Vision 2020 Update: A Student Project at University of Houston – Clear Lake

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Early this year, the City of Friendswood requested the help of students in the School of Business at the University of Houston – Clear Lake. The request was for an update on the tax impact of different land-use scenarios that were presented in the original Vision 2020 report given in 1998, and later updated in January 2005. Presented below are the summarized results of the student project that was initiated to satisfy the City's request. The project's goal was to estimate changes in the city property tax rate that would result from different developmental patterns in land use. The results suggest that tax rate stability is possible with modest assumptions about revenue structure, expenditure trends, and property value.

This report is divided into three sections. Section I presents background information on recent trends in the property tax base in the City of Friendswood. Section II presents the tax-impact analysis and discusses the results, and Section III follows with a basic sensitivity analysis. Section IV provides some concluding remarks.


I. Background

We examined trends in assessed property values from 1998 to 2007. These trends are important because they reflect the relative burden of property taxes on residential and commercial property. From 1998 to 2007, residential assessed property values grew at an average annual rate of 11.0%, while commercial assessed property values grew at a rate of 2.5% (Table 1). Currently, residential assessed value is about 77% of total assessed value, compared to 62% in 1998.

Table 1: Residential, Commercial, and Total Assessed Property Values, 1998 and 2007

	1998	2007	Annual Growth
Residential Assessed Value	$682,832,883	$1,743,291,114	11.0%
Commercial Assessed Value	$417,086,590	$522,889,136	2.5%

Data source: Certified Appraisal Rolls, 1998-2007

From 1998 to 2007, there was a widening gap between residential and commercial assessed property values in Friendswood, driven by rapid growth in the assessed value of residential property and slower growth in commercial property value (see graph below – top trend line is residential property value). The City of Friendswood now relies much more heavily on residential property values as a source for tax revenue than in 1998.

Assessed Property Value 1998-2007
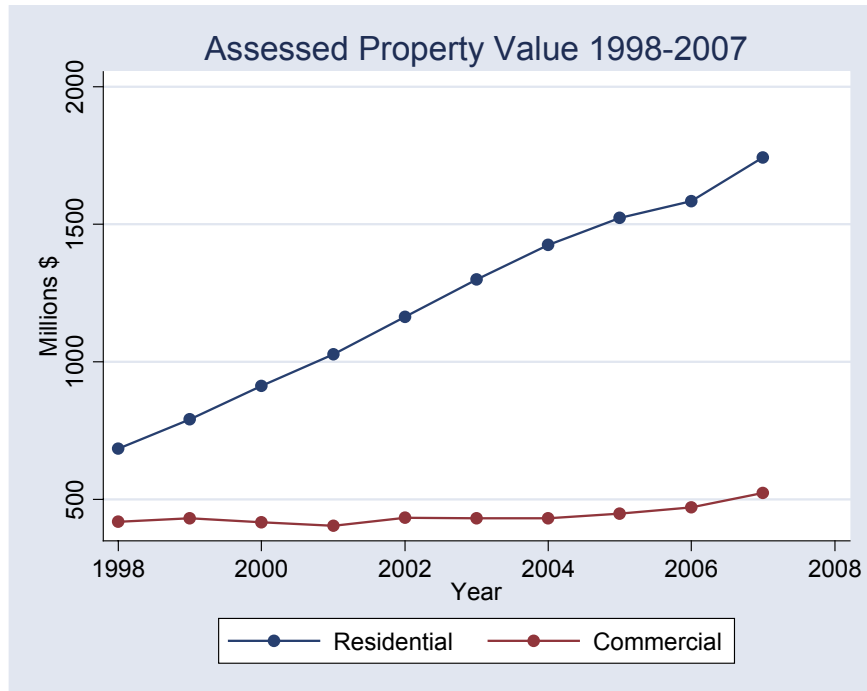
Given that the objective of this report is to examine acreage build-out, it would be of interest to track the above changes in assessed property values with actual developmental patterns over the same time period. Unfortunately, this is not possible due to a lack of historical land use data. An alternate method to track development patterns is to examine the change in the number of tax units over time. Table 2 shows the number of tax units in 1998 and 2004 for two categories of taxable property: single-family residential and commercial/industrial. While both categories exhibit similar change on a percentage basis, the absolute change in residential units far surpasses that of commercial and industrial. These trends again highlight the City's increasing reliance on residential property for its tax base since 1998.

