

Appendix B: 2035 RTP System Analyses

This section summarizes the results of analyses of various measures used to describe the effectiveness of the Houston-Galveston regional transportation system as it exists today and as it is planned for the future. The discussion begins with summaries of measures of mobility and accessibility including the following:

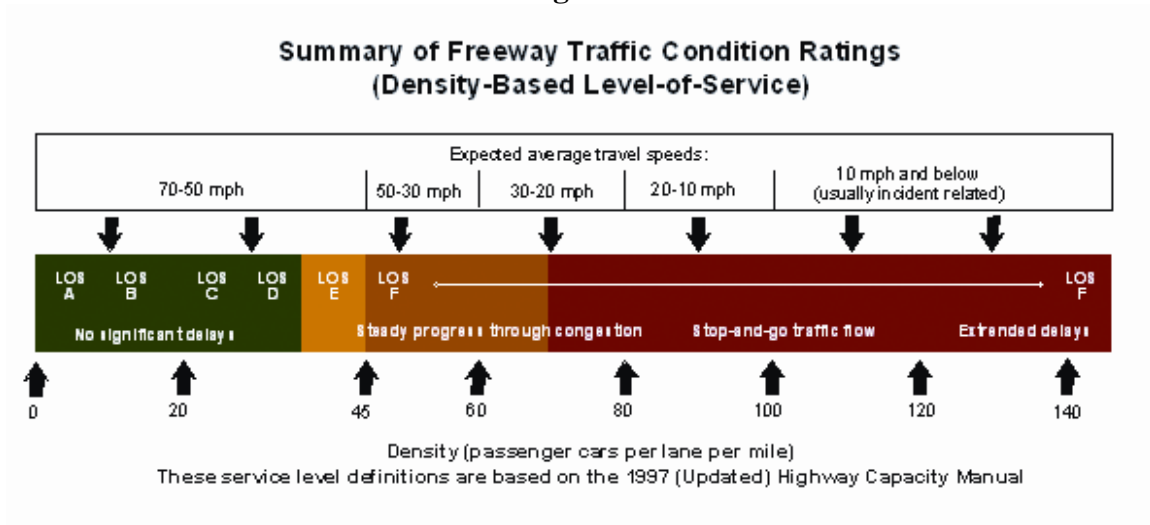
- Level of Mobility (LOM)-serious/severe congestion levels are shown indicating the results of the projects in the 2035 RTP.
- User Benefits defined as the value of time saved for users of the transportation system by automobile and transit modes.
- Accessibility relative to the time required to get to the central core of the region by auto and transit (shown in travel time contours).
- Summaries of population and employment within specific time frames by transit access.

Level of Mobility (LOM)

The LOM was developed to illustrate the degree of congestion on roadways within the region. The LOM is comparable to the standard engineering Level of Service (LOS) measure which is based on volume-to-capacity (V/C) ratios.

Level of Mobility	V/C Ratio	Level of Service (LOS)
Tolerable	V/C less than 0.85	A,B
Moderate	V/C between 0.85 and 1.00	C
Serious	V/C between 1.00 and 1.25	D
Severe	V/C greater than 1.25	E, F

