

Greater Hayden Run Village Traffic Study Summary of Davidson Road Traffic Data May 25, 2005

Pertinent Background Information

For the purpose of this study, the Greater Hayden Run Village area consists of four subdivisions in northwest Hilliard: Hayden Run Village, Brixston, Fox Hollow, and Hilliard Estates. The boundaries of these subdivisions define the study area for the traffic study being undertaken.

Davidson Road provides the primary means of ingress and egress for residents of the Greater Hayden Run Village area from the adjacent arterial street network. Homes front directly onto Davidson Road. The speed limit on Davidson Road west of Avery Road is 25 mph. The speed limit on Davidson Road east of Avery Road is 35 mph.

Davidson Road is listed in the City of Hilliard Thoroughfare Plan. Between Leppert Road and Avery Road, Davidson Road is defined as a Network Collector street; east of Avery Road, Davidson Road is defined as a Minor Arterial street.

Normally, neighborhood collector streets do not appear on the Thoroughfare Plan, and the neighborhood streets are designed to discourage through movement of traffic. Because of the fact that the primary collector street of the subdivision is also an extension of a minor arterial street, a conflict between the needs of the traveling public and the needs of the residential property owners exists.

The presence of cut-through traffic (non-local traffic with neither destinations nor origins within the subdivisions) on Davidson Road is not new. However, when the Avery Road/Hayden Run Road intersection was closed for reconstruction in April 2005 the situation was exacerbated.

Purpose of the Study

The purpose of the Greater Hayden Run Village Traffic Study is to evaluate the volume and speed of traffic on various streets within the neighborhoods, determine problem locations, and evaluate solutions to problem locations. Solutions may include target enforcement, community education/outreach, improved signage or pavement marking, or the installation of physical traffic calming devices.

The collection and summarization of traffic data on Davidson Road, which is presented herein, is only the beginning of the study process. A task force, consisting of police and fire safety officials, engineers, school transportation officials, elected officials, and designated neighborhood volunteers, will be formed in order to get input from all affected groups and individuals as the study progresses.

Definitions

In order to better understand the technical data presented in this study, it is important to define commonly used terminology.

The *85th percentile speed* is the speed below which 85 percent of vehicles traveled. The 85th percentile speed usually represents the maximum reasonable speed for the traffic and is often used in determining speed limits.

The *10 mph pace speed* represents the 10-mph range in which the highest percentage of vehicles were recorded.

The *mean (average) speed* is obtained by dividing the sum of all the speeds in the sample by the number of vehicles in the sample.

Methods and Equipment Used In Collecting Traffic Data

There are various methods used to collect traffic data. The data collected is only as accurate as the tools used to collect it; therefore, it is important to understand the limitations of various methods/sources of data collection before conclusions are drawn from it.

Manual volume counts use personnel to count the number or classification of vehicles. *Manual spot speed studies* generally use unmarked (non-police) personnel and radar devices to obtain spot speeds of passing vehicles. Due to human factors, as the length of time counted and the volume of vehicles on the roadway increases, the accuracy of the data collected generally decreases.

Automatic counters can be used to collect data for an extended period of time. The City of Hilliard owns four automatic counters that use road tubes connected to a computerized data collection device to record volumes and speeds. Volumes and speeds recorded using road tubes are fairly accurate, but they do have limitations in their use. Vehicles must cross tubes perpendicularly to accurately record volumes and speeds; therefore, placing the tubes away from driveways, intersections, or curved sections of roadway improves the accuracy of the data collected. Excessively high speeds are recorded by the counting devices when two vehicles simultaneously cross the tubes in opposite directions or when the counting devices are vibrated, bumped, or abruptly moved. Parking, stopping, or driving excessively slow on top of the road tubes alters, and in some cases invalidates, the data. For these reasons, data collection using road tubes within residential subdivisions should be evaluated carefully.