Table 2: Tax Units, 1998 and 2004

	1998	2004	Change	Percent
Residential, Single-family	8,595	10,464	1,869	21.7%
Real, Commercial & Industrial	258	304	46	17.8%

Data source: Certified Appraisal Rolls, 1998-2005

To sum, the City of Friendswood now depends much more on residential property as a tax base than in 1998. This corresponds to a current development pattern that heavily favors residential property: 88% of current developed acreage is residential, compared to 12% that is commercial. The next step is to evaluate the relationship of acreage to assessed value, and the tax implications of this relationship for Vision 2020.

II. Tax-Impact Analysis

The tax-impact analysis derives from a basic break-even analysis. We want to estimate tax rates associated with the property tax revenue that is necessary to cover a proportion of city expenditures. The fundamental relationship of our analysis is given by the following:

$$\text{Tax Rate} = \frac{\text{Needed Property Tax Revenue}}{\text{Net Assessed Property Value}}$$

To examine the impact of acreage build-out on future tax rates, we estimate the two amounts on the right-hand side of this relationship. Needed property tax revenues are estimated based on forecasted city expenditures in 2020. Net assessed property values are estimated based on different build-out scenarios of city acreage. With values for needed revenues and net assessed value, we can offer predictions on the necessary tax rates that will support the city's spending. The following subsections describe the estimation procedures.

Needed Property Tax Revenue

Property tax revenue is estimated in this analysis as a percentage of needed overall revenues to cover city expenditures. Using data from the 1990 to 2006 city budgets, we find that city expenditures increased from approximately $10 million to $30 million over this time period. We use this data series to project city expenditures to 2020 based on two possible trends: a linear trend and a quadratic (nonlinear) trend. The following graphs give the results of these analyses (note: 1993 and 2002 are excluded from the analysis due to expenditures being unusually high in those years):

