Waco MPO
2040 Socio-Economic Data Forecast Report

Purpose and Need

In conjunction with the Texas Department of Transportation, the Waco MPO develops a travel demand forecast model to estimate future traffic conditions on arterial and major collector roadways within the Waco Metropolitan Area. This model requires several socio-economic data inputs in order to estimate the origin, destination and quantity of trips produced within the region. The forecast model results provide important highway performance projections used by the MPO Policy Board when determining regional project funding priorities.

This report estimates population, housing units, employment by type and household income by traffic analysis zone for use in the model validation process. The base year for the travel demand forecast model is 2040.

Methodology

The MPO utilizes a modified Delphi approach to forecast each data input. This approach begins with initial forecasts developed by MPO staff based on a best estimate of in-migration and out-migration of population & employment to / from each traffic analysis zone. Regional population totals are controlled to an estimate provided by the Texas Data Center. The MPO utilizes the 0.5 migration scenario produced by the Texas Data Center to estimate 2040 population for McLennan County. This represents a net migration rate of one-half of that experienced by the State of Texas between 1990 and 2000. The 0.5 migration scenario produced a 2010 estimated population closely approximating the actual population for McLennan County reported by the US Census Bureau. Housing Unit estimates are based upon the assumption that persons per housing unit will not significantly change from values observed by the Census Bureau in 2010.

Table 1 – Forecasted 2040 Population and Housing Unit Totals – 0.5 Migration Scenario

Population	Change from 2010	Persons per Housing Unit	Housing Units	Change from 2010
285,484	+50,578	2.47	115,580	+20,694

Source: Texas Data Center; University of Texas at San Antonio

Once the initial estimates have been assigned to TAZs, the MPO Technical Committee reviews these estimates based upon their knowledge and understanding of trends likely to impact the region and proposes changes. The Delphi approach generally involves several iterations of estimating until a final estimate is considered realistic.

Beginning with the 2040 model, the MPO will be utilizing 2 forecasts of population and employment to represent the possibility of different growth scenarios that the region may experience between 2010 and 2040. The first scenario represents the 'trend' where no significant changes in land-use policy, travel patterns or choices in residential / employment location are experienced during the forecast period. The second scenario represents an alternative where new population and employment are significantly influenced by changes in travel or development costs and/or land-use restrictions in undeveloped portions of the region. These scenarios were first identified in the McLennan County Future Landuse Study completed in 2007 with the alternative scenario generally representing the 'Urban Centers' scenario. It is important to note that the County population and employment totals are identical under both scenarios.

Employment Forecast Methodology

Employment forecasts begin with an estimation of the total employment for McLennan County. Normally this forecast assumes that the percent of the population employed remains constant from 2010 to 2040. This percentage for 2010, however, was substantially lower than in previous years due mainly to the high jobless rates as a result of a national recession. Employment percentages in 2005, however, were observed at the opposite extreme with historically high percentages for the Waco region. As a result, MPO staff estimated that the 2040 employment percentage would be approximately the average of the 2 years: 44.04%. This results in an estimated total employment for McLennan County in the year 2040 of 125,713.

The next step is estimating the percentage of employment to be assigned to individual employment sectors. Current research suggests that national employment should continue its shift away from the basic sector to service and retail sectors. This would continue a trend of increasing automation within the manufacturing industries as well as additional jobs being outsourced to markets with lower labor costs.

A significant unknown, however, regards the retail sector and the long-term impact of web-based shopping on local retailers. Trends observed during 2011 showed significant shifts in retail spending away from traditional retailers. It is unknown whether this trend is temporary as considerable uncertainty continues to exist as to the profitability of online retailers and the fact that shipping costs associated with such sales are significant. For the purposes of estimating future retail employment, the MPO staff assumed that long-term traditional retailers will adapt to the changing markets and that this sector will continue to expand within the Waco region. The education and special generator sectors were estimated to have approximately similar percentages of total employment from 2010 to 2040.