The City of Hilliard Police Department has a speed trailer, which displays a vehicle's speed as it passes the trailer unit. This device is an excellent tool used by the police department to educate the public and, in some cases, reduce speeds of the conscientious driver; however, this unit is not a good source for traffic data collection. The method used to count and record speeds (stationary radar) is not accurate for the

purpose of engineering studies, and the fact that the unit is labeled “Hilliard Police” may alter the driving behavior of motorists. The purpose of engineering data collection is to collect data that best represents normal driving patterns, not those altered due to the presence of law enforcement personnel or equipment. For these reasons, data collected through the use of police speed trailers or radar collected by a uniformed officer in a patrol car is not used in speed studies.

Previous Data Collected

In October 1999, a manual volume count and spot speed study was conducted on Davidson Road near Brixston Court by use of radar in an unmarked City vehicle. Speeds were collected between the hours of 7:00 AM – 9:00 AM, 11:00 AM – 1:00 PM, and 3:00 PM – 5:00 PM. During these times, the 85th percentile speed was calculated to be 30 mph. Average Daily Traffic (ADT) volumes were not collected as part of this study.

In March 2000, traffic volume data was collected using automatic counters throughout the City as part of the development of the Thoroughfare Plan. Speed data was not collected as part of this study. Three counts were taken on Davidson Road between Leppert Road and Avery Road. The results are summarized below:

<u>Location</u>	<u>ADT (veh/day)</u>
East of Leppert Road	1878
West of Leybourne Road	2528
West of Avery Road	3600

April/May 2005 Data Collected

The week after the Avery Road/Hayden Run Road intersection was closed for reconstruction by the Franklin County Engineer’s Office, volume and speed data was collected by the City of Hilliard through the use of automatic road tube counting devices. Data was collected between Friday, April 29, 2005 and Thursday, May 5, 2005 at four different locations. The four locations are as follows:

- Location 1: 5672 Davidson Road, between Leppert Road and Brixshire Drive
- Location 2: 5524 Davidson Road, between Brixston Court and Brixston Drive
- Location 3: 5408 Davidson Road, between Leybourne Road and Stonehill Street
- Location 4: 5314 Davidson Road, between Wallington Drive and Drayton Road

On Friday, May 6, 2005, three large portable changeable message signs were erected at the intersections of Davidson Road/Avery Road, Davidson Road/Leppert Road, and Avery Road/Wallington Drive. The signs read “TARGET ENFORCEMENT AREA – SPEED LIMIT 25 MPH STRICTLY ENFORCED”. After these signs were erected, speed and volume data was collected again at the same locations to determine whether or not the signage had an effect on driver behavior. The second set of data was collected between Wednesday, May 11, 2005 and Tuesday, May 17, 2005.

A summary of the data collected at each location is shown below.

Location 1 – Davidson Road between Leppert Road and Brixshire Drive

	4/29/05 – 5/5/05 <u>Before Signage</u>	5/11/05 - 5/17/05 <u>After Signage</u>
Average Daily Traffic (2-way)	5360 vpd	5585 vpd
85 th Percentile Speed	30 mph	29 mph
10 mph Pace Speed	21 - 30 mph	21 – 30 mph
Percent in Pace	48.4%	86.5%
Percent > 30 mph	12.0%	6.3%
Mean (Average) Speed	20 mph	25 mph

Location 2 – Davidson Road between Brixston Court and Brixston Drive

	4/29/05 – 5/5/05 <u>Before Signage</u>	5/11/05 - 5/17/05 <u>After Signage</u>
Average Daily Traffic (2-way)	5590 vpd	5720 vpd
85 th Percentile Speed	30 mph	29 mph
10 mph Pace Speed	21 - 30 mph	21 – 30 mph
Percent in Pace	88.1%	91.7%
Percent > 30 mph	7.7%	3.3%
Mean (Average) Speed	26 mph	25 mph

Location 3 – Davidson Road between Leybourne Road and Stonehill Street

	4/29/05 – 5/5/05 <u>Before Signage</u>	5/11/05 - 5/17/05 <u>After Signage</u>
Average Daily Traffic (2-way)	5240 vpd	6180 vpd
85 th Percentile Speed	30 mph	30 mph
10 mph Pace Speed	21 - 30 mph	21 – 30 mph
Percent in Pace	78.4%	86.4%
Percent > 30 mph	14.8%	6.6%
Mean (Average) Speed	27 mph	25 mph

