Delaware Trip Monitoring System Survey
2008

prepared for

Delaware Department of Transportation

By

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December 2009

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Introduction

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The Delaware Trip Monitoring System Survey, as part of the Delaware Statewide Model Improvement Project, is an ongoing survey designed and conducted by CADSR since 1995. The survey is utilized to gather information about the weekday travel behaviors and preferences of drivers, 16 years and older, across the State. It began initially to update DelDOT trip generation models and takes the place of trip diaries used by other States. In a random process, respondents are selected and asked to list the origin, destination, time, and trip method (mode) of every trip made in the preceding day. Demographic data is compiled for each respondent and public opinion on transportation issues is also obtained. Since the start of the survey there have been over 28,000 people surveyed, and over 68,000 trips have been documented.

This report has three sections following this brief introduction. The first section is a presentation of survey results related to the trips people make which is the primary focus of the survey. The next section deals with questions related to transit usage and carpooling. The final section shows results of public opinion questions related to the condition of the transportation system and the Delaware Department of Transportation's (DelDOT) performance in managing it. The survey itself is included in the appendix. Also included in the appendix is a brief discussion of interpreting results.

Travel in Delaware

The Delaware Trip Monitoring System asks each respondent information about trips made in the previous day, including location of origin and destination, trip time, trip method (i.e. car, transit, walk, bike), trip purpose, and other information about trips taken. This section summarizes information about trips and travel. In viewing survey results throughout this report it is important to remember that only weekday travel (Monday thru Friday) is surveyed. Also trips resulting as part of a person's work, while at work, are not surveyed. So for example if someone is making sales calls or deliveries as part of their job, these trips are not surveyed.

One of the first questions was whether a respondent traveled on the previous day. Figures 1 thru 3 below summarize results. Interviewers have been instructed to assist respondents in recalling travel in the previous day with a suggestion - "Did you go to a store, or pick up or drop some one off, or make any kind of trip by walking or other method?. In some cases, once examples of other types of travel are suggested, respondents recall trips taken they did not at first indicate. The percentage of people taking no trips in previous years is usually around 11%. In the year 2008, about 15% of respondents did not make any trips in the previous day. When compared to previous years this "no trip" value is higher and is shown to be higher for each of the three counties as well, as seen in figure 2.

Figure 1
Did You Go Anywhere Yesterday?
DTMS Survey, Years 2006 to 2008

	2008	2007	2006
Yes	85.1%	88.8	89.5
No	14.9%	11.2	10.5

Figure 2
Did You Go Anywhere Yesterday? By County
DTMS Survey, Years 2006 thru 2008

	Kent			New Castle			Sussex			DE		
Year	**2008**	**2007**	**2006**	**2008**	**2007**	**2006**	**2008**	**2007**	**2006**	**2008**	**2007**	**2006**
Yes	82.2%	89.0	88.2	87.5	89.2	90.2	80.8	87.3	88.8	85.1	88.8	89.5
No	17.8%	11.0	11.8	12.5	10.8	9.8	19.2	12.7	11.2	14.9	11.2	10.5

If the respondent did not make any trips they were asked the main reason why not, as tabulated in figure 3. The "other" reason was most often "no where to go", "no reason to go out" or such, and often "it was my day off" or "resting". Other common reasons were recreation oriented, not having a car, or being disabled. Figures 4 and 5 show the question by employment status.

Figure 3
If You Did Not Go Anywhere Yesterday,
What Was The Main Reason Why You Did Not Make Any Trips?
DTMS Survey Year 2008

	% response
Working at Home	16
Sick(self or family member)	11
Vacation	10
Retired/Unemployed/Housewife	23
Other	39

Figure 4

Did You Go Anywhere Yesterday?, By Employment Status
DTMS Survey Year 2008

	%Yes	%No
Employed	91.4	8.6
Unemployed	70.3	29.7
Student	90.8	9.2
Retired	70.1	29.9
Homemaker	75.0	25.0
Self Employed	82.1	17.9
All	**85.2**	**14.8**

Figure 5
Did You Go Anywhere Yesterday?, By Employment Status
DTMS Survey, 3 Year Average, 2006 to 2008

	%Yes	%No
Employed	93.4	6.6
Unemployed	71.8	28.2
Student	90.2	9.8
Retired	74.0	26.0
Homemaker	79.6	20.4
Self Employed	87.7	12.3
All	**87.5**	**12.5**

From the sample size and from statistics about trips taken and demographic data surveyed, an average value of trips per person can be calculated as presented in Figures 6 and 7. The data shows a trend of less trips taken each year. In 2008 the data shows that more people did not travel on the survey day than in previous years, and for those making a trip there were on average less trips taken. This would be in line with figures from other data sources. Vehicle miles traveled estimates (VMT), decreased toll income, and decreased gas tax revenues were seen in 2008 to decline in the neighborhood of a 15[*]. Economic conditions are believed to have had an effect on the amount of travel.

Figure 6
Average Trips per Person per Weekday By Year
DTMS Survey Years 2003 to 2008

YEAR	Trips per Person per day
2008	2.4
2007	2.8
2006	2.9
2005	3.0
2004	2.8
2003	2.6

Figure 7
Average Trips per Person per Weekday By Year
DTMS Survey Years 2003 to 2008
For persons who said they made a trip in the previous day

YEAR	Trips per Person per day
2008	2.8
2007	3.2
2006	3.2
2005	3.3
2004	3.0
2003	2.8
2002	2.7
2001	2.6
2000	2.3

[*] DelDOT Division of Planning

The Delaware Trip Monitoring System Survey is a valuable tool in providing information on how various factors are related to travel. How much a particular individual travels is influenced by many factors including, employment status, whether there are children in the household, income, housing type, and age. A model that can predict trip generation in consideration of demographic factors was developed in research conducted by CADSR for the Delaware Center for Transportation* and serves an example of how the survey data have been used to understand travel. Examples of how various factors influence the number of trips taken are presented in the following figures. Results show that more vehicles, higher income, and being employed, are factors that are related to higher trip rates as shown in Figures 8 thru 11 below. Also, increased household size indicates a greater likelihood of children in the household, and additional trips related to the care and activities of children.

Figure 8
Average Trips per Person per Day by Household Income
DTMS 3 year average, 2006 thru 2008

less than $10,000	2.0
$10,000- $14,999	2.1
$15,000 - $19,999	2.5
$20,000 - $24,999	2.2
$25,000 - $29,999	2.4
$30,000 - $34,999	2.4
$35,000 - $39,999	2.5
$40,000 - $49,999	2.7
$50,000 - $74,999	2.9
$75,000 - $99,999	3.0
$100,000 - $149,000	3.0
$150,000 or more	3.1

*Racca, David P., "Active Adult (55+) Community Trip Generation Rates", Delaware Center for Transportation, University of Delaware, Newark, Delaware, January 2006.

Figure 9
Average Trips per Person per Day by Total Number of Motorized HH Vehicles
DTMS 3 Year average 2006 thru 2008

# Cars/Pickups/Vans	Trips/Person/Day
0	**1.7**
1	**2.5**
2	**2.7**
3	**2.8**
4	**2.8**
5	**2.9**

Figure 10
Average trips per person per day by household size
DTMS Year 2006 to 2008

Persons per household	Trips/Person/Day			
	2008	**2007**	**2006**	**3yr average**
1	2.1	2.6	2.6	2.4
2	2.2	2.7	2.7	2.5
3	2.5	2.7	2.9	2.7
4	2.8	3.1	3.1	3.0
5	2.4	3.1	3.2	2.8
6	2.6	2.4	3.5	2.8
All	2.4	2.8	2.9	2.7

Figure 11
Average Trips per Person per Day by Employment Status
DTMS Year 2008 thru 2005

	2008	**2007**	**2006**	**2005**
Employed	2.6	3.0	3.1	3.2
Unemployed	2.1	2.3	2.3	2.4
Student	2.4	2.7	2.7	2.5
Retired	1.9	2.3	2.3	2.3
Homemaker	2.5	3.2	2.9	3.0
Self Employed	2.7	3.6	3.5	3.4
All	2.4	2.8	2.9	3.0

The average number of trips per day varies somewhat depending on age, as those 65 years and older travel less. Otherwise there is not much difference by age for total daily trips.

