

Department of Public Works and Transportation
Division of Operations
Montgomery County, Maryland

TRAFFIC STUDY

Logger ID: 091523

I. IDENTIFICATION:

Location: Wayne Avenue between Fenton

Study By: Mike Tantillo

Street and Georgia Avenue

Recommended Approval _____

Study Date: 01/15/2009

Recommended Approval _____

Police District: Silver Spring

Recommended Approval [Signature] 2/4/09

Approved [Signature] 2/4/09

T.O. # _____ W.O. # _____

II. PURPOSE:

A new library will be constructed along the south side of Wayne Avenue, west of Fenton Street. The Executive Branch of Montgomery County Government was asked by the County Council to examine the possibility of a mid-block crosswalk on Wayne Avenue in order to connect the library to the County-owned parking garage on the north side of Wayne Avenue. This proposed crosswalk would be located about 120 feet west of the western crosswalk on Fenton Street, and would connect to the pedestrian entrance/exit on the eastern end of the parking garage. This study evaluates the viability of establishing a marked crosswalk at this location.

III. EXECUTIVE SUMMARY: (See Discussion for further details)

This study evaluates a proposed mid-block crossing that would provide a direct connection from the new library to the stair/elevator tower of the County parking garage. This crosswalk would be located across Wayne Avenue about 120 feet west of the signalized intersection of Wayne Avenue and Fenton Street. The segment of Wayne Avenue on which the crosswalk is proposed is approximately 750 feet long. Signalized intersections are present at both ends of this segment, and both of the intersections have marked, signalized crosswalks.

The crosswalk was evaluated based on Montgomery County's mid-block unsignalized crosswalk evaluation form and on the Recommended Practice for Midblock Crossings developed by the Institute of Transportation Engineers (ITE). Factors used to evaluate the crosswalk include distance to nearest protected crosswalks, pedestrian demand, distance to the nearest cross street or driveway, vehicular traffic volume on the roadway, prevailing speed of traffic, available sight distances, presence of a median refuge, and availability of gaps in traffic flow to allow

pedestrians to safely cross.

In general, mid-block crosswalks should be at least 300 feet from adjacent protected crossings, across roadways with daily traffic volumes of less than 12,000 vehicles per day, 100 feet from the nearest cross street or driveway, and on roadways with sufficient gaps in traffic to allow pedestrians to cross within 60 seconds. A crosswalk at the above proposed location would be about 120 feet from the nearest protected crosswalk at Fenton Street, and within 100 feet of the County parking garage entrance. The roadway traffic volumes are estimated at approximately 12,700 vehicles per day.

The main concerns of a crosswalk located at the east end of the county parking garage are the traffic movements and queuing on Wayne Avenue. Traffic exiting the garage onto Wayne Avenue eastbound often backs up into the garage from the Fenton Street signal. Traffic entering the garage must weave with this exiting traffic, creating an unsafe situation for pedestrians who would be crossing very close to this weaving and who would be crossing through a line of stopped vehicles during peak periods. Queued traffic would make it difficult for drivers to see pedestrians in the crosswalk. The proposed Purple Line (light rail transit line) would also travel through the Wayne Avenue and Fenton Street intersection. This proposed Purple Line, if constructed, would mean less green signal time would be allocated to Wayne Avenue, making congestion worse in the future. In addition, there are two service alleys, one next to the County parking garage and one next to the library on the west side that will be used by large trucks. For the above reasons, an unprotected crosswalk is not recommended at this location.

Two other alternatives were evaluated for possible crosswalks along Wayne Avenue. The first alternative was a signalized pedestrian crossing at the east end of the County garage. This alternative would stop vehicles with a traffic signal and allow pedestrians to safely cross. This was not determined to be a viable option, since signal operations would worsen vehicular traffic flow on Wayne Avenue, increasing congestion, and therefore increasing sight distance issues. If the crosswalk was considered to be a separate intersection from the Wayne Avenue/Fenton Street intersection, vehicle traffic would back up in the short area between the two intersections. If the crosswalk was considered to be part of an extended Wayne Avenue/Fenton Street intersection, the yellow and all-red clearance times would need to be longer in order to clear the large intersection. This would result in an inefficient intersection operation, especially considering the future operation of the signal with priority treatment for the Purple Line.

The second alternative evaluated was an unsignalized crosswalk on Wayne Avenue at the west end of the County parking garage, adjacent to the west stair tower. This location contains a raised median which could be used as a pedestrian refuge island. This location is also farther from the nearest signalized intersection than the location at the east end of the garage and has fewer conflicting vehicular movements. Although this location is more suitable for a crosswalk, it is less conveniently located for library patrons, who would have to backtrack after crossing Wayne Avenue and the stair tower at this corner does not provide access for the mobility impaired. It is likely that most library patrons would instead choose to use the protected Fenton Street crosswalk, which would require less backtracking.

Therefore, it is not recommended to install a mid-block crosswalk along Wayne Avenue. Pedestrians should be encouraged to use the Fenton Street intersection with pedestrian treatments near the garage stair/elevator tower to discourage crossings there. It should also be noted that the reconfiguration of the Fenton Street intersection for the Purple Line would likely move the crosswalk closer to the library entrance and garage stair/elevator tower. See the discussion section for more details.

This study did not evaluate the feasibility of a pedestrian bridge over Wayne Avenue connecting the County parking structure with an upper level of the library. Although clearly the safest from the standpoint of eliminating conflicts with traffic, our experience is that these facilities are only effective when designed to provide access that is as convenient if not more so than other alternatives.

IV. STREET CLASSIFICATION:

<u>Street Name</u>	<u>Classification</u>		<u>TS</u>	<u>Posted Speed</u>
	<u>Master Plan</u>	<u>Functional</u>		
1. Wayne Avenue	Arterial	Arterial	No	25 MPH

V. DISCUSSION:

This study begins with the assumption that the proposed library will generate enough traffic utilizing the County parking garage and then walking to the library to meet the minimum pedestrian volumes for consideration of a mid-block crosswalk. Wayne Avenue is a 5-lane undivided arterial roadway through the Silver Spring Central Business District. The center lane of Wayne Avenue serves as a two-way left turning lane for access to adjacent businesses. Wayne Avenue has signalized intersections with Georgia Avenue (US 29) and Fenton Street on either side of the study area. The length of Wayne Avenue through the study area is approximately 750 feet. Marked crosswalks with pedestrian signal indications are present across all four legs of both intersections. Along the north side of Wayne Avenue are a gym, an Office Depot and a County parking garage. Along the south side are offices, residential buildings, and retail, along with the site of the proposed library.

The most logical location for a mid-block crosswalk from the perspective of a pedestrian exiting the garage at street level is at the stair/elevator tower on the east end of the parking garage. The crosswalk would connect the garage directly to the site of the library and would be located 120 feet east of the Fenton Street intersection. This is the location that was requested to be evaluated.