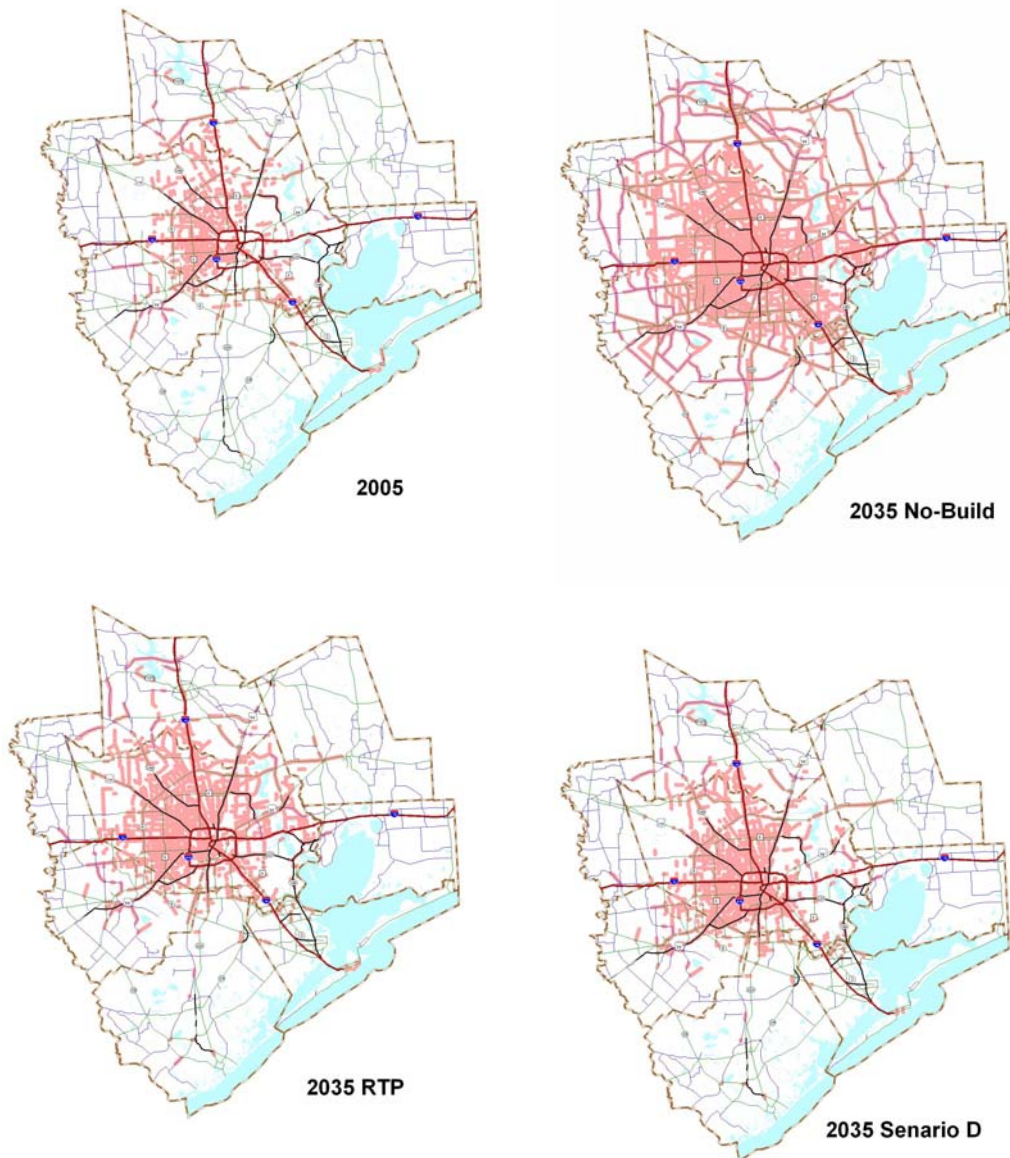
Figure 1



The maps below show the areas with serious and severe levels of congestion (v/c ratios greater than 1.0) during the PM peak periods. The series of maps represent the following:

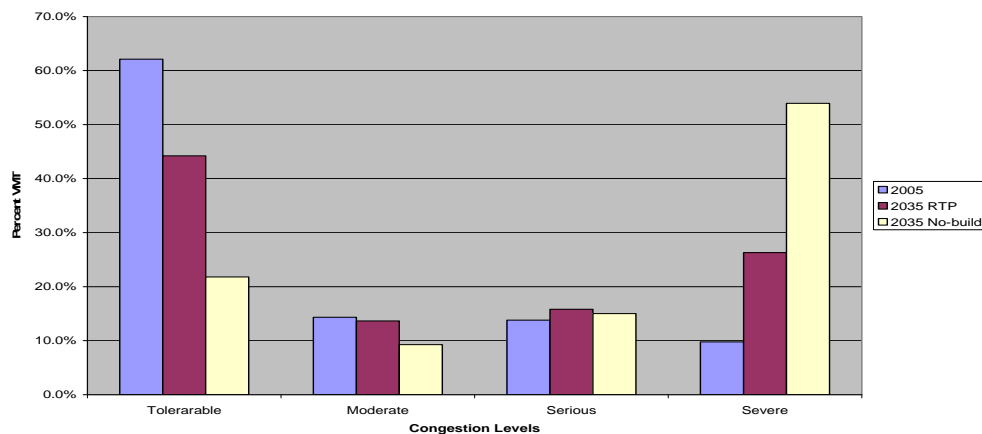
- current levels (2005),
- a 2035 No Build which includes the current transportation system with future travel demands,
- the 2035 RTP (Trend) with the planned projects and,
- the 2035 Envision Houston (Scenario D).