Location 4 – Davidson Road between Wallington Drive and Drayton Road

	4/29/05 – 5/5/05 <u>Before Signage</u>	5/11/05 - 5/17/05 <u>After Signage</u>
Average Daily Traffic (2-way)	5805 vpd	6825 vpd
85 th Percentile Speed	31 mph	30 mph
10 mph Pace Speed	21 - 30 mph	21 – 30 mph
Percent in Pace	74.6%	87.0%
Percent > 30 mph	16.1%	8.6%
Mean (Average) Speed	26 mph	26 mph

Conclusions

In comparing the 1999 and 2000 data with the data obtained in April/May 2005, the following conclusions can be drawn:

- The volume of traffic on Davidson Road has increased significantly. In some locations, traffic volumes have more than doubled in five years. This cannot all be attributed to the closure of the Avery Road/Hayden Run Road intersection. Much of the western portions of Hilliard have experienced significant growth in the early 2000's, including the development of Weston Trail, Hoffman Farms, the Estates at Hoffman Farms, and even developments removed from the area such as Lakewood. Since the Greater Hayden Run Village subdivisions were fully developed prior to the 2000's, the increased traffic volumes on Davidson Road are probably not caused by growth or development within these neighborhoods. Therefore, the increased traffic volumes likely are caused by a combination of external factors. Regardless of whether the increase is due to the closure of Avery Road/Hayden Run Road or whether it is due to the growth of portions of western Hilliard, it is likely that Davidson Road carries a large percentage of cut-through traffic.
- While the volume of traffic has increased significantly, the speed of traffic has not. The 85th percentile speed of 30 mph calculated in 1999 is consistent with the 85th percentile speed calculated in 2005.

In comparing the 2005 data before and after the large portable changeable message signs were erected indicating a target enforcement area, the following conclusions can be drawn:

- The large signs appeared to have a minor effect on 85th percentile speeds and average speeds, decreasing both by 1 mph in some cases.
- The large signs appeared to have no effect on the 10 mph pace speeds.
- The large signs appeared to have a significant effect on the percentage of vehicles driving over 30 mph. The percentage of vehicles driving at speeds greater than 30 mph was cut in half after the signs were erected. This could have been a direct result of the presence of the signage or it could be attributed to the actual presence of more enforcement. Either way, actual enforcement or threat of enforcement had some effect on driver behavior.

Recommendations

Concerns about the volume and speed of traffic on Davidson Road are not new to City officials. Speeds are greater than the posted 25 mph, but they are not excessive. The volume of traffic on Davidson Road, however, does impact the "livability" of the neighborhood, and the City would benefit in evaluating ways in which to decrease traffic volumes to improve the quality of life of residents of the Greater Hayden Run Village neighborhoods.

Recommendations are as follows:

- Form a Greater Hayden Run Village Task Force and continue the traffic study with emphasis on measures to decrease the volume and speed of traffic in the neighborhoods. Task Force members should include representatives from the four subdivisions, representatives from the City Engineering and Safety Departments, representatives from the Norwich Township Fire Department, representatives from the Hilliard City School Administration and/or Transportation Departments, and representatives from City Administration and/or City Council. Task Force members will meet to discuss the problems, evaluate data collected, determine appropriate solutions, and serve as liaisons between the Task Force and the neighborhoods or governmental entities that they represent.
- Continue police enforcement of the speed limit on Davidson Road.
- Through the Task Force, evaluate possible measures that may be implemented to decrease the volume or speed of traffic on Davidson Road in 2005 while the Avery Road/Hayden Run Road intersection is closed.
- Re-count the traffic volumes on Davidson Road after the Avery Road/Hayden Run Road intersection is re-opened to determine how much of the increase in traffic volumes can be attributed to the construction activities.
- Any physical traffic calming measures or changes to the existing infrastructure should be based on “normal” conditions rather than conditions experienced during reconstruction of the Avery Road/Hayden Run Road intersection.