



**MEMORANDUM**

**TO:** Monty Berhane Dag Petroleum Suppliers, Inc.

**CC:** Richard Aguglia, Esq. Hunton & Williams LLP

**FROM:** Deanna M. Donahoo  
Chad A. Baird  
Erwin N. Andres, P.E.

**DATE:** September 15, 2008

**SUBJECT:** 1400 Maryland Avenue NE Gas Station Redevelopment Traffic Assessment

**INTRODUCTION**

This memorandum summarizes the traffic impacts associated with the redevelopment of the site located at the northeast corner of Maryland Avenue and 14<sup>th</sup> Street in northeast Washington, DC. The redevelopment consists of a gasoline station with 8 fueling positions and a convenience mart. The site is located along the north side of Maryland Avenue NE, which is an east-west minor arterial roadway in the vicinity of the site that runs to US 50 to the east. Figure 1 shows the location of the site and the intersection studied to assess the impact. Figure 2 presents an aerial photograph of the site.

In the vicinity of the site, Maryland Avenue NE is a median-divided roadway providing two lanes in each direction with a posted speed limit of 25 mph. Based on the 2008 District Department of Transportation (DDOT) Traffic Volume Map, the Annual Average Daily Traffic (AADT) along Maryland Avenue west of 14<sup>th</sup> Street is approximately 11,200 vehicles. The AADT along Maryland Avenue NE east of 14<sup>th</sup> Street NE is approximately 7,000 vehicles. In the vicinity of the site, 14<sup>th</sup> Street NE is a one-way southbound collector roadway providing one travel lane and a bicycle lane with a posted speed limit along this roadway of 25 mph. The AADT along 14<sup>th</sup> Street south of Maryland Avenue NE is approximately 2,900 vehicles.

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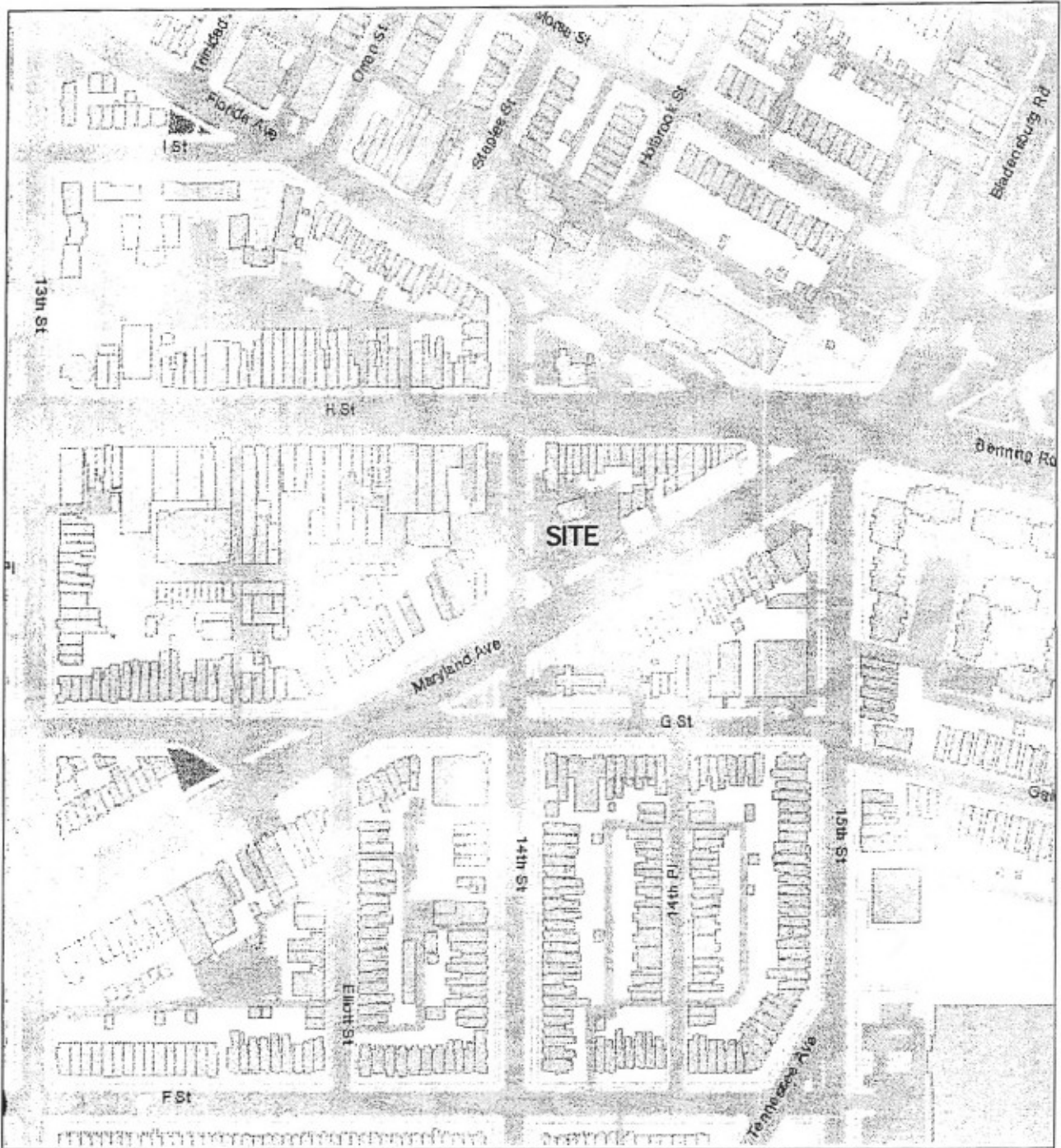


