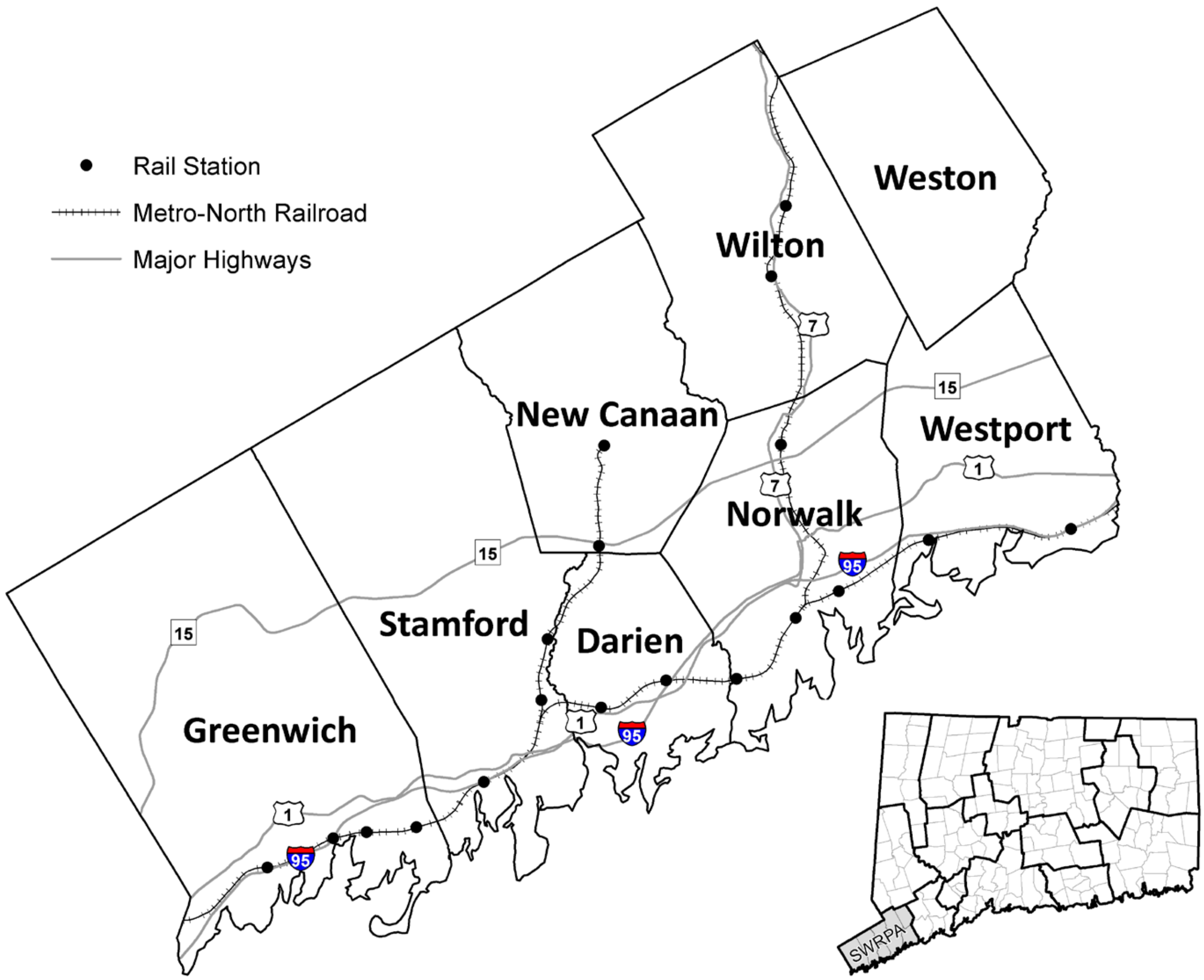
2012 South Western Region Travel Time Monitoring Program

Congestion Management Process



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Introduction:
The Travel Time Monitoring Program is an important component of the Congestion Management Process (CMP) of the South Western Regional Planning Agency (SWRPA) and South Western Region Metropolitan Planning Organization (SWRMPO). The CMP serves as a tool for evaluating the transportation system and the effectiveness of transportation improvement projects over time. The CMP also serves as a tool to identify deficiencies within the system and, in turn, to develop priorities for the Long Range Transportation Plan. The CMP satisfies requirements of FHWA's Congestion Mitigation and Air Quality Improvement Program (CMAQ), which is continued in the recent MAP-21 legislation (Moving Ahead for Progress in the 21st Century Act)[1].

Starting in the spring of 2009, SWRPA expanded the travel time monitoring program to cover an additional highway and a larger study area. Route 7, one of the Region's principal highways, was added to the monitoring program along with I-95 and CT 15 (the Merritt Parkway). However, due to staffing constraints, the 2012 Travel Time Monitoring Program study area is restricted to the South Western Region. It is hoped that the monitoring program will expand in the future to cover additional major roadways throughout the Region, such as US 1, where travel time monitoring was conducted for the *Route 1 Greenwich/Stamford Corridor Study*[2] and the *Darien Route 1 Corridor Study*[3].

Objectives:
The objective of the Travel Time Monitoring Program is to obtain quantitative data measuring travel time and delay along the highway network in Southwestern Connecticut. Data is obtained using the 'floating car method,' which involves placing a global positioning system (GPS) device in the windshield of a probe vehicle. SWRPA uses this data to improve its understanding of congestion along major highways and transit routes. Data produced from this program support SWRPA's transportation planning program and CMP by helping SWRPA locate 'hot spots' and recommend improvements that mitigate congestion and improve the reliability of the transportation system.

Data collected through this program is supplemented with data made available in the Connecticut Department of Transportation's (CTDOT) *Congestion Screening and Monitoring* (CSM) report. This report presents current and forecasted traffic volume and delay data for all state highways. CTDOT no longer issues an annual report, but volume-to-capacity and annual daily traffic data are still made available by CTDOT. However, vehicle miles traveled and congestion data is no longer available, so data from the 2010 CSM report is used instead, which is the last year it was published.

