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While the existence of the transit facility was welcomed by a majority of the residents, adjacent land values did decrease near three of the four facilities, however, when paring adjacent versus non-adjacent land values, the findings indicate that non-adjacent properties' land values decreased faster than the adjacent properties. Near the single transit facility where both the adjacent and non-adjacent land values increased, the non-adjacent properties had a greater percentage increase.

The areas where the transit sites are located experienced decreases in population over the period 1980 to 1990, and coincide with the general population decline that occurred within Houston's 1-610 Loop. Furthermore, it was determined via regression analysis, that the variables with the greatest influence on the changes in land value were the transit center age and changes in population. The findings indicate that the transit facility was not the overriding variable causing changes in land values.

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LAND VALUE ASSESSMENT NEAR BUS TRANSIT FACILITIES: A CASE STUDY OF SELECTED TRANSIT CENTERS IN HOUSTON, TEXAS

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Abstract

This is a study designed to measure the potential impacts of transportation facilities upon land values of contiguous properties compared to non-contiguous properties, within a quarter-mile "zone of influence". A survey was designed and randomly administered to residents within each stated zone of influence, and provided information about the residents' perception of the influence exerted by the area transit facility upon the neighborhood and land values. The results of the survey were compared to data from the Harris County Appraisal District. Census data were obtained to measure demographic changes from 1980 to 1990 and determine the relationship between socioeconomic variables and the transit facility.

While the existence of the transit facility was welcomed by a majority of the residents, adjacent land values did decrease near three of the four facilities, however, when comparing adjacent versus non-adjacent land values, the findings indicate that non-adjacent properties' land values decreased faster than the adjacent properties. Near the single transit facility where both the adjacent and non-adjacent land values increased, the non-adjacent properties had a greater percentage increase.

The areas where the transit sites are located experienced decreases in population over the period 1980 to 1990, and coincide with the general population decline that occurred within Houston's I-610 Loop. Furthermore, it was determined via regression analysis, that the variable with the greatest influence on the changes in land value were the transit center age and changes in population. The findings indicate that the transit facility was not the overriding variable causing changes in land values.

Executive Summary

Providing more efficient transit service continues to be a major objective of transportation professionals in our urban areas. One strategy has been to construct transit centers and park and ride facilities that allow the patron greater route choice and more frequent service. However, residents who live near these facilities express concern about the impacts of transportation facilities on land values. The negative connotation associated with transit use and transit riders must be removed from the public conscience before full acceptance is achieved. This study has been designed to determine the effects of selected transit facilities in Houston on adjacent land values, and compare those effects to land values on properties throughout a quarter mile "zone of influence". These transit facilities included four transit centers: Bellaire, Magnolia, Southeast, Kashmere and one park & ride: the North Shepherd Park & Ride.

A survey was designed and administered to residents within each stated zone of influence. This survey provided information about the residents' perception of the influence exerted by the area transit facility and the transit provider. The survey results were compared to data obtained from the Harris County Appraisal District. Finally census data were obtained to measure demographic changes from 1980 to 1990 and determine the relationship between socioeconomic variables and the transit facility.

While the existence of the transit facility was welcomed by a majority of the residents, adjacent land values did decrease near three of the four facilities (the North Shepherd Park & Ride does not have adjacent residential properties). However, when comparing

adjacent versus non-adjacent land values, the findings indicate that non-adjacent properties' land values decreased faster than the adjacent properties. Near the single transit facility where both the adjacent and non-adjacent land values increased, the adjacent properties had a greater percentage increase versus the non-adjacent properties. Sixty-seven percent of the survey respondents favored having a transit site in their neighborhood, although 35 percent were unsure if their land values were being affected by the transit site. Finally, 72 percent admitted to not utilizing their area transit facility.

The areas where the transit sites are located experienced decreases in population over the period from 1980 to 1990, and coincide with the general population decline that occurred within Houston's I-610 Loop. Furthermore, it was determined via regression analysis, that the variable with the greatest influence on the changes in land value were the median incomes of area residents (adjusted R^2 equaled nearly .27).

Was the existence of the transportation facility the primary cause for changes in land value? The findings indicate that the transit facility was not the overriding variable causing such a change in land values. Other variables, some of which may be present in virtually every neighborhood in Houston, may account for changes in land value throughout Houston's urban core, even in areas where transit sites are not located. This will prove to be encouraging to transit providers nationwide to indicate that the ideas of transit villages to preserve the environment and reduce congestion may be just a transit stop away.

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INTRODUCTION AND BACKGROUND

The impacts of transportation facilities on land values are of great concern to transit officials, public officials, other transportation professionals and the public in general. While the existence of a transit site[1] will ultimately "...enhance the value of nearby properties by providing greater accessibility and visibility..." (Rice Center, 1987), the negative impacts to land values adjacent to transit sites include the nuisance effect of traffic, the potential loss of residential structures, and the possibility of dislocation of business (Downs, 1982). Due to increased awareness, the public is very concerned about the net effect and long term impacts of construction of transit centers and park and ride facilities within the community[2]. The need to reduce the levels of traffic congestion on major arterials in urban areas throughout the country has led to increased levels of cooperation between local, regional, and private sector groups who have acknowledged that transportation coordination is paramount to land use and local and regional economic policies. A thorough search of literature showed that most transit site case studies were related to public transportation by rail. Few reports outlined specific effects on communities near developed bus transit sites. The study will quantify property value effects, real and perceived, of existing bus transit centers and park and ride lots of the Metropolitan Transit Authority (METRO) of Harris County in Houston, Texas.

[1] The term "transit site" includes both transit centers and park and ride facilities.

[2] Transit centers are facilities that emphasize transferability among the many express and local service routes of a particular site. Transit centers are also characterized by limited or no parking capabilities. Park and ride facilities, on the other hand, are characterized by the large numbers of parking spaces designed as a central point for carpools and vanpools, and direct non-stop bus service to the central business district (CBD) or other activity centers.

One of the direct effects transit sites on adjacent land value relates to the physical impact(s) of the terminal location and the extent of the new construction. The questions raised include: 1) How will new construction near a residential neighborhood impact the environment; and 2) What types of delays will be experienced on residential and neighborhood collector streets? Indirect effects are related to economic, visual, and social impacts as a consequence of the following: transit site construction, local employment, business activity, property values, and the relative attractiveness or aesthetics of the neighborhood adjacent to the transit site. Similar research associated with Arizona highways delineated several variables that impact land adjacent to freeways. This study will use similar methodologies as well as an examination of a variety of indicators including changes in property value, land use patterns, business composition and pattern of urban growth. (Tomasik, 1987).

Transit sites generate new points of major activity and promote development market potential (Knight, 1982). After careful analysis of many land value studies, most researchers conclude that the impacts of building a transportation facility is beneficial to the surround community. For example, rail transit facilities often generate high intensity land uses near stations that are similar to those found near highway interchanges. The impact of a transit site depends on whether land is vacant, ready for development, or developed. Public policy sometimes exerts opposite pressures on land values, so that the net result cannot be forecasted in advance with references to specific circumstances (Downs, 1982).

California has experienced mixed results in the impacts of transportation facilities and land values. Studies completed in southern California report that the impacts of a light rail

transit site were not those that were anticipated. Area transportation planners and public officials designed the transit facility in an existing railroad right-of-way in hopes of revitalizing adjacent neighborhoods and encouraging a new influx of business activity. The report states: "During the past six years there has been almost no visible improvement or development in the neighborhoods around most stations." (Loukaitou-Sideris, Banerjee, Fall 1996).