Figure 1  
Local Roadway Network and Site Location

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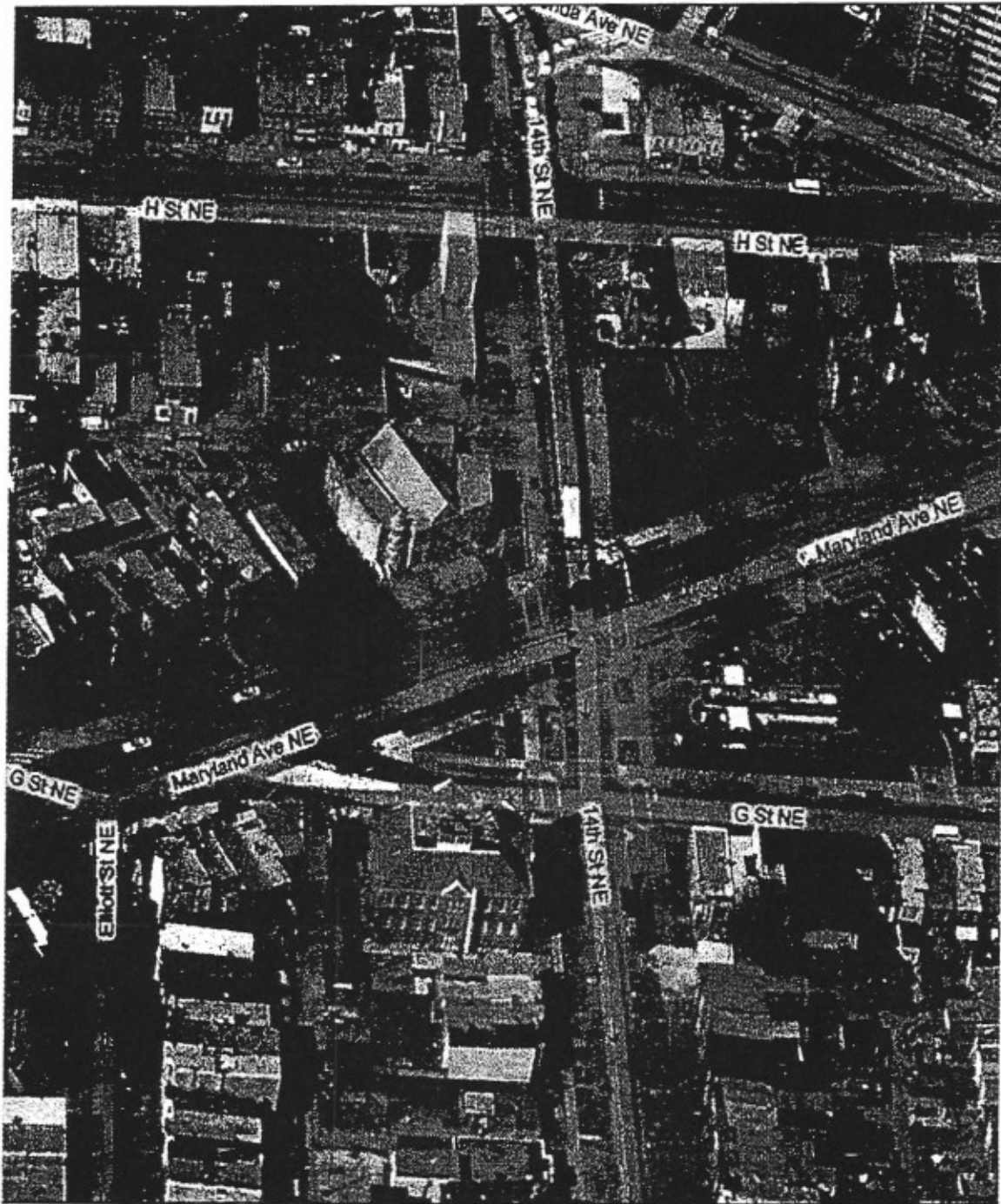


Figure 2  
Aerial Photograph of Subject Property at 1400 Maryland Avenue, NE

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### ***Site Access and Circulation***

The proposed development consists of a new gas station providing 8 fueling positions and a convenience mart. The site currently has two site driveways located along 14<sup>th</sup> Street. Because 14<sup>th</sup> Street NE is one-way southbound, only left turns into and out of the site driveways are permitted. Dag Petroleum is proposing reopening one curb-cut along Maryland Avenue NE that would provide full access to the site. The circulation within the site allows for two-way circulation in order to facilitate vehicles coming from either 14<sup>th</sup> Street NE or Maryland Avenue NE to access the fueling dispensers or the convenience mart.

The site driveways are proposed to minimize the unnecessary circulation that patrons would need to perform in order to access the site. The driveway on 14<sup>th</sup> Street NE is geared to serve patrons coming south from the H Street NE corridor. This driveway also provides access to a traffic signal at Maryland Avenue to allow for patrons exiting the site to head either east or west on Maryland Avenue NE. Similarly, the Maryland Avenue driveway is geared to draw patrons from either direction along Maryland Avenue NE. The proposed full-access driveway on Maryland Avenue NE is geared to allow both right turns and left turns into the site, especially since there is no alternative for eastbound Maryland Avenue NE traffic to access the site. The existing median break on Maryland Avenue NE will be maintained to allow for these movements at the Maryland Avenue NE driveway. Figure 3 presents the proposed site plan.

It is important to note that the one of the pre-existing uses for the subject site was a gas station use. Based on the January 21, 1977 Certificate of Occupancy (C of O) issued by DCRA for the subject property, the gas station was permitted to provide service for 6 fueling positions. In supporting that previous use, 2 curb cuts on Maryland Avenue and 2 curb cuts on 14<sup>th</sup> Street were provided. The proposed access plan is only providing for one curb cut along Maryland Avenue.

Based on the site plan, all 8 of the 8 proposed fueling stations will be accommodated on private property. All of the underground storage tanks (USTs) and the convenience mart is also located on private property. Public space will be required to provide the access to and circulation for the fueling positions and underground storage tanks (USTs), which was also required when the C of O for the previous gas station use was granted.

### ***Truck Access and Circulation***

Given the configuration of the existing and proposed driveways serving the site and the location of the underground storage tanks (USTs), the trucks will enter from Maryland Avenue, unload the fuel, and exit via the Maryland Avenue driveway. To confirm the adequacy of the driveways to accommodate the truck turning requirements, Autoturn analysis was performed to demonstrate that the proposed truck routing plan operates effectively. The truck routing plan and resulting Autoturn analysis are presented in Figure 4.

