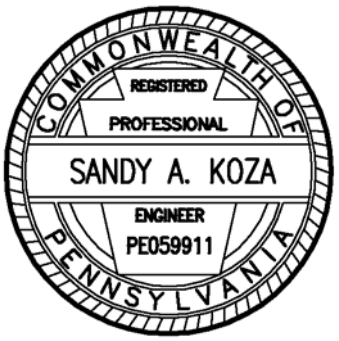
McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Transportation Impact Study for Abington Terrace

Abington Township, Montgomery County, PA



Sandy A. Koza, P.E., PTOE
PA PE License Number PE059911

Prepared by
McMahon Associates, Inc.
425 Commerce Drive, Suite 200
Fort Washington, PA 19034
215.283.944

Prepared for
BET Investments, Inc.

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Executive Summary

BET Investments, Inc. proposes to redevelop the existing Abington YMCA, which is located in the southeast quadrant of the intersection of Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017), as well as an adjacent parcel to the south that currently contains a funeral home in Abington Township, Montgomery County, PA (see **Figure 1**). According to the latest site plan, the existing YMCA and funeral home buildings will be removed and replaced by an age-restricted apartment complex, Abington Terrace, which could provide up to 180 units. **Figure 2** provides an illustration of the most recent site plan layout.

The purpose of this transportation impact study is to evaluate the traffic impacts of the proposed redevelopment of the site. The scope of this study includes an evaluation of the existing weekday morning and weekday afternoon peak hours, as well as the future 2020 build-out year, without and with the development at the following study intersections:

- Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017);
- Old York Road (S.R. 0611) and Adams Avenue;
- Old York Road (S.R. 0611) and YMCA Access;
- Susquehanna Road (S.R. 2017) and the existing YMCA Accesses;
- Susquehanna Road (S.R. 2017) and Sunrise of Abington Access; and
- Susquehanna Road (S.R. 2017) and Huntingdon Road.

Trip Generation Characteristics

The existing trips associated with the YMCA were based on the access traffic count data. The traffic volumes generated by the proposed age-restricted development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers' (ITE) publication entitled, *Trip Generation Manual, Tenth Edition*. Specifically, the equations for ITE Land Use Code 252: Senior Adult Housing – Attached were utilized for the weekday morning and weekday afternoon peak hours, while the rate was utilized to calculate the number of daily trips. The redevelopment of the site is anticipated to generate approximately 698 total trips (inbound and outbound) during a typical weekday, of which 36 total trips (inbound and outbound) will be generated during weekday morning peak hour and 45 total trips (inbound and outbound) will be generated during the weekday afternoon peak hour.

A comparison between the existing YMCA and proposed age-restricted apartment complex indicates that the age-restricted apartments are anticipated to generate significantly less trips. Specifically, during a typical weekday the new age-restricted apartments will generate approximately 437 less total trips (inbound and outbound), of which there would be 195 and 179 less total trips (inbound and outbound) during the weekday morning and weekday afternoon peak hour, respectively.

Site Accesses

Access to the YMCA is currently provided via two driveways along Susquehanna Road (S.R. 2017) and one driveway along Old York Road (S.R. 0611), while the funeral home has two driveways along Old York Road (S.R. 0611). With the redevelopment of the site, the existing accesses located along Susquehanna Road (S.R. 2017) will be removed and a new full-movement access will then be located approximately 184 feet to the west of Huntingdon Road. Along Old York Road (S.R. 0611), the three

existing driveways will all be removed and a new right-in/right-out only driveway will then be provided approximately 155 feet to the south of Adams Avenue.

Both accesses would be classified as low-volume driveways per PennDOT criteria, as the entire site will generate less than 1,500 trips per day or 750 vehicles per day. Based on the results of this evaluation, the following access configurations and traffic controls are recommended and are subject to detailed engineering of the site accesses:

Old York Road (S.R. 0611) and Site Access

- Provide one 12-foot wide (minimum) curbed ingress lane and one 12-foot wide curbed (minimum) egress lane;
- Provide stop-control along the site access approach to Old York Road (S.R. 0611);
- Install "Do Not Block Driveway" signage along the northbound approach of Old York Road (S.R. 0611) at the proposed site access location;
- Provide ADA compliant ramps and crossings for the sidewalk system crossing the site access; and
- Provide appropriate curb radii based upon the largest vehicle anticipated to utilize the site access.