Figure 12
Average Trips per Person per Day by Age Grouping
DTMS Year 2006 thru 2008

Age Group	2008	2007	2006
16 to 24	2.6	2.6	2.8
25 to 34	2.6	2.9	3.1
35 to 44	2.8	3.3	3.2
45to 54	2.6	3.1	3.0
55 to 64	2.4	2.9	2.9
65 and older	1.8	2.3	2.3
All	2.5	2.8	2.9

As shown in Figures 13 and 14 there are only slight differences indicated for average trips per person per day between counties in Delaware, or between males and females,

Figure 13
Average Trips per Person per Day by County
DTMS Year 2006 thru 2008

	2008	2007	2006
Kent	2.3	2.8	2.9
New Castle	2.5	2.9	3.0
Sussex	2.2	2.8	2.8
Delaware	2.4	2.8	2.9

Figure 14
Average Trips Per Person per Day by Gender
DTMS Year 2006 thru 2008

	2008	2007	2006
Male	2.3	2.7	2.8
Female	2.5	3.0	3.0

Average trips per person in the suburbs are slightly higher than for urban areas. This is probably related to factors such as higher income and a higher number of children living in the suburbs.

Figure 15
Average Trips per Person per Day by Type of Area
DTMS Years 2006 thru 2008

	2008	2007	2006
Urban	2.2	2.8	2.7
Suburban	2.5	2.9	3.0
Rural	2.3	2.9	2.8

There is not much difference seen for residential travel with respect to the day of the week. It is important to note again that the DTMS only surveys travel on weekdays.

Figure 16
Average Trips per Person per Weekday By Day of Week
For Those Making a Trip
DTMS Survey 3 Year Average 2006 to 2008

YEAR	Average Trips per Person per day
Monday	2.7
Tuesday	3.0
Wednesday	2.8
Thursday	2.8
Friday	3.0

It is assumed that respondents could recall trips made on the preceding day. It was found that in some cases there were certain trips, termed “incidental trips” that respondents would sometimes not mention. Stops for gas or a stop at a convenience store or laundry on the way to work are examples of these incidental trips. Respondents would recall the main purpose of their travel but would often not mention the incidental trips. A question is included in the survey for each trip that asks whether there were any other stops on the way. Most of us often plan our travel as a chain of errands and destinations.

About 16% of trips surveyed included a stop at a gas station or convenience store or other stop as part of the trip. For the year 2008 there were 7165 surveyed trips. In trip figures presented so far, these incidental trips were not factored in but if they were, there would be 1148 additional trips in the sample. For example, an estimate of 2.4 trips per person for in state trips would increase to 2.8 trips per person.

If respondents made one or more trips in the previous day then questions were asked about each trip including origin, destination, travel mode, and travel time. For travel method, (travel mode) results for the 2008 survey and previous years are tabulated below in Figure 17. Results for the year 2008 are similar to previous years. About 96% of all trips surveyed were by car either as passenger or driver.

Figure 17
Travel Method/Mode Split Percentages
DTMS Survey Years 2004 to 2008

Travel Method	YEAR				
	2008	**2007**	**2006**	**2005**	**2004**
Car	96.3	96.1	96.2	96.6	95.6
Public Bus	1.6	1.2	1.4	1.3	1.2
Walked	0.9	0.9	0.9	1.0	1.4
School Bus	0.3	0.6	0.5	0.5	0.8
Bicycle	0.3	0.3	02	0.2	0.2

With car trips it was noted in the survey whether the respondent was the driver or a passenger. The destination or purpose of each trip was surveyed, so the travel method can be tabulated as it relates to destination as shown in Figure 18.

Figure 18
Trip Destination by Trip Method (percentages)
DTMS 2008 (Drv = driver of a car) (Pas = passenger in a car)

	Drv	Pas	Bus	Walk	Sch Bus	Bike
Work	92.9	3.0	2.4	0.6	0.1	0.2
Store	83.0	15.1	0.8	0.8		
School	80.6	11.5	0.5	1.8	11.6	
Drop off/Pick up a person	95.7	4.3				
Social	72.9	25.4	0.9	0.6		
Recreation	80.7	14.1	1.2	0.9	0.3	2.8
Eat out	75.5	23.4	0.5	0.5		
Child Care	100					
Doctors (medical)	80.4	17	1.3			
Bank or Post Office	92.8	4.3	2.9			
Public Transportation Stop	25					
Barber/Hairdresser	85.7	14.3				
House of Worship	71.7	25.5	2.8			
Other	82.6	11.6	0.8	3.9		

Figure 19
Trip Destination by Trip Method (percentages)
DTMS 2004 to 2008, 5year average (Drv = driver of a car) (Pas = passenger in a car)

	Drv	Pas	Bus	Walk	Sch Bus	Bike
Work	92.0	4.0	1.7	0.9	0.1	0.1
Store	84.0	13.6	0.8	1.0		0.5
School	76.6	10.3	2.1	2.1	8.4	0.3
Drop off/Pick up a person	95.5	3.9	0.1	0.2	0.2	
Social	78.5	19.6	0.9	0.6		
Recreation	83.5	12.4	0.6	1.4	0.2	1.2
Eat out	77.5	20.8	0.1	1.4		
Child Care	93.9	3.7	2.5			
Doctors (medical)	79.9	17.3	1.8	0.1		
Bank or Post Office	88.6	7.9	1.8	1.3		0.4
Public Transportation Stop	44.8		10.3	22.4		
Barber/Hairdresser	87.6	11.2		1.1		
House of Worship	74.7	22.9	1.2	1.2		

Trip Method can also be viewed in relation to household income. Those in lower income households take less car trips and more transit (Bus) trips and walk trips as shown on the next page.

Figure 20
Household Income by Trip Method
DTMS 2006 - 2008 (Drv = driver of a car) (Pas = passenger in a car)

	Drv	Pas	Bus	Walk	School	Bike
less than $10,000	64.4	19.6	8.8	2.1		3.6
$10,000- $14,999	70.4	26.1	1.1	2.2		
$15,000 - $19,999	79.7	14.0	3.3	2.1	0.3	0.4
$20,000 - $24,999	81.0	9.7	3.4	3.8		0.7
$25,000 - $29,999	84.5	8.3	2.8	1.5	0.3	0.6
$30,000 - $34,999	85.3	12.6	0.9	0.6		
$35,000 - $39,999	89.1	7.8	2.7	0.9		
$40,000 - $49,999	84.3	8.7	2.4	1.4	1.7	0.3
$50,000 - $74,999	89.4	8.8	0.4	0.6	0.4	0.1
$75,000 - $99,999	91.0	6.1	0.6	0.7		0.1
$100,000 - $149,000	92.8	5.1	0.2	0.5	0.1	0.1
$150,000 or more	91.2	6.7		0.5		0.6

Trip method/mode data would indicate that females are more often passengers than drivers and that females show a slightly higher transit use, as also shown in national travel survey data.

Figure 21
Gender by Trip Method
DTMS 2008 (Drv = driver of a car) (Pas = passenger in a car)

	Drv	Pas	Bus	Walk	School	Bike
Male	87.9	7.8	1.7	0.6	0.6	0.7
Female	81.9	14.9	1.5	1.2	0	0

As would be expected, there is some variation in trip method with age. Younger adults show a higher use of transit. The youngest and oldest adult age categories show more likelihood of being a passenger in a car trip.