Chart 1 – Estimated Percent Employees by Employment Sector - 2040

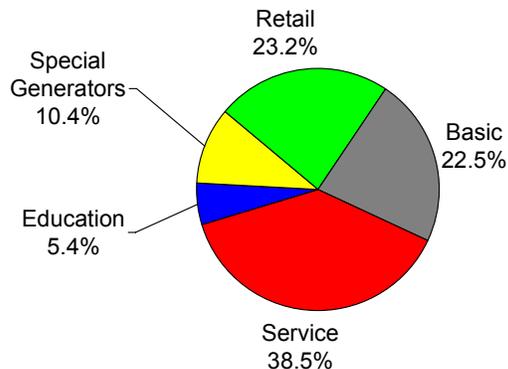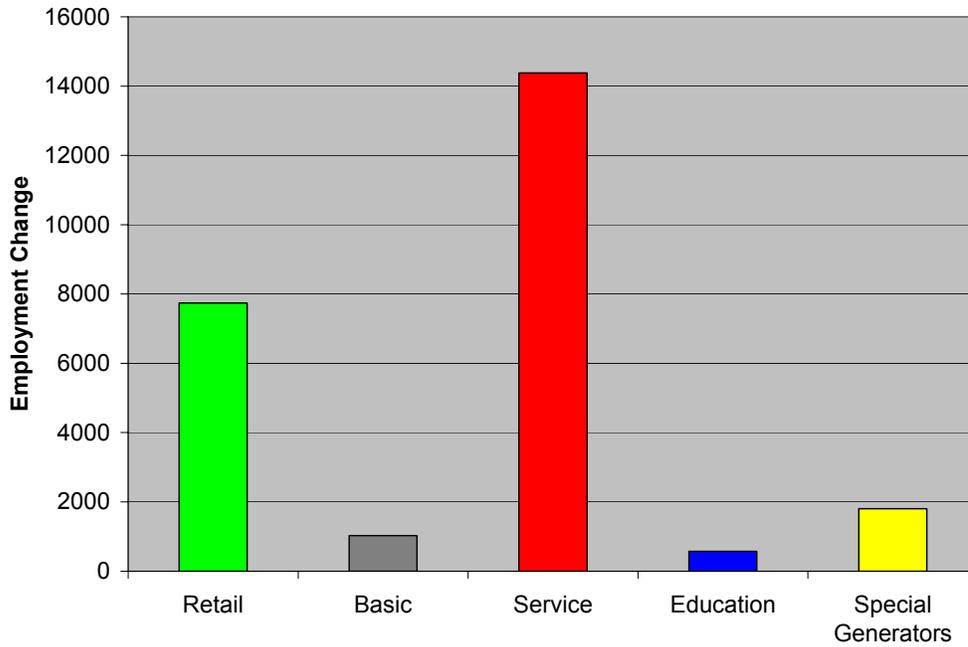**Table 5 – Forecasted 2040 Employment for the Waco Metropolitan Area**

Employment Type	Employment	Forecasted Change from 2010
Retail	29,228	+7,738
Basic	28,285	+1.026
Service	48,408	+14,383
Education	6,729	+569
Special Generators	13,063	+1,807
Total	125,713	+25,523

Chart 2 – Projected Change in Employment by Sector: 2010 vs. 2040

As with projected population, the MPO distributed 2040 employment to individual Traffic Analysis Zones through the trend and alternative scenarios previously discussed. Also identical to projected population, the county totals for employment and each of the employment sectors are identical for each scenario.

Household Income Methodology

Studies conducted for the Waco Metropolitan Area by the Texas Department of Transportation indicate that income is strongly positively associated with the total number of daily trips. As indicated in Chart 3, as income increases, so do the number of trips. This is important information for use in projecting traffic volumes as higher income zones produce a significantly greater number of trips per household than lower income zones. It is assumed that future trip generation rates will remain constant for each income class.