In Atlanta, the transit sites were designed to aesthetically blend into the community infrastructure. This "blending" may have contributed to an increase in residential property values in the proximity of these transit sites. Additionally, 61 percent of the commercial establishments within 500 feet of transit sites also reported an increase in income (Joint Center for Urban Mobility Research-Rice Center, 1987).

In Houston, the decentralization of businesses throughout the Houston-Galveston region to suburban locations has made the use of transit facilities and land use crucial to the overall mobility of the Gulf Coast region. A study was completed evaluating the land values within a quarter mile zone of influence of a park and ride and high occupancy vehicle (HOV) lane facility on interstate I-45 in north Houston[3]. The findings of this study indicate that the impacts upon land use and land value within the stated zone of influence to be relatively insignificant (Washington, 1987). This transit site, North Shepherd Park and Ride, will be reevaluated to examine the previous findings in light of current land and economic development in the region.

[3] An HOV lane is a barrier protected reversible lane separated from the main lanes of a highway. Usually located in the center of a highway, HOV lanes are dedicated for buses and car and vanpools where the occupancy is a minimum of two commuters. On many HOV lanes motorcycles are also permitted.

Some case studies further illustrate that many local residents do not always recognize the positive aspects resulting from a new transit facility being located in their neighborhood. Aspects such as increased mobility play a direct impact in the ability to extend the range of possible employment opportunities for a region's unemployed. Factors that may influence a region's population from fully acknowledging all of transit's benefits include, but are not limited to, increases in noise, pollution, and temporary disruption of local habits because of the increased construction activity necessary to complete a project of a rather large magnitude (Joint Center for Urban Mobility Research - Rice Center, 1987).

OBJECTIVES AND METHODOLOGY

The focal point of this research will be establishing a profile for determining what kinds of impacts transit facilities exert on the residential land values of adjacent properties compared with other surrounding properties at selected transit sites throughout the greater Houston area. The information received from HCAD indicates residential *total market value* (the total market value includes the value of the land plus any structures, if any, that may exist on that land) for contiguous properties, as well as those properties within a quarter-mile non-contiguous, or zone of influence, around each transit site using data from 1986 and 1995.[4] The 1986 residential total market values have been adjusted using the consumer price index (CPI) to constant 1995 dollars to allow for consistency in comparisons between the new adjusted value and the actual 1995 figures.[5] The actual land values necessary for comparison to quantify changes over the identified time period, and identify the perceptions of the neighboring residents of each transit site. A survey was conducted to obtain responses and ascertain those perceptions by randomly surveying residents within the identified zone of influence by mail. If their perceptions do not mirror the actual quantifiable values, the implications for the transit provider, in this case Houston METRO, may indicate an image problem associated with the service provided, transit patrons, or the transit facilities.

The methodology used in constructing these profiles includes not only an examination of perceptions and appraisal data, but also the 1990 US census data. Census data will include information regarding income, race, and numbers of housing units and occupancy rates. An

[4] HCAD's computer records begin in 1986. The written records of appraised values prior to 1986 were either unobtainable or incomplete.

[5] The CPI multiplier for the adjustment of 1986 land values to 1995 real dollars was 1.34

analysis of the 1980 versus 1990 data will indicate what types of changes have occurred during the ten year period. Even though the Houston economy experienced a downturn during the latter half of the 1980's, the data should still indicate the types of economic and social movements that influenced many neighborhoods throughout the city.

TRANSIT CENTER AND NEIGHBORHOOD PROFILES

The transit sites selected represent a spectrum of the north, northeast, east, southeast, and west communities in the Houston area, and reflect a wide range of ethnic, income and land use characteristics. The five transit sites that are the focus of this study include transit centers Bellaire, Kashmere, Magnolia, and Southeast, and the sole park and ride facility, North Shepherd. A composite of the transit centers (excluding the North Shepherd Park & Ride) is found in Table 1. All the identified transit centers provide connections to other transit sites as well as activity centers. Data from each Transit Center was obtained to determine the transportation characteristics and capabilities of each facility. Neighborhood profiles consists of information from HCAD and relevant census data from 1980 and 1990.

Table 1. Transit Center Characteristics

Transit Center	Size (in acres)	Yr. Of Operation	Number of Routes	Number of Bays	Long Term Parking Spaces	Total Boardings	Total Alightings
Kashmere	3	8/92	6	6	17	2004	1661
Magnolia	2	3/92	8	4	0	1471	1121
Southeast	7.5	9/87	9	9	0	2876	2814
Bellaire	1	12/87	5	6	0	2914	2704

Source: Metropolitan Transit Authority of Harris County, June 1997

Figure 1 shows the location of the transit sites throughout the Houston area. The neighborhoods around the transit facilities reflect the diversity consistent with the city as a whole. Median household income for 1980 has been adjusted to 1990 constant dollars for

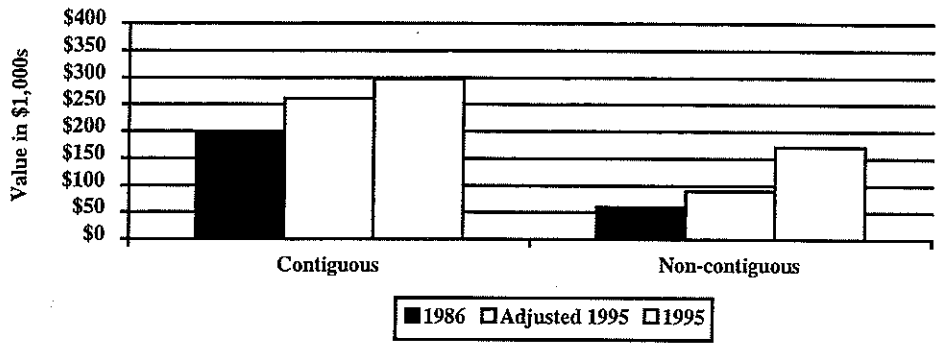
comparison with the actual 1990 figures.[6] The racial composition of the 1990 population data will be discussed to determine the relevance of ethnicity in relation to the resident's responses to the survey. The 1980 ethnicity data are not reported, as any significant racial shifts that may have occurred during the 1980s should not influence the survey respondents in 1996, or their perceptions about transit and transit use. Information about median household income and available housing, including data on the percentage of occupants who own or rent, should indicate the development or decline of the area.

[6] The CPI multiplier for the adjustment of median household income from 1980 to 1990 real dollars was 1.45.

BELLAIRE

The Bellaire Transit Center began operations in December 1987 on a one acre site in Bellaire, Texas, an incorporated city of 3.6 square miles, located adjacent to Loop 610 in southwest Houston area. As of October 1995 there were five routes serving the facility which contains six bus bays. The Bellaire Transit Center has no long term parking spaces for able bodied or disabled patrons. The average residential land value for contiguous properties, using constant 1995 dollars, increased by 12 percent, from an adjusted 1986 value of $261,258 to $297,856. The average residential land value for non-contiguous properties within the quarter mile survey area was $171,900 in 1995, which equates to a 46 percent increase (Figure 2). While both the contiguous and non-contiguous land values experienced increases, the contiguous properties' increase was 34 percent less than their non-contiguous counterparts, which may be due to their location, although the presence of the transit center may also have impacted the values.

