Traffic Analysis Memorandum
Oak Drive/Ridge Road Sidewalk and Bikeway Improvements

Introduction

The Montgomery County Department of Transportation is performing a Phase I Facility Planning Study to consider sidewalk and bikeway improvements for Ridge Road (MD 27) from Oak Drive (south intersection) to Bethesda Church Road and along Oak Drive, between its southern and northern intersections with MD 27. Although neither roadway capacity nor safety improvements are included in the scope of the study, a cursory-level traffic analysis has been performed and results are summarized herein.

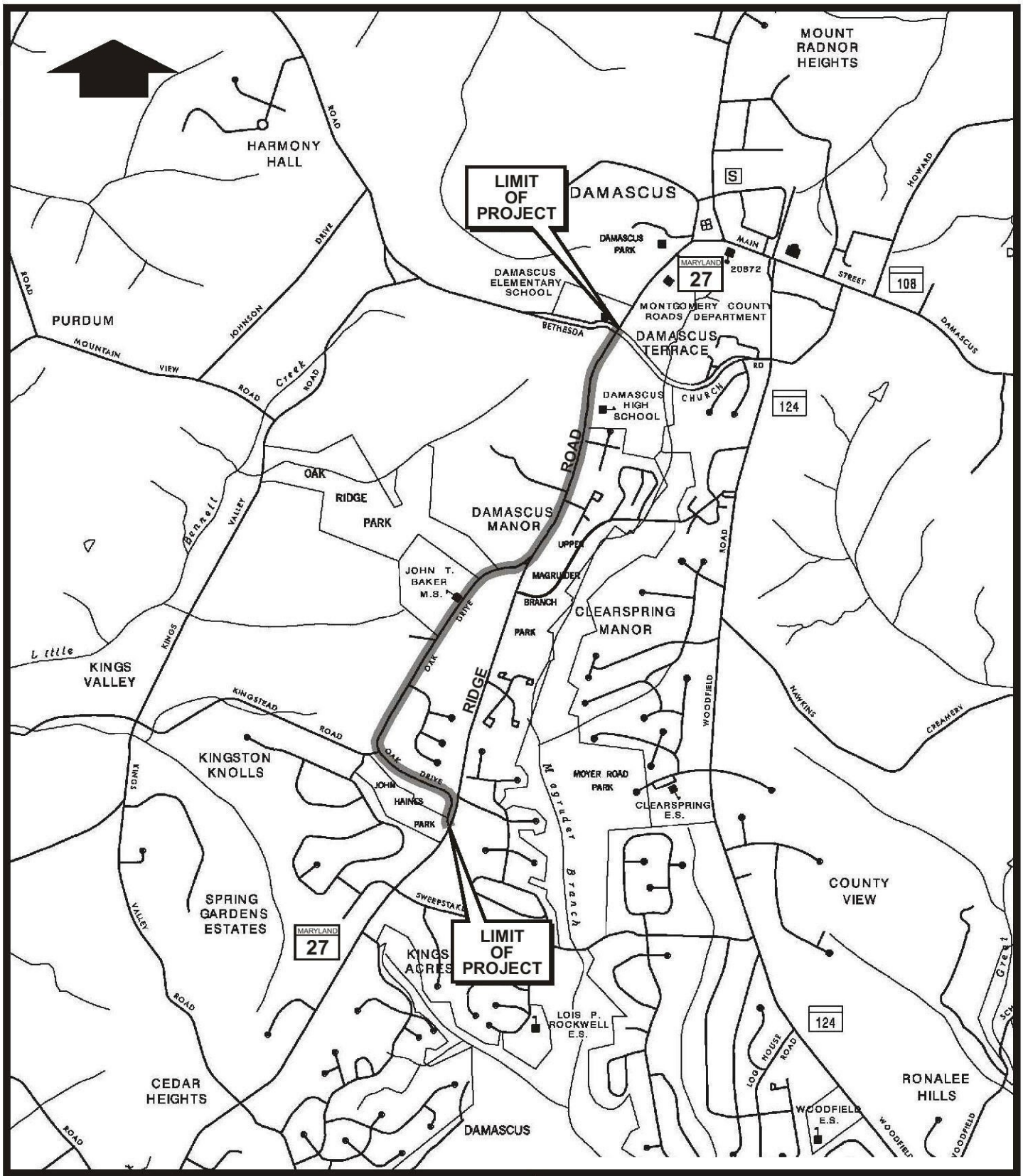
Vehicular Traffic Volumes and Levels of Service

