Appendix A – July 25, 2013 *Summary of Prior Studies and Town Speed Data*

Appendix B – August 29, 2013 *Origin – Destination Study Results*

Appendix C – December 2, 2013 *Responses to Resident and Council Request*

Appendix D – *GIS Map of Traffic Calming Devices and Signage; Sign Consolidation Recommendations*

Appendix A

Sabra, Wang & Associates, Inc.

ENGINEERS • PLANNERS • ANALYSTS

July 25, 2013

Mr. Richard Charnovich
Manager, Town of Somerset
4510 Cumberland Avenue
Chevy Chase, MD 20815

Re: Summary of Prior Town Studies

Dear Mr. Charnovich:

The following memorandum summarizes available public traffic data and the content of prior studies contracted by the Town of Somerset. The memorandum is divided into three sections:

1. Summary of information available from relevant studies contracted or conducted by the Town of Somerset or studies conducted by the State Highway Administration (SHA).
2. Summary and discussion of entry and exit data collected at the town's four main vehicle access points.
3. Summary and discussion of the speed information provided by Town of Somerset's Speed Sentry.

SUMMARY OF AVAILABLE STUDIES & COUNTS

- Studies and Counts conducted or contracted by the Town of Somerset
  - October 1983, Citizen-conducted count
    - AM peak, mid-day peak, and PM peak period entry and exit counts
    - Data is provided for a 6 total hours. Data is not broken down into time increments or by travel direction.
  - September, 2004; Gorove Slade (GS):
    - Turn Movement Counts at select intersections
    - 15 minute increments for 2 AM peak hours and 2 PM peak hours
  - June, 2007; Vanasse Hangen Brustlin, Inc. (VHB):
    - Turn Movement Counts at select intersections
    - 2-hour combined AM and PM peak period counts; no smaller increments provided
  - February 2009 Plan for a comprehensive traffic calming and pedestrian safety plan.
    - Extensive observational and qualitative data and subsequent recommendations for traffic calming.
  - Various times, Somerset Speed Sentry data
    - Speed and volume, select locations. Data collected by radar - speed and volume in one direction only. Data provided in .csv format.
- Publicly Available Studies
  - November 2012, State Highway Administration (SHA)
    - Average Daily Traffic (ADT) count in one hour increments.

- Bi-directional count was conducted on Dorset, just west of Wisconsin.

- March 2007, State Highway Administration (SHA)
  - Turn Movement Count at Dorset & Wisconsin;
  - 15 minute increments; 6am to 7pm.

The following table summarized the available data at each entrance point to the Town of Somerset, by year and by breakdown of data into smallest time-increment.

Table 1: Summary of Available entry/exit, Data by year and by smallest time increment

Intersection	Date of Count and Time Increment					
	Sep-04	Mar-07	Jun-07	Dec-10	Nov-11	Nov-12
Dorset at Little Falls	15 min	n/a	2 hr	n/a	Speed Sentry*	n/a
Dorset at Wisconsin	15 min	15 min	2 hr	n/a	Speed Sentry*	1 hr
River at Greystone	15 min	n/a	2 hr	n/a	n/a	n/a
Cumberland at Wisconsin	15 min	n/a	2 hr	Speed Sentry*	n/a	n/a
* Speed Sentry data captures traffic volume in only one direction - either entry or exit, but not both						

Sabra Wang & Associates (SWA) reviewed the above studies to determine a methodology such that consistent data sets can be compared over time. The studies contained data that was in various time increments – 15 minutes, hourly, 2-hours, and continuous (Speed Sentry). The speed sentry data provided the most robust data because it yielded both a time-stamped vehicle count and speed output. However, the Sentry radar only measures in one travel direction. In addition, there were many instances of double and triple counting of vehicles in the .csv files; accordingly, these files required scrubbing to remove duplicative data, prior to processing. The GS and VHB studies provided counts for a one-hour and two-hour peak period, respectively. The publically-available SHA counts provided data in one-hour increments.

In order to make proper comparisons over time, SWA evaluated *two-hour peak periods* for the AM and PM peak periods. In the following summary and review, SWA did not include the 1983 citizen study because of its age and because the data was not disaggregated into suitable time increments. Similarly, the 2009 independent evaluation of traffic calming, pedestrian, and bike safety needs was thorough, containing useful observations and valid recommendations; however, no new data was presented for comparison purposes. The remaining memorandum summarizes and compares the changes of entry and exit data over time at Town access points and summarizes the findings from the speed sentry data. Data driven conclusion are <u>underlined</u> throughout the report.

SUMMARY OF ENTRY AND EXIT DATA

To first determine peak entry and exit times for Somerset, SWA reviewed the most recent traffic count data collected by SHA along Dorset – the main neighborhood collector road and surrogate cut-through road. SHA collected a 48-hour bi-directional count on Dorset Ave in November 2012. Based on the count, about 3000 vehicles per day travel Dorset. Figure 1 below show the hourly distribution of vehicle traffic throughout the day for each travel direction.

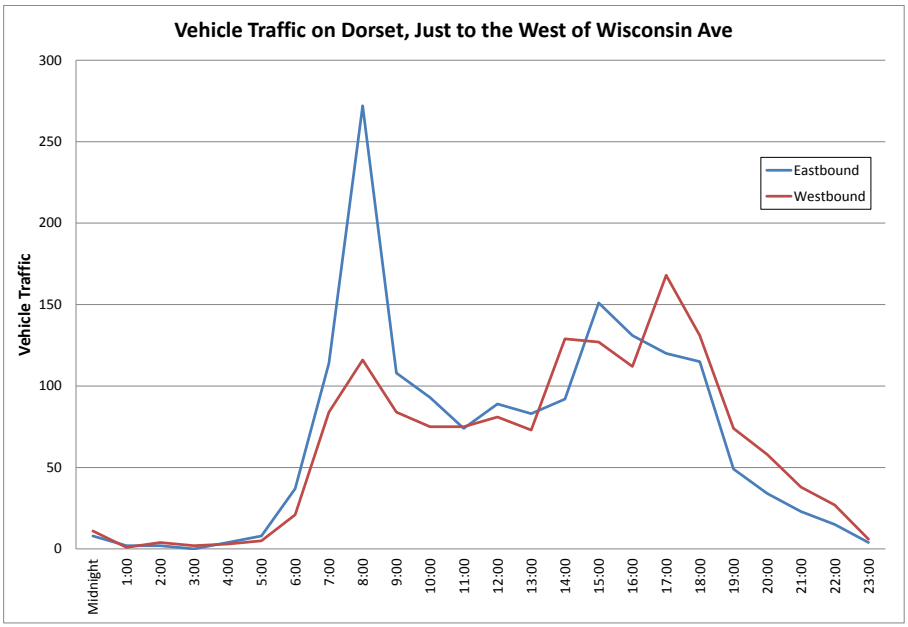


Figure 1: Eastbound and Westbound Vehicle Traffic on Dorset, just to the west of Wisconsin (source: SHA)

Based on the hourly traffic distribution, the peak periods of traffic for Dorset (and presumably, the entire Town) occur from 7 to 9 AM in the morning and about 4 to 6 PM in the evening. The evening peak hour is a little wider than what is typically seen in a residential neighborhood, due to parents picking up their children from the Somerset Elementary, where the typical school day ends at 3:05 PM. Similarly, the morning peak is higher because the school start time coincides with the peak morning commuting time.

Based on these data, SWA compared entry and exit volumes at each access point over time to determine how these peak period volumes changed with the installation of traffic calming measures. Entry and exit data at the Town's main access points comes from two sources – studies contracted by the Town and publically available data, collected by SHA. In addition, SWA used speed sentry data collected by the Town, where applicable. Because various data sources were used, not every access point has entry and exit data available for all of the studies.

