February 2, 2022, the maximum queue length from the Fox Street driveway totaled 47 vehicles including eight (8) vehicles in the intersection of Fox Street and Coulter Street. With an average of about 21 feet per vehicle, this results in a maximum queue length of almost 900 feet. The maximum queue length from the Schoolhouse Lane driveway totaled 33 vehicles. With an average of about 21 feet per vehicle, this results in a maximum queue length of almost 700 feet. In total, the maximum observed queue totaled 80 vehicles, or about 1,680 feet. It should be noted that maximum queue refers to the maximum number of vehicles observed only on the two days of observation. Anecdotally, queues have been known to extend further along Fox Street and along Coulter Street in both directions, and also along the entire length of the Schoolhouse Lane driveway.

Indeed, due to the effects of Covid-19, there has been a reduced reliance on school buses to transport students to/from the school. Instead, parent drop-off/pick-up activity has

been increased significantly. It is anticipated that school bus service and parent drop-off/pick-up activity will eventually return to 2018-2019 levels resulting in a reduction of the observed queues indicated above.

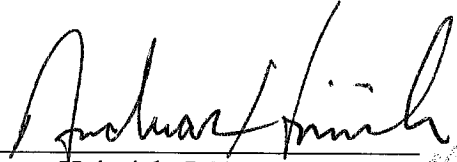
With the proposed improvements to the campus including elimination of the internal connection between Fox Street and Schoolhouse Lane, and the relocation of the new Lower School, the amount of queue length for parent drop-off/pick-up will be altered. If the queue begins at the curve at the end of the parking bay adjacent to the new Lower School, the direct queue line will be about 700 feet, plus an additional 270 feet in the entrance lane of the main driveway out to Schoolhouse Lane, or about 46 vehicles. This is far fewer than what was observed in February 2022. Lower School students can walk to/from the curb cut-out located between the Main Building and the Kurtz Theater Building, and the queue length can be extended approximately 450 feet to a total length of about 1,420 feet to accommodate about 67 or 68 vehicles. This is still about 12 or 13 vehicles short of the maximum queue observed in February 2022. The queue can be advanced 150 feet into the circle in front of the Main Building which will require some students having to walk a greater distance. This will be sufficient to accommodate almost 75 vehicles. Again, it is anticipated that school bus service and parent drop-off/pick-up activity will eventually return to 2018-2019 levels resulting in a reduction of the observed queues indicated above. In any event, manual traffic control will continue to be required to route incoming vehicles in, around and out of the new parking bays.

As indicated above, observation on two Wednesdays revealed a maximum queue length of about 1,680 feet. The proposed plan can provide a queue length of about 1,570 feet, which is not adequate to accommodate the observed maximum queue. Under these circumstances, the maximum queue is likely to extend out onto Schoolhouse Lane. To avoid blocking through traffic along Schoolhouse Lane, queues can be extended through the Strawbridge lot along the west side of Schoolhouse Lane. This will add another 600 feet or so of queue length (28 or 29 vehicles), but will require additional manual traffic control to route traffic through that lot and then back across Schoolhouse Lane. Again, it is anticipated that school bus service and parent drop-off/pick-up activity will eventually return to 2018-2019 levels resulting in a reduction of the observed queues indicated above.

There is one additional concern to make note of. While all circulation aisles will be wide enough for two-way traffic, as the queue extends to its maximum length, one lane throughout much of the parking areas, as well as the inbound lane from Schoolhouse Lane, will be blocked with vehicles in the queue. Should there be an emergency on campus, the entire Schoolhouse Lane access driveway and parking areas will hinder the ability for emergency vehicles to enter via the Schoolhouse Lane driveway. Emergency response vehicles must be notified in advance of arrival during these time periods to use the Fox Street driveway. Contingency planning should also be provided for the manual traffic control staff to have all vehicles in the queue vacate the campus immediately to improve access for emergency response vehicles.

**Conclusions**

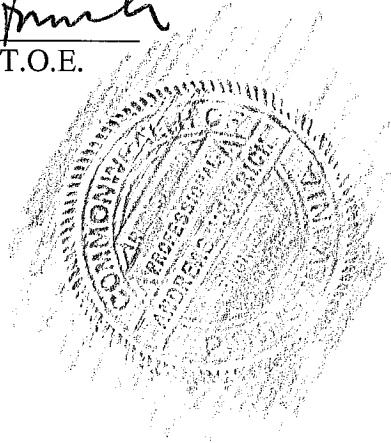
The foregoing Updated Traffic Access Study for the William Penn Charter School, demonstrates that safe and efficient access will be provided for access to/from the campus. Contingency planning should be provided for the manual traffic control staff to safely and efficiently move traffic during the parent drop-off/pick-up time periods.