To estimate 2040 household income, the MPO staff used a 2 step process. Step 1 estimated the average income of households present within each zone in 2010 and remaining within the zone in 2040. Step 2 involved those households that either moved into or left the zone in between 2010 and 2040. MPO staff estimated the number of these households that would fall into one of 6 income classes (see table 6). An aggregate income total (Number of Households multiplied by Average Income) was determined for each income class plus those identified in step 1. For new households added to the zone, this income was added to the total from step 1. For households that left the zone, this total was subtracted from the total in step 1. From this aggregated total, average income was calculated for each traffic analysis zone (total aggregated income divided by total households).

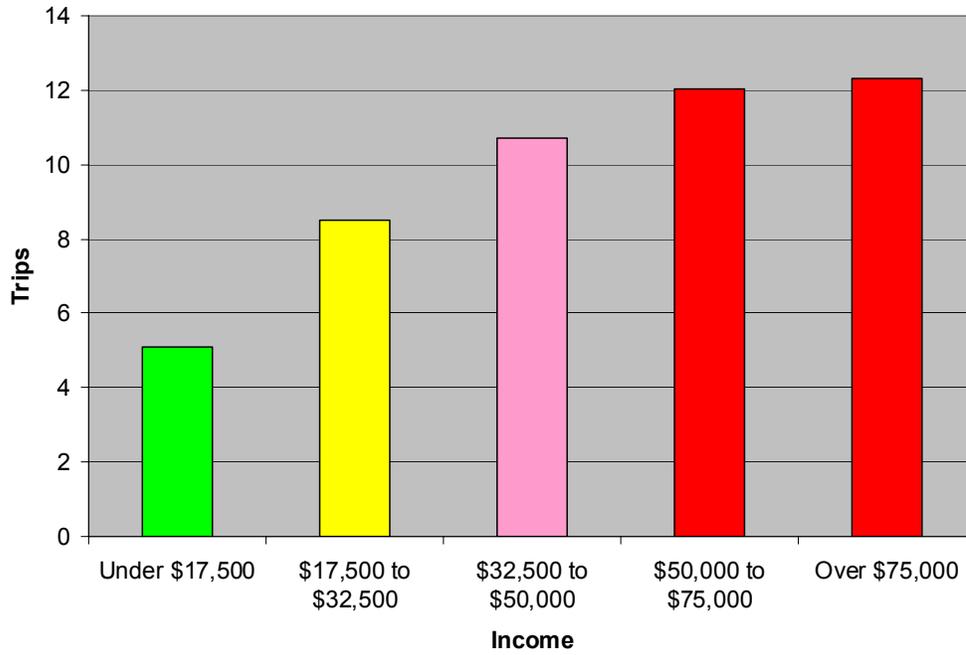**Chart 3 – Average Number of Trips per Household per 24 hour period**

Table 6 – Household Income Classes used in determining new or removed income from each Traffic Analysis Zone

Income Class	Income Range
1	Less than $10,000
2	$10,001 to $25,000
3	$25,001 to $50,000
4	$50,001 to $100,000
5	$100,001 to $150,000
6	Greater than $150,000

Population Forecasts: 2010 to 2040

The main differences between the scenarios are not only the location of new population (or decline), but also the magnitude of the gain or decline. The trend scenario is projected to continue significant population growth in suburban or rural areas and a corresponding decline in the urban core. The alternative scenario substantially decreases the zones projected to decline and in many cases projects growth in zones that were projected to decline under the trend scenario. As a result, the alternative scenario substantially reduces the number of zones projected to grow in suburban and rural areas as well as the magnitude of growth for those zones still projected to grow.

Table 7 – Highest Growth TAZs: Trend Scenario

TAZ	Area	City	Population Change: 2010 to 2040
242	SE of China Spring Rd at FM 185	Waco	+1,075
226	SW of Chapel Rd at Ritchie Rd	Waco / Rural	+950
211	Surrey Ridge Area	Robinson	+921
243	West of McGregor Airport	McGregor / Rural	+799
238	NW of China Spring Rd at Wortham Bend Rd	Waco	+775
247	Stone Creek Ranch Area	Waco / Rural	+773
418	SW of Old Lorena Rd at Spring Valley Rd	Lorena	+738
237	SW of China Spring Rd at Wortham Bend Rd	Waco	+733
265	Arrowhead Estates / Polo Park Area	Waco	+723
122	SE of New Rd at Bagby Ave	Waco	+714

