

3.3.2.6 Traffic Volumes and Congestion Levels on Limited-Access Highways in the Boston Metropolitan Region

An alternative analysis of congestion levels for the limited-access highway system is presented in this section. This analysis, which uses a method based on average weekday traffic (AWDT) volumes, is used to identify portions of the network that experience recurring congestion.¹¹

The figures on the following pages display the AWDT volumes and congestion levels for the limited-access highways in the Boston region. In the figures, the bandwidths for the various sections of highway are directly proportional to AWDT volumes—the thicker the bandwidth, the higher the volume of daily traffic. Congestion level is defined for this analysis as the ratio of the AWDT per lane to the empirical threshold of 20,000 vehicles per day per lane. The colors indicate congestion levels, with green representing noncongested traffic and dark red representing congested (saturated) conditions.

Presented in Figure 3.11 is the diagram for the year 2000 measure of daily traffic volume and congestion. Many of the region's limited-access highways are routinely congested for some amount of time during the peak commute periods, because their daily volumes exceed their capacity to handle the amount of traffic. A historical look at these two measures is presented in Figure 3.12. It shows that by 1970, virtually the entire present-day regional limited-access highway system was in place, but that very little of it was experiencing serious congestion. Before 1970, congestion was occurring primarily on I-93/Southeast Expressway and the Central Artery. During subsequent years, congestion spread throughout much of the system.

¹¹ This method is detailed in the memorandum, "Express Highway Hours of Congestion Related to Twenty-Four-Hour Traffic Volumes per Lane," Tom Lisco, Central Transportation Planning Staff, March 18, 1997.

FIGURE 3.11

Daily Traffic Volumes and Congestion Levels on Limited-Access Highways in Eastern Massachusetts, 2000

