

# TMS Engineers, Inc.

## Transportation Management Services

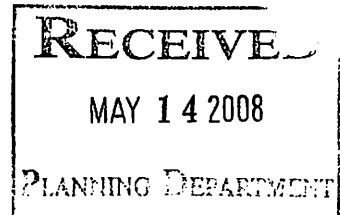
4547 Hudson Drive · Stow, Ohio 44224

www.TMSEngineers.com

January 7, 2008

Mr. Peter Zwick, P.E., P.S.  
Zwick & Associates, Inc.  
8750 Stearns Road  
Olmsted Falls, Ohio 44138

Re: Proposed Residential Development  
Biddoulph Trail



Dear Peter:

This letter is a follow-up to our report on the expected traffic impacts for the proposed residential sub-division development to be constructed south of Butternut Ridge Road just west of Columbia Road (S.R. 252) in North Olmsted, Ohio. The proposed development is expected to have 29 single family homes on a cul-de-sac that will access to Butternut Ridge Road.

Our analysis indicated that due to the substantially low predicted trip generation numbers, the development traffic will have a negligible impact on the adjacent street system and a full traffic impact study is not necessary.

Based on the trip generation analysis described above, the following table shows the estimated generated traffic during the peak hours for a residential subdivision of the same size as proposed based upon national averages.

ESTIMATED GENERATED TRAFFIC					
Single Family Detached Housing ITE Land Use 210					
AM WEEKDAY PEAK HOUR			PM WEEKDAY PEAK HOUR		
IN	OUT	TOTAL	IN	OUT	TOTAL
7	22	29	22	13	35

The above table shows that the driveway volume is less than 100 trips per hour in both the AM and PM peak hours. It is our opinion when the traffic volumes that are at this level, the development traffic will not require dedicated deceleration lanes to be installed on Butternut Ridge Road. We are confident that a intersection capacity analysis or warrant evaluations from the Ohio Department of Transportation will indicate that these lanes will not be justified.

Mr. Peter Zwick, P.E., P.S.

January 7, 2008

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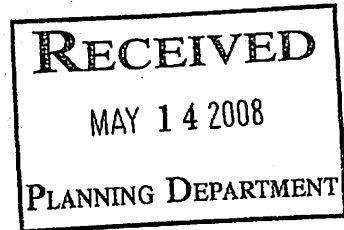
If you have any questions or need additional information, please contact me.

Very truly yours,

**TMS Engineers, Inc.**



Michael W. Schweickart, P.E., PTOE  
President



# TMS Engineers, Inc.

## Transportation Management Services

4547 Hudson Drive ~ Stow, Ohio 44224

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October 16, 2007

Mr. Peter Zwick, P.E., P.S.  
Zwick & Associates, Inc.  
8750 Stearns Road  
Olmsted Falls, Ohio 44138

Re: Trip Generation Analysis  
Proposed Residential Development  
Biddoulph Trail

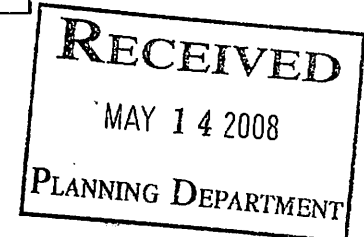
Dear Peter:

I performed the following trip generation analysis for the proposed residential sub-division development to be constructed south of Butternut Ridge Road just west of Columbia Road (S.R. 252) in North Olmsted, Ohio (see Location Map, Figure 1). The proposed development will have 29 single family homes on a cul-de-sac that will access to Butternut Ridge Road.

The calculation of future traffic requires an estimate of traffic the development will generate after construction. This estimate is typically expressed as a trip rate. In order to estimate traffic for the proposed development, a trip rate was calculated using data and procedures found in the Institute of Transportation Engineers (ITE) "Trip Generation" Manual, Seventh Edition. A copy of my trip generation worksheet is attached.

Based on the trip generation analysis described above, the following table shows the estimated generated traffic during the peak hours for a residential subdivision of the same size as proposed based upon national averages.

ESTIMATED GENERATED TRAFFIC					
Single Family Detached Housing ITE Land Use 210					
AM WEEKDAY PEAK HOUR			PM WEEKDAY PEAK HOUR		
IN	OUT	TOTAL	IN	OUT	TOTAL
7	22	29	22	13	35



Mr. Peter Zwick, P.E., P.S.

