CPC Planning Data Sheet
CHESTER COUNTY PLANNING COMMISSION
APRIL
2010

Travel Time Surveys, 2000–2009

The operation of the Chester County roadway network is of direct interest to County residents and businesses. A public opinion survey conducted by the County Planning Commission in 2007 indicated that 70 percent of the respondents considered "traffic congestion" as one of their greatest concerns regarding transportation in Chester County.

Landscapes2, the County's long range policy plan, calls to "preserve and optimize the performance and functionality of the transportation system." Understanding how travel times have changed in Chester County assists in tracking of Landscapes2 implementation.

Since 1998, the Chester County Planning Commission has conducted a bi-annual travel time survey of seven major roadways in Chester County as part of the annual Landscapes Index. This data sheet highlights the key results and trends related to average travel speeds, summarized in three-year averages from 2000 to 2009.

Results

The county-wide average travel speed decreased by 3.5 miles per hour (mph), over a ten year period as shown in Figure 1. For an individual driver commuting 30 miles roundtrip every weekday in 2009, this translates to an additional 24 minutes of driving every week, or alternatively an additional 21 hours of driving annually, compared to 2000.

Landscapes2 in Action

"Preserve and optimize the performance and functionality of the transportation system."
(Transportation Policy T 1.3)

Figure 1: County-wide travel speed (2000–2009), three-year average

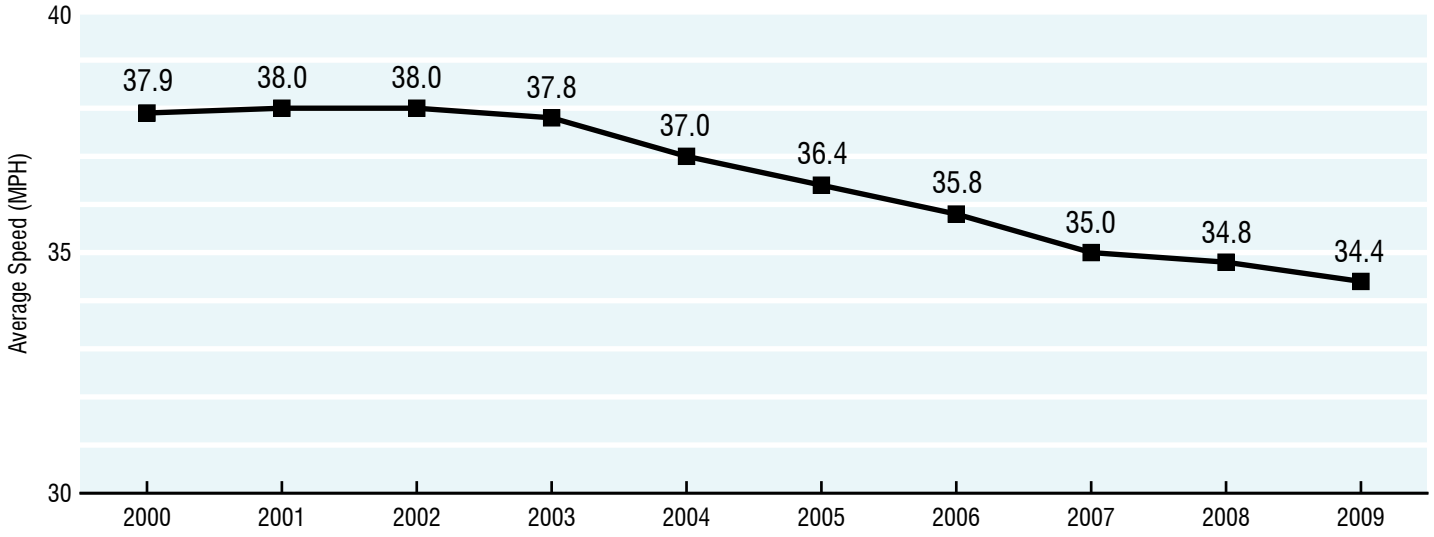
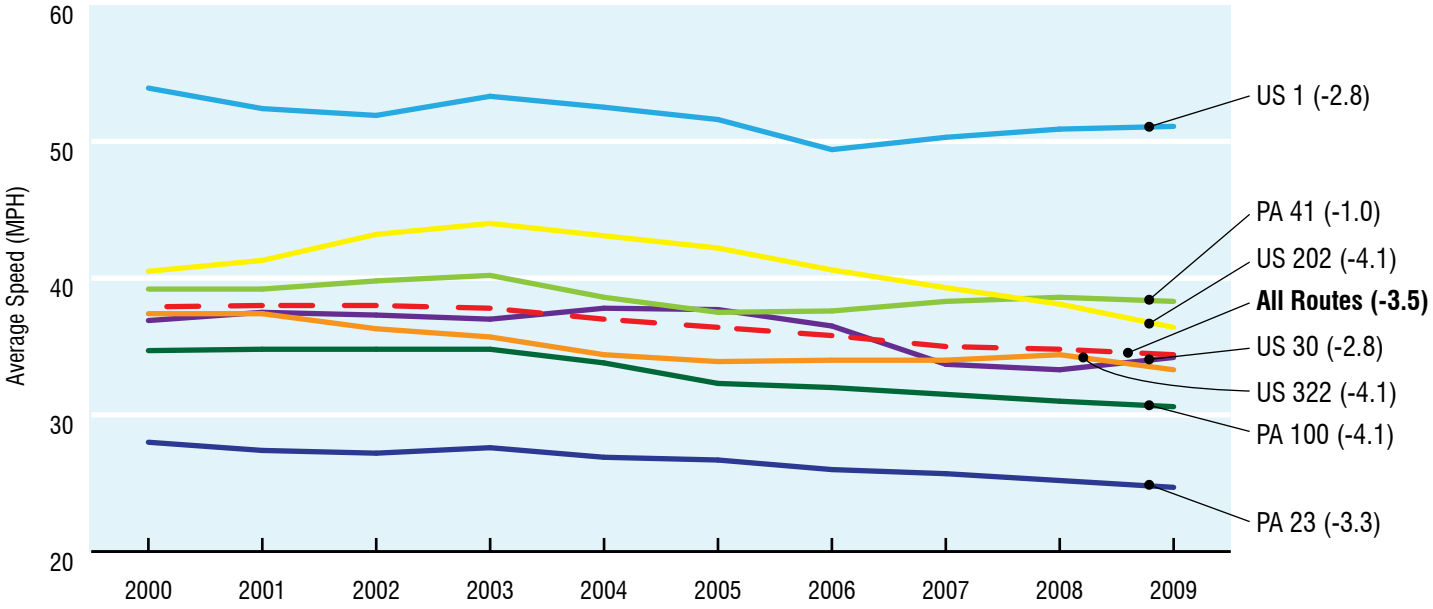


Figure 2: Average speeds for surveyed roadways (2000–2009), three-year averages

Route (Change in mph, 2000–2009)



Overall trends

During the survey period, each of the seven surveyed roadways experienced a decrease in average travel speed, as displayed in Figure 2. The greatest decreases in travel speed were observed on PA 100, US 202, and US 322. Travel speeds on these three corridors decreased at a rate of approximately 1 mile per hour every 2 years.

Survey methodology

Travel time surveys on seven major roadways were conducted by Chester County Planning Commission staff in May and August of each year. The surveyed roadways, shown in Figure 3, were selected based on several factors including traffic volume, geography, and location of trip generators. These roadways represent approximately 35% or 140 miles of the County's expressway and arterial network.