Performance Measures:
Traffic data is a fundamental component of transportation planning analysis. Travel time, one of a number of performance measures used to study transportation, is defined as the time required to travel a route between two points, is a basic measure in transportation. Travel time is a concept that is in regular use among a wide variety of audiences, from transportation professionals to elected officials to business persons to the traveling public.

[1] http://www.fhwa.dot.gov/map21/summaryinfo.cfm
[2] http://www.swrpa.org/Default.aspx?Transport=199
[3] http://www.darienroute1study.org/

‘Congestion’ is defined as “the level at which transportation system performance is no longer acceptable due to traffic interference.”[4] More simply, congestion means that there are more vehicles using a segment of roadway than it was designed for, resulting in slower speeds and delays. SWRPA’s CMP is most concerned with recurring congestion created by peak period demand rather than non-recurring congestion, which can be caused by an incident or other unexpected disruption.

Traffic congestion is widely recognized as a preeminent quality of life issue in Southwestern Connecticut. For instance, a 2002 survey by SWRPA revealed that 71.7% of respondents consider traffic congestion to be a ‘very serious problem[5]’ and 81.2% believe traffic on area highways was becoming ‘more congested[6]’. A 2009 study[7] identified the western portion of I-95 and CT 15 as having some of the most serious recurring congestion problems in Connecticut. This study also determined that congestion tolls would have only a ‘limited ability…to substantially improve these conditions[8].’

According to INRIX’s Traffic Scorecard on Congested Corridors for 2011[9], the segment of I-95 between Field Point Road in Greenwich (near Exit 3) and Mill Plain Road in Fairfield (Exit 21) ranked 56th among the most congested corridors in the U.S. This represents an improvement from 2010 when the corridor was ranked 39th nationwide. According to the report, it took an average of 34 minutes to travel this 22.2 mile corridor, representing an average travel speed of 39 MPH, and average delay of 12 minutes. Data from the same report ranked the segment of the Merritt Parkway (CT-15) between Den Road in Greenwich (Exit 33) and CT-57 in Westport (Exit 42) as the 159th most congested corridor in the U.S., which is an improvement from 2010 when the corridor was ranked 118th nationwide. According to the report it took an average of 17 minutes to travel this 12.8 mile corridor, representing an average travel speed of 45 MPH, and average delay of 5 minutes.

Until implementation of the travel time monitoring program in 2007, SWRPA relied primarily on congestion data developed by CTDOT for its annual CSM report. Through the Travel Time Monitoring Program, SWRPA has generated traffic data for the South Western Region’s principal highways that is accessible to and comprehensible by the traveling public.

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4 http://www.fhwa.dot.gov/resourcecenter/teams/planning/cms.cfm

5 SWRPA. *Vision 2020: 2002 Congestion Mitigation Survey*. 12. This study represents SWRPA’s seminal effort in analyzing and mitigating traffic congestion, leading to the Travel Time Monitoring Program and other studies.

6 *ibid*, 13.

7 Transportation Strategy Board. *Connecticut Electronic Tolling and Congestion Pricing Study Final Report*. 4-19.

8 *ibid, 15-10.*

9 INRIX. Traffic Scorecard. Congested Corridors 2011. http://scorecard.inrix.com/scorecard/uscorridors.asp

Table 1. Highway Congestion, South Western Region, 2009 vs 2030.

Route	Mileage	Avg. Hours of Congestion 2009	VMT Affected 2009	VMT Total 2009	Congested 2009, %	Avg. Hours of Congestion 2030	VMT Affected 2030	VMT Total 2030	Congested 2030, %
1	22.8	0.2	7,501	434,098	1.7	0.4	15,071	494,825	3.0
7	12.3	1.6	33,068	356,023	9.3	3.0	63,806	418,242	15.3
15	23.5	1.5	183,689	1,355,804	13.5	3.7	494,224	1,681,197	29.4
33	11.0	0.3	4,331	123,076	3.5	0.8	11,651	145,227	8.0
53	10.9	0.0	112	70,122	0.2	0.1	1,484	90,118	1.6
57	8.7	0.4	4,033	96,496	4.2	2.1	25,632	129,319	19.8
95	22.4	2.3	554,480	2,924,417	19.0	7.3	1,681,791	3,626,277	46.4
104	6.8	0.3	3,073	107,574	2.9	0.5	5,275	110,801	4.8
106	13.6	0.3	5,507	110,112	5.0	0.3	5,852	120,918	4.8
107	0.2	0.0	0	2,124	0.0	0.0	0.0	2,506	0.0
123	8.4	0.4	4,509	100,369	4.5	0.7	8,543	108,515	7.9
124	9.4	0.0	15	67,938	0.0	0.0	45	72,613	0.1
136	13.4	0.1	1,008	111,988	0.9	0.2	3,814	131,358	2.9
137	9.3	0.2	2,598	168,522	1.5	0.2	3,791	173,578	2.2
684	1.4	0.0	103	102,930	0.1	0.0	116	116,311	0.1
Total	**178.7**	**0.7**	**804,176**	**6,200,871**	**13.0**	**1.9**	**2,321,425**	**7,502,109**	**30.9**

Note: Some routes have been omitted from the table for clarity but are included in the total.
Source: CTDOT 2010 Congestion Screening and Monitoring Report, Table 11

Background

The two maps on the following pages (Figures 1 and 2) demonstrate the current (2010) and projected future (2030) traffic volumes and volume-to-capacity (V/C) ratios on South Western Region highways. These data are derived from CTDOT's *2011 Congestion Screening and Monitoring Report* which is an annual data publication analyzing current and future predicted highway volumes and volume-to-capacity ratios in order to plan for future highway needs.

I-95 is the South Western Region's most heavily traveled highway[10]. In 2009, daily vehicle miles traveled (VMT) on I-95 in the Region exceed 2.9 million miles and segments of the highway have average daily traffic (ADT) in excess of 150,000 vehicles. By 2030, CTDOT's travel model forecasts ADT on I-95 in excess of about 180,000 vehicles in Stamford, Darien and Norwalk. Traffic volumes of this magnitude would result in volume-to-capacity (V/C) ratios greater than 1.3, which is indicative of an extremely congested roadway. In 2010, 98% of I-95 centerline miles within the Region were approaching or over capacity (V/C > 0.8).