Projected Expenditures 2020 (Nonlinear)
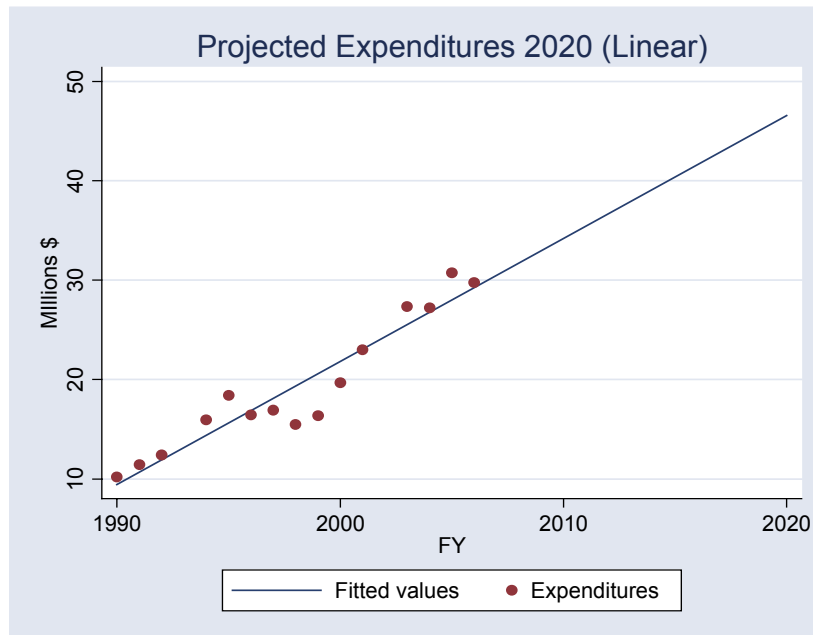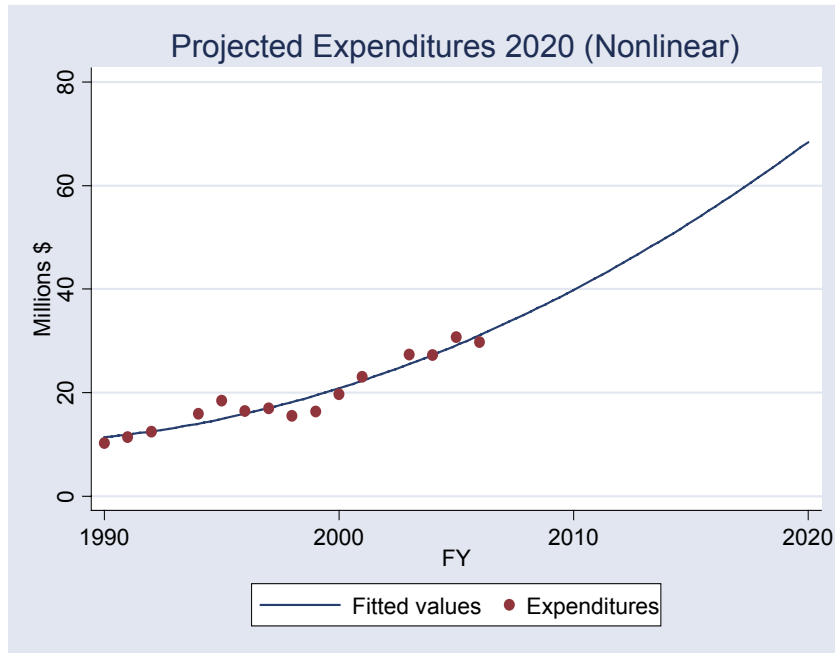
The dotted data-points indicate observed values for city expenditures from 1990 to 2006. The trend lines indicate the projections to 2020. The analysis suggests that city expenditures will approach $46.6 million (linear trend) to $68.1 million (quadratic trend) in 2020. This reflects predicted annual growth of 3.4% to 6.5% relative to 2006 expenditures. Though a linear trend offers a good prediction, we are concerned with the apparent upswing in expenditures starting around 1998. This suggests that city expenditures may be increasing at a faster rate than in previous years, in which case a nonlinear trend may offer a better prediction.

Given these estimates for city expenditures, the necessary property tax revenue can be calculated using an assumption about the proportion of total revenue attributed to property taxes. From 1990 to 2006, property tax revenue accounted for 20% to 45% of total revenue in any given year. However, in several years, revenues from non-tax sources were relatively high (1993, 1995, and 2000-2003). When these years are excluded, property taxes accounted for an average of 40% of total revenues for the city. We take this number to be a reasonable indicator of the contribution of property taxes to total revenues in a normal year. This corresponds to the percentage used in the Vision 2020 update presented to the City Council in January 2005.

If property taxes account for 40% of total revenue in 2020, then the necessary revenue of $46.6 million suggests that property taxes will need to be $18.64 million. The necessary revenue of $68.1 million suggests that property taxes will need to be $27.24 million. These are the values assumed for "Needed Property Tax Revenue" in the tax-impact analysis.

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<u>Net Assessed Property Value</u>

The next step is to estimate net assessed property value. The interest of the City relates to the tax impact of different build-out scenarios. We therefore estimate net assessed value as it relates to residential and commercial acreage. Using the original Vision 2020 plan as a reference, we evaluate three residential/commercial acreage build-out scenarios: 73/27, 80/20, and 84/16. Table 3 presents the current (2007) development in the City and the acreage associated with different build-out proportions.

Table 3: Residential & Commercial Acreage

	Current	Buildout		
		73/27	80/20	84/16
Residential	6,557	7,910	8,668	9,101
Commercial	929	2,925	2,167	1,734
Undeveloped	3,349	-	-	-
Total taxable	10,835	10,835	10,835	10,835
Exempt	2,426	2,426	2,426	2,426
Total	13,261	13,261	13,261	13,261

Note: Current acreage is based on a report provided by Claunch & Miller, Inc. (June 2007).