Susquehanna Road (S.R. 2017) and Site Access

- Provide one 12-foot wide (minimum) curbed ingress lane and one 12-foot wide (minimum) curbed egress lane;
- Provide stop-control along the site access approach to Susquehanna Road (S.R. 2017);
- Provide ADA compliant ramps and crossings for the sidewalk system crossing the site access; and
- Provide appropriate curb radii based upon the largest vehicle anticipated to utilize the site access.

Old York Road (S.R. 611) and Susquehanna Road (S.R. 2017)

This signalized intersection operates at acceptable conditions (LOS D), under the existing, future without-development, and future with-development conditions. Since the site will generate less traffic compared to the existing YMCA, the intersection traffic operations should improve with the planned development. Therefore, no mitigation measures are recommended for this intersection.

According to the analyses, queue formations along the northbound approach of Old York Road (S.R. 0611) may extend beyond the proposed site access during the weekday afternoon only. Given that the new site will generate less traffic compared to the existing YMCA and the queue lengths are anticipated to be shorter compared to the existing queues, no mitigation measures are recommended. It is recommended that "Do Not Block Driveway" signage be installed along Old York Road (S.R. 0611) at the access to allow for traffic to enter/exit.

The traffic analyses contained herein reveals that safe and efficient access to and from the proposed development can be provided and that the adjacent roadways and intersections can accommodate the projected site-generated traffic.

Existing Transportation Settings and Conditions

The proposed development will be located in the southeast corner of the intersection of Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017) in Abington Township, Montgomery County, PA. The existing roadways and intersections in the vicinity of the site, which comprise the study area roadway network, are described in this section.

Roadway Characteristics

The study area roadway network and characteristics are summarized below in **Table 1**.

Table 1 - Existing Roadway Characteristics

Roadway Name (Jurisdiction)	Average Daily Traffic Volumes (vehicles per day)	Roadway Classification		Travel Lanes (per direction)	Posted Speed Limit (mph)
		Smart Transportation (1)	PennDOT/ Township (2)		
Old York Road (S.R. 0611)	26,120 to 28,598 (3)	Regional Arterial	Urban – Other Principal Arterial	2	35
Susquehanna Road (S.R. 2017)	13,387 to 16,614 (3)	Community Arterial	Urban – Other Principal Arterial	1	25
Huntingdon Road	n/a	Neighborhood Collector	Local Road	1	25
Adams Avenue	n/a	Local Road	Local Road	1	25

(1) Based on Table 5.1 – Roadway Categories in the PennDOT publication, *Smart Transportation Guidebook*.
(2) Based on the roadway classifications provided on PennDOT's Internet Traffic Monitoring System (iTMS) website.
(3) Based on traffic data from PennDOT's Internet Traffic Monitoring System (iTMS) website.

The following key intersections in the vicinity of the site comprise the study area:

- Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017);
- Old York Road (S.R. 0611) and Adams Avenue;
- Old York Road (S.R. 0611) and YMCA Access;
- Susquehanna Road (S.R. 2017) and the existing YMCA Accesses;
- Susquehanna Road (S.R. 2017) and Sunrise of Abington Access; and
- Susquehanna Road (S.R. 2017) and Huntingdon Road.

The existing characteristics of the study intersections, including photographs, field sketches, and signal permit plans are provided in **Appendix A**.

Land Use Context

The proposed development (dashed outline) is located in Abington Township within the R3 Medium Density Residential (orange) and the CS Community Service (light blue) Zoning Districts as seen in the Abington Township Zoning Map **(Exhibit 1)**. The applicant is requesting that the property be rezoned to be located within the AO Apartment-Office District (brown) and that use H-12 Senior Apartment Units be permitted by Conditional Use within this zoning district. The proposed site would then be adjacent to existing land within the Township with the same zoning classification.