CT 15 (the Merritt Parkway) is the South Western Region's second most heavily traveled highway[11]. In 2009, daily VMT on CT 15 in the Region approached 1.4 million miles and segments of the highway have ADT in excess of 70,000 vehicles. By 2030, CTDOT's travel model forecasts ADT on CT 15 in excess of 89,000 vehicles in Norwalk and 86,000 vehicles in New Canaan. Traffic volumes of this magnitude would result in V/C ratios approaching and in some cases exceeding 1.7, which is indicative of an extremely congested roadway. Already in 2010, every centerline mile of CT 15 within the Region was over capacity (V/C > 0.8).

[10] Connecticut Department of Transportation: Bureau of Policy and Planning, *2010 Congestion Screening and Monitoring Report*, 2010.
[11] ibid.

US 7 is a principal north-south highway in the South Western Region as well as a connecting route between this region and Danbury, the Housatonic Valley Region and northwestern Connecticut. Within this Region, US 7 has two distinct sections. From its interchange with I-95 north approximately four miles, US 7 is an access-controlled expressway. For the remaining eight miles in the South Western Region, US 7 is a surface arterial. Going north into the Housatonic Valley Region, US 7 is a surface arterial until just south of its interchange with I-84, where it again becomes an access-controlled expressway.

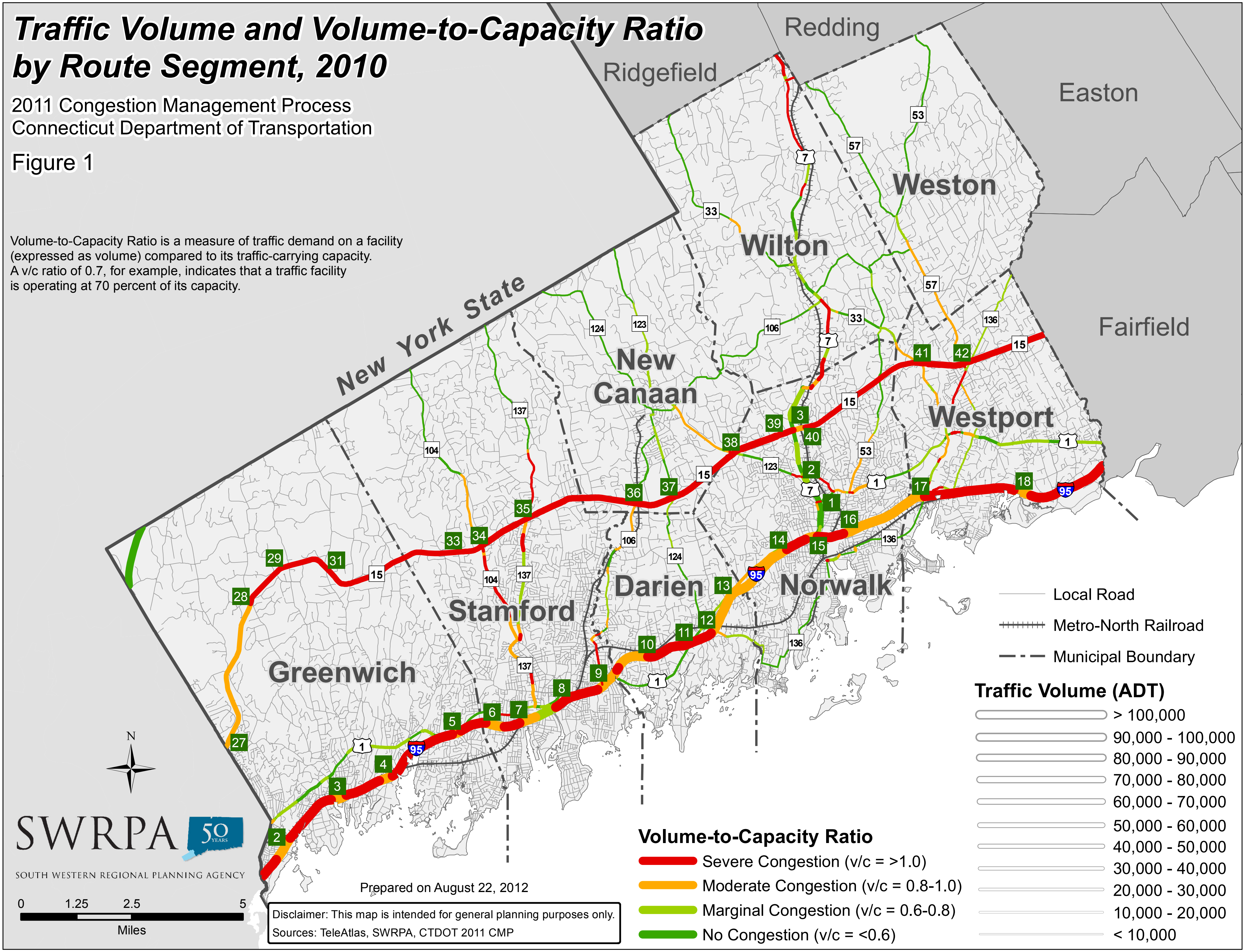
In 2009, daily VMT on US 7 in the region exceeded 350,000 miles. In 2010, the busiest stretches of the US 7 expressway segment have ADT in excess of 63,000 vehicles and V/C ratios around 0.5, indicating a well performing expressway. By 2030, VMT is expected to exceed 410,000 miles with V/C ratios approaching 0.7. The busiest stretches of the surface arterial portion of US 7 had ADT around 35,000 vehicles and V/C ratios in excess of 1.0 in 2010. By 2030, ADT is expected to reach 40,000 vehicles along the busiest stretches with V/C ratios varying from 0.7 to 1.7.