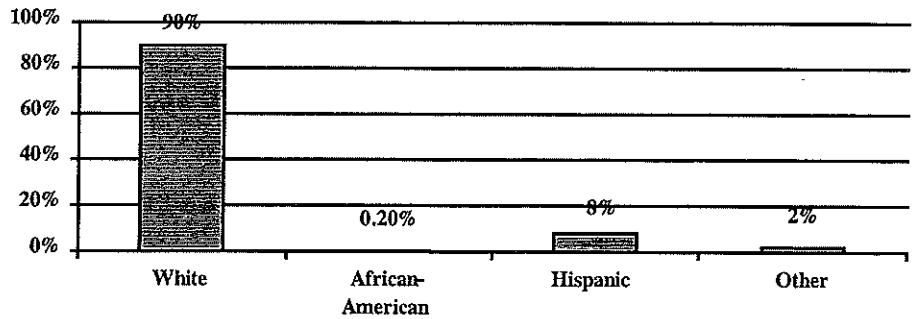
Figure 2
Mean Total Residential Market Value for the City of Bellaire



Source: HCAD, 199

In 1980 the city of Bellaire had a total population of 14,950 that decreased eight percent by 1990 to 13,842, with Anglo-Americans comprising 90 percent of the city's total population. African-Americans comprised less than one percent of the total population and those of Hispanic origins eight percent (Figure 3). The remaining two percent are listed as *other*. The median household income rose 21 percent in constant 1990 dollars from $36,149 to $45,892. Five percent of the 6,198 housing units were listed as *vacant* in 1990, roughly no change from 1980, and 75 percent of the occupied units were owned by the residents.[7]

Figure 3
1990 City of Bellaire Population



Source: 1990 US Census

KASHMERE

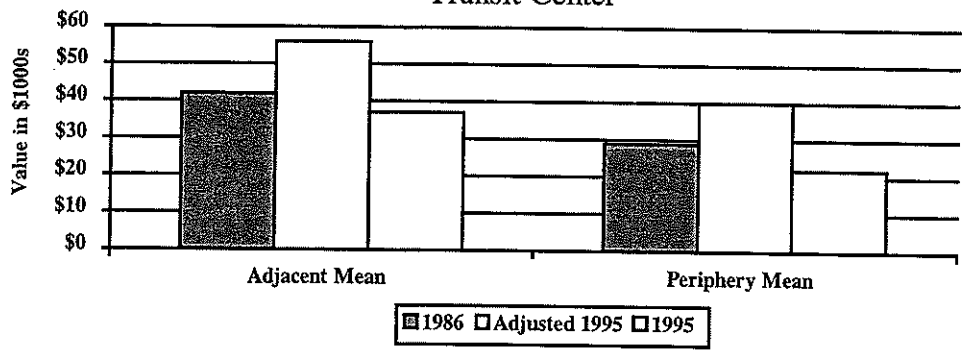
The Kashmere site began operations in August 1992, with 17 long term parking spaces, on just over three acres of land, servicing six routes with six bus bays. The average in land values decreased from $56,445 to $37,350 (-51%) in constant 1995 dollars, for

[7] Owner occupied units include individuals that own and those that mortgage the property.

contiguous properties, while the non-contiguous properties also declined in average land value by 75 percent to $22,985 (Figure 4). The difference in the significance of land values suggests the non-contiguous values decreased 24 percent faster than adjacent land values in a comparison of 1995 constant dollars.

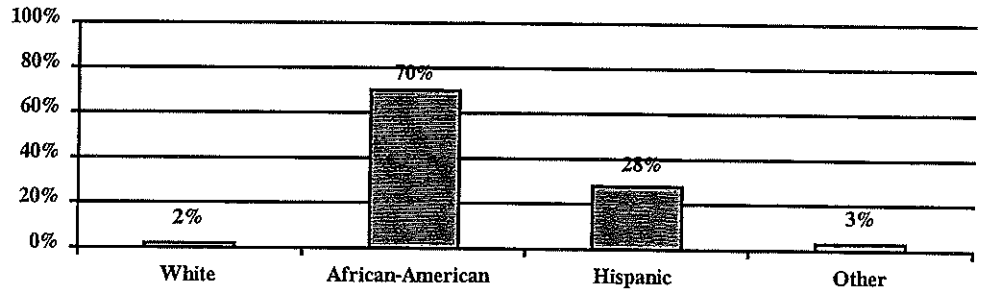
A decrease in population was experienced in the area surrounding the Kashmere Transit Center, from 2,689 in 1980 to 1,967 in 1990, a 37 percent decrease (Figure 5). The 1990 racial composition indicates two percent were Anglo-American, 70 percent African-American, 28 percent Hispanics, and less than one percent *other*. The reported median household income in 1990 was $15,383, which is a one percent increase versus the 1980 adjusted median household income of $15,237. The total numbers of housing units decreased by four percent from 1980 to 1990, and 25 percent of all housing units are vacant, a 66 percent increase from the nine percent vacancy rate in 1980.

Figure 4
Mean Residential Total Market Values near the Kashmere Transit Center



Source: HCAD, 1996

Figure 5
1990 Population near the Kashmere Transit Center



Source: 1990 US Census

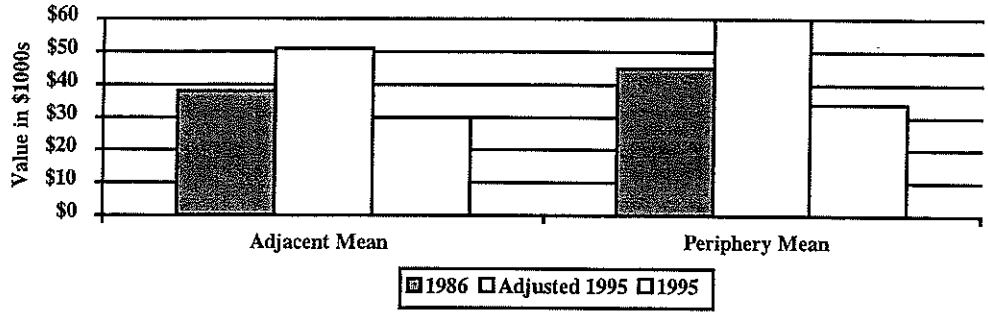
MAGNOLIA

Opening in March of 1992, the Magnolia Transit Center sits on nearly two acres of land with a total of four bus bays and access to eight METRO routes. The Magnolia site does not provide regular dedicated parking spaces or parking spaces for the disabled. Examination of the Magnolia transit center's average land values indicates decreases in contiguous as well as non-contiguous properties. The contiguous average land values decreased by 68 percent to $30,630 in 1995, and the non-contiguous land values within the zone of influence decreased 76 percent to $34,601 in 1995 constant dollars (Figure 6). The difference in percentage change between the contiguous land values versus the non-contiguous land values verify that the non-contiguous values decreased eight percent faster than the contiguous properties.

In 1980, the area population was 7,131 and decreased 15 percent to 6,214 in 1990, a decrease of 15 percent, of which 94 percent were all listed as Hispanic (Figure 7). The

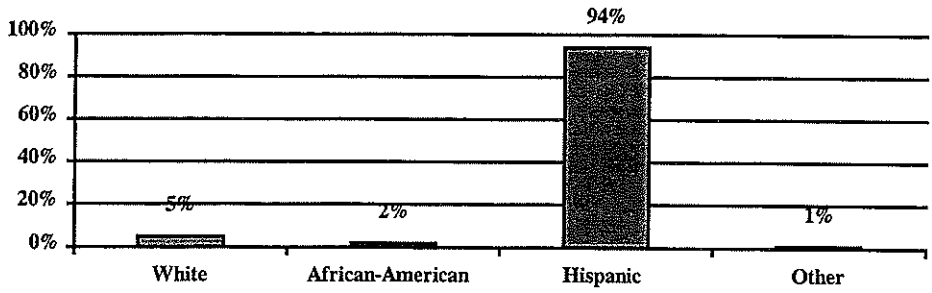
median household income decreased 10 percent from $20,309 to $18,483 in constant 1990 dollars. A 16 percent decrease was also experienced in the total number of housing units, from 2,204 to 1900 in 1990, and 87 percent were occupied, indicating a vacancy rate of 13 percent, with 58 percent of the occupied units being inhabited by the housing unit's owner. Conversely, there was a seven percent vacancy rate in 1980 with 41 percent of the occupied units belonging to the owner.

