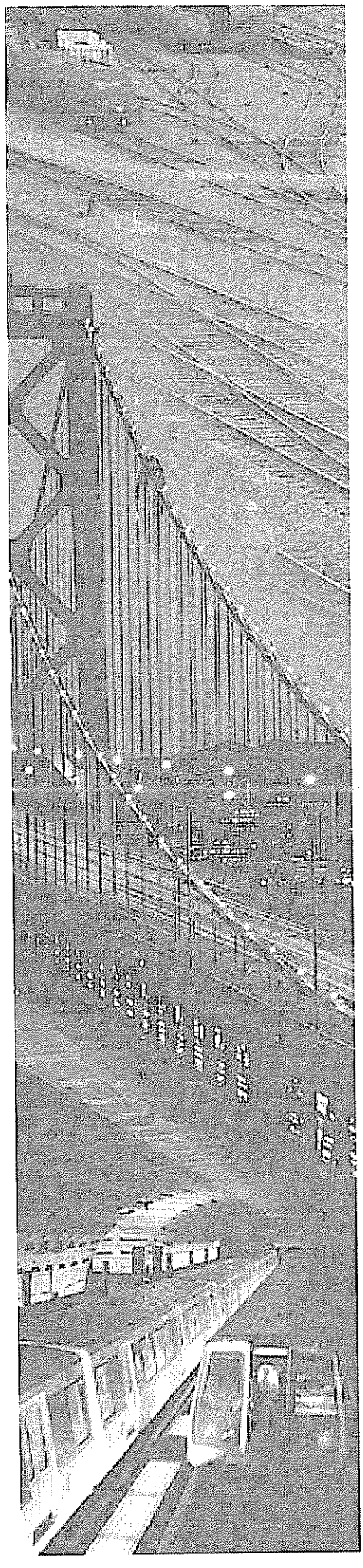

DCT 192

Application of Global Positioning System (GPS) to Travel Time and Delay Measurements

By

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October 2008

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The Delaware Center for Transportation is a university-wide multi-disciplinary research unit reporting to the Chair of the Department of Civil and Environmental Engineering, and is co-sponsored by the University of Delaware and the Delaware Department of Transportation.

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Application of Global Positioning System (GPS) to Travel Time And Delay Measurements

Summer 2008

by:
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Introduction

Since 1996, the Global Positioning System (GPS), a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations, has collected travel time and delay data on major roadways throughout Delaware. The GPS statistically matches manual data collection in accuracy and is highly efficient and therefore continues to effectively collect data within Delaware today. Every year, a report is compiled documenting and summarizing the collected data. The *Application of Global Positioning System (GPS) to Travel Time and Delay Measurements – 1997 Phase* report describes the testing of the applicability and accuracy of the GPS system, while the *1998 Phase* report provides step-by-step instructions for data collection.

In past years, travel data was collected during peak-travel times between mid-September and Thanksgiving. In 2002, data collection expanded to include Summer peak-travel times as well. In 2003, the Summer mileage covered increased from 652 to 896 miles, and in 2004, this mileage increased again from 896 to 1006 miles. In 2008 the mileage increased to 1169 miles. This report describes the methodology used to collect Summer peak-travel time data and includes a summary and conclusion of the collected data.

Methodology

The continued success of the travel time and delay data collected over the past eleven years in monitoring congestion trends along Delaware roadways in the Fall months has led the Delaware Department of Transportation (DelDOT) to include the major travel routes to and from the shore points during the Summer months in the data collection. This data has become critical to the analysis of travel patterns surrounding the Delaware beaches and to the monitoring of congestion along these major routes.

All major routes leading to and from the Delaware beaches are covered. Routes and numerous additional segments were added in 2003 and even more have been added in 2004. 3 new roads were added in 2008. The new roads are SR 5, Plantation Rd (SR 1D), and SR 30. A small part of SR 30 did exist before. All of the routes covered can generally be divided into two groups:

- North-South roads: SR 1, US 13, US 113, SR 896, SR 71, SR 9, SR 5, SR 30, Plantation Rd (SR 1D), I-95, and I-495. These routes are primarily used by travelers coming to and from the main northern points, including New Castle County, Pennsylvania, New Jersey, Cecil County (in Maryland), etc.
- East-West roads: SR 404, SR 14, SR 16, SR 20, SR 24, SR 26, SR 36, SR 54, I-295. These roads are generally used by travelers from Maryland, Virginia, and Washington, D.C. entering the Delaware shore points.

For each route that was covered, control points were selected between the segments of the roadway. The control points were positioned at major intersections or where road characteristics, such as the number of lanes, speed limit, or development type changed. Once the control points were selected, they were entered into the data dictionary files using the Pathfinder editing system, which allows control points and specific attributes to be added, deleted, or edited. Data dictionary files allow control points and other roadway attributes, such as the speed limit and number of lanes, to be collected and stored with only a click of the mouse.

A major feature that was added to data collection in 2004 was the addition of a background map with corresponding control points to the Aspen software used while driving. This background map would allow the data collector to view where the car was in relation to the next control point as well as the surrounding roads and intersections. The control points were

represented by red crosses throughout the background map and were placed exactly where the next segment began. Both the background map and control points were added by layering two shape files extracted from the Geographic Information Systems (GIS) network. By adding these features, the data collector no longer had to rely on the car odometer and predetermined distances to anticipate the next control point.

Prior to the start of the project, new equipment was purchased in order to facilitate easier and more accurate data collection. Much of the equipment that had been used in previous years was outdated and not functioning correctly. Two new laptops were purchased, as well as new software, a new antenna, and new cabling for the GPS units. The software upgrade was necessary because the new laptops would not support the older programs. Aspen, which is no longer produced, was replaced by TerraSync, and the GPS Pathfinder Office software was upgraded to version 3.10.

As for data collection times, data was collected on Summer weekends between June 16th and August 18th. Generally, the majority of beach-goers travel to and from the shore points on Friday afternoons, Sunday afternoons, and throughout the day on Saturday. Traditionally, data has been collected heading toward the beach (southbound and eastbound) on Friday evenings from 3 to 7 PM and from 9 AM to noon on Saturday mornings. Data was also collected heading away from the beach (northbound and westbound) on Saturday evenings from 4 to 8 PM and on Sunday afternoons from 4 to 7 PM.

Due to the better than expected results of the Summer data collection in 2006, the Delaware Center for Transportation was asked to revise their data collection times to attempt to capture more of the congestion associated with beach travel. A report entitled *Recommendations for Revised Methodology for Summer Data Collection Regarding DCT Projects: Applications of*

Global Positioning System to Travel Time and Delay was completed in the winter of 2006. The report recommended time intervals in which data collectors should expect to see the most traffic. The report concluded that data collection times for many of the routes should be adjusted on Saturdays in order to collect more accurate data. Data collection times on Friday and Sunday remained the same as the previous year. Appendix A shows the adjusted data collection times; any roads not included in the Appendix A did not need adjustments.

Due to the number of routes to be covered and the need for at least 2 successful runs of each route, it was necessary to use two vehicles to complete the project on time. Two people rode in each car: a driver and a data collector. The latter operated the laptop computer and noted each attribute, while the former attempted to approximate the average driver. While one person might feasibly drive and collect data at the same time, this would present a potential safety hazard.

Each route was driven at least twice in each direction to guarantee the accuracy of the data that was collected. Recommendations for revised Methodology for Summer Data Collection also recommended that SR 1 be completed four times, therefore data for SR 1 was collected four times and data collection was spread as evenly as possible over Friday, Saturday, and Sunday.

In the event of problems, whether due to equipment failure, weekend-long inclement weather, or large irregularities in the travel patterns, the roads were traveled again to ensure that peak beach-traffic patterns were captured. Also, in the event of heavy rain or very poor weather conditions, which did not happen this season, data was not collected at all, in order to avoid the collection of inaccurate data, which would not fully represent particular travel and delay times, as well as ensure the safety of data collectors. Where more than two runs were completed, only

the results of the two or more that best captured the peak volume were used and averaged. Once all the data was collected, exported, and printed, it was analyzed and summarized on a segment-by-segment basis.

Differences between Fall and Summer Projects

The same basic methodology is used in both the Fall and Summer GPS Travel Time projects. In addition, many of the roads covered are the same. However, there are some key differences separating the projects:

1. Some of the roads covered during the Summer are different than those covered in the Fall. The Fall project emphasizes commuter routes, particularly in New Castle County, while the Summer project covers major beach routes throughout the state.
2. Instead of weekday morning and afternoon collection times as in the Fall, the Summer data was collected on weekends.
3. In the Fall, data is collected separately for both morning (AM) and afternoon (PM), and at least two runs of each route are completed in each direction at each time of day. Results are then tabulated separately for AM and PM. In the Summer, there is no AM/ PM division. Thus, roads are covered only twice in each direction.
4. Because the Summer project focuses primarily on statewide, long-distance beach traffic rather than short intra-county commuter trips, the roads are not separated by county as they are in the Fall.

Interpretation of 2008 Summer Data

This report includes a data table with all of the collected information arranged by route name. The leftmost column contains the name of the route being covered. Each route is then divided into the different segments and data is provided in each direction. To the right of the segment names, the table contains the following information:

- Distance (Miles) – This is the distance in miles for the given segment of roadway shown to the left. When the term "Total" is specified, the distance corresponds to the total length from the first control point to the last.

- Mean Peak Travel Time (Seconds) – This is the average time in seconds that was required to travel the length of the segment.

- Mean Peak Travel Speed (mph) – The average speed of the test vehicle from one point to the next is the Mean Peak Travel Speed. This value is given in miles per hour and is obtained by dividing the Distance of the segment by the Mean Peak Travel Time.

- Total Peak Delay (Seconds) – This is the time, in seconds, spent in delay on the given segment. By DelDOT's definition, delay is the time during which the vehicle speed drops below five miles per hour.

- Peak Delay Source – This is the reason for the delay noted in the previous column. Reasons for delay include signals, construction, accidents, congestion, pedestrian crossings, train crossings, etc. Traffic signals are the primary cause of delay.

- Mean Peak Running Speed (mph) – This is the average speed in miles per hour that a vehicle would travel through the section of roadway if delay were not experienced. The running speed, R, is obtained by the following equation:

$$R = \frac{\text{Distance}}{\text{Mean Peak Travel Time - Total Peak Delay}}$$

- Percent Time in Delay – This is the percentage of time spent in delay for the route segment shown. The percentage is found by dividing the Total Peak Delay by the Mean Peak Travel Time, then multiplying the quantity by 100. Example:

  Total Peak Delay = 82.02 sec

  Mean Peak Travel Time = 360 sec

$$\text{Percent Time in Delay} = \frac{82.08\,\text{sec}}{360\text{sec}} \times 100 = 22.8\%$$

- Number of Lanes – This represents the number of lanes during the given segment. For those segments that have a varying number of lanes, two or more values will appear in this column.

- Posted Speed (mph) – This represents the posted speed limit for the given segment of the roadway shown. For segments with more than one posted speed, two or more values will appear in this column.

Summary and Conclusions

Beach traffic congestion during the Summer of 2008 was again collected both precisely and effectively by the GPS Travel Time and Delay project teams. Although 3 new roads received attention, all roads covered in 2007 were again covered in 2008. This allowed for the continuing collection and analysis of travel time and delay time along the existing Summer routes.

Data collection using a GPS unit is an advancement to manual data collection. The system, however, is not perfect and some problems arose. The new equipment eliminated the problems of notebook computers malfunctioning during data collection, which would shut off the GPS units. However, at times the satellite signal was lost, due to inclement weather or tree obstruction. Nonetheless, manual data collection was always feasible and was used in the few instances when necessary.

The results from the 2008 Summer data collection show a general improvement in LOS on almost all routes. Data collection was repeated on some roads due to the lack of congestion the was expected. Interstate 95 and 295 were collected on four separate occasions to try to catch peak traffic flows. During the first times that data was collected on both of the routes, there was little to no congestion. Data was re-collected on these roads during two other different time intervals to try to capture more of the expected congestion.

Data collection teams realized that while traffic was observed to be moderate to heavy on most runs, and speeds were below posted on many roadway segments, vehicles were still moving. Collection teams that were involved in previous years noted that there seemed to be less traffic than the previous year, but the traffic seemed to be more steady throughout the day. It is possible that the extremely high price of gasoline affected some Summer travel. In addition traffic seemed to flow at a more steady volume throughout the entire day on Saturday. It may be possible that travelers are becoming more conscious of traffic delays and therefore spreading their travel out over a longer period of time.

Drivers to the beach appeared to be driving about as fast as in 2007, and drivers were very aggressive on the longer north and south bound roads. Speeds exceeding 70 miles per hour on roads with 55 mph speed limits were not uncommon. In addition, drivers were observed along I-95 and SR 1 driving down the breakdown lane in order to avoid the congestion. Most of the time the drivers on the breakdown lane were trying to turn off onto an exit.

Drivers experienced delays on US 13 in Seaford. Extremely short green times were observed on US 13 at the intersection of Tharp Road. It was observed that only 10-20 vehicles were making it through the green light, and the cross streets had more green time than was needed. In addition, the development of large shopping centers along SR 1 have caused excessive delays near the beach. Drivers appear to be using US 113 to circumvent the signalization along the last few segments of SR 1.

Variability in the time of peak traffic volume also caused difficulties. There are numerous factors that cause variation in this peak time, some of which are current weather, predicted weather, and holidays. If weather is predicted to be poor, fewer vacationers go to the beaches, or if the weather is sunny and then turns rainy, people usually leave early. Even with

the report recommending travel times, those recommended peak times did not always coincide with the peak times on Saturday.