A mid-block/uncontrolled crosswalk evaluation form was completed, based on the ITE's recommended practices, which are attached. According to these guidelines, the crossing location should generally be more than 300 feet from the nearest protected crossing, and the Average Daily Traffic volume (ADT) should generally be less than 12,000 vehicles per day. The guidelines further suggest that four-lane undivided roadways (and by extension, 5-lane undivided

roadways with 4-lanes of through traffic) carrying more than 12,000 vehicles per day are generally not desirable for the implementation of mid-block unprotected crosswalks.

The ITE's recommended practices include general criteria stating that mid-block crosswalks should be located 100 feet or more from the nearest side street or driveway. The recommended practices also state that adequate sight distance should be available, and that unsignalized mid-block crosswalks should not be provided where traffic volumes do not have gaps in the traffic stream long enough for a pedestrian to walk to the other side of the roadway. All of the above are concerns with an unsignalized crosswalk at this location on Wayne Avenue.

A traffic impact study completed by Kimley-Horn and Associates for the Purple Line contains projected future peak-hour traffic volumes for Wayne Avenue. The AM peak hour traffic volume is projected to be 935 vehicles, and the PM peak hour traffic volume is projected to be 1,269 vehicles. The highest hour of traffic volume on a roadway is generally 10% of the average daily traffic volume. Thus, the average daily traffic volume on Wayne Avenue would be approximately 12,690 vehicles per day. This volume suggests that there may be too much vehicular traffic on Wayne Avenue to safely implement an unprotected crosswalk based on the criteria in the crosswalk evaluation form. Due to the lack of available gaps in traffic during peak hours, pedestrian safety is a concern at unprotected crosswalks on roadways where volumes are at or greater than approximately 12,000 vehicles per day. It is safer for pedestrians to cross at a protected crossing, which in this case is 120 feet to the east at Fenton Street. The ITE's recommended practices indicate that unsignalized crosswalks can be provided when the volumes are at or below 15,000 vehicles per day if a median refuge is provided. A median refuge could be added at the proposed location; however this would significantly exacerbate traffic congestion and does not eliminate the problems with weaving, turning vehicles into the parking garage entrance, and the lack of available gaps due to congestion. Thus, there are still justifications for not installing an unsignalized crosswalk even if a pedestrian refuge island were added to the median of Wayne Avenue.

Currently, there exists a congestion problem on this segment of Wayne Avenue during the PM Peak hour. Eastbound traffic on Wayne Avenue queues up at the Fenton Street signal. This queue is due to the volume of vehicles turning left from Wayne Avenue onto Fenton Street. During the PM peak, this queue often extends into the County parking garage. There are also many left turns into the garage during the PM peak hour from Wayne Avenue. The entrance to the garage is farther east than the garage exit, meaning drivers turning left into the garage have to cross the queue of vehicles exiting the garage towards Fenton Street. The short stretch of two-way left turn lane between the garage entrance and exit functions as a weaving segment with queued vehicles turning into the garage sharing space with vehicles attempting to locate gaps in westbound traffic on Wayne Avenue such that they can merge into the through lanes. This traffic pattern is problematic and undesirable even without a pedestrian crossing in the midst. These queues and weaving patterns occur at the location of the proposed mid-block crosswalk. Unprotected crosswalks present a safety problem when traffic queues across them, since the queued vehicles block the drivers' view of the crosswalk. This is especially problematic in cases where the queue is caused by traffic turning onto another roadway, and the queues in adjacent

traffic lanes are not even. Pedestrians can walk between queued vehicles in one lane, and step into an adjacent lane with moving traffic. Drivers in that adjacent lane may not expect pedestrians to step out between queued vehicles, and may be unable to safely stop upon seeing a pedestrian in the crosswalk. In addition, many drivers will be concentrating on executing turns into and out of the garage, and may not realize there is a crosswalk if they are unfamiliar with the location.

The proposed Purple Line is expected to cause changes to the Wayne Avenue/Fenton Street intersection and signal in the future. A formal decision regarding the construction of the Purple Line has not yet been made, however there is the potential for a light rail line to run down Wayne Avenue east of Fenton Street, and veer to the south at Fenton Street. This would place a Purple Line light rail stop behind the library (see attached draft design). This light rail option would complicate signal operations at the intersection of Wayne Avenue and Fenton Street, as the light rail would add an additional phase to the signal, and therefore a smaller proportion of green time would be allocated to Wayne Avenue and Fenton Street. These changes could increase the amount of queuing on Wayne Avenue approaching the intersection with Fenton Street, thereby exacerbating the queuing, weaving, and congestion problems described above.

As part of the reconfiguration of the intersection of Wayne Avenue and Fenton Street for the light rail line, the stop bar and pedestrian crossing of the west leg of Wayne Avenue will be moved farther back so as not to directly conflict with the rail tracks. Relocating the crosswalk further to the west on Wayne Avenue will move it closer to the library and parking garage stair/elevator tower, thereby increasing the convenience of this crosswalk to library users. Given the constraints and issues described above, an unprotected crosswalk is not recommended for this location.

A signalized pedestrian crossing is another option that can be considered in light of safety concerns with an unprotected crossing. A signalized pedestrian crossing could be operated in one of two ways: separate signals for the crosswalk and the Wayne Avenue/Fenton Street intersection, or the two can be connected as one large signalized intersection complex.

Two separate signals would cause operational problems on the roadway segment between the crosswalk and the intersection of Wayne Avenue and Fenton Street, as the two signals would be separated by only 120 feet. The two signals can be coordinated to facilitate predominant traffic flows; however, heavy turning movements at the Wayne Avenue/Fenton Street intersection would likely mean vehicles would turn onto Wayne Avenue from Fenton Street and encounter a red signal at the crosswalk only 120 feet after executing the turning maneuver. The short distance between the two signals would limit the number of vehicles that can queue up at the crosswalk signal without spilling into the Fenton Street intersection. It should be noted that queues may not form evenly in both lanes, as drivers would select a particular lane depending on their destination.

Eastbound traffic on Wayne Avenue may encounter a similar problem. The queues for the Fenton Street intersection would extend through the signalized crosswalk during peak times, and

this is an undesirable traffic condition, as pedestrians may attempt to weave through queued vehicles when the crosswalk signal is in the "WALK" phase.

Compliance at a signalized pedestrian crossing at this location may be problematic. Pedestrians seeing stopped vehicles may assume it is safe to cross when it is in fact not safe. Since the signal would need to be on the same cycle length as the signal at Fenton Street to ensure coordination, pedestrians may not wish to wait for the pedestrian signal. A cycle half the length of the Fenton Street signal could be explored to allow pedestrians to cross more frequently, though this presents operational problems with having signals on different cycle lengths. In addition, it may represent a safety concern to motorists to have signals operating on different cycle length in close proximity to one another. For example, eastbound drivers may see a green signal indication at Fenton Street and not realize that the crosswalk signal was still displaying a red indication.