Table 8 – TAZs with Largest Population Decline: Trend Scenario

TAZ	Area	City	Population Change: 2010 to 2040
130	SE of Valley Mills Dr at Sanger Ave	Waco	-389
35	Provident Heights Area	Waco	-327
39	NW of Herring Ave at N 18th	Waco	-256
41	SW of Herring Ave at N 18th	Waco	-246
345	Texas State Technical College	Waco	-212
95	NW of LaSalle Ave at S 12th	Waco	-190
27	SW of Bosque Blvd at N 18th	Waco	-187
29	SW of Bosque Blvd at N 26th	Waco	-185
15	SW of Baylor Campus	Waco	-182
40	SE of Herring Ave at N 18th	Waco	-169

Table 9 – Highest Growth TAZs: Alternative Scenario

TAZ	Area	City	Population Change: 2010 to 2040
237	SW of China Spring Rd at Wortham Bend Rd	Waco	+733
413	Sun West / Harris Creek Area (SE of US 84 at Old Lorena Rd)	Waco	+728
122	SE of New Rd at Bagby Ave	Waco	+714
412	Twin Rivers Development (NE of US 84 at Speegleville Rd)	Waco	+539
171	MCC West Campus	Waco	+536
129	Richland Mall Area	Waco	+525
168	NE of Lake Shore Dr at N 19th	Waco	+525
428	NW of Waco Dr at Lake Air Dr	Waco	+525
13	SW of IH-35 at S 5th	Waco	+499
209	SE of IH-35 at Loop 340	Robinson	+490

Table 10 – TAZs with Largest Population Decline: Alternative Scenario

TAZ	Area	City	Population Change: 2010 to 2040
345	Texas State Technical College	Waco	-212
117	VA Hospital Area	Waco	-80
57	Estella Maxey Homes	Waco	-65
407	SE of US Bus 77 at Orchard Ln	Waco	-62

Employment Forecasts: 2010 to 2040

Total Employment

Projections for total employment closely mirror that for population. The trend scenario projects significant growth in suburban areas and a corresponding decline in the urban core whereas the alternative projects a redistribution of employment within the urban core and substantial reduction of the projected employment growth in the suburbs. It is important to note, however, that the patterns are somewhat different for each employment sector, but when added together the total employment closely matches the population projections.

Table 11 – TAZs with Highest Total Employment Growth: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
209	SE of IH-35 at Loop 340	Robinson	+1,061
208	NE of IH-35 at Loop 340	Waco	+950
261	Hillcrest Hospital Area	Waco	+906
149	Badger Ranch Area	Woodway	+885
367	University High School Area	Waco	+754
262	Alliance Industrial Park Area	Hewitt	+698
228	Central Texas Marketplace	Waco	+692
230	NW of Sun Valley Blvd at Bagby Ave	Waco / Hewitt	+603
117	VA Hospital Area	Waco	+583
211	Surrey Ridge Area	Robinson	+576

Table 11 – TAZs with Largest Decline in Total Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
130	SE of Valley Mills Dr at Sanger Ave	Waco	-354
129	Richland Mall Area	Waco	-333
5	SE of Franklin Ave at S 4th	Waco	-313
159	Heart O' Texas Fair Area	Waco	-298
2	Downtown Waco	Waco	-255
24	SE of Waco Dr at N 17th	Waco	-242
428	NW of Waco Dr at Lake Air Dr	Waco	-232
142	Parkdale Area (SE of Bosque Blvd at Valley Mills Dr	Waco	-226
424	NE of Bosque Blvd at Valley Mills Dr	Waco	-224
356	NE of Valley Mills Dr at Lake Air Dr	Waco	-224

Table 11 – TAZs with Highest Total Employment Growth: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
88	Baylor Research Park Area	Waco	+780
117	VA Hospital Area	Waco	+583
261	Hillcrest Hospital Area	Waco	+513
168	NE of Lake Shore Dr at N 19th	Waco	+415
149	Badger Ranch Area	Woodway	+387
230	NW of Sun Valley Blvd at Bagby Ave	Waco / Hewitt	+358
216	SE of Tx Central Pkwy at Imperial Dr	Waco	+351
360	Providence Hospital Area	Waco	+340
192	TSTC Campus	Waco	+308
229	SW of Loop 340 at Bagby Ave	Waco	+306