Figure 6
Mean Residential Total Market Values near the Magnolia Transit Center



Source: HCAD, 1996

Figure 7
1990 Population near the Magnolia Transit Center

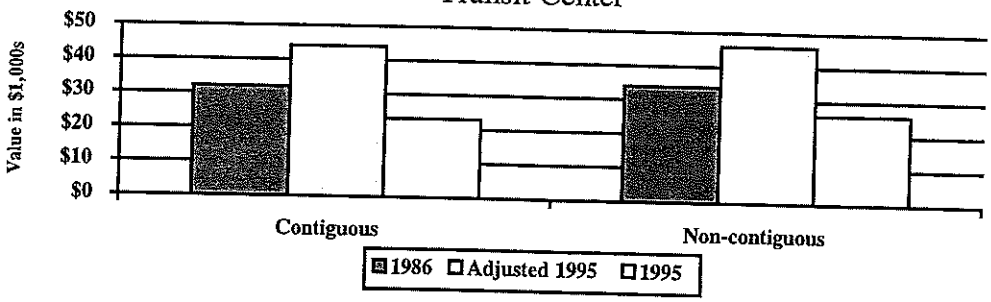


Source: 1990 US Census

SOUTHEAST

The Southeast Transit Center, established in the fall of 1987, is a facility with nine bus bays and five drop-off parking spaces supporting nine METRO routes. The land values for both the contiguous and non-contiguous properties decreased near the Southeast transit center, 68 percent and 76 percent respectively (Figure 8). The significance in the percentage change between the contiguous and non-contiguous properties indicates the non-contiguous values decreased eight percent faster than the contiguous properties.

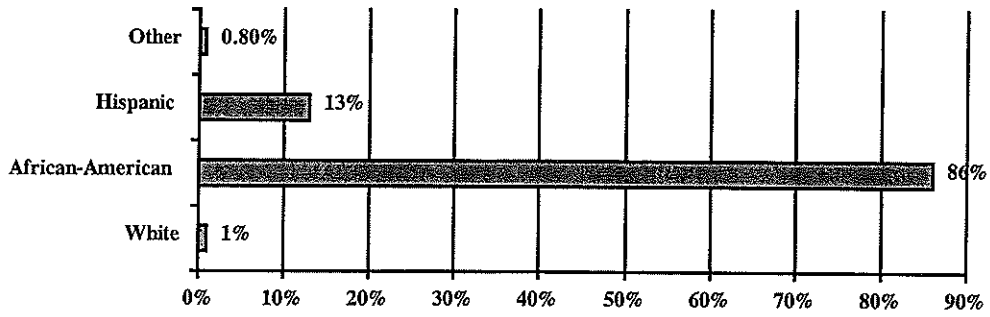
Figure 8
Mean Residential Total Market Values near the Southeast Transit Center



Source: HCAD, 1996

The neighborhood surrounding the Southeast Transit Center, had a total population of 4,826 residents in 1990, a 28 percent decrease from 1980 (Figure 9). The racial composition from the 1990 data indicates that 86 percent of the population were African-Americans, one percent Anglo-Americans, 13 percent Hispanic, and less than one percent classified as *other*. The total housing units equaled 1,891, a 14 percent decrease from the over two thousand available housing units in 1980, with only 14 percent listed as vacant and unoccupied in 1990. Of the 86 percent occupied units, 53 are occupied by the owner. Conversely, in 1980 there were 1,963 total occupied units (91 percent) and only 9 percent were listed as vacant. The median household income for this neighborhood was reported at $14,139 in 1990, a 35 percent decrease from the adjusted 1980 figure of $19,098.

Figure 9
1990 Population Data near Southeast Transit Center



Source: 1990 US Census

NORTH SHEPHERD

The North Shepherd Park and Ride lot was established in April 1980 with a total site acreage of nearly 22 acres. Five routes serve the facility with two bus bays, and a total of 1,603 parking spaces (1,550 long term, 43 drop-off, and 10 ADA parking spaces). The sole park and ride facility in this study, the North Shepherd Park & Ride, does not have residential properties that are adjoining the facility, as the nearest residents are located several blocks away. Therefore, all market value responses have been classified as non-contiguous values. The average land value decreased by 49 percent from $32,677 to $21,886 in 1995 real dollars (Figure 10).

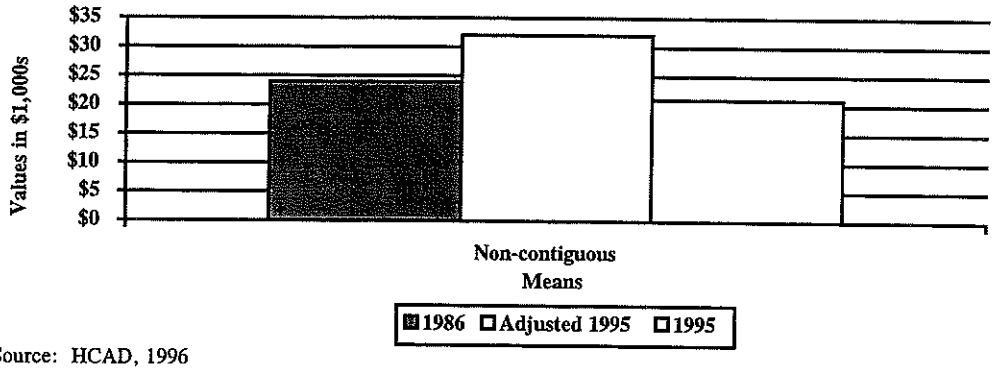
In 1990, ninety-five percent of the area population of 6,066 are African-Americans (Figure 11) with a median household income of $10,514. In 1980 the population was 7,612

and the adjusted median household income was $19,347, which indicates decreases in population of 25 percent, and in median household income of 27 percent. Of the total housing units in 1990 (2,390), the vacancy rate was 18 percent, and 58 percent of those in the occupied units were the owners. Whereas in 1980, the vacancy rate was nine percent, and 66 percent were owner occupied, pointing out a 49 percent increase in vacancy rates from 1980 to 1990.

The final analysis of census data involved the examination of the identified variables on a city-wide basis. The population of the city of Houston increased two percent from 1980 to 1990 to over 1.6 million, while the total numbers of housing units also increased by seven percent. In 1990 there was a vacancy rate of 15 percent compared to 11 percent in 1980, and 45 percent of the units were owner occupied, whereas 48 percent were owner occupied in 1980. Comparing median household income indicates a 46 percent increase using constant 1990 dollars to $26,261 from $14,309.

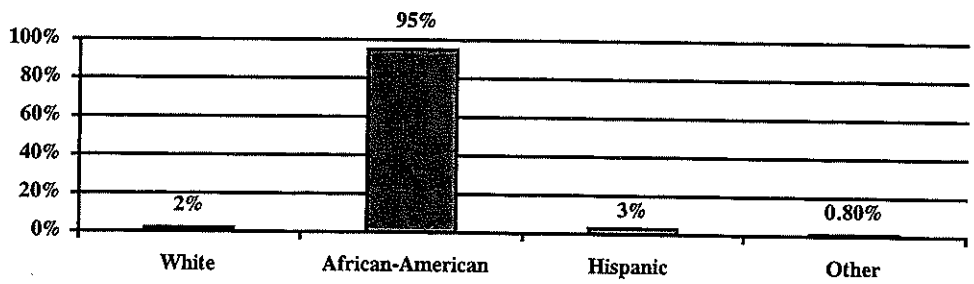
Compared to the baseline figure of the city as a whole, the population, median household income and total housing units increased city-wide by 2 percent, 46 percent, and 7 percent, respectively. Thus, the neighborhoods near the transit centers, in general did not show values as high as the city as a whole. All the transit sites identified for this study experienced decreases in population over the period 1980 to 1990. All but four of the transit sites witnessed a decrease in the total numbers of available housing for area residents. And only two transit sites showed an increase in median household income, one percent near Kashmere, and 21 percent near Bellaire.

