Chapter 4

REGIONAL GROWTH AND TRAVEL PATTERNS

Long-range transportation plans are informed by estimates of the future population, employment, and regional landuse. These elements help to assess the future mobility needs and regional travel patterns and enable the planner to evaluate the transportation investments needed to create and maintain an effective regional transportation system for the future.

POPULATION FORECAST

The Houston-Galveston area consistently ranks as one of the fastest growing metropolitan regions in the nation; fueled by a positive net migration and a relatively high rate of natural increase. The region's population grew from about 3.1 million residents in 1980 to about 6.8 million residents in 2018 – an increase of well over 100%. This averages to the addition of nearly one million residents per decade. The strong population growth trend is expected to continue well into the future and the region is projected to have up to 10.7 million residents by the year 2045 (Figure 4-1).

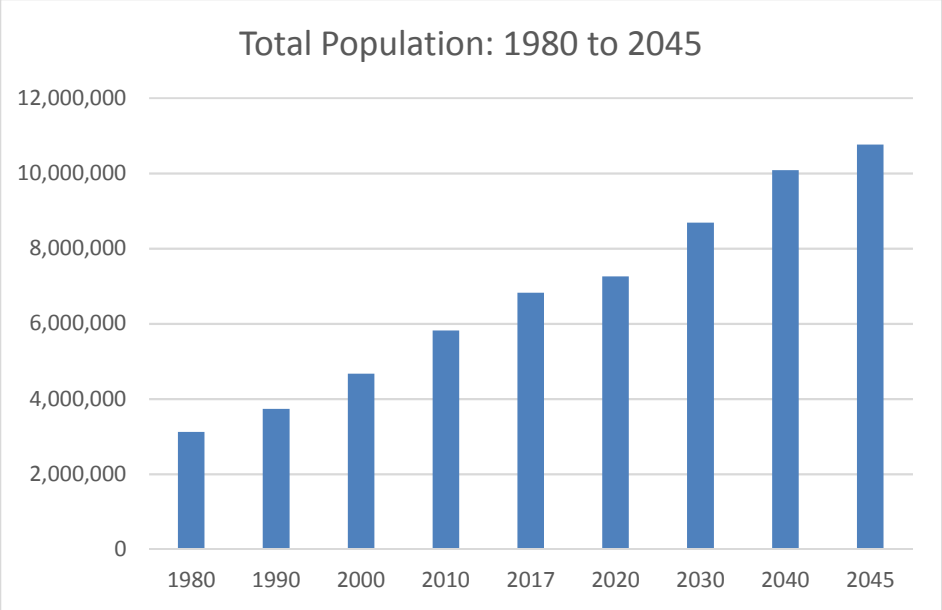


Figure 4-1: Regional Population Growth Forecast

While more residents move back to the rejuvenated inner city, the region will continue to expand towards the suburbs outside the Beltway (Figure 4-2 and Figure 4-3).

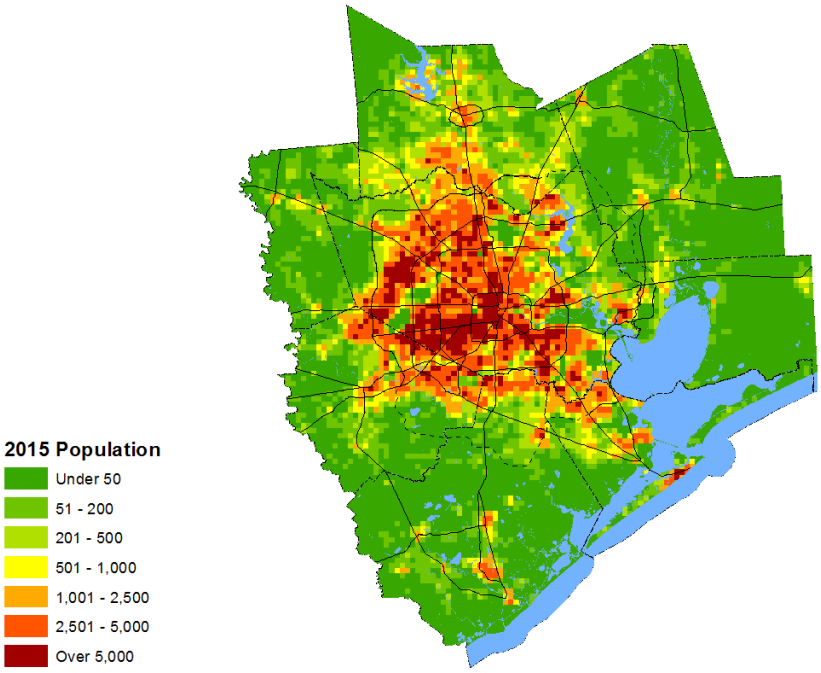


Figure 4-2: Regional Population (2015)