Ideally, in the future, a computerized process to extract the GPS results and travel data is expected to yield greater accuracy and efficiency. Additionally, observations noted that data collection beyond US 13 on the East-West routes, not including SR 404, does not provide strong travel time and delay data and may be unnecessary in future projects. It was determined that hardly any congestion or even volume was observed past this point and up until the Maryland state line. Thus, the last control point on these roads could be placed at the intersections with US 13, as such a change would result in more resources being concentrated on more heavily traveled segments of other routes.

For the most part, data is collected every day of the weekend with no specification given to which day, only which direction. Thus, data collected on Friday evenings is averaged with data collected on Saturday mornings, since both times represent southbound traffic to the shore points. So far, there has been no serious problems or inaccuracies with this method; however, it may be more beneficial to collect and analyze this data on more of a day-to-day basis, with possibly two runs being completed for each route in each direction as well as on each day, in order to allow for a more direct analysis of the data and a more specific account of when beach roads are most congested. However; this may require the addition of one to two more vehicles and teams in order to schedule two runs of each road on each day of the weekend within the given data collection times period.

Also, after careful observation along with direct contact with the toll plazas, as mentioned earlier, it was discovered that congestion northbound on Saturday mornings can be just as high as congestion southbound at this time. Methods of collection including Saturday morning north

bound routes may be a possible addition to future projects, and it may contribute to the accuracy and development of a successful travel time and delay study during the Summer, when traffic peak times do vary considerably. In order to allow for these additions and the time constraints put on Summer data collection, it may be necessary to include a third car, as well as a third set of data collectors, in accomplishing this Summer project in the future. This Summer project was very successful in capturing an accurate picture of travel time and delay all over Delaware and its shore points, and these changes would not only continue the success of the project but allow for a more detailed and comprehensive approach to GPS data collection and its application to such travel time and delay measurements.

Finally, Appendices were attached to this report. Appendix A shows recommended data collection times. Appendix B has 10-most degraded, 10-most improved, and 20-worst segments. Appendix C has a map of the roads covered in Summer 2008. Appendix D describes the methodology of calculating mean peak travel speed. Appendix E describes the methodology of calculating mean peak delay. Appendix F describes the methodology of calculating the difference between posted speed and average speed. Appendices G and H show the Level of services in Summer 2007 and 2008. These appendices are useful to compare the changes in level of service between Summer 2007 and 2008. Appendix I shows the final table containing Summer 2008 data collection data.

List of Appendices:

Appendix A

Recommended Data Collection Intervals on Saturdays

Route	Direction	Beginning Segment	Start Time
SR 1	SB NB	SR 141 SR 54	9:00–10:00am 4:00-5:00pm
US 113	SB NB	SR 1 Split Maryland State Line	11:00am-12:00pm 4:00-5:00pm
US 13 (Wilmington to Dover)	SB NB	I-495 SR 1/US 113 Split	9:00–10:00am 4:00-5:00pm
US 13 (Dover to MD Line)	SB NB	SR 1/US 13 Split SR 54	9:00–10:00am 4:00-5:00pm
SR 404	EB WB	Maryland State Line SR 1	10:00–11:00am 4:00-5:00pm
SR 16	EB WB	Maryland State Line SR 1	10:00–11:00am 4:00-5:00pm
SR 36	EB WB	SR 404 SR 36/16 Split	10:00–11:00am 4:00-5:00pm
SR 20	EB WB	Maryland State Line SR 1	10:00–11:00am 10:00–11:00am
SR 24	EB WB	Maryland State Line SR 1	9:00–11:00am 4:00-5:00pm
SR 26	EB WB	SR 54 Split SR 1	9:00–10:00am 4:00-5:00pm
SR 30	SB NB	SR 1 US 13	10:00–11:00am 4:00-5:00pm
SR 1D Plantation Rd	SB NB	US 9 SR 1	10:00–11:00am 4:00-5:00pm
SR 5	SB NB	SR 1 Indian River Bay	10:00–11:00am 4:00-5:00pm
SR 54	EB WB	Maryland State Line SR 20	9:00–10:00am 4:00-5:00pm

*Routes not included on this chart did not need adjustments in data collection intervals.

*Source: Recommendations for Revised Methodology for Summer Data Collection Regarding DCT Projects: Applications of Global Positioning System to Travel Time and Delay – Winter 2006

Appendix B

Notable Segments:

This is a listing of segments which appear to require special attention:

- 10-Most Degraded Segments
- 10-Most Improved Segments
- 20-Worst Segments

To find these segment the following equations have been used:

$$\%\_PS\_TS = \frac{Mean\ Peak\ Travel\ Speed - Weighted\ Average\ Speed}{Weighted\ Average\ Speed}$$

$$\%\_D\_PS\_TS = \%\_PS\_TS_{2008} - \%\_PS\_TS_{2007}$$

A_1: 10-Most Degraded Segments

Segments are selected by taking the difference between the LOS of 2007 and the LOS of 2008 and taking the segments which indicated the most drastic decline. If two or more segments had the same level of degradation, the segment with the least %_D_PS_TS took priority.

A_2: 10-Most Improved Segments

Segments are selected by taking the difference between the LOS of 2007 and the LOS of 2008 and taking the segments which indicated the most notable improvement. If two or more segments had the same level of improvement, the segment with the greatest %_D_PS_TS took priority.

A_3: 20-Worst Segments

The 20 segments with the greatest LOS are selected and displayed in this table.

A_1: 10-Most Degraded Segments – 2008:

ID	Route Number	Dir	Segment	LOS 07	LOS 08	%_D_PS_TS
344	SR 24	WB	US 113 to 30/24 split	A	B	-109.12%
313	SR 20	EB	SR 24 to SR 20 E/US 113 Split	A	D	-82.90%
160	SR 1	SB	SR 14 to SR 36 (Slaughter Beach)	A	F	-76.15%
428	SR 54	WB	US 13 to Waller Rd (RD 512)	A	B	-71.48%
137	SR 1	NB	Exit 97 (two on ramps) to Exit 98	B	F	-68.42%
352	SR 24	EB	SR 5 South to SR 23 / SR 5 North	A	F	-64.91%
49	US 13 Wilm	SB	SR 273 to US 40	A	C	-62.50%
13	SR 896	SB	SR 71 to SR 15	A	B	-56.71%
1	SR 896	SB	I-95 to Old Baltimore Pike	A	B	-52.23%
175	SR 1	SB	Rehoboth Avenue to King Charles Ave (DE)	A	A	-49.93%

A_2: 10-Most Improved Segments - 2008:

ID	Route Number	Dir	Segment	LOS 07	LOS 08	%_D_PS_TS
331	SR 24	EB	MD line to Road 499	A	A	99.35%
467	I 95	SB	Exit 3 (SR 273) to Exit 1 (SR 896)	D	A	90.73%
161	SR 1	NB	SR 36 (Slaughter Beach to SR 14)	D	A	83.92%
463	I 95	NB	Exit 3 (SR 273) to Exit 4 (SR 1)	D	A	80.36%
469	I 95	NB	MD Line to Exit 1 (SR 896)	C	A	79.52%
242	SR 404	WB	US 9 Merge to US 113	E	A	77.25%
464	I 95	SB	Exit 4 (SR 1) to Exit 3 (SR 273)	C	A	67.14%
290	SR 14	WB	SR 1 to US 113	B	A	53.64%
5	SR 896	NB	US 40 to Old Baltimore	B	A	53.20%
248	SR 404	WB	RT 5 to Rt 30	C	A	52.82%

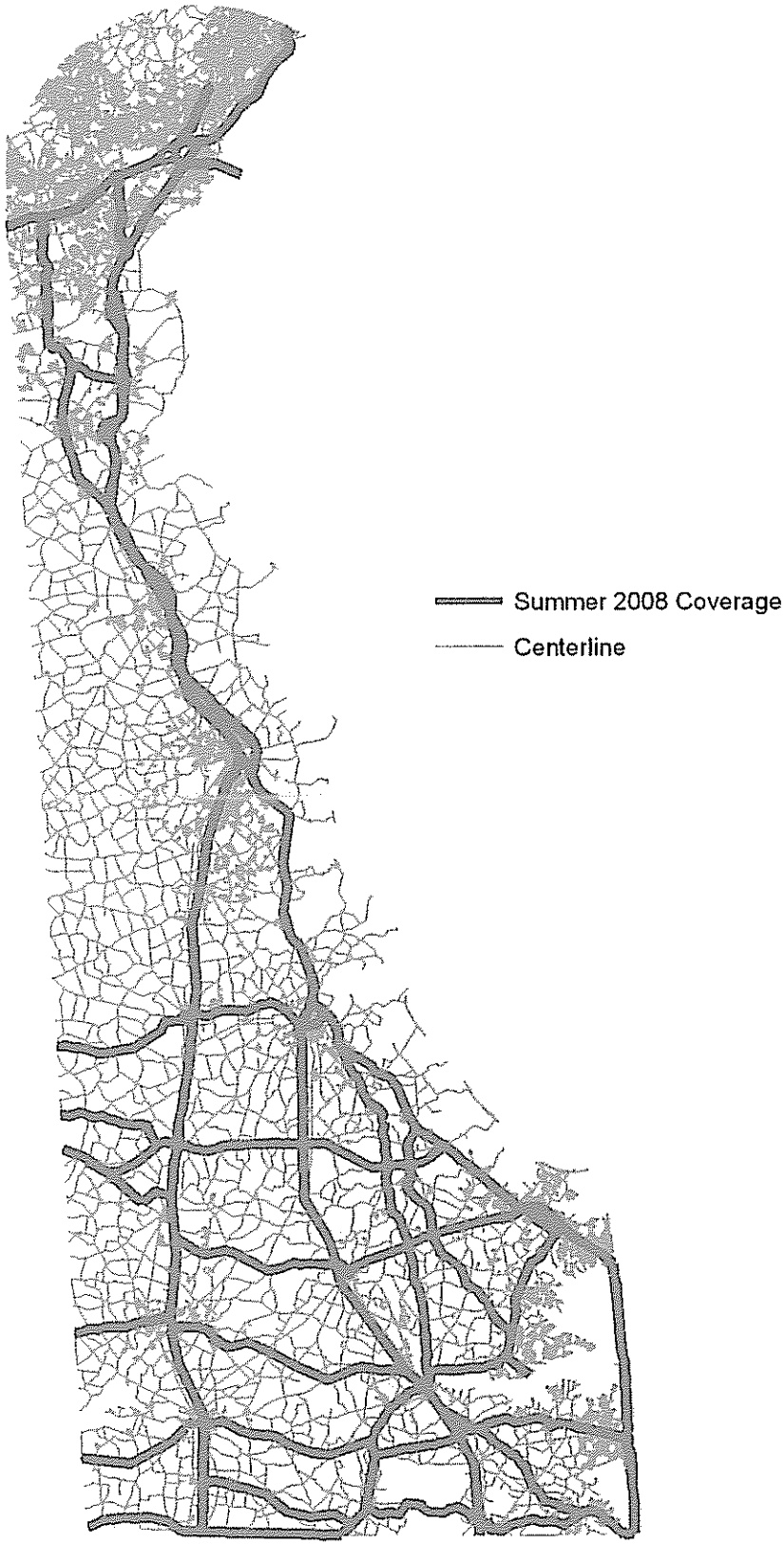
A_3: 20-Worst Segments - 2008:

ID	Route Number	Dir	Segment	LOS	LOS %	Avg. Speed (mph)
137	SR 1	NB	Exit 97 (two on ramps) to Exit 98	F	80.21%	12.9
101	SR 1	NB	Christiana Mall (exit 164) to Merge with I-95 N	F	79.56%	8.6
160	SR 1	SB	SR 14 to SR 36 (Slaughter Beach)	F	78.49%	11.5
352	SR 24	EB	SR 5 South to SR 23 / SR 5 North	F	74.20%	9.0
23	SR 896	NB	SR 1 to US 13	E	64.88%	8.6
367	SR 26	EB	US 113 to SR 20	E	62.32%	10.2
7	SR 896	SB	US 40 to Porter Rd.	E	61.85%	16.0
176	SR 1	NB	King Charles Ave (DE) to Rehoboth Avenue	D	57.74%	13.1
313	SR 20	EB	SR 24 to SR 20 E/US 113 Split	D	56.96%	21.7
235	SR 404	EB	US 13/404 W Split to US 13/404 E Split	D	55.37%	19.6
427	SR 54	EB	Waller Rd (RD 512) to US 13	D	53.64%	11.6
46	US 13 Wilm	SB	SR 141 to SR 273	D	48.27%	19.2
140	SR 1	NB	Combo w/ US 113 (95) to Exit 97 (two on ramps)	D	46.41%	34.8
107	SR 1	NB	US 40 (exit 160) to SR 273 (exit 162)	D	45.42%	29.9
302	SR 20	WB	US 13 / SR 20 E to US 13 / SR 20 W	C	43.87%	21.1
91	US 13 Wilm	SB	US 13/113 Split to 1/113 Merge (SR 1 Exit 95)	C	43.80%	20.4
142	SR 1	SB	Combo w/ US 113 (95) to Exit 93	C	42.61%	27.3
8	SR 896	NB	Porter Rd. to US 40	C	42.01%	24.0
169	SR 1	SB	US 9 West / SR 404 to SR 24	C	41.85%	14.3
397	US 13 Dover	SB	SR 404 W to SR 404 E	C	41.61%	19.8

Appendix C

Summer Coverage:

The following GIS drawing displays in red all the routes that are covered by the Summer 2008 GPS data collection.


Summer 2008 Coverage
Centerline

Appendix D

Mean Peak Travel Speed:

The following GIS drawing displays the mean peak travel time in miles per hour in both directions for every segment of the Summer 2008 GPS data collection.