Figure 22
Trip Method by Age Categories
DTMS 2006 to 2008 3 year average
(Drv = driver of a car) (Pas = passenger in a car)

	Drv	Pas	Bus	Walk	School	Bike
age 16 to 24	66.7	22.8	3.1	1.9	4.7	0.4
age 25 to 34	92.0	5.2	1.9	0.2		0.5
age 35 to 44	93.4	4.0	0.8	0.8		
age 45 to 54	89.8	6.8	0.9	0.8		0.2
age 55 to 64	90.9	7.2	0.7	0.8		0.1
age 65 and up	86.4	14.6	0.9	1.5		0.6

Figure 23
Trip Method by Race
DTMS 2003 to 2008, 5 yr avg. (Drv = driver of a car) (Pas = passenger in a car)

	Drv	Pas	Bus	Walk	School	Bike
Latino/Hispanic/Mexican American	85.4	11.7	1.7	1.1		
Black/African American	77.5	12.9	5.5	1.7	1.4	0.5
White/Caucasian	88.0	9.4	0.5	.8	0.3	0.2
Asian/Pacific Islander	79.1	10.8	2.6	2.8	2.6	.7

The DTMS also surveys the trip purpose of every trip to better understand the reasons Delawarean's travel. In the following figures the percentage of trips in each purpose category are shown.

Figure 24
Trip Purpose by Year
Percentages in Each Category, DTMS

Trip Purpose	2008	2007	2006	2005
Work	31.4	33.1	34.8	32.4
Store	18.8	17.6	17.0	16.2
School	5.2	5.9	4.3	4.2
Drop off/Pick up	8.9	9.0	11.0	12.4
Social	8.3	6.4	5.6	6.9
Recreation	7.8	5.9	4.9	7.2
Eat out	4.5	4.9	6.1	4.8
Child Care	0.5	1.1	0.7	0.8
Medical	3.7	4.5	3.7	4.4
Bank/PostOfficd	1.6	2.5	2.5	3.1
House of worship	2.5	1.3	0.8	0.8
Other	6.8	7.5	8.7	6.6

The major difference in trip purpose by gender is that females show work trips a lower and shopping and "Drop Off/Pickup" trips as higher fractions of their total trips.

Figure 25
Trip Purpose by Gender
Percentages in Each Category, DTMS
2006 thru 2008, three year avg

Purpose	Male	Female
Work	41.1	26.4
Store	15.3	19.9
School	4.2	5.6
Drop off/Pick up	7	11.8
Social	7.1	6.5
Recreation	6.5	5.9
Eat out	4.9	5.4
Child Care	0.2	1.3
Doctors (medical)	3.1	4.6
Bank or Post Office	2.0	2.4
Trans Stop	0.3	0.3
Barber/Hairdresser	0.1	0.8
House of Worship	1.4	1.7

Trip purpose distribution is fairly similar for various age groupings with the youngest and oldest categories showing the greatest differences.

Figure 26
Trip Purpose by Age Groupings
Percentages in Each Category, DTMS 2006 to 2008

	16-24	25-34	35-44	45-54	55-64	65 +
Work	22.9	41.3	38.4	41.6	32.3	11.5
Store	11.9	13.3	14.9	15.2	21.5	32.7
School	20.0	4.6	4.2	3.2	1.1	1.5
Drop off/Pick up	7.9	12.7	15.4	8.9	5.7	4.0
Social	13.4	6.6	3.7	5.2	6.3	9.2
Recreation	6.6	5.2	5.7	5.6	7.2	7.2
Eat out	4.0	4.0	4.1	5.5	5.9	8.0
Child Care	0.9	1.7	1.1	0.3	0.3	0.2
Doctors (medical)	1.8	3.5	2.9	3.1	4.9	8.1
Bank or Post Office	2.1	1.1	1.2	2.7	2.9	3.6
Trans Stop	0.1	0.5	0.2	0.5	0.4	-
Barber/Hairdresser	0.5	0.3	0.4	0.3	0.5	0.9
House of Worship	1.3	0.9	1.0	1.5	2.5	2.6

Vehicle occupancy is a topic of interest particularly for those addressing commuting, congestion and transit. For car trips, the DTMS survey asks how many people are in the car during the trip. Work trips have always shown the lowest vehicle occupancy where workers usually drive alone to work. Other trip purposes such as for recreation or

transporting children naturally show higher occupancy rates. The average for all trips tends to be about 1.6 persons per vehicle over the last few years.

Figure 27
Average Vehicle Occupancy (persons / vehicle) for Car Trips By Year
DTMS Years 2000 thru 2008

2008	2007	2006	2005	2004	2003	2002	2001	2000
1.7	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.5

Figure 28
Average Vehicle Occupancy (persons / vehicle) for Car Trips By Trip Purpose
DTMS Year 2008

Work	**1.2**
Store	**1.7**
School	**1.6**
Drop off / Pickup	**2.2**
Social	**2.2**
Recreation	**2.1**
Eat out	**2.1**
Child Care	**1.7**
Doctors(medical)	**1.9**
Bank or Post Office	**1.3**
Public Trans Stop	**2.0**
Barber Hairdresser	**1.6**
House of Worship	**2.5**
All Trips	**1.7**

Respondents in the DTMS survey are also asked for the beginning and end time of each trip so trip time can be examined. Average trip times have generally increased each year. A number of tables with respect to various factors follow.

Figure 29
Average trip time all trips 2004 to 2008
DTMS Years 2001 thru 2008

	2008	2007	2006	2005	2004	2003	2002	2001
In state	**24.5**	**23.2**	**23.7**	**23.0**	**23.0**	**22.5**	**21.2**	**21.1**
All trips	**30.2**	**26.7**	**27.1**	**26.4**	**25.8**	**26.5**	**23.4**	**22.6**

Figure 30
Average Trip Time (minutes) by County
(Excluding trips greater than 2 hours)
DTMS Year 2008

	InState	All Trips
Kent	25.8	30.7
New Castle	23.6	29.6
Sussex	25.9	31.7

Figure 31
Average Trip Time (minutes) by Travel Method/Mode
(instate trips)
DTMS Year 2008

Method	avg trip time	avg trip time for previous 5 years (2003 to 2007)
Driver of car	23.5	22.7
Passenger in car	27.2	26.1
Public Bus	48.4	44.4
Walked	29.4	21.4
School bus	42.9	34.0
Rode bike	8.0	17.6

Figure 32
Average Trip Time (minutes) by Travel Purpose
(In State trips versus all trips) DTMS Year 2008

Purpose	2008	2008 (including out of state)
Work	25.4	30.4
Store	19.2	20.6
School	23.7	23.4
Drop off/Pick up a person	20.2	24.7
Social	25.8	35.2
Recreation	27.2	42.6
Eat out	17.5	19.5
Child Care	23.0	21.7
Doctors (medical)	33.3	36.9
Bank or Post Office	21.4	21.6
Public Transportation Stop	10.6	78.4
Barber/Hairdresser	22.2	25.7
House of Worship	27.5	29.0

Figure 33
Average Trip Time (minutes) by County
(Excluding trips greater than 2 hours)
DTMS Year 2008

	InState	All Trips
Kent	25.8	30.7
New Castle	23.6	29.6
Sussex	25.9	31.7

Figure 34
Average Trip Time (minutes) by Type of Area
(Excluding trips greater than 2 hours)
DTMS Year 2004

Urban
Suburban
Rural

Figure 35 below presents the distribution of beginning trip times for the DTMS Data. The distribution is similar over the last 5 years. Travel during the morning and peak travel times is about a third of the daily trips taken by Delawareans. There is some indication of a gradual increase in percentage for off peak times, particularly in the afternoons.