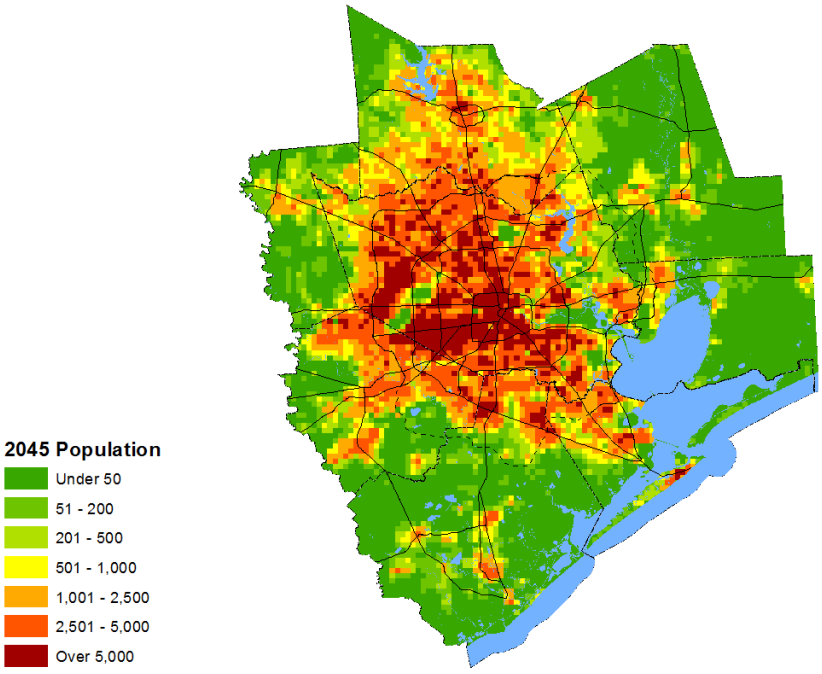


Figure 4-3: Regional Population Forecast (2045)

HOUSEHOLDS FORECAST

The number, size, composition, geographical location, and the density of households in the region all influence the demand for transportation services and infrastructure. Understanding the trends related to households will inform plans to accommodate the future transportation needs. Like the population, the number of households in the region increased from 1.1 million in 1980 to about 2.5 million in 2018. It is projected that the region will have about 4.1 million households by 2045. While the number of households are increasing, however, the household sizes are decreasing. Compared to 2.82 residents in 1980, household size currently averages 2.78 and is expected to decrease to 2.61 by the year 2045 (Figure 4-4). Finally, household density is expected to increase as more people move into the region. The current density of 247 households per square mile is projected to grow to up to 469.5 households per square mile in 2045.

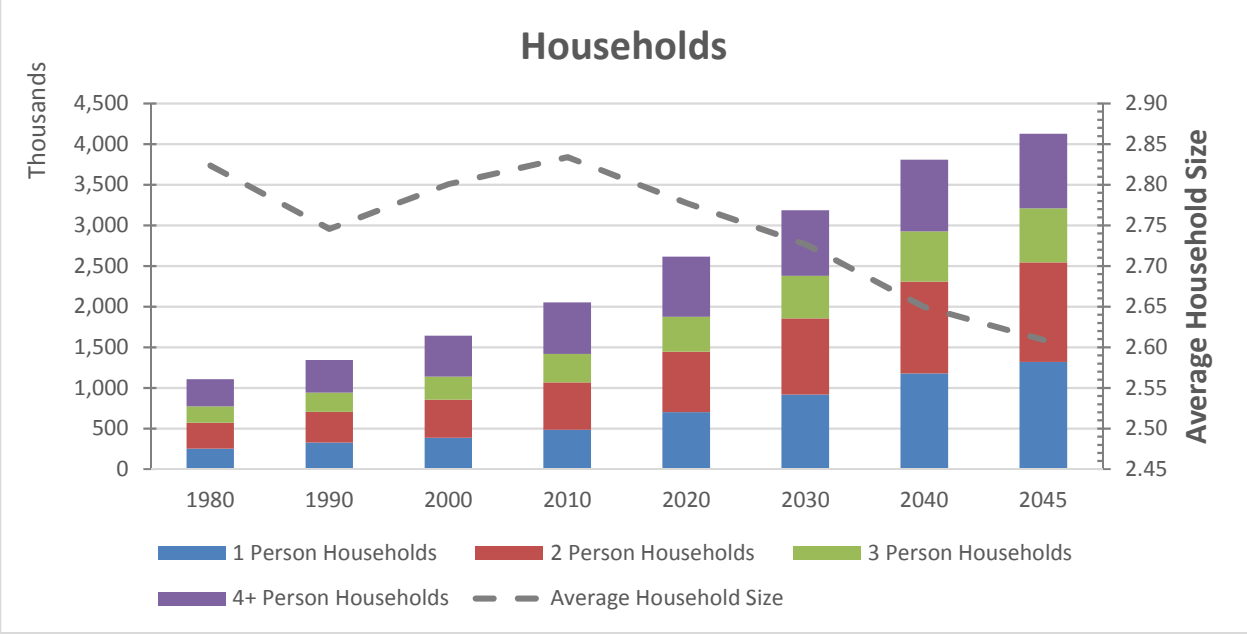


Figure 4-4: Regional Household Change (1980 – 2045)

AGE DISTRIBUTION

One of the key factors that contributes to the region's vibrant and growing economy is its youthful population. The median age of the population of the Houston-Galveston region is currently 34 years. About 51% of the population is less than 35 years old while only 10% of the population are over 65. By 2045, however, it is projected that up to 18% of the population will be 65 years or over, and that the median age will be 38 years

EMPLOYMENT FORECAST

The Houston-Galveston region is one of the largest employment hubs in the nation. The region has been described as the top metropolitan region in the nation for economic growth potential and ranks second in manufacturing GDP.[1] Moreover, up to 20 Fortune 500 companies make the region their home.[2] Job growth continues to flourish in the region. From 2010 to 2015, jobs in the region increased from about 2.7 million to almost 3.2 million jobs. Employment is projected to increase to about 4.8 million by 2045 (Figure 4-5). The projected job growth is expected to be greatest in the urban core within the beltway region (Figure 4-6 and Figure 4-7).