If the crosswalk and the Wayne Avenue/Fenton Street intersection were considered to be one large intersection complex, the coordination would not be as great of a concern. However such an intersection would not operate as efficiently as two separate intersections would. In order for traffic within the intersection to clear, sufficient yellow clearance time and all-red time must be provided during the signal cycle. The time required is based on the size of the intersection, which would encompass the width of Fenton Street, the width of the crosswalk, and the 120 feet separation distance between the two. This clearance time would be much greater than the current clearance time. Since a larger proportion of the signal phase would be allocated to clearance, a smaller portion of green time would be available for vehicular traffic on Wayne Avenue, which would exacerbate the congestion problem. Another problem would be south bound motorists turning right on green would have time to accelerate before encountering pedestrians in the crosswalk during the concurrent "WALK" phase.

In both signalized crosswalk scenarios, the nearest signal to the parking garage exit would be 120 feet closer than under present conditions. Traffic exiting the County garage currently encounters queues and congestion leading to the Fenton Street intersection which would be expected to worsen if the first signal drivers encounter after exiting the garage is 120 feet closer than it is presently.

Thus, it is not recommended to install any crosswalk at this location, protected or unprotected. Other locations along Wayne Avenue were examined to determine the most logical location for a potential mid-block crosswalk. One possible location was determined to be the west end of the County parking garage where a stair tower exists. At this location, there is a raised median which can function as a pedestrian refuge, and thus pedestrians could safely wait while crossing for traffic to clear. The crossing would still have issues due to the proximity of the Georgia Avenue intersection; however it is approximately 250 feet from Georgia Avenue, about double the 120 feet of separation between the initially proposed location and Fenton Street. The proposed Purple Line would not affect operations at the Georgia Avenue intersection. An alley adjacent to the west end of the garage is one-way toward Wayne Avenue, and traffic is forced to turn right onto Wayne away from the crosswalk. Thus the alley does not present any movements that would conflict with a crosswalk at this location.

The mid-block pedestrian crossing location at the west end of the garage would not be as convenient to library users as a mid-block crossing at the east end of the garage, as it would be at least 380 feet from the library entrance. Given the choice of a mid-block crossing at the west end of the garage, or the Fenton Street crossing, most pedestrians destined for the library would likely choose the protected Fenton Street crossing. Therefore, a mid-block crosswalk is not recommended for Wayne Avenue at this location, mainly due to its impracticality for library patrons.

Pedestrians at street level should be encouraged to utilize the protected crosswalk at Wayne Avenue and Fenton Street, as this represents the safest location for pedestrian crossings. Pedestrians should be discouraged from crossing mid-queue in front of the garage using design and/or landscape treatments that discourage crossings at this point and re-direct pedestrians to the desired crossing location at the existing signal at Fenton Street. A recommended treatment type could be similar to the treatment used on Fenton Street north of Wayne Avenue, which contains a decorative metallic buffer approximately one-foot high, and decorative landscaping to discourage pedestrians from stepping over the buffer. A landscape architect should design this treatment. See attached photograph for pedestrian buffer example (Fenton Street north of Wayne Avenue).

While pedestrians would still be able to cross Wayne Avenue at gaps in the buffer treatment (which would be required for the garage driveways), the crossings should certainly not be encouraged with a marked crosswalk due to safety concerns. Instead, signs guiding pedestrians to cross at the intersection of Wayne Avenue and Fenton Street should be posted. Such signs should utilize a combination of the R9-3a (No Pedestrians Regulatory Sign) and R9-3b (Regulatory Sign directing pedestrians to use crosswalk with arrow pointing towards Fenton Street) signs from the Manual on Uniform Traffic Control Devices (MUTCD). Signs should be posted in front of the library, in front of the pedestrian exit from the garage, and at the two garage driveways.

In summary, a mid-block crosswalk should not be installed on Wayne Avenue at the east end of the parking garage due to safety and operational concerns at that location. A more suitable location for a crosswalk is at the west end of the garage, though this location would not be as convenient for library users. Since the existing signalized crosswalk at the Wayne Avenue/Fenton Street intersection is closer to the library than a mid-block crossing at the west end of the garage, a mid-block crossing should not be installed. If the proposed Purple Line is constructed, the Fenton Street crosswalk would likely be moved closer to the library entrance, and should be striped as a 15-foot wide crosswalk due to the larger expected pedestrian volumes.

VI. ATTACHMENTS: Turning Movement Count X Speed Study
 Mechanical Count Accident Study
 Area Map X Physical Condition X

Table 9.5 Recommended Practice for Midblock Crossings

General
<ul style="list-style-type: none"> The decision to locate a midblock crosswalk will be based on numerous factors. Generally, however, consider providing a marked midblock crossing when protected intersection crossings are spaced greater than 400 ft., or so that crosswalks are located no greater than 200 to 300 ft. apart in high pedestrian volume locations, and meets the criteria below.
<ul style="list-style-type: none"> Midblock crossings may be considered when there is significant pedestrian demand to cross a street between intersections, such as connecting to major generators or transit stops.
<ul style="list-style-type: none"> Midblock crosswalks should be located at least 100 ft. from the nearest side street or driveway so that drivers turning onto the major street have a chance to notice pedestrians and properly yield to pedestrians who are crossing the street.
Criteria
<ul style="list-style-type: none"> Streets with an average daily traffic volume of 12,000 vehicles per day or less.
<ul style="list-style-type: none"> Multi-lane streets carrying less than 15,000 ADT if a raised pedestrian refuge median is provided:
<ul style="list-style-type: none"> Prevailing speeds less than 40 mph.
<ul style="list-style-type: none"> A minimum pedestrian crossing volume of 25 pedestrians per hour for at least four hours of a typical day.
<ul style="list-style-type: none"> Adequate sight distance is available for pedestrians and motorists.
Recommendations
<ul style="list-style-type: none"> Unsignalized midblock crosswalks should not be provided on streets where traffic volumes do not have gaps in the traffic stream long enough for a pedestrian to walk to the other side or to a median refuge. At locations with inadequate gaps that also meet MUTCD signalization warrants, consider a signalized midblock crossing.
<ul style="list-style-type: none"> Consider a signalized midblock crosswalk where pedestrians must wait more than an average of 60 seconds for an appropriate gap in the traffic stream. When average wait times exceed 60 seconds, pedestrians tend to become impatient and cross during inadequate gaps in traffic.
<ul style="list-style-type: none"> On streets with continuous two-way left-turn lanes, provide a raised median pedestrian refuge with a minimum refuge length of 20 ft. and a minimum width of 6 ft.
<ul style="list-style-type: none"> Provide overhead safety lighting on both ends of midblock crosswalks.
<ul style="list-style-type: none"> Provide wheelchair ramps or at-grade channels at midblock crosswalks with curbs and medians.
<ul style="list-style-type: none"> Provide raised median pedestrian refuge at midblock crossings where the total crossing width is greater than 60 ft.
<ul style="list-style-type: none"> Use high-visibility (ladder-style) crosswalk markings to increase visibility longitudinally.
<ul style="list-style-type: none"> Provide advance stop or yield lines to reduce multiple threat crashes.
<ul style="list-style-type: none"> Provide advance crosswalk warning signs for vehicle traffic.
<ul style="list-style-type: none"> Provide curb extensions at midblock crosswalks with illumination and signing to increase pedestrian and driver visibility.
<ul style="list-style-type: none"> "Z" crossing configurations should be used for midblock crossings with medians wherever possible (see Figure 9.16). Provide an at-grade channel in median at a 45-degree angle toward advancing traffic to encourage pedestrians to look for oncoming traffic.
Other Considerations
<ul style="list-style-type: none"> A strategy to calm traffic speeds in advance of and at a midblock crossing is to raise the pavement to meet the sidewalk elevation by use of gentle ramps (see Figure 9.17). Consider use of overhead flashing beacons.