Traffic Volume and Volume-to-Capacity Ratio by Route Segment, 2010

2011 Congestion Management Process
Connecticut Department of Transportation

Figure 1

Volume-to-Capacity Ratio is a measure of traffic demand on a facility (expressed as volume) compared to its traffic-carrying capacity. A v/c ratio of 0.7, for example, indicates that a traffic facility is operating at 70 percent of its capacity.



Prepared on August 22, 2012

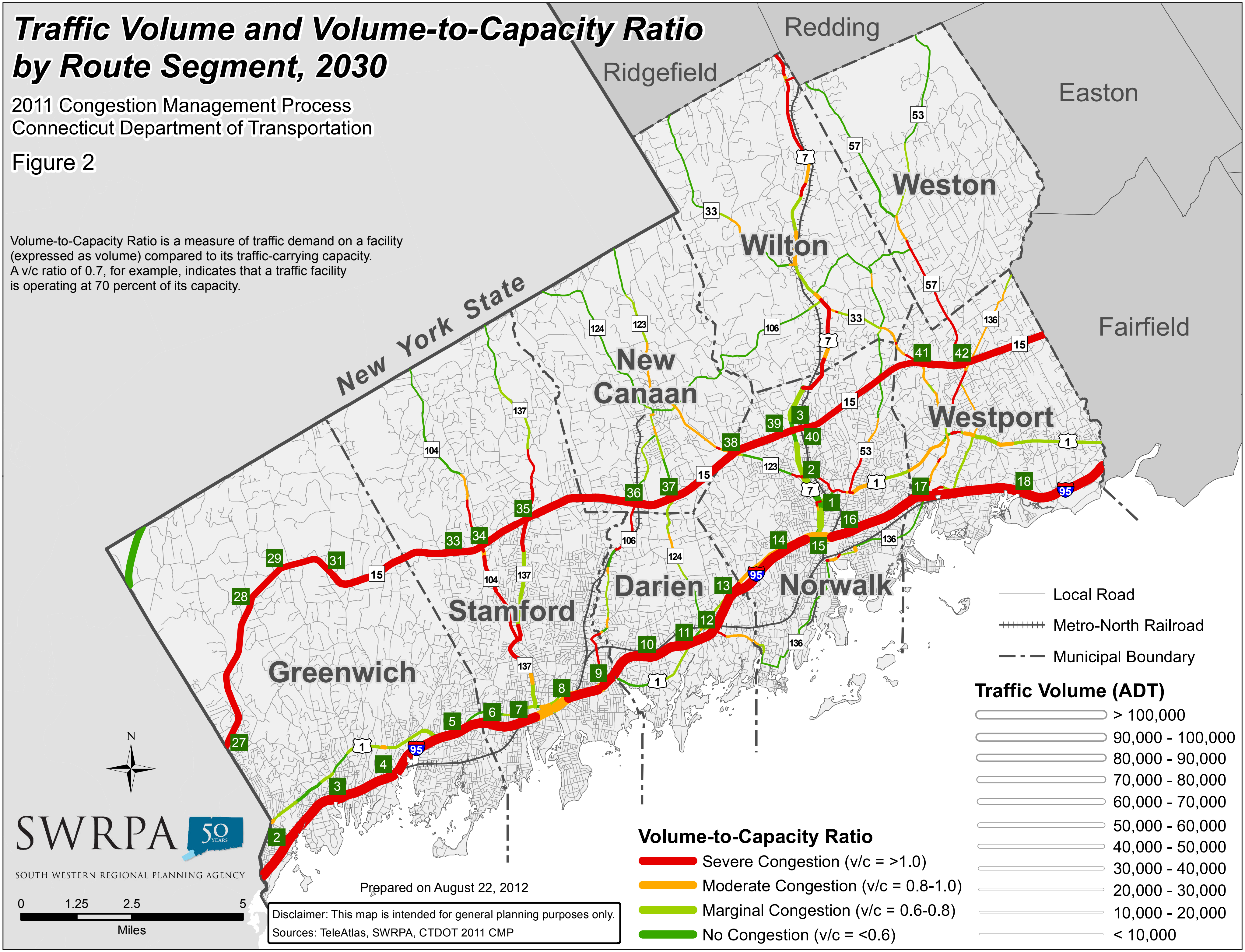
Disclaimer: This map is intended for general planning purposes only.
Sources: TeleAtlas, SWRPA, CTDOT 2011 CMP

Traffic Volume and Volume-to-Capacity Ratio by Route Segment, 2030

2011 Congestion Management Process
Connecticut Department of Transportation

Figure 2

Volume-to-Capacity Ratio is a measure of traffic demand on a facility (expressed as volume) compared to its traffic-carrying capacity. A v/c ratio of 0.7, for example, indicates that a traffic facility is operating at 70 percent of its capacity.



Prepared on August 22, 2012

Disclaimer: This map is intended for general planning purposes only.
Sources: TeleAtlas, SWRPA, CTDOT 2011 CMP

Study Area
Due to staffing constraints, the 2012 Travel Time Monitoring Program is limited to the South Western Region. For years 2009-2011 SWRPA expanded the study area to include all of the South Western Region as well as portions of the Greater Bridgeport and Housatonic Valley Regions. This was done with the recognition that congestion along Connecticut's coastal corridor extends beyond the South Western Region into the Bridgeport, Danbury and New Haven areas. The larger study area more accurately reflects travel behavior in southwestern Connecticut. For instance, Census journey-to-work statistics show that nearly one in four persons working in the South Western Region reside in the Greater Bridgeport, Housatonic Valley, or South Central Regions[12]. It is the hope of SWRPA to make travel time monitoring a joint effort between SWRPA and its partners at Greater Bridgeport Regional Council (GBRC) and Housatonic Valley Council of Elected Officials (HVCEO).

Method
With the advent of GPS technologies and Geographic Information System (GIS) applications, detailed travel time data can be easily collected and analyzed. Probe vehicles equipped with inexpensive, off-the-shelf GPS technology can obtain detailed datasets of time, distance, and speed. Simple analysis using GIS software on a desktop computer allows these datasets to be studied and presented in an easily comprehensible format.