Although the regional economy still depends heavily on the energy industry, the development of other economic sectors is diminishing the impact of vagaries in oil and gas jobs on regional employment. Over the next three decades, however, the job-to-household ratio is projected to decline. Due to ongoing changes in household structure, the aging of the population, and changes in technology, it is projected that the region will have only 1.16 jobs per household in 2045 – down from 1.4 in 2017.

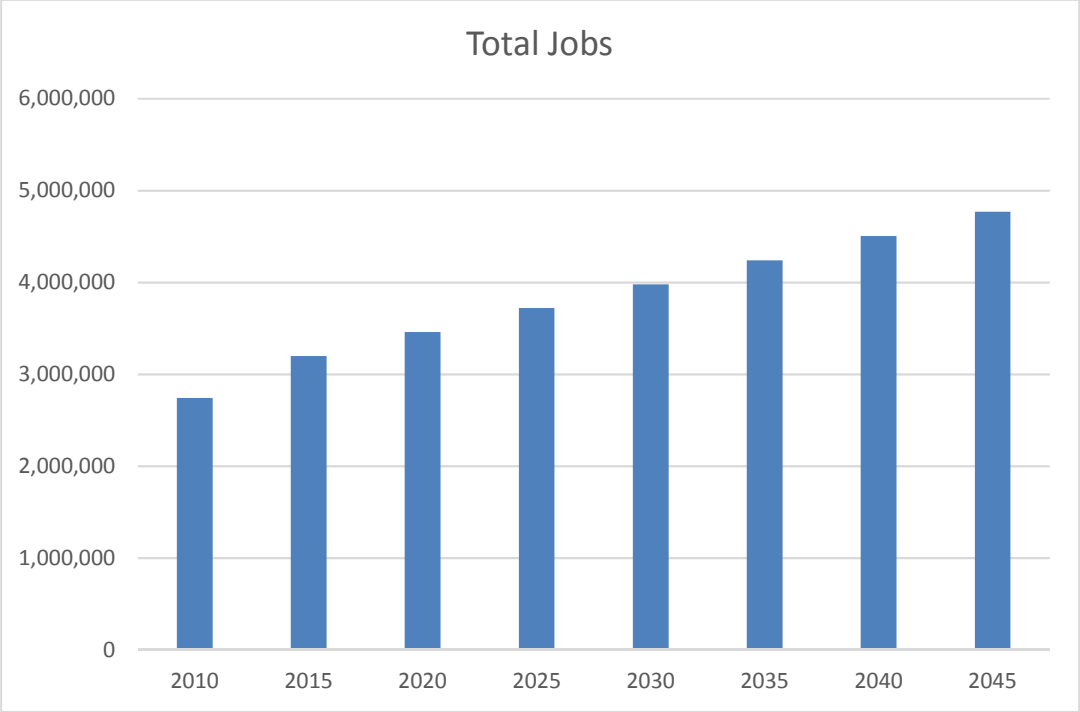
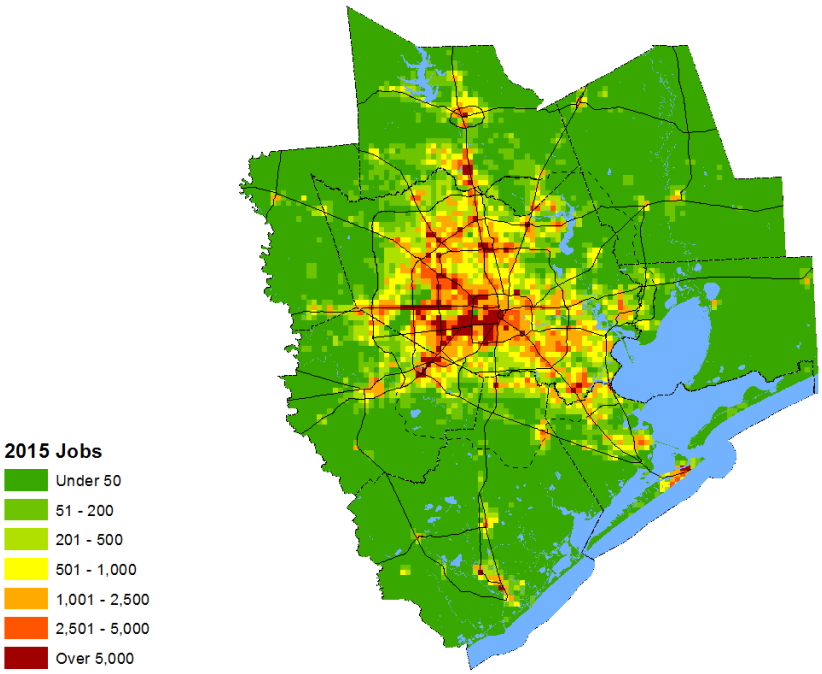
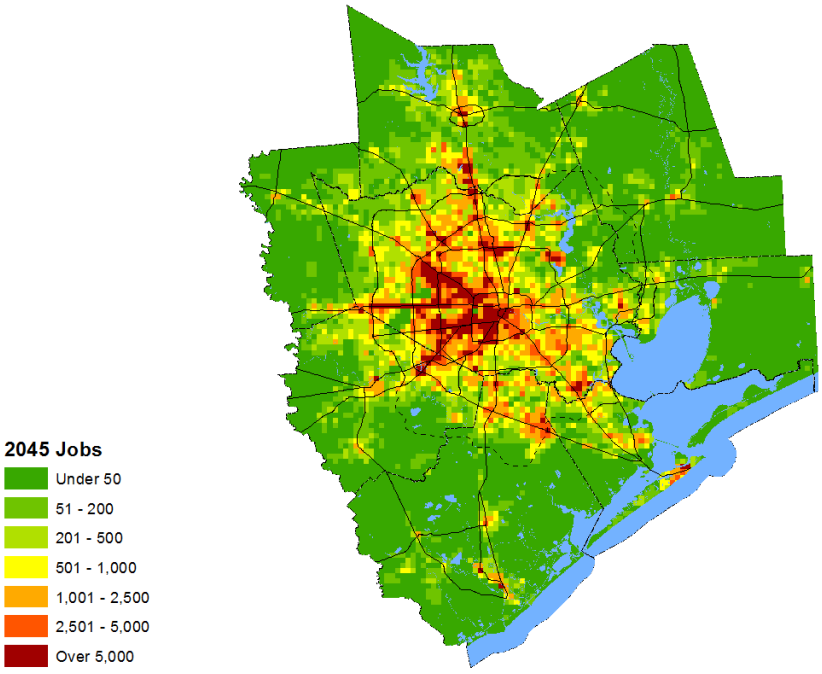