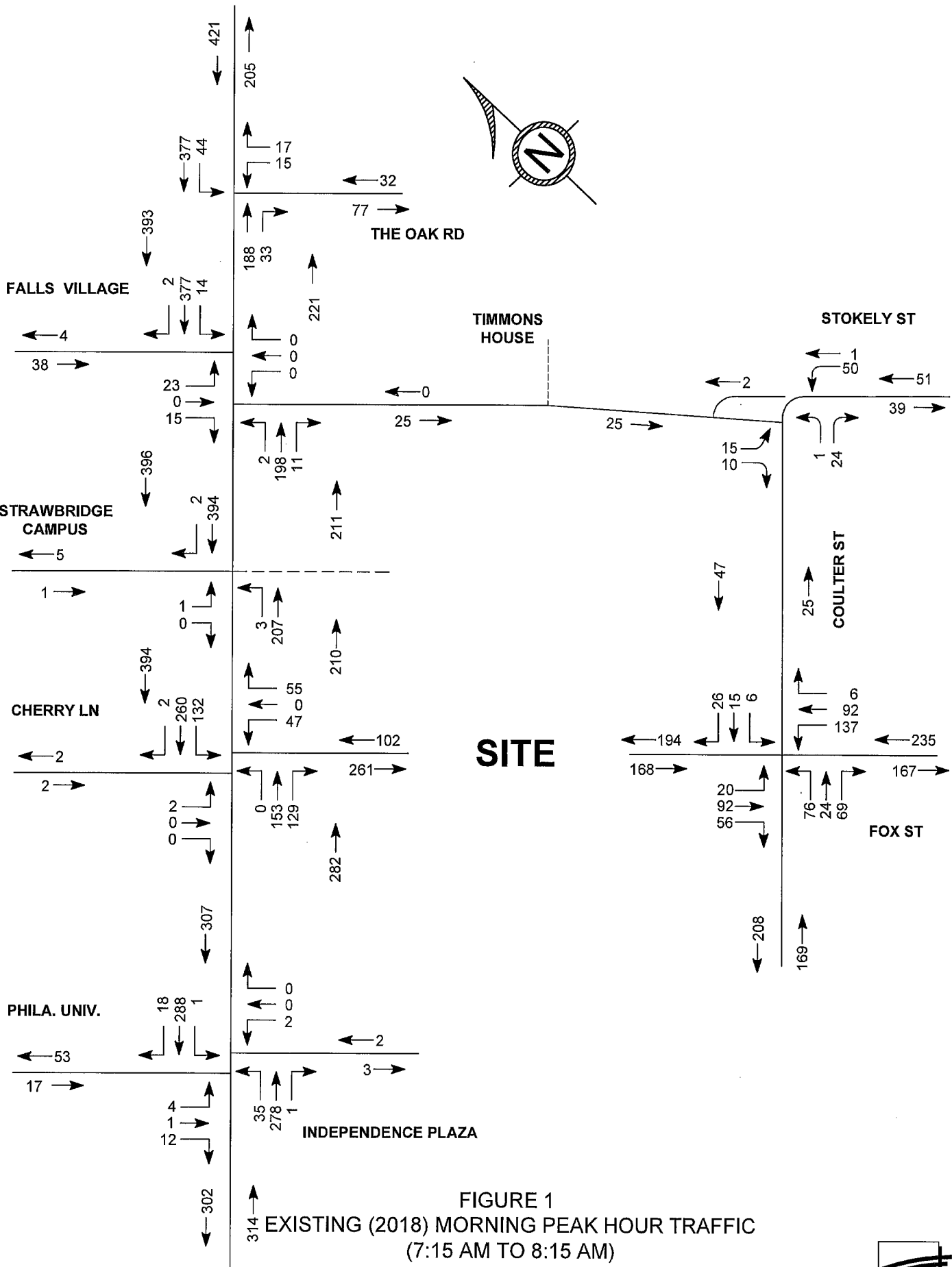
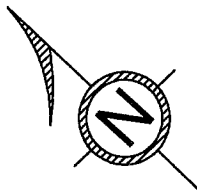


Andreas Heinrich, P.E., P.T.O.E.  
Principal

AH:rh

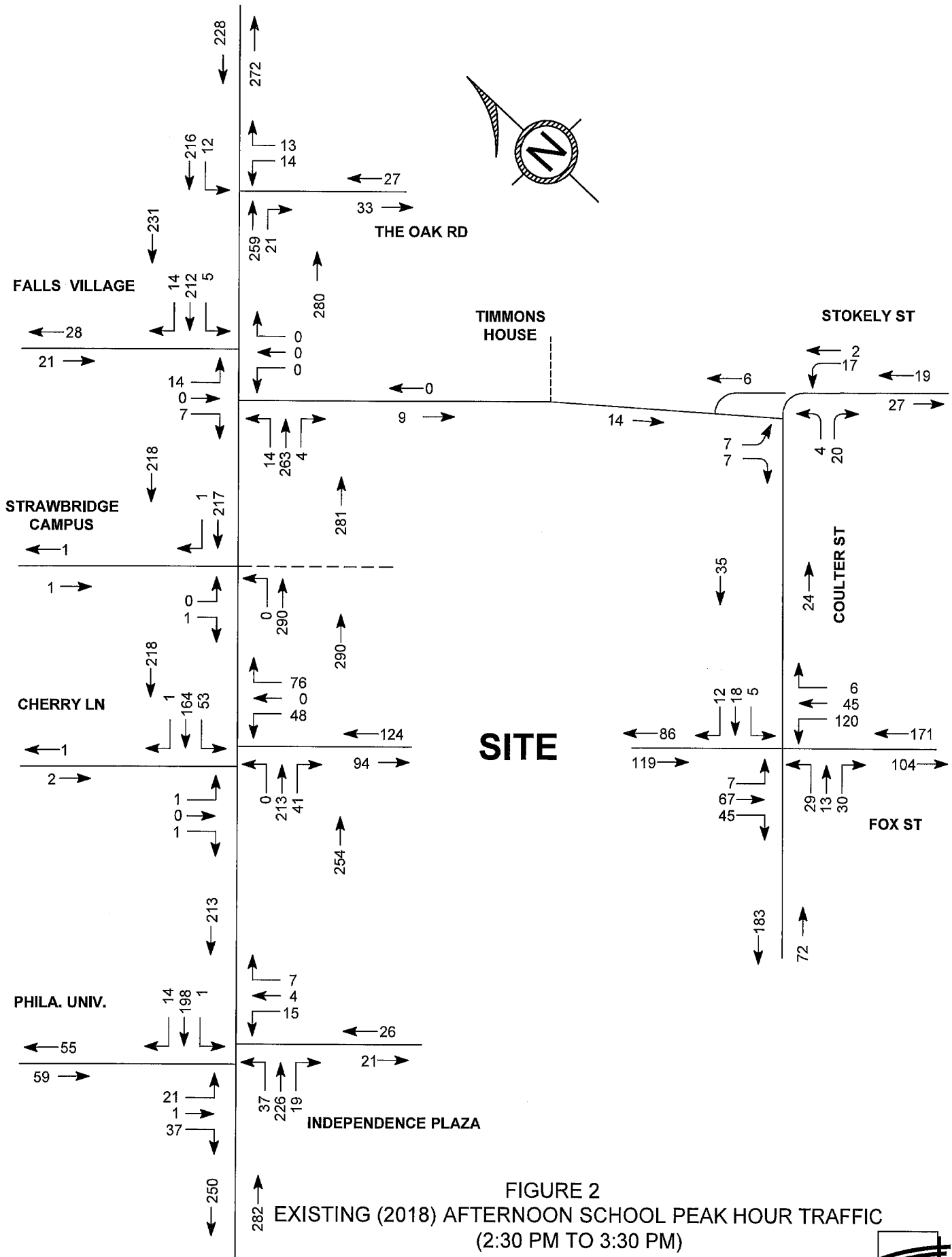
cc: Conrad Talley, AIA  
Brian D. Spray, P.E.