The graphics illustrate significant improvements in system performance with the projects in the financially constrained 2035 RTP compared to a No-build scenario. However, more investment would be needed to address all areas of peak period congestion in the region. The potential impact of an alternative land-use arrangement, such as the Envision Scenario (D) shows further reductions in the most congested areas compared to the Trend (A) scenario.



The chart below shows the relative distribution of morning peak period congestion levels for the current and future systems as a percentage of vehicle miles traveled in each LOM category. There will be an increase in regional congestion levels if the forecasted growth occurs. The most significant changes would be at the low end of the range (tolerable congestion levels) and high end (severe) congestion levels, between the current system performance and a future scenario without the RTP projects (the no-build). The projects in the RTP would reduce the percentage of severely congested VMT in the morning peak period, from about 50% to less than 30% compared to a No-build scenario.

Figure 6
Level of Mobility-AM Peak



Regional Accessibility

The term accessibility is used here to describe the level of ease or convenience that travelers experience in getting to and from various parts of the region for various trip purposes. Travel times for home-based work trips are the primary focus of the following discussion. According to Census Bureau estimates, the mean (weighted average) perceived travel time to work in Harris County increased from about 26 minutes in 1990 to 28 minutes in 2000. For both years those values are about 3-4 minutes higher (slower) than the mean travel time to work for the state of Texas.

Regional accessibility can be illustrated graphically by travel time contours (Figure 7). The contour maps shown below are based on the average travel times from the region to downtown, with values combined into equal time-bands (in 30 minute increments). Those equal time-bands (or contours) are overlaid with the regional roadway network and show the relative travel distances from downtown, for the current and future 2035 roadway systems. The contour map shows that the future regional accessibility to downtown (CBD) by auto, will be very similar to today with the improvements included in the 2035 RTP. By contrast the relative distance that could be traveled if the RTP projects were not implemented is noticeably less (Figure 8).

2035 RTP Travel Time Contours to CBD.

Figure 7- 2005

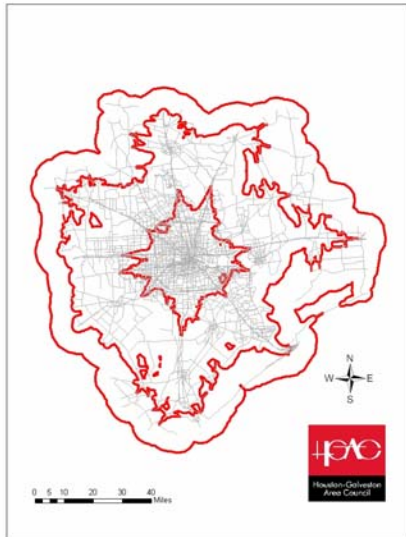


Figure 8-2035 No Build

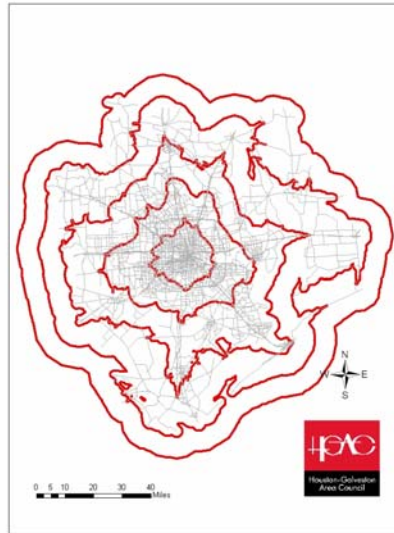
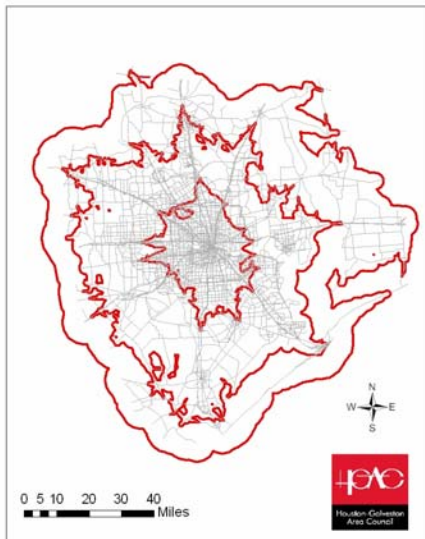