October 16, 2007

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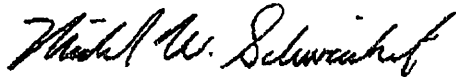
The above table shows that the driveway volume is less than 100 trips per hour in both the AM and PM peak hours. It is our opinion when the traffic volumes that are at this level, the development traffic will not have an impact on the surrounding street network system. This opinion is based upon the fact that traffic impact studies are recommended to be performed by the **Institute of Transportation Engineers** whenever the trip generation in any peak hour is greater than 100 trips per hour. This recommendation is made because this is the point where a change in roadway capacity may be found and mitigation may or may not be needed. Since this development is expected to generate less than the minimum of 100 trips per hour, it is my professional opinion that a full traffic impact study is not necessary. The Ohio Department of Transportation also concedes that traffic impact studies are unnecessary when the trip generation is less than 100 trips per hour. This is stated in their **State Highway Access Management Manual**.

It is also our opinion that traffic signal control for the intersection of Butternut Ridge Road and the development access street is not necessary to handle the additional traffic. Traffic signal control cannot be installed unless one of the criteria from the **Ohio Manual of Uniform Traffic Control Devices** is met. This is dictated by the **Ohio Revised Code**. Traffic signal control could be justified if the traffic volume were to equal 150 vehicles per hour for eight hours exiting from the development to Butternut Ridge Road. This development will not generate enough traffic to meet this requirement.

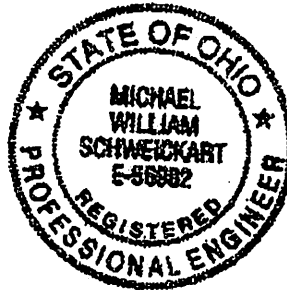
If you have any questions or need additional information, please contact me.

Very truly yours,

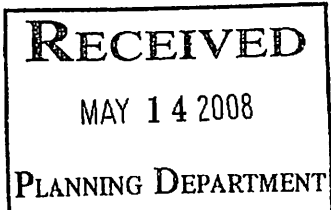
**TMS Engineers, Inc.**



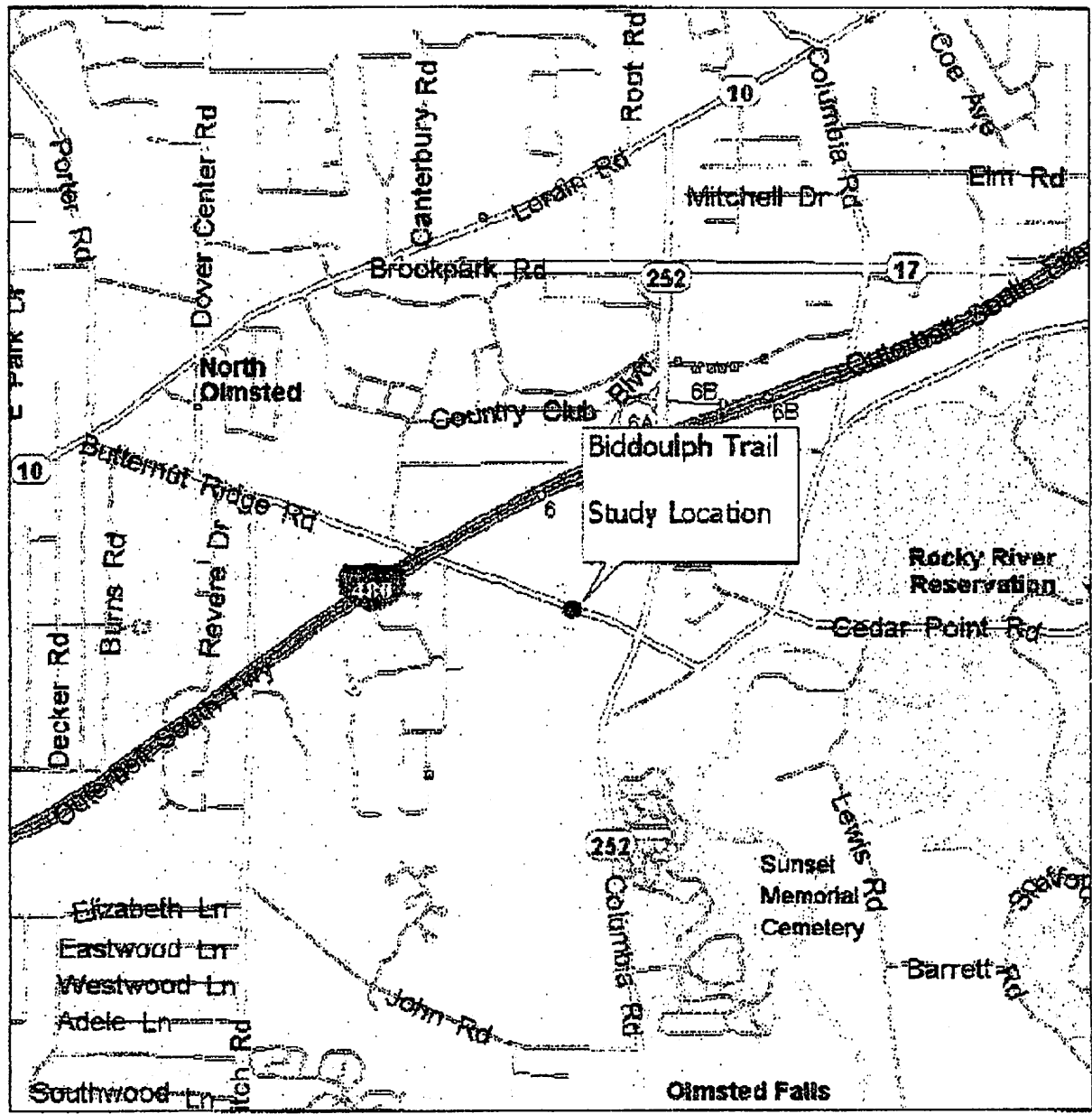
Michael W. Schweickart, P.E., P.T.O.E.  
President