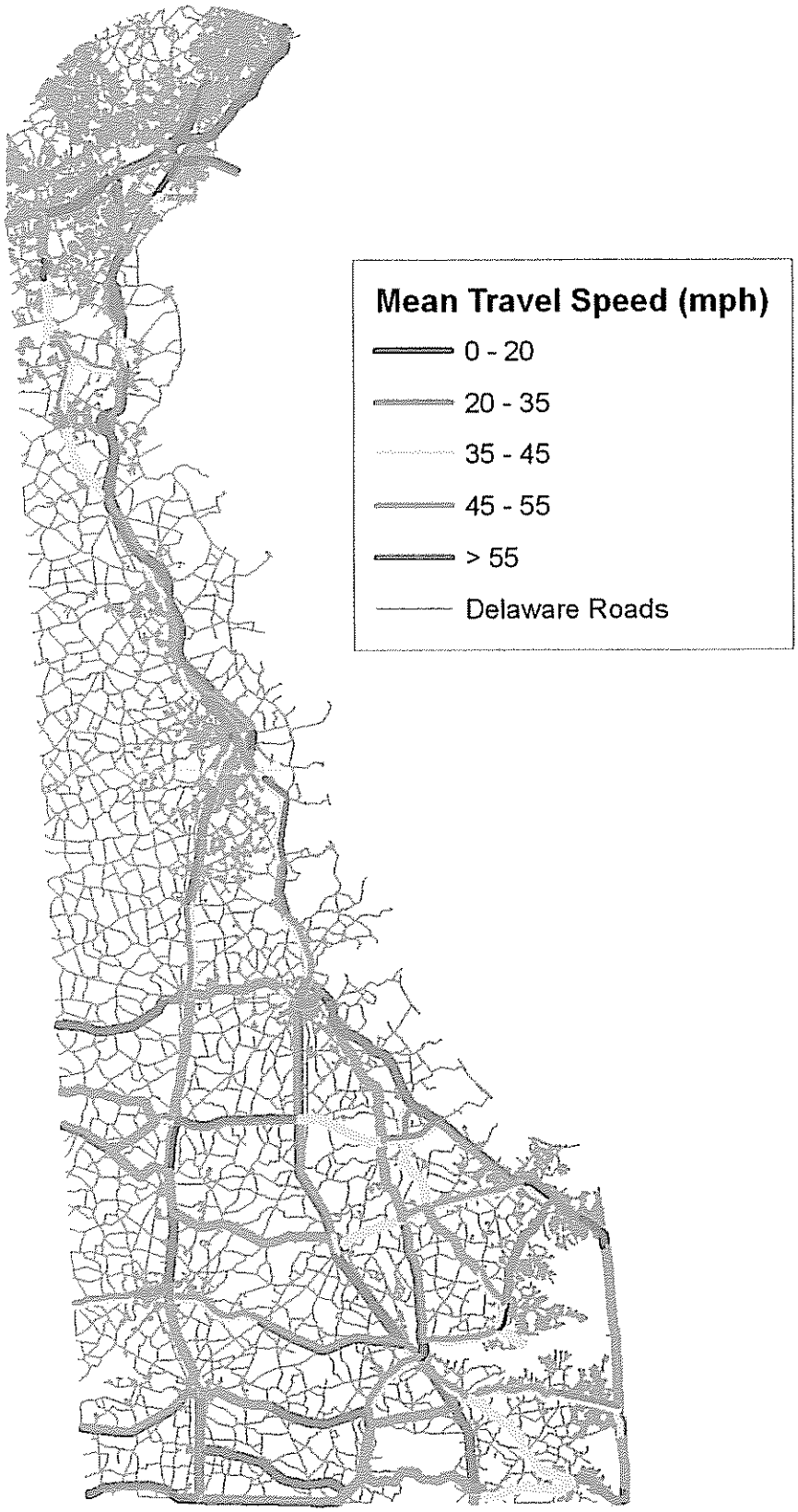
Methodology:

The mean peak travel speed for every segment is calculated by averaging the total time required to travel the length of each segment of all runs (mean peak travel time), and dividing the segment length by that time.

Equations:

$$MeanPeakTravelTime = \frac{\sum_{1}^{n} TotalTravelTime\_Run(x)}{n}$$

$$MeanPeakTravelSpeed = \frac{SegmentDistance(Miles)}{MeanPeakTravelTime(Seconds)} * \frac{3600seconds}{1hour}$$


Mean Travel Speed (mph)
0 - 20
20 - 35
35 - 45
45 - 55
> 55
Delaware Roads

Appendix E

Mean Peak Delay:

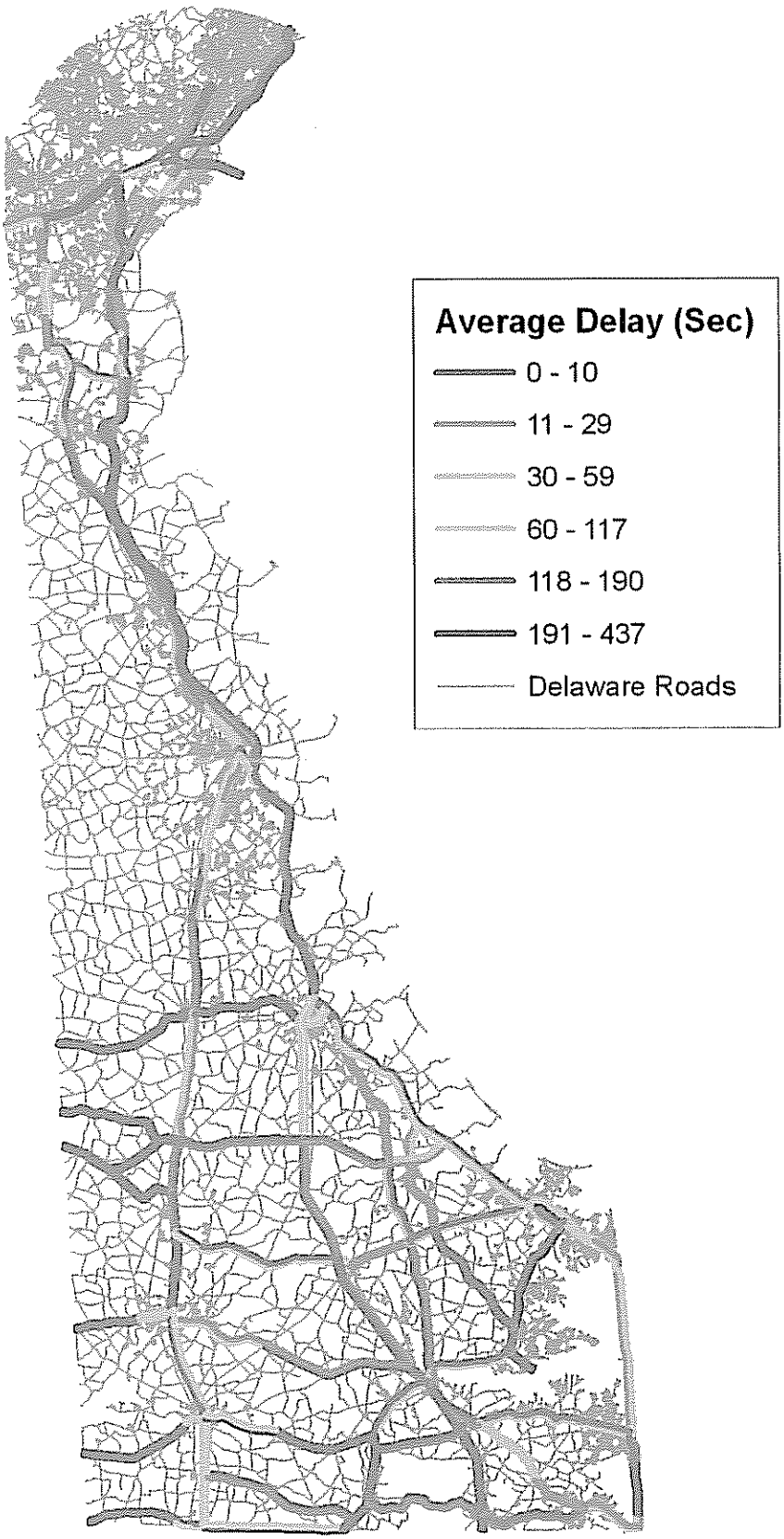
The following GIS drawing displays the average delay along each segment in both directions for every segment of the Summer 2008 GPS data collection.

Methodology:

Average delay is calculated by adding together the delay measured in each run and dividing the total by the number of runs. The result is displayed in seconds of delay.

Equations:

$$AverageDelay(seconds) = \frac{\sum_{1}^{n} Delay(seconds)\_run(x)}{n}$$


Average Delay (Sec)
0 - 10
11 - 29
30 - 59
60 - 117
118 - 190
191 - 437
Delaware Roads

Appendix F

Posted Speed vs. Average Speed Difference:

The following GIS drawing displays the percent difference between the posted speed and the average speed for every segment of the Summer 2008 GPS data collection.

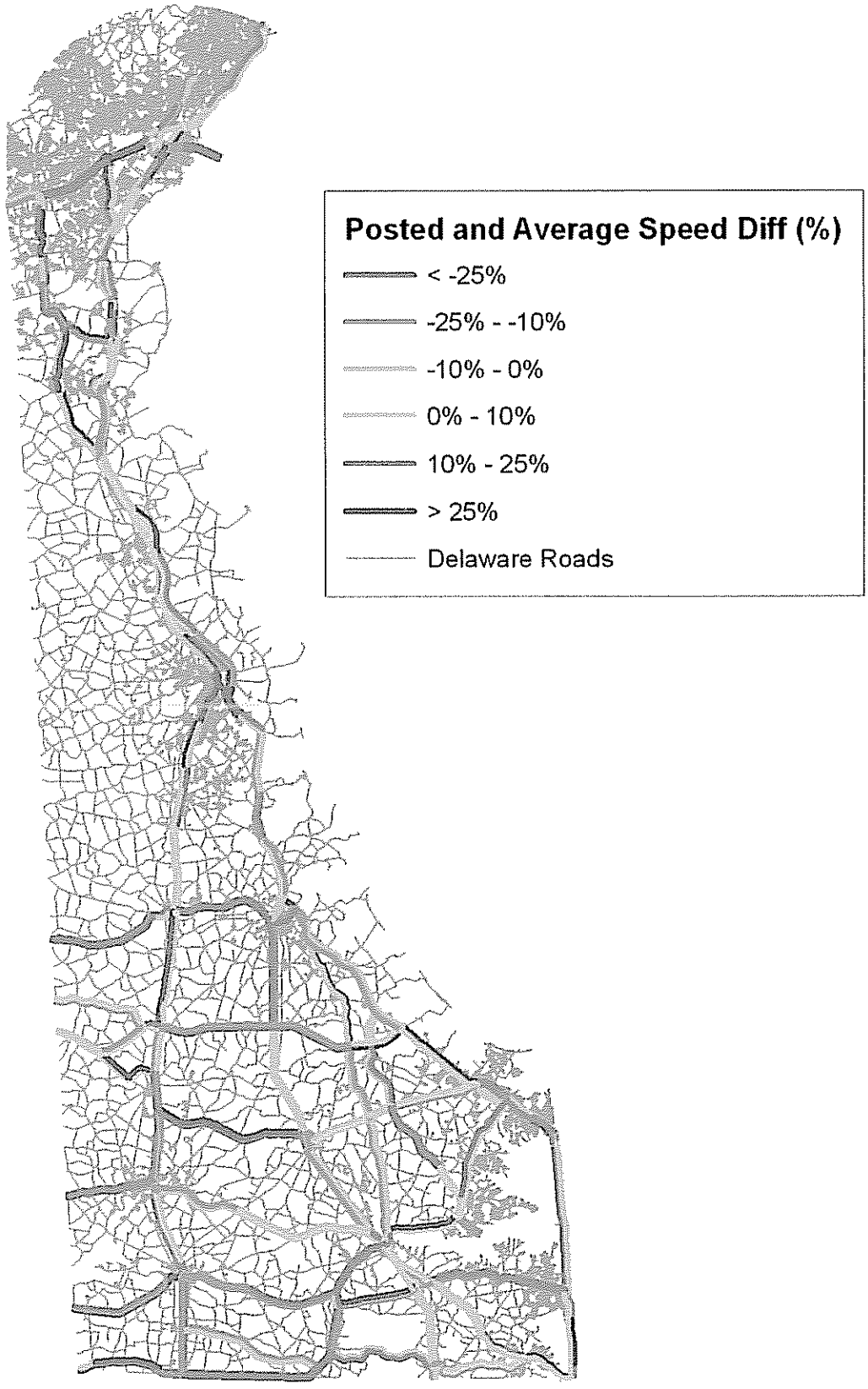
Methodology:

The percent difference between the posted speed and the average speed is calculated be subtracting the average speed of all runs from the posted speed and dividing the difference by the posted speed. This is done for all segments.