Adapted from:

Safety Effects of Marked versus Unmarked Crosswalks at Uncontrolled Locations, FHWA, 2002

Manual of Uniform Traffic Control Devices, FHWA, 2003 Edition

Guide for the Planning, Design and Operation of Pedestrian Facilities, AASHTO, 2004

**TRAFFIC
ENGINEERING & OPERATIONS**

MID-BLOCK / UNCONTROLLED CROSSWALK CRITERIA

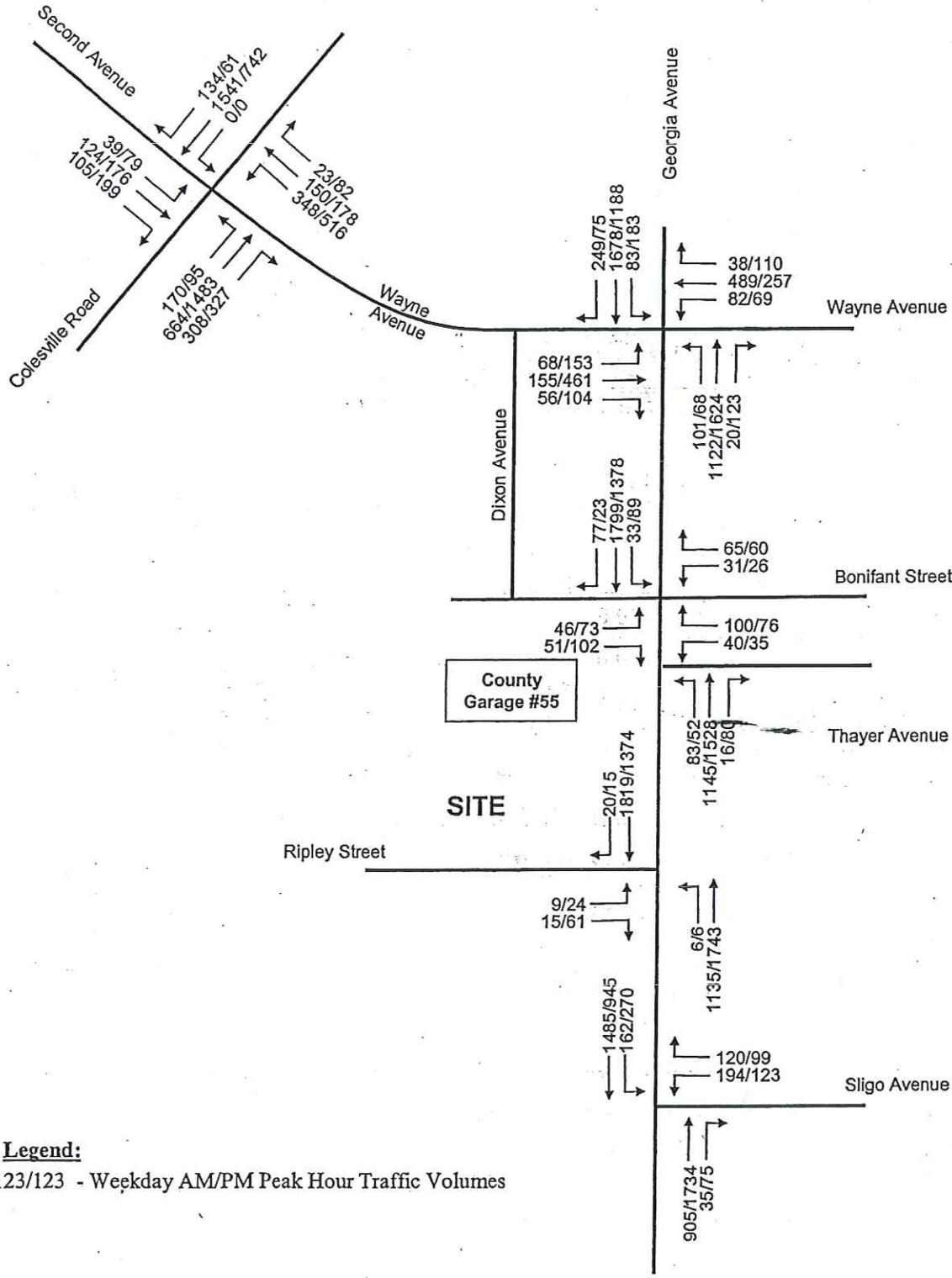
LOCATION Wayne Ave e. of Fenton St. DATE 12/18/08
 EVALUATION BY MJT REQUESTED BY _____

SL. NO	CRITERIA	Yes	NO	REMARKS
1	The pedestrian crossing volume is <u>not</u> caused by a correctable gap in the sidewalk system.	✓		Continuous sidewalks
2	Minimum distance of 300 feet to the nearest protected crossing (crossing controlled by stop signs or signal or grade separation).		✓	Fenton/Wayne int. 300 feet away and is signalized
3	Pedestrian trip generated by Schools, senior citizen facilities, community center, library, or other significant pedestrian generators.	✓		Library
4	Posted speed is 35mph or less. (Uncontrolled mid-block crosswalks are usually not recommended where 85 th percentile speed is > 40mph.)	✓		
5	The location shall have safe stopping sight distance. (see chart below)	✓		
6	25 pedestrians or (15 or more elderly and or children), during any two peak hours within 50 feet of the proposed crossing.	✓		Assumed
7	<u>Two-lane Roadway</u> ADT ≤ 12,000 vpd (Four-lane undivided roadways carrying more than 12,000vpd should not be considered)		✓	according to KHA future volumes (no county counts available) peak hr volumes 935 - AM, 1269 - PM.
8	Overhead lighting / ambient lighting	✓		
9	Presence of bus stops on either side of the roadway		✓	