Figure 10
Mean Residential Total Market Values for Non-contiguous Properties near the North Shepherd Park & Ride



Source: HCAD, 1996

Figure 11
1990 Population near the North Shepherd Park & Ride Facility



Source: 1990 US Census

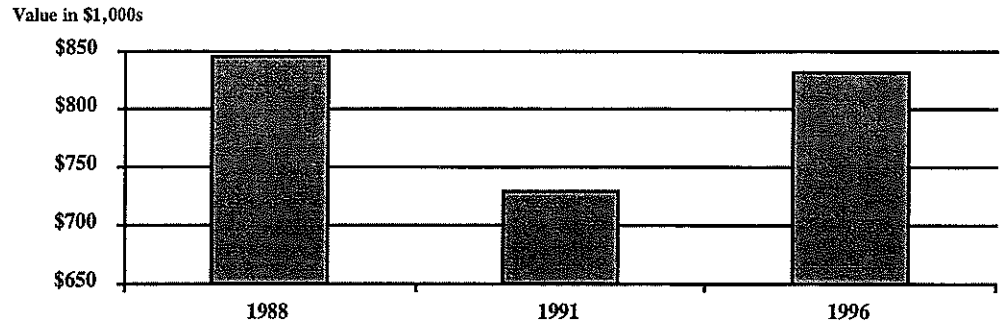
NEIGHBORHOOD COMMERCIAL PROFILES

Commercial properties were randomly selected to determine relative changes in their average land values, regardless of their location within the quarter mile zone of influence around each transit facility. While the oldest HCAD computer data available for residential properties goes back to 1986, the computer data begins in 1988. Three points of data were obtained for the commercial properties: 1988, 1991, and 1996. The data indicated that there were fluctuations in the average values that would not have been evident with just two data points. All 1988 and 1991 values have been inflated to 1996 real dollars for a more accurate comparison.[8]

Near the Bellaire facility, the commercial properties averaged nearly $850,000 in 1988, after inflating to 1996 dollars, and decreased 16 percent by 1991 (Figure 12). However, a recovery was made between 1991 and 1996 of 12 percent. The Kashmere facility had an average commercial value just exceeding $190,000 in 1988 and experienced a decrease between 1988 and 1996 of 51 percent, to an average value just exceeding $126,000 (Figure 13).

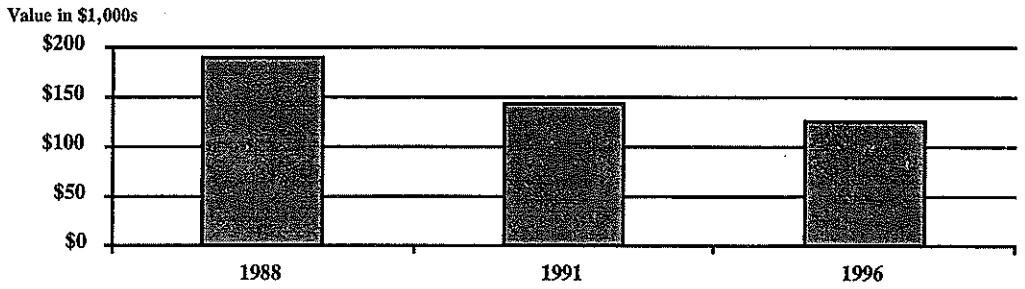
[8] The CPI multiplier for 1988 values is 1.32, while the multiplier for 1991 values is 1.15.

Figure 12
Average Commercial Property Values, Bellaire, Tx



Source: HCAD, 1997

Figure 13
Average Commercial Property Values, Kashmere Transit Center

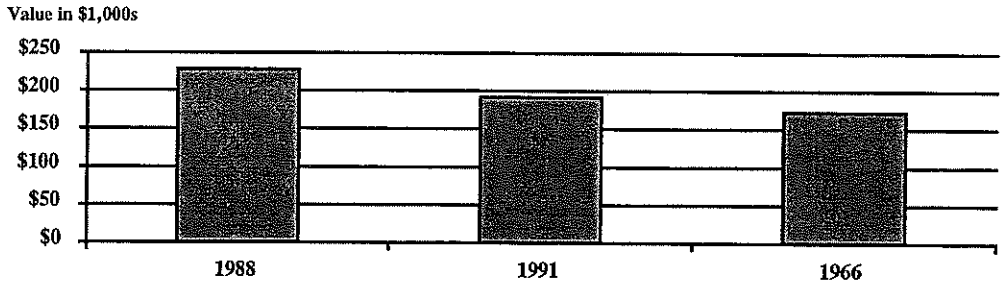


Source: HCAD, 1997

The commercial properties located near the Magnolia site decreased 18 percent between 1988 and 1991, and had an overall decrease of 32 percent by 1996 (Figure 14). In 1988 the commercial values near the Southeast Transit facility exceeded $216,000 and decreased 39 percent by 1991. However, those values increased 29 percent by 1996, indicating a percentage difference from 1988 to 1996 of only one percent (Figure 15). The only average commercial values that experienced increases from 1986 to 1991 occurred near the North Shepherd facility, where an increase of 19 percent was realized (Figure 16). By 1991 the commercial properties experienced a decrease of eight percent to just over 1.3 million and recovered by 13 percent in 1996.

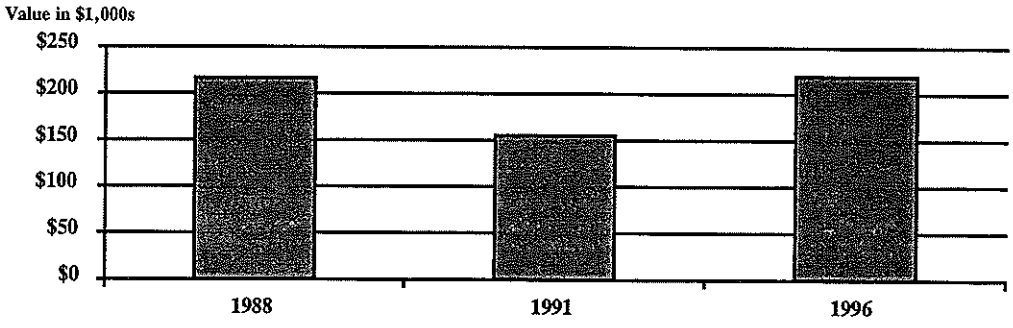
Four of the five averages for commercial properties experienced a decline in values from 1988 to 1991, and may be explained by the overall sluggishness of the Houston economy at the end of the 1980's. By 1996, the average commercial values near the newest transit centers, Magnolia and Kashmere (both began operations in 1992), were continuing a downward trend, as both experienced declines between 1988 and 1996 of 32 and 51 percent, respectively. However, the commercial values near the older transit centers, Bellaire and Southeast (both began operations in 1987), began to show positive increases by 1996, from the previous five year point of 1988. This may indicate that the commercial values near the older facilities have stabilized after the initial flurry associated with the construction and transition periods when new businesses are trying to establish themselves. It is expected that the neighborhoods near the newer facilities will also experience similar stability by the year 2000, and commercial values should begin to show signs of recovery.