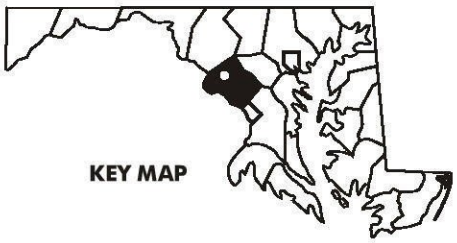
Existing traffic data, including vehicular and pedestrian volumes, was provided by Montgomery County DOT along Ridge Road (*See Figure 1*) and at the signalized intersections of Oak Drive (north intersection) and Bethesda Church Road. The turning movement and pedestrian breakdown reports provided were recorded in February 2006 and January 2008 at the Oak Drive (north intersection) and Bethesda Church Road intersections, respectively.

In addition, Annual Average Daily Traffic (AADT) was provided along the Ridge Road corridor for the year 2008. Data was monitored and collected at two stations along Ridge Road, one located 1.74 miles south of the southern project limit (Station B2701) and the other located at 0.32 mile north of the northern project limit (Station B2945). The average daily vehicle count at the southern monitoring station was 22,341 vehicles and 21,511 vehicles at the northern station.

The Critical Lane Volume Analysis (CLV) methodology was used to evaluate capacity for the intersections within the study area during the AM and PM peak hours. Performance measures of effectiveness include critical lane volume (CLV), volume-to-capacity ratio (V/C ratio), and Level of Service (LOS). The total CLV for each peak period is calculated by combining the critical lane volumes for the northbound/southbound (NB/SB) movements and eastbound/westbound (EB/WB) movements. The CLV indicates the highest volume for a given approach lane configuration in a given direction. The V/C ratio is the ratio of current flow rate to the capacity of the facility. This ratio is often used to determine how sufficient capacity is at a given intersection. A ratio of greater than 1.0 indicates that the facility is failing, as the number of vehicles exceeds the roadway capacity. The LOS is a letter designation that corresponds to a certain range of roadway operating conditions. The levels of service range from A to F, with an A indicating the best operating conditions and F indicating the worst, or a failing, operating condition. *(see Table 1)*

Fig1_LocMap.cdr





MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

OAK DRIVE / RIDGE ROAD (MD27)
SIDEWALK AND BIKEWAY IMPROVEMENTS
PHASE I FACILITY PLANNING STUDY

LOCATION MAP

DATE	SCALE IN FEET	FIGURE NO.
Sept. 2009	2000 0 2000	1

Table 1. Level of Service (LOS)/Critical Lane Volume (CLV)/Volume-to-Capacity Ratio (V/C) Thresholds

Level of Service	Critical Lane Volume	Volume to Capacity Ratio
A	≤1000	≤0.62
B	≤1150	≤0.72
C	≤1300	≤0.81
D	≤1450	≤0.91
E	≤1600	≤1.00
F	›1600	›1.00

Turning movements were counted at the signalized intersections of Oak Drive (north intersection) on February 7, 2006 and Bethesda Church Road on January 22, 2008. The results of the capacity analysis at study area intersections with existing traffic volumes are provided. *(see Table 2 and Figures)*

Table 2. Existing Intersection Capacity Analysis at the Intersections of Ridge Road (MD 27) and Oak Drive (north) and Bethesda Church Road, AM (PM)

Location	CLV	V/C Ratio	LOS
Ridge Road at Oak Drive (north intersection)	867 (1109)	0.54 (0.69)	A (B)
Ridge Road at Bethesda Church Road	886 (1039)	0.55 (0.65)	A (B)

Pedestrian traffic counted at the Oak Drive (north) intersection on February 7, 2006 from 6:00 am to 6:00 pm totaled 17 people. Pedestrian counts indicated that seven people approached the intersection between 7:00 and 9:00 AM and between 4:00 and 6:00 PM accounting for approximately 82 percent of the total 12-hour pedestrian traffic at this location. Approaching this intersection, sidewalks only exist on the northbound side of Ridge Road up to the intersection crosswalk and along the westbound side of Oak Drive.