**FIGURE 1**  
EXISTING (2018) MORNING PEAK HOUR TRAFFIC  
(7:15 AM TO 8:15 AM)  
**WILLIAM PENN CHARTER SCHOOL**  
CITY OF PHILADELPHIA, PA





**SITE**

FIGURE 2  
 EXISTING (2018) AFTERNOON SCHOOL PEAK HOUR TRAFFIC  
 (2:30 PM TO 3:30 PM)

**WILLIAM PENN CHARTER SCHOOL**  
 CITY OF PHILADELPHIA, PA



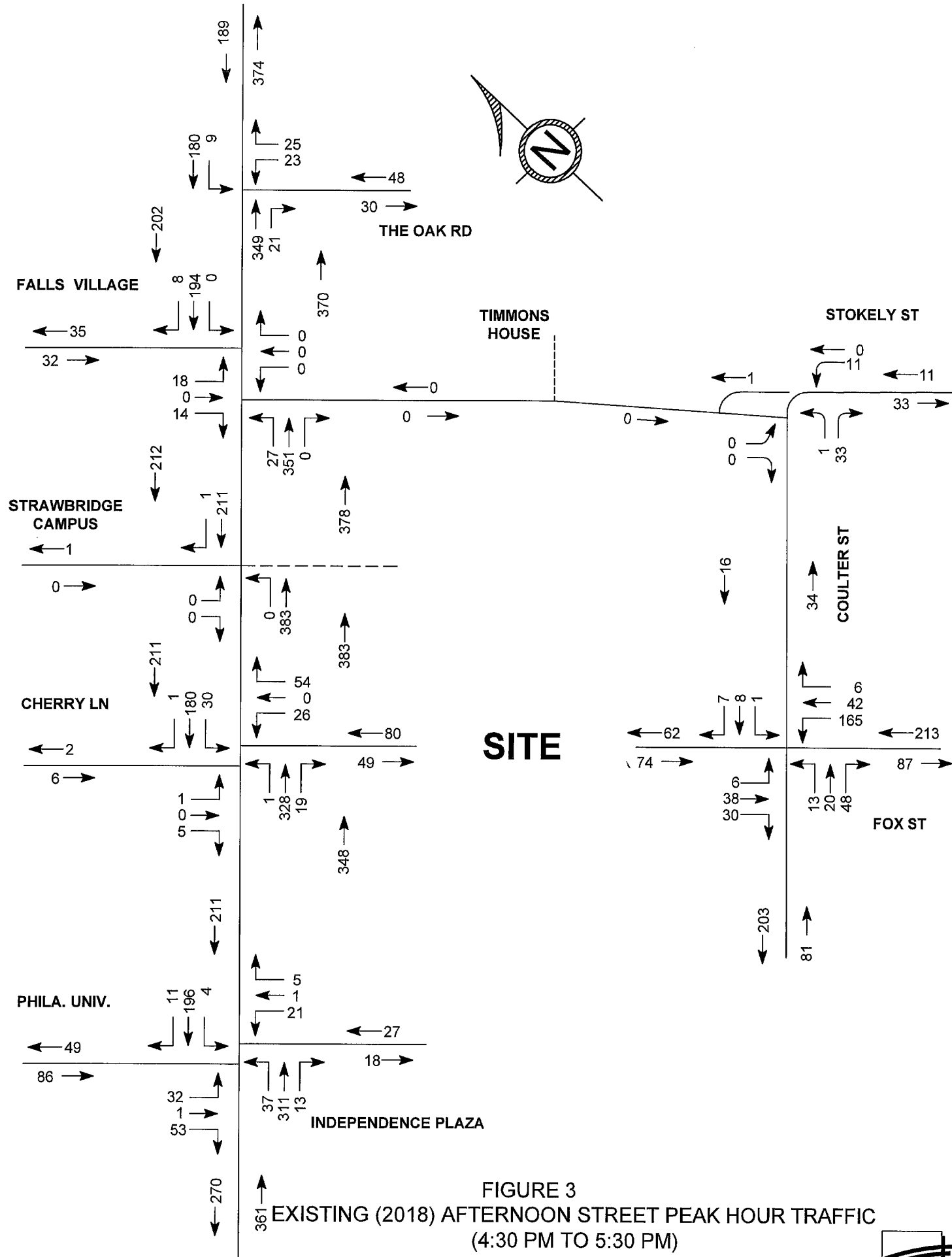


FIGURE 3  
 EXISTING (2018) AFTERNOON STREET PEAK HOUR TRAFFIC  
 (4:30 PM TO 5:30 PM)  
**WILLIAM PENN CHARTER SCHOOL**  
 CITY OF PHILADELPHIA, PA