Equations:

$$Average\ \ Speed\ = \frac{\sum_{1}^{n} Average\ \ Speed\ \_\ run(x)}{n}$$

$$Posted\ \&\ Average\ Speed\ Diff.\% = \frac{(Posted\ Speed - Average\ Speed)}{Posted\ Speed} * 100\%$$


Posted and Average Speed Diff (%)
< -25%
-25% - -10%
-10% - 0%
0% - 10%
10% - 25%
> 25%
Delaware Roads

Appendix G

Level of Service 2007:

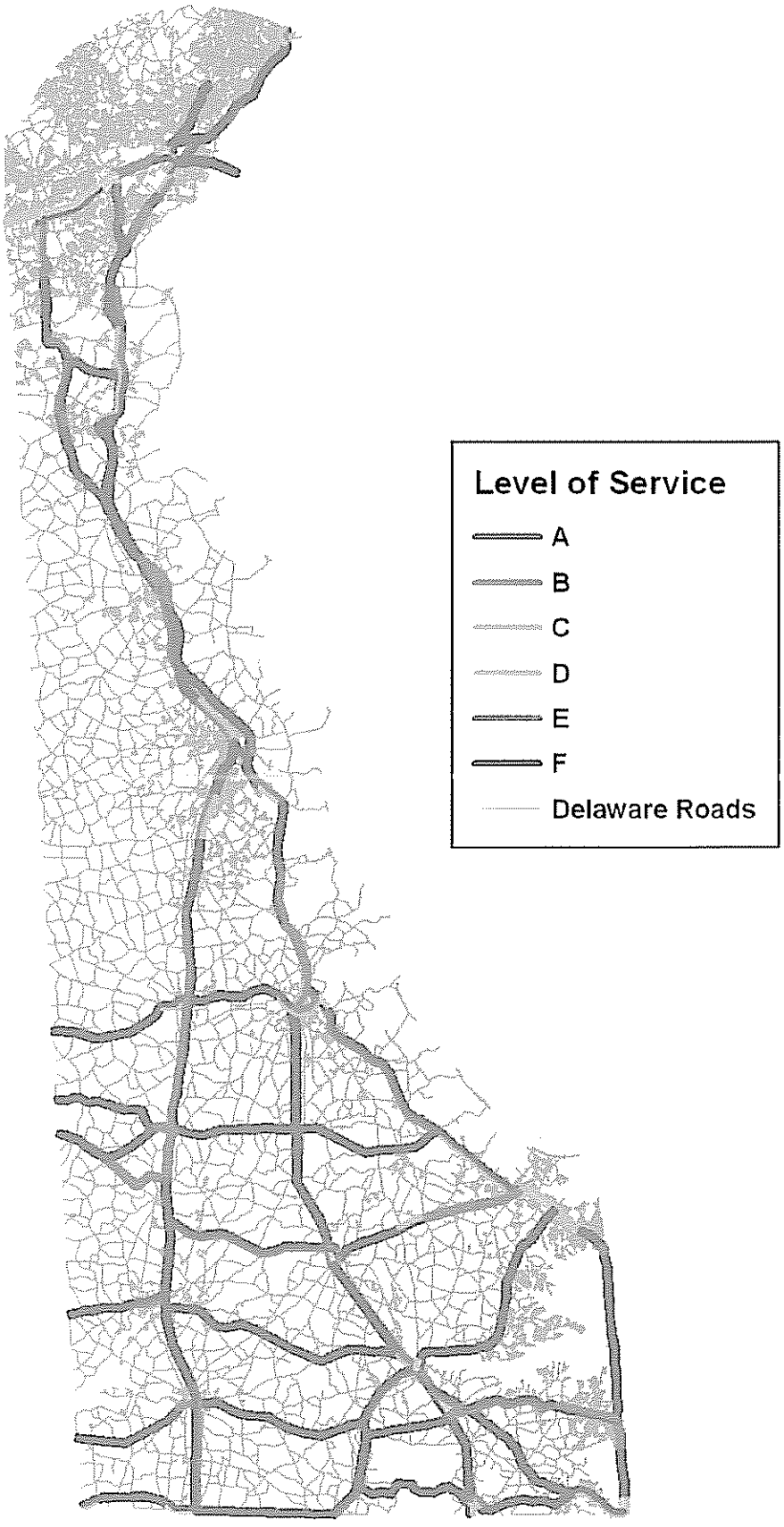
The following GIS drawing displays the calculated level of service for each direction of all segments for every segment of the Summer 2007 GPS data collection.

Methodology:

Using the percent difference between the posted speed and average speed, the level of service is calculated. By first identifying segments that are interstates or interstate/freeways and roads that are arterials in 2007, the following tables are used to classify the appropriate level of service.

Percentage of speed below the posted speed limit:

For Interstate or Interstate/Freeways:	Arterials:
LOS A: 0-14%	LOS A: 0-10%
LOS B: 14-18%	LOS B: 10-30%
LOS C: 18-20%	LOS C: 30-45%
LOS D: 20-30%	LOS D: 45-60%
LOS E: 30-50%	LOS E: 60-70%
LOS F: 50% +	LOS F: 70% +


Level of Service
A
B
C
D
E
F
Delaware Roads

Appendix H

Level of Service 2008:

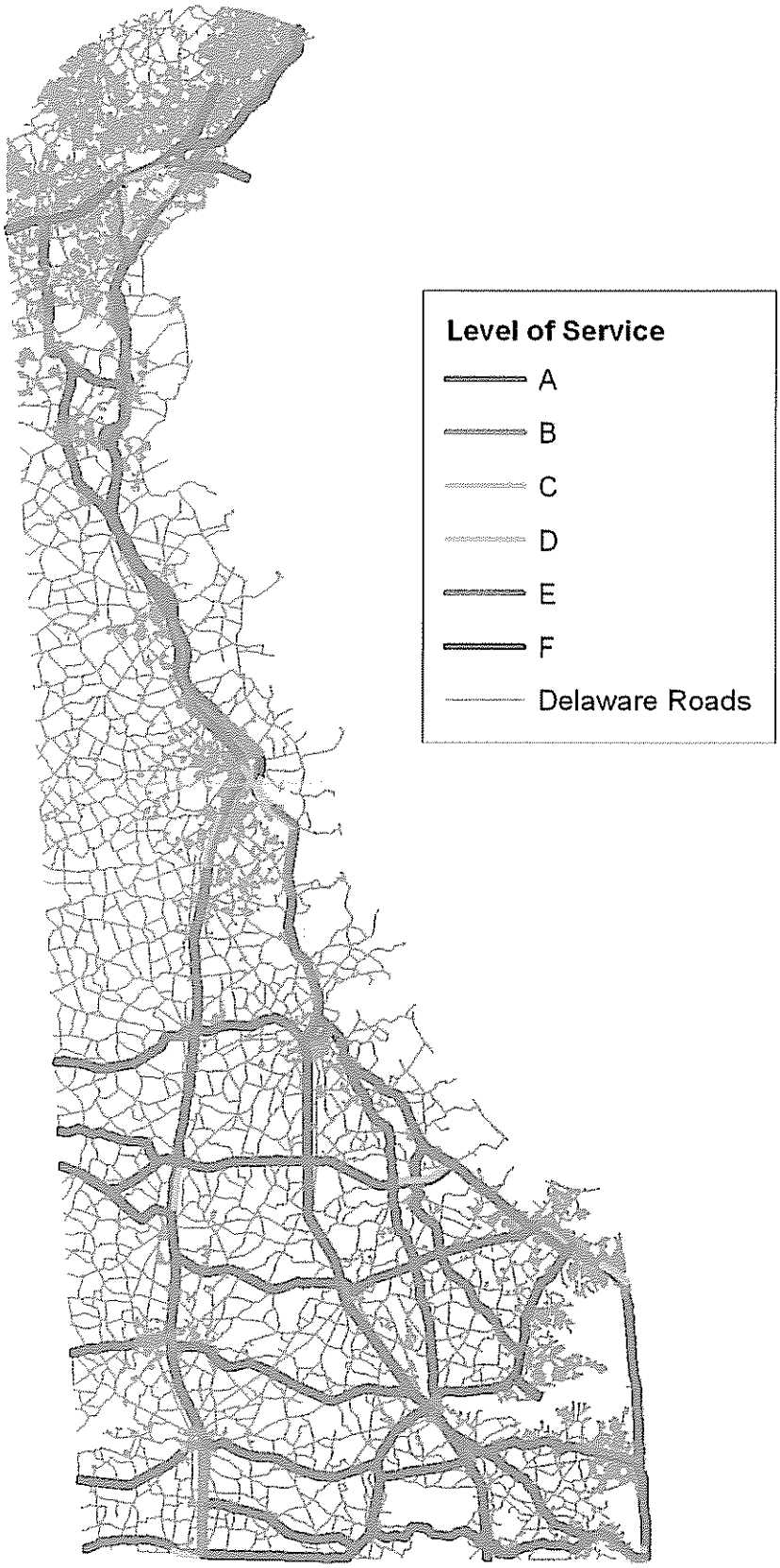
The following GIS drawing displays the calculated level of service for each direction of all segments for every segment of the Summer 2008 GPS data collection.

Methodology:

Using the percent difference between the posted speed and average speed, the level of service is calculated. By first identifying segments that are interstates or interstate/freeways and roads that are arterials in 2008, the following tables are used to classify the appropriate level of service.

Percentage of speed below the posted speed limit:

For Interstate or Interstate/Freeways:	Arterials:
LOS A: 0-14%	LOS A: 0-10%
LOS B: 14-18%	LOS B: 10-30%
LOS C: 18-20%	LOS C: 30-45%
LOS D: 20-30%	LOS D: 45-60%
LOS E: 30-50%	LOS E: 60-70%
LOS F: 50% +	LOS F: 70% +


Level of Service
A
B
C
D
E
F
Delaware Roads

Appendix I

Peak Travel Time Data – Summer 2008

The following table is the averaged data for all segments analyzed during the Summer 2008 GPS data collection. The table includes the route number, route name, segment direction, segment distance, mean peak travel time, mean peak travel speed, total delay, peak delay source, mean peak running speed, percent time in delay, number of lanes and the posted speeds.

Comparing to 2007, Mean Peak Travel Speed in the state of Delaware has increased from 42.3 to 43.9 mph. Also Percent Time in Delay has decreased from 15.2% in 2007 to 8.4% in 2008. The main reason for this improvement could be because of the high price of gas in Summer 2008. In Summer 2008, the national average gas price hit $4.00/gal. Because the high price of gas, many U.S. families cut some of their summer vacations. This reduction in the number of trips reduced VMT in the Summer 2008 comparing to Summer 2007 and made Delaware roads less congested than what they were in Summer 2007.

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 896	SR 896	I-95 to Old Baltimore Pike	SB	0.8	121	23.9	48	Signal	39.6	39.7%	2	50	B
SR 896	SR 896	Old Baltimore Pike to I-95	NB	0.8	60	46.5	0	--	46.5	0.0%	2	50,40	A
SR 896	SR 896	Old Baltimore to US 40	SB	2.2	163	47.5	12	Signal	51.1	7.1%	2	50	A
SR 896	SR 896	US 40 to Old Baltimore	NB	2.2	150	52.0	28	Signal	63.9	18.6%	2	50	A
SR 896	SR 896	US 40 to Porter Rd.	SB	1.4	320	16.0	64	Road Construction	20.0	20.0%	2, 3	50,55	E
SR 896	SR 896	Porter Rd. to US 40	NB	1.4	208	24.0	44	Signal	30.4	21.2%	2, 3	55,50	C
SR 896	SR 896	Porter Rd. to SR 71	SB	2.0	183	38.9	63	Signal	59.4	34.4%	2	55	A
SR 896	SR 896	SR 71 to Porter Rd.	NB	2.0	164	44.8	38	Signal	58.1	22.9%	2	55	A
SR 896	SR 896	SR 71 to SR 15	SB	2.0	177	40.3	15	Signal	43.9	8.2%	2	55	B
SR 896	SR 896	SR 15 to SR 71	NB	2.0	164	42.9	0	--	42.9	0.0%	2	55	B
SR 896	SR 896	SR 15 to SR 896 / SR 71 Split (Boyd's Corner Rd)	SB	2.1	231	33.4	87	Signal	53.3	37.4%	2	55,50,25	A
SR 896	SR 896	SR 896 / SR 71 Split (Boyd's Corner Rd) to SR 15	NB	2.2	167	46.4	0	--	46.4	0.0%	2	55	B
SR 896	SR 896	SR 896 / SR 71 Split (Boyd's Corner Rd) to US 13	SB	3.5	328	38.4	58	Signal	46.7	17.7%	1, 2	25,35,50	A
SR 896	SR 896	US 13 to SR 896 / SR 71 Split (Boyd's Corner Rd)	NB	3.5	260	48.5	0	--	48.5	0.0%	2, 1	50,35,25,55	A
SR 896	SR 896	US 13 to SR 1	SB	0.2	25	29.4	0	--	29.4	0.0%	2	40,50	C
SR 896	SR 896	SR 1 to US 13	NB	0.2	84	8.6	43	Signal	17.6	51.0%	2	50	E
SR 896 Total		**I-95 to SR 1**	**SB**	**14.2**	**1547**	**33.0**	**346**	**--**	**42.5**	**22.3%**			
		SR1 to I-95	**NB**	**14.2**	**1257**	**40.6**	**152**	**--**	**46.2**	**12.1%**			
SR 71	SR 71	896 / 71 Split (Boyd's Corner Rd) to US 301Split	SB	3.4	376	32.2	83	Signal	41.4	22.2%	1	50,35	A
SR 71	SR 71	US 301Split to 896 / 71 Split (Boyd's Corner Rd)	NB	3.4	297	40.7	3	Signal	41.1	1.0%	2, 1	35,45,50	A
SR 71	SR 71	US 301 Split to SR 299	SB	1.0	174	20.4	37	Signal	25.9	21.4%	1	50,35,25	B
SR 71	SR 71	SR 299 to US 301 Split	NB	1.0	134	26.6	11	Signal	28.9	7.9%	1	35,45	B
SR 71	SR 71	SR 299 to US 13	SB	5.7	481	42.8	0	--	42.8	0.0%	1	25,35,50,40,50,40	A
SR 71	SR 71	US 13 to SR 299	NB	5.7	485	42.4	14	Signal	43.6	2.9%	2, 1	50,40,50,35,25	A
SR 71 Total		**896 / 71 Split (Boyd's Corner Rd) to US 13**	**SB**	**10.1**	**1031**	**35.1**	**121**	**--**	**39.8**	**11.7%**			
		US 13 to 896 / 71 Split (Boyd's Corner Rd)	**NB**	**10.1**	**916**	**39.5**	**28**	**--**	**40.7**	**3.0%**			
US 13 Wilm.	DuPont Hwy	I -495 to I-295	SB	1.8	219	29.5	44	Congestion/Signal	36.8	20.0%	2, 3	50	B
US 13 Wilm.	DuPont Hwy	I-295 to I-495	NB	1.8	136	46.7	0	--	46.7	0.0%	2	50	A
US 13 Wilm.	DuPont Hwy	I-295 to SR 141	SB	1.3	247	18.5	119	Congestion/Signal	35.8	48.3%	3	50	B
US 13 Wilm.	DuPont Hwy	SR 141 to I-295	NB	1.3	226	20.9	92	Congestion/Signal	35.2	40.7%	4, 3	50	B
US 13 Wilm.	DuPont Hwy	SR 141 to SR 273	SB	1.3	241	19.2	62	Congestion/Signal	25.9	25.8%	3,4	50	D
US 13 Wilm.	DuPont Hwy	SR 273 to SR 141	NB	1.3	112	41.6	33	Signal	59.0	29.5%	4	50	A
US 13 Wilm.	DuPont Hwy	SR 273 to US 40	SB	1.0	132	27.7	20	Congestion/Signal	32.7	15.4%	4	50,55	C