The pedestrian movements at Bethesda Church Road were counted on January 22, 2008 between 6:00 AM and 6:00 PM. Analysis revealed 14 people approached the intersection with the majority of pedestrian movements occurring between 9:00 to 11:00 AM and 4:00 to 5:00 PM, totaling six and four pedestrians, respectively. At this location, 72% of the total 12-hour pedestrian volume occurred between those time periods. Approaching this location, sidewalks exist in all quadrants except along southbound Ridge Road, north and south of the intersection.

Safety Issues and Crash Data

A crash analysis was conducted based on data provided by the Montgomery County DOT, Traffic Engineering and Operations Section for a five-year period from January 1, 2003 to December 31, 2007 and compared to statewide average rates for the years 2005 through 2007. Crash data was analyzed along Ridge Road (MD 27) between the intersections of Oak Drive (south intersection) and Bethesda Church Road including Bloom Drive, Tralee Terrace, Valley Park Drive, Oak Drive (north intersection) and Damascus Manor Road.

Within the project limits along Ridge Road, the average accident rate was 142.8 accidents/100 million vehicle miles (acc/100 mvm), which is higher than the statewide accident rate of 105.94 acc/100 mvm for similar roadways. The accident rates for all categories of crashes, including opposite direction, rear end, left turn sideswipe, angle, single vehicle and other, were higher than the statewide average. Additionally, the average injury accident rate was 69.74 acc/100 mvm, which is higher than the statewide average of 47.93 acc/100 mvm.

Of the intersections analyzed for crashes along Ridge Road, 21% of all crashes occurred at Bethesda Church Road, 13% at Oak Drive (north intersection), 11% at Oak Drive (south intersection), 8% at Tralee Terrace, Valley Park Drive and Sunset Drive and 5% occurred at Damascus Manor Road during the study period. The most prevalent crash type in the study area is rear-end, accounting for nearly 37% of all collisions, followed by left-turn (over 15%), single vehicle (over 13%) and right angle (over 10%) collisions.

There were two pedestrian-related crashes with injuries, but no fatalities, reported in the study area. One pedestrian-related crash occurred at the intersection of Tralee Terrace and one occurred south of the intersection with Bloom Drive. There were no reported bicycle-related crashes.

The most commonly cited probable cause of crashes at the study intersections was failure to give full attention (48%), followed by failure to yield right-of-way (22%), influence of alcohol and drugs, following too closely and failure to obey traffic controls (under 4% each) and too fast for conditions and failure to keep right of center (over 2%).