Data was collected on Tuesdays, Wednesdays, and Thursdays. Mondays and Fridays were avoided because traffic on those days is impacted by weekend travel. Data collection began on March 21, 2012 and continued through June 7, 2012. Spring and fall are generally considered the best months to conduct traffic monitoring. During the winter months, inclement weather can impact both the volume and speed of traffic. During the summer months, primary and secondary schools are not in session and many households take vacation, which decreases the volume of traffic on the highways.

Data was collected during the morning and evening peak hour periods. Based on hourly traffic count data from CTDOT's continuous count stations, the morning peak was identified as 6:30 a.m. to 9:30 a.m. with the core peak from 7:00 a.m. to 9:00 a.m. The evening peak was identified as from 3:30 p.m. to 7:00 p.m. with the core peak from 4:30 p.m. to 6:30 p.m. High traffic volume during the peak periods is largely attributed to trips between home and work.

Other travel time studies, such as the study conducted by the Council of Governments of the Central Naugatuck Valley, took into account outside factors that may affect the traffic congestion in the region. These factors include incidents, inclement weather, construction work zones, special events, and poor signal timing. SWRPA's monitoring program focuses solely on recurring congestion, although construction activities on US 7 certainly impacted travel time on that route during the 2009 data collection, and the repaving or construction of segments of I-95 may have had an impact during this year's data collection. No data was collected during periods of inclement weather. Data collected while there was an incident on the highway was omitted from the final analysis.

SWRPA uses the floating car method, which employs a probe vehicle equipped with a GPS device. The GPS devices were programmed to log their location every second. Drivers of the probe vehicles were instructed to accurately represent traffic flow. To do so, drivers were instructed to ride in the middle

[12] SWRPA. *South Western Region Long Range Transportation Plan: 2007 – 2035*, 2007. Among all persons working in the South Western Region, 14.3% reside in the Greater Bridgeport Region, 7.1% reside in the Housatonic Valley Region and 3.9% reside in the South Central Region.

(travel) or right lane while maintaining the speed limit or the appropriate speed of traffic. Offensive or aggressive driving, 'fighting' traffic, and riding in the fast lane were discouraged.

In order to relate the GPS data to existing highway data, a series of control points were plotted along the study routes using a GIS. Control points were placed so as to match the mile point breaks in CTDOT's annual CSM report with a minimum separation of 0.25 to 0.50 miles. Generally, these mile points are located at entrances and exits along the expressway or intersections along surface roads. The section of highway between two control points is referred to as a highway segment.

After each data collection 'run', the GPS device's track log (a text file) is downloaded onto a computer for analysis. Each log point recorded by the GPS device includes three key pieces of the data: latitude, longitude, and time. The track file is loaded into a GIS and plotted on a map based on the recorded latitude and longitude. This track data is then 'spatially joined' to the control points, thereby associating each control point with the attribute data of the nearest track point. The control points and associated track data are then saved to a personal geodatabase and labeled with the date, direction, and time of day (e.g. I-95 southbound AM run on May 5, 2012 is labeled as 95_S_A_12-05-05).

The resulting data is then output as a table and loaded into a separate spreadsheet, which calculates the speed and time per highway segment. Speed is determined by dividing the length of the segment by the time required to travel between the control points that define the beginning and end of the segment. In a few instances where good GPS data was not available (due to tree cover or a lost signal) or a satisfactory spatial join was not achieved, the data is reasonably adjusted based on data from the next closest control points. This process is repeated for each travel time run in each direction. Finally, the individual run data for each period and direction is aggregated and averaged. The averaged data is then brought back into a GIS for presentation.

Evaluation

That there are delays on the Region's highways during the peak travel hours should not be a surprise to anyone, especially commuters who rely on these roads every day. However, the delays on area highways are not as omnipresent as they might seem. Based on the data generated for this report, it is clear that certain segments of these highways produce more delays during peak commuting times. Notable among these delay-prone segments are I-95 through Stamford's central business district (Exits 6 – 8), the approaches to the US 7 interchanges on both I-95 (Exits 14 - 16) and CT 15 (Exits 39 - 40), and various stretches of US 7 including from the northern end of the expressway alignment at Grist Mill Road in Norwalk and through the surface arterial segment in Wilton.

Table 2. Travel Time: Summary Results

Route	Direction	AM/PM	# Runs	Mean Travel Time	Min. Travel Time	Max. Travel Time	Mean Speed	Max. Speed	Min. Speed
I-95	S	AM	5	0.44.16	0.36.57	0.57.53	30	36	23
CT 15	S	AM	5	0.38.33	0.25.33	0.51.07	37	55	28
US 7	S	AM	5	0.30.12	0.26.21	0.34.56	24	27	20
I-95	N	PM	5	0.47.18	0.24.28	1.07.34	28	55	20
CT 15	N	PM	5	0.44.26	0.27.00	1.09.42	32	52	20
US 7	N	PM	5	0.23.36	0.22.31	0.25.56	30	32	28

Extent of corridors studied: I-95 = 22.41 miles; CT 15 = 23.49 miles; US 7 = 11.92 miles
Source: South Western Region Travel Time Monitoring Program – Spring 2012

I-95 Southbound AM (Figure 3)
Staff collected data from five runs along I-95 southbound in the morning peak. For the entire 22.41 mile corridor from the Westport/Fairfield townline to the New York State line, the average speed was 30 MPH and the average travel time was 44:16. The slowest run took 57:53 and averaged 23 MPH. The slowest stretches include the segment south of the Westport/Fairfield townline (Exits 19 – 18), the CT 33 and CT 136 interchange in Westport (Exit 17), the US 7 interchange in Norwalk (Exits 16 – 14), and the segment through the Stamford central business district (Exits 8 – 7). Observed travel speeds more closely matched posted speed limits along the segments through Darien (Exits 12 – 9), and through Greenwich (Exits 5 – 1).