Table 11 – TAZs with Largest Decline in Total Employment: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
258	Midway High School Area	Hewitt / Waco	-233
338	NW of SH 6 at FM 1860	Riesel	-220
11	SE of IH-35 at Univ Parks Dr	Waco	-99
23	NW of IH-35 at Valley Mills Dr	Waco	-85
428	NW of Waco Dr at Lake Air Dr	Waco	-77
395	SE of Elm Mott	Elm Mott	-62
313	SE of West	West	-58
268	NE of Lorena	Lorena	-57

Retail Employment

Under the trend scenario, retail activity is projected to shift significantly to suburban areas, especially to the south & west of Loop 340. The Valley Mills Drive corridor, long a center of retail activity, is projected to have significant declines in retail activity as a result of this shift. Under the alternative scenario, most future activity remains located within the primary retail corridors present in 2010.

Table 12 – TAZs with Largest Increase in Retail Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
209	SE of IH-35 at Loop 340	Robinson	+485
208	NE of IH-35 at Loop 340	Waco	+450
149	Badger Ranch Area	Woodway	+293

Table 13 – TAZs with Largest Decline in Retail Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
129	Richland Mall Area	Waco	-289
21	NE of Valley Mills Dr at Dutton Ave	Beverly Hills	-170
174	MCC East Campus Area	Waco	-165

Table 14 – TAZs with Largest Increase in Retail Employment: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
168	NE of Lake Shore Dr at N 19th	Waco	+285
118	SW of IH-35 at Valley Mills Dr	Waco	+201
4	NE of Franklin Ave at S 4th	Waco	+139

Table 15 – TAZs with Largest Decline in Retail Employment: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
11	SE of IH-35 at Univ Parks Dr	Waco	-81
174	MCC East Campus Area	Waco	-70
364	SW of Waco Traffic Circle	Waco	-49

Basic Employment

The distribution of basic employment is projected to be similar under both scenarios as location is heavily dependent upon access to utilities and highways as well as requiring proper land-use zoning. The main difference between the two scenarios is magnitude of the shift from the urban core to suburban locations: this shift being more pronounced under the trend scenario as opposed to the alternative.

Table 16 – TAZs with Largest Increase in Basic Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
216	SE of Tx Central Pkwy at Imperial Dr	Waco	+252
230	NW of Sun Valley Blvd at Bagby Ave	Waco / Hewitt	+249
192	TSTC Campus	Waco	+238

Table 17 – TAZs with Largest Decline in Basic Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
428	NW of Waco Dr at Lake Air Dr	Waco	-253
338	NW of SH 6 at FM 1860	Riesel	-226
130	SE of Valley Mills Dr at Sanger Ave	Waco	-164

Table 18 – TAZs with Largest Increase in Basic Employment: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
88	Baylor Research Park Area	Waco	+426
216	SE of Tx Central Pkwy at Imperial Dr	Waco	+252
230	NW of Sun Valley Blvd at Bagby Ave	Waco / Hewitt	+249

Table 19 – TAZs with Largest Decline in Basic Employment: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
428	NW of Waco Dr at Lake Air Dr	Waco	-253
338	NW of SH 6 at FM 1860	Riesel	-226
128	NE of Loop 340 at Waco Dr	Waco	-82

Service Employment

The service sector is projected to have the most significant increases relative to other employment sectors and as a result broad increases in service employment are projected in both alternatives. The primary difference is that the trend scenario projects much of this increase in suburban or rural areas versus the alternative scenario projects significant increases within the urban core and somewhat reduces the projected increases in the suburban areas. It's important to note that no significant declines in service employment are projected for any zone under the alternative scenario.