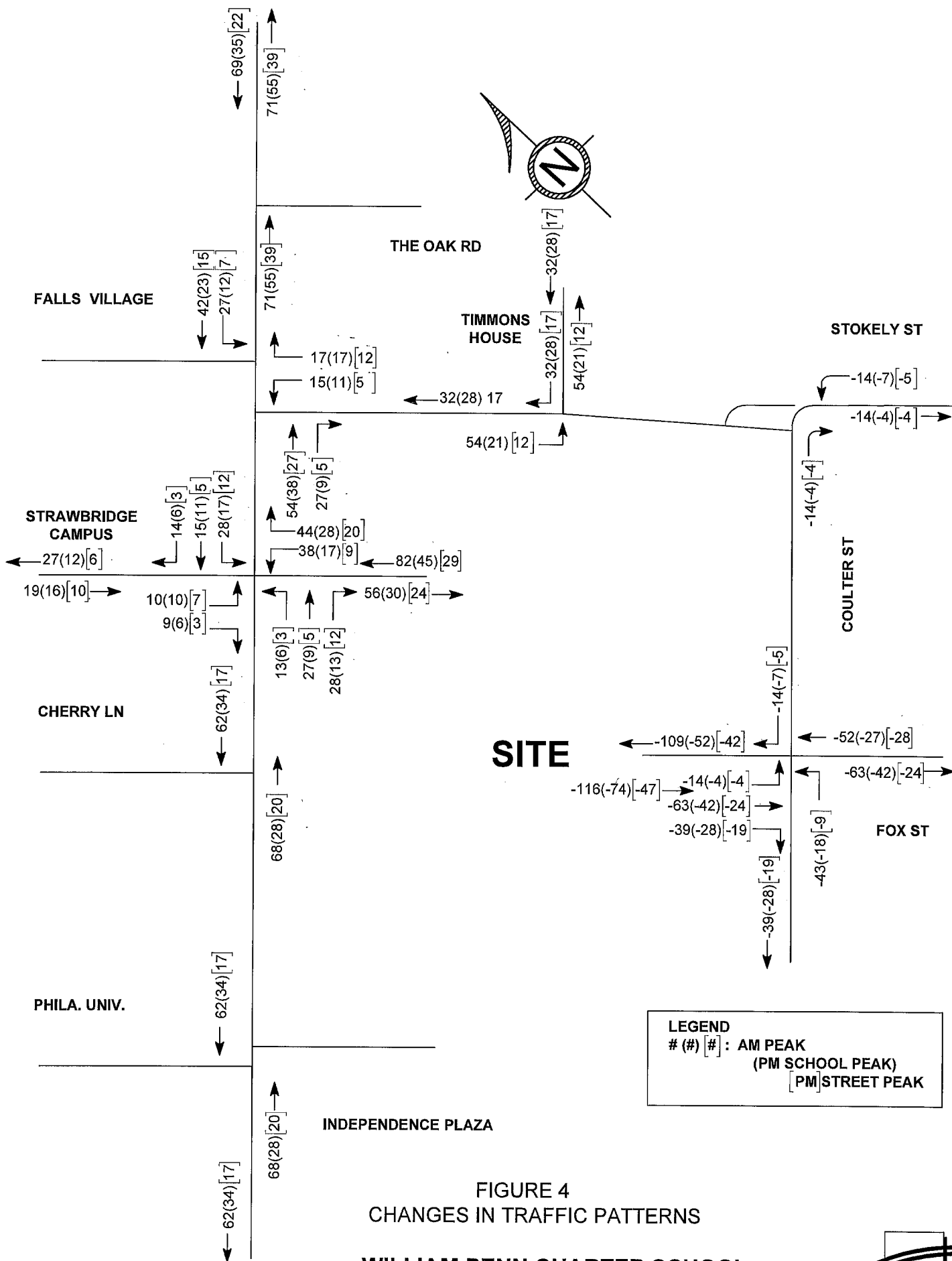


FIGURE 4  
 CHANGES IN TRAFFIC PATTERNS

WILLIAM PENN CHARTER SCHOOL  
 CITY OF PHILADELPHIA, PA





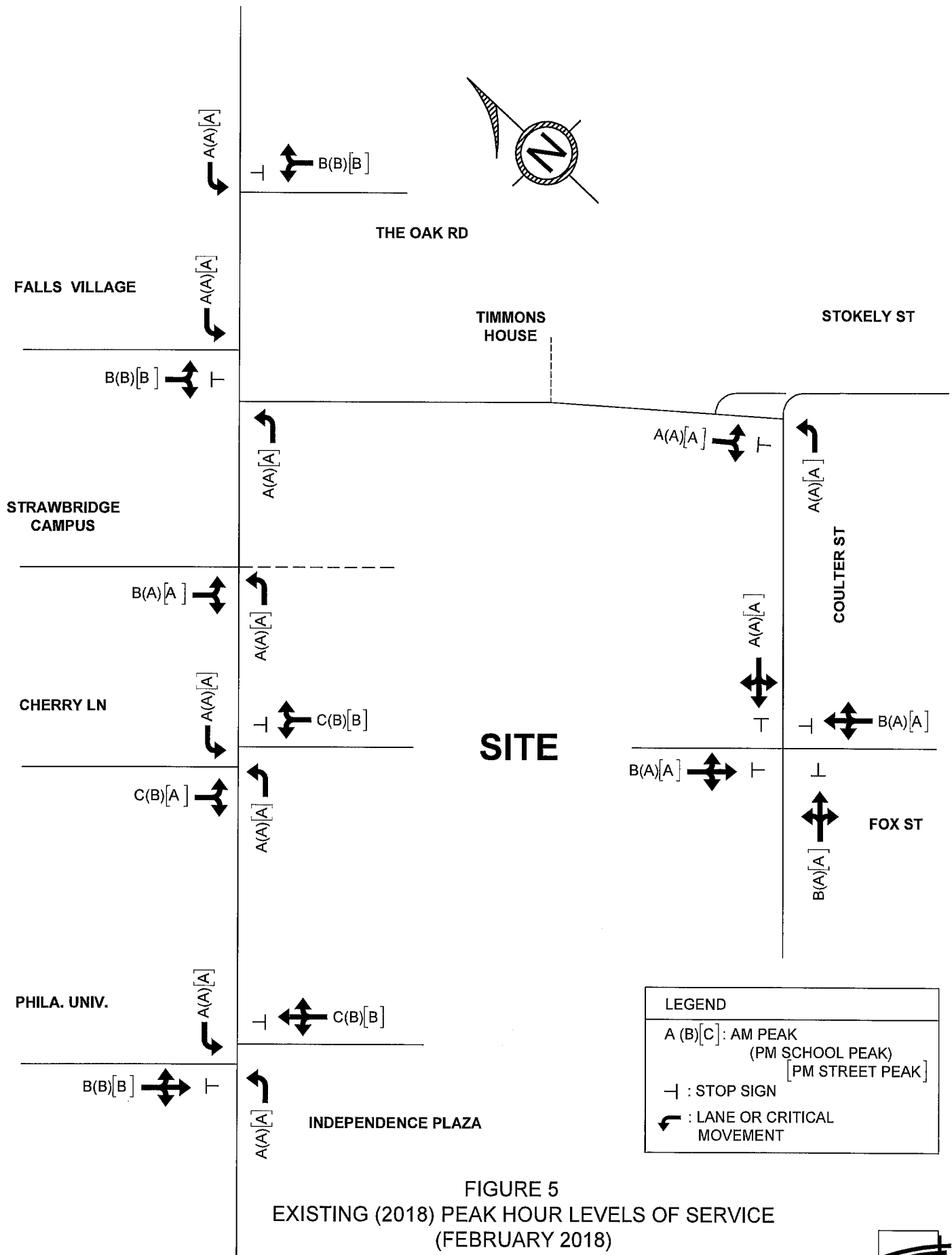
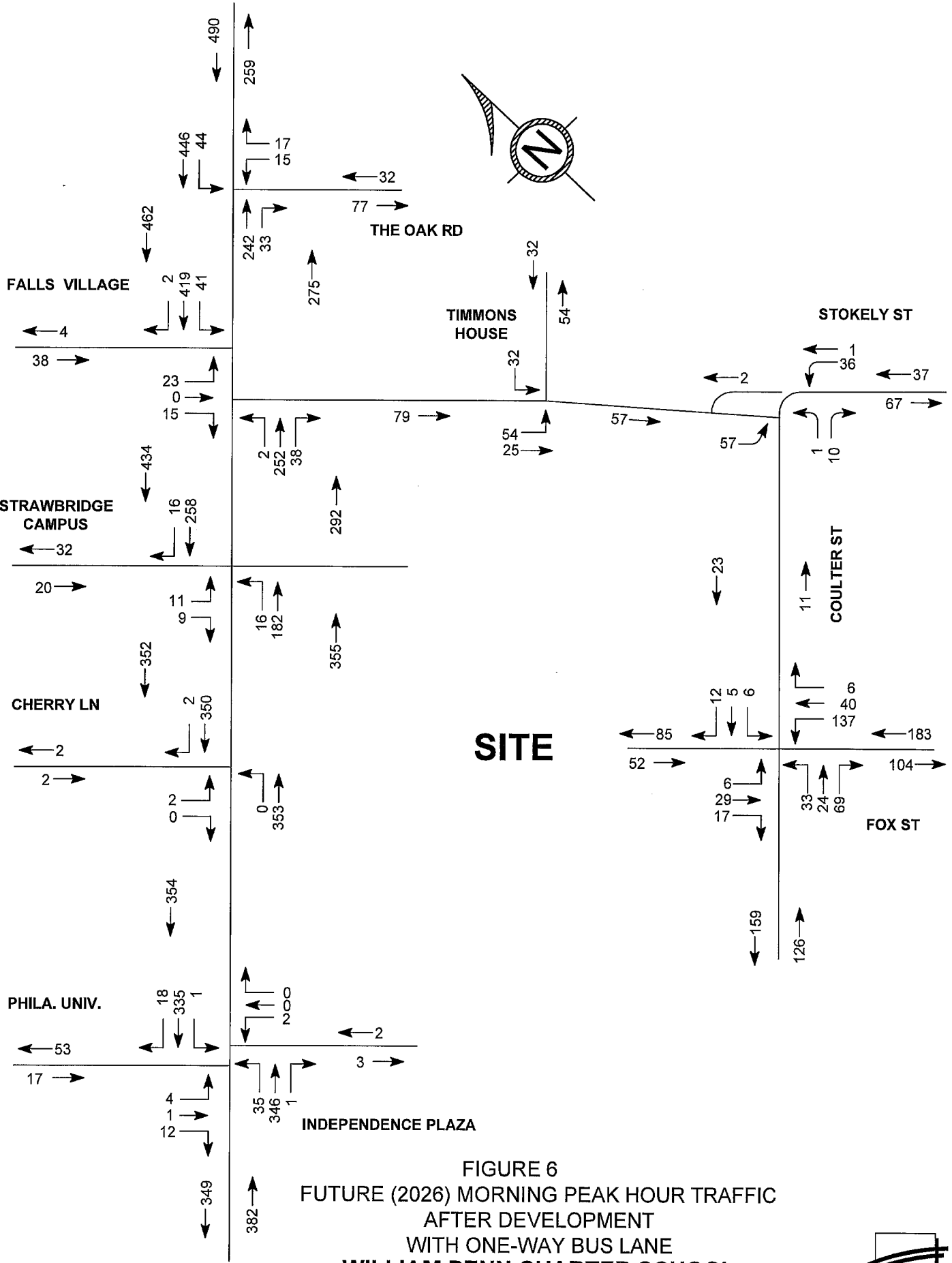