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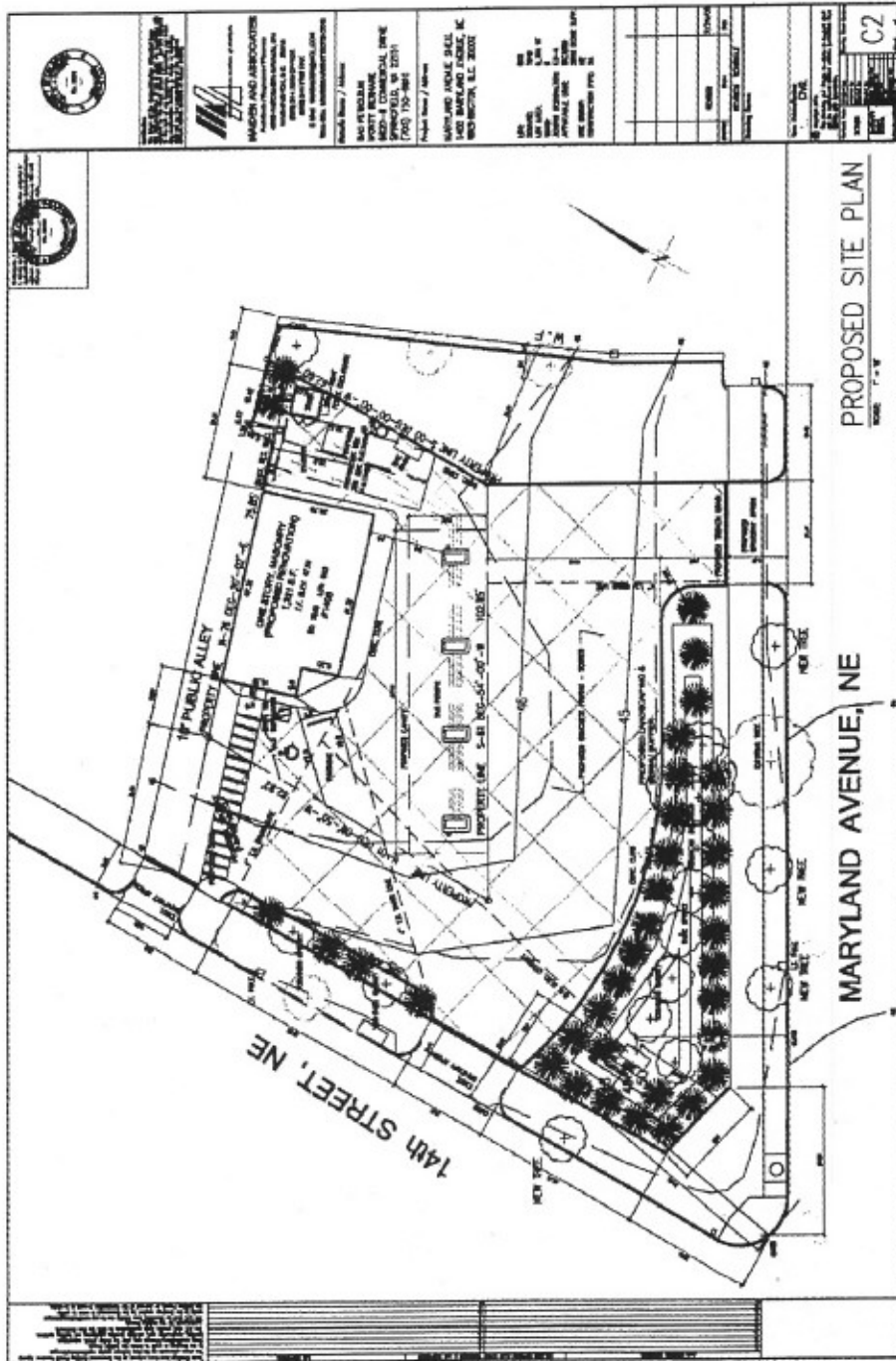