Fig3.cdr

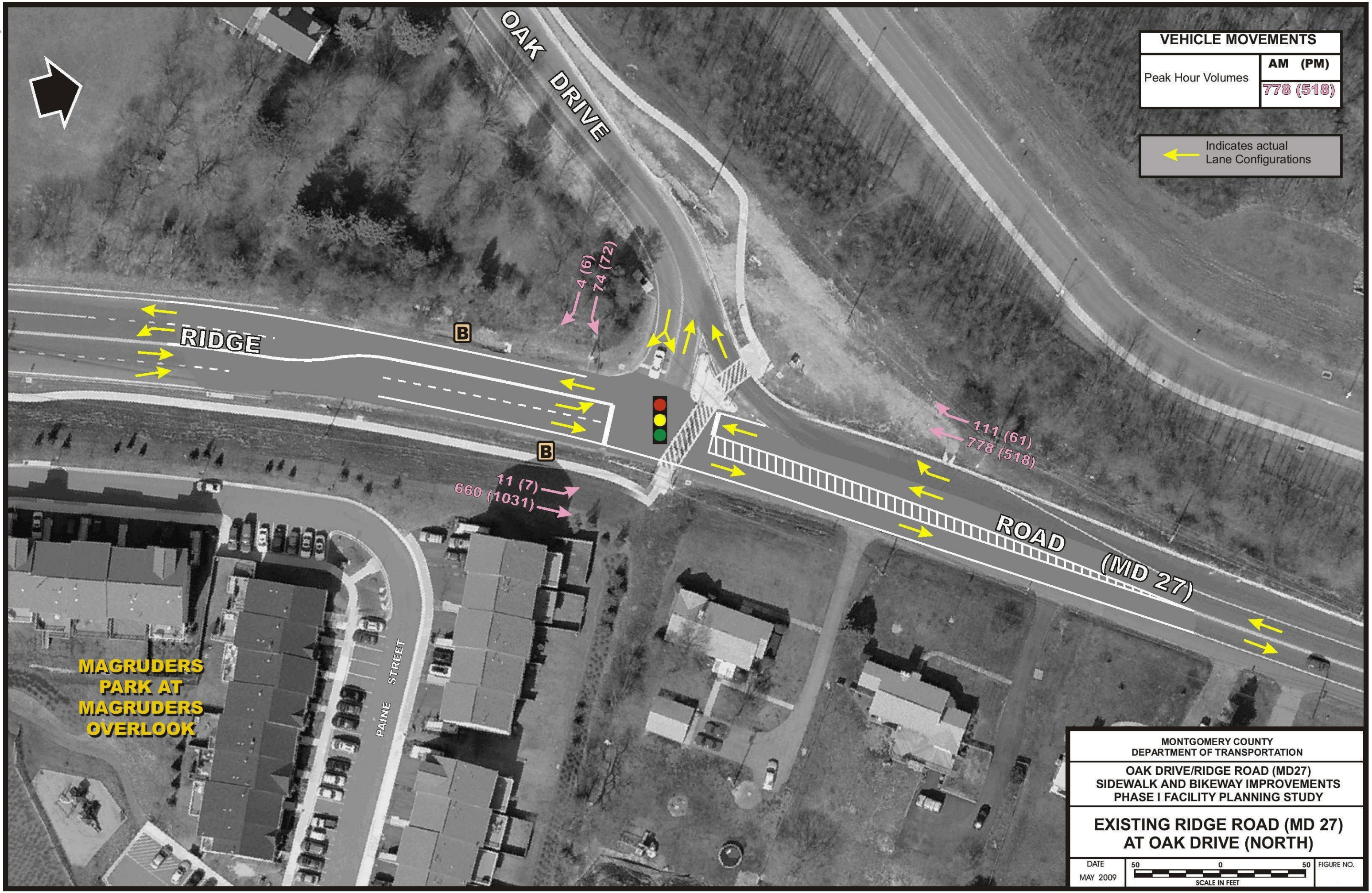
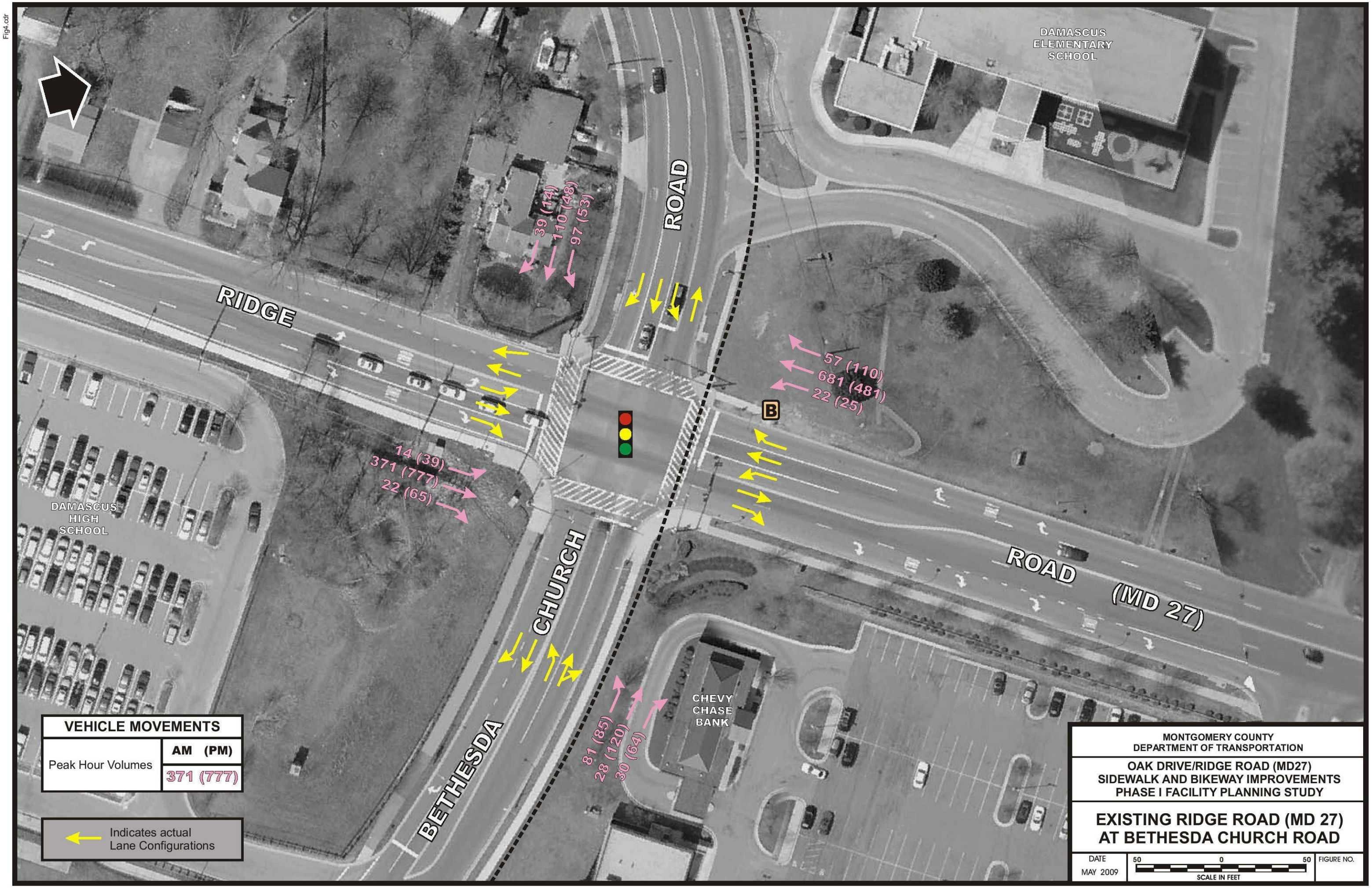