There are currently 7,486 developed, taxable acres in the City, with 88% developed as residential and 12% developed as commercial. With 3,349 undeveloped acres, the build-out scenarios are based on a total of 10,835 taxable acres to be developed as residential and commercial. For example, an 80/20 build-out will have 8,668 (80% of 10,835) acres as residential and 2,167 (20% of 10,835) acres as commercial.

The property tax revenue generated from developed land depends on the assessed value of that land. The key calculation in our analysis is to calculate the relative contributions of residential and commercial acreage to total assessed value. We do this by calculating the per-acre value of residential and commercial land relative to current development, and project these values to ultimate build-out scenarios. The 2007 Certified Appraisal Roll gives the following values for residential and commercial land (Table 4):

Table 4: Assessed Property Values, 2007

Land - Homesite	$493,358,868
Improvements - Homesite	1,697,472,096
Homestead Cap Adjustment	(12,360,185)
Homestead Exemptions	(435,179,665)
Residential Property	**$1,743,291,114**
Land - Nonhomesite	206,129,627
Land - Ag Mkt	27,625,210
Improvements - Nonhomesite	230,200,027
Total Productivity Loss	(27,382,734)
Personal Property	79,268,156
Minerals	7,048,850
Commercial Property	**$522,889,136**
Total Assessed Value	**$2,266,180,250**

The per-acre contributions of residential and commercial property are therefore:

Table 5: Per-Acre Contributions to Assessed Value

Residential Value	$1,743,291,114
Residential Acreage	6,557
Per-acre Value	**$265,867**
Commercial Value	$522,889,136
Commercial Acreage	929
Per-acre Value	**$562,852**

   The final step is to apply these values to the three build-out scenarios and calculate the associated total assessed values. To convert total assessed value to net assessed value, we note that over the past decade, exempt value averaged 6.5% of total assessed value. We use this to arrive at the net value. The resulting numbers are taken as the estimates for "Net Assessed Property Value" in the tax-impact analysis (Table 6).

Table 6: Net Assessed Value at Build-out

	73/27	80/20	84/16
Residential	$2,103,009,412	$2,304,536,736	$2,419,657,226
Commercial	$1,646,340,929	$1,219,699,416	$975,984,674
Total	$3,749,350,340	$3,524,236,152	$3,395,641,899
Net	**$3,505,642,568**	**$3,295,160,802**	**$3,174,925,176**

Note: Net assessed value is calculated as total assessed value less 6.5%.

All three build-out scenarios are associated with a reduced proportional burden on residential property in generating tax revenue compared to the City's current development pattern. The current pattern is associated with 77% of total assessed value derived from residential property. The build-out scenarios of 73/27, 80/20, and 84/16 are associated with 56%, 65%, and 71% of total assessed value derived from residential property, respectively.

Implied Tax Rates

The implied tax rates given by the estimated values for needed property revenues and net assessed value are given in Tables 7a and 7b:

Table 7a: Implied Tax Rates, Linear Trend in Expenditures

	73/27	80/20	84/16
Needed Property Tax Revenue	$18,640,000	$18,640,000	$18,640,000
Estimated Net Assessed Value	$3,505,642,568	$3,295,160,802	$3,174,925,176
Tax Rate	**0.5317%**	**0.5657%**	**0.5871%**

Table 7b: Implied Tax Rates, Nonlinear Trend in Expenditures

	73/27	80/20	84/16
Needed Property Tax Revenue	$27,240,000	$27,240,000	$27,240,000
Estimated Net Assessed Value	$3,505,642,568	$3,295,160,802	$3,174,925,176
Tax Rate	**0.7770%**	**0.8267%**	**0.8580%**

Given a linear path of future city expenditures, the implied tax rate based on different build-out scenarios ranges from .5317% to .5871%. The current rate of .5821% falls just below that of the 84/16 build-out scenario. Given a nonlinear path of future city expenditures, the implied tax rate based on different build-out scenarios ranges from .7770% to .8580%. This reflects a 33% to 47% increase in the current tax rate. Given the assumptions of the analysis, the City can maintain a stable tax rate if expenditures follow a linear path. However, if expenditures increase along a nonlinear trend, there will be upward pressure on tax rates regardless of the development pattern.