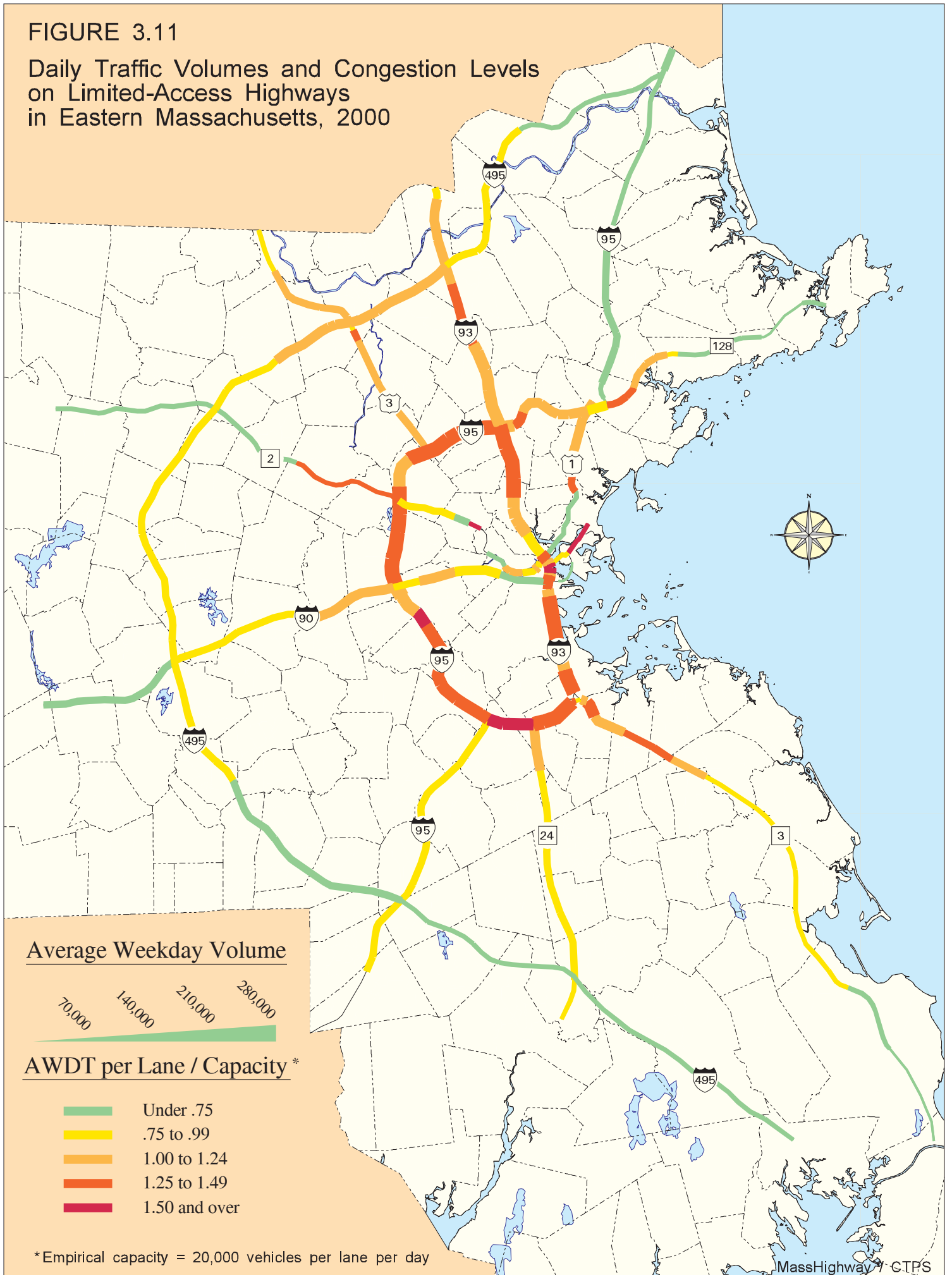
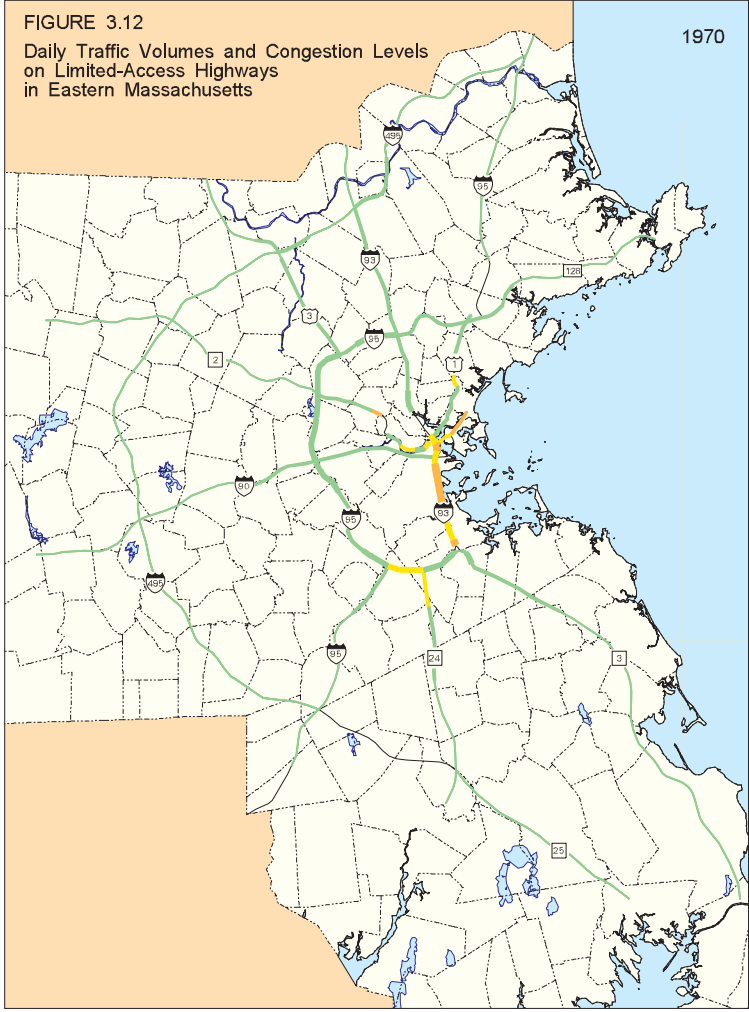