In order to best represent the data, SWA first segregated entry and exit volumes at each location and summarized them, by the year that the study was conducted. By tabulating the data this way, any changes over time in entering or exiting data are readily apparent for each Town access point. The following two tables show the entry and exit traffic volumes in the AM and PM peak periods, respectively. Table cells labeled "n/a" indicated that no data is available for the given study. In addition, entry and exit data were combined for each access point and mapped for both AM and PM peak periods in Appendix B-1 and B-2, respectively. The map shows any aggregate changes in *two-way* volume at the Town access points.

Table 2: Changes to AM peak period entry and exit volumes at Town access points

Access Point		Date (data represents 2-hour *AM* peak period)					
		Sep-04	Mar-07	Jun-07	Dec-10	Nov-11	Nov-12
Dorset at Little Falls	Entering	124	n/a	208	n/a	n/a	n/a
	Exiting	122	n/a	175	n/a	141	n/a
Dorset at Wisconsin	Entering	133	163	163	n/a	n/a	200
	Exiting	229	261	266	n/a	175	386
Greystone at River	Entering	44	n/a	59	n/a	n/a	n/a
	Exiting	99	n/a	113	n/a	n/a	n/a
Cumberland at Wisconsin	Entering	62	n/a	61	39	n/a	n/a
	Exiting	4	n/a	9	n/a	n/a	n/a

Table 3: Changes to PM peak period entry and exit volumes at Town access points

Access Point		Date (data represents 2-hour *PM* peak period)					
		Sep-04	Mar-07	Jun-07	Dec-10	Nov-11	Nov-12
Dorset at Little Falls	Entering	268	n/a	240	n/a	n/a	n/a
	Exiting	171	n/a	190	n/a	222	n/a
Dorset at Wisconsin	Entering	194	225	193	n/a	n/a	280
	Exiting	222	298	273	n/a	238	251
Greystone at River	Entering	134	n/a	95	n/a	n/a	n/a
	Exiting	77	n/a	75	n/a	n/a	n/a
Cumberland at Wisconsin	Entering	38	n/a	40	39	n/a	n/a
	Exiting	12	n/a	22	n/a	n/a	n/a

While there is substantial deviation from count to count, the trend between 2004 to 2012 is one of increasing or level entry and exit volumes. Given that the Town's land use has not changed and that the developable land is largely built-out, any additional traffic entering or exiting the Town over the years can be attributed to cut through traffic[1].

2007 Origin Destination Study

In June of 2007, VHB conducted an origin-destination study to determine the proportion of the entering and exiting traffic that can be attributed to nonresidents. The VHB study observed vehicles entering at the four main access points to the Town and also observed which of these vehicles exited the town (i.e. utilized the town's road as short cuts). Several valid assumptions

[1] Minor changes in the composition of traffic will always exist, year to year, as the age-related demographics change.

were made in this study and should be repeated for any similar future study[2]. The following two tables show the percentage of entering traffic in the AM and PM peak period, respectively, that can be classified as cut-through traffic.

Table 4: Origin-Destination of *AM* Peak period traffic

Entry Point	Total Entering Traffic over 2-hr *AM* peak Period	Cut-through traffic		Local traffic	
		Volume	Percent	Volume	Percent
Dorset at Little Falls	208	83	40%	125	60%
Dorset at Wisconsin	163	48	29%	115	71%
Greystone at River	59	11	19%	48	81%
Cumberland at Wisconsin	61	24	39%	37	61%
TOTAL (all entering traffic)	**491**	**166**	**34%**	**325**	**66%**

Table 5: Origin-Destination of *PM* Peak period traffic

Entry Point	Total Entering Traffic over 2-hr *PM* peak Period	Cut-through traffic		Local traffic	
		Volume	Percent	Volume	Percent
Dorset at Little Falls	240	110	46%	130	54%
Dorset at Wisconsin	193	78	40%	115	60%
Greystone at River	95	6	6%	89	94%
Cumberland at Wisconsin	40	9	23%	31	78%
TOTAL (all entering traffic)	**568**	**203**	**36%**	**365**	**64%**

The following are some general observations based on the above tables:

- The largest amount of cut through traffic occurs along Dorset between Little Falls and Wisconsin.
- Cut through traffic in the evening exceeds the amount of cut through traffic in the morning. One possible explanation for this is that evening peak period traffic is generally higher peak than morning peak traffic, because the former include commuting trips *and* retail trips.
- Only a nominal amount of traffic uses Greystone and Cumberland as a cut through route.
- Overall, a little over 1/3rd of all traffic entering Somerset in the AM and PM peak period is cut-through traffic.

In addition, traffic that is labeled *cut through* may also capture child drop-off trips to Somerset Elementary, where a parent entered on Little Falls and exited on Wisconsin, or vice-versa. In order to better capture cut through trips that directly related to commuting traffic or personal non-Town related business (i.e. shopping, going to lunch, etc.), future origin-destination studies need to be conducted during hours where school is not in session.

[2] Assumptions: 1) If a vehicle's travel times between entry and exit exceeded 15 minutes, it was not considered a through trip; 2) Vehicles entering and exiting the same intersection were not considered a through trip; 3) School buses were excluded; 4) Trips between Cumberland/Wisconsin and Dorset/Wisconsin were not considered through trips.

SUMMARY OF SPEED INFORMATION

At the July 11th project kick-off meeting, Sabra Wang & Associates (SWA) received a collection of approximately twenty roadway segments with speed sentry data collected by the town. Data was provided in .csv format, which allowed for easy formatting and evaluation. Of these data sets, SWA summarized the speed data for nine locations throughout the town; the remaining roadway segments were not included because they were either too close to another summarized location or the data was incomplete (i.e. a full 24-hour period was not available). From the speed .csv files, SWA was able to evaluate:

- Volume[3]
- Average Speed
- Percent of motorists exceeding 20 mph
- Percent of motorists exceeding 25 mph
- Percent of motorists exceeding 30 mph

85% speed data was not calculated because it has no applicability to the Town's speed limit policy of 20 mph residential streets. The results of the speed evaluation are mapped in Appendix A, at the end of this memorandum. In general, speeding over 30 mph was extremely rare anywhere in town. On average, throughout the Town, approximately 3% of vehicles exceeded 25 mph. Town wide, the speed limit of 20 mph was exceeded far more often – between 9% on Falstone to almost 50% on Surrey. With the exception of Dorset and Greystone, the remaining roads in Somerset see very low traffic volumes. For example, while half the vehicles on Surrey exceed 20mph, this represents about 150 vehicles – less than the 12% of vehicles that speed at Dorset by Little Falls.

Since the each vehicle's speed is measured and time-stamped with the Speed Sentry system, SWA also sorted all speed data by time of day to determine if there was a correlation between speed and general commuting times (defined as 7 to 9 AM and 4 to 6 PM). The results are summarized in the following table.

Table 6: Distribution of Speeders by commuting periods and non-commuting periods

Time Period	No. Speeders (>20 mph)								
	Trent Street	5607 Warwick	5502 Greystone*	5413 Surrey	4825 Essex	4818 Cumberland	4705 Falstone	4823 Dorset	4516 Dorset
7:00 AM to 9:00 AM	17	12	17	16	15	0	12	16	70
9:00 AM to 4:00 PM	52	31	65	42	22	7	5	58	196
4:00 PM to 6:00 PM	14	14	24	5	9	10	6	36	70
6:00 PM to 7:00 AM	17	27	34	18	8	1	5	48	101
Total	100	84	140	81	54	18	28	158	437
*Includes both directions									

The data show that for both Dorset and the *non cut-through* streets, the majority of the speeding occurs during off-peak hours. This suggests that speeding traffic can be attributed to not only

[3] The speed sentry provided speed and count data in one direction. Over the course of a 24-hour period it is reasonable to expect that, for residential roads, the volume of traffic in *each* direction will be approximately equal.

commuting cut through traffic, but also local traffic and visitor traffic, including residents' privately contracted support staff (e.g. au pairs, nannies, maids, gardeners, etc.).