Figure 4-5: Regional Employment Growth (2010 – 2045)

[1] *Business Facilities* (2018, July,) 14th Annual Metro Rankings Report. Retrieved from https://businessfacilities.com/2018/07/business-facilities-2018-metro-rankings-report/.
[2] Ibid.



Map 4-6: Regional Employment (2015)



Map 4-7: Regional Employment Forecast (2045)

TRAVEL PATTERNS

The transportation system exists to serve the mobility needs of the people who live and work in the Houston-Galveston metropolitan region. Forecasting future travel patterns helps to reveal the adequacy of planned investments for meeting future needs. As discussed earlier in this document, the H-GAC region is expected to experience a significant growth in its population, households, and in the number of local jobs through the year 2045. These increases are expected to lead to a considerable rise in vehicular travel within the region (Figure 4-8). Regional travel is measured by the total miles traveled by all the residents in the region daily – also known as vehicle miles traveled (VMT).

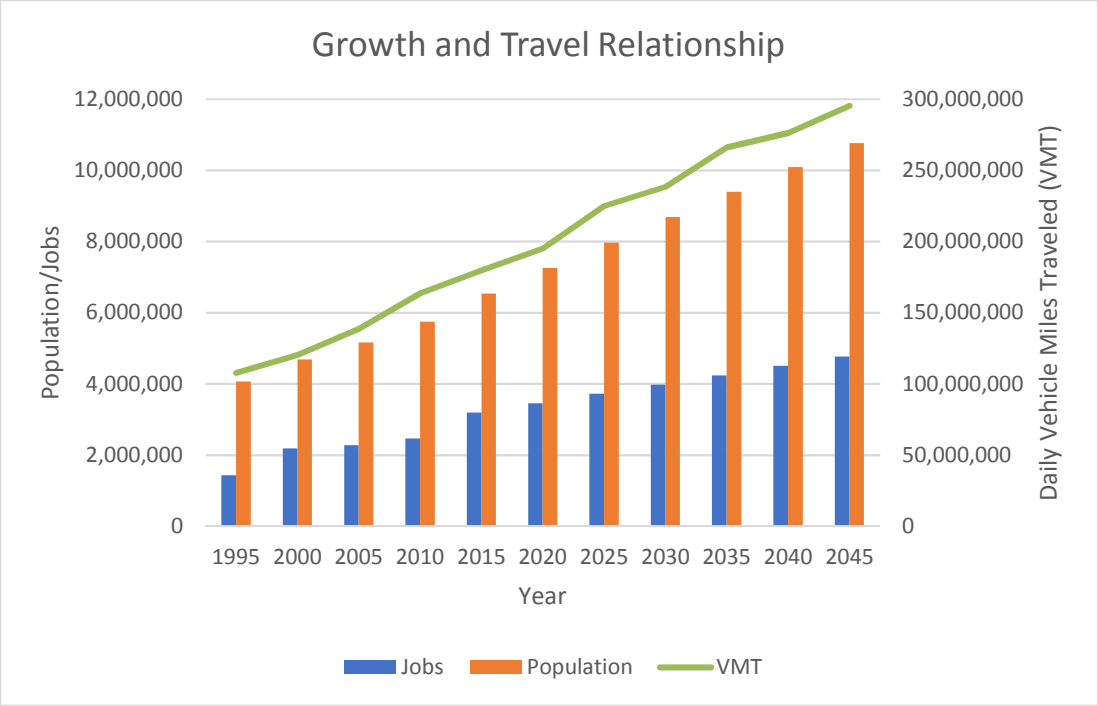


Figure 4-8: Impact of Forecast Growth on Amount of Daily Regional Travel

All areas of the H-GAC region will experience increased travel over the next 25 years. Driven by the location of jobs and residents, vehicular travel will increase from 179 million vehicle miles of travel to 295 million in 2045, an increase of almost 40 percent. Travel patterns will also continue to change during the plan horizon. As growth in suburban Harris County and adjacent counties continues, travel to, from or within the area outside Beltway 8 will represent 70% of all trips. The largest increase in travel will be trips that both begin and have their destination in the area outside the Grand Parkway, forecasted to double by 2045.