Figure 14
Average Commercial Property Values, Magnolia Transit Center



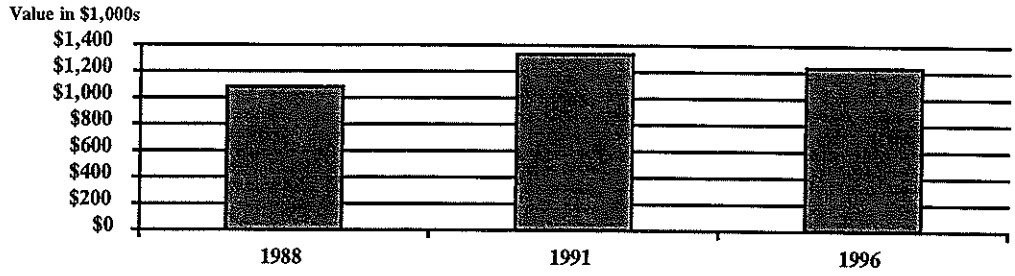
Source: HCAD, 1997

Figure 15
Average Commercial Property Values, Southeast Transit Center



Source: HCAD, 1997

Figure 16
Average Commercial Property Values, North Shepherd Park and Ride



Source: HCAD, 1997

STATISTICAL ANALYSIS

There are several factors that are known to influence land value, including accessibility to highways, proximity to industrial sites and other job opportunities, and local zoning laws. Transportation and public officials have for decades touted highways and proximity to public transit (usually light-rail or trolleys) as an economic generator for the region, where property values would automatically increase. Recent studies have shown, however, that there may be several additional variables that contribute to the increased valuation or devaluation of land values. Loukaitou-Sideris and Banerjee (1996) examined why land values did not increase in neighborhoods adjacent to light-rail stations in Southern California, and discovered four variables were absent from these communities: significant population, strong local economy, sustained political commitment, and neighborhood amenities.

Other studies have provided varied results in proving the absolute relationship between land value and the proximity to transit. In Miami, the announcement of the Miami metrorail system "weakly" affected the sales prices of homes in the proposed area. However, in Portland, single-family homes located within 500 meters of their light-rail line sold for more than 10 percent higher than comparable homes located beyond that distance (Cervero and Landis, 1995). Based on recent studies, we determined the variables that may have the greatest influence on land values were population, median income, the age of each transit center, vacancy rates, and owner occupied housing units in the zone of influence near each transit site.

A standard regression analysis was performed to determined the strength of the variables. The dependent variable for our regression analysis was the change in adjacent property values (1980-1990), and the independent variables were: change in the vacancy of housing units (1980-1990), transit center age, change in median income (1980-1990), and the change in population (1980-1990). The coefficient data from the regression as found in Table 1. Of the four independent variables used in the initial regression analysis, the age of the transit center and the change in population had the greatest explanatory power. The land values seem to be stronger when the transit center is older.

Table 2. Statistical Analysis Results

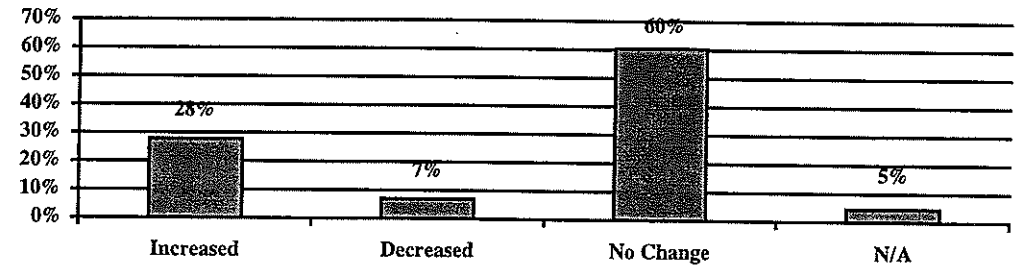
	Standard Coefficient (Beta)	t	Sig.
Transit Center Age	1.063	.613	.544
Change in Median Income (1980-1990)	.534	1.263	.216
Change in Population (1980-1990)	1.087	.740	.464
Change in Vacancy (1980-1990)	.050	.324	.748
$R^2 = .352$ Adjusted $R^2 = .273$			

FINDINGS - PROPERTY SURVEYS

Surveys were mailed to randomly selected residents located adjacent to the transit sites and throughout the quarter-mile zone of influence. Consisting of four sections (land value assessment, attitude, relativity, and socio-economic status) the surveys were designed to assess the perceptions of the property owners, or inhabitants, concerning their land values and the possible effects, negative or positive, of being located next to a transit site. The response rate from the over 900 surveys distributed was nearly 5 percent; and thus should be considered anecdotal.

In the first section measuring land value, the residents were asked to indicate if any changes had occurred in their property values since their respective transit site began operations. Over 60 percent responded that their property values had remained the same, and 28 percent felt their property values had in fact increased during this time period (Figure 17). Almost seven percent indicated a perceived decrease in land value, and the remainder did not respond to this question.

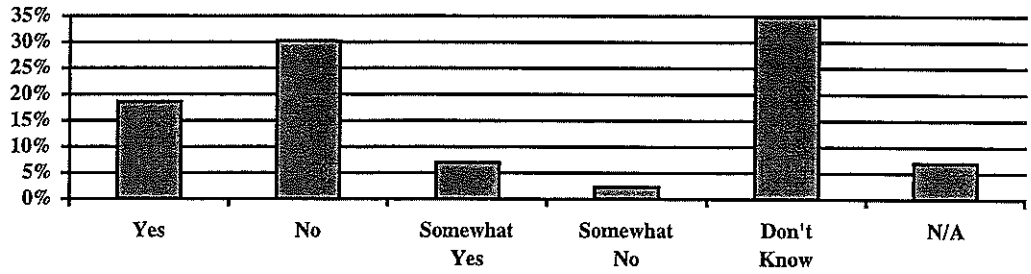
Figure 17
"Has your property value increased, decreased, or remained the same since the development of the transit site?"



Source: CTTR, 1996

The respondents were then asked if they felt the existence of the transit center had a direct influence on their property values. Thirty-five percent were *not sure*, another 30 percent indicated *no*, and 19 percent replied *yes* (Figure 18). When asked if they, the residents, had made any improvements to their homes since the development of the local transit site, 60 percent indicated that they had in fact made home improvements. Of that 60 percent, over 25 percent remarked that the home improvement involved the installation of a new roof, and almost 21 percent indicated that the construction involved new structures.

Figure 18
"Do you feel the transit center has impacted the value of your property?"



Source: CTTR, 1996

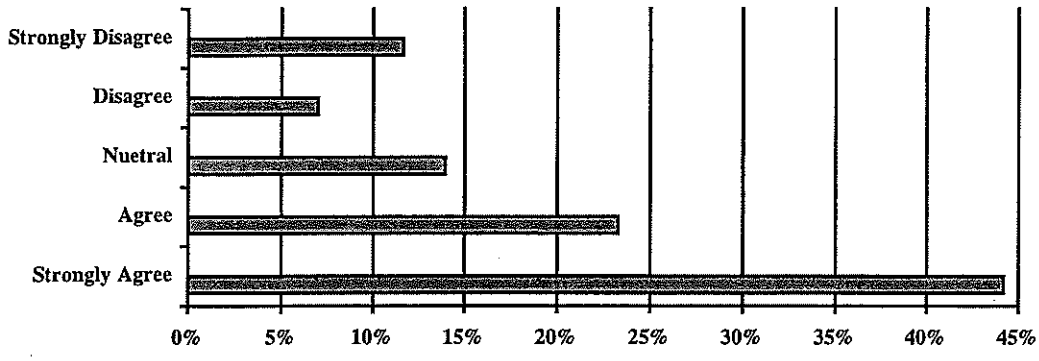
Using the indicators of local roads, highways, levels of traffic, the creation of new business, and the overall neighborhood environment, the survey asked residents whether they have noticed any significant improvements since the development of their local transit site. Forty-four percent *agreed/strongly agreed* that improvements had been made to local roads, conversely, 16 percent strongly agreed to recognizing improvements to local highways, while 23 percent *strongly disagreed* that local highways improved. Twenty-three percent *strongly disagreed* that traffic had improved since the opening of the local transit center and nearly 24 percent were ambivalent about traffic conditions. Twenty-five percent *strongly agreed* that new businesses had improved, and nearly 21 percent also *strongly agreed* to recognizing improvements in their neighborhood.