NEXT STEPS

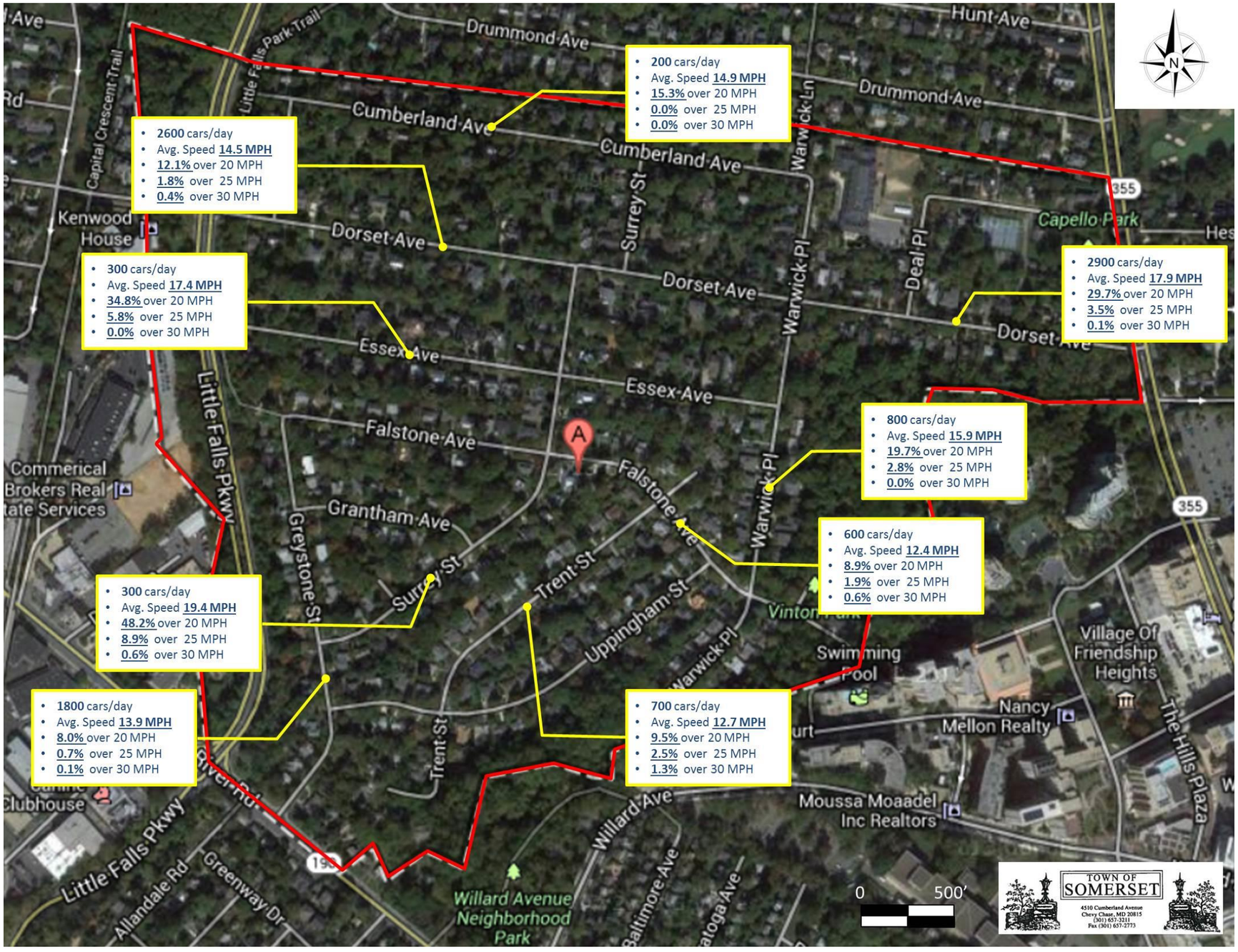
The through-traffic and speed summaries provide a proper context for determining which areas/intersections continue to be "problem locations" and which locations have little room for improvement. The next step is to determine what roadway segments and intersections, if any, are worthy of targeting for further speed reduction or cut-through reduction, respectively. Upon your review of this memorandum, we can discuss a future data collection effort that is tailored to the Town's most pressing needs. Please do not hesitate to contact me at (443) 741-3500, ext. 3652 if you have questions about this memorandum.

Sincerely,

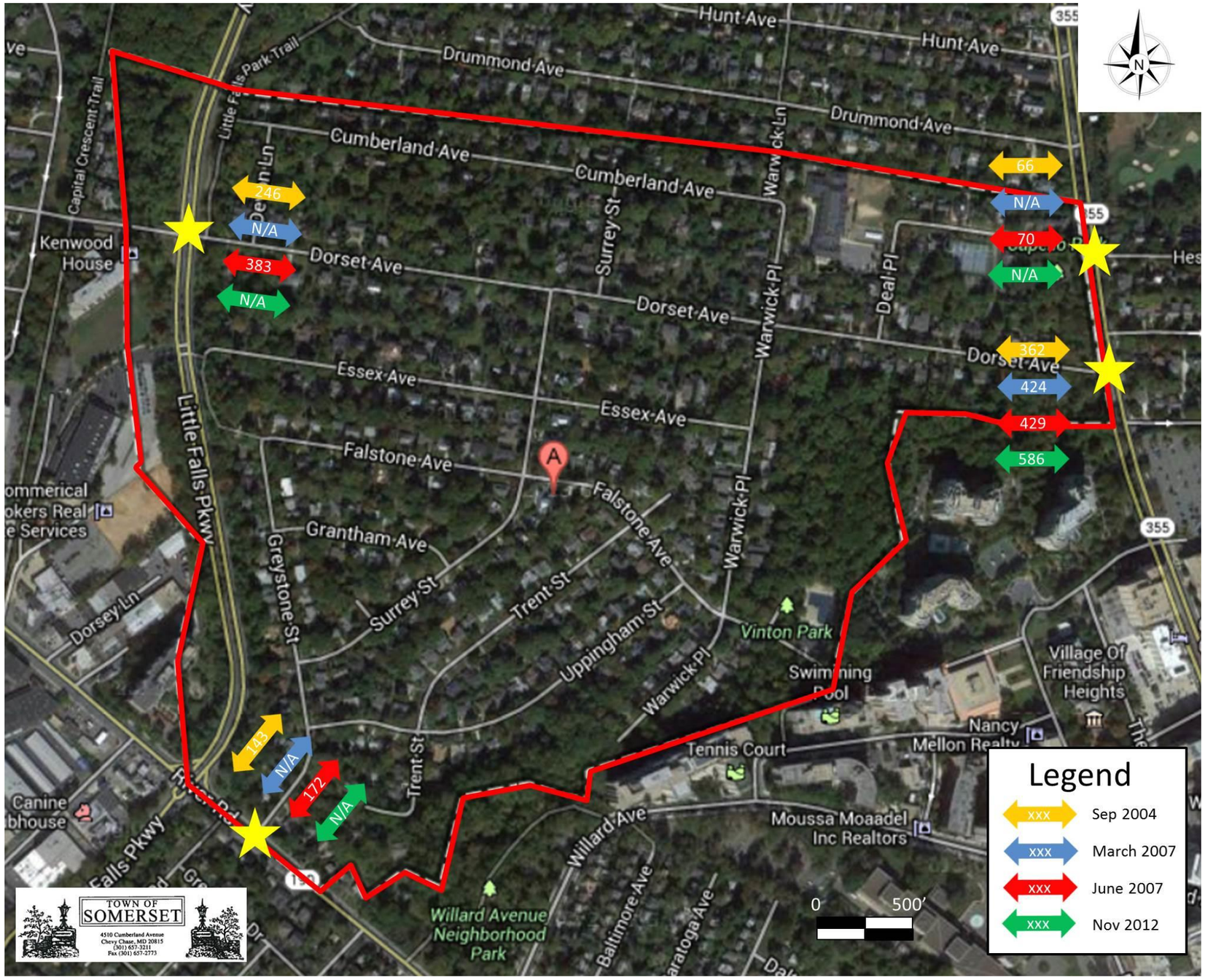
SABRA, WANG & ASSOCIATES, INC.