The growth of employment beyond the IH 610 loop has led to significant commuting in traditionally non-peak directions on many of the region's freeways and toll roads. This trend will continue as the peak travel direction reverses in some major travel corridors such as parts of IH 69 (US 59) South, IH 10 West

and IH 45 North. Although the development of major employment centers in formerly suburban (or rural) areas leads to greater use of major road capacity, it presents new challenges for efficiently serving suburban destined commuters with competitive transit alternatives.

CONGESTION

Travel forecasts suggest that traffic congestion will be a significant problem for the H-GAC region if adequate mitigation steps are not taken. When regional travel increases faster than the transportation system can be improved to accommodate the increased demand, congestion related delays can be expected to grow worse with time. Expressed in other terms, as the regional VMT grows, daily vehicle hours traveled (VHT) will increase at an even higher rate. This relationship can be seen in Figure 4-9.

H-GAC's travel model also projects that the amount of travel delay that road users regionwide will experience will grow from nearly 700,000 hours per day in 2020 to over 1.4 million hours by the year 2045 (Figure 4-10). Delay is measured as the difference between time spent traveling on an uncongested network and the time spent traveling on a congested one. Average travel speed on the other hand is projected to decline from 36.4 miles per hour in 2020 to 34.6 miles per hour in 2045.

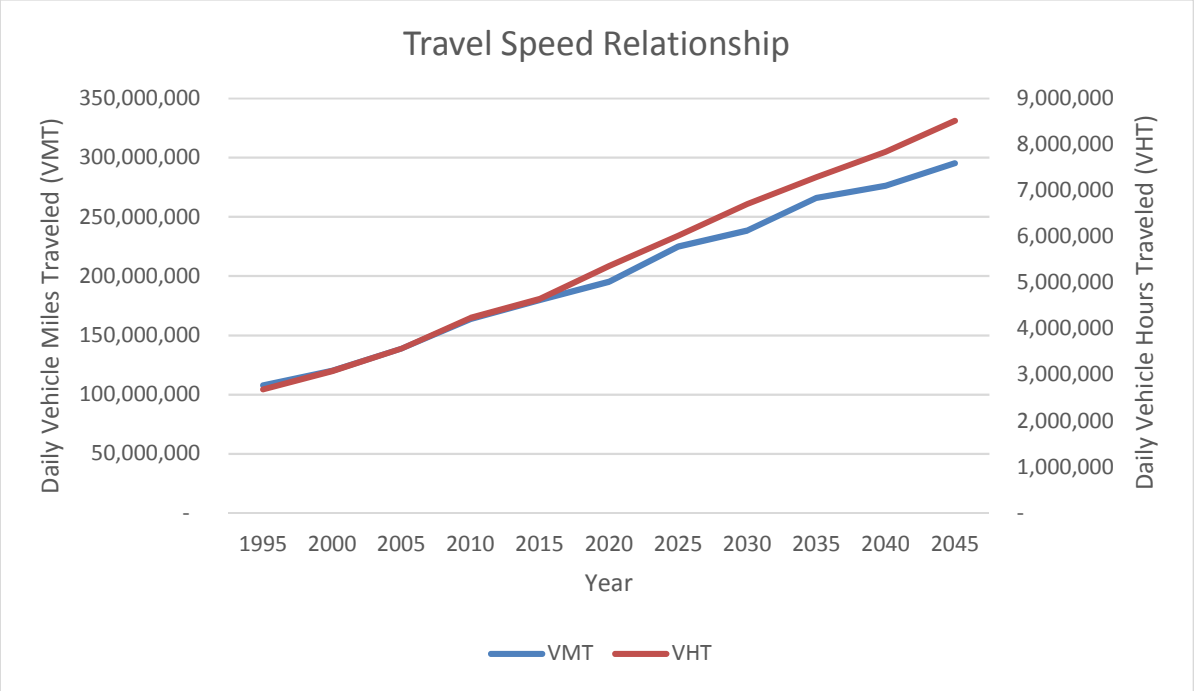


Figure 4-9: Impact of Forecast Growth on Distance and Time Spent Traveling

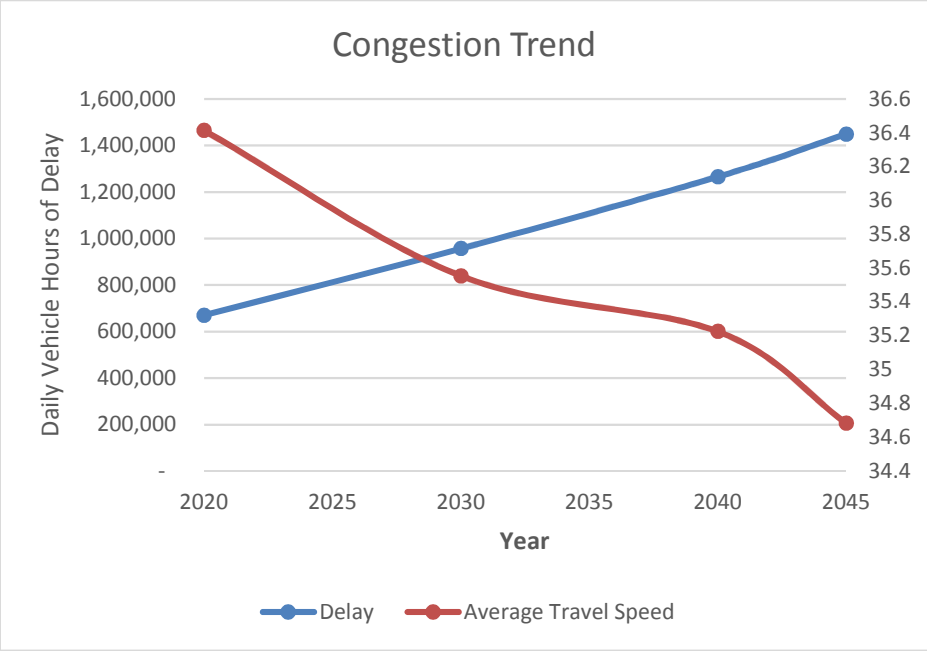


Figure 4-10: Impact of Forecast Growth on Delays and Travel Speeds