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
US 13 Wilm.	DuPont Hwy	US 40 to SR 273	NB	1.0	96	37.7	17	Signal	45.7	17.5%	2, 4	50	A
US 13 Wilm.	DuPont Hwy	US 40 to SR 1/13 Merge	SB	3.2	401	28.8	153	Congestion/Signal	46.6	38.1%	4, 2	55,65	B
US 13 Wilm.	DuPont Hwy	SR 1/ US 13 Split to US 40	NB	3.6	275	47.2	14	Signal	49.7	5.1%	2	55,50	A
US 13 Wilm.	DuPont Hwy	SR 1/US 13 Merge to SR 72 (152)	SB	2.5	173	52.1	28	Signal	62.0	16.0%	2	65	A
US 13 Wilm.	DuPont Hwy	SR 72 (152) to SR 1/US 13 Split	NB	2.1	170	45.4	20	Signal	51.3	11.6%	2	65,55	B
US 13 Wilm.	DuPont Hwy	SR 72 (151) to C&D Canal	SB	3.1	198	56.4	13	Signal	60.5	6.7%	2	65,55	A
US 13 Wilm.	DuPont Hwy	C&D Canal to SR 72 (152)	NB	3.1	188	59.3	18	Signal	65.4	9.4%	2	65	A
US 13 Wilm.	DuPont Hwy	C&D Canal to SR 896	SB	2.7	244	39.8	14	Signal	42.2	5.7%	2	55	B
US 13 Wilm.	DuPont Hwy	SR 896 to C&D Canal	NB	2.7	229	42.4	0	--	42.4	0.0%	2	55,65	B
US 13 Wilm.	DuPont Hwy	SR 896 to SR 299	SB	3.1	241	46.7	14	Signal	49.6	5.9%	2	35	A
US 13 Wilm.	DuPont Hwy	SR 299 to SR 896	NB	3.1	277	40.8	30	Signal	45.8	10.9%	2	35,55	A
US 13 Wilm.	DuPont Hwy	SR 299 to SR 71	SB	5.4	338	57.6	0	--	57.6	0.0%	2	35,55	A
US 13 Wilm.	DuPont Hwy	SR 71 to SR 299	NB	5.4	401	48.5	19	Signal	50.9	4.6%	2	55,35	A
US 13 Wilm.	DuPont Hwy	SR 71 to SR 1 (ex 119)	SB	4.2	241	62.1	4	Signal	63.2	1.8%	2	55	A
US 13 Wilm.	DuPont Hwy	SR 1 (ex 119) to SR 71	NB	4.1	291	51.3	0	--	51.3	0.0%	2	55	A
US 13 Wilm.	DuPont Hwy	SR 1 to SR 6E (Commerce St)	SB	2.2	191	42.2	26	Signal	49.0	13.8%	2	55,45,35	A
US 13 Wilm.	DuPont Hwy	SR 6E (Commerce St) to SR 1	NB	2.2	151	52.9	0	--	52.9	0.0%	2	55	A
US 13 Wilm.	DuPont Hwy	SR 6E (Commerce St) to SR 1 (to exit 114)	SB	1.6	154	36.4	21	Signal	42.0	13.5%	2	35,45,55	A
US 13 Wilm.	DuPont Hwy	SR 1 (to exit 114) to SR 6E (Commerce St)	NB	1.6	141	39.7	10	Signal	42.8	7.1%	2	45, 35	A
US 13 Wilm.	DuPont Hwy	SR 1 (to exit 114) to SR 42	SB	4.2	311	48.7	32	Signal	54.2	10.1%	2	55	A
US 13 Wilm.	DuPont Hwy	SR 42 to SR 1 (to exit 114)	NB	4.2	334	45.3	27	Signal	49.2	7.9%	2	55,45	A
US 13 Wilm.	DuPont Hwy	SR 42 to Scarborough Rd	SB	2.0	176	41.5	24	Signal	48.0	13.5%	2	55	B
US 13 Wilm.	DuPont Hwy	Scarborough Rd to SR 42	NB	2.0	153	47.7	7	Signal	49.8	4.3%	3, 2	55	A
US 13 Wilm.	DuPont Hwy	Scarborough Rd to SR 8	SB	3.4	355	34.5	55	Signal	40.8	15.4%	2, 3	45,40,35	A
US 13 Wilm.	DuPont Hwy	SR 8 to Scarborough Rd	NB	3.4	421	29.1	99	Signal	38.1	23.5%	3	35,40,45	A
US 13 Wilm.	DuPont Hwy	SR 8 to US 13/113 Split	SB	0.4	68	19.1	25	Signal	30.1	36.5%	3	35,50	B
US 13 Wilm.	DuPont Hwy	US 13/113 Merge to SR 8	NB	0.3	41	27.4	5	Signal	31.4	12.9%	3	35	B
US 13 Wilm.	US 113	US 13/113 Split to 1/113 Merge (SR 1 Exit 95)	SB	2.2	391	20.4	76	Signal	25.3	19.4%	3	45	C
US 13 Wilm.	US 113	1/113 Split (SR 1 Exit 95) to US 13/113 Merge	NB	2.3	281	29.0	21	Signal	31.3	7.4%	3	45	C
US 13 Wilm. Total		**I-495 Overpass to 1/113 Split**	**SB**	**45.6**	**4319.0**	**38.0**	**729.5**	--	**45.7**	**16.9%**			
		1/113 Split to I-495 Overpass	**NB**	**45.6**	**3920.7**	**41.8**	**409.6**	--	**46.7**	**10.4%**			
SR 1	I-95	SR 141 to Merge with SR 1	SB	3.1	236	47.1	15	Congestion/Accident	50.2	6.2%	4	45,55	A
SR 1	I-95	Merge with I-95 N to SR 141	NB	3.2	386	29.8	66	Congestion	35.9	17.0%	2, 4	50,55	C

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 1	SR 1	Merge with SR 1 to Christiana Mall (exit 164)	SB	1.1	100	38.2	0	--	38.2	0.0%	2	55	C
SR 1	SR 1	Christiana Mall (exit 164) to Merge with I-95 N	NB	0.5	207	8.6	23	Congestion	9.7	11.0%	2	50,45	F
SR 1	SR 1	Christiana Mall (exit 164) to SR 273 (exit 162)	SB	0.9	48	69.5	0	--	69.5	0.0%	2	55	A
SR 1	SR 1	SR 273 (exit 162) to Christiana Mall (exit 164)	NB	0.9	99	32.7	9	Congestion	36.1	9.5%	2	55,50	C
SR 1	SR 1	SR 273 (exit 162) to US 40 (exit 160)	SB	1.7	125	50.1	1	Congestion	50.5	0.8%	2	55	A
SR 1	SR 1	US 40 (exit 160) to SR 273 (exit 162)	NB	1.7	208	29.9	1	Congestion	30.0	0.3%	2	55	D
SR 1	SR 1	US 40 (exit 160) to US 13 North (exit 156)	SB	1.7	120	50.1	3	Congestion	51.5	2.6%	2	55	A
SR 1	SR 1	US 13 North (exit 156) to US 40 (exit 160)	NB	2.3	171	48.1	0	Congestion	48.1	0.0%	3, 2	55	B
SR 1	SR 1	US 13 North (exit 156) to SR 72 (exit 152)	SB	2.5	152	59.4	0	--	59.4	0.0%	3	65	A
SR 1	SR 1	SR 72 (exit 152) to US 13 North (exit 156)	NB	2.1	130	58.7	0	Congestion	58.7	0.0%	3	65,55	A
SR 1	SR 1	SR 72 (exit 152) to C&D Canal	SB	2.8	186	54.1	2	Congestion	54.7	1.1%	3	65	B
SR 1	SR 1	C&D Canal to SR 72 (exit 152)	NB	3.0	161	66.6	0	--	66.6	0.0%	2, 3	65	A
SR 1	SR 1	C&D Canal to SR 896 (exit 142)	SB	3.0	217	49.6	75	Toll Plaza	76.0	34.7%	3,2	65	A
SR 1	SR 1	SR 896 (exit 142) to C&D Canal	NB	2.8	139	72.4	0	Toll Congestion	72.4	0.0%	2	65	A
SR 1	SR 1	SR 896 (exit 142) to SR 299 (exit 136)	SB	3.9	218	65.1	2	Congestion	65.6	0.8%	2	65	A
SR 1	SR 1	SR 299 (exit 136) to SR 896 (exit 142)	NB	3.9	245	57.8	0	--	57.8	0.0%	2	65	B
SR 1	SR 1	SR 299 (exit 136) to US 13 (exit 119)	SB	9.6	550	62.9	3	Congestion	63.3	0.6%	2	65	A
SR 1	SR 1	US 13 (exit 119) to SR 299 (exit 136)	NB	9.6	489	70.5	10	--	72.0	2.0%	2	65	A
SR 1	SR 1	US 13 South (exit 119) to US 13-Smyrna (exit 114)	SB	4.0	215	67.4	0	--	67.4	0.0%	2	65	A
SR 1	SR 1	US 13-Smyrna (exit 114) to US 13 South (exit 119)	NB	4.1	218	67.4	0	--	67.4	0.0%	2	65	A
SR 1	SR 1	US 13-Smyrna (114) to Scarborough Rd (104)	SB	6.3	491	46.2	0	--	46.2	0.0%	2	65	B
SR 1	SR 1	Scarborough Rd (104) to US 13-Smyrna (114)	NB	6.3	332	68.6	0	Congestion	68.6	0.0%	2	65	A
SR 1	SR 1	Scarborough Rd (104) to Exit 98	SB	3.9	408	34.3	150	Toll Congestion	54.3	36.9%	2, 4, 2	65	B
SR 1	SR 1	Exit 98 to Scarborough Rd (104)	NB	3.9	286	48.9	1	Congestion/Toll Congestion	49.0	0.2%	2, 4, 2	65	B
SR 1	SR 1	Exit 98 to Exit 97 (two on-ramps)	SB	1.2	63	67.6	0	--	67.6	0.0%	2	55	A
SR 1	SR 1	Exit 97 (two on ramps) to Exit 98	NB	1.2	327	12.9	0	Congestion	12.9	0.0%	2	65	F
SR 1	SR 1	Exit 97 (two on ramps) to Combo w/ US 113 (95)	SB	1.4	101	48.4	29	Congestion	68.3	29.1%	2	55	A
SR 1	SR 1	Combo w/ US 113 (95) to Exit 97 (two on ramps)	NB	1.4	142	34.8	0	Congestion	34.8	0.0%	2	65	D
SR 1	SR 1	Combo w/ US 113 (95) to Exit 93	SB	1.0	128	27.3	17	Congestion	31.6	13.4%	2, 3	55	C
SR 1	SR 1	Exit 93 to Combo w/ US 113 (95)	NB	1.0	85	41.1	0	Congestion	41.1	0.0%	3, 2	55,65	C
SR 1	SR 1	Exit 93 to SR 9	SB	1.7	162	37.1	3	Congestion	37.7	1.7%	3, 2	55	C
SR 1	SR 1	SR 9 to Exit 93	NB	1.7	106	57.0	0	--	57.0	0.0%	2	55	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 1	SR 1	SR 9 to RD 18 (Bowers Beach)	SB	4.5	378	43.1	28	Congestion/Signal	46.5	7.3%	2	55	B
SR 1	SR 1	RD 18 (Bowers Beach) to SR 9	NB	4.5	249	65.4	0	--	65.4	0.0%	2	55	A
SR 1	SR 1	RD 18 (Bowers Beach) to SR 12	SB	3.4	250	49.2	8	Congestion	50.8	3.2%	2	55	A
SR 1	SR 1	SR 12 to RD 18 (Bowers Beach)	NB	3.4	189	65.2	2	Signal	65.9	1.1%	2	55	A
SR 1	SR 1	SR 12 to US 113 Split	SB	4.1	333	44.5	9	Congestion	45.8	2.8%	2	55	B
SR 1	SR 1	US 113 Merge to SR 12	NB	3.9	284	49.9	4	Signal/Congestion	50.6	1.3%	2	55	A
SR 1	SR 1	US 113 Split to SR 14	SB	1.3	72	65.0	0	--	65.0	0.0%	2	55	A
SR 1	SR 1	SR 14 to US 113 Merge	NB	1.5	99	54.0	0	--	54.0	0.0%	2	55	A
SR 1	SR 1	SR 14 to SR 36 (Slaughter Beach)	SB	1.0	322	11.5	8	Congestion/Signal	11.8	2.5%	2	55	F
SR 1	SR 1	SR 36 (Slaughter Beach to SR 14)	NB	1.0	55	68.3	0	--	68.3	0.0%	2	55	A
SR 1	SR 1	SR 36 (Slaughter Beach) to SR 16	SB	10.9	688	57.1	64	Congestion/Signal	62.9	9.3%	2	55	A
SR 1	SR 1	SR 16 to SR 36 (Slaughter Beach)	NB	10.9	624	62.9	4	--	63.3	0.6%	2	55	A
SR 1	SR 1	SR 16 to US 9 West / SR 404	SB	6.7	469	51.5	39	Congestion/Signal	56.1	8.3%	2	55,50	A
SR 1	SR 1	US 9 West / SR 404 to SR 16	NB	6.7	437	55.3	10	Signal	56.5	2.2%	2	55	A
SR 1	SR 1	US 9 West / SR 404 to SR 24	SB	2.6	643	14.3	278	Congestion/Signal	25.2	43.2%	2	50,45,35	C
SR 1	SR 1	SR 24 to US 9 West/SR 404	NB	2.6	280	32.9	59	Signal	41.7	21.1%	3, 2	45,50,55	B
SR 1	SR 1	SR 24 to Rehoboth Avenue	SB	2.2	359	21.9	109	Congestion/Signal	31.5	30.4%	2, 3, 2	35	B
SR 1	SR 1	Rehoboth Avenue to SR 24	NB	2.2	284	27.6	61	Signal	35.2	21.4%	2, 3	35,45	B
SR 1	SR 1	Rehoboth Avenue to King Charles Ave (DE)	SB	1.8	256	25.0	54	Congestion/Signal	31.6	20.9%	2	35,30	A
SR 1	SR 1	King Charles Ave (DE) to Rehoboth Avenue	NB	1.8	481	13.1	22	Signal/Congestion/Accident	13.7	4.6%	2	30,35	D
SR 1	SR 1	King Charles Ave (DE) to Collins St.	SB	0.7	137	18.7	31	Congestion/Signal	24.1	22.3%	2	30	B
SR 1	SR 1	Collins St. to King Charles Ave (DE)	NB	0.7	135	19.7	22	Signal/Congestion	23.5	16.1%	2	30	B
SR 1	SR 1	Collins St. to SR 26	SB	10.4	733	50.9	29	Congestion/Signal	52.9	3.9%	2	30,45,55,50,45,35	A
SR 1	SR 1	SR 26 to Collins St.	NB	10.4	732	51.0	55	Signal/Congestion	55.1	7.5%	2	35,50,55,30	A
SR 1	SR 1	SR 26 to Logan St.	SB	2.1	199	37.2	0	--	37.3	0.2%	2	35	A
SR 1	SR 1	Logan St. to SR 26	NB	2.1	245	30.3	21	Signal	33.1	8.4%	2	35	A
SR 1	SR 1	Logan St. to James St.	SB	3.0	216	50.9	0	--	50.9	0.0%	2	35,55,50,35	A
SR 1	SR 1	James St. to Logan St.	NB	3.0	222	49.4	1	Signal	49.7	0.6%	2	50,55,45,35	A
SR 1	SR 1	James St. to SR 54	SB	0.9	174	18.7	42	Congestion/Signal	24.7	24.0%	2	35,40	C
SR 1	SR 1	SR 54 to James St.	NB	0.9	107	30.5	28	Signal	41.2	26.1%	2	35,50	A
SR 1 Total		**SR 141 to SR 54**	**SB**	**105.4**	**8750.5**	**43.3**	**998.7**	**--**	**48.9**	**11.4%**			
		SR 54 to SR 141	**NB**	**105.1**	**8152.4**	**46.4**	**396.2**	**--**	**48.8**	**4.9%**			
US 113	US 113	SR 1 Split to SR 14	SB	1.9	248	27.6	75	Signal	39.6	30.3%	2	45,40,50	B