Figure 35
Distribution of Trips During the Day
(begin time of trip, percentage of daily weekday trips)
DTMS Year 2004 to 2008

	2004	2005	2006	2007	2008	5yr avg.
Midnight to 3am	0.5	0.6	0.9	0.5	0.6	0.6
3am to < 6am	1.9	2.2	2.2	2.1	2.3	2.2
6am to < 9am	21.4	20.7	21.2	21.2	19.3	20.7
9am to < noon	15.0	15.8	15.9	14.1	17.4	15.8
noon to 3pm	17.9	16.8	16.7	16.2	19.2	17.4
3pm to 6pm	25.4	25.7	25.3	26.9	24.9	25.6
6pm to 9pm	13.4	13.3	13.7	14.7	12.1	13.4
9pm to midnight	4.5	4.8	4.0	4.1	4.3	4.4

Figure 36 shows the distribution of work trips during the day. Roughly 2/3 of work trips occur during what is considered the morning and afternoon peak hours. Figure 36 does not include the effect of trips that are chained, but only where the trip is clearly for work purposes, that is, where origin is "home" and the destination is "work" or where the origin is "work" and the destination is "home". Trips for a morning routine where children are dropped off at school before going to work, or a person stops off at a store on the way to home from work are not included in the tabulation.

Figure 36
Distribution of work Trips During the Day
Time going to work
(begin time of trip, percentage of daily weekday trips)
DTMS Year 2004 to 2008

	2004	2005	2006	2007	2008	5yr avg.
Midnight to 3am	0.3	0.3	0.7	0.4	0.3	0.4
3am to < 6am	7.2	9.3	8.4	7.8	8.8	8.4
6am to < 9am	63.3	60.0	61.3	65.0	60.7	61.9
9am to < noon	11.2	11.8	13.9	11.8	14.8	12.8
noon to 3pm	8.6	10.4	9.9	7.7	8.5	9.1
3pm to 6pm	6.4	4.8	3.8	5.8	3.8	4.8
6pm to 9pm	1.5	1.7	1.0	0.7	2.1	1.4
9pm to midnight	1.5	1.8	0.9	0.8	1.0	1.2

Figure 37
Distribution of Shopping Trips During the Day
Percentages, Time going shopping in 3hr grouping
(begin time of trip, percentage of daily weekday trips)
DTMS Year 2004 to 2008

	2004 to 2008 5yr avg.
Midnight to 3am	**0.2**
3am to < 6am	**0**
6am to < 9am	**6**
9am to < noon	**30**
noon to 3pm	**26**
3pm to 6pm	**22**
6pm to 9pm	**14**
9pm to midnight	**2**

A factor that is frequently used in modeling travel demand is "Vehicles per household". The DTMS estimates average total motorized vehicles per household as 2.4.

Figure 38
Average Number of Vehicles per Household in Delaware
DTMS Year 2008

Cars	1.4
SUV's	0.4
Trucks	0.4
Vans/Minivans	0.2
Motorcycles/Mopeds/Motor Scooters	0.1
Total Motorized Vehicles	2.4

Another question asked on the DTMS survey dealing with travel behavior is one that asks about shopping habits as shown in Figure 39.

Figure 39
Which Of The Following Best Describes Your Shopping Habits?
DTMS Year 2004
% responding

%	
40.9	I shop primarily on weekends.
14.6	I mostly shop on the way to or from work.
34.5	I make shopping trips primarily from home, Monday thru **Friday**
8.1	Other
1.8	Don't know.

An important piece of information that is captured in the DTMS survey is the geographic location of trip origins and destinations. Based on an address, subdivision name, or intersection, each trip origin and destination is geocoded to a Delaware Modified Grid, a unit of geography slightly smaller than a Delaware Traffic Zone or Census Block Group. This allows for an analysis of where geographically travel is occurring and is useful in examining effects of various densities of residential or commercial development. Enough data has been collected to examine travel at the county level and in some cases by Census County Division (Planning District).

County to county flows are tabulated in figures 40 thru 42. For work trips, Kent and Sussex each have 10% going between them. The flow of workers between Kent and New Castle is more unbalanced with 16% going from Kent to New Castle and only about 3% going from New Castle to Kent County. Sussex and New Castle have a significant portion of workers out of State with 17% and 18% respectively.

Figure 40
Travel Destinations For those Living in New Castle County
Estimated Percentage of daily trips
From a 3 year average, years 2006 to 2008

	To Kent County	To NC	To Sussex	OutsideDE
3yr All trip	1.4%	90.2%	0.3	8
3 yr Work Trip	2.6	79	0.4	18

Figure 41
Travel Destinations For those Living in Kent County
Estimated Percentage of daily trips
From a 3 year average, years 2006 to 2008

	To Kent	To NC	To Sussex	OutsideDE
3yr All trip	84%	5	5	5%
3 yr Work Trip	68	16	9	7

Figure 42
Travel Destinations For those Living in Sussex County
Estimated Percentage of daily trips
From a 3 year average, years 2006 to 2008

	To Kent	To NC	To Sussex	OutsideDE
3yr All trip	6%	1	82	11%
3 yr Work Trip	10	1	72	17

To view origin and destination information at a greater detail, survey records can be grouped by Census County Division, sometimes call Planning Districts. The locations of the CCD's are shown in figures 43 and 44.

Figure 43
Census County Divisions in New Castle County

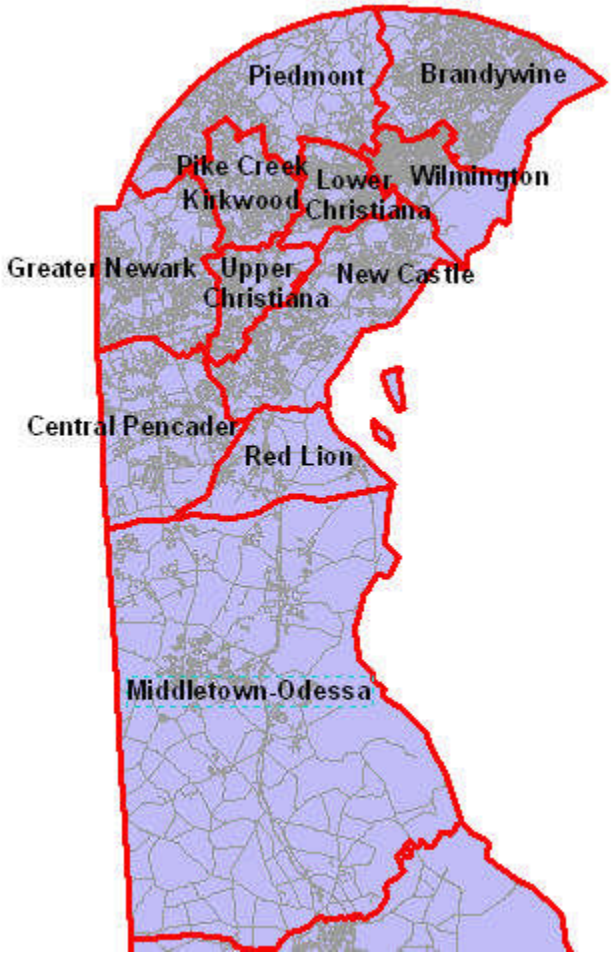

Figure 44

Census County Divisions in Kent and Sussex Counties

There was enough data available in New Castle County to develop origin and destination matrices for work trips as shown on the next 3 pages. The Wilmington CCD is shown having the greatest proportion of employment with 21 percent . Brandywine, Newark, Lower Christina, and New Castle.