The same indicators (local roads, highways, levels of traffic, the creation of new business, and the overall neighborhood environment) were then used to query the survey respondents to indicate their impressions regarding any level(s) of deterioration that may

have occurred as a result of the development of a local transit center. Twenty-three percent *strongly disagreed* and 33 percent *disagreed/strongly* disagreed to noticing any form of deterioration in area roads and highways, respectively. Nine percent *strongly agreed* to recognizing some form of decline in local businesses, while another 23 percent *strongly disagreed* that deterioration had occurred.

The second section of the survey, measuring attitudes, asked the respondents to reply to five questions with optional responses ranging from strongly agree to *strongly disagree.* When asked the question, *"I favor this transit site being located in my area?"*, 44 percent strongly agreed while only 12 percent strongly disagreed (Figure 19). Forty-seven percent *strongly agreed* that a transit site was needed in their area, and 56 percent *agreed/strongly agreed* that the local transit site enhanced the attractiveness of their neighborhood. Five percent of those surveyed indicated that they *strongly agreed* to the question, *"I feel that the development of the transit site has deprived my neighborhood of existing businesses?"* Further, 30 percent *strongly agreed* that the enhancement of local transit has promoted business in their area, however, 24 percent *strongly disagreed.*

Figure 19
"I favor this transit site being located in my area"



Source: CTTR, 1996

Questions concerning transit site utilization by area residents comprised the third section of the residential survey. When asked "*How many days per week do you use the transit site?*", the overwhelming response (72 percent) was *zero*. Eighty-eight percent own/mortgage their homes, and 70 percent have lived in their respective neighborhoods 16 years or more. Socio-economic status comprised the final section of the survey and asked residents to identify their age category, gender, income level and ethnicity. The largest age class was the 40-49 group with 33 percent; 63 percent of the respondents were female; the dominant income grouping was the $11,000 to $15,999 with 16 percent; and 63 percent of the respondents were African-American.

SUMMARY

The objective of this study was to determine the effects of five transit sites on the land values of the neighborhoods where they are located in the greater Houston area. Of particular interest, was the land values of contiguous properties and whether any changes that may have occurred affected them disproportionately versus non-contiguous properties. Residents within this zone of influence were randomly selected to complete a survey designed to gauge their perceptions of their land values and the possible impacts upon those values by the existence of a transit site in their neighborhood. The 1990 census data were used to gain relevant demographic information about the neighborhoods where the transit sites are located to assist in the analysis. To contrast the perceived impacts, randomly selected homes were researched using HCAD data to gather quantifiable changes in land value from 1986 to 1995. To protect the privacy of individual property owners, no personal information has been recorded in this study nor was it obtained by the research staff. Some of the findings include:

- The HCAD data indicate for all transit centers the average land values decreased for contiguous and non-contiguous properties, except one. The Bellaire site had increases in land values in both contiguous and non-contiguous properties. Using actual 1986 and 1995 land values the decreases ranged from 13 percent to 40 percent for contiguous tracts, and 28 percent to 31 percent for non-contiguous properties. However, residents did not perceive these decreases as 60 percent of the survey respondents indicated that they felt their land values had remained the same, and 28 percent felt their land value had actually

increased since the opening of the transit site in their neighborhood. In the case of the survey respondents near the Bellaire site, where the land values did increase, 25 percent answered affirmatively that the transit site had affected their land values. The average land values of contiguous properties actually increased 35 percent, while the averages for the non-contiguous properties increased 60 percent, the greatest percentage change of all the identified transit centers.

- Although all properties decreased near Kashmere and Magnolia, the contiguous properties did not decrease as much as non-contiguous properties.
- The transit center with the greatest percentage decreases in land values was the Southeast transit center where the change in contiguous properties was -40 percent and non-contiguous values were -28 percent. Incidentally, African-Americans made up 82 percent and Hispanics comprised 13 percent of the population near the Southeast site, while Ango-Americans made up only one percent of this neighborhood.
- The second greatest percentage change in land value averages occurred near the Magnolia transit center where contiguous properties decreased 26 percent and non-contiguous properties decreased 31 percent. In this case the contiguous properties had the higher land value. The racial composition near this site is as follows: Hispanics 94 percent, African-Americans less than one percent, Anglo-Americans five percent, and all

others one percent. The Magnolia Transit Center also had the largest number of renters in occupied housing.

- In the city of Bellaire, the location of the Bellaire Transit Center, African-Americans comprise less than one percent of the population, while Anglo-Americans made up 90 percent of the residents.
- The North Shepherd Park and Ride had the largest number of vacant housing (18 percent) and the smallest percent change in median average for non-contiguous land values (a 2 percent decrease.)
- Over the past five years the average commercial land values increased. The commercial properties near the North Shepherd transit site increased 34 percent to over $1.2 million during 1986 to 1996, the greatest percentage increase of all the transit sites. The commercial properties near Kashmere decreased 14 percent to slightly over $125,000, the greatest percentage decrease.
- Seventy-two percent of the survey respondents indicated that they do not utilize their local transit facility.
- Thirty-five percent of the survey respondents were unsure if the transit site had any impact at all on their land values.
- Sixty-seven percent agreed/strongly agreed to favoring a transit site in their neighborhood.

As previously noted, the Bellaire Transit Center was the only site to show actual increases in averages of contiguous land values. There is not sufficient evidence to conclude

that the existence of the transit site was the sole variable causing the increases. Likewise, since the contiguous and non-contiguous land values decreased near the other transit sites, there is not adequate information to accurately assume the location of the transit facility was the sole factor responsible for such decreases. When asked to assess the changes in their land values, 60 percent of the survey respondents indicated that their perception was that their property values had remained the same. Another 28 percent felt the property values had increased. To these residents, the existence of the transit facility did not negatively affect their land values.

There are many other relationships and factors that need to be addressed when examining the existence, or location, of transit centers and park and ride lots, and causes of increases or decreases in land value. For example, what is the relationship between income, racial composition, and land values? Is there a correlation between length of residence in a neighborhood and transit usage? Have new businesses appeared and flourished solely because of the traffic generated by transit facilities? The comparison between the average land values indicates that overall contiguous properties held their values better than their non-contiguous counterparts, even where there was a general decline in land values in the area.