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LOCATION MAP

FIG. NO.:	1
PAGE NO.:	3

Biddoulph Trail, North Olmsted, Ohio  
 Summary of Trip Generation Calculation  
 For 29 Dwelling Units of Single Family Detached Housing  
 October 16, 2007

	Average Rate	Standard Deviation	Adjustment Factor	Driveway Volume
Avg. Weekday 2-Way Volume	11.48	0.00	1.00	333
7-9 AM Peak Hour Enter	0.26	0.00	1.00	7
7-9 AM Peak Hour Exit	0.77	0.00	1.00	22
7-9 AM Peak Hour Total	1.03	0.00	1.00	30
4-6 PM Peak Hour Enter	0.76	0.00	1.00	22
4-6 PM Peak Hour Exit	0.45	0.00	1.00	13
4-6 PM Peak Hour Total	1.21	0.00	1.00	35
Saturday 2-Way Volume	11.34	0.00	1.00	329
Saturday Peak Hour Enter	0.68	0.00	1.00	20
Saturday Peak Hour Exit	0.58	0.00	1.00	17
Saturday Peak Hour Total	1.27	0.00	1.00	37

Note: A zero indicates no data available.  
 The above rates were calculated from these equations:

24-Hr. 2-Way Volume:  $LN(T) = .92LN(X) + 2.71, R^2 = 0.96$   
 7-9 AM Peak Hr. Total:  $T = .7(X) + 9.43$   
 $R^2 = 0.89, 0.25$  Enter, 0.75 Exit  
 4-6 PM Peak Hr. Total:  $LN(T) = .91LN(X) + .53$   
 $R^2 = 0.91, 0.63$  Enter, 0.37 Exit  
 AM Gen Pk Hr. Total:  $T = .7(X) + 12.05$   
 $R^2 = 0.89, 0.26$  Enter, 0.74 Exit  
 PM Gen Pk Hr. Total:  $LN(T) = .89LN(X) + .61$   
 $R^2 = 0.91, 0.64$  Enter, 0.36 Exit  
 Sat. 2-Way Volume:  $LN(T) = .94LN(X) + 2.63, R^2 = 0.93$   
 Sat. Pk Hr. Total:  $T = .89(X) + 10.93$   
 $R^2 = 0.9, 0.54$  Enter, 0.46 Exit  
 Sun. 2-Way Volume:  $T = 8.83(X) + -9.76, R^2 = 0.94$   
 Sun. Pk Hr. Total:  $LN(T) = .89LN(X) + .44$   
 $R^2 = 0.88, 0.53$  Enter, 0.47 Exit

Source: Institute of Transportation Engineers  
 Trip Generation, 7th Edition, 2003.

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