Figure 45, Distribution of destinations (%) from 3 year average, 2006 to 2008

For Those Living and Working in New Castle County, Delaware

	Brandywine	Central Pencader	Greater Newark	Lower Christiana	Middletown-Odessa	New Castle	Piedmont	Pike Creek-Central Kirkwood	Red Lion	Upper Christiana	Wilmington
Journey to Work	15	5	13	10	4	13	5	4	1	10	21
All trips	18	6	13	7	8	12	6	8	1	8	12

Figure 46, Estimate of Weekday Percentage of Work Trips from 3 year average, 2006 to 2008

For Those Living and Working in New Castle County, Delaware

District of Residence (rows) by District Destination of Work trip (columns)

New Castle County Destination Planning Districts (Census County Divisions)

Home District	Brandywine	Central Pencader	Greater Newark	Lower Christiana	Middletown-Odessa	New Castle	Piedmont	Pike Creek-Central Kirkwood	Red Lion	Upper Christiana	Wilmington	Row Total
Brandywine	7	0	1	1	0	1	1	0	0	1	4	16
Central Pencader	1	2	2	1	0	1	0	0	0	1	1	10
Greater Newark	1	0	3	1	0	1	0	0	0	2	1	10
Lower Christiana	1	0	1	1	0	1	0	0	0	1	2	8
Middletown-Odessa	1	1	1	1	2	2	0	0	0	1	2	11
New Castle	1	1	2	1	0	4	1	1	0	2	2	14
Piedmont	1	0	1	1	0	1	1	0	0	0	1	7
Pike Creek-Central Kirkwood	1	0	1	2	0	1	1	1	0	1	2	10
Red Lion	0	0	0	0	0	0	0	0	0	0	0	2
Upper Christiana	0	1	1	0	0	1	0	0	0	1	1	4
Wilmington	2	0	0	1	0	1	0	0	0	0	4	9
Column Total	15	5	13	10	4	13	5	4	1	10	21	100

Figure 47, Estimate of Weekday Percentage of Trips (All Purposes) from 3 year average, 2006 to 2008

For Those Living in New Castle County, Delaware

District of Residence (rows) by District Destination of Work trip (columns)

HOME CCD	Brandywine	Central Pencader	Greater Newark	Lower Christiana	Middletown-Odessa	New Castle	Piedmont	Pike Creek-Central Kirkwood	Red Lion	Upper Christiana	Wilmington	Row Totals
Brandywine	14	0	0	0	0	0	0	0	0	1	2	18
Central Pencader	0	4	1	0	0	1	0	0	0	1	0	8
Greater Newark	0	0	9	0	0	0	0	1	0	1	1	13
Lower Christiana	0	0	0	4	0	0	0	0	0	0	1	7
Middletown-Odessa	0	0	0	0	7	1	0	0	0	1	0	10
New Castle	0	1	1	0	0	8	0	0	0	1	1	13
Piedmont	0	0	0	0	0	0	4	1	0	0	1	7
Pike Creek-Central Kirkwood	0	0	1	1	0	0	0	5	0	0	1	9
Red Lion	0	0	0	0	0	0	0	0	1	0	0	2
Upper Christiana	0	0	0	0	0	0	0	0	0	3	0	5
Wilmington	1	0	0	0	0	1	0	0	0	0	6	10
Column Totals	18	6	13	7	8	12	6	8	1	8	12	100

Figure 48, Estimate of Number of Daily Work Trips, from 3 year average, 2006 to 2008

For Those Living and Working in New Castle County, Delaware

District of Residence (rows) by District Destination of Work trip (columns)

	New Castle County Destination Planning Districts (Census County Divisions)											
Home District	Brandywine	Central Pencader	Greater Newark	Lower Christiana	Middletown-Odessa	New Castle	Piedmont	Pike Creek-Central Kirkwood	Red Lion	Upper Christiana	Wilmington	Row Total
Brandywine	12421	490	1739	1595	55	1891	1209	238	254	1468	7302	28662
Central Pencader	1891	2987	3720	1639	889	1986	411	848	0	1748	1999	18117
Greater Newark	925	462	6167	2254	149	998	455	279	117	2850	2306	16962
Lower Christiana	1352	792	1279	1974	61	1096	611	304	0	2076	3913	13458
Middletown-Odessa	1404	1258	2501	1282	4374	2998	113	599	52	2136	3432	20150
New Castle	1486	903	3190	2018	521	7085	1006	1418	532	3196	2940	24296
Piedmont	1539	448	1687	1413	0	1789	2124	303	116	737	2501	12658
Pike Creek-Central Kirkwood	2649	386	1027	3155	119	1194	1785	1801	0	1342	4398	17856
Red Lion	0	0	536	885	429	115	76	0	87	76	655	2859
Upper Christiana	206	1510	1302	492	61	1054	110	452	77	1350	1031	7646
Wilmington	3396	155	435	933	166	2629	584	246	0	700	6451	15695
Column Total	27270	9391	23582	17641	6825	22835	8485	6488	1234	17680	36929	178360

Insufficient data is available for Kent and Sussex Counties to produce an origin and destination matrix at the CCD level. However, the data that is available yields information toward a general picture. From a 5 year average (2004 to 2008) for Kent County, about 75% of the work trips for those living and working in Kent were to the Dover planning district, 10% of the trips were to Smyrna, with the remaining planning districts having each about 6% or less of the trips.

A quarter of the work trips in Sussex County are to the Lewes CCD with the distribution of other trips being more balanced across CCD than with Kent as shown below.

Figure 49, Percentage of Sussex County Work Trips
Five Year Average (2004 to 2008)
By Census County Division (CCD)

CCD	%employment
Lewes	25
Seaford	15
Selbyville -Frankford	15
Georgetown	13
Millsboro	11
Milton	6
Bridgeville- -Greenwood	6
Milford South	5
Laurel-Delmar	4

Transit, Carpooling, and EZ Pass

There are several questions on the DTMS survey that are included to help transportation agencies understand the needs, perceptions, and demand for multi-modal facilities and programs to address congestion.

The first questions addressed in this section deal with transit. Please refer to Figures thru below. DART First State is the group within DelDOT that manages the para-transit and fixed route public bus services in Delaware. About a third of Delawareans have used or know of a person in their household who has used public transit services. For those that have previously used DART services, better schedules or information, and more routes are among the leading factors that would encourage people to use transit more often. The primary factor that would influence them to use services is no driver's license or no vehicle available.

Figure 50
Has any household member ever used any of the DART First State transit services for a trip in Delaware?
DTMS Year 2008,% responding

	2004	2005	2006	2007	2008	5yr avg
Yes	32	30	32	31	28	30
No	67	70	67	69	70	69

Figure 51
If DART services were used,
"Would the following make you use these services more frequently?"
DTMS Year 2008,% responding

	Yes	**No**
Lower Fares	15	85
More frequent service	27	73
Better schedules/route information	31	69
More routes	37	63
Weekend service	20	80
Later operation hours (such as night service)	18	82
Have no driver's license/no car available	25	75

The main reason given for not using DART transit services is "Car is always available", followed in a distant second place by "Inconvenient".

Figure 52
If the respondent had not used DART services,
"What are the reasons these services are not used?"
DTMS Year 2008,% responding

	Applies	Not Apply
Car is always available	79	21
Inconvenient (eg. routes, bus stops)	26	74
Hours of service are not appropriate	8	92
Do not like buses	6	94
Want privacy (Do not like crowds)	6	94
Unaware of routes or schedules	13	86
Health problems	2	98
No public transportation in area	16	84

Rideshare Delaware is a program conducted by the Delaware Transportation Management Agency to encourage carpooling, particularly for the journey to work, toward a goal of decreased congestion and less need for new roads, and better air quality. The program supports carpooling by helping to set up suitable carpooling opportunities and by providing a guaranteed ride home in emergencies and other policies that make carpooling more desirable. The survey questions are geared toward understanding the awareness of Rideshare Delaware and in understanding the factors that may influence people to carpool. Close to 60% of the respondents said they were not interested in carpooling but the services RideShare Delaware offers, like assistance in setting up carpools and providing a guaranteed ride home, would make a difference in encouraging people to carpool.