OAK DRIVE
RIDGE
ROAD (MD 27)
PAINE STREET
MAGRUDERS PARK AT MAGRUDERS OVERLOOK
B
B
4 (6)
74 (72)
11 (7)
660 (1031)
111 (61)
778 (518)
VEHICLE MOVEMENTS
Peak Hour Volumes
AM (PM)
778 (518)
Indicates actual Lane Configurations
MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
OAK DRIVE/RIDGE ROAD (MD27)
SIDEWALK AND BIKEWAY IMPROVEMENTS
PHASE I FACILITY PLANNING STUDY
EXISTING RIDGE ROAD (MD 27)
AT OAK DRIVE (NORTH)
DATE
MAY 2009
50 0 50
SCALE IN FEET
FIGURE NO.

Fig4.cdr



VEHICLE MOVEMENTS	
	AM (PM)
Peak Hour Volumes	371 (777)

Indicates actual Lane Configurations

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

OAK DRIVE/RIDGE ROAD (MD27)
SIDEWALK AND BIKEWAY IMPROVEMENTS
PHASE I FACILITY PLANNING STUDY

EXISTING RIDGE ROAD (MD 27) AT BETHESDA CHURCH ROAD

DATE
MAY 2009

50 0 50
SCALE IN FEET

FIGURE NO.