CT-15 Southbound AM (Figure 3)
Staff collected data from five runs along CT-15 southbound in the morning peak. For the entire 23.49 mile corridor from the Westport/Fairfield townline to the New York State line, the average speed was 37 MPH and the average travel time was 38:33. The slowest run took 51:07 and averaged 28 MPH. One travel run (3/21/2012) was exceptionally fast with an average speed of 55 MPH. When removing this run from the average of all runs, the overall travel speed drops to 34 MPH. The slowest stretches include the US 7 interchange in Norwalk (Exits 40 – 39), and the segment through New Canaan (Exits 38 – 36). Observed travel speeds more closely matched posted speed limits along the segments south of New Canaan through to Greenwich (Exits 36 – 27). Reconstruction of the East Rocks Road Bridge in Norwalk (Project # 102-302), may have had an effect on overall travel time.

US 7 Southbound AM (Figure 3)
Staff collected data from five runs along US 7 southbound in the morning peak. For the entire 11.92 mile corridor from the Ridgefield/Wilton townline to the I-95 interchange in Norwalk, the average speed was 24 MPH and the average travel time was 30:12. The slowest run took 34:56 and averaged 20 MPH. The slowest stretches include the segment from Georgetown near CT 107 to Scribner Hill Road in Wilton, the segment south of the northern intersection of CT 33 in Wilton to Grist Mill Road in Norwalk where the expressway alignment begins, and the approach to the I-95 interchange in Norwalk. Observed travel speeds more closely matched posted speed limits between the northern terminus of the expressway and US-1 (Exit 1) in Norwalk.

I-95 Northbound PM (Figure 4)
Staff collected data from five runs along I-95 northbound in the evening peak. For the entire 22.41 mile corridor from the New York State line to the Westport/Fairfield townline, the average speed was 28 MPH and the average travel time was 47:18. The slowest run on I-95 took 1:07:34 and averaged 20 MPH. One travel run (5/1/2012) was exceptionally fast, with an average speed of 55 MPH. When removing this run from the average of all runs, the overall travel speed drops to 25 MPH. The slowest stretches include the segment through central Greenwich (Exits 3 – 5), the segment through Stamford's central business district and into Darien (exits 6 – 11), the segment before and after the US 7 interchange (Exits 14 – 16), and at CT 33/136 in Westport (Exit 17). Observed travel speeds more closely matched posted speed limits from the New York State border to Arch Street in Greenwich (Exit 3) and at Sherwood Island Connector in Westport (Exit 18). Also, road reconstruction along northbound segments of I-95 in Greenwich may have had an effect on overall travel time.

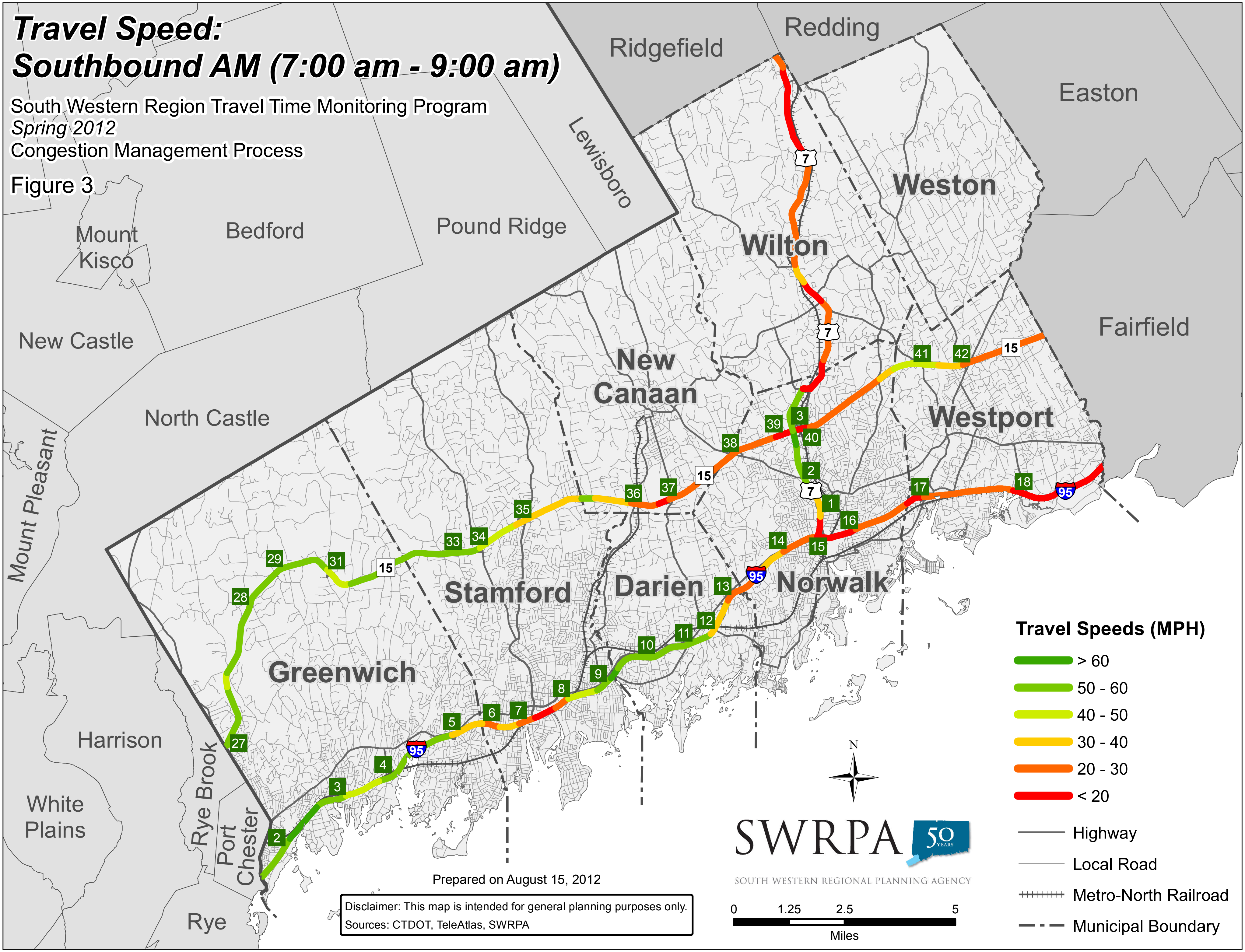
CT-15 Northbound PM (Figure 4)