FIGURE 5  
 EXISTING (2018) PEAK HOUR LEVELS OF SERVICE  
 (FEBRUARY 2018)  
**WILLIAM PENN CHARTER SCHOOL**  
 CITY OF PHILADELPHIA, PA





**FIGURE 6**  
**FUTURE (2026) MORNING PEAK HOUR TRAFFIC**  
**AFTER DEVELOPMENT**  
**WITH ONE-WAY BUS LANE**  
**WILLIAM PENN CHARTER SCHOOL**  
**CITY OF PHILADELPHIA, PA**



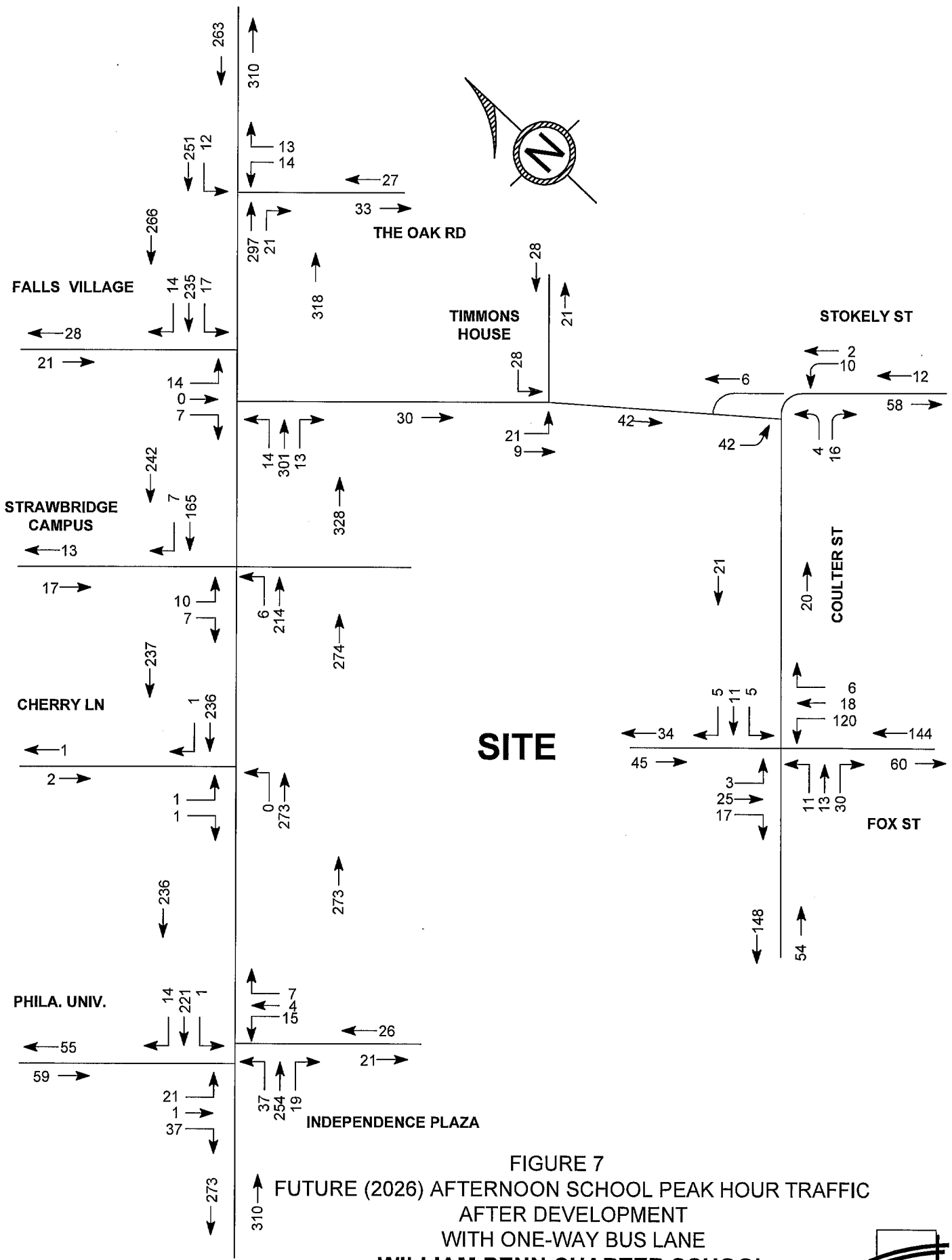


FIGURE 7  
 FUTURE (2026) AFTERNOON SCHOOL PEAK HOUR TRAFFIC  
 AFTER DEVELOPMENT  
 WITH ONE-WAY BUS LANE  
**WILLIAM PENN CHARTER SCHOOL**  
 CITY OF PHILADELPHIA, PA