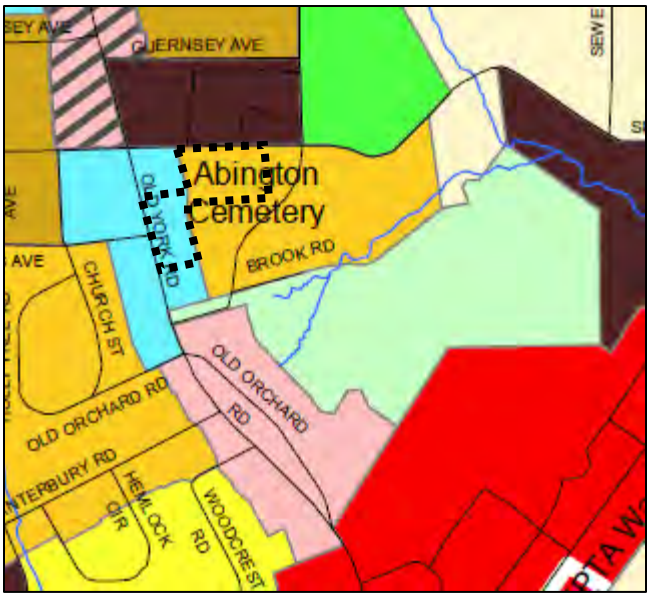

Exhibit 1 –2017 Abington Township Zoning Map

Area Transit Services

Under current conditions, SEPTA Bus Route 55 provides stops along Old York Road (S.R. 0611). Bus stops are provided within 400 feet of the site with stops located in the northwest and southeast quadrants at the intersection of Old York Road (S.R. 0611)/Susquehanna Road (S.R. 2017), as well as on the east side of Old York Road (S.R. 0611) opposite Adams Avenue, which is along the site frontage. The Noble Station of SEPTA's West Trenton Line Regional Rail is also located within a mile of the site and Bus Route 55 provides a connection to this station, as well as to the Olney Transportation Center.

Pedestrian-Bicycle Facilities

Under current conditions, sidewalk is provided along the Old York Road (S.R. 0611) site frontage. No sidewalk is provided along the Susquehanna Road (S.R. 2017) site frontage. According to *Section 146-27.A* of Abington Township *SALDO*, sidewalks are to be provided along all streets. Therefore, it is anticipated that sidewalk will be provided along the Susquehanna Road (S.R. 2017) site frontage. In addition, a drop off/pick up facility will be provided at the proposed site access along Susquehanna Road (S.R. 2017).

Traffic Count Data

Daily traffic counts were obtained from PennDOT's Internet Traffic Monitoring System (iTMS) website. The traffic count data, which is summarized in Table 1, is provided in **Appendix B**. Manual turning movement traffic counts were conducted in June 2017 during the weekday morning (7:00 A.M. to 9:00 A.M.) and weekday afternoon (4:00 P.M. to 6:00 P.M.) peak periods. The results of these traffic counts are tabulated by 15-minute intervals in **Appendix C**. The four highest consecutive 15-minute peak intervals during these traffic count periods constitute the peak hours that are the basis of this traffic analysis.

The existing peak hour traffic volumes were balanced conservatively (adjusted upwardly) between the intersections, where appropriate and the initial, unbalanced volumes along with balancing notes are

provided in Appendix C. The resultant peak hour traffic volumes are depicted in **Figure 3A** for the weekday morning peak period (7:00 A.M. to 9:00 A.M.) and weekday afternoon peak period (4:00 P.M. to 6:00 P.M.). The traffic volumes in Figure 3A were then analyzed to determine the existing operating conditions, and the results of this analysis are shown in **Figure 3B.** Specific details regarding the analysis results and traffic operations are provided later in this report.

Site Characteristics

This section presents the details regarding the proposed site, including the incremental increase in traffic volumes generated by the development during the peak hours and the distribution of site traffic to the study area roadways, as well as the proposed site access configuration, traffic control, and sight distance requirements.

Trip Generation

The existing trips associated with the YMCA were based on the access traffic count data, conducted in June 2017. The traffic volumes generated by the proposed age-restricted development were prepared based on trip generation data compiled from numerous studies contained in the Institute of Transportation Engineers' (ITE) publication entitled, *Trip Generation Manual, Tenth Edition*. Specifically, the equations for ITE Land Use Code 252: Senior Adult Housing – Attached were utilized for the weekday morning and weekday afternoon peak hours, while the rate was utilized to calculate the daily trips.

Table 2 provides a comparison of the total trips generated under existing conditions and with the proposed age-restricted development. As can be seen, the site is anticipated to generate approximately 698 total trips (inbound and outbound) during a typical weekday, of which 36 total trips (inbound and outbound) will be generated during weekday morning peak hour and 45 total trips (inbound and outbound) will be generated during the weekday afternoon peak hour. These values are significantly less than those generated by the YMCA as seen in Table 2.