Exceptions: (a) The crossing location is the designated school walking route plan.
 (b) A traffic Engineering study indicates a safety problem that can be addressed by a marked mid-block crosswalk.
 (c) If the crossing location connects an exiting extensively used Hiker/biker trail on either side of the roadway.
AASHTO STOPPING SIGHT DISTANCE REQUIREMENT (AASHTO 2004)

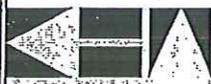
Classification/ Design Speed	SSD
20 mph	115 FT
25 mph	155 FT
30 mph	200 FT
35 mph	250 FT
40 mph	305 FT

9350
12699



County Garage #55

SITE



Kimley-Horn and Associates, Inc.

KHA Project # 110001001

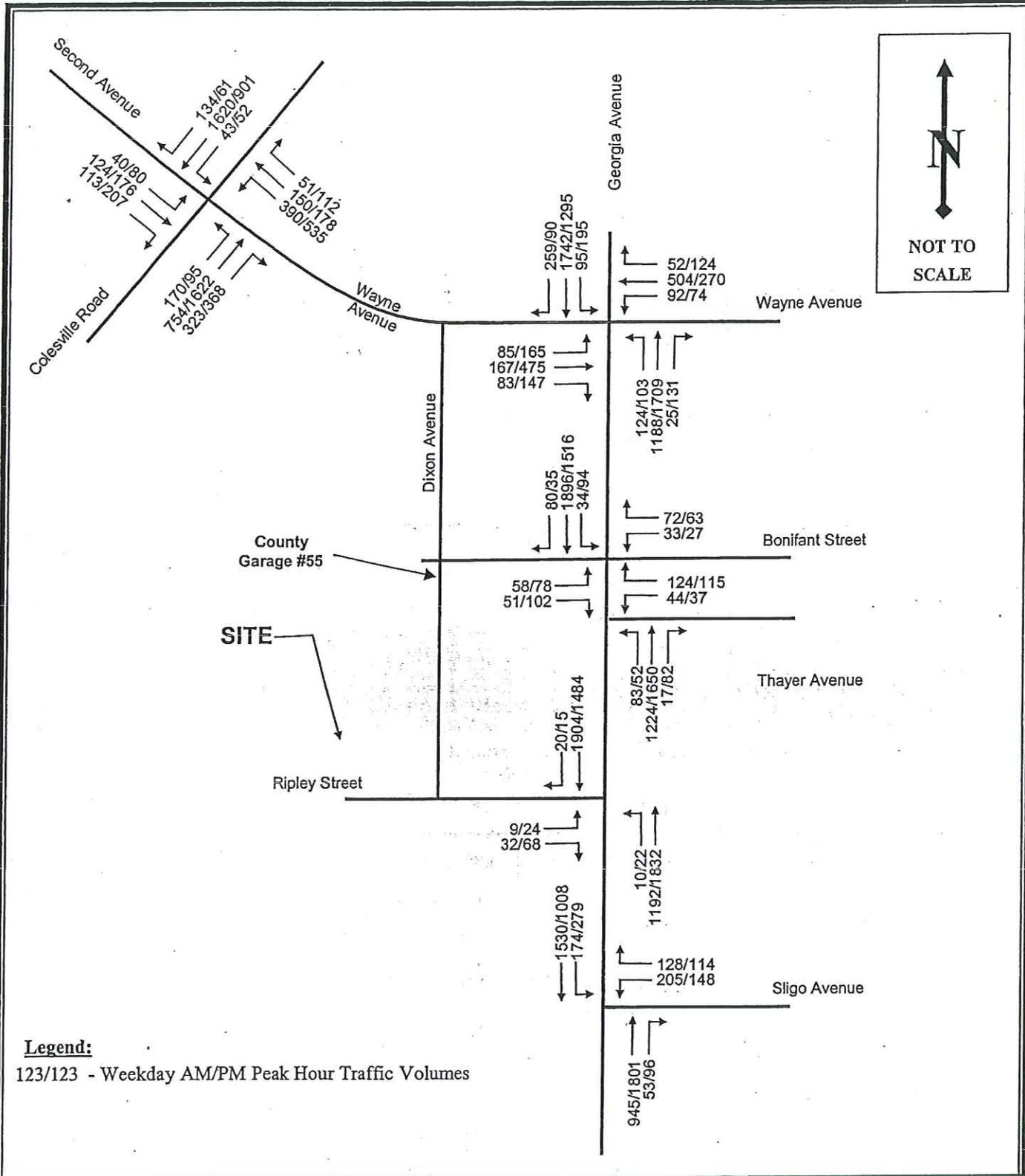
Existing Peak Hour Traffic Volumes

Midtown Silver Spring
Silver Spring, Maryland

Figure

3

Page 8



Total Future Peak Hour Traffic Volumes

Midtown Silver Spring
Silver Spring, Maryland

Figure
8



Address **926 Wayne Ave**

Address is approximate

Wayne Avenue between Fenton St and Georgia Ave

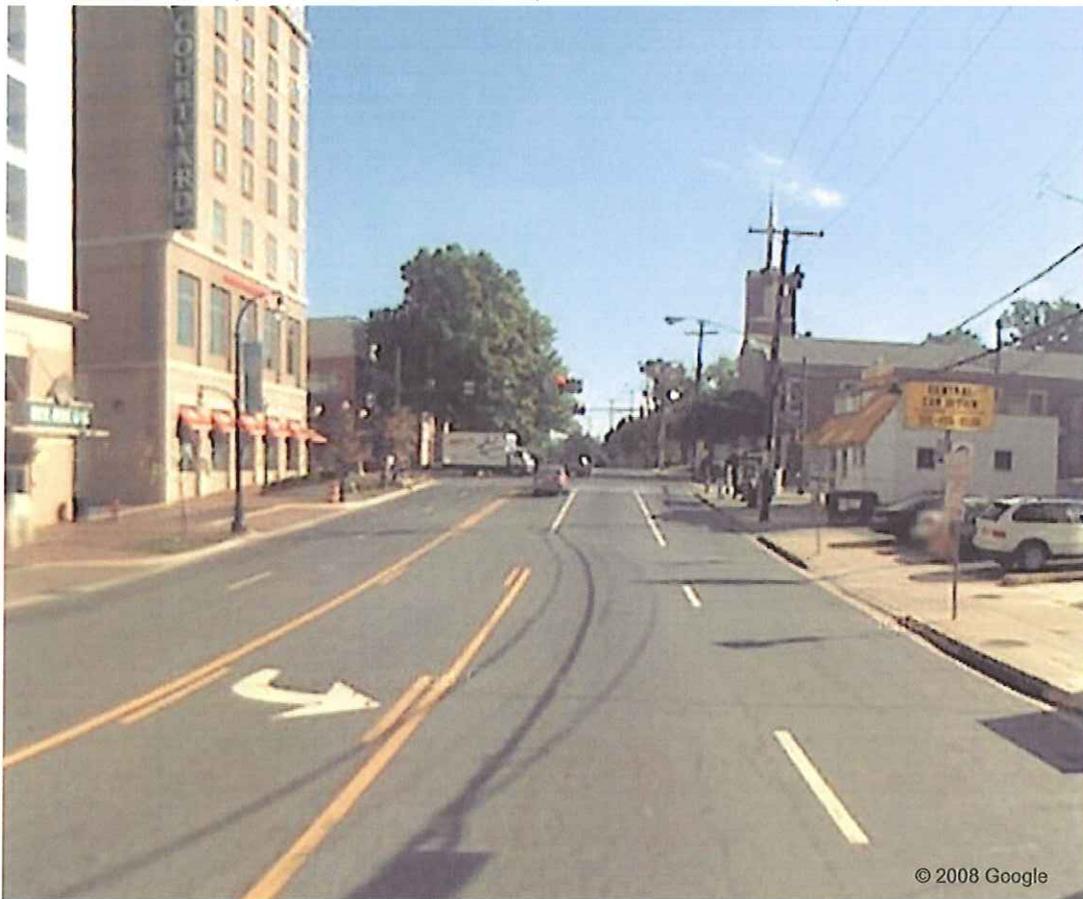




Address **926 Wayne Ave**

Address is approximate

Wayne Ave between Fenton St and Georgia Ave