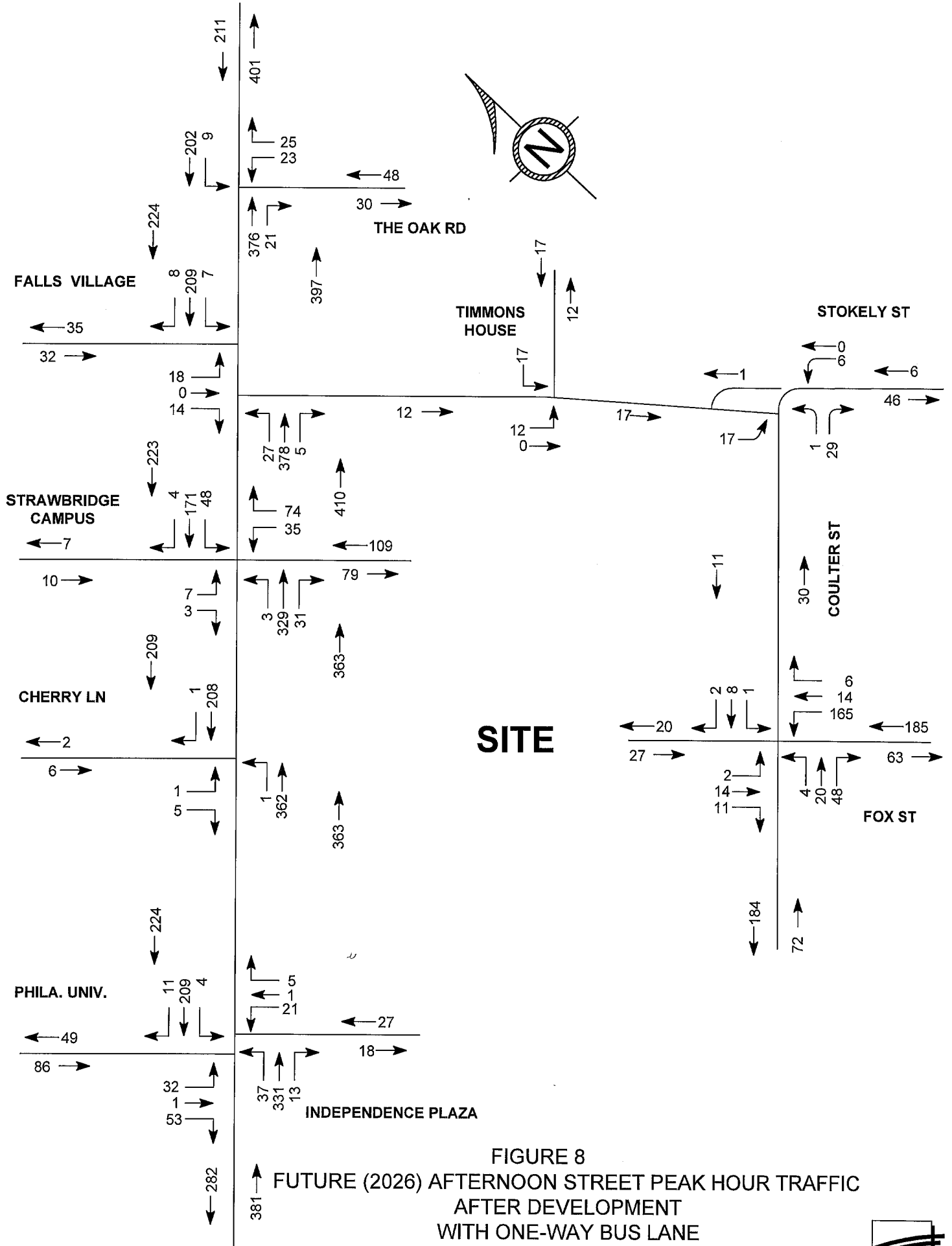


FIGURE 8  
 FUTURE (2026) AFTERNOON STREET PEAK HOUR TRAFFIC  
 AFTER DEVELOPMENT  
 WITH ONE-WAY BUS LANE  
**WILLIAM PENN CHARTER SCHOOL**  
 CITY OF PHILADELPHIA, PA