Figure 3  
 Site Plan for Proposed Gas Station Redevelopment

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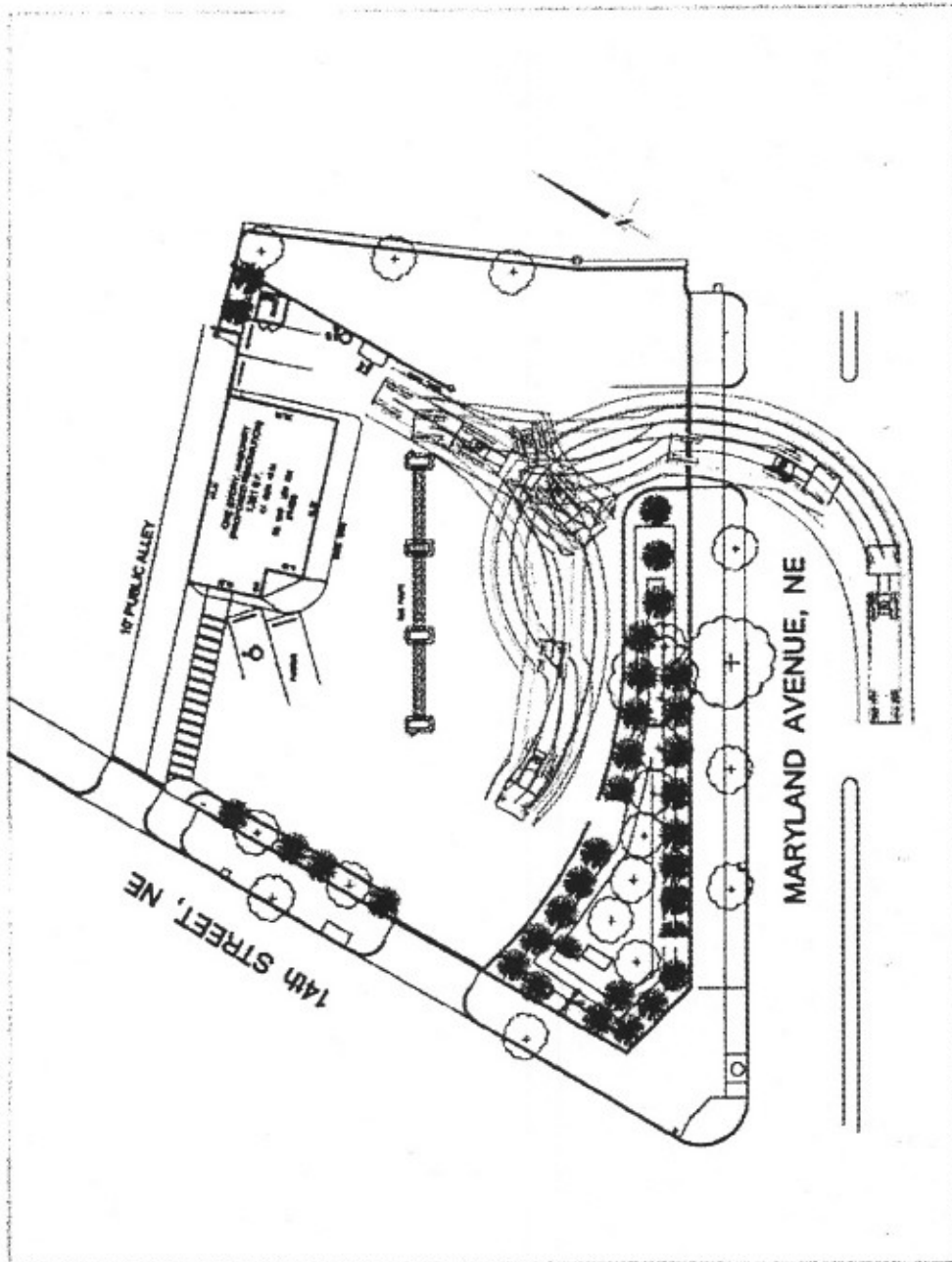


Figure 4  
Proposed Site Plan and Associated Truck Turning Analysis

**CAPACITY ANALYSIS**

*Existing Conditions*

Traffic counts were performed at the intersection of 14<sup>th</sup> Street NE and Maryland Avenue NE on Thursday, August 6, 2008, between 6:00 a.m. and 9:00 a.m. during the weekday morning peak period and between 4:00 p.m. and 7:00 p.m. during the evening peak period. Weekend counts were not performed considering that the traffic generation associated with gas stations draw heavily from the adjacent roadways where gas stations are located. Given that the adjacent roadways for this proposed gas station redevelopment experience their peak traffic levels during the weekday morning and afternoon commuter peak periods, it is appropriate to study only the weekday peak commuter periods.

Figure 5 shows the peak hour volumes for morning and evening peak hours between 8:00 a.m. and 9:00 a.m. and between 5:30 p.m. and 6:30 p.m., respectively. The lane configurations and signal timings were based on field surveys conducted by Gorove/Slade Associates. The lane configurations are shown in Figure 6. Capacity analysis was performed using Synchro 6.0 software. Results are summarized in Table 1 below. Based on the results in Table 1, all approaches of the study intersection operate at acceptable levels of service under existing conditions.

**Table 1: Capacity Analysis Results – Existing Conditions**

Intersection (Approach)	Existing Conditions	
	AM Peak Hour Level of Service	PM Peak Hour Level of Service
14 <sup>th</sup> Street & Maryland Avenue		
<b>Overall</b>	<b>B (16.7)</b>	<b>B (15.4)</b>
Eastbound	A (7.2)	A (7.6)
Westbound	A (7.5)	A (7.3)
Southbound	D (41.2)	D (41.9)

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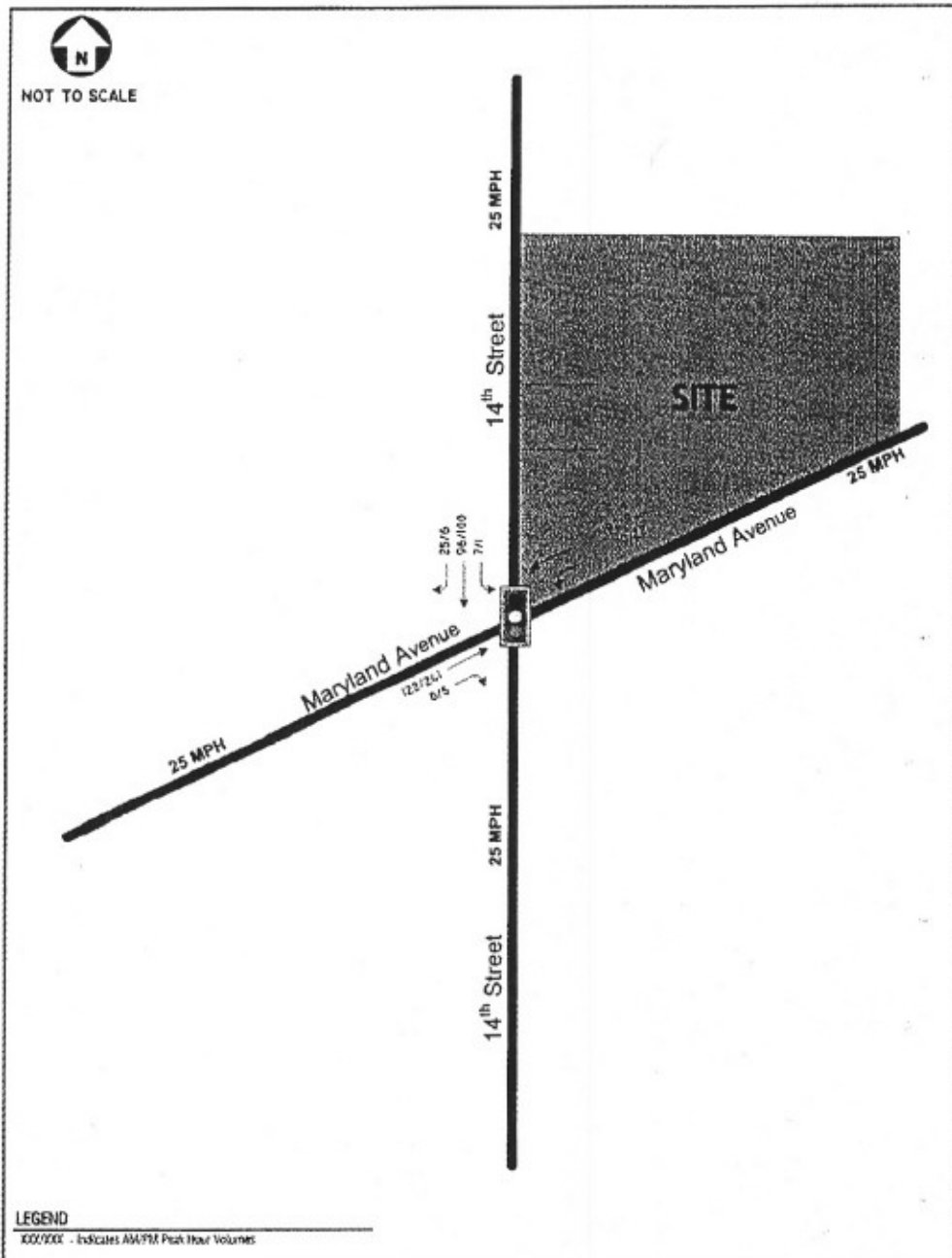