The tax rates reported here are sensitive to certain assumptions of the analysis. The next section evaluates these assumptions in a basic sensitivity analysis.

III. Sensitivity Analysis

The analysis above is sensitive to three key assumptions. We evaluate the directional impact of these assumptions on the derived tax rates.

Assumption #1: Property taxes continue to account for 40% of total revenue.

- Any proportion <u>lower</u> than 40% will result in lower needed property tax revenues and <u>lower</u> tax rates.

- Any proportion <u>higher</u> than 40% will result in higher needed property tax revenues and <u>higher</u> tax rates.

It is possible that the proportion of total revenue from property taxes will fluctuate around 40%. For example, growth in commercial development could increase sales tax revenue, reducing the relative proportion of city revenue that derives from property taxes. We perform a flexible analysis on the impact of assumption #1, using 35% and 45% as alternate proportions of total revenue that derive from property taxes. The results are summarized in Table 8:

Table 8: Implied Tax Rates, Differential Revenue Proportions

		Build-out		
Proportion	Expenditures	73/27	80/20	84/16
35%	$46.6m	0.4652%	0.4950%	0.5137%
45%	$46.6m	0.5982%	0.6364%	0.6605%
35%	$68.1m	0.6799%	0.7233%	0.7507%
45%	$68.1m	0.8742%	0.9300%	0.9652%

This analysis suggests that the current tax rate of .5821% can be maintained only if property taxes remain under 40% of total revenue and expenditures follow a linear path to $46.6 million.

Assumption #2: City expenditures follow a predictable path.

- City expenditure growth <u>greater</u> than predicted growth will increase the necessary city revenue, and put <u>upward</u> pressure on tax rates.

- City expenditure growth <u>lower</u> than predicted growth will decrease the necessary city revenue, and put <u>downward</u> pressure on tax rates.

We are confident that the projections of city expenditures offered in this report are suitable to the analysis. Given recent trends, the linear and nonlinear projections are offered as lower and upper bounds on expenditures in 2020. Therefore, no further analysis is offered relative to assumption #2.

Assumption #3: Per-acre assessed value for residential and commercial land is constant over time.

- Any <u>appreciation</u> of residential or commercial land value will increase the per-acre contribution of residential or commercial acreage on assessed property value, putting <u>downward</u> pressure on tax rates.

- Any <u>depreciation</u> of land value will decrease the per-acre contribution on assessed property value, putting <u>upward</u> pressure on tax rates.

Future trends in per-acre residential and commercial assessed property values are the most difficult to forecast in this analysis. Without previous data on trends in acreage development, it is impossible to separate past growth in total assessed value due to physical development and that due to increases in per-acre value. This is especially difficult since residential and commercial land values will likely grow at different rates, depending on the type of development pursued by the City. We can say that for the tax rates in Table 7b to equal the current rate of .5821%, the average annual growth in total assessed property value will have to be between 3.2% and 4.0% until 2020. This seems reasonable given the 8.4% growth experienced over the past decade (recall Table 1).

IV. Conclusion

The results of this project suggest that stable tax rates can be achieved under modest assumptions about revenue structure, expenditure trends, and property values. Deviations from these assumptions can put upward pressure on tax rates, especially with an increase in the proportion of city revenue that comes from property taxes and with expenditure growth that is faster than predicted. However, even these deviations can be offset with reasonable growth in residential and commercial property values.

The greatest uncertainty derives from the growth in property values that will accompany acreage growth in residential and commercial property. This will be influenced by the type and extent of land development. An analysis of such trends is beyond the scope and resources of this project, but may be cause for future investigation by the CEDC.