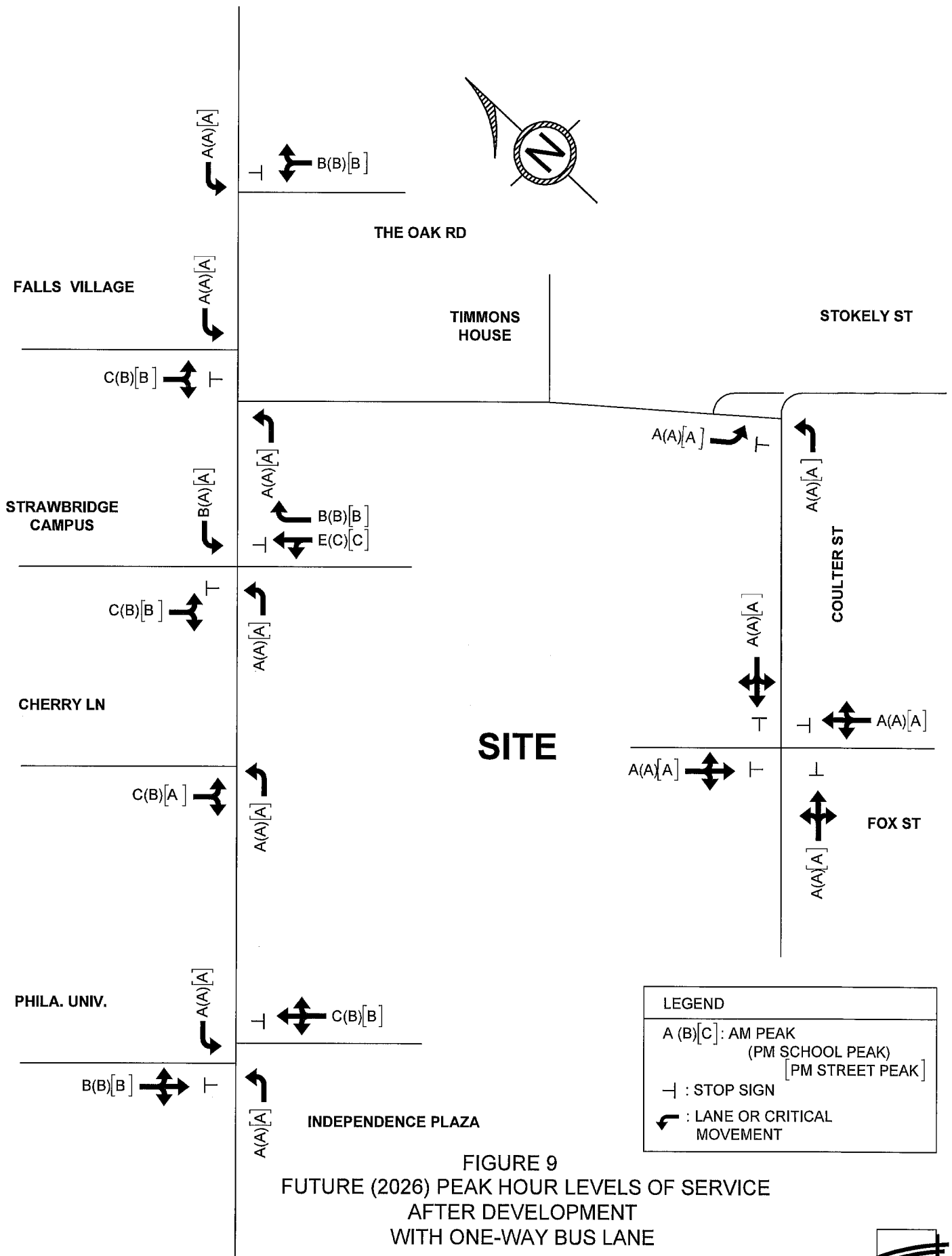
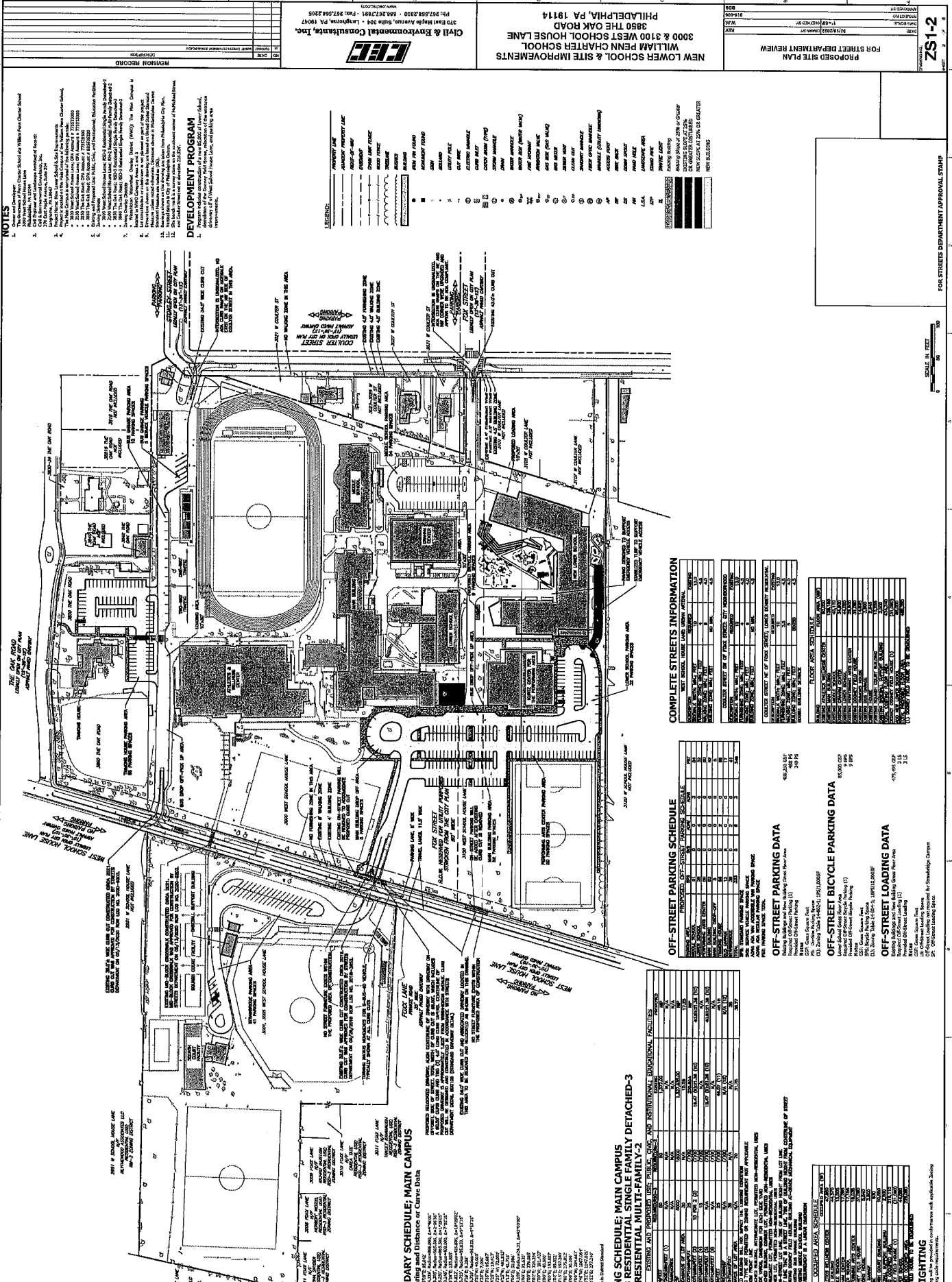


FIGURE 9  
 FUTURE (2026) PEAK HOUR LEVELS OF SERVICE  
 AFTER DEVELOPMENT  
 WITH ONE-WAY BUS LANE  
**WILLIAM PENN CHARTER SCHOOL**  
 CITY OF PHILADELPHIA, PA





- NOTES**
1. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  2. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  3. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  4. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  5. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  6. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  7. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  8. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  9. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.
  10. The information on this drawing is based on the information provided by the client and is not to be used for any other purpose.

- DEVELOPMENT PROGRAM**
1. Program and schedule of work for the development of the site.
  2. Program and schedule of work for the development of the site.
  3. Program and schedule of work for the development of the site.
  4. Program and schedule of work for the development of the site.
  5. Program and schedule of work for the development of the site.
  6. Program and schedule of work for the development of the site.
  7. Program and schedule of work for the development of the site.
  8. Program and schedule of work for the development of the site.
  9. Program and schedule of work for the development of the site.
  10. Program and schedule of work for the development of the site.