Figures 4-11 and 4-12 compare the severity of congestion estimated for the years 2020 and 2045, with the assumption that all the projected population and employment increases occurred but no improvements were made to the transportation system. The figures indicate that serious and severe congestion would be prevalent on area roadways in 2045 if the projects recommended in the 2045 RTP were not implemented. This is described as the "no-build" scenario. The total vehicle hours in the region is anticipated to more than double and the portion of time spent traveling in serious and severe congestion would increase from a combined 15% of all daily travel in 2020 to over 50% in 2045.

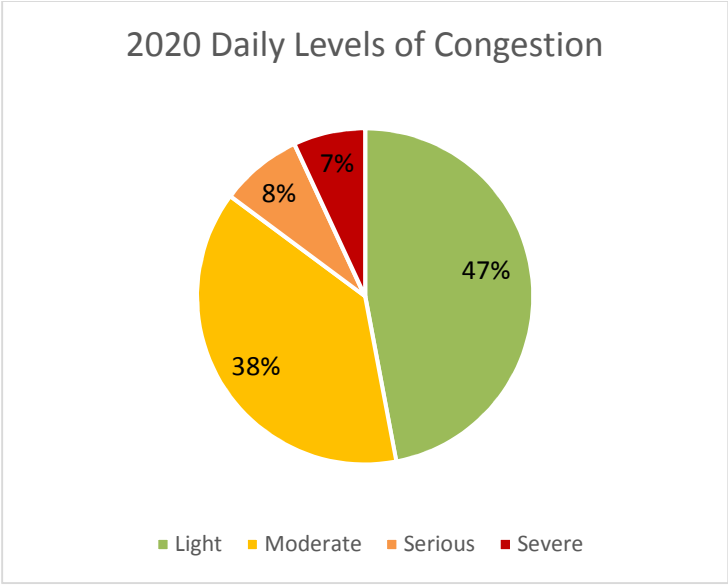


Figure 4-11: 2020 Daily Congestion Levels

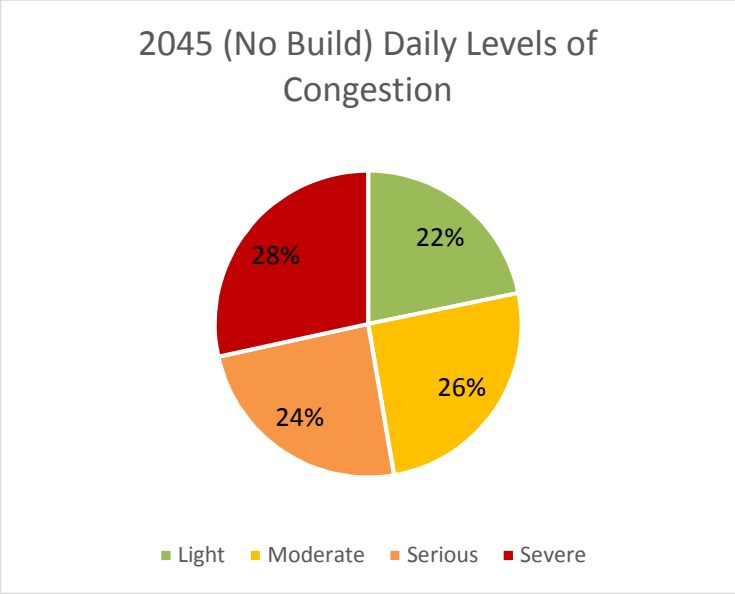


Figure 4-12: 2045 Daily Congestion Levels without Improving the Transportation System

Figure 4-13 through 4-15 give a spatial representation of the predicted levels of congestion discussed above. Current demand on the region's transportation network already results in major corridors becoming seriously or severely congested during peak hours. Under the growth forecasts for population and employment discussed above, the congestion levels on the existing transportation network intensify and spread through most of the core of the region. If the roadway projects recommended in 2045 RTP are implemented ("build" scenario), the impact of the growth expected in the regional congestion levels is somewhat reduced but are still noticeably worse than current levels. This underscores the importance of recommended strategies to invest in transit, active transportation, and intelligent transportation systems, that better utilize the existing roadway infrastructure to manage the impacts of this region's growth on congestion.