Bryon White, P.E., PTOE
Project Manager

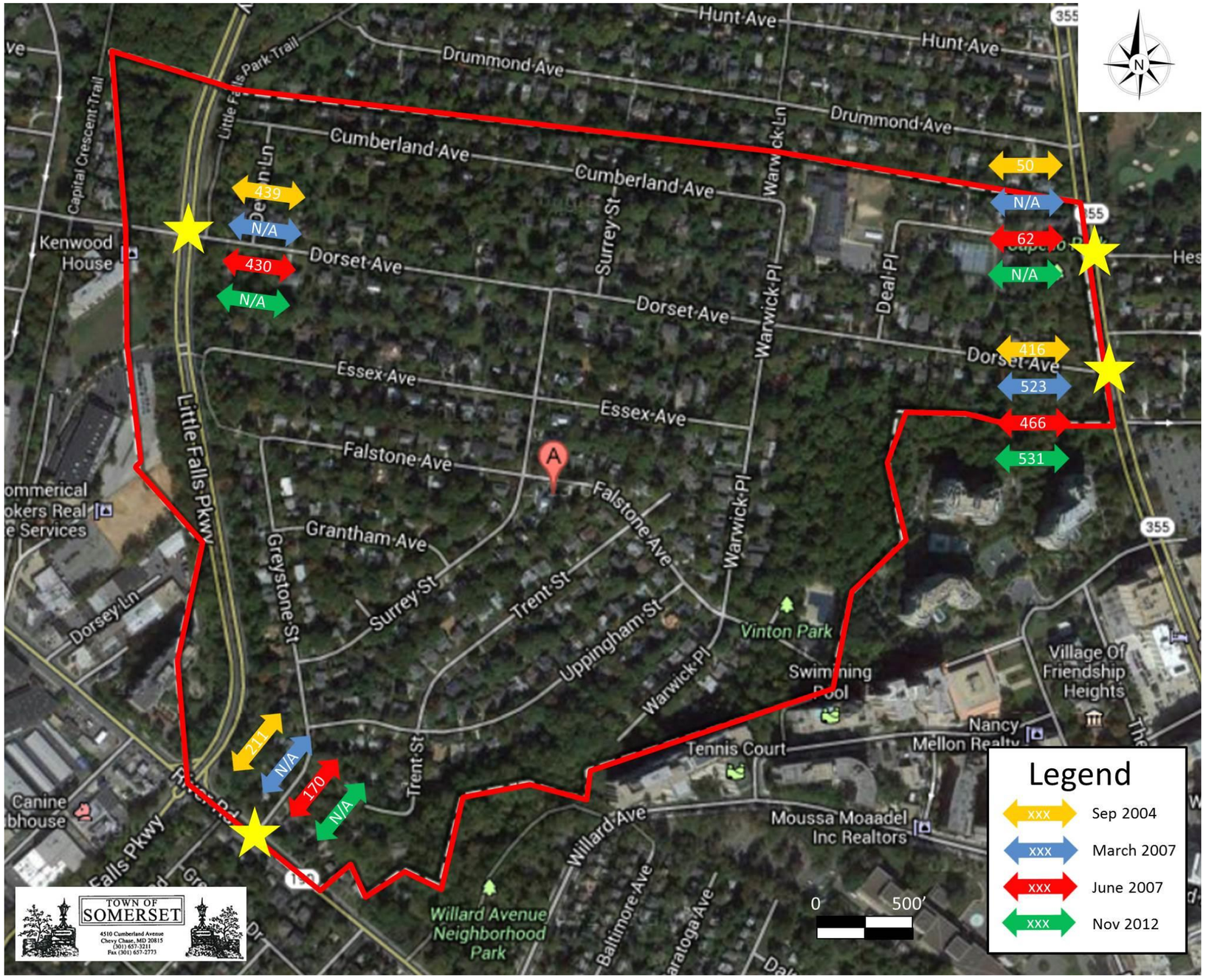
Appendix A: Speed Profile Data at Select Location through the Town of Somerset, as recorded by the Speed Sentry



Appendix B-1: Entry and Exit data for the AM peak period at Town access point



Appendix B-2: Entry and Exit data for the PM peak period at Town access point



Appendix B

Sabra, Wang & Associates, Inc.
ENGINEERS • PLANNERS • ANALYSTS

August 29, 2013

Mr. Richard Charnovich
Manager, Town of Somerset
4510 Cumberland Avenue
Chevy Chase, MD 20815

Re: Origin – Destination Study (with school out of session)

Dear Mr. Charnovich:

The following memorandum briefly summarizes the Origin-Destination (O-D) study conducted by Sabra Wang on Tuesday August 20, 2013. As discussed previously, we stationed counters at the three main intersections serving the town (Cumberland was neglected, because a previous O-D study and other traffic counts showed very low volumes). Vehicles entering and leaving at each intersection were recorded and identified by writing down their color and the last three digits of their license plate. In addition to identifying each vehicle, their entry/exit times were also recorded[1]. The results of the study are summarized in two parts:

1. *Overall* cut through though traffic originating from each of the three main entry points into Somerset. The overall cut through traffic is separated into AM and PM peak periods, with AM period being 7 to 9, and the PM period being 4 to 6. Two-hour increments were used to maintain the parameters used in prior studies.
2. The cut-through traffic for each particular *turn movement* into Somerset (e.g. left in from Little Falls, etc.) was also examined.

Table 1 below shows the cut through traffic as a percentage of all the traffic entering the Town for the AM peak period. Cut through traffic is shown in red.

Table 1: AM Cut through Traffic

AM Total	Incoming Traffic	Cut-through Traffic	% cut through
Dorset Ave. & Wisconsin Ave.	99	24	***24.2%***
Dorset Ave & Little Falls Pkwy.	120	55	***45.8%***
Greystone St. & River Rd.	45	2	***4.4%***
Total	***264***	***81***	***30.7%***

[1] Vehicles that had entry and exit times greater than 15 minutes were not counted as cut through traffic. Neither were Private postage delivery trucks or USPS mail trucks. Finally, vehicles that entered and exited from the same location were not counted as cut-through traffic

As shown in the above table, about 31% of all AM peak period traffic is cutting though. However, the amount varies greatly depending on the intersection. While only 4% of River Road entry traffic was cut through traffic, almost half of the traffic entering from Little Falls was designated cut through. Approximately one quarter of traffic entering from Wisconsin was cut through traffic.

Table 2 below shows the cut through traffic as a percentage of all the traffic entering the town for the PM peak period.

Table 2: PM Cut-through Traffic

PM Total	Incoming Traffic	Cut-through Traffic	% cut through
Dorset Ave. & Wisconsin Ave.	**142**	58	***40.8%***
Dorset Ave & Little Falls Pkwy.	**169**	69	***40.8%***
Greystone St. & River Rd.	**88**	14	***15.9%***
Total	***399***	***141***	***35.3%***

As shown in the above table, about 35% of all PM peak period traffic is cutting though. About 40% of traffic entering on either end of Dorset was cut through traffic, while about 16% of traffic entering from River was cut through.

We further broke down the above numbers into cut through traffic, by *turn movement*. Figure 1 and Figure 2, on the following page, show the percentage of each turn movement that can be attributed to cut through traffic for the AM and PM periods, respectively.