Figure 53
For Employed Persons, "Have you ever heard of Rideshare Delaware?"
DTMS Year 2004 to 2008, % responding

	2004	2005	2006	2007	2008
Yes	64	63	64	62	60
No	36	37	36	37	39

Figure 54
For Employed Persons Who Have Heard of Rideshare,
"Have you used its services?"
DTMS Year 2008,% responding

	%
Yes	4
No	96

Figure 55
For Employed Persons Who Have Heard of Rideshare,
"Did you know Rideshare Delaware offers a Guaranteed Ride Home Program?"
DTMS Year 2008,% responding

	%
Yes	31
No	69

Figure 56
For Employed Persons Who Used Rideshare,
"Did using Rideshare Delaware's services assist you or your group in forming a carpool?
DTMS Year 2008,% responding

	%
Yes	49
No	51

Figure 57
For Employed Persons,
"Which of following might influence you to car/vanpool to work?"
DTMS Year 2008,% responding

	% Influence	% Would Not Influence
Reserved, near the door parking for car/vanpools	6	94
Flexible work hours to accommodate ridesharing	20	80
Easy way to find carpool partners	16	84
Free Guaranteed Ride Home in case of emergency	13	87
Priority lane on Highway	9	91
Vanpool Subsidy	9	91
I already car/vanpool	5	95
Not interested in car/vanpooling	59	41

EZ Pass is the automated toll collection system where drivers put a transponder in their car and then can use the EZ Pass lanes rather that going to the toll boot cashiers. The DTMS survey includes two questions that ask about current and planned usage of the program. These results are seen as residential household estimates.

Figure 58
Are you enrolled in EZ-Pass?
DTMS Year 2008,% responding

	2004	2005	2006	2007	2008
Yes	35	29	44	45	45
No	65	61	56	54	55

Figure 59
if you are not currently enrolled in EZ-Pass or are you planning to enroll in EZ-Pass in the coming year?
DTMS Year 2004,% responding

	2008
Yes	9
No	87

There are two questions in regards to disabilities.

Figure 60 DTMS Survey Question (2008)
"Does any member of the household have a disability?"

Yes	6.4
No	93.5

Figure 61 DTMS Survey Question (2008)
"Given that a member of household has a disability, do they use Special Transportation?"

Yes	28
No	72

Opinion and Perceptions

A few questions are included in the DTMS survey that ask users about their perceptions of the transportation system.

The first question has to do with public perceptions of the condition of Delaware's roads. As shown in Figure 44, a little more than two thirds of Delawarean's believe roads are in good or better condition, with only about 10% saying that would rate the condition of roads as "Poor". There are no large differences between counties for this question, perhaps those living in Kent County believe their roads are in better condition.

Figure 62
Overall, how would you rate the condition of Delaware's highways and roads that you use daily?
DTMS Years 2008 thru 2004 ,% responding

	2004	2005	2006	2007	2008
Excellent	6	6	6	5	5
Very Good	23	22	23	20	22
Good	38	39	39	43	41
Fair	23	22	23	22	21
Poor	10	10	9	9	9

Figure 63
Overall, how would you rate the condition of Delaware's highways and roads that you use daily? By County
DTMS Years 2004 to 2008 ,% responding

	Kent	New Castle	Sussex
Excellent	8	4	7
Very Good	28	20	23
Good	40	42	36
Fair	18	24	21
Poor	6	10	12

As shown in the Figures below, close to two thirds believe that DelDOT is doing a good or better job of managing transportation with only about 8 percent believing that DelDOT is doing a poor job.

Figure 64
Overall, how would you rate the performance of DelDOT in managing transportation in the state of Delaware?
DTMS Years 2004 thru 2008,% responding

	2004	2005	2006	2007	2008
Excellent	4	4	4	3	3
Very Good	17.0	16	15	15	14
Good	38	36	37	38	39
Fair	17	18	21	20	21
Poor	9	11	11	12	10
Don't Know	15	15	12	12	12

Figure 65
Overall, how would you rate the performance of DelDOT in managing transportation in the state of Delaware? By County
DTMS Years 2004 to 2008 ,% responding

	Kent	**New Castle**	**Sussex**
Excellent	6	3	4
Very Good	20	14	15
Good	40	38	34
Fair	15	21	20
Poor	7	11	14
Don't Know	5	6	5

The DTMS also includes a question about traffic congestion and the perceived sources. The response "Typical rush hour traffic" always leads with "Road Construction" next. Viewing this question by county, New Castle County and Kent County show similar responses, where Sussex County is a bit different. Perhaps the higher response for "Other" in Sussex County is related to summer beach traffic.

Figure 66
When you encounter traffic congestion in Delaware, what is it usually related to?
DTMS Years 2004 thru 2008,% responding

	2004	2005	2006	2007	2008
An Accident	13.2	12.7	13.1	16.6	14.8
Road Construction	22.1	26.1	22.6	23.4	29.7
Typical rush hour traffic	38.9	38.1	39.6	41.0	34.1
Special events	3.4	3.4	3.1	2.4	3.5
Don't encounter traffic congestion	6.9	5.3	5.2	6.1	5.1
Other	14.3	13.4	15.8	9.6	11.1

Figure 67
When you encounter traffic congestion in Delaware, what is it usually related to?
By County
DTMS Year 2008 ,% responding

	Kent	New Castle	Sussex
An Accident	16	16	12
Road Construction	24	29	38
Typical rush hour traffic	34	40	19
Special events	7	1	8
Don't encounter traffic congestion	9	4	7
Other	10	10	15

APPENDIX

DELAWARE TRIP MONITORING SURVEY
2008

Questionnaire

Appendix A - 2008 DelDOT Survey

INTRO Hello, I'm calling from the University of Delaware. We are conducting a survey of Delaware residents for the Delaware Dept of Transportation to collect information on travel patterns to determine current and future transportations needs and services.

Your phone number has been chosen randomly by the computer to be included in the study. For verification purposes, is this <phone #>?

[ ] YES
[ ] NO (number redialed)

Is this a private residence?

[ ] YES
[ ] NO (interview terminated)

We need to randomly select one adult who lives in your household to be interviewed. How many members of your household, including yourself, are 16 years of age or older?

Enter number of adults _____

How many of these adults are men?

Enter number of MEN ___

How many of these adults are women?

Enter number of WOMEN ___

The person in your household I need to speak with is the <Selected Respondent>.

May I speak with the <Selected Respondent>*?

[ ] Yes, coming to the phone
[ ] Not Available (set callback)

*IF SELECTED RESPONDENT IS ON THE PHONE
Then you are the person I need to speak with. Once again, the purpose of the study is to gather information on travel patterns to determine current and future transportation needs and services.

*WHEN SELECTED RESPONDENT COMES TO THE PHONE

Hello, I'm calling from the University of Delaware. We are conducting a survey of Delaware residents for the Delaware Dept of Transportation to collect information on travel patterns to determine current and future transportations needs and services. Your answers will be completely confidential and no response will be identified with you personally.

Q1 Are you enrolled in EZ-Pass

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q2 Do you plan to enroll in EZ-Pass this year?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q3 DID YOU GO ANYWHERE YESTERDAY? This could include going to work, a shopping trip, stopping at the bank or convenience store, recreation, family responsibilities, dropping or picking up family members from school or events. ANY TYPE of TRAVEL, whether it is by car, bus, walking, bicycling or other means is of interest.

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q4 What was the main reason why you did not make any trips yesterday?

[ ] Working at home
[ ] Sick (either yourself or a family member)
[ ] Vacation
[ ] Retired /Unemployed/Housewife
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

INFO1 For each of the trips you made YESTERDAY we need to know where the trip began and ended, the start time of the trip, the means of travel, the number of passengers you traveled with, and the trip purpose. Let's go through each in turn, and I will record the information.

Q5 From what General Location did you begin your first trip?

[ ] Home
[ ] Work
[ ] Store
[ ] School
[ ] Drop off/Pick up a person
[ ] Social
[ ] Recreation
[ ] Eat out
[ ] Child Care
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q6 Please specify the address of your first trip. We need either a Development, a Street, an Address, or the nearest intersection to this location as well as the city or town.

_____

_____

Q7 What is the ZIP CODE FOR THIS LOCATION?

ZIP CODE FOR LOCATION_____
[ ] DON'T KNOW
[ ] REFUSED

Q8 What time did you begin your trip.

Time _____
[ ] DON'T KNOW
[ ] REFUSED

Q9 Was that AM or PM?

[ ] AM
[ ] PM
[ ] DON'T KNOW
[ ] REFUSED

Q10 Trip Method

[ ] Driver of car
[ ] Passenger in car
[ ] Public Bus
[ ] Walked
[ ] School bus
[ ] Rode bike
[ ] Vanpool
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q11 Including yourself, how many people were in the car or van?