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
US 113	US 113	SR 14 to SR 1 Merge	NB	2.1	213	35.0	41	Signal	43.3	19.2%	2	40,45	A
US 113	US 113	SR 14 to SR 16	SB	7.6	592	46.1	87	Signal	54.1	14.8%	2	50,55	A
US 113	US 113	SR 16 to SR 14	NB	7.6	476	57.3	59	Signal	65.3	12.3%	2	55,50,40	A
US 113	US 113	SR 16 to SR 404/18	SB	8.0	471	61.0	4	Signal	61.5	0.8%	2	50	A
US 113	US 113	SR 404/18 to SR 18	NB	8.0	543	52.9	16	Construction/Signal	54.6	3.0%	2	55	A
US 113	US 113	SR 404/18 to US 9 (non truck route)	SB	1.2	92	46.2	1	Signal	46.7	1.1%	2	50	A
US 113	US 113	US 9 (non truck route) to SR 404/18	NB	1.2	94	44.6	0	--	44.6	0.0%	2	50	B
US 113	US 113	US 9 (non truck route) to SR 20 West	SB	7.1	430	59.5	0	--	59.5	0.0%	2	50,55	A
US 113	US 113	SR 20 West to US 9 (non truck route)	NB	7.1	453	56.7	22	Signal	59.5	4.8%	2	50,55,50	A
US 113	US 113	SR 20 West to SR 24	SB	1.5	132	41.9	19	Signal	49.0	14.4%	2	50	A
US 113	US 113	SR 24 to SR 20 West	NB	1.5	105	52.3	0	--	52.3	0.0%	2	50,55	A
US 113	US 113	SR 24 to SR 20 East	SB	1.6	124	46.1	0	--	46.1	0.0%	2	50,55	B
US 113	US 113	SR 20 East to SR 24	NB	1.6	117	48.6	0	--	48.6	0.0%	2	55,50	A
US 113	US 113	SR 20 East to SR 26	SB	2.0	127	56.7	0	--	56.7	0.0%	2	55	A
US 113	US 113	SR 26 to SR 20 East	NB	2.0	153	47.3	17	Signal	53.1	10.9%	2	55	A
US 113	US 113	SR 26 to SR 54	SB	5.8	352	58.9	0	--	58.9	0.0%	2	55	A
US 113	US 113	SR 54 to SR 26	NB	5.7	356	58.0	4	Signal	58.6	1.0%	2	55	A
US 113	US 113	SR 54 to Maryland State Line	SB	0.9	58	52.5	0	--	52.5	0.0%	2	50	A
US 113	US 113	Maryland State Line to SR 54	NB	0.9	60	51.0	6	Signal	56.7	10.0%	2	50	A
US 113 Total		**US 13 (Split) to MD Line**	**SB**	**37.5**	**2625.3**	**51.4**	**186.0**	**--**	**55.3**	**7.1%**			
		MD Line to US 13 (Merge) (PM)	**NB**	**37.6**	**2570.0**	**52.7**	**164.0**	**--**	**56.3**	**6.4%**			
SR 404	SR 404	MD State line to SR 36	EB	3.3	210	55.7	0	--	55.7	0.0%	1	50,55	A
SR 404	SR 404	SR 36 to MD State line	WB	3.3	231	50.6	8	Signal	52.5	3.5%	1	50	A
SR 404	SR 404	SR 36 to US 13/404 W Split	EB	5.0	358	49.9	2	Construction/Signal	50.2	0.4%	1	45,50	A
SR 404	SR 404	US 13/404 W Split to SR 36	WB	5.0	350	51.3	3	Signal	51.8	0.9%	2, 1	50,45,55	A
SR 404	404/US 13	US 13/404 W Split to US 13/404 E Split	EB	2.5	460	19.6	57	Signal	22.3	12.3%	2	55,45	D
SR 404	404/US 13	US 13/404 E Split to US 13/404 W Split	WB	2.5	210	43.0	22	Signal	47.9	10.2%	2	55,50	A
SR 404	SR 404	US 13/404 E Split to US 113	EB	10.9	766	51.4	78	Signal/Yield Sign	57.2	10.2%	1	40,50,55	A
SR 404	SR 404	US 113 to US 13/404 E Split	WB	10.9	750	52.4	0	--	52.4	0.0%	1	50,40,30	A
SR 404	SR 404	US 113 to US 9 Split	EB	1.1	243	17.0	21	Signal	18.6	8.6%	1	25,30,40	C
SR 404	SR 404	US 9 Merge to US 113	WB	1.1	201	20.6	61	Signal	29.5	30.4%	1	30,25	A
SR 404	SR 404	US 9 Split to Rt 30	EB	4.1	364	40.8	16	Signal	42.6	4.3%	1	50,40,35,30,25	A
SR 404	SR 404	Rt 30 to US 9 Merge	WB	4.1	409	36.3	18	Signal	37.9	4.4%	1	25,30,35,40,50,45	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 404	SR 404	Rt 30 to RT 5	EB	1.8	166	39.9	33	Signal	49.6	19.6%	1	50	A
SR 404	SR 404	RT 5 to Rt 30	WB	1.8	134	49.4	0	--	49.4	0.0%	1	45	A
SR 404	SR 404	RT 5 to SR 1	EB	6.3	525	43.1	68	Signal	49.5	12.9%	1	40,50,45,50	A
SR 404	SR 404	SR 1 to RT 5	WB	6.3	455	49.8	3	Signal	50.1	0.5%	1	45,50,40	A
SR 404 Total		**US 13 (Split) to MD Line**	**EB**	**35.0**	**3091.0**	**40.8**	**272.5**	--	**44.8**	**8.8%**			
		MD Line to US 13 (Merge) (PM)	**WB**	**35.1**	**2739.5**	**46.1**	**114.0**	--	**48.1**	**4.2%**			
SR 16	SR 16	Maryland State Line to 36/16 Split	EB	7.1	512	49.6	3	Signal	49.9	0.6%	1	50	A
SR 16	SR 16	36/16 Split to Maryland State Line	WB	7.1	495	51.3	0	--	51.3	0.0%	1	50,35	A
SR 16	SR 16	Rt 36 Split to Rt 13	EB	1.5	155	35.0	0	--	35.0	0.0%	1	25,35,50	A
SR 16	SR 16	Rt 13 to Rt 36 Split	WB	1.5	169	32.1	0	--	32.1	0.0%	1	35,25,40	A
SR 16	SR 16	Rt 13 to Rt 113	EB	8.0	616	46.6	18	Signal	48.0	2.8%	1	40,25	A
SR 16	SR 16	Rt 113 to Rt 13	WB	8.0	515	55.9	0	--	55.9	0.0%	1	40,50,35	A
SR 16	SR 16	Rt 113 to SR 30	EB	5.7	474	43.1	13	Signal	44.3	2.6%	1	50,35,25,35,40	A
SR 16	SR 16	SR 30 to Rt 113	WB	5.7	568	35.9	184	Signal	53.2	32.4%	1	35,25,35,50,40	A
SR 16	SR 16	SR 30 to SR 1	EB	4.0	324	45.0	28	Signal	49.2	8.6%	1	50,40,35,40,50	A
SR 16	SR 16	SR 1 to SR 30	WB	4.0	580	25.1	46	congestion	27.3	7.8%	1	40,35,40,50	C
SR 16 Total		**Maryland State Line to SR 1**	**EB**	**26.3**	**2080.0**	**45.5**	**61.0**	--	**46.8**	**2.9%**			
		SR 1 to Maryland State Line	**WB**	**26.3**	**2326.5**	**40.6**	**229.5**	--	**45.1**	**9.9%**			
SR 36 Total		**RT 404 to SR 36/16 Merge**	**EB**	**3.6**	**266**	**48.7**	**0**	--	**48.7**	**0.0%**	**1**	**50**	**A**
		SR 36/16 Split to RT 404	**WB**	**3.6**	**267**	**48.5**	**0**	--	**48.5**	**0.0%**	**1**	**50**	**A**
SR 14	SR 14	Maryland State line to Whiteleysburg Rd	EB	7.8	463	60.6	0	--	60.6	0.0%	1	50	A
SR 14	SR 14	Whiteleysburg Rd to Maryland State line	WB	7.8	474	59.1	0	--	59.1	0.0%	1	50,35	A
SR 14	SR 14	Whiteleysburg Rd to US 13	EB	1.8	229	29.1	2	Signal	29.2	0.7%	1	25,35,50	B
SR 14	SR 14	US 13 to Whiteleysburg Rd	WB	1.8	220	30.2	0	--	30.2	0.0%	1	35,25	A
SR 14	SR 14	US 13 to SR 15	EB	6.2	421	53.1	0	--	53.1	0.0%	1	50,40,25	A
SR 14	SR 14	SR 15 to US 13	WB	6.2	419	53.4	8	Signal	54.4	1.9%	1	25,40,50,40	A
SR 14	SR 14	SR 15 to US 113	EB	1.1	113	36.4	6	Signal	38.5	5.3%	1	40,50	B
SR 14	SR 14	US 113 to SR 15	WB	1.1	85	48.3	2	Signal	49.1	1.8%	1	40,35	A
SR 14	SR 14	US 113 to SR 1	EB	2.1	320	23.2	36	Signal	26.2	11.3%	1	35,25,35,40	B
SR 14	SR 14	SR 1 to US 113	WB	2.1	265	28.1	96	Signal	43.9	36.1%	1	35,25,35	A
SR 14 Total		**Maryland State Line to SR 1**	**EB**	**19.0**	**1544.5**	**44.4**	**43.5**	--	**45.7**	**2.8%**			
		SR 1 to Maryland State Line	**WB**	**19.0**	**1461.5**	**46.9**	**105.0**	--	**50.5**	**7.2%**			