Table 2 - Site Vehicular Trip Generation (1)

Description	Size	Daily	Weekday Morning			Weekday Afternoon		
			In	Out	Total	In	Out	Total
Proposed Age-Restricted Development (2)	180 units	698	13	23	36	25	20	45
Existing YMCA (3)	33,600 s.f.	1,135	134	97	231	127	97	224
Difference (Proposed less Existing)		-437	-121	-74	-195	-102	-77	-179

(1) Based on data from ITE's *Trip Generation Manual, Tenth Edition.*

(2) Based on the equations for ITE Land Use Code 252: Senior Adult Housing – Attached for weekday morning and afternoon and rates for daily.

(3) Daily trips are based on the rates for ITE Land Use Code 495: Recreational Community Center from the *Trip Generation Manual, Ninth Edition*, and peak hour trips are based on the counts at the site access driveways conducted in June 2017.

An additional comparison has also been completed to determine the potential trip generation characteristics for the site based upon the permitted by-right development potential. The site could potentially be developed to provide 80 market-based apartments with 20,000 square feet of retail space. The anticipated trip generation characteristics for those uses are then based upon the equations for Land Use Code 220: Multifamily Housing (Low-Rise) and the rates for Land Use Code 820: Retail. The by-right uses could then generate a total of 1,319 trips on a typical weekday, of which 58 and 124 total trips (inbound and outbound) would be generated during the weekday morning and weekday afternoon peak hours, respectively. The by-right uses would then generation more trips than the proposed age-restricted apartments, but less trips than the prior YMCA use.

Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development's site accesses and any intersection turning restrictions. As the existing on-site uses will be removed with the planned redevelopment, all traffic associated with the existing YMCA was first removed from the roadway network. **Figure 4** illustrates the removal of these trips, which is based upon the current traffic patterns at the driveways. The distribution percentages for the anticipated directions of approach and departure for the site are then illustrated in **Figure 5A**. Application of the percentages illustrated in Figure 5A to the proposed trips contained in Table 2 are illustrated in **Figure 5B**.

Site Access Configuration and Traffic Control

Access to the YMCA is currently provided via two driveways along Susquehanna Road (S.R. 2017) and one driveway along Old York Road (S.R. 0611), while the funeral home has two driveways along Old York Road (S.R. 0611). With the redevelopment of the site, the existing accesses located along Susquehanna Road (S.R. 2017) will be removed and a new full-movement access will then be located approximately 184 feet to the west of Huntingdon Road. Along Old York Road (S.R. 0611), the three existing driveways will all be removed and a new right-in/right-out only driveway will then be provided approximately 155 feet to the south of Adams Avenue.

The recommendations for the proposed access designs, including auxiliary turn lanes, traffic control, and geometric design, were based on industry accepted criteria and guidelines. Specifically, the need for left- and right-turn deceleration lanes was based on the current PennDOT guidelines in accordance with *Publication 46, Chapter 11 – Traffic Studies*. The various warrant/guideline analysis worksheets are contained in **Appendix D**.

Additionally, the geometric design of the proposed site accesses were preliminarily evaluated based on guidelines contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads*, as well as local PennDOT District policies. Based upon the daily trip generation anticipated for the site, the site accesses would all be classified as low-volume driveways, since the age-restricted apartment complex generates less than 1,500 trips per day or 750 vehicles per day. The following intersection configurations and traffic controls are recommended, subject to the detailed engineering of the site access:

<u>Old York Road (S.R. 0611) and Site Access</u>

- Provide one 12-foot wide (minimum) curbed ingress lane and one 12-foot wide curbed (minimum) egress lane;
- Provide stop-control along the site access approach to Old York Road (S.R. 0611);
- Install "Do Not Block Driveway" signage along the northbound approach of Old York Road (S.R. 0611) at the proposed site access location;
- Provide ADA compliant ramps and crossings for the sidewalk system crossing the site access; and
- Provide appropriate curb radii based upon the largest vehicle anticipated to utilize the site access.

Susquehanna Road (S.R. 2017) and Site Access

- Provide one 12-foot wide (minimum) curbed ingress lane and one 12-foot wide (minimum) curbed egress lane;
- Provide stop-control along the site access approach to Susquehanna Road (S.R. 2017);
- Provide ADA compliant ramps and crossings for the sidewalk system crossing the site access; and
- Provide appropriate curb radii based upon the largest vehicle anticipated to utilize the site access.