Number of people ___
[ ] DON'T KNOW
[ ] REFUSED

Q12 Where did you go or what was the purpose of this first trip?

[ ] Home
[ ] Work
[ ] Store
[ ] School
[ ] Drop off/Pick up a person
[ ] Social
[ ] Recreation
[ ] Eat out
[ ] Child Care
[ ] Doctors (medical)
[ ] Bank or Post Office
[ ] Public Transportation Stop (Train Bus)
[ ] Barber/Hairdresser
[ ] House of Worship (Church etc)
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q13 Please specific the Location. We need either a Development, a Street, an Address, or the nearest intersection to this location as well as the city or town.

_____

_____

Q14 What is the ZIP CODE FOR THIS LOCATION?

ZIP CODE FOR LOCATION_____
[ ] DON'T KNOW
[ ] REFUSED

Q15 What time did you end your trip.

Time _____
[ ] DON'T KNOW
[ ] REFUSED

Q16 Was that AM or PM?

[ ] AM
[ ] PM
[ ] DON'T KNOW
[ ] REFUSED

Q17 Did you stop at convenience store or stop for gas anytime during this trip?

Enter a value _____
[ ] DON'T KNOW
[ ] REFUSED

Q18 You said that you went to a store. Was your shopping trip in a mall, a shopping, center, or downtown retail area? If yes, how many stores did you go in?

Enter a value _____
[ ] DON'T KNOW
[ ] REFUSED

Q19 Did you eat while you in the mall, shopping center , or in the downtown retail area.

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q20 Were sidewalks or paths available for this trip?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q21 Did you make more trips?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

----- REPEATS FOR UP TO 9 TRIPS -----

Q22 Did you use EZ-Pass for any of these trips?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q23 Which of the following best describes your shopping habits?

[ ] I shop primarily on the weekends
[ ] I mostly shop on the way to or from work
[ ] I make shopping trips primarily from home, Monday thru Friday
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q24 In order to analyze the data, we need the following household information, which will be kept completely confidential. How many people live in your household?

Enter a value _____
[ ] REFUSED

Q25 Starting with yourself, what is your age?

Enter a value _____
[ ] REFUSED

Q26 What is your status in the household?

[ ] Father (if child in HH)
[ ] Mother (if child in HH)
[ ] Child in HH (age 16 and over)
[ ] domestic (maid, Housekeeper, HH worker)
[ ] Relative (Grandparent/cousin/etc)
[ ] Boarder
[ ] Head of Household/Unrelative/boygirl friend/roomate
[ ] Living alone (no other person in HH)
[ ] Husband (if NO Child in HH)
[ ] Wife (if NO Child in HH)
[ ] REFUSED

Q27 What is your Employment Status?

[ ] Employed
[ ] Unemployed
[ ] Student
[ ] Retired
[ ] Homemaker
[ ] Self-employed
[ ] REFUSED

SEX Interviewer Only: Code gender

[ ] Male
[ ] Female
[ ] DON'T KNOW

Q28 The next person in your household what is their age?

Enter a value_____
[ ] REFUSED

Q29 What is their status in the household?

[ ] Father (if child in HH, this could include a grown child)
[ ] Mother (if child in HH, this could include a grown child)
[ ] Child (of Father or Mother) this could include a grown child
[ ] Domestic (maid, Housekeeper, etc)
[ ] Other Relative (Grandchild/Grandparent/Cousin/niece/nephew, Aunt, Uncle)
[ ] Boarder
[ ] Roommate (Unrelated/boyfriend/girlfriend/child of boyfriend/girlfriend)
[ ] Living Alone
[ ] Husband (NO Child in HH)
[ ] Wife (NO Child in HH)
[ ] REFUSED

Q30 What is their Status? Are they __?

[ ] Employed
[ ] Unemployed
[ ] Student (age 6 and over)
[ ] Retired/Disable
[ ] Homemaker
[ ] Self-employed
[ ] Refused
[ ] Child 5 years or under
[ ] REFUSED

Q31 What is their sex?

[ ] Male
[ ] Female
[ ] REFUSED

----- REPEATS FOR UP TO 5 MORE HH MEMBERS -----

Q32 What is your Occupation?

_____

_____

Q33 How many of the household members are able to travel on their own who are Under 16 years old?

Enter a value _____
[ ] DON'T KNOW
[ ] REFUSED

Q34 How many of the household members are able to travel on their own who are 16 years and over?

Enter a value _____
[ ] DON'T KNOW
[ ] REFUSED

Q35 How many motorized vehicles of each type are available for use by residents of your household

1) Cars ___
2) SUVs ___
3) Trucks ___
4) Vans/Mini-Vans ___
5) Motorcycles/motorscooters/mopeds ___
[ ] DON'T KNOW
[ ] REFUSED

Q36 Does any household member have a disability that limits the type of transportation they can use?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q37 Does this person (or do these persons) use specialized transportation services?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q38 Has any household member ever used any of the DART First State transit services for a trip in Delaware?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q39 What would make you use these services more frequently? Select all that apply)

1) Lower Fares
2) More frequent service
3) Better schedules/route information
4) More routes
5) Weekend service
6) Later operation hours (such as night service)
7) Have no driver's license/no car available
8) Employer transit benefit or subsidy
9) Other

Q40 What is the other reason that would make you use services more frequently?

_____

_____

Q41 What are the reasons these services are not used? INTERVIEWER: Select all that apply

1) Car is always available
2) Inconvenient (eg. routes, bus stops)
3) Hours of service are not appropriate
4) Do not like buses
5) Want privacy (Do not like crowds)
6) Unaware of routes or schedules
7) Health problems
8) No public transportation in area
9) Other

Q42 What is the other reason these services are not used?

_____

_____

Q43 Have you ever heard of DART's Rideshare Delaware?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q44 Have you used its services?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q45 Did using DART's Rideshare Delaware services assist you or your group in forming a carpool?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q46 Did you know DART's Rideshare Delaware offers an emergency ride home benefit for its participants who use a rideshare mode to get to work?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q47 Which of following might influence you to car/vanpool to work. INTERVIEWER: Select all that apply

1) Reserved, near the door parking for car/vanpools
2) Flexible work hours to accommodate ridesharing
3) Easy way to find carpool partners
4) Free Guaranteed Ride Home in case of emergency
5) Priority lane on Highway
6) Vanpool subsidy
7) I already car/vanpool
8) Not interested in care/vanpooling
9) Other

Q48 What other reason might influence you to car/vanpool to work?

_____

_____

Q49 What county do you live in

[ ] Kent
[ ] New Castle
[ ] Sussex
[ ] DON'T KNOW
[ ] REFUSED

Q50 Which of the following best describes the type of area where you live

[ ] Urban
[ ] Suburban
[ ] Rural
[ ] DON'T KNOW
[ ] REFUSED

Q51 In what type of structure is your household located?

[ ] Single family house detached from any other house
[ ] Single family house attached to one or more houses (duplex, townhouse, or condominium)
[ ] Mobile home or trailer
[ ] Hotel/motel
[ ] Apartment building

Q52 Would that be a high rise, low rise, or a garden apartment?

[ ] High Rise
[ ] Low Rise
[ ] Garden
[ ] DON'T KNOW
[ ] REFUSED

Q53 you rent or own your home?

[ ] Rent
[ ] Own
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q54 What ethnic group best describes your household?

[ ] Latino/Hispanic/Mexican American
[ ] Black/African American
[ ] White/Caucasian
[ ] Asian/Pacific Islander
[ ] Native American/American Indian
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q55 What is your household income? Is it...

[ ] less than $10,000
[ ] $10,000- $14,999
[ ] $15,000 - $19,999
[ ] $20,000 - $24,999
[ ] $25,000 - $29,999
[ ] $30,000 - $34,999
[ ] $35,000 - $39,999
[ ] $40,000 - $49,999
[ ] $50,000 - $74,999
[ ] $75,000 - $99,999
[ ] $100,000 - $149,000
[ ] $150,000 or more
[ ] DON'T KNOW
[ ] REFUSED

Q56 Overall, how would you rate the condition of Delaware's highways and roads that you use DAILY?