- LEGEND**
- 1. Proposed Building Footprint
  - 2. Proposed Parking Space
  - 3. Proposed Loading Zone
  - 4. Proposed Street
  - 5. Proposed Sidewalk
  - 6. Proposed Landscape
  - 7. Proposed Utility
  - 8. Proposed Fencing
  - 9. Proposed Signage
  - 10. Proposed Other

- BOUNDARY SCHEDULE: MAIN CAMPUS**
- Bearing and Distance of Curve Data
- | Station | Bearing         | Distance |
|---------|-----------------|----------|
| 1+00    | N 00° 00' 00" E | 100.00   |
| 2+00    | N 00° 00' 00" E | 100.00   |
| 3+00    | N 00° 00' 00" E | 100.00   |
| 4+00    | N 00° 00' 00" E | 100.00   |
| 5+00    | N 00° 00' 00" E | 100.00   |
| 6+00    | N 00° 00' 00" E | 100.00   |
| 7+00    | N 00° 00' 00" E | 100.00   |
| 8+00    | N 00° 00' 00" E | 100.00   |
| 9+00    | N 00° 00' 00" E | 100.00   |
| 10+00   | N 00° 00' 00" E | 100.00   |

- ZONING SCHEDULE: MAIN CAMPUS**
- RSD-3 RESIDENTIAL SINGLE FAMILY DETACHED-3  
RM-2 RESIDENTIAL MULTI-FAMILY-2
- | Zone  | Area (sq ft) | Percentage |
|-------|--------------|------------|
| RSD-3 | 100,000      | 10%        |
| RM-2  | 900,000      | 90%        |

**EXISTING AND PROPOSED USE, PUBLIC, CIVIC, AND INSTITUTIONAL FACILITIES**

Facility	Area (sq ft)	Percentage
Existing Use	100,000	10%
Proposed Use	900,000	90%

**OFF-STREET PARKING SCHEDULE**

Category	Area (sq ft)	Percentage
Off-Street Parking	100,000	10%
Off-Street Bicycle Parking	10,000	1%
Off-Street Loading Data	10,000	1%

**COMPLETE STREETS INFORMATION**

Street	Width	Speed Limit	Other Info
Oak Road	40'	35 MPH	Signalized Intersection
West School Lane	30'	25 MPH	Signalized Intersection
Fox Lake	20'	15 MPH	Signalized Intersection

**OFF-STREET PARKING DATA**

Category	Area (sq ft)	Percentage
Off-Street Parking	100,000	10%
Off-Street Bicycle Parking	10,000	1%
Off-Street Loading Data	10,000	1%

**OFF-STREET BICYCLE PARKING DATA**

Category	Area (sq ft)	Percentage
Off-Street Bicycle Parking	10,000	1%

**OFF-STREET LOADING DATA**

Category	Area (sq ft)	Percentage
Off-Street Loading Data	10,000	1%

**SITE LIGHTING**

Category	Area (sq ft)	Percentage
Site Lighting	10,000	1%

**BOUNDARY SCHEDULE: MAIN CAMPUS**

Bearing and Distance of Curve Data

Station	Bearing	Distance
1+00	N 00° 00' 00" E	100.00
2+00	N 00° 00' 00" E	100.00
3+00	N 00° 00' 00" E	100.00
4+00	N 00° 00' 00" E	100.00
5+00	N 00° 00' 00" E	100.00
6+00	N 00° 00' 00" E	100.00
7+00	N 00° 00' 00" E	100.00
8+00	N 00° 00' 00" E	100.00
9+00	N 00° 00' 00" E	100.00
10+00	N 00° 00' 00" E	100.00

**ZONING SCHEDULE: MAIN CAMPUS**

RSD-3 RESIDENTIAL SINGLE FAMILY DETACHED-3  
RM-2 RESIDENTIAL MULTI-FAMILY-2

Zone	Area (sq ft)	Percentage
RSD-3	100,000	10%
RM-2	900,000	90%

**EXISTING AND PROPOSED USE, PUBLIC, CIVIC, AND INSTITUTIONAL FACILITIES**

Facility	Area (sq ft)	Percentage
Existing Use	100,000	10%
Proposed Use	900,000	90%

**OFF-STREET PARKING SCHEDULE**

Category	Area (sq ft)	Percentage
Off-Street Parking	100,000	10%
Off-Street Bicycle Parking	10,000	1%
Off-Street Loading Data	10,000	1%

**OFF-STREET BICYCLE PARKING DATA**

Category	Area (sq ft)	Percentage
Off-Street Bicycle Parking	10,000	1%

**OFF-STREET LOADING DATA**

Category	Area (sq ft)	Percentage
Off-Street Loading Data	10,000	1%

	2020-21	2021-22	2022-23	2023-24	2023-25	2023-26
	<u>FORECAST</u>	<u>FORECAST</u>	<u>FORECAST</u>	<u>ORECAST</u>	<u>FORECAST</u>	<u>FORECAST</u>
Pre-K	30	31	28	30	30	30
K	43	46	42	45	45	45
1	43	43	48	45	45	45
2	45	48	46	45	45	45
3	44	46	48	45	45	45
4	45	46	46	45	45	45
5	44	55	52	50	50	50
6	68	66	67	68	66	66
7	77	79	76	82	83	81
8	76	89	85	82	88	89
9	115	116	120	116	117	118
10	108	109	115	118	114	115
11	114	104	108	113	116	112
12	<u>118</u>	<u>110</u>	<u>103</u>	<u>107</u>	<u>112</u>	<u>115</u>
	<b>970</b>	<b>988</b>	<b>984</b>	<b>991</b>	<b>1001</b>	<b>1001</b>

[Updated arrival/dismissal times are:

	Arrival	Dismissal
Pre-K	8:30	3:00
K-5	8:00	3:00
6-8	8:10	2:35
9-12	8:20	3:10

<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>
<b><u>ACTUAL</u></b>	<b><u>FORECAST</u></b>	<b><u>ORECAST</u></b>	<b><u>FORECAST</u></b>	<b><u>FORECAST</u></b>	<b><u>FORECAST</u></b>
27	30	30	30	30	30
40	43	43	43	43	43
46	43	43	43	43	43
44	46	43	43	43	43
45	44	45	43	43	43
44	45	40	45	45	45
44	44	45	40	45	45
53	60	60	61	56	61
71	68	75	75	76	71
81	77	74	81	81	82
118	116	115	115	115	115
115	116	114	113	113	113
110	113	114	112	111	111
<u>109</u>	<u>109</u>	<u>112</u>	<u>113</u>	<u>111</u>	<u>110</u>
<b>947</b>	<b>954</b>	<b>953</b>	<b>957</b>	<b>955</b>	<b>955</b>