Figure 5  
Existing Weekday Peak Hour Traffic Volumes



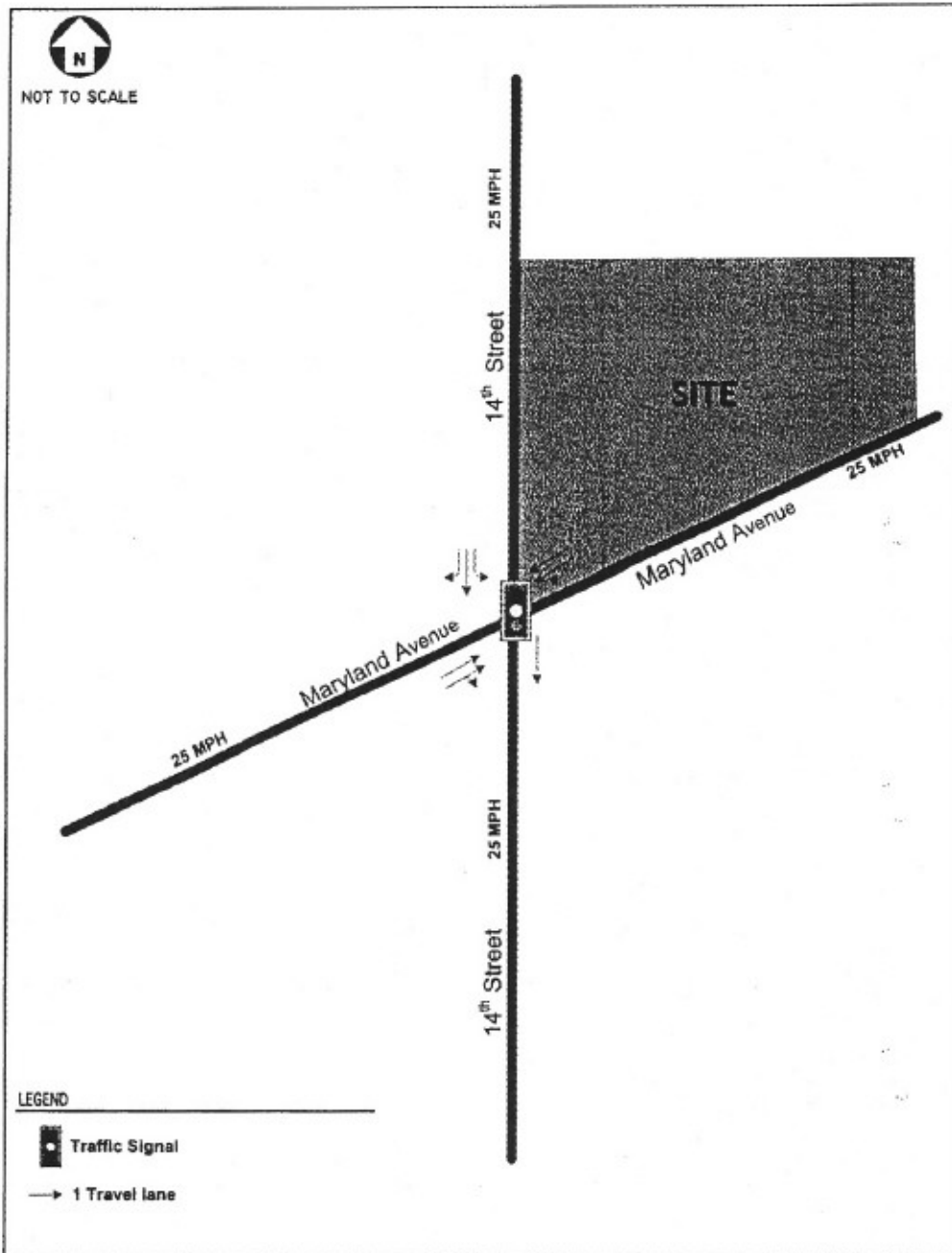


Figure 6  
Existing Lane Use Configuration

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*Future Conditions*

Future conditions were analyzed to include existing volumes projected with a 1% growth rate for one year and accounting for the site generated traffic associated with the redevelopment of the gas station. The *ITE Trip Generation Manual, 7<sup>th</sup> Edition* was used to derive trip generation rates for the gas station based on 8 fueling positions.