[ ] Excellent
[ ] Very Good
[ ] Good
[ ] Fair
[ ] Poor
[ ] DON'T KNOW
[ ] REFUSED

Q57 Overall, how would you rate the performance of DelDOT in managing transportation in the state of Delaware?

[ ] Excellent
[ ] Very Good
[ ] Good
[ ] Fair
[ ] Poor
[ ] DON'T KNOW
[ ] REFUSED

Q58 Do you own a computer?

[ ] Yes
[ ] No
[ ] REFUSED

Q59 Does it have internet access?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q60 Do you have a cell phone?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q61 Do you use it for text messaging?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q62 Do you have more than one telephone number?

[ ] Yes
[ ] No
[ ] DON'T KNOW
[ ] REFUSED

Q63 How many residential numbers do you have? (does NOT include business, computer or fax lines)

Number of telephone numbers ___
[ ] DON'T KNOW
[ ] REFUSED

Q64 When you encounter traffic congestion in Delaware, what is it usually related to?

[ ] An Accident
[ ] Road Construction
[ ] Typical rush hour traffic
[ ] Special events
[ ] Don't encounter traffic congestion
[ ] DON'T KNOW
[ ] REFUSED
[ ] OTHER _____

Q65 What is your zip code?

Enter Zip Code _____
[ ] DON'T KNOW
[ ] REFUSED

Q66 What street or development do you live on? Or where is the closest intersection to your home?

INTERVIEWER: If respondent is not willing to answer. Read: "I understand that you are not comfortable telling me the street or dev but we would like to know at least the nearest street intersection to your home."

_____

_____

That's all the questions I have. Thank you for your time and cooperation in doing this survey.

Appendix B - Interpreting Results

Many figures are tabulated in this report, involving many factors. A complete examination of error for each tabulation would take a great deal of time but in examining the numbers presented it is helpful to have a rough idea of what is significant. In years before 2008, the survey sample was a simple random sample for residents 16 years and older in Delaware. In 2008 more observations were selected from Kent and Sussex County, equal to that of New Castle County so the sample was a stratified sample. The overall effect of doing more surveys is to obtain more information about Delaware's less populated counties and the general effect on the confidence level is to improve estimates for Kent and Sussex, so to explain a rough sense of certainty of results the case of assuming a simple random sample will suffice.

The standard error of a reported proportion or percentage *p* measures its accuracy, and is the estimated standard deviation of that percentage. It can be estimated from just *p* and the sample size, *n*, if *n* is small relative to the population size, using the following formula

$$\text{Standard error} = \sqrt{\frac{p(1-p)}{n}}$$

Interpretation of the standard error is that although we do not know the "true" percentage, it is highly likely (96 percentile) to be located within two standard errors of the estimated percentage.

For example:

Previous years have shown that about 10% of respondents do not make a trip on the surveyed day. So p = .10 and p(1-p) = .09. At least 2000 surveys were completed each year so taking "n" the sample as 2000 the standard error would be about 0.7 percent so that figures presented would be considered to be about +/-1.5 percent from actual values.

As another example assume someone is interested on the degree of confidence on the measure of no trips for Kent County. Assuming a sample of n = 350 which is close to the number sampled in Kent County, the standard error would be about 1.6 percent and

figures shown for Kent County are about +/- 3.2 percent. There were 1008 samples in Kent County for 2008 so figures for that year would be calculated similarly as +/- 2 percent. As estimates are viewed at smaller levels of geography the number of observations for that area are smaller and of course confidence intervals widen. So also when data is viewed with respect to various factors.

For example, consider the tabulation of the percentage of making a trip by employment status as shown in the figure below.

Did You Go Anywhere Yesterday?,
By Employment Status, State of Delware
DTMS Survey Year 2008

	%Yes	%No
Employed	91.4	8.6
Unemployed	70.3	29.7
Student	90.8	9.2
Retired	70.1	29.9
Homemaker	75.0	25.0
Self Employed	82.1	17.9
All	**85.2**	**14.8**

There were only 116 Homemakers in the sample and an estimate of the confidence level for the homemaker percentage traveled the previous day for the state of Delaware would be about +/- 5.5 percent. If you took it further and wanted to examine the confidence interval for the percentage traveled in the previous day for Homemaker's in Kent County, then for 2007 there was a sample of 21 and the confidence interval would be +/- 13 percent. In 2008 there was a sample of 42 homemakers in Kent County and the confidence interval for that figure would be about +/- 9 percent. While 13 and 9% seem to be large confidence intervals the tabulations still can show relationships between factors and indicate trends from year to year. Estimates are very often very consistent from year to year and reflect the effects of external factors that are expected to effect the numbers.

Estimates of error vary in the tables and are were provided with each tabulation. As a general rule of thumb, percentage estimates for a factor at the State level are in the neighborhood of +/- 1.5 % or more, at the county level starting in 2008 about +/- 2 % or

more, (previous years county level is about +/- 3.5 %), for several factors arrayed across a state sample confidence levels can range from 5% to 10%, for factors arrayed across two factors or for lower levels of geography confidence levels can be in the range of 5 to 15% or more depending on how few samples are taken for the factors of interest.

To estimate the standard error of quantities and in particular averages as reported for the survey the formula used is

Standard Error of Sample Average = Square Root (1- f) s^2 / n

Where N is the size of the population, n is the size of the sample, s is the standard deviation of the factor, and f is the sample fraction n/N.

For a large sample a 95% confidence interval for the Average is:

Actual Population Average = Sample Average +/- 1.96 * Std Error of Sample Avg

For example for the tabulation below, in 2007 there was a sample of n = 2018, with about N = 660,000 people sixteen years and older in the state. Sample fraction (f) would be .997 and is ignored. The standard deviation of total trips is s = 1.9. Standard error would be about 0.043, so trips per person in 2007 would be about 2.8 +/- 0.1.

Average Trips per Person per Weekday By Year
DTMS Survey Years 2003 to 2008

YEAR	Trips per Person per day
2008	2.4
2007	2.8

If a confidence level is desired for a smaller level of geography, for Kent County for instance, the sample is n = 335, the standard deviation of total trips is again about 1.9, the sample average was calculated at 2.3 from table below. The standard error is then about SE = 0.1 and the trips per person for Kent County is expected to be 2.3 +/- 0.2% which is

considered as not significantly different from New Castle County though this very slight difference in the estimate less than New Castle is observed every year.

Average Trips per Person per Day by County
DTMS Year 2007

	2007
Kent	2.8
New Castle	2.9
Sussex	2.8

As a final example, refer to the table below.

Average Trips per Person per Day by Age Grouping
State of Delaware, DTMS Year 2006 thru 2008

Age Group	2007	sample size
16 to 24	2.6	237
25 to 34	2.9	320
35 to 44	3.3	364
45to 54	3.1	379
55 to 64	2.9	292
65 and older	2.3	357

Taking the smallest sample number of 237 in the ‘16 to 24’ age group and the standard deviation of total trips calculated for that group s = 1.7, the standard error of the average trips estimate would be about 0.11 and the average total trips estimate would for the 16 to 24 group would be roughly 2.6 +/- 0.25%. When compared to the average total trips confidence interval for the group ’25 to 34’ which is similar, the difference in age group ’16 to 24’ and ’25 to 34’ is not significant, though the difference is similar to what is seen every year giving a strong indication that the younger groups perhaps travel slightly less. If data is averaged over several years the difference over the longer time period include more samples and smaller confidence intervals. Going the other way and supposing that one was interested in the confidence interval of average total trips for Age Groups for a particular county, Kent County for instance, sample size is in the neighborhood of n = 40 and estimated averages are the sample average +/- 0.6 in which case no figures in a tabulation of average total rips by age group for Kent County would be significant.