Figure 9- 2035 RTP



Summit-User Benefits

Another analytical technique uses the Summit software program which generates color coded plots that represent changes in system accessibility between alternative system improvements. The measure that is used, User Benefits, is based on a microeconomics theory relative to the value of time saved for users of the transportation system. The areas where travelers would save time are shown in green and the areas in red/orange show travel time losses. The losses in travel time are likely the result of increased regional growth in demand, without significant increases in the transportation system in those areas. Figure 10 shows the user benefits for the 2035 RTP

compared to a No Build scenario for all origins. Figure 11 shows the user benefits for all destinations. Overall the analyses shows improvements in most areas. Further review is needed for those areas indicated as losing travel time benefits.

Figure 10- 2035 User Benefits compared to No Build- All Origins- Auto and Transit

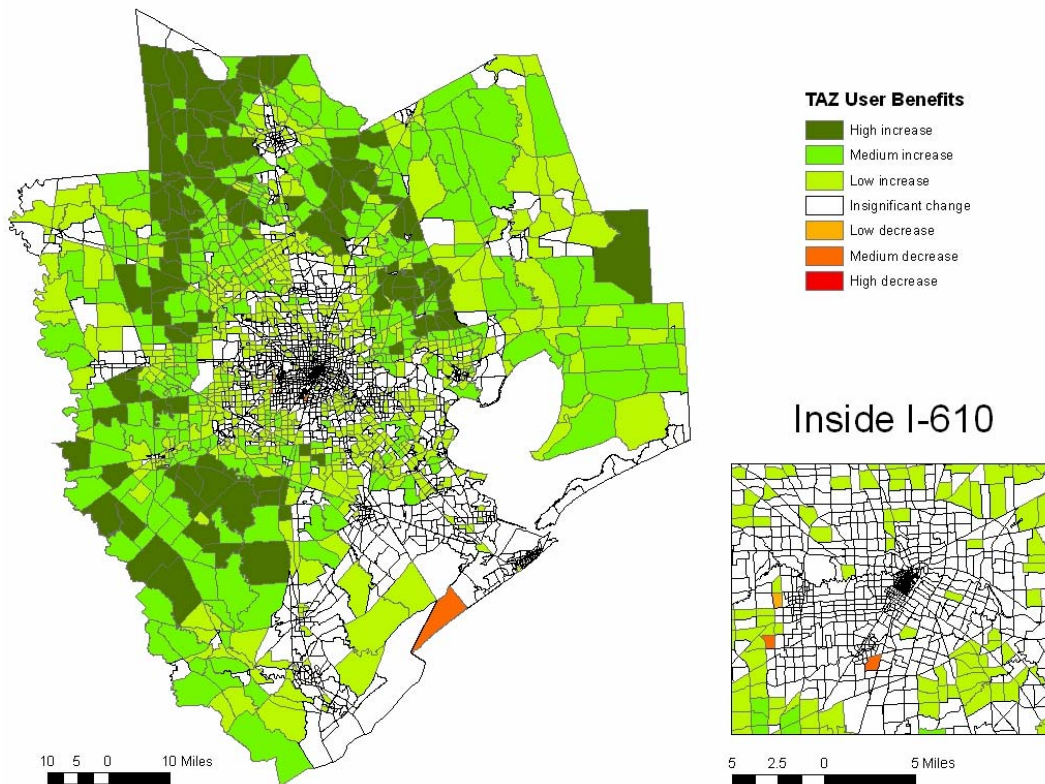
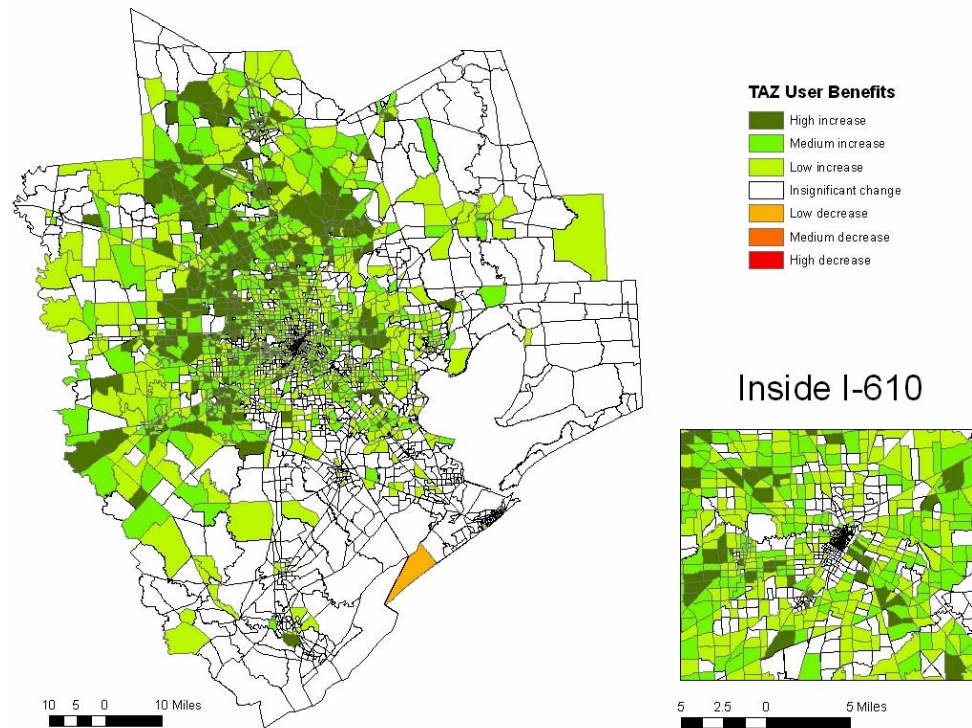