© 2008 Google



Address **930 Wayne Ave**

Address is approximate

Wayne Ave looking towards Fenton St. at approximate site of proposed crosswalk



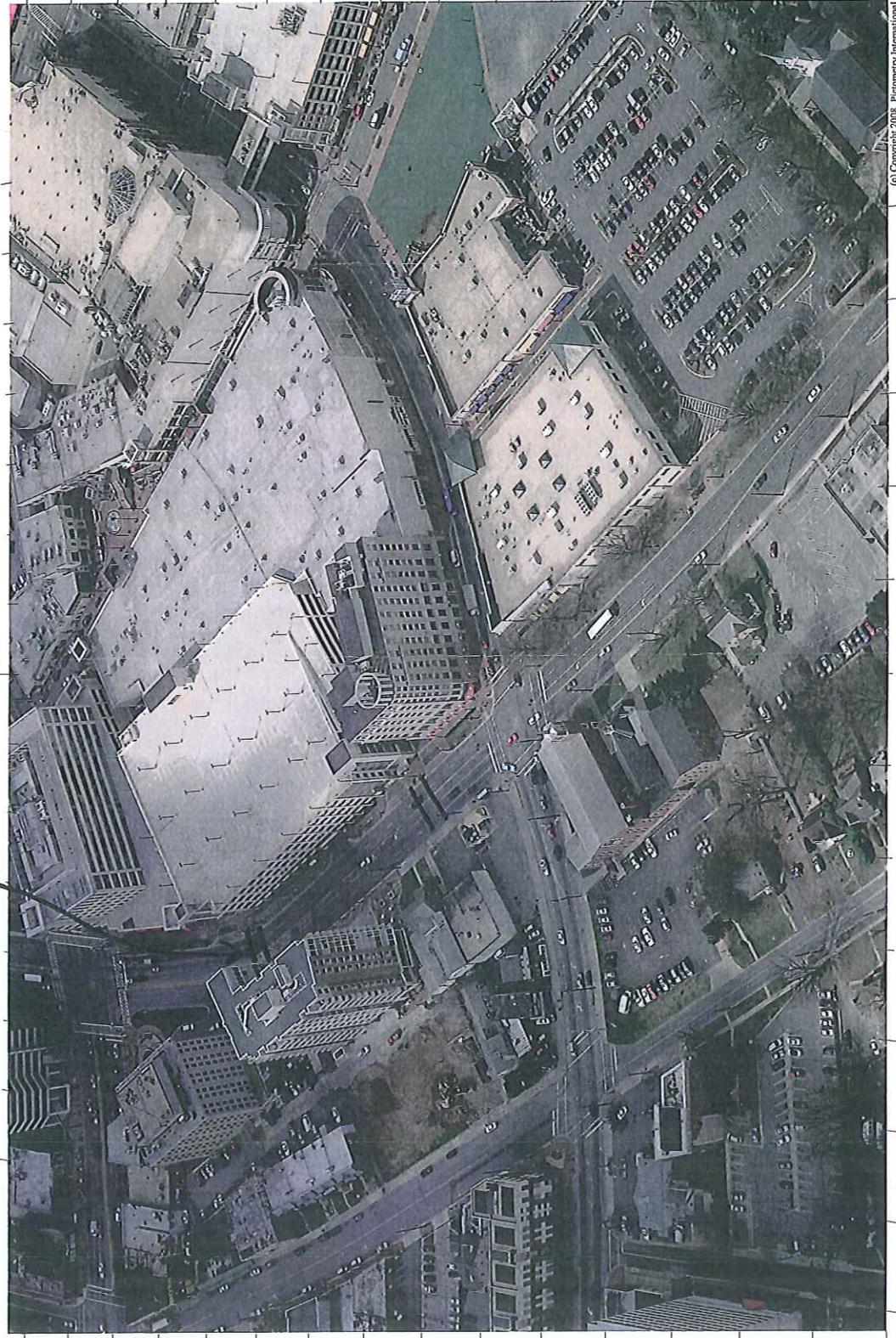


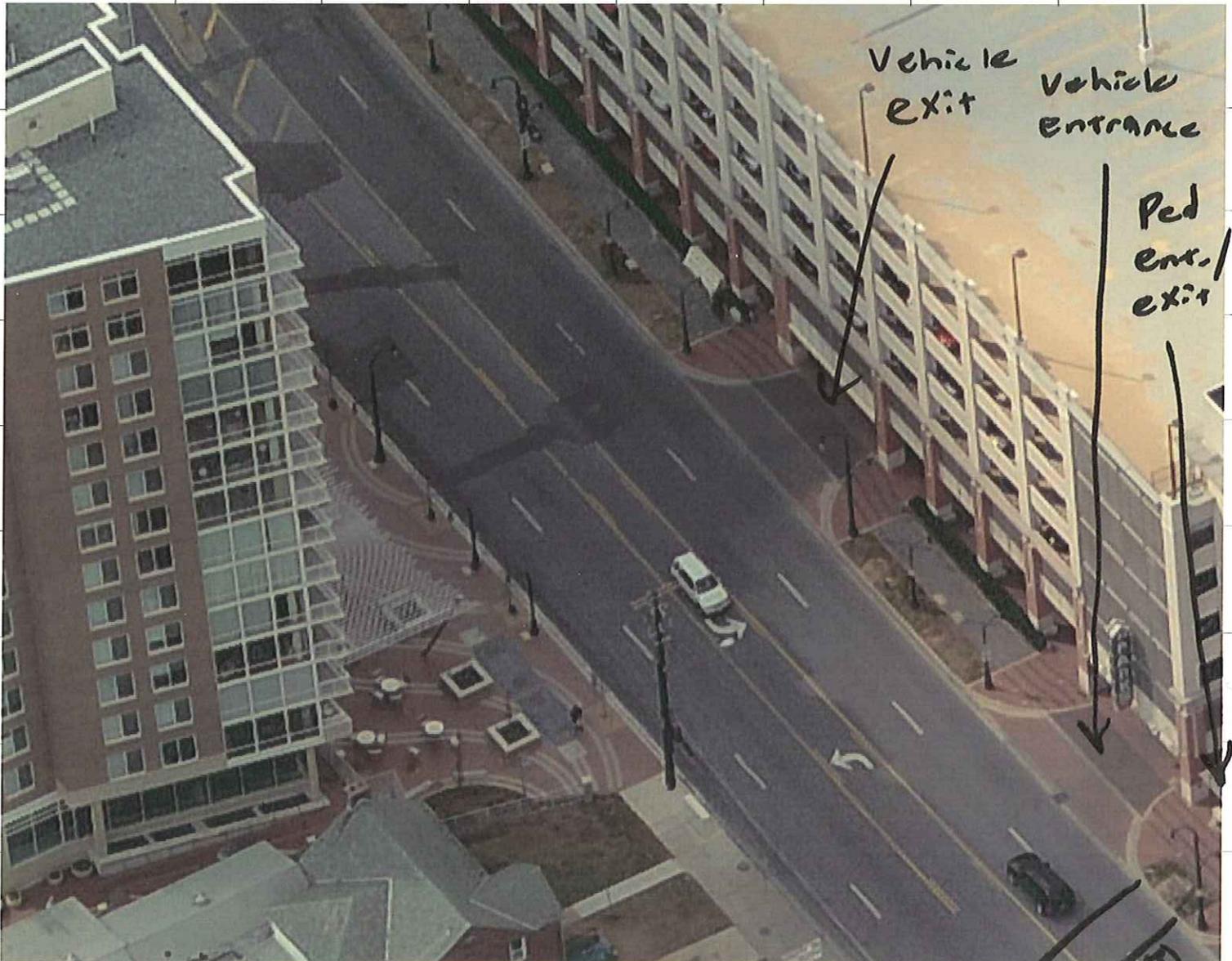
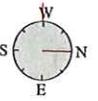
Fenton St. Ped - barrier



ALTERNATE LOCATION

—
—
approx.
size of
proposed
X-walk

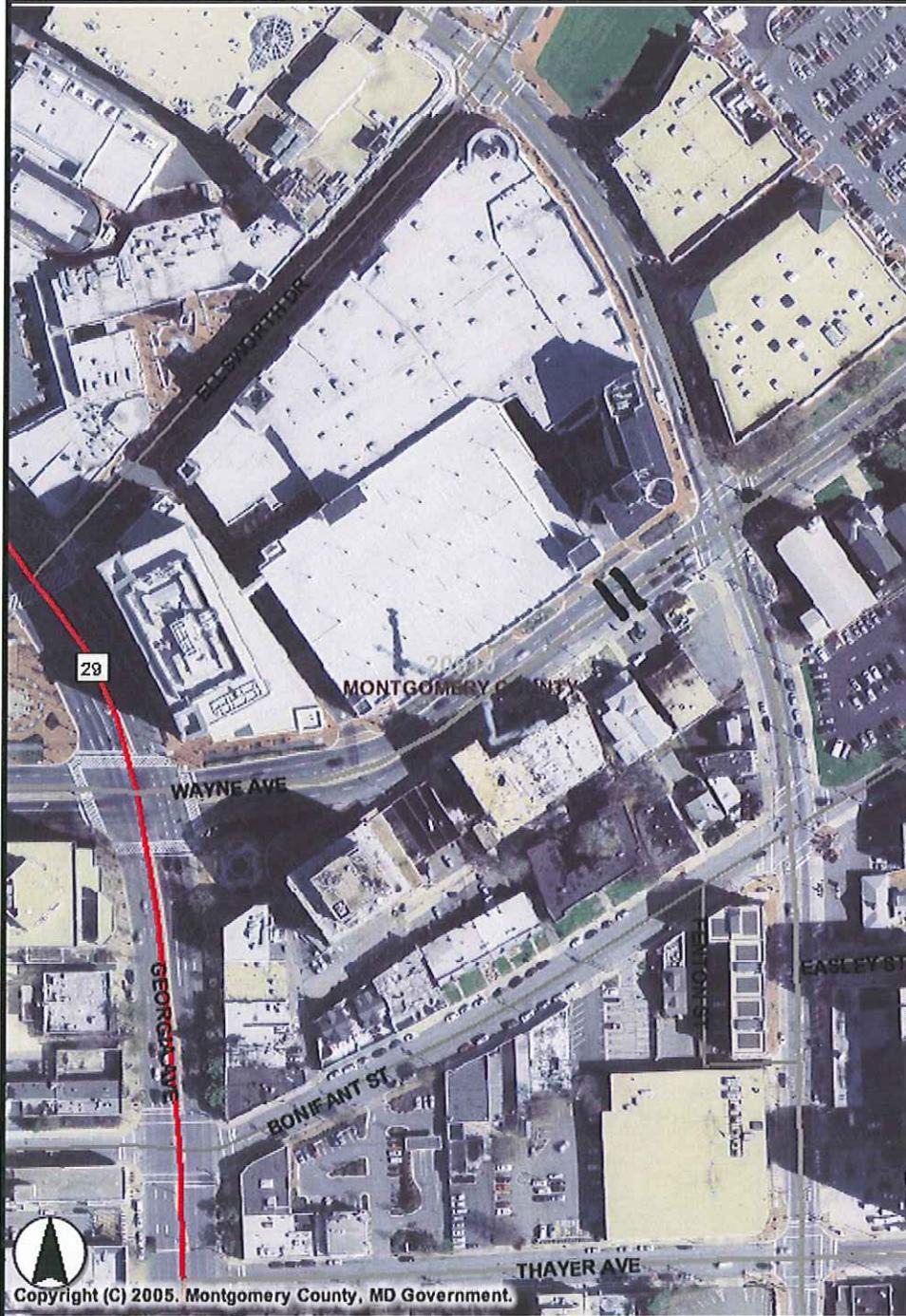




(c) Copyright 2008, Pictometry International

proposed
crosswalk

Wayne Avenue Crosswalk Site



Copyright (C) 2005. Montgomery County, MD Government.