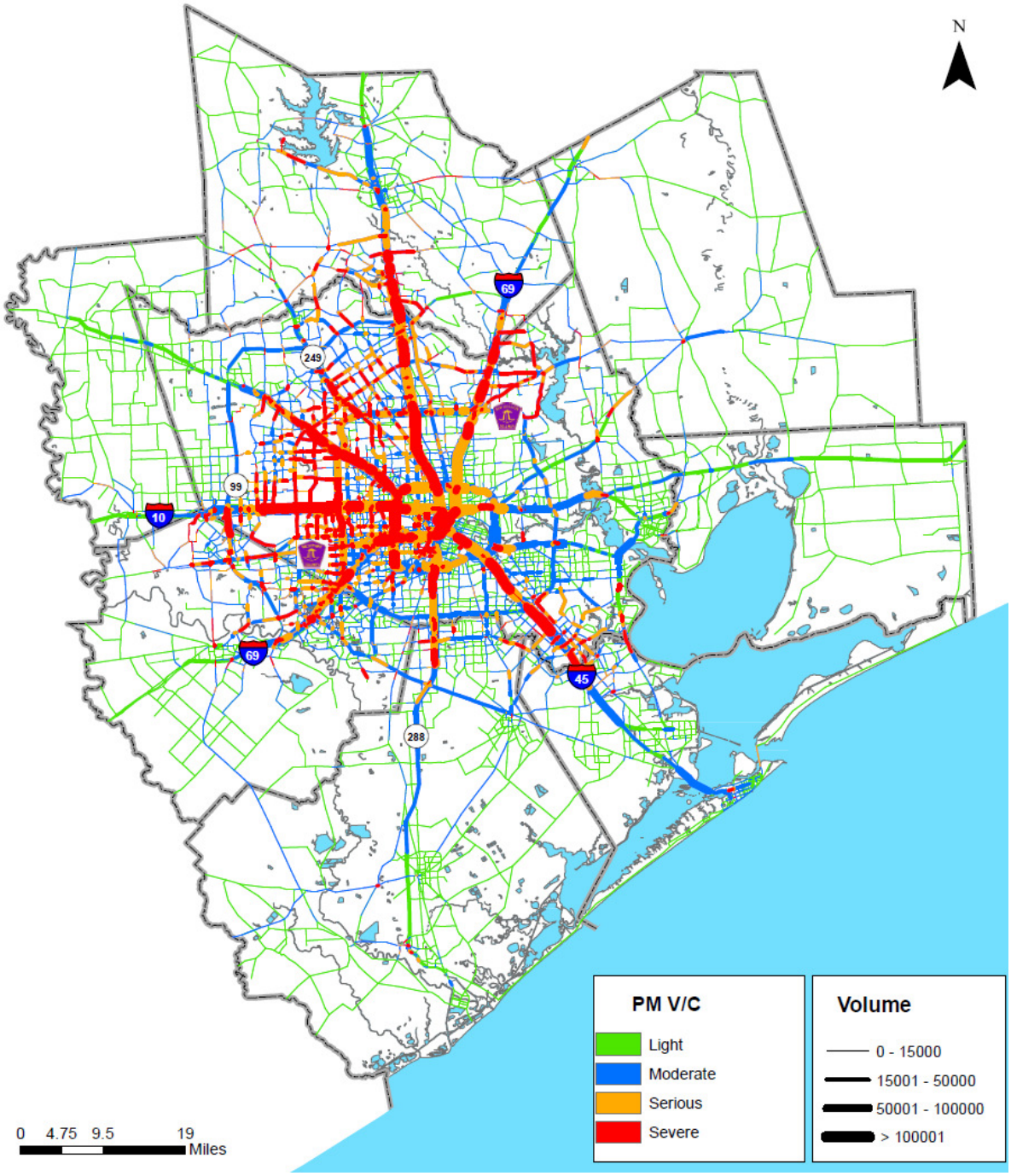


Figure 4-13: 2020 Peak Congestion

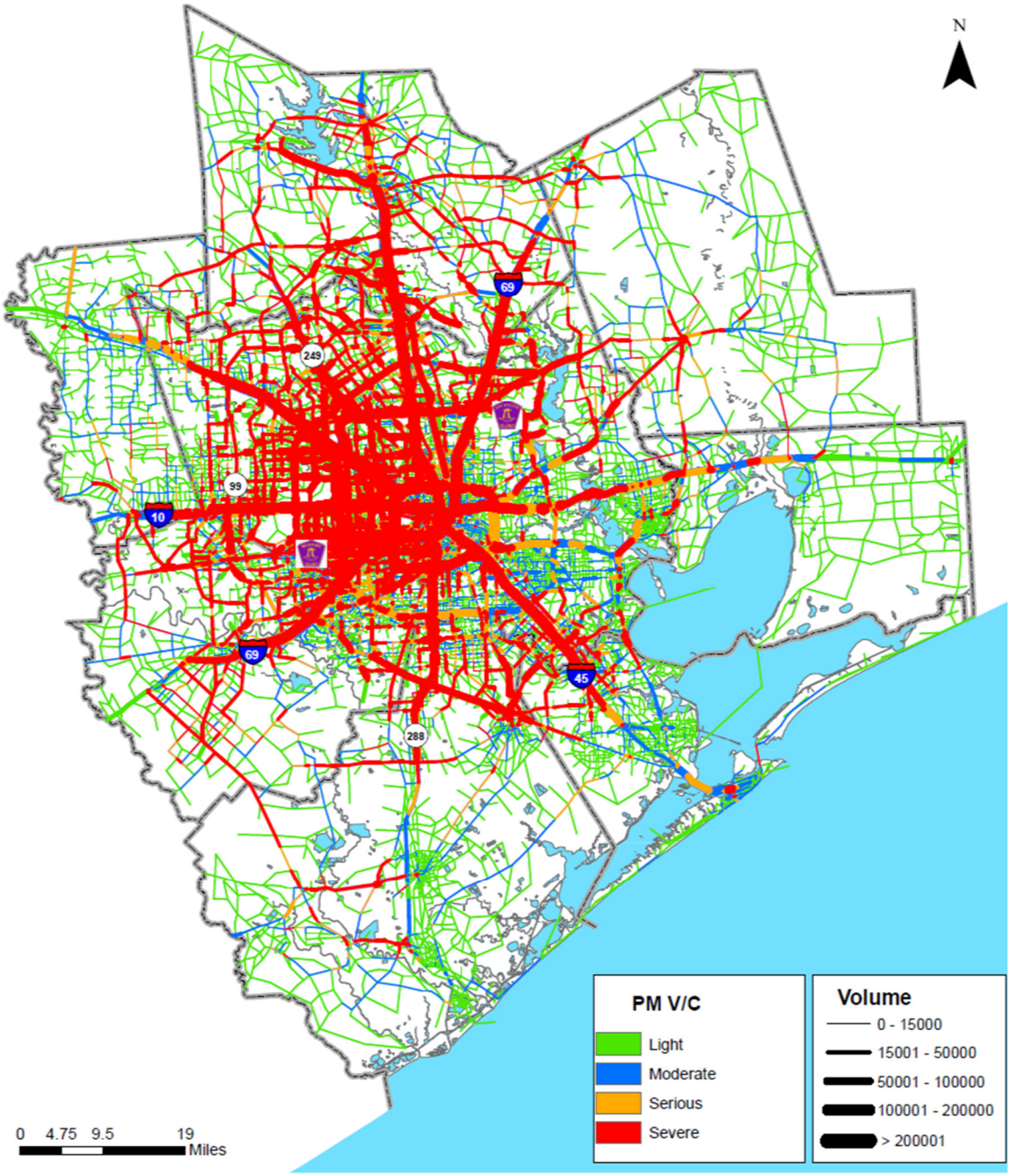


Figure 4-14: 2045 Peak Congestion