Figure 11
2035 User Benefits compared to No Build- All Destinations- Auto and Transit



Transit System Analysis - Accessibility

Public transit accessibility is displayed in Figures 12-14 below. The figures show the average travel times to the CBD by walk access to local buses in the current system- 2005, in the future system 2035 without the planned improvements and in the 2035 RTP system as planned. The light green shaded areas represent transit travel times between 30 and 60 minutes, which is close to the reported average transit work trip travel time of 50 minutes using the local bus system.¹

¹ U.S. Census 2000, Transportation Planning Package (CTPP) - Harris County - mean travel time to work.

Figure 12- 2005 Walk Access to Transit- 30 minute Time Bands

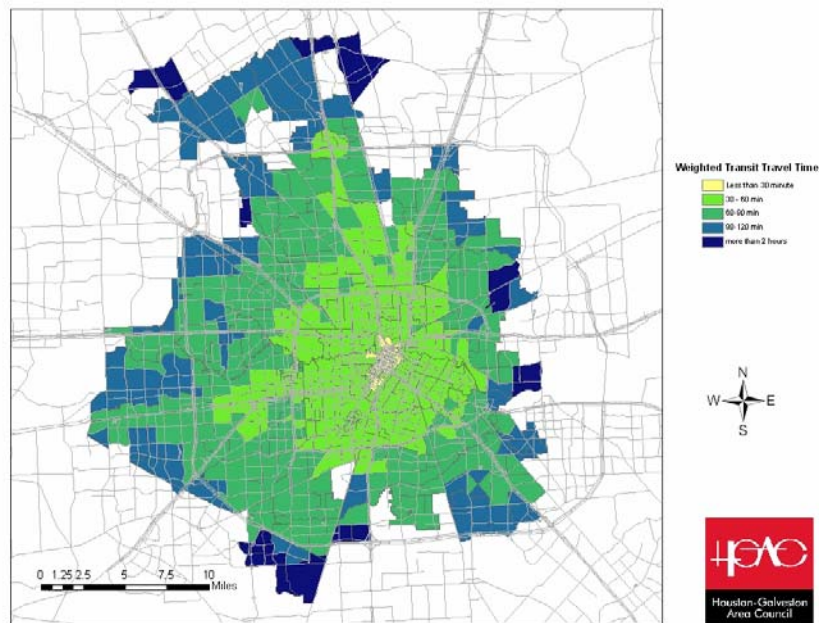


Figure 13- 2035 No-build Walk Access to Transit

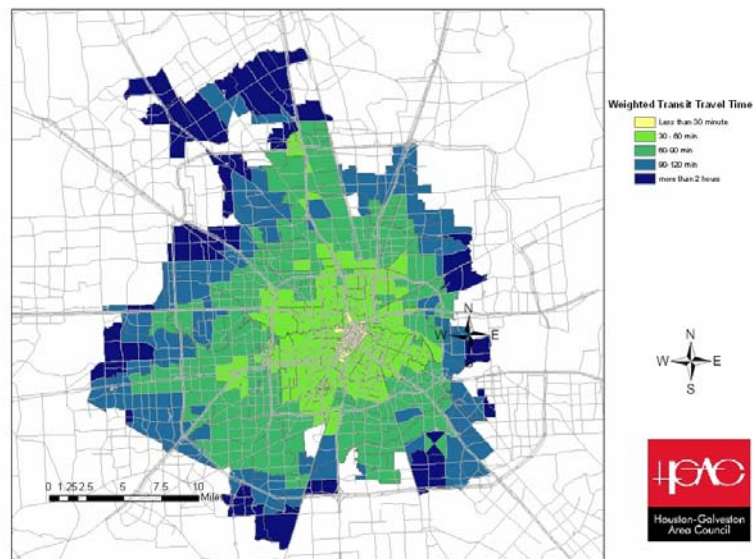
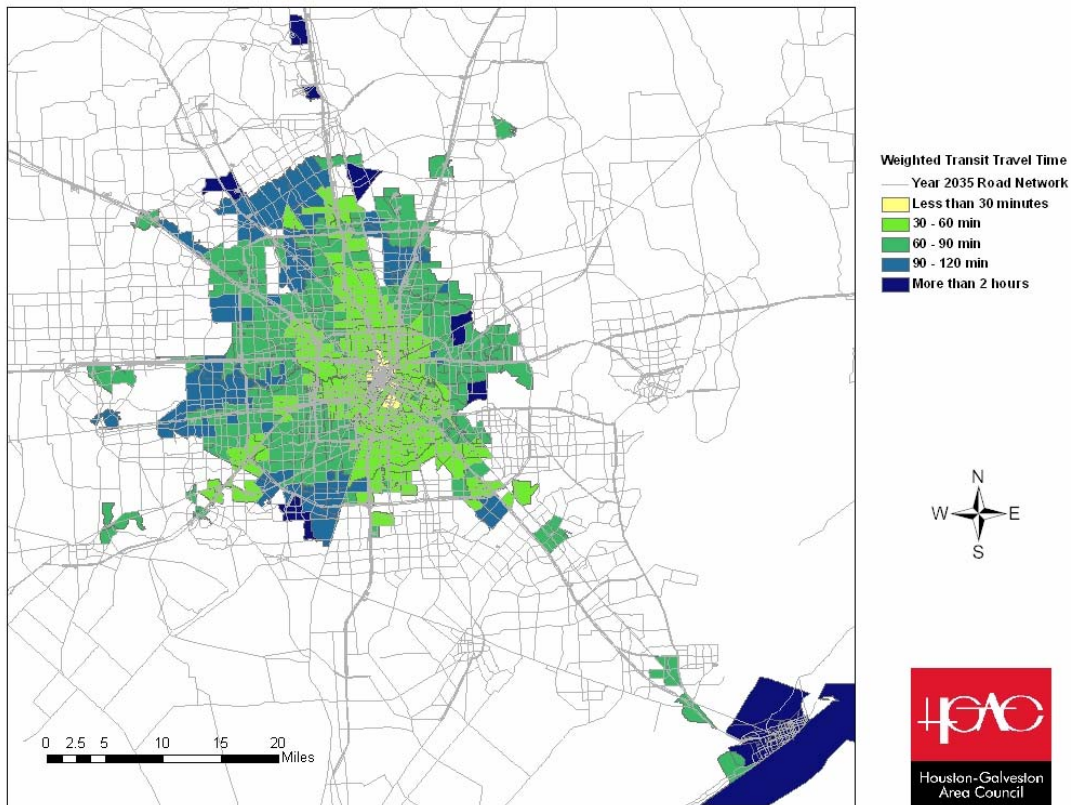