In addition, a pass-by trip reduction of 62% was applied to these trips to account for the through traffic along 14<sup>th</sup> Street and Maryland Avenue that would potentially enter the site as an intermediate stop to their primary destination. This pass-by percentage of 62% was based on the average pass-by trip percentage for a gasoline service station with convenience market in the *ITE Trip Generation Handbook, 2<sup>nd</sup> Edition*.

**Table 2: Trip Generation**

Development	ITE Code	Size	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
<b>1400 Maryland Avenue NE</b>								
Gasoline Service Station with Convenience Market	945	8 Fueling Stations	41	39	80	54	53	107
Pass-by Trip Red. 62%			-25	-24	-50	-33	-33	-66
<b>Total New Trips</b>			<b>16</b>	<b>15</b>	<b>31</b>	<b>21</b>	<b>20</b>	<b>41</b>

Source: *Trip Generation Manual, 7th Edition*. Institute of Transportation Engineers. 2003. Note: Data for AM Peak Hour and PM Peak Hour show data for Peak Hour of Adjacent Street Traffic between, respectively, 7 - 9 am and 4 - 6 pm, when provided.

The trip distribution of the site-generated trips was based on the existing travel patterns derived from the existing traffic counts. The pass-by trips were derived from the through traffic along 14<sup>th</sup> Street NE going southbound and Maryland Avenue NE going eastbound and westbound, which would join back in the same stream of traffic. The new site trips are shown in Figure 7. The total future traffic including the projected existing volumes and site volumes is shown in Figure 8.

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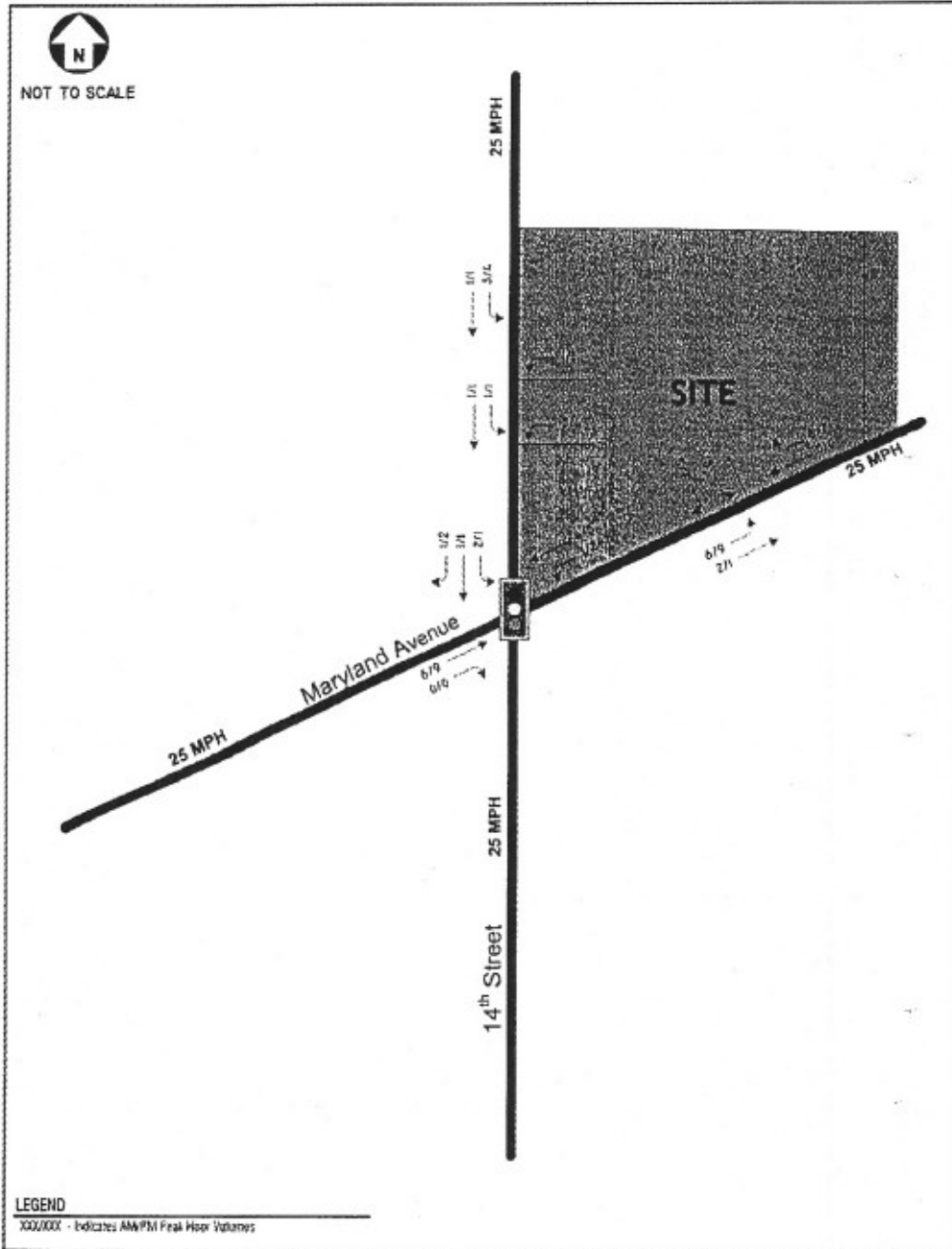