Location Map

Overview Image Map

Map Legend

- County Boundary
- Zip Codes
- Street Names
- Scenic Routes
- Interstates
- Major Roads
- US and State Road
- County Roads
- Streets
- Out-of-County Streets
- Municipalities
- 2006 Orthophotos

== approx. site of prop. crosswalk

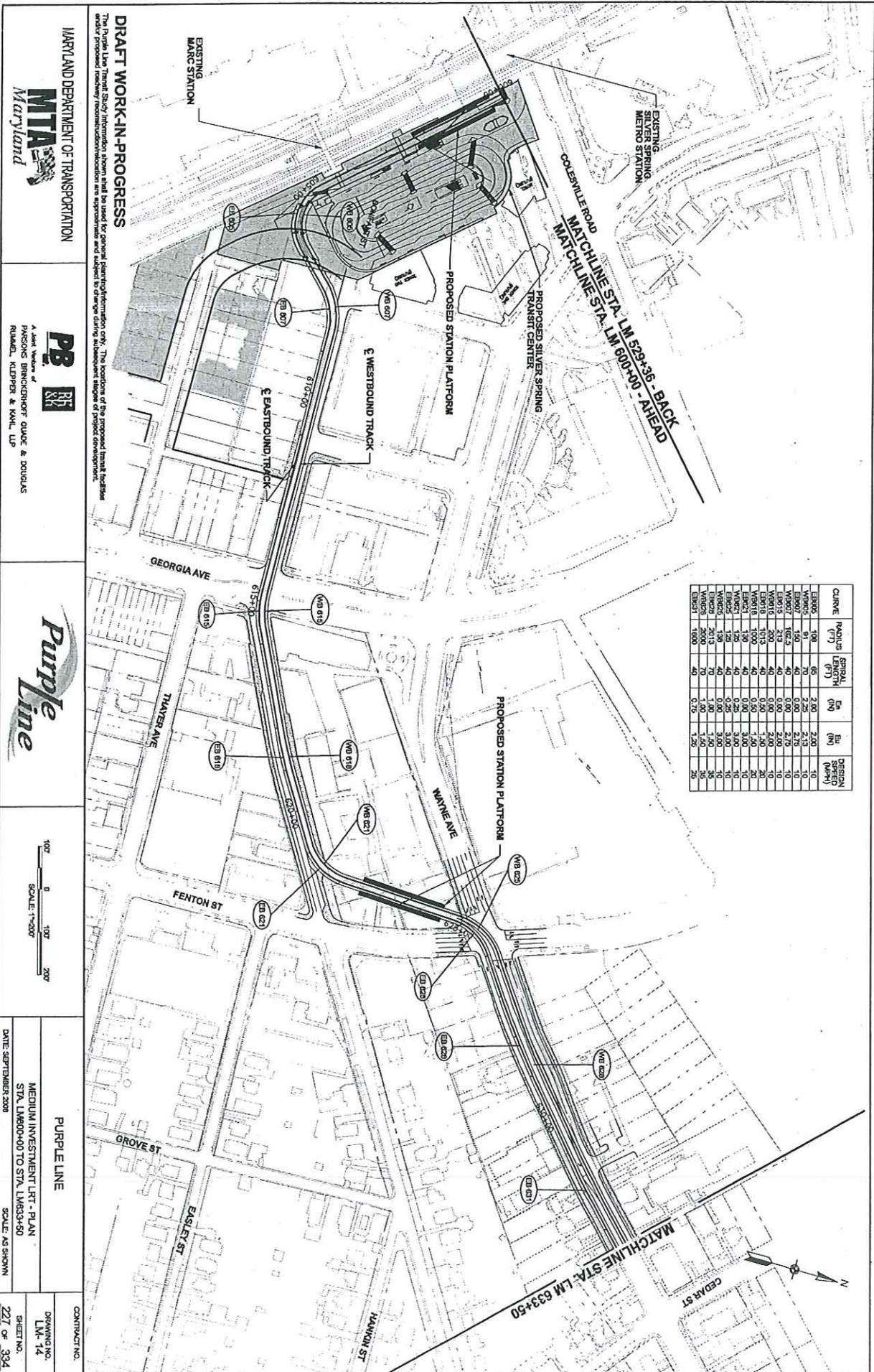


Map Source:
 Montgomery County, Maryland
 Department of Technology Services
 Geographic Information Systems
 Date: 12/29/2008
 Scale: 1 Inch = 201 Feet



Data Sources: Montgomery County DTS-GIS, Maryland National Capital Park and Planning Commission, U.S. Census Bureau, and Vargis, LLC. (Orthophotos).

DISCLAIMER: This is a product of the Montgomery County Government. The data presented on this map are believed to be accurate. However, the Montgomery County Government and its data suppliers do not guarantee and make no warranties for the accuracy of the data presented.



CURVE	RADIUS (FT)	GENERAL LENGTH (FT)	EA (M)	EB (M)	DESIGN SPEED (MPH)
EA000	500	45	2.00	2.00	10
EA001	51	70	2.25	2.15	10
EA002	162.5	40	0.00	2.75	10
EA003	213	40	0.00	2.00	10
EA004	200	40	0.00	2.00	10
EA005	1000	40	0.00	1.50	20
EA006	150	40	0.00	3.00	10
EA007	125	40	0.25	3.00	10
EA008	150	40	0.00	3.00	10
EA009	2013	70	1.00	1.50	35
EA010	2000	70	1.50	2.50	35
EA011	1000	40	0.00	1.25	25

DRAFT WORK-IN-PROGRESS

The Purple Line Transit Study information shown shall be used for general planning/information only. The location of the proposed transit facilities and/or proposed roadway reconstruction/indication are approximate and subject to change during subsequent stages of project development.

MARYLAND DEPARTMENT OF TRANSPORTATION

MTA
Maryland

PB **RR** **MM**

A joint venture of
 PASCOS BRONKHORST QUACK & BOUGAS
 RUMAL, KLEPPER & KHL, LP

Purple Line

100' 0 100' 200'
 SCALE: 1"=200'

PURPLE LINE

MEDIUM INVESTMENT LRT - PLAN
 STA. LM600+00 TO STA. LM633+50
 DATE: SEPTEMBER 2000
 SCALE: AS SHOWN

CONTRACT NO.
 DRAWING NO. LM-14
 SHEET NO. 227 OF 334