Sight Distance

Sight distance field measurements and an evaluation were performed at the proposed site accesses along Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2042). Generally, the prevailing travel speed, roadway grades and profiles, and the number of travel lanes play a role in determining if safe sight distances are available for egress and ingress at the proposed intersections. The existing sight distances at the proposed site accesses intersections were measured and compared to PennDOT's sight distance requirements. These sight distance requirements are contained in *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads*.

Table 3 summarizes the available sight distance measurements, as well as PennDOT's sight distance requirements at the proposed intersections locations. The available sight distance exceeds the desirable sight distance for the Old York Road (S.R. 2017) proposed access. For the Susquehanna Road proposed access (S.R. 2017), the desirable based upon the posted speed limit and the minimum acceptable based upon the 85th percentile travel speeds are both met for all movements. Copies of the PennDOT M-950S forms are provided in **Appendix E** along with photographs of the available sight distance for the proposed Susquehanna Road (S.R. 2017) access.

It should also be noted that an 85th percentile speed study was conducted along Susquehanna Road (S.R. 2017), which is also provided in Appendix E. According to the speed study, the 85th percentile speed for Susquehanna Road is 31 and 32 miles per hour in the eastbound and westbound directions of travel, respectively. According to *Section 441.8.h(2)(iii) of Pennsylvania Code, Chapter 441,* the posed speeds shall be used unless operating speeds vary from the posted speed by more than ten miles per hour. Since the posted speed limit along Susquehanna Road is 25 miles per hour, it has been used to determine the desirable required sight distance, while the 85th percentile has been used to determine the minimum acceptable safe sight distance.

Table 3 - Sight Distance Evaluation
Old York Road (S.R. 0611) and Site Access

Movement	Direction	Posted Speed (mph)	Approximate Grade	PennDOT Requirements (feet)		Available Sight Distance (feet)
				Desirable [1]	Acceptable [2]	
Exiting	**Looking Left**	35	+3%	300	239	421

(1) Based on the desirable sight distance requirements contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads* and the posted speed limit for four-lane roads.

(2) Based on the safe stopping sight distance requirements contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads* and the posted speed limit.

Susquehanna Road (S.R. 2017) and Site Access

Movement	Direction	Posted Speed (mph)	Approximate Grade	PennDOT Requirements (feet)		Available Sight Distance (feet)
				Desirable (1)	Acceptable (2)	
Exiting	**Looking Left**	25	-3%	250	244	$\geq$ 500
	Looking Right	25	+3%	195	221	290
Left turn Entering	**Looking Ahead**	25	-3%	190	221	500
	From the Rear	25	+3%	190	267	289

(1) Based on the desirable sight distance requirements contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads* and the posted speed limit.

(2) Based on the safe stopping sight distance requirements contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads* and the 85th percentile travel speeds.

Future Traffic Conditions

This section presents the future build-out year (2020) traffic conditions, both without and with the proposed development, which is anticipated to be completed and occupied by 2020. The future 2020 without-development traffic volumes were estimated by increasing the existing 2017 traffic volumes to account for regional growth, as described below. After the removal of the existing YMCA traffic from the site, the incremental increase due to the anticipated trip generation for the site was then added, resulting in the future 2020 with-development traffic volumes.

Regional Traffic Growth

To account for regional traffic growth, the existing traffic volumes were increased by an annual traffic growth rate 0.61 percent per year compounded for three years (1.84 percent total) to 2020 build-out year. This growth rate is consistent with the traffic growth rate recommended by the PennDOT Bureau of Planning and Research *Growth Factors for August 2016 to July 2017* for similar urban, non-interstate roadways in Montgomery County. It should be noted that this rate is more conservative than those recommended in the updated *Growth Factors for August 2017 to July 2018* document, which indicates a yearly growth rate of 0.41 per year.

Planned Roadway Improvements

According to a *Conceptual Plan* prepared by Traffic Planning and Design, Inc., dated July 7, 2015, improvements are planned for the intersection of Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017), including restriping all approaches, providing a new right-turn lane along the eastbound approach of Susquehanna Road (S.R. 2017), cutting back the median for lane shift along the northbound approach of Old York Road (S.R. 0611), and increasing the southeast corner radius.