Staff collected data from five runs along CT-15 northbound in the evening peak. For the entire 23.49 mile corridor from the New York State line to the Westport/Fairfield townline, the average speed was 32 MPH and the average travel time was 44:26. The slowest run took 1:09:42 and averaged 20 MPH. One travel run (5/1/2012) was exceptionally fast with an average speed of 52 MPH. When removing this run from the average of all runs, the overall travel speed drops to 29 MPH. The slowest stretches include the segment between Long Ridge and High Ridge roads in Stamford (Exits 34 – 35), and the segment from CT 106 in New Canaan and through the US 7 interchange to US 57 in Westport (Exits 36 – 42). Observed travel speeds more closely matched posted speed limits along the segment through Greenwich (Exits 27 – 33), the segment through eastern Stamford and western New Canaan (Exits 35 – 36), and the segment north of CT 57 in Westport (Exit 42) to the Westport/Fairfield townline. Again, reconstruction of the East Rocks Road Bridge in Norwalk (Project # 102-302), may have had an effect on overall travel time.

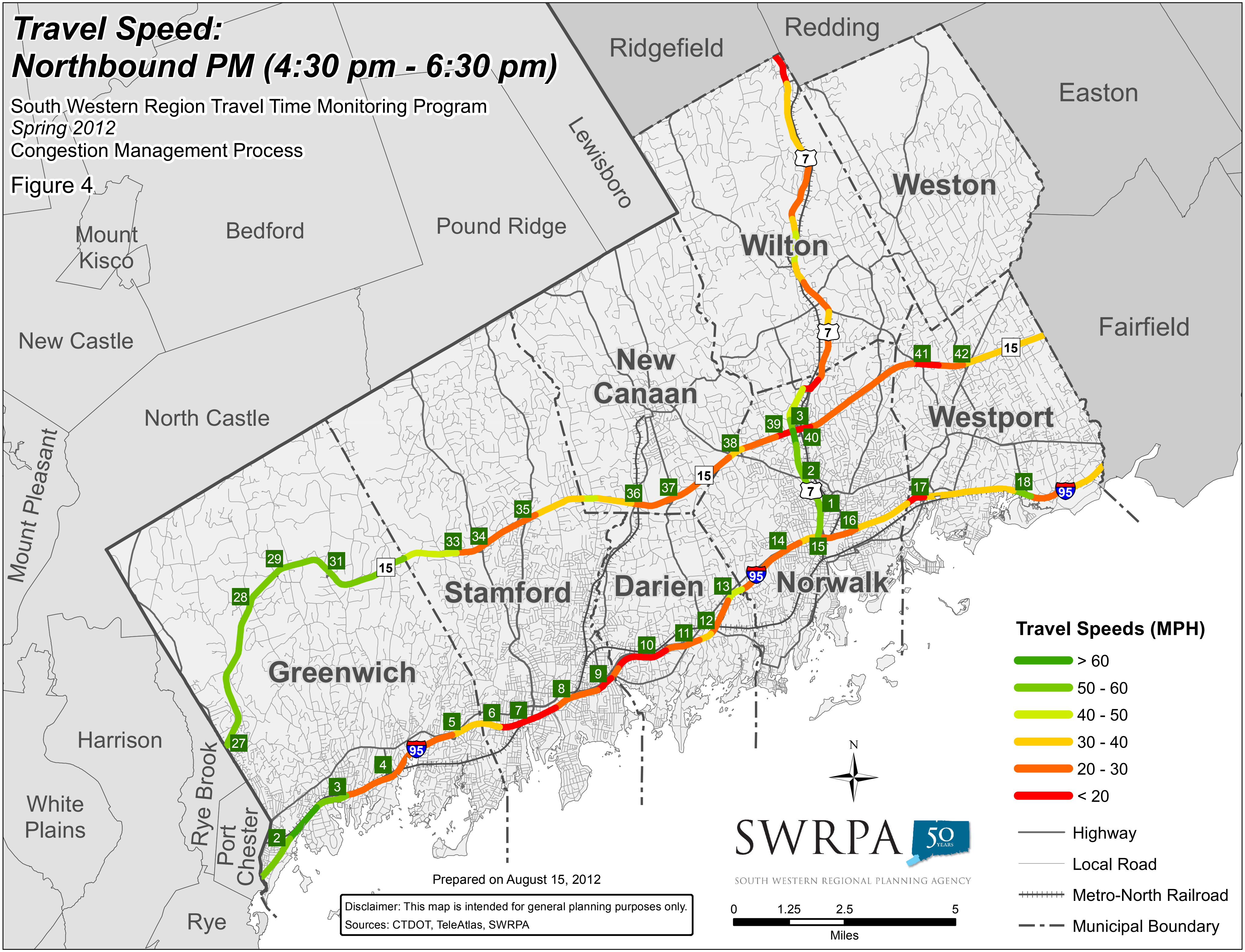
US 7 Northbound PM (Figure 4)

Staff collected data from five runs along US 7 northbound in the evening peak. For the entire 11.92 mile corridor from the I-95 interchange in Norwalk to the Wilton/Ridgefield townline, the average speed was 30 MPH and the average travel time was 23:36. The slowest run took 25:56 and averaged 28 MPH. The slowest stretches include the segment from the northern end of the expressway alignment in Norwalk to south of the southern intersection of CT 33 in Wilton, the segment between the southern and northern intersections of CT 33 in Wilton, the segment from Catalpa Road to Scribner Hill Road in Wilton, and the segment from CT 107 in Wilton to the Wilton/Ridgefield townline. Observed travel speeds more closely matched posted speed limits along the segments from the I-95 interchange to the northern end of the expressway alignment in Norwalk, and the segment between the northern intersection of CT 33 to Catalpa Road in Wilton.