Figure 14-2035 RTP-Walk Access to Transit



The transit access improvements in the 30-60 minute time-band reflect the implementation of the projects in the 2035 RTP. As shown Figure 14, above they indicate the most noticeable changes in the northern (IH-45 North, and US 290) and southern travel corridors (between SH288 and IH-45 South). Those access improvements are likely the results of the implementation of the METRO Solutions 2035 planned high capacity guided rapid transit (GRT) in those corridors.

Another way of measuring the changes in regional transit accessibility is shown by calculations of the regional population and employment within specific time bands by time of day for the current and future transportation system. Figures 15 and 16 (below) highlight the share of regional population and employment accessible within 30 minute time bands by walk access to transit.²

Figure 16 (below) shows the regional percentage of employment accessible by transit (2000, 2025) by mode of access. It also indicates a decrease in accessibility for the local and express transit subsystems and an increase for those with driving access to the park and ride system.

The employment accessible within 30 minutes (or less) by local transit doubles from 100 to 200,000 in 2035 compared to the current system. There is also a significant increase in the

² Trips are in reference to a centrally located analysis zone in the Central Business District for home-based work peak period trips.

employment accessible within 60 minutes by local transit access from 650 thousand to over 900 thousand.

Figure 15

2005 Transit Access-Walk

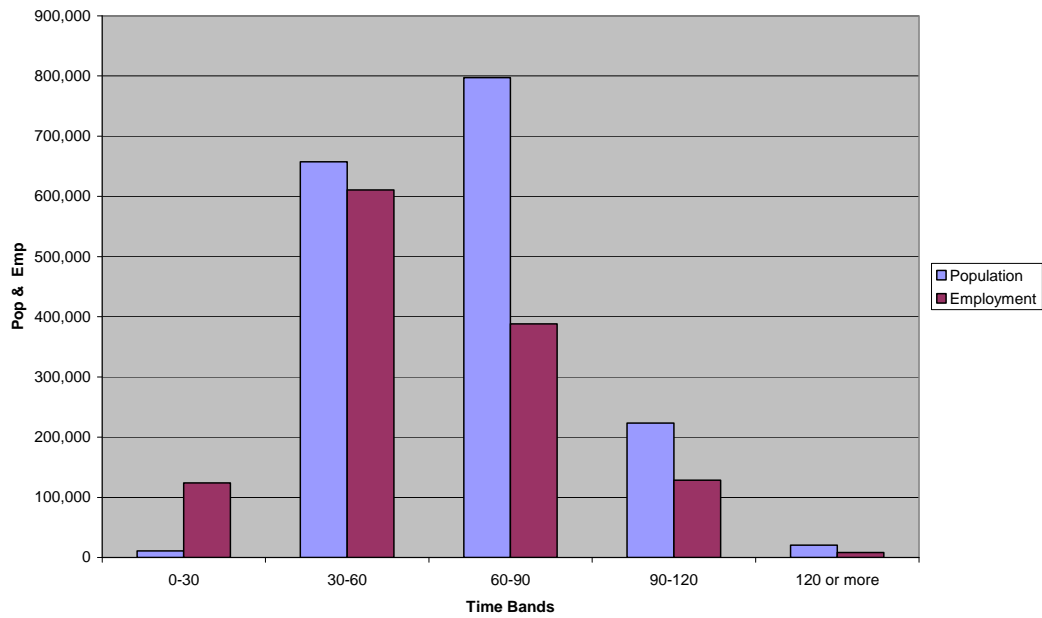


Figure 16

2035 Transit Walk Access