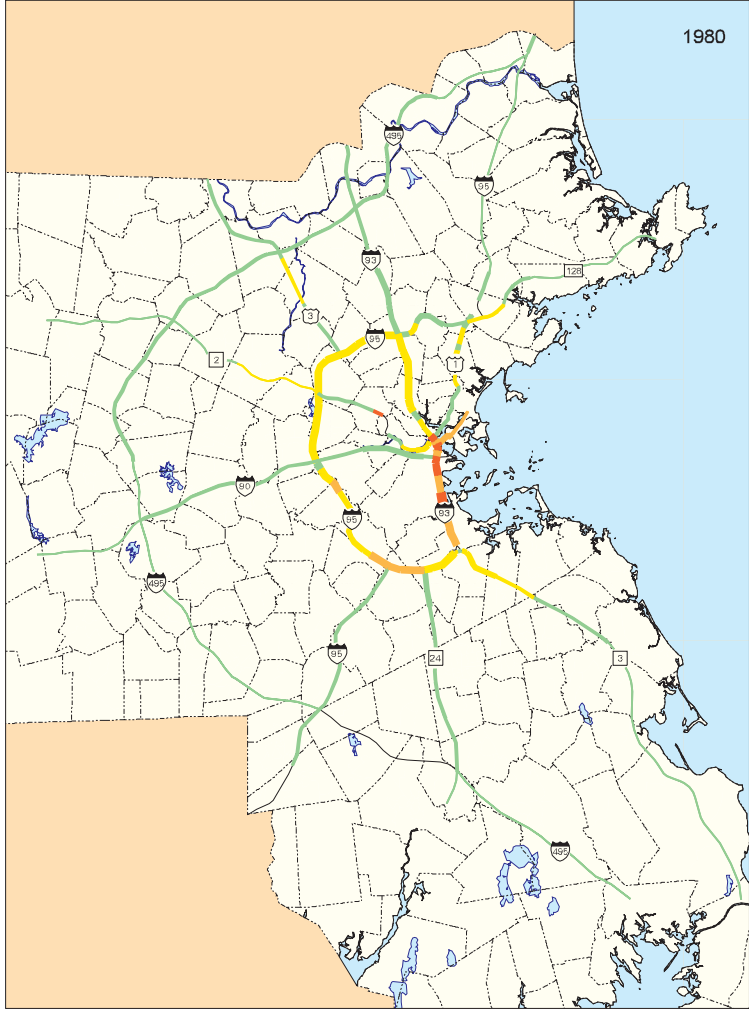
FIGURE 3.12

Daily Traffic Volumes and Congestion Levels on Limited-Access Highways in Eastern Massachusetts