The two maps on the following pages (Figures 3 and 4) present the averaged speed data along roadway segments for I-95, CT 15 and US 7 southbound in the morning and northbound in the evening:



Travel Speed:
Southbound AM (7:00 am - 9:00 am)
South Western Region Travel Time Monitoring Program
Spring 2012
Congestion Management Process
Figure 3
Ridgefield
Redding
Easton
Lewisboro
Weston
Wilton
Mount Kisco
Bedford
Pound Ridge
New Castle
North Castle
New Canaan
Fairfield
Westport
Mount Pleasant
Stamford
Darien
Norwalk
Greenwich
Harrison
White Plains
Rye Brook
Port Chester
Rye
Travel Speeds (MPH)
> 60
50 - 60
40 - 50
30 - 40
20 - 30
< 20
Highway
Local Road
Metro-North Railroad
Municipal Boundary
N
SWRPA
50 YEARS
SOUTH WESTERN REGIONAL PLANNING AGENCY
0
1.25
2.5
5
Miles
Prepared on August 15, 2012
Disclaimer: This map is intended for general planning purposes only.
Sources: CTDOT, TeleAtlas, SWRPA


Travel Speed:
Northbound PM (4:30 pm - 6:30 pm)
South Western Region Travel Time Monitoring Program
Spring 2012
Congestion Management Process
Figure 4
Ridgefield
Redding
Easton
Lewisboro
Weston
Wilton
Mount Kisco
Bedford
Pound Ridge
New Castle
North Castle
New Canaan
Westport
Fairfield
Mount Pleasant
Stamford
Darien
Norwalk
Greenwich
Harrison
White Plains
Rye Brook
Port Chester
Rye
Travel Speeds (MPH)
> 60
50 - 60
40 - 50
30 - 40
20 - 30
< 20
Highway
Local Road
Metro-North Railroad
Municipal Boundary
N
SWRPA
SOUTH WESTERN REGIONAL PLANNING AGENCY
0 1.25 2.5 5
Miles
Prepared on August 15, 2012
Disclaimer: This map is intended for general planning purposes only.
Sources: CTDOT, TeleAtlas, SWRPA

Comparison to Previous Years

Although it is difficult to compare data from different years due to a lack of sufficient sample size and changes to the study area, it appears that peak period travel times have remained relatively constant for the last five years. A decrease in peak period travel times can be seen in 2010, but this discrepancy may be the result of the small sample size of the data. Travel speeds seemed to have remained similar despite marked changes in the cost of gasoline and other fuels as well as a fluctuation in employment due to the recent economic recession and recovery.

Table 3. Travel Speeds: 2007 – 2012

	Southbound AM						Northbound PM					
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
I-95	*31	35	36	N/A	33	*30	*28	33	29	N/A	29	*28
CT 15		33	34	24	37	*37		36	41	28	40	*32
US 7			28	20	27	*24			29	27	30	*30

*Study only included South Western Region

Source: South Western Region Travel Time Monitoring Program. 2007 – 2012

Table 4. Travel Speeds: 2007 – 2012 (South Western Region only)

	Southbound AM						Northbound PM					
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
I-95	31	34	37	N/A	34	30	28	31	25	N/A	24	28
CT 15		38	41	27	43	37		34	40	26	39	32
US 7			27	22	26	24			25	24	26	30

Source: South Western Region Travel Time Monitoring Program. 2007 – 2012

As a basis for comparison, traffic count data on I-95 in Norwalk, measured at a continuous count station near Exit 14 at the Scribner Avenue underpass, is aggregated for the a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 7 p.m.) periods, in the peak direction (Table 5). Data were analyzed for Tuesday through Thursday during the second full week in May, which reflects the days chosen to conduct the Time Travel Monitoring trips. These data show an increase in traffic count of approximately 6% between 2007 and 2012. Therefore, it does not appear that fuel price changes or the slow economy have led to a decline in peak period travel over the last five years. However, average annual daily traffic on I-95, which represents the average daily traffic count over an entire year, declined approximately 5% between 2007 and 2012[13]. This seems to indicate that non-peak period trips, which tend to be more discretionary, have been impacted by fuel price changes or the slow economy.

[13] CTDOT. Yearly Continuous Count Station Data, Average Annual Daily Traffic, 2007 – 2012.

Table 5. Peak Period and Peak Direction Average Daily Traffic on I-95 in Norwalk, Second Fully Week in May, 2007 – 2012

Year	AM/PM	Tue	Wed	Thu	Avg. Daily
2007	**AM**	10,152	10,128	8,773	9,684
	PM	12,928	9,526	12,403	11,619
2008	**AM**	10,258	10,239	10,477	10,325
	PM	11,827	12,279	11,041	11,716
2009	**AM**	10,805	10,705	10,545	10,685
	PM	12,352	13,432	12,910	12,898
2010	**AM**	10,546	9,034	9,213	9,598
	PM	13,644	13,283	12,134	13,020
2011	**AM**	10,454	10,677	10,851	10,661
	PM	11,864	12,848	11,793	12,168
2012	**AM**	10,361	10,067	10,510	10,313
	PM	10,948	13,520	12,198	12,222

AM = 7 a.m. – 9 a.m., PM = 4 p.m. – 7 p.m. All data from the second full week in May.
Source: CTDOT Continuous Count Station Data

Because I-95 is operating at- or well-over capacity throughout the South Western Region and especially during peak periods, it seems unlikely that common, year-to-year fluctuations in traffic volumes (as observed at the continuous count station in Norwalk) have had a significant impact on travel speeds.

Recommendations

In order to more effectively implement its Time Travel Monitoring Program component of its CMP, SWRPA offers the following recommendations to CTDOT:

- Coordinate a broader regional or statewide cooperative approach to Congestion Management Program or Congestion Screening and Monitoring which will realize efficiencies and more comprehensive analysis.
- Provide data and analysis comparable to the discontinued Congestion Screening and Monitoring Report which can be used by regions to support their CMP activities.
- Acquire and disseminate INRIX™ highway congestion data, which would alleviate the need to manually collect travel time data using the “floating car method.”
- Provide a framework for the inclusion of congestion within other modes of transportation such as bus and rail, in order to fully assess the levels of congestion across all major modes of transportation.
- Incorporate additional work products into its CMP such as the monitoring and modeling data associated with the *I-95 Value Pricing Study*, among others.