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 20	SR 20	MD State Line to Sussex Ave.	EB	4.1	339	43.8	7	Signal	44.8	2.1%	1	30,40,50	A
SR 20	SR 20	Sussex Ave. to MD State Line	WB	4.1	285	52.1	0	--	52.1	0.0%	1	50,40,30	A
SR 20	SR 20	Sussex Ave. to US 13 / SR 20 W	EB	2.2	284	27.7	34	Signal/Congestion/Stop Sign	31.4	12.0%	2	35,30,40	B
SR 20	SR 20	US 13 / SR 20 W to Sussex Ave.	WB	2.2	298	26.3	58	Signal	32.7	19.5%	2	30,35,45	B
SR 20	SR 20	US 13 / SR 20 W to US 13 / SR 20 E	EB	0.9	96	32.4	0	--	32.4	0.0%	2	45,35	B
SR 20	SR 20	US 13 / SR 20 E to US 13 / SR 20 W	WB	0.8	144	21.1	24	Signal	25.3	16.7%	2	45	C
SR 20	SR 20	US 13/20 E merge to US 9	EB	6.4	559	41.5	90	Signal	49.5	16.1%	1	50,45	A
SR 20	SR 20	US 9 to US 13/20 E split	WB	6.4	507	45.8	29	Signal	48.6	5.7%	1	45,50	A
SR 20	SR 20	US 9 to SR 20 W/US 113 Merge	EB	9.7	612	57.0	1	Stop Sign	57.1	0.2%	1	50	A
SR 20	SR 20	SR 20 W / US 113 Split to US 9	WB	9.7	679	51.3	18	Signal	52.7	2.7%	1	50	A
SR 20	SR 20	SR 20 W/US 113 Merge to SR 24	EB	1.5	135	41.0	21	Signal	48.5	15.6%	2	50	A
SR 20	SR 20	SR 24 to SR 20 W / US 113 Split	WB	1.5	147	37.6	41	Signal	52.0	27.6%	2	50	A
SR 20	SR 20	SR 24 to SR 20 E/US 113 Split	EB	1.6	264	21.7	11	traffic congestion	22.6	4.2%	2	50,55	D
SR 20	SR 20	SR 20 E/US 113 Merge to SR 24	WB	1.6	149	38.4	31	Signal	48.4	20.5%	2	50,55	A
SR 20	SR 20	SR 20 E / US 113 Split to SR 26	EB	2.8	258	38.7	12	Signal	40.5	4.5%	1	35,30,35,50	A
SR 20	SR 20	SR 26 to SR 20 E / US 113 Merge	WB	2.8	216	46.3	4	Signal	47.1	1.9%	1	50,35,30	A
SR 20	SR 20	SR 26 to SR 17	EB	5.4	531	36.5	39	Signal/Congestion/Stop Sign	39.4	7.3%	1	35,50	A
SR 20	SR 20	SR 17 to SR 26	WB	5.4	483	40.2	43	Signal/Stop Sign	44.1	8.8%	1	50,35	A
SR 20	SR 20	SR 17 to SR 54 Merge	EB	3.7	314	42.3	13	Signal	44.1	4.1%	1	50,35	A
SR 20	SR 20	SR 54 split to SR 17	WB	3.7	297	44.7	12	Signal	46.6	4.0%	1	35,50	A
SR 20	SR 20	SR 54 Merge to SR 1	EB	3.9	442	32.1	33	Signal/Congestion	34.7	7.5%	1	35,40,50	B
SR 20	SR 20	SR 1 to SR 54 Split	WB	3.9	418	34.0	19	Signal	35.6	4.4%	1	40,35	A
SR 20 Total		**Maryland State Line to SR 1**	**EB**	**42.2**	**3831.5**	**39.7**	**260.5**	**--**	**42.6**	**6.8%**			
		SR 1 to Maryland State Line	**WB**	**42.2**	**3620.5**	**41.9**	**277.0**	**--**	**45.4**	**7.7%**			
SR 24	SR 24	MD line to Road 499	EB	7.3	320	81.6	0	--	81.6	0.0%	1	25,35,40,50	A
SR 24	SR 24	Road 499 to MD line	WB	7.3	507	51.6	0	--	51.6	0.0%	1	50,40,35,25	A
SR 24	SR 24	Road 499 to US 13	EB	1.6	284	20.2	55	Signal	25.0	19.3%	1	35,25	B
SR 24	SR 24	US 13 to Road 499	WB	1.6	257	22.3	38	Signal	26.1	14.6%	1	35,45	C
SR 24	SR 24	US 13 to Road 449	EB	4.7	326	51.6	0	--	51.6	0.0%	1	50,45,35	A
SR 24	SR 24	Road 449 to US 13	WB	4.7	374	45.1	92	Signal	59.7	24.5%	1	50	A
SR 24	SR 24	Road 449 to 30/24 split	EB	6.6	419	57.1	5	Signal	57.8	1.3%	1	50	A
SR 24	SR 24	30/24 split to Road 449	WB	6.6	393	60.8	0	--	60.8	0.0%	1	50	A
SR 24	SR 24	30/24 split to US 113	EB	5.0	442	40.6	64	Signal	47.5	14.6%	1	25,50	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 24	SR 24	US 113 to 30/24 split	WB	5.0	536	33.4	0	--	33.4	0.0%	1	50,25	B
SR 24	SR 24	US 113 to SR 30	EB	0.8	151	18.8	25	Signal	22.5	16.6%	1	25	B
SR 24	SR 24	SR 30 to US 113	WB	0.8	148	19.2	30	Signal	24.0	20.0%	1	25,35	B
SR 24	SR 24	SR 30 to SR 5 South	EB	5.3	458	41.5	46	Signal	46.0	9.9%	1	50,40,50,35	A
SR 24	SR 24	SR 5 South to SR 30	WB	5.3	398	47.7	0	--	47.7	0.0%	1	35,50,40,50	A
SR 24	SR 24	SR 5 South to SR 23 / SR 5 North	EB	1.6	619	9.0	162	congestion/Signal	12.3	26.2%	1	45,50	F
SR 24	SR 24	SR 23 / SR 5 North to SR 5 South	WB	1.6	144	38.9	0	--	38.9	0.0%	1	40	A
SR 24	SR 24	SR 23 / SR 5 North to SR 1	EB	7.7	1064	25.9	437	congestion/Signal	44.0	41.1%	1	35,40,50,45	A
SR 24	SR 24	SR 1 to SR 23 / SR 5 North	WB	7.7	810	34.1	152	Signal	41.9	18.7%	1	50,40,50,35	A
SR 24 Total		**Maryland State Line to SR 1**	**EB**	**40.4**	**4081.7**	**35.6**	**794.5**	**--**	**44.3**	**19.5%**			
		SR 1 to Maryland State Line	**WB**	**40.4**	**3565.0**	**40.8**	**310.0**	**--**	**44.7**	**8.7%**			
SR 26	SR 26	SR 54 split to SR 30	EB	3.3	231	51.4	0	--	51.4	0.0%	1	35	A
SR 26	SR 26	SR 30 to SR 54 split	WB	3.3	226	52.6	0	--	52.6	0.0%	1	50	A
SR 26	SR 26	SR 30 to US 113	EB	5.6	388	51.7	27	Signal	55.5	6.8%	1	40,50	A
SR 26	SR 26	US 113 to SR 30	WB	5.6	374	53.6	1	Stop Sign	53.8	0.4%	1	50,40	A
SR 26	SR 26	US 113 to SR 20	EB	1.3	474	10.2	88	Signal	12.6	18.6%	1	35,30,35	E
SR 26	SR 26	SR 20 to US 113	WB	1.3	177	27.4	2	Signal	27.8	1.3%	1	35,30	B
SR 26	SR 26	SR 20 to SR 17	EB	6.2	630	35.4	58	Congestion/Signal	39.0	9.2%	1	40,50,35	A
SR 26	SR 26	SR 17 to SR 20	WB	6.2	477	46.8	6	Signal	47.4	1.3%	1	35,50,40	A
SR 26	SR 26	SR 17 to SR 1	EB	4.1	354	41.3	71	Signal	51.7	20.1%	1	35,40	A
SR 26	SR 26	SR 1 to SR 17	WB	4.1	694	21.1	148	Congestion/Signal	26.8	21.3%	1	35	B
SR 26 Total		**SR 54 Split to SR 1**	**EB**	**20.5**	**2076.5**	**35.5**	**243.5**	**--**	**40.2**	**11.7%**			
		SR 1 to SR 54 Split	**WB**	**20.5**	**1947.3**	**37.9**	**158.0**	**--**	**41.2**	**8.1%**			
US 13 Dover	US 13	SR 24 to SR 54 (MD Line)	SB	6.9	615	40.2	113	Signal	49.3	18.4%	2	55	B
US 13 Dover	US 13	SR 54 (MD Line) to SR 24	NB	6.9	456	54.3	28	Signal	57.8	6.0%	2	55,50	A
US 13 Dover	US 13	SR 9 West to SR 24	SB	1.1	197	20.5	74	Signal	32.9	37.7%	2	50,55	C
US 13 Dover	US 13	SR 24 to SR 9 West	NB	1.1	144	28.3	43	Signal	40.3	29.9%	2	55	B
US 13 Dover	US 13	SR 20 East to SR 9 West	SB	5.2	372	50.2	30	Signal	54.6	8.1%	2	55,50	A
US 13 Dover	US 13	SR 9 West to SR 20 East	NB	5.2	295	63.3	2	Signal	63.7	0.5%	2	45	A
US 13 Dover	US 13	SR 20 West to SR 20 East	SB	0.9	69	44.7	3	Signal	46.4	3.6%	2	45,55	A
US 13 Dover	US 13	SR 20 East to SR 20 West	NB	0.8	95	32.0	20	Signal	40.6	21.2%	2	45	A
US 13 Dover	US 13	SR 404 E to SR 20 West	SB	4.9	346	51.0	17	Signal	53.6	4.9%	2	55,45	A
US 13 Dover	US 13	SR 20 West to SR 404 E	NB	4.9	372	47.4	44	Signal	53.7	11.7%	2	55	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
US 13 Dover	US 13	SR 404 W to SR 404 E	SB	2.5	455	19.8	175	Signal	32.1	38.5%	2	55	C
US 13 Dover	US 13	SR 404 E to SR 404 W	NB	2.5	195	46.7	15	Signal	50.6	7.7%	2	55	A
US 13 Dover	US 13	SR 16 to SR 404 W	SB	3.3	234	50.3	9	Signal	52.2	3.6%	2	35,55	A
US 13 Dover	US 13	SR 404 W to SR 16	NB	3.3	232	51.1	13	Signal	54.1	5.6%	2	55,45,35	A
US 13 Dover	US 13	SR 14 to SR 16	SB	8.2	436	67.8	0	--	67.8	0.0%	2	45,50,55,45,35	A
US 13 Dover	US 13	SR 16 to SR 14	NB	8.2	492	59.8	0	--	59.8	0.0%	2	55,50,45	A
US 13 Dover	US 13	SR 12 to SR 14	SB	5.8	638	32.5	110	Congestion/Construction/Signal	39.2	17.2%	2	55,45,35	B
US 13 Dover	US 13	SR 14 to SR 12	NB	5.8	367	56.6	0	--	56.6	0.0%	2	45,50,55,45	A
US 13 Dover	US 13	SR 10A to SR 12	SB	4.5	323	50.6	39	Signal	57.4	11.9%	2	55,45,55	A
US 13 Dover	US 13	SR 12 to SR 10A	NB	4.5	304	53.4	0	--	53.4	0.0%	2	45,55	A
US 13 Dover	US 13	SR 10 to SR 10A	SB	3.0	307	35.5	43	Signal	41.3	14.0%	2	50,55	B
US 13 Dover	US 13	SR 10A to SR 10	NB	3.0	239	45.2	8	Signal	46.7	3.1%	2	55,50	B
US 13 Dover	US 13	US 13 / US 113 Split to SR 10	SB	3.6	414	31.6	82	Congestion/Signal	39.3	19.7%	2	50	B
US 13 Dover	US 13	SR 10 to US 13 / US113 Merge	NB	3.6	423	30.7	43	Signal	34.2	10.2%	2	50,35	B
US 13 Dover Total		**US 13 / US 113 Split to SR 54 (MD State Line)**	**SB**	**49.8**	**4402.0**	**40.7**	**693.0**	**--**	**48.4**	**15.7%**			
		SR 54 (MD State Line) to US 13 / US 113 Merge	**NB**	**49.8**	**3611.0**	**49.6**	**214.0**	**--**	**52.8**	**5.9%**			
SR 54	SR 54	Maryland Line to Columbia Rd	EB	1.2	78	55.8	0	--	55.8	0.0%	1	50	A
SR 54	SR 54	Columbia Rd to Maryland Line	WB	1.2	77	56.5	1	Signal	57.2	1.3%	1	50,40	A
SR 54	SR 54	Columbia Rd to Waller Rd (RD 512)	EB	5.0	331	55.0	0	--	55.0	0.0%	1	50	A
SR 54	SR 54	Waller Rd (RD 512) to Columbia Rd	WB	5.0	330	55.2	0	--	55.2	0.0%	1	40,25	A
SR 54	SR 54	Waller Rd (RD 512) to US 13	EB	1.3	399	11.6	91	Congestion/Signal	15.1	22.8%	1	25,40	D
SR 54	SR 54	US 13 to Waller Rd (RD 512)	WB	1.3	165	28.2	4	Signal	28.8	2.1%	1	25,35,50	B
SR 54	SR 54	US 13 to MD 353 Merge	EB	8.9	572	56.2	3	Signal	56.5	0.5%	1	35	A
SR 54	SR 54	MD 353 Split to US 13	WB	8.9	657	48.9	92	Signal	56.8	13.9%	1	50,35	A
SR 54	SR 54	MD 353 merge to SR 26 Split	EB	2.4	163	52.0	0	--	52.0	0.0%	1	35,50,35	A
SR 54	SR 54	SR 26 Merge to MD 353 Split	WB	2.4	165	51.5	6	Signal	53.3	3.3%	1	35	A
SR 54	SR 54	SR 26 Split to US 113	EB	8.4	641	47.2	11	Signal	47.9	1.6%	1	35	A
SR 54	SR 54	US 113 to SR 26 Split	WB	8.4	606	49.9	2	Signal	50.0	0.3%	1	35,25	A
SR 54	SR 54	US 113 to SR 17	EB	1.1	129	29.6	5	Signal	30.8	3.9%	1	25,35	A
SR 54	SR 54	SR 17 to US 113	WB	1.1	134	28.5	15	Signal	31.9	10.8%	1	25,35	A
SR 54	SR 54	SR 17 to SR 20	EB	6.3	520	43.4	15	Signal	44.6	2.9%	1	50,35,25,35,50,35,25	A
SR 54	SR 54	SR 20 to SR 17	WB	6.3	533	42.3	3	Stop Sign	42.5	0.5%	1	35,50,35,25,35,50,40	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 54 Total		**MD State Line to SR 20**	**EB**	**34.5**	**2832.0**	**43.9**	**124.5**	--	**45.9**	**4.4%**			
		SR 20 to MD State Line	**WB**	**34.5**	**2665.0**	**46.7**	**120.5**	--	**48.9**	**4.5%**			
I-95	I-95	Exit 7 (Delaware Ave) to Exit 8	NB	1.3	89	53.5	0	--	53.5	0.0%	2, 3, 2	55	A
I-95	I-95	Exit 8 to Exit 7 (Delaware Ave)	SB	1.3	84	56.6	0	--	56.6	0.0%	2, 3, 2	55	A
I-95	I-95	Exit 6 (Maryland Ave) to Exit 7	NB	0.9	54	61.3	0	--	61.3	0.0%	3, 2	55	A
I-95	I-95	Exit 7 to Exit 6 (Maryland Ave)	SB	0.9	59	56.1	0	--	56.1	0.0%	2	55	A
I-95	I-95	I-495 JCT to Exit 6 (Maryland Ave)	NB	2.8	152	65.8	0	--	65.8	0.0%	4, 2, 3	55	A
I-95	I-95	Exit 6 (Maryland Ave) to I-495 JCT	SB	2.5	156	57.4	19	Accident/ Right lane closed	65.2	11.9%	2, 3, 2	55	A
I-95	I-95	Exit 5 (SR 141/I-295 JCT) to I-495 JCT	NB	1.0	74	48.7	0	--	48.7	0.0%	3, 4	55	B
I-95	I-95	I-495 JCT to Exit 5 (SR 141/I-295 JCT)	SB	1.0	66	53.8	0	--	53.8	0.0%	5, 3, 5	55	A
I-95	I-95	Exit 4 (SR 1/Churchmans) to Exit 5 (I-295)	NB	3.0	184	59.0	0	--	59.0	0.0%	4, 3	55	A
I-95	I-95	I-295 to Exit 4 (SR 1/Churchmans)	SB	3.0	177	61.7	0	--	61.7	0.0%	5, 4	55	A
I-95	I-95	Exit 3 (SR 273) to Exit 4 (SR 1)	NB	1.3	63	74.3	0	--	74.3	0.0%	4	55	A
I-95	I-95	Exit 4 (SR 1) to Exit 3 (SR 273)	SB	1.3	66	71.9	0	--	71.9	0.0%	4	55	A
I-95	I-95	Exit 1 (SR 896) to Exit 3 (SR 273)	NB	4.3	201	76.7	0	--	76.7	0.0%	3, 4	55	A
I-95	I-95	Exit 3 (SR 273) to Exit 1 (SR 896)	SB	4.3	209	73.6	0	--	73.6	0.0%	4	55	A
I-95	I-95	MD Line to Exit 1 (SR 896)	NB	2.3	162	52.3	30	Toll Congestion	64.1	18.4%	3	55,40,25,55	A
I-95	I-95	Exit 1 (SR 896) to MD Line	SB	2.3	178	46.7	11	Toll Congestion	49.7	6.0%	4,3	55,40,25,55	A
I-95 Total		**MD State Line to SR 20**	**NB**	**17.0**	**977.8**	**62.4**	**29.8**	--	**64.4**	**3.0%**			
		SR 20 to MD State Line	**SB**	**16.6**	**995.3**	**60.2**	**29.3**	--	**62.0**	**2.9%**			
I-295	I-295	I-95 to US 13	EB	2.0	123	57.2	0	--	57.2	0.0%		55,50	A
I-295	I-295	US 13 to I-95	WB	2.0	139	51.0	0	--	51.0	0.0%		50	A
I-295	I-295	US 13 to SR 9	EB	1.3	78	57.9	0	--	57.9	0.0%		50	A
I-295	I-295	SR 9 to US 13	WB	1.2	75	58.6	0	--	58.6	0.0%		50	A
I-295	I-295	SR 9 to D.M.B.	EB	2.5	171	52.7	0	--	52.7	0.0%		50,35,50	A
I-295	I-295	D.M.B. to SR 9	WB	2.5	149	59.6	9	Toll Congestion	63.4	6.0%		50	A
I-295 Total		**I-95 to D.M.B**	**EB**	**5.7**	**371.8**	**55.3**	**0.0**	--	**55.3**	**0.0%**			
		D.M.B to I-95	**WB**	**5.7**	**363.5**	**56.1**	**9.0**	--	**57.5**	**2.5%**			
I-495	I-495	I-95 to Exit 1 (US 13)	NB	2.0	103	71.2	0	--	71.2	0.0%	2,3	55	A
I-495	I-495	Exit 1 (US 13) to I-95	SB	1.8	111	59.7	0	--	59.7	0.0%	3,2	65	A
I-495	I-495	Exit 1 (US 13) to Exit 2 (Rt. 9)	NB	1.0	48	72.2	0	--	72.2	0.0%	3	65	A
I-495	I-495	Exit 2 (Rt. 9) to Exit 1 (US 13)	SB	0.9	51	66.1	0	--	66.1	0.0%	3	65	A
I-495	I-495	Exit 2 (Rt. 9) to Exit 3	NB	1.5	78	69.2	0	--	69.2	0.0%	3	65	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
I-495	I-495	Exit 3 to Exit 2 (Rt. 9)	SB	1.5	84	64.2	0	--	64.2	0.0%	3	65	A
I-495	I-495	Exit 3 to Exit 4 (Rt. 3 Marsh Rd.)	NB	1.5	84	64.7	0	--	64.7	0.0%	3	65	A
I-495	I-495	Exit 4 (Rt. 3 Marsh Rd.) to Exit 3	SB	1.5	87	62.5	0	--	62.5	0.0%	3	65	A
I-495	I-495	Exit 4 (Marsh Rd.) to Exit 5 (Rt. 13)	NB	4.9	240	73.2	0	--	73.2	0.0%	3	65	A
I-495	I-495	Exit 5 (Rt. 13) to Exit 4 (Marsh Rd.)	SB	4.8	252	69.1	0	--	69.1	0.0%	2,3	65	A
I-495	I-495	Exit 5 (US 13) to PA Line	NB	1.0	72	49.8	0	--	49.8	0.0%	3,2	65	B
I-495	I-495	PA Line to Exit 5 (US 13)	SB	1.1	55	70.0	0	--	70.0	0.0%	2	65	A
I-495 Total		**I-95 (DE) to I-95 (PA Line)**	**NB**	**11.8**	**623.0**	**68.5**	**0.0**	--	**68.5**	**0.0%**			
		I-95 (PA Line) to I-95 (DE)	**SB**	**11.7**	**638.5**	**65.8**	**0.0**	--	**65.8**	**0.0%**			
SR 1D	Plantation Rd.	US 9 to SR 24	SB	2.5	262.5	34.3	36.0	Signal	39.7	13.7%	1	45	B
SR 1D	Plantation Rd.	SR 24 to US 9	NB	2.5	205.5	43.8	0.0	--	43.8	0.0%	1	45	A
SR 1D	Plantation Rd.	SR 24 to SR 1	SB	0.7	138.5	18.2	63.0	Signal	33.4	45.5%	2	35	A
SR 1D	Plantation Rd.	SR 1 to SR 24	NB	0.7	65.0	38.8	0.0	--	38.8	0.0%	2	35	A
SR 1D Total		**US 9 to SR 1**	**SB**	**3.2**	**401.0**	**28.7**	**99.0**	--	**38.1**	**24.7%**			
		SR 1 to US 9	**NB**	**3.2**	**270.5**	**42.6**	**0.0**	--	**42.6**	**0.0%**			
SR 5	SR 5	SR 1 to SR 16	SB	2.4	217.0	39.8	27.0	Signal	45.5	12.4%	1	35,50	A
SR 5	SR 5	SR 16 to SR 1	NB	2.4	249.5	34.6	52.0	Stop Sign	43.7	20.8%	1	35,50	A
SR 5	SR 5	SR 16 to US 9	SB	5.2	502.5	37.3	11.5	Signal	38.1	2.3%	1	40,50,35,25	A
SR 5	SR 5	US 9 to SR 16	NB	5.2	508.5	36.8	24.0	Signal	38.6	4.7%	1	40,50,35,25	A
SR 5	SR 5	US 9 to SR 23	SB	5.7	429.5	47.8	0.0	--	47.8	0.0%	1	50,35,25	A
SR 5	SR 5	SR 23 to US 9	NB	5.7	389.5	52.7	0.0	--	52.7	0.0%	1	50,35,25	A
SR 5	SR 5	SR 23 to SR 24 Split	SB	2.5	221.5	40.6	10.0	Yield Sign	42.6	4.5%	1	50	B
SR 5	SR 5	SR 24 Split to SR 23	NB	2.5	172.0	52.3	0.0	--	52.3	0.0%	1	50	A
SR 5	SR 5	SR 24 Split to SR 24 Merge	SB	1.6	188.0	30.6	33.0	Signal	37.2	17.6%	1	40	A
SR 5	SR 5	SR 24 Merge to SR 24 Split	NB	1.6	183.0	31.5	20.5	Signal	35.4	11.2%	1	40	B
SR 5	SR 5	SR 24 Merge to Indian River Bay	SB	2.0	183.0	39.3	0.0	--	39.3	0.0%	1	25,40,50	A
SR 5	SR 5	Indian River Bay to SR 24 Merge	NB	2.0	176.0	40.9	6.5	Signal/Yield Sign	42.5	3.7%	1	25,40,50	A
SR 5 Total		**SR 1 to Indian River Bay**	**SB**	**19.4**	**1741.5**	**40.1**	**81.5**	--	**42.1**	**4.7%**			
		Indian River Bay to SR 1	**NB**	**19.4**	**1678.5**	**41.6**	**103.0**	--	**44.3**	**6.1%**			
SR 30	SR 30	SR 54 / SR 26 to US 13	SB	10.1	636.7	57.1	1.0	Signal	57.2	0.2%	1	50	A
SR 30	SR 30	US 13 to SR 54 / SR 26	NB	10.1	648.0	56.1	12.0	Stop Sign	57.2	1.9%	1	50	A
SR 30	SR 30	SR 54 Merge to SR 54 / SR 26	SB	1.5	125.0	43.2	0.0	--	43.2	0.0%	1	35,50	A
SR 30	SR 30	SR 54 / SR 26 to SR 54 Merge	NB	1.5	130.0	41.5	0.0	--	41.5	0.0%	1	35,50	A