Figure 7  
Net Site-Generated Trips

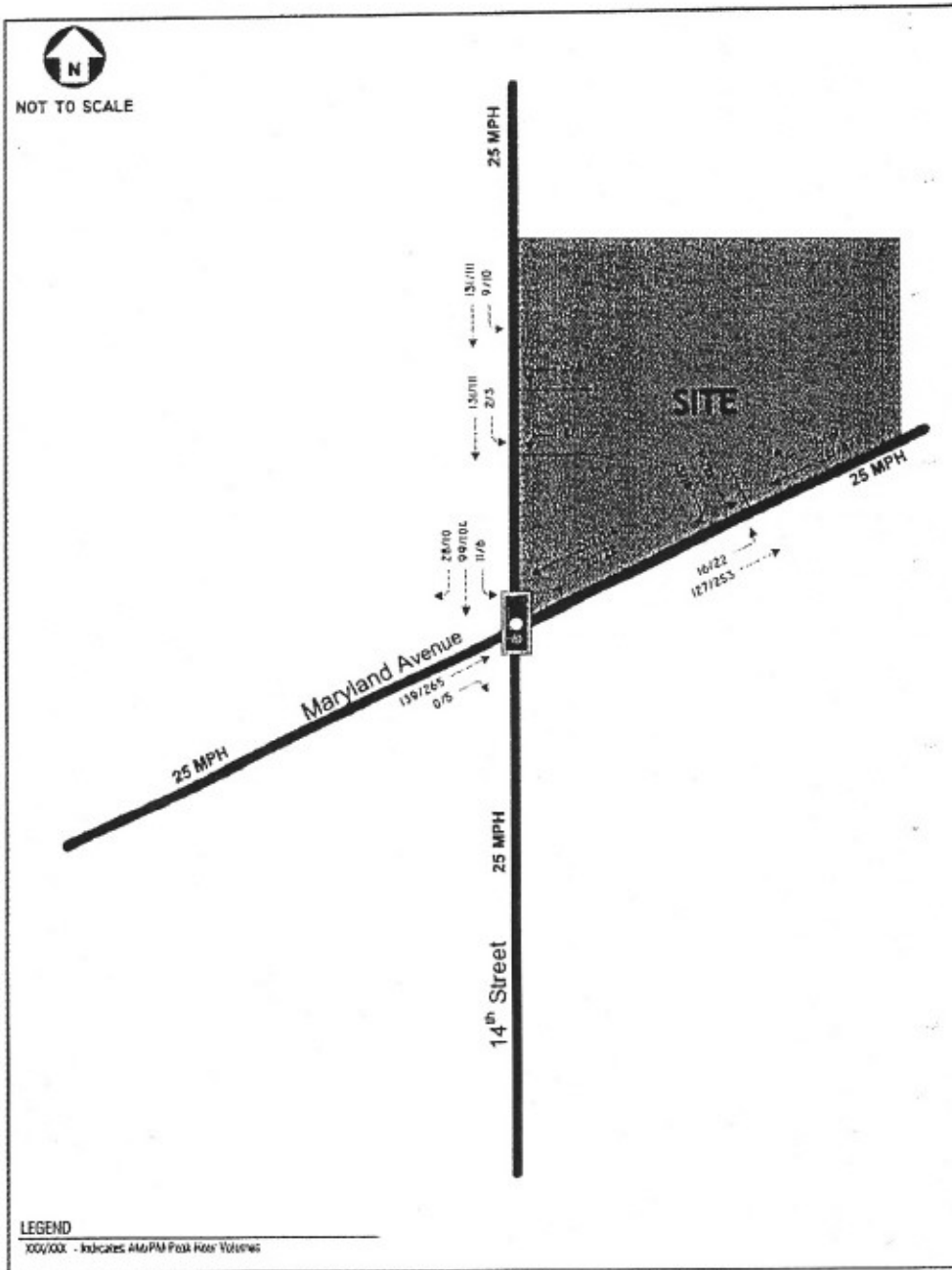


Figure 8  
Future Weekday Peak Hour Traffic Volumes

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Capacity analysis was performed for total future conditions with the redevelopment of the gas station using Synchro 6.0 software. The results are summarized in Table 3.

**Table 3: Capacity Analysis Results – Future Conditions**

Intersection (Approach)	Future Conditions	
	AM Peak Hour Level of Service	PM Peak Hour Level of Service
14 <sup>th</sup> Street & Maryland Avenue		
Overall	<b>B (16.7)</b>	<b>B (15.3)</b>
Eastbound	A (7.2)	A (7.6)
Westbound	A (7.6)	A (7.3)
Southbound	D (41.2)	D (41.9)

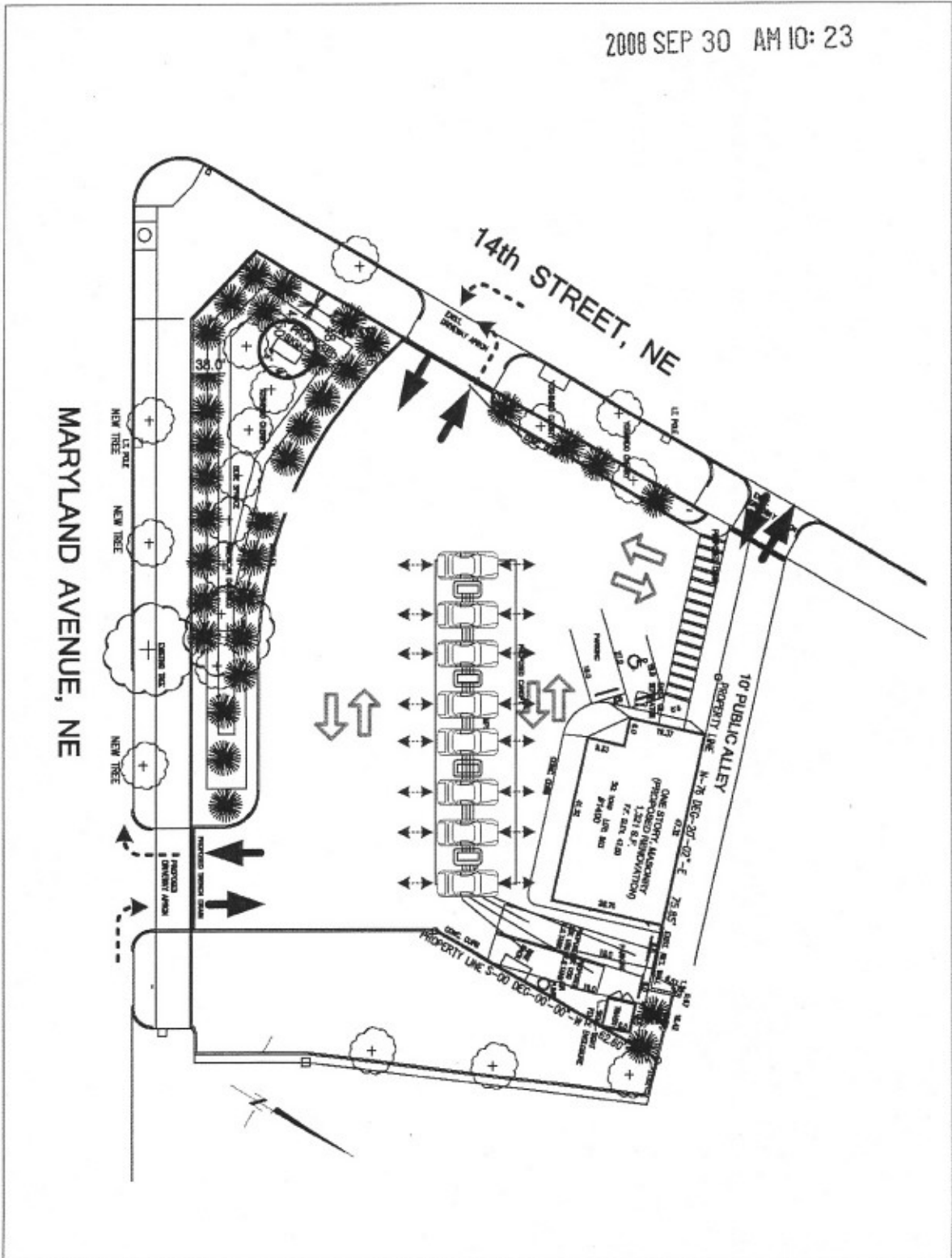
The results show that all intersection approaches will continue to operate within capacity with a nominal increase in delay levels without affecting the LOS of any approach or the overall intersection with the redevelopment of the gas station.