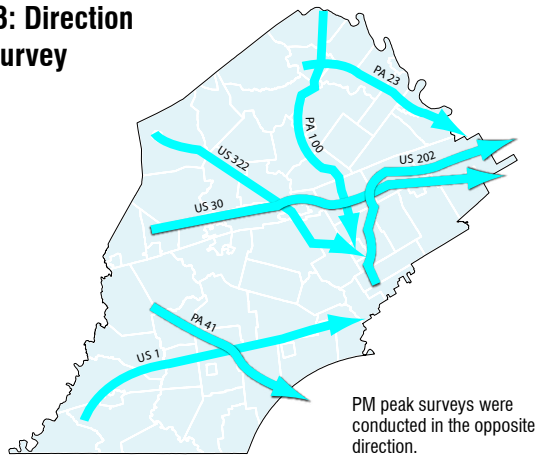
Surveys were conducted in the predominant, peak direction during the morning (7:00 am–9:00 am) and afternoon (4:00 pm–6:00 pm) periods. The start time for the survey on each roadway was established to capture peak conditions based on traffic counts and was used each year. The travel times were recorded as a total running time between various checkpoints. Surveyors also provided notes regarding traffic conditions, including inclement weather, accidents, or road construction. However, travel times were not adjusted to account for various adverse conditions because they were considered common occurrences encountered on Chester County roads.

An annual county-wide average travel speed (in miles per hour) was calculated by dividing the total distance (280 miles) by the total running time for all surveys.

The Travel Time indicator in the Landscapes Index is reported as the distance traveled in 30 minutes using the annual county-wide average speed.

This data sheet presents annual travel time survey results as a three-year moving average. This measurement is preferred for conducting trend analysis and is calculated by averaging survey data over a three-year period for each data point. For example, results reported for 2000 are the average of data collected in 1998, 1999, and 2000.

Figure 3: Direction of AM survey



Specific trends

Travel speeds were collected and reported for segments of each surveyed roadway. Segments were established based on roadway characteristics, travel patterns, segment length, and critical intersections. The change in segment travel speed, as displayed in Figure 4, reveals the following trends:

Travel speeds decreased more significantly during the PM peak

The travel speed survey results revealed a greater decrease in travel speed occurred during PM (4:00 pm – 6:00 pm) over AM (7:00 am – 9:00 am) peak surveys. Over the survey period, the average travel speed for PM peak surveys decreased an average of five miles per hour, while AM peak surveys decreased by an average of two miles per hour.

Signalized arterial roads were more vulnerable to speed decreases than expressways

Greater decreases in travel speed were observed on the surveyed arterial roadways with at-grade intersections (-3.8 mph) than the limited access expressway facilities (-1.2 mph).

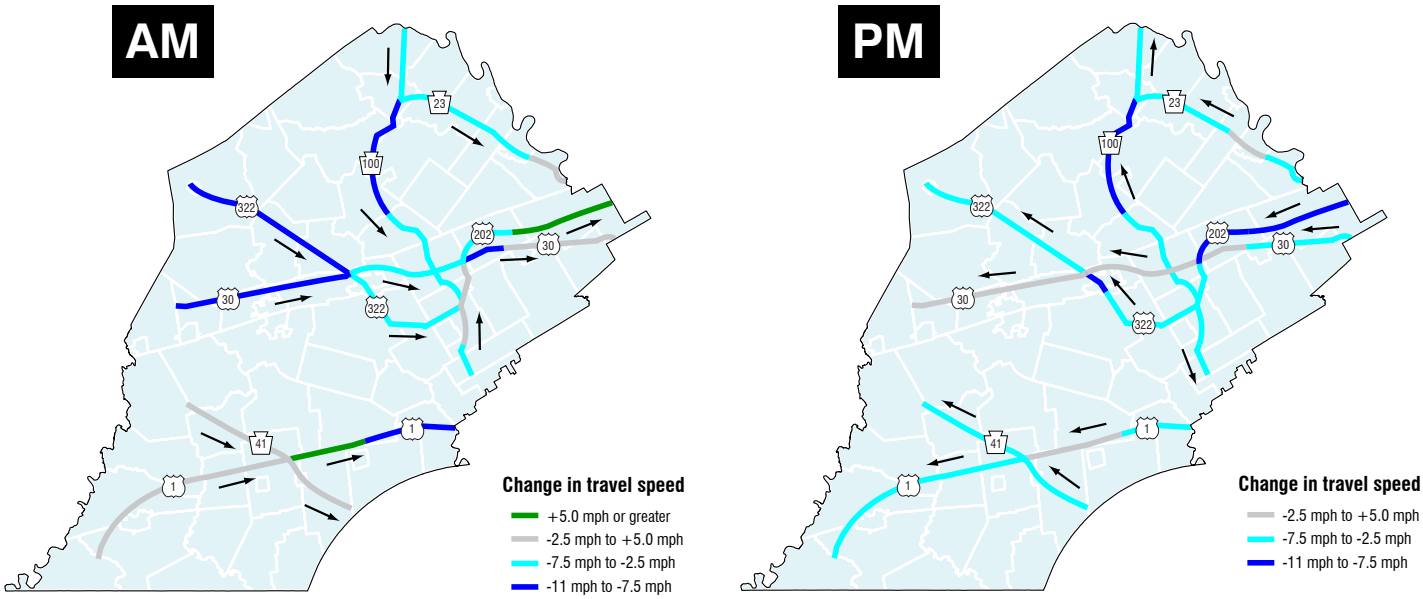
Travel speeds decreased on a majority of the segments