In both the AM and PM peak periods the amount of cut through traffic is low from River Road, both in nominal terms and as a percentage of entering traffic. Similarly, AM cut through traffic represents about 25% of all vehicles entering from Wisconsin; but this, too, is a low nominal amount. In the PM peak period, however, about half the vehicles entering from southbound Wisconsin represent cut through traffic. Cut through traffic entering from Little Falls represents the largest nominal amount for each intersection in both the AM and PM peak periods. Specifically, between a quarter and a half of all traffic entering left or right from Little Falls represents cut through traffic. However, the majority of traffic entering Somerset from West of Little Falls is cut through traffic in both the AM and PM peak periods. Finally, as in the prior 2007 O-D study, the overwhelming majority of cut through traffic enters and exits off of Dorset.

Upon completion of your review of this memorandum, we can discuss any further parsing of this data, new data collection efforts, and other next steps.

Sincerely,

Bryon J. White, P.E., PTOE
Project Manager

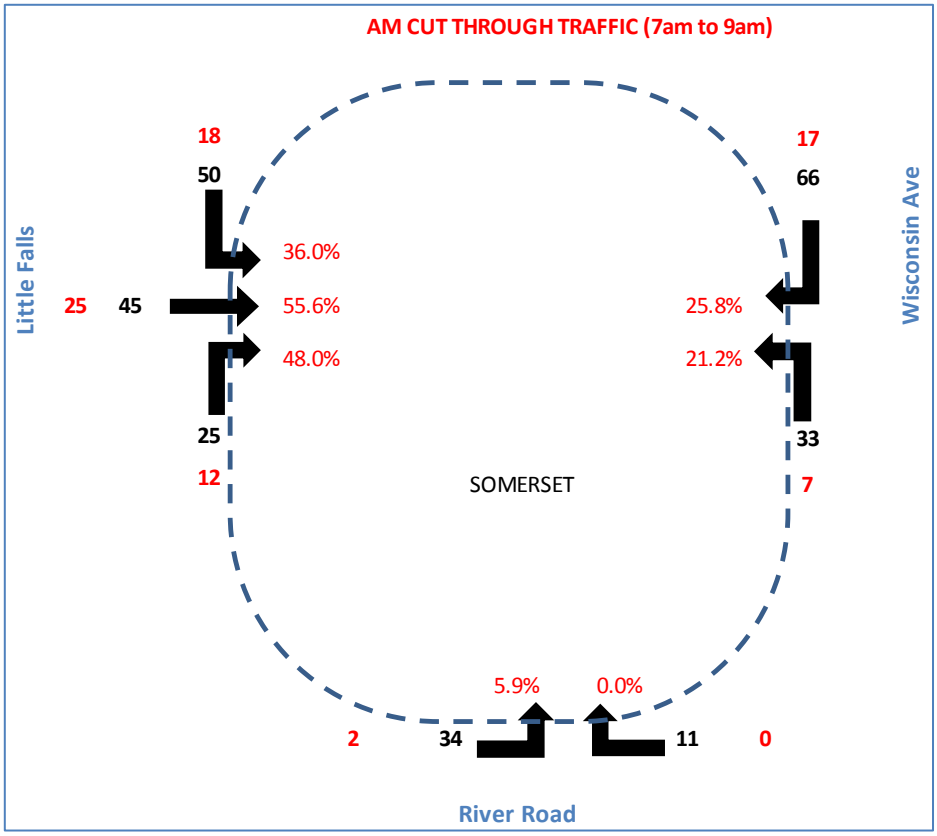


Figure 1: AM cut through traffic (shown in red) for each turn movement

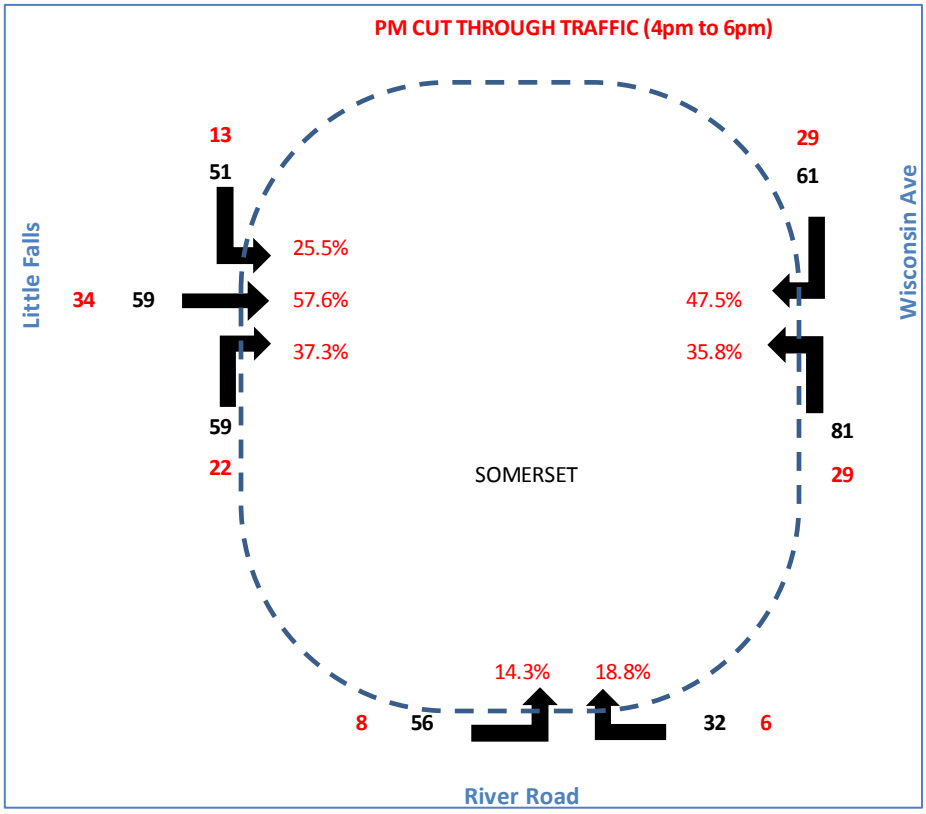


Figure 2: PM cut through traffic (shown in red) for each turn movement

Appendix C

Sabra, Wang & Associates, Inc.

ENGINEERS • PLANNERS • ANALYSTS

December 2, 2013

Mr. Richard Charnovich
Manager, Town of Somerset
4510 Cumberland Avenue
Chevy Chase, MD 20815

Re: Evaluation of Resident Traffic Requests and *Next Step* Items
(revised 12/2/2013, to include Uppingham Speed data)

Dear Mr. Charnovich:

To summarize our work to date, Sabra Wang & Associates (SWA) has provided: 1) a summary of prior studies and available public/private traffic data; 2) Summary of speed data from the Somerset's Speed Sentry radar; 3) results from an Origin-Destination Study- conducted during non-school hour, and 4) a static and online mapping tool, showing all geolocated signage and traffic calming devices within Somerset.

Based on our 9/24/2013 conference call, we established several *next steps* from our scope of services to be subsequently addressed; these next steps are covered in the following memorandum - divided into two sections.

1. Sabra Wang's evaluation and recommendations related to the **Resident Concerns** enumerated in the RFP Addendum (plus a few supplemental comments).
2. **Other Traffic-related Issues** from conference call:
    a. Evaluation of signage for Compliance and potential for sign consolidation
    b. Review of Parking restrictions at Dorset and potential impact of removal
    c. Evaluate possibility of increased traffic calming at Dorset, short of full closure or diversion into neighborhood.
    d. Determine criteria for turn restrictions from Little Falls

1. Resident Concerns

Resident requests are listed in italics below, followed by SWA's observations and conclusions/recommendations.