without Improving the Transportation System

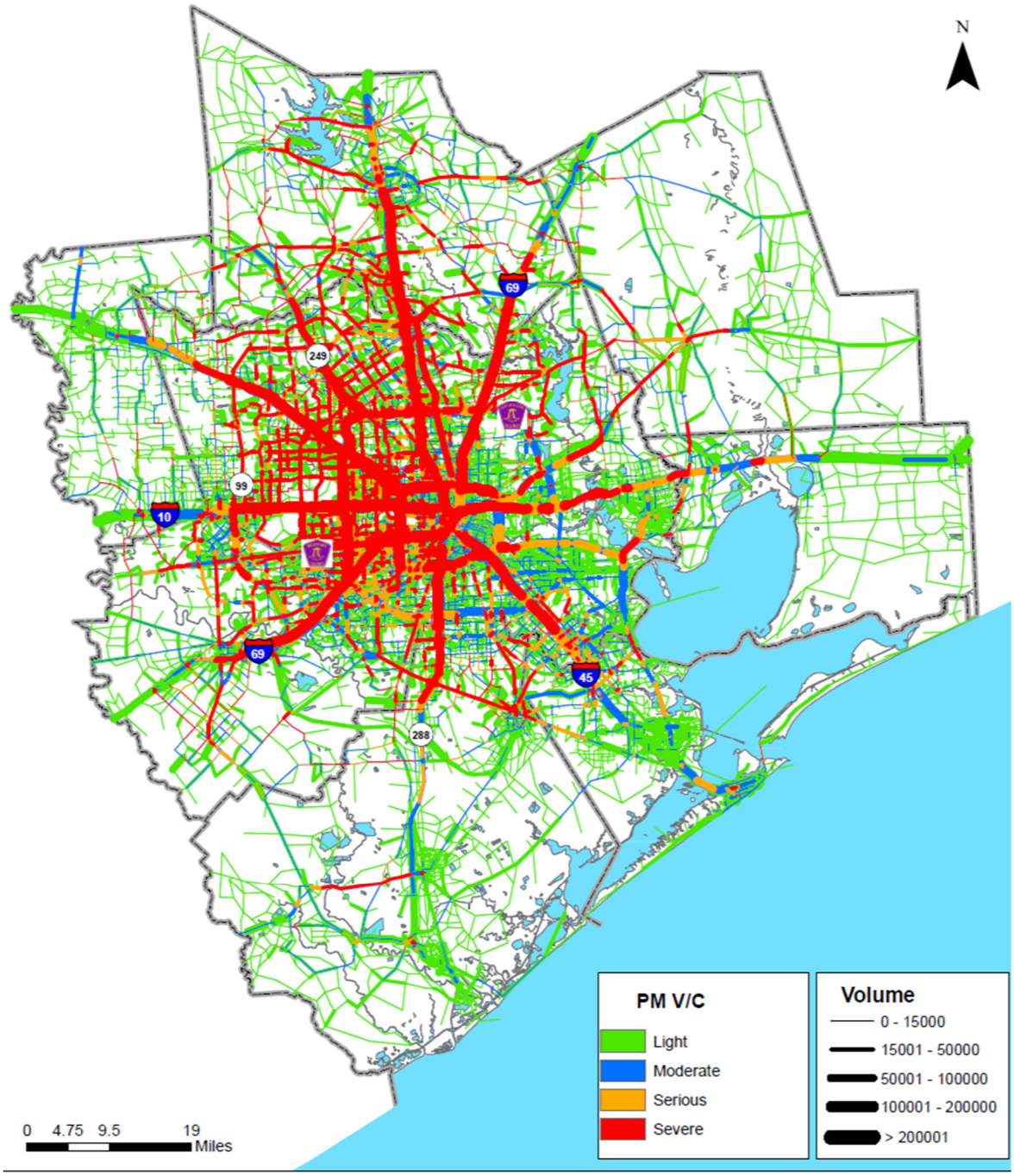


Figure 4-15: 2045 Peak Congestion with Roadway Capacity Improvements only