Future Traffic Conditions

The total background growth was then added to the existing 2017 traffic volumes, resulting in the future 2020 build-out year without-development traffic volumes. Next, after removal of all traffic associated with the existing YMCA as illustrated in Figure 4, the site generated traffic volumes, as shown in Figure 5B, were added to the future 2020 build-out year without-development traffic volumes, resulting in the future 2020 build-out year with-development traffic volumes. Spreadsheets summarizing the volume projections from the existing year (2017) to the future build-out year (2020) are provided in **Appendix F**.

The resultant future 2020 build-out year peak hour traffic volumes without development are illustrated in **Figure 6A.** The future 2020 build-out year with-development peak hour traffic volumes are illustrated in **Figure 6B**. These traffic volumes were then analyzed to determine the future 2020 build-out year without- and with- development traffic operating conditions, and the results of the analyses are shown in **Figure 6C** for the without-development conditions and in **Figure 6D** for the base with-development conditions.

Capacity/Level-of-Service Results

The peak hour traffic volumes were analyzed to determine the existing and future traffic operating conditions, both without and with the proposed development, in accordance with the standard techniques contained in the current *Highway Capacity Manual (2010)* for both signalized and unsignalized intersections. The HCM 2010 Methodology within Synchro 10.1 (build 2, rev. 20) traffic analysis software was utilized to complete traffic analyses, unless otherwise noted.

These standard capacity/level-of-service analysis techniques, which calculate total control delay, are described in **Appendix G** for both signalized and unsignalized intersections, as well as the correlation between average total control delay and the respective level-of-service (LOS) criteria for each intersection type.

According to PennDOT's *Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permit Plans,* the following procedures and assumptions were utilized:

- For signalized intersections, the Pennsylvania base saturation flow rate (Exhibit 10-9) and Pennsylvania traffic signal control calibration parameters (Exhibit 10-10) outlined in PennDOT's *Publication 46, Traffic Engineering Manual*, were used.

- For unsignalized intersections, the base critical headways at TWSC intersections (Exhibit 10-11) and base follow-up headways at TWSC intersections (Exhibit 10-12) outlined in PennDOT's *Publication 46, Traffic Engineering Manual*, were used.

- If the evaluation of without development to with development indicates that the overall intersection level-of-service has dropped, the applicant will be required to mitigate the level-of-service if the increase in delay is greater than 10 seconds. If the overall intersection delay increase is less than or equal to 10 seconds, mitigation of the intersection will not be required.

- Vehicle queues are based on the *2010 Highway Capacity Manual* methodology, which are initially reported in vehicles. The reported number of vehicles was then converted to feet by multiplying by a factor of 25.

The existing and future build-out year (2020) traffic conditions, both without and with the proposed development are summarized in Figures 3B, 6C, and 6D, respectively, while the detailed capacity/level-of-service analysis worksheets are provided in **Appendices H, I, and J. Table 4** summarizes the overall levels of service for the study intersections for the existing and future without- and with-development conditions. Since the redevelopment of the site will result in less traffic, operations are anticipated to improve. The detailed level-of-service and queue matrices are provided at the end of the report in **Tables 5 and 6.**

Table 4- Overall Intersection Levels-of-Service
2020 Build-out Year Weekday Morning Peak Hour

Intersection	2017 Existing	Without Development	With Development (1)	Delay Increase for LOS Drop (2)	Requires Mitigation?
Old York Road (S.R. 0611) and Adams Avenue	A (0.5)	A (0.5)	A (0.5)	n/a	No
Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017)	D (37.9)	D (39.2)	D (36.1)	n/a	No
Susquehanna Road (S.R. 2017) and Sunrise of Abington	A (0.1)	A (0.1)	A (0.1)	n/a	No
Susquehanna Road (S.R. 2017) and Huntingdon Road	A (2.5)	A (2.6)	A (2.4)	n/a	No

(1) Base with no-improvements condition is shown.
(2) Based on difference from with development to without-development.

2020 Build-out Year Weekday Afternoon Peak Hour

Intersection	2015 Existing	Without Development	With Development (1)	Delay Increase for LOS Drop (2)	Requires Mitigation?
Old York Road (S.R. 0611) and Adams Avenue	A (0.3)	A (0.3)	A (0.3)	n/a	No
Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017)	D (48.2)	D (50.6)	D (43.4)	n/a	No
Susquehanna Road (S.R. 2017) and Sunrise of Abington	A (0.1)	A (0.1)	A (0.1)	n/a	No
Susquehanna Road (S.R. 2017) and Huntingdon Road	A (4.6)	A (5.0)	A (4.7)	n/a	No

(1) Base with no-improvements condition is shown.
(2) Based on difference from with development to without-development.