1. *Speeding on Lower Falstone on the Little Falls Parkway side and on Surrey Street between Greystone and Falstone*
    a. <u>Lower Falstone:</u> Speed Sentry radar data was collected on upper Falstone only, near Trent. The average daily volume at this location is about 600 vehicles per day. The average speed was 12.4 mph, with 8.9% of vehicles traveling over 20 mph and 1.9% of vehicles traveling over 25 mph. Radar has not been placed at lower Falstone, however, there is a significant 8+% grades heading toward Greystone and Surrey that

can contribute to speeding. In addition, parking is restricted on the south side of Falstone between Surrey and Greystone.

i. *Recommendation:* Because of the speeds that can be attained due to the steep grades on lower Falstone, traffic calming is recommended. A simple cost-effective traffic calming solution would be to stagger the restricted parking areas along the north and south sides of the street, as opposed to maintaining parking restrictions wholly on one side of the street. This solution would require more streets signs (and a Town ordinance) but would create *virtual* chicanes that would prevent a driver from getting up to speed.

Figure 1: Example of a physical chicane to calm traffic

b. Surrey: The town collected speed sentry data at this location. Vehicle volume was about 300 for the 24 hr period. The average speed was 19.4 mph, with 48.2% of vehicles exceeding 20 mph and 8.9% of vehicles exceeding 25 mph. Street width is about 22' curb to curb with light on-street parking.

i. *Recommendation:* Based on the percentage of vehicles traveling above the posted speed limit, traffic calming may be warranted at this location – even though the overall volumes are very low. The intersections of Grantham/Surrey and Greystone/Surrey are about 700 feet apart, meaning that a single traffic calming device, such as a 15 mph speed hump, would be sufficient if placed equidistant between the two intersections. Placing a traffic calming device at this location would make it difficult to comfortably exceed the speed limit prior to braking for an approaching stop sign.

2. *Stop Sign observance at Dorset & Deal and at Surrey & Grantham*

a. *Dorset & Deal:* Observations include a continental-style crosswalk on Deal; overhead intersection lighting; no obvious stop sign obstructions (though the stop sign on the west leg could be obscured during peak foliage); rumble strips present

and in good shape on both approaches of Dorset and; stop bars that are one foot wide.

i. *Recommendations:* Compliance is sometimes difficult at stop signs that aren't warranted by vehicle volumes. If motorists rarely see a reason to stop (i.e. no side street traffic or crossing pedestrians), then they become conditioned to not needing to stop, even though there may be legitimate pedestrian safety concerns at the intersection. For a stop sign to work as an effective safety tool, all parties have to have the expectation that the signage will be obeyed. To further induce stopping compliance, SWA recommends widening stop bars to 2' width and incorporating crosswalks across both legs of Dorset even though no receiving sidewalk exists.

b. *Surrey & Grantham:* Observations include a very low vehicle volume on Grantham and low volume on Surrey. Through traffic on Surrey can be expected to rarely have conflicting vehicle traffic, despite the presence of all-way stop control. No marked crosswalks observed. Overhead lighting is present. Stop signs were the minimum size. North leg stop sign is not retroreflective.

i. *Recommendation:* Consider adding continental-style crosswalks to the south leg of Surrey. Relocate the south leg stop bar back and add a pedestrian ramp to connect sidewalk on Grantham to sidewalk on east side of Surrey.

Figure 2: Example of continental-style crosswalk used throughout Somerset

3. *Installation of safe passage crossing at Warwick and Essex where a conventional crosswalk may be difficult to implement*

a. Observations: Stop bar is fading on the north leg. Overhead lighting is present. Stop sign is visible and sufficiently sized. Motorists running the stop sign were observed.

i. *Recommendation:* Install continental crosswalk that is used elsewhere in the Town with new receiving curb ramp to be located near 5617 Warwick. In addition, there is public space available for an ADA compliant (5' x 5') level landing behind the utility pole and trashcan at the northwest quadrant of the intersection (see figure below).

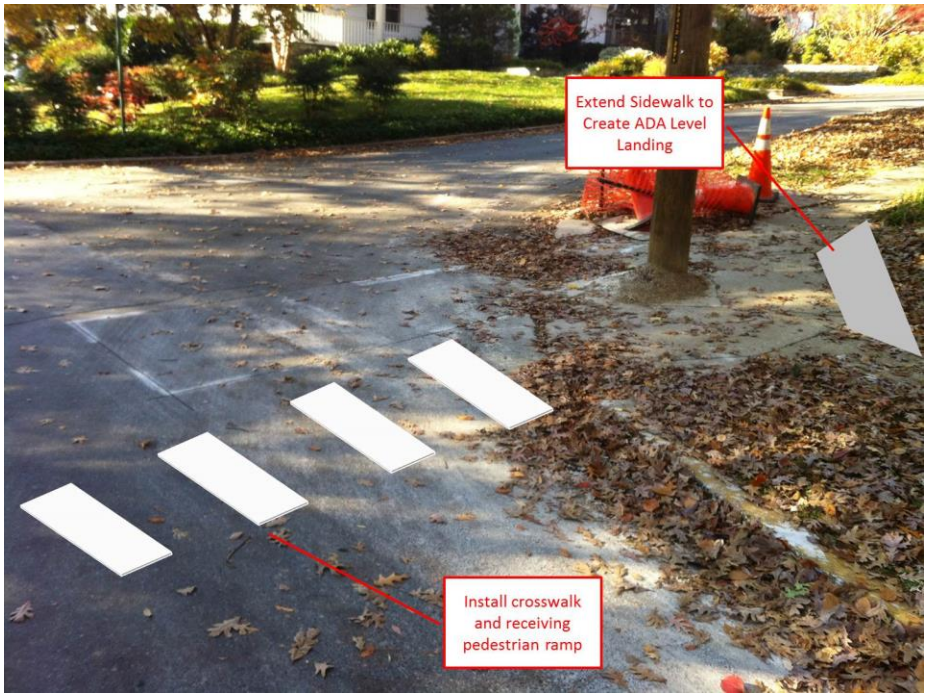


Figure 3: Recommendations for Warwick at Essex

4. *Pedestrian safety on Lower Trent; no sidewalk and two stop signs along curve have conflicting signage.*
    a. Observations: Signage doesn't appear to be conflicting. A similar sign configuration exists at Deal/Cumberland and at Greystone/Falstone. Previous "15mph curve" warning sign was removed during stop sign installation. The application of the stop signs is unclear, because there appears to be no conflicting movements to warrant a stop sign, unless the signs act as more of a warning to watch for pedestrians that are required to walk in the street. Usage of no-parking signage is appropriate to allow two-way travel along the curve. Overhead lighting is present. Stop bars are 1' wide.
        i. *Recommendations:* Widen stop bars to 2' width. There is an opportunity to install sidewalk along the east side of Trent from the curve northward to Uppingham in order to prevent the need for pedestrians walking in the street – which presumably represents the conflicting movement that justifies the stop control. The east side of Trent has the lesser potential for tree/utility disruption.
5. *Pedestrian safety due to poor visibility on lower Essex on the Little Falls Parkway side, where no sidewalk exists.*
    a. Observations: The steep downgrade toward Little Falls allows for drivers to pick up speed quickly, making it dangerous for pedestrians who have no choice but to walk in the street. Matures trees abut the back of the curbs on both sides, resulting in difficulty in retrofitting this space for sidewalk[1]. Good overhead street lighting

[1] Any new sidewalk would likely need to go *behind* the tree line and require obtaining public right-of-way easements from property owners.

exists, but full foliage may block much of the downward lighting, reducing visibility of pedestrians.

i. *Recommendations:* In lieu of sidewalk installation, consider a pilot site for pedestrian-scale lighting[2]. See Figure 4. Pedestrian scale lighting is pole-mounted and typically only 16' above grade so that its light is not blocked by trees. Another option would be to stagger the parking restrictions, as discussed for Lower Falstone.