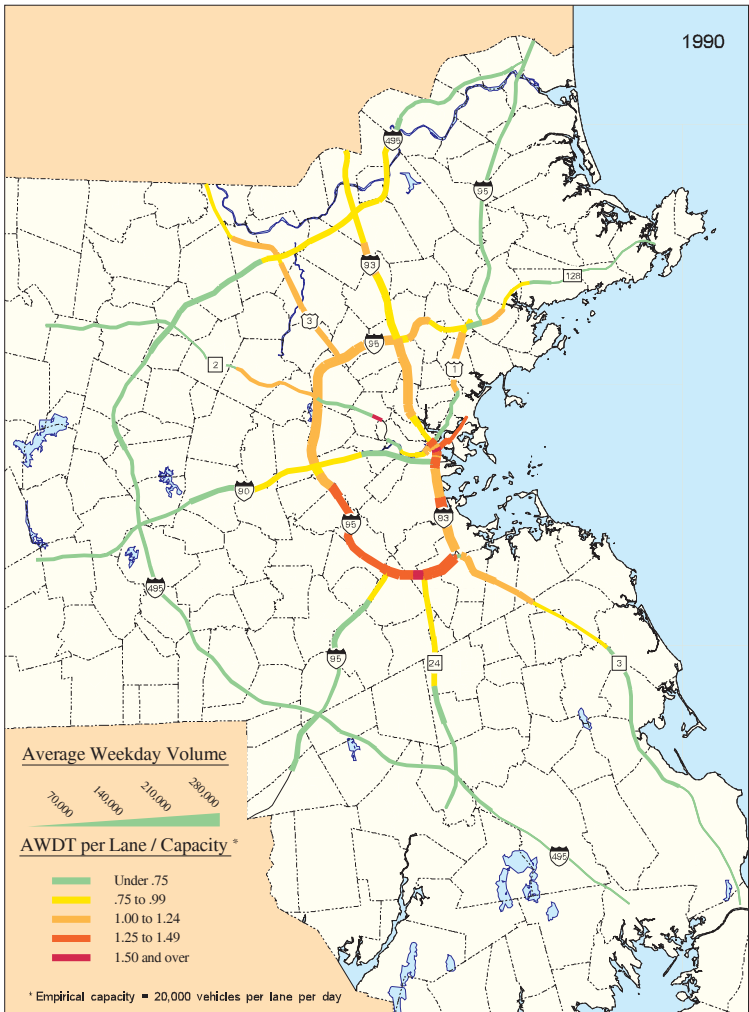
1970



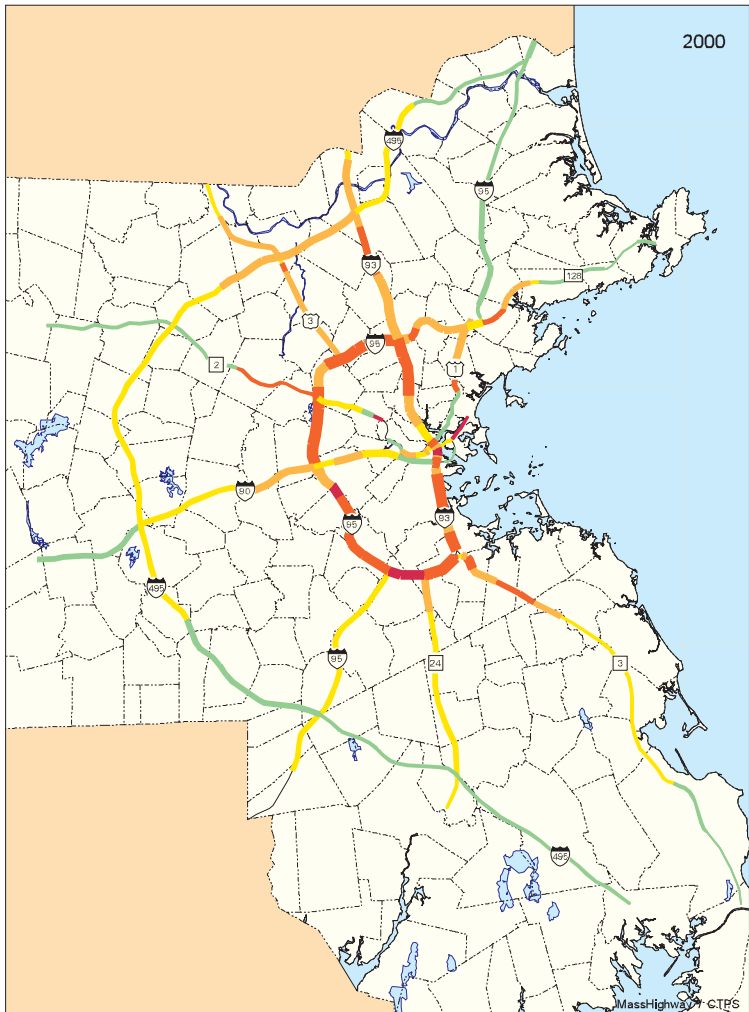
1980



1990



2000



3.4 REGIONAL ROADWAY TRAVEL TRENDS

The following items are roadway-travel-related statistics drawn from a variety of sources, as noted. These are presented here to add to the reader's general understanding of roadway congestion trends in the region.

- Between 1995 and 2000, the number of hours a person is delayed in traffic grew by about 25 percent, based on the measure of **annual person-hours of delay**.¹²
- During the same time period, **total roadway centerline miles** increased by less than 5 percent.¹³ New roadway construction in the region was mainly limited to roads accessing new developments and other local roads.
- Between 1996 and 2001, **average daily traffic** (ADT) for all types of roadways in the region grew by an average of 13 percent, or about 2.5 percent per year.¹⁴
- Between 1996 and 2001, **daily vehicle-miles traveled** (VMT) grew by about 4 percent.¹⁵
- About 80 million vehicle-miles are logged every day,¹⁶ over two-thirds of these on the limited-access highways and arterial roadways, even though they account for only about a fifth of the centerline miles of the roadway network.¹⁷
- According to U.S. Census Bureau figures, the **average commuting travel time** in the Boston metropolitan region increased from 24.1 minutes in 1990 to 28.5 minutes in 2000 for those workers residing in the region. For those residents who drove alone (66 percent of Boston-area residents), the average commuting travel time increased from 22.9 minutes to 26.9 minutes. Congestion-induced delays and socioeconomic factors are major contributors to these increases.¹⁸
- Crashes and other roadway incidents cause congestion (known as nonrecurring congestion when thus caused), but, conversely, they also can be the result of congestion (as in rear-end crashes caused by stop-and-go traffic conditions). The **annual number of crashes** in the region has been stable in the last eight years. As travel has increased (in terms of ADT and VMT), the crash rate (the number of crashes per mile traveled) has dropped.¹⁹

¹² Data from David L. Schrank and Timothy J. Lomax, *2003 Annual Urban Mobility Report*, Texas Transportation Institute, The Texas A&M University System, sponsored by the American Road and Transportation Builders Association/Transportation Development Foundation and the American Public Transportation Association, September 2003. Available on the Internet at <http://mobility.tamu.edu/>.

¹³ Ibid.

¹⁴ CTPS calculations based on a sample of traffic volumes.

¹⁵ Schrank and Lomax, *Urban Mobility Report*, TTI, 2003.

¹⁶ CTPS travel demand model.

¹⁷ Schrank and Lomax, *Urban Mobility Report*, TTI, 2003.

¹⁸ U.S. Census Bureau, *Journey to Work*, 2000.

¹⁹ Crash data, standardized and geocoded by CTPS for MassHighway, 2002.