Table 20 – TAZs with Largest Increase in Service Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
209	SE of IH-35 at Loop 340	Robinson	+511
208	NE of IH-35 at Loop 340	Waco	+500
261	Hillcrest Hospital Area	Waco	+479

Table 21 – TAZs with Largest Decline in Service Employment: Trend Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
5	SE of Franklin Ave at S 4th	Waco	-159
424	NE of Bosque Blvd at Valley Mills Dr	Waco	-119
3	NE of Waco Dr at N 17th	Waco	-118

Table 22 – TAZs with Largest Increase in Service Employment: Alternative Scenario

TAZ	Area	City	Employment Change: 2010 to 2040
32	Old Hillcrest Hospital Area	Waco	+246
261	Hillcrest Hospital Area	Waco	+226
214	SE of US 84 at Texas Central Pkwy	Woodway	+182

Note: No significant declines in service employment are projected for any zone.

Education Employment & Special Generators

Education employment is generally tied directly to population distribution and as such closely approximates where new schools will be required or where current schools will need to be either closed or reduced in size. As a result the trend scenario shifts this employment from the urban core to suburban or rural areas versus the alternative scenario which keeps much of the employment in the same zones as in 2010. One important note, the most significant shift in education employment under either scenario was as a result of the relocation of the Midway ISD administrative offices which occurred in 2011.

Little to no change in the location or the magnitude of employment changes of special generators is projected under either scenario.

Income Trends

In general, the distribution of income across the metropolitan area is expected to be very similar for both scenarios. The reasons for this, however, are very different. Under the trend scenario, persons with high or moderate income are projected to continue relocating to suburban or rural areas while those with low or limited incomes, who have

limited ability to relocate, remain in the same zones or residence as in 2010. Under the alternative scenario, it is projected that incomes within the urban core will increase somewhat as these zones will be more attractive as a place of residence for those with moderate or even moderately high incomes. It is projected, however, that the suburban and rural zones will continue to have relatively higher incomes but not necessarily due to the relocation of higher income groups. The primary projection is that these areas will become significantly more expensive due to the relative cost of infrastructure and service costs and the relative cost of commuting compared to the urban core. As a result, it is anticipated that under the alternative scenario only those with relatively high incomes will be able to afford to live in the outer suburbs or rural zones.

Table 23 – TAZs with Largest Increase in Household Income: Trend Scenario*

TAZ	Area	City	Change in Income: 2010 to 2040
176	SE of Lake Shore Dr at Steinbeck Bend Dr	Waco	+$44,317
178	Steinbeck Bend Area (NE of Steinbeck Bend Dr at Carson Ln)	Waco	+$36,193
286	NE of SH 317 at FM 3047	McGregor	+$36,167

*For zones with a population of at least 50 in 2010 & 2040.

Table 24 – TAZs with Largest Decline in Household Income: Trend Scenario*

TAZ	Area	City	Change in Income: 2010 to 2040
3	NE of Waco Dr at N 17th	Waco	-$8,802
179	Bosqueville Area (NE of Steinbeck Bend Dr at Rock Creek Rd)	Waco / Rural	-$8,534
308	NW of SH 6 at FM 185	Rural	-$7,358

*For zones with a population of at least 50 in 2010 & 2040.

Table 25 – TAZs with Largest Increase in Household Income: Alternative Scenario*

TAZ	Area	City	Change in Income: 2010 to 2040
241	SW of FM 185 at Yankie Rd	Waco	+$47,461
379	NW of IH-35 at Univ Parks Dr	Waco	+$46,919
176	SE of Lake Shore Dr at Steinbeck Bend Dr	Waco	+$46,137

*For zones with a population of at least 50 in 2010 & 2040.

Table 26 – TAZs with Largest Decline in Household Income: Alternative Scenario*

TAZ	Area	City	Change in Income: 2010 to 2040
291	SW of SH 317 at FM 185	Crawford	-$2,300
147	NE of US 84 at Ritchie Rd	Woodway	-$2,228
414	NW of US 84 at Santa Fe Dr	Woodway	-$1,506

*For zones with a population of at least 50 in 2010 & 2040.

Appendix A: Maps

Appendix B: TAZ Data