## CONCLUSION

The redevelopment of the gas station can be accommodated with the proposed access and circulation scheme without adverse impact to the surrounding roadway network. The capacity analysis results demonstrate that all of the study intersection approaches will continue to operate within capacity with a nominal increase in delay levels without affecting the LOS of any approach or the overall intersection with the redevelopment of the gas station. In addition, the proposed access and circulation plan is consistent with the features of the subject property that was previously granted a Certificate of Occupancy when the site was formerly used as a gas station use.

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On-Site Vehicular Circulation Diagram





## **Erwin N. Andres, P.E.**

### **Principal**

Mr. Andres has a wide range of traffic and transportation project experience including: traffic impact studies, site access and circulation planning, functional parking lot and garage design, parking demand analysis, corridor studies, campus master planning, major data collection efforts, loading dock design, intersection improvement design, signal design and signing and pavement marking design. He has worked for public, private and institutional sector clients throughout the United States.

### **Professional Registration and Certification**

Registered Professional Engineer - Maryland (#29177)  
Registered Professional Engineer - New Jersey (#4557000)

### **Education**

Bachelor of Science in Civil & Environmental Engineering  
Rutgers University, New Brunswick, NJ

### **Professional Associations**

Institute of Transportation Engineers (ITE)  
American Planning Association (APA)  
National Society of Professional Engineers (NSPE)

### **Publications**

"Ask the Expert", Healthcare Magazine, November 2003

### **Representative Projects**

### **COLLEGES, UNIVERSITIES, AND INSTITUTIONS**

Mr. Andres has developed demand management plans, construction management plans, circulation studies, parking studies and transportation master plans for a number of universities, schools and institutions including Ohio State University, Columbus, OH; University of Virginia Health Sciences District Campus, Charlottesville, VA; George Washington University at Mount Vernon College, Washington, DC; National Institutes of Health Master Plan, Bethesda, MD; NASA Goddard Space Flight Center, Greenbelt, MD; The National Cathedral Campus Plan, Washington, DC; Washington International School, Washington, DC; and The Norwood School, Potomac, MD.

### **MIXED-USE AND COMMERCIAL DEVELOPMENTS**

Mr. Andres has prepared traffic studies, parking analysis, site access planning, loading access design, site circulation planning and signal designs for projects including: USDOT Headquarters Building, Washington, DC; Exton Square Mall, Exton, PA; Hamilton Marketplace, Hamilton, NJ; and Hospital Center at Orange Redevelopment, Orange, NJ.

### **PARKING STUDIES AND PARKING GARAGE DESIGN**

Mr. Andres has performed parking needs studies and garage planning for projects such as the National Institutes of Health, Bethesda, MD; Ohio State University, Columbus, OH; and Evermay Society, Washington, DC.

### **RETAIL**

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Mr. Andres has prepared traffic, parking, site access and site circulation studies for grocery stores, lifestyle centers, power centers, regional centers and urban retail including the Georgetown Safeway, Washington, DC; Exton Square Mall Expansion, Exton, PA; Lowe's Home Improvement Store, Stony Brook, NY; 7-Eleven Stores, NJ and NY locations; Commerce Bank branches, various NJ, NY, CT, and PA locations; Yum! Brands Restaurants, NY locations; and McDonald's Restaurants, various NJ locations.

#### **OFFICE AND RESIDENTIAL DEVELOPMENTS**

Mr. Andres has worked on office and residential development projects involving site planning and access planning as well as the design of both traffic signals and parking garage facilities. Projects have included USDOT Headquarters Building, Washington, DC; National Academy of Sciences, Washington, DC; Orange Hospital Center Residences; Orange, NJ; Ivy Senior Housing Center, Newark, NJ; and the Washington Home, Washington, DC.

#### **TRAFFIC IMPACT STUDIES**

Mr. Andres has conducted numerous traffic impact studies in support of rezoning, subdivision, site plan approvals and EIS applications for large and small residential, commercial, office retail and institutional developments. His work includes experience in Pennsylvania, Virginia, Maryland, New Jersey, New York, Connecticut and the District of Columbia.

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