Peak Travel Time Data - Summer 2008

Route	Route Name	Segments	Dir.	Dist. (Miles)	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %	No. of Lanes	Posted Speed	LOS
SR 30	SR 30	SR 26 Merge to SR 54 Merge	SB	3.3	219.0	54.2	0.0	--	54.2	0.0%	1	35,50	A
SR 30	SR 30	SR 54 Merge to SR 26 Merge	NB	3.3	222.0	53.5	0.0	--	53.5	0.0%	1	35,50	A
SR 30	SR 30	SR 24 Split to SR 26 Merge	SB	0.9	55.7	58.2	0.0	--	58.2	0.0%	1	50	A
SR 30	SR 30	SR 26 Merge to SR 24 Split	NB	0.9	60.5	53.6	0.0	--	53.6	0.0%	1	50	A
SR 30	SR 30	US 113 to SR 24 Split	SB	5.0	361.0	49.9	0.0	--	49.9	0.0%	1	25,50	A
SR 30	SR 30	SR 24 Split to US 113	NB	5.0	372.0	48.4	5.5	Signal	49.1	1.5%	1	25,50	A
SR 30	SR 30	SR 24 Merge to US 113	SB	0.8	172.0	16.7	55.0	Signal	24.6	32.0%	1	25	A
SR 30	SR 30	US 113 to SR 24 Merge	NB	0.8	136.0	21.2	4.0	Signal	21.8	2.9%	1	25	B
SR 30	SR 30	US 9 to SR 24 Merge	SB	8.4	543.7	55.6	1.7	Signal	55.8	0.3%	1	40,45,50	A
SR 30	SR 30	SR 24 Merge to US 9	NB	8.4	582.0	52.0	21.0	Signal	53.9	3.6%	1	40,45,50	A
SR 30	SR 30	SR 16 to US 9	SB	5.4	406.0	47.9	32.7	Signal	52.1	8.0%	1	50	A
SR 30	SR 30	US 9 to SR 16	NB	5.4	372.0	52.3	8.0	Signal	53.4	2.2%	1	50	A
SR 30	SR 30	SR 1 to SR 16	SB	8.2	590.7	50.0	13.7	Stop Sign/Signal	51.2	2.3%	1	40,50	A
SR 30	SR 30	SR 16 to SR 1	NB	8.2	620.5	47.6	15.0	Stop Sign/Signal	48.8	2.4%	1	40,50	A
SR 30 Total		**SR 1 to US 13**	**SB**	**43.6**	**3109.7**	**50.5**	**104.0**	--	**52.2**	**3.3%**			
		US 13 to SR 1	**NB**	**43.6**	**3143.0**	**49.9**	**65.5**	--	**51.0**	**2.1%**			

Total Peak Travel Time Data Summer 2008

Dist. Miles	Mean Peak Travel Time (Seconds)	Mean Peak Travel Speed (mph)	Total Peak Delay (Seconds)	Peak Delay Source	Mean Peak Running Speed (mph)	Percent Time in Delay %
1168.8	95811	43.9	8072	--	48.0	8.4%

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