Old York Road (S.R. 0611) and Susquehanna Road (S.R. 2017)

According to the analyses, queue formations along the northbound approach of Old York Road (S.R. 0611) may extend beyond the proposed site access during the weekday afternoon only. Given that the new site will generate less traffic compared to the existing YMCA and the queue lengths are anticipated to be shorter compared to the existing queues, no mitigation measures are recommended. However, it is recommended that "Do Not Block Driveway" signage be installed along Old York Road (S.R. 0611) at the access to allow for traffic to enter/exit.

According to the Township, potential improvements are planned for this signalized intersection. A *Conceptual Plan* prepared by Traffic Planning and Design, Inc., dated July 7, 2015, is provided in **Appendix K**, which illustrates restriping all approaches, providing a new right-turn lane along the eastbound approach of Susquehanna Road (S.R. 2017), cutting back the median for lane shift along the northbound approach of Old York Road (S.R. 0611), and increasing the southeast corner radius. A supplemental analyses was completed for the 2020 build-out year to account for the completion of these improvements. The supplemental analysis results are also provided in Appendix K. While the planned improvements will benefit the region, the improvements are not required in conjunction with the redevelopment of the site, as the proposed age-restricted apartments will generate less traffic

compared to the existing YMCA and the intersections will continue to operate at the same acceptable conditions overall (LOS D) during both peak hours without these potential improvements.

Old York Road (S.R. 0611) and Site Access

As proposed, stop-control will be provided along the approach to Old York Road (S.R 0611) and the intersection will be restricted to right-in/right-out only movements. For the 2020 build-out year, the stop-controlled approach will operate acceptably (LOS B) during the weekday morning and weekday afternoon peak hours.

Susquehanna Road (S.R. 2017) and Site Access

As proposed, stop-control will be provided along the new access approach to Susquehanna Road (S.R. 2017). For 2020 build-out year, the stop-controlled approach will operate acceptably (LOS C) during the weekday morning and weekday afternoon peak hours.

To supplement the analyses results, a gap study was also conducted along Susquehanna Road (S.R. 2017) in the vicinity of the proposed full-movement access to document the existing available gaps. A copy of the gap study is provided in **Appendix L**. Based upon the adjusted critical headways and follow-up times using the PennDOT default values, the gap study indicates that there will be adequate gaps to accommodate the anticipated build-out year (2020) projected volumes for all egress movements from the driveway based upon the combined gaps in the Susquehanna Road (S.R. 2017) travel lanes, as well as the left-turn ingress movement based upon the gaps in the westbound direction of travel only.

Conclusions and Recommendations

A review of the overall levels-of-service indicates that the off-site study intersections will operate at acceptable levels-of-service overall (LOS D) from without- to with-development conditions for the future build-out year (2020). Based on the results of this evaluation, the following access configurations and traffic controls are recommended and are subject to detailed engineering of the site accesses:

Old York Road (S.R. 0611) and Site Access

- Provide one 12-foot wide (minimum) curbed ingress lane and one 12-foot wide curbed (minimum) egress lane;
- Restrict the site access to right-in/right-out only movements;
- Provide stop-control along the site access approach to Old York Road (S.R. 0611);
- Install "Do Not Block Driveway" signage along the northbound approach of Old York Road (S.R. 0611) at the proposed site access location;
- Provide ADA compliant ramps and crossings for the sidewalk system crossing the site access; and
- Provide appropriate curb radii based upon the largest vehicle anticipated to utilize the site access.

Susquehanna Road (S.R. 2017) and Site Access

- Provide one 12-foot wide (minimum) curbed ingress lane and one 12-foot wide (minimum) curbed egress lane;
- Provide stop-control along the site access approach to Susquehanna Road (S.R. 2017);
- Provide ADA compliant ramps and crossings for the sidewalk system crossing the site access; and
- Provide appropriate curb radii based upon the largest vehicle anticipated to utilize the site access.

As the redevelopment of the site will generate less traffic than the existing YMCA use, area traffic operations should improve with the planned development. Therefore, no off-site mitigation measures are planned with the redevelopment of the site.