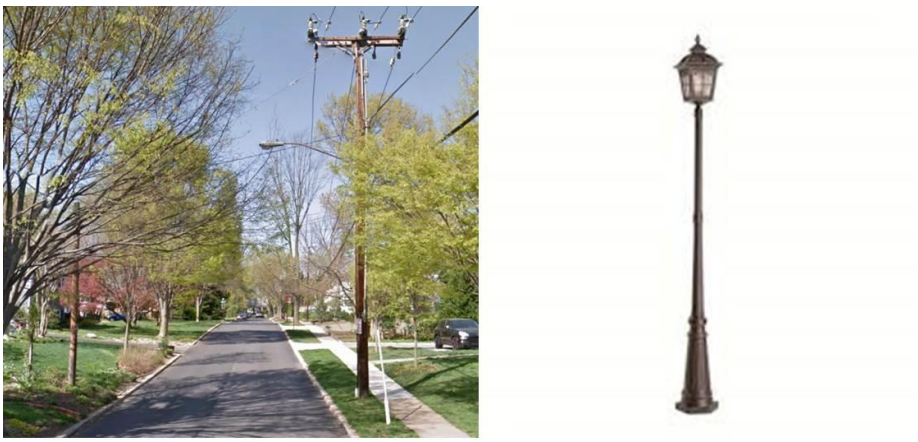


Figure 4: Overhead "Cobra" lighting on the left; pedestrian scale lighting on the right

6. *Improvement of corner sight Distance on Surrey at Falstone involving existing on-street parking and bushes.*
   a. Observations: No objects or foliage was noted that would obscure the stop sign – even in peak bloom. Parking is restricted a sufficient distance on the approach to allow for sign visibility.
      i. *Recommendations:* Consider "Stop Ahead" markings on approach.

Figure 5: Example of "Stop Ahead" street markings

[2] All lighting is the overhead utility pole-mounted "cobra head" street lighting – not pedestrian scale lighting. While sufficient for AASHTO standards, it may not meet the needs of pedestrians. Tree canopy obscures street lighting because of the lamp's height.

7. *Cut-through rush hour traffic that travels from Drummond through the alley down Cumberland and exiting onto Dorset at Devon lane in the morning*
    a. Data from Town speed sentry: On Tuesday 2/14/2012, 7am – 9am, 11 total vehicles were detected traveling westbound, with an average speed – 17 mph. In the evening, heading the opposite direction, 25 vehicles were counted with an average speed of 14 mph. (3/14/2012, 3/21/2012 – 4-6pm).
        i. *Recommendation:* Continue to monitor, but preliminary data shows extremely low hourly volume.
8. *Visibility of all stop signs.*
    a. Observations: SWA looked at three areas related to stop sign visibility: 1) reflectivity of the signs; 2) sign placement relative to an intersection and curb; 3) and stopping sight distance.
        i. Of the 65 stop signs in town, all but 5 had a retroreflective coating. The exceptions were:
            1. School Exit at Warwick
            2. School Exit at Deal
            3. Southbound Surrey at Grantham
            4. Southbound Greystone at Uppingham
            5. Southbound Surrey at Dorset
        ii. Placement compliance per MUTCD.
            1. No non-compliant placement issues were noted in a field inspection. Several stop signs were the minimum size - 24"x24" – and could be increased to the 30"x30" – which is more typical in suburban residential neighborhoods.
        iii. Site distance obstruction (e.g. horizontal/vertical curve, shrubbery, etc.) and requisite stopping distance visibility.
            1. Per AASHTO guidelines, at 20 mph, the stopping sight distance (perception plus react/brake) is about 110 feet. No stop signs were observed that didn't meet this criteria for visibility. This held true, assuming a vehicle traveling at 25 mph, as well.
9. *Dorset cut-through traffic continues to increase; Town should explore peak hour turn restrictions.*
    a. Observations on cut-through traffic: While there is substantial deviation from count to count, the trend between 2004 to 2012 is one of increasing or level entry and exit volumes on Dorset. Given that Somerset's land use has not changed and that the developable land is largely built-out, any additional traffic entering or exiting the Town over the years can be attributed to cut through traffic[3].
    b. Peak hour restrictions: Montgomery County DOT follows policy from Executive Regulation 17-94 AM *"Through Traffic Volume Access Restrictions in Residential*

[3] Minor changes in the composition of traffic will always exist, year to year, as the age-related demographics change.

Areas" which was authorized to aid in the County's efforts to "enhance neighborhood traffic safety and maintain 'livable' residential environments by providing a procedure for reducing excessive volumes of through traffic." The policy attempts to balance the needs of all impacted parties while maintaining the efficient and appropriate use of County streets. The follow table highlights the criteria as it relates to Dorset Road:

Criteria	Description	Dorset Rd	Satisfied?
Street Classification	Access volume restrictions limited to tertiary, secondary and primary residential streets	Dorset is classified as a primary residential streets	**Yes**
Measured Traffic Volumes	A minimum two-directional volume: > 400 vehicles per hour for at least one hour of a weekday peak or off-peak time period on a primary street with one unobstructed travel lane in each direction > 250 vehicles per hour on a non-primary residential street with one unobstructed travel lane in each direction > 100 vehicles per hour on any residential street with one unobstructed travel lane serving both directions.	Based on the primary roadway classification, the measured traffic volumes do not exceed the 400 total two-way volume per hour on Dorset between Wisconsin Ave and Little Falls Pkwy. [4]	**No**
Estimated Non-Local Traffic	Non-local traffic must exceed 50% of the highest hourly volume, as documented by a license plate survey	Based on the 2007 Vanasse Hangen and Brustlin (VHB) study, conducted during the school year, cut through traffic was 46%.[5]	**No**

Based on the above table, Dorset Road does not meet Montgomery County's criteria for peak hour turn restrictions. However, given the steadily increasing volumes shown on Dorset over the years, it has the potential to meet the criteria, provided that existing and future traffic calming measures are not an impediment to future cut-through traffic. Based on prior experience with turn restrictions, the process can take about five years from petition the County to a formal hearing. The procedure starts with a petition to the County District Engineer that represents your area, requesting the closure – who will then ask for 1) an O-D study and; 2) a study on the effect of rerouting the diverted trips on the traffic operation of the surrounding intersections. Finally, other policy-related items to considers, prior to petitioning the County include the effects on other Somerset streets (i.e. would restricting Dorset push the cut through traffic on to Greystone, for example?). Also, turn restrictions many need several exceptions - school buses, public transit buses, taxis, school drop-offs, USPS, delivery trucks, not to mention nannies, gardeners and other contractors on which residents rely.

[4] No count conducted by a private consultant approached 400 peak hour trips. A publically available count conducted by SHA on Dorset, near Wisconsin, showed the highest peak hour at 388. It is reasonable to conclude that, in time, as surrounding areas redevelop/rezone, that the peak hour traffic will exceed 400.

[5] SWA's Origin-Destination study showed that Dorset receives slightly greater than 50% cut through traffic in the evening peak period, however this count was conducted when school was out of session and volumes were lower.

10. EZ Pass that requires residents to have a transponder to enter parts of Town

Logistically, this would seem to be very difficult and burdensome for those doing business in the Somerset: nannies, au pairs, delivery trucks and the USPS, fast food deliveries, busses, taxis – not to mention residents' visitors. There are other non-technical concerns related to restricted access to residents of the town. Primarily, state funding (i.e. highway user fees) would likely be pulled – as the streets would no longer be deemed "public" streets.