Two-thirds of roadway segments demonstrated a decrease greater than -2.5 mph during the 10-year period. These segments were located on all seven routes. Segments that reported the most significant travel speed decreases were generally located in areas that experienced notable growth during the survey period, such as PA 100 (Eagle), US 322 (Guthriesville), US 30 (Coatesville area), and US 1 (Longwood).

Few segments exhibited a significant increase in travel speed

The greatest increase in travel speed was observed on Route 202 (Section 400) between PA 29 and the Montgomery County border, as a result of widening this facility to six lanes during the survey period. A portion of the US 1 also reported an increase in travel speed. This increase was the result of significant construction-related delays during the first few years of the travel time survey.

Figure 4: Change in travel speed by roadway segment (2000–2009)



Factors influencing changes in travel speed

Based on the travel time survey data, field observations, and further research, several key factors were identified that may have influenced travel speed changes on the surveyed corridors. Notable factors identified by the travel time survey included:

- **Significant land development**
  The travel time results revealed a strong correlation between high growth areas and decreasing travel speeds. Portions of the County that have experienced significant increases in land development, such as Eagle (PA 100), Guthriesville (US 322), and the Route 1 Corridor, reported corresponding decreases in surveyed travel speeds.

- **Maintenance and coordination of traffic signals**
  The performance of traffic signals affected corridor travel speeds, examples include PA 100 (Eagle), US 322 (Guthriesville), US 30 (Frazer), and US 1 (Longwood). Newly installed signals also produced decreases in travel speeds on the surveyed arterials, as these signals introduced traffic delay on the arterial roadways in order to maintain acceptable levels of safety and mobility for secondary roadways.

- **Impact of roadway incidents and obstructions**
  The travel time surveys reported traffic accidents, disabled vehicles, delivery trucks, and improperly parked vehicles impacting travel speeds along the surveyed corridors.

- **Impact of roadway construction**
  Construction-related delays affected many of the surveyed corridors. The impact of construction on travel speeds was more pronounced on limited access roadways (US 1, US 30, US 202) where speeds were more significantly reduced in comparison to normal operating conditions.

- **Benefit of capacity improvements**
  Capital improvements, most notably the widening of Route 202 Section 400 to six lanes, produced an increase in travel speed for a particular roadway section. Smaller capacity projects, such as ramp improvements at the US 30/PA 113 interchange and intersection improvements at US 322/Business 322, produced minor increases in travel speed for a portion of a roadway. However, these projects did not significantly affect corridor-wide travel speeds.

These factors and their impact on travel speeds should be considered in ongoing policy decisions related to managing congestion. The interrelationship of these variables highlights the challenge of managing congestion and preserving countywide mobility.