11. Speed Bump request on Uppingham between Greystone and Trent

a. Observations: Uppingham is 400' in length from Trent to Greystone – four lots on each side of the block. Speed Sentry radar data was collected on Uppingham between Greystone and Trent in October and November 2013. The average daily volume at this location is about 700 vehicles per day (based the average of three days). The average speed was 12.4 mph, with 2.8% of vehicles traveling over 20 mph and 0.1% of vehicles traveling over 25 mph. This segment is stop controlled on each end of block and has a downhill grade midblock heading toward Trent in combination with a slight horizontal curve in the road.
    i. *Recommendation:* Install "Stop Ahead" markings on the eastbound approach toward Trent Street.

Other Traffic-related Issues

1. *Evaluate the potential for sign consolidation.*
    a. While some sign consolidation exists currently, opportunity exists for further consolidation. An example location for potential sign consolidation is shown in the figure below.

Figure 6: Potential Sign consolidation location on Cumberland near Surrey.

Combining parking restriction signs and regulatory and/or warning signs offer the best potential for sign consolidation. However, parking signs and warning/regulatory signs are typically mounted perpendicular to each other, with the former being mounted parallel to the curb. Accordingly, the U-channel sign posts used by the Town will not be sufficient, requiring square channel sign posts, shown in the following figure. Note that this consolidation doesn't necessarily reduce the number of signs, but rather the number of pole installations.

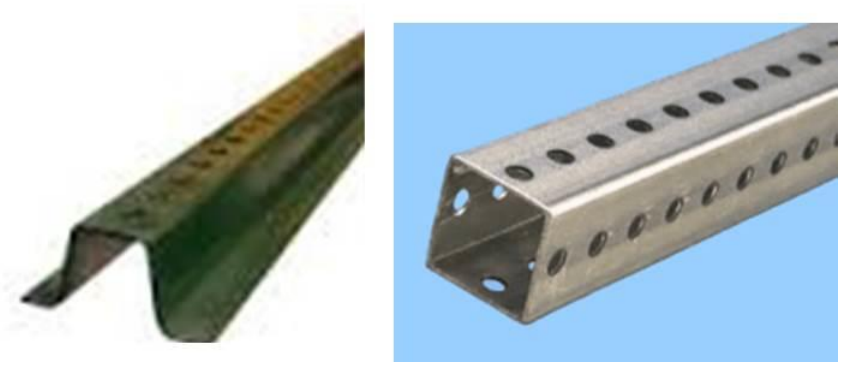


Figure 7: U channel and square channel sign posts

One option for parking sign consolidation is to remove the no parking signs and replace them with painted curb.

2. Review of Parking restrictions at Dorset

Per discussions with the Town, SWA understands the problem to be the use of the 4500 block of Dorset as a free "commuter lot" for the Friendship Heights Metro Station and surrounding retail, because the two-hour restrictions are not enforced. However, there is also a belief that the parking effectively serves as a traffic calming device.

a. Observations and Existing Conditions:
   i. There is 2-hr parking on north side during non-peak hours, with approximately 16 available curbsides parking spaces.
   ii. 10/3/2013: 2 vehicles parked on this block at 9:00 AM; 5 vehicles parked at 12:00 PM.
   iii. 11/8/2013: 2 vehicles parked on this block at 9:00 AM; 6 vehicles parked at 10:30 AM, though several appeared to be contractors.
   iv. No parking is allowed on the south side.
   v. 15 mph speed hump located at 300' and 600' West of Wisconsin.
   vi. The intersection of Dorset and Deal is 850' from Wisconsin and is stop controlled with rumble strips on each Dorset approach to Deale.

b. *Recommendations:* Based on SWA's observations, the available on-street spaces do not appear to be abused by non-residents utilizing them as commuter parking. However, if abuse is seen to occur, options for reduction include:
   i. Increasing enforcement (ticketing) for non-contractor vehicles.
   ii. Removal of on-street parking restrictions and replacement with a Visitor Parking Permit (VPP) system for guests.

c. Finally, regarding the role of parked vehicles as traffic calming, because of the closely-spaced 15-mph speed humps between Wisconsin and Deal, parked vehicles add little traffic calming value to an already calmed street.

3. *Evaluate the possibility of increased traffic calming on Dorset Road, short of full closure or diversion into neighborhood.*
    a. Dorset currently has the following traffic calming devices between Little Falls and Wisconsin 3,500 feet (approximately 2/3rd mile):
        i. 7 bi-directional 15mph speed humps.
        ii. 2 bi-directional 5 mph speed humps.
        iii. All-way stops at all four intersections (except the north leg of Surrey).
        iv. Rumble-strip pairings for EB/WB Dorset at Warwick and at Deal
        v. Full-time parking is allowed on the north side from Surrey to Devon.
    b. *Recommendation:* Given that the speed hump/bump spacing is approximately 400 feet on average for the entire stretch and that full-time on-street parking is in place for a partial segment, additional impediments are unlikely to have a substantial impact on reducing cut-through traffic. A diverter (or semi-diverter) would simply push traffic off of Dorset and onto parallel in-town streets, increasing their existing volumes many-fold.
        i. <u>One additional measure to be considered is to alter the off-peak permitted parking to full-time parking for a segment of the north side of Dorset - from 4709 Dorset Road to the north leg of Surrey.</u> This could potentially reduce the overall average speed a measureable amount but still would not likely reduce the cut through traffic volume.

4. *Determine criteria for turn restrictions for Little Falls*
    a. GV 33 (Little Falls Parkway) is owned by Maryland National Capital Park and Planning Commission and maintained by the County. MNCPPC does not set transportation policy for them and defers traffic-related issues to the local jurisdiction. See #9 in the *Resident Concerns* section above.

After you have had an opportunity to review this memorandum, we can discuss any questions or follow-up concerns.

Sincerely,

SABRA, WANG & ASSOCIATES, INC.

Bryon White, P.E., PTOE
Project Manager

Appendix D

Town of Somerset: Traffic Calming Evaluation

Traffic Calming Devices

- Rumble Strip
- Speed Bump
- Speed Hump

Signs

- Stop
- Speed Limit
- Warning
- Parking
- Other Regulatory Signs
- School/Other

- Town of Somerset
- School
- Greenspace
- Streams

General Notes on Sign Consolidation

1. Bottom of any sign should be at least 5' from the ground.
2. If pedestrians or parked cars are expected to encroach on the sign, the minimum height should be increased to 7'.
3. Per the Maryland MUTCD, Parking Signs *should* be placed 30 to 45 degrees from perpendicular with the curb line. This makes consolidation difficult, as it would require special brackets (e.g. metal ratchet ties) to affix the signs to existing posts, since the posts for non-parking signs are set into the ground such that their orientation allows for signs to be perpendicular to the curb line.
4. Also, existing signs on posts may have to be raised or longer posts installed; alterantively, post extenders can be bolted on to increase their length.
5. The "No Parking" sign should always be the bottom sign.
6. Consolidation of parking and stop signs is not recommended.

The following table has the locations where sign consolidation is feasible

Location	Consolidation of	
	Sign 1	Sign 2
Northeast Corner of Trent Ct and Falstone	2 hr parking	No Outlet
West side of greystone at speedhump between Uppingham and Falstone	2 hr parking	Bump
Midblock speed hump on east side of Warwick between Essex and Falstone	No parking	Bump
Midblock speed hump on west side of Warwick between Essex and Falstone	No parking	Bump
Warwick Place, northwest corner of Warwick and Essex	No parking	Bump
North side of Dorset adjacent to speed hump, just east of Deal	Restricted Parking	Bump
South side of Dorset adjacent to speed hump, just west of Wisconsin Ave	No parking	Bump
South side of Cumberland just east of Deal	No parking	Speed Bump Ahead
North Side of Cumberland just west of Wisconsin	2 hr parking	Bump
North Side of Cumberland just east of Deal	2 hr parking	Bump
Northwest corner of Surrey and Cumberland	Fire Lane	Bump
4902 Dorset	No parking	Bump
4816 Dorset	No parking	Bump
4722 Dorset	No parking	Bump
4708 Dorset	No parking	Bump