As the nation pursues the concepts of livable communities where transportation facilities are the focal points of neighborhood design, these findings should be encouraging to urban developers and transit agency officials. In three of four instances, contiguous land values were better than the non-contiguous land values. All the commercial land values were beginning to indicate strong economic recovery after a period of general sluggishness city-wide. Therefore, bus facilities alone exert no greater influence, negative or positive, on the residential land values of adjacent properties compared with other non-contiguous properties

in the areas surrounding the transit sites. Cervero and Landis may have been accurate when they made the following statement after studying the relationship between transportation and land use: "While transit matters to housing prices in many locations, it may not matter enough. This suggests a potential role for local, transit-supportive land use policies." (Cervero and Landis, 1995)

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Appendix A - Transit Center Data

	Bellaire Transit Center	
	1986	**1995**
Contiguous Properties		
Average	$194,969	$297,856
Median Average	$117,300	$218,600
Non-Contiguous Properties		
Average	$69,453	$171,900
Median Average	$68,350	$117,950

	Kashmere Transit Center	
	1986	**1995**
Contiguous Properties		
Average	$42,123	$37,350
Median Average	$37,370	$33,250
Non-Contiguous Properties		
Average	$29,973	$22,985
Median Average	$25,050	$21,000

	Magnolia Transit Center	
	1986	**1995**
Contiguous Properties		
Average	$38,472	$30,630
Median Average	$36,100	$31,000
Non-Contiguous Properties		
Average	$45,484	$34,601
Median Average	$39,100	$29,300

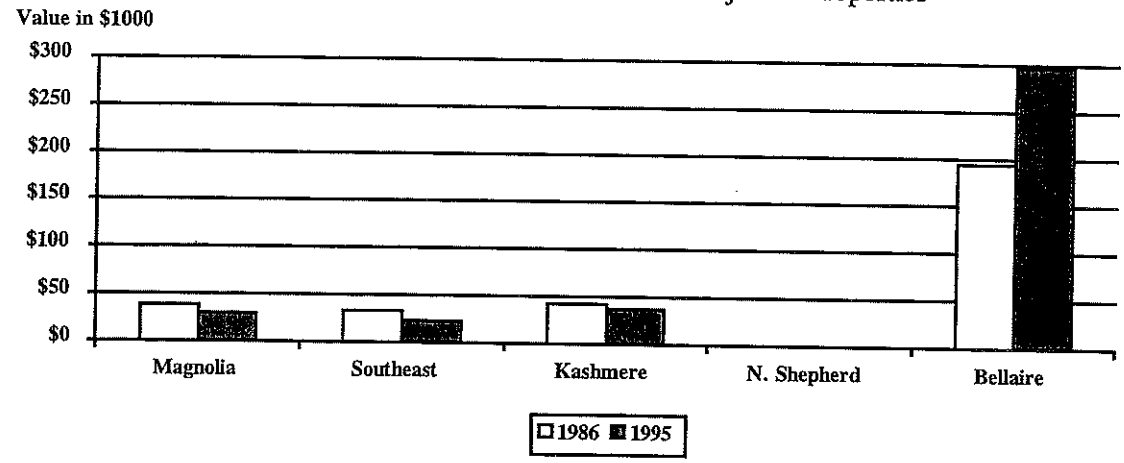
	North Shepherd Park and Ride	
	1986	**1995**
Contiguous Properties[9]		
Average	N/A	N/A
Median Average	N/A	N/A
Non-Contiguous Properties		
Average	$24,386	$21,886
Median Average	$15,645	$15,340

[9] Because of the location of the North Shepherd Park and Ride there are no contiguous properties as found in the other transit sites.

	Southeast Transit Center	
	1986	**1995**
Contiguous Properties		
Average	$33,186	$23,629
Median Average	$33,600	$23,000
Non-Contiguous Properties		
Average	$34,491	$26,918
Median Average	$34,400	$25,800

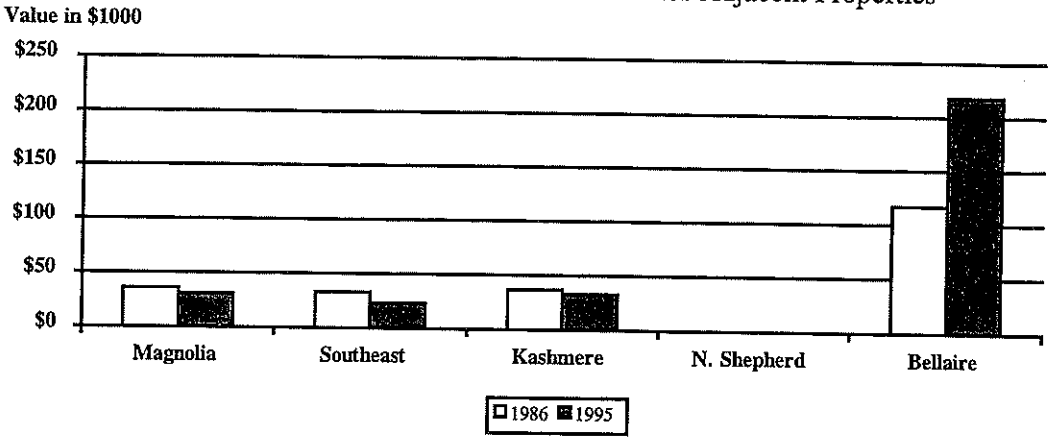
Appendix B - Misc. Residential Survey Data

Figure B-1
Mean Residential Total Market Values for Adjacent Properties



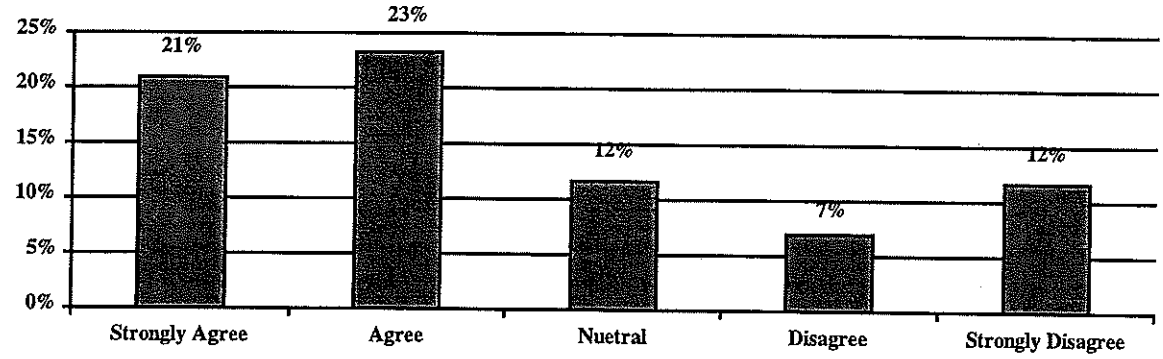
Source: Harris County Appraisal District, 1996

Figure B-2
Median Residential Total Market Value for Adjacent Properties



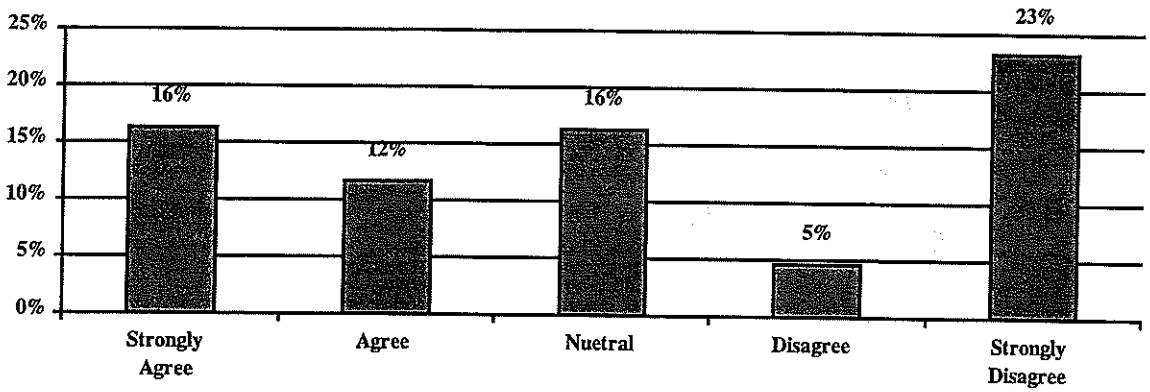
Source: Harris County Appraisal District, 1996

Figure B-3
"Since the development of the transit site, valuable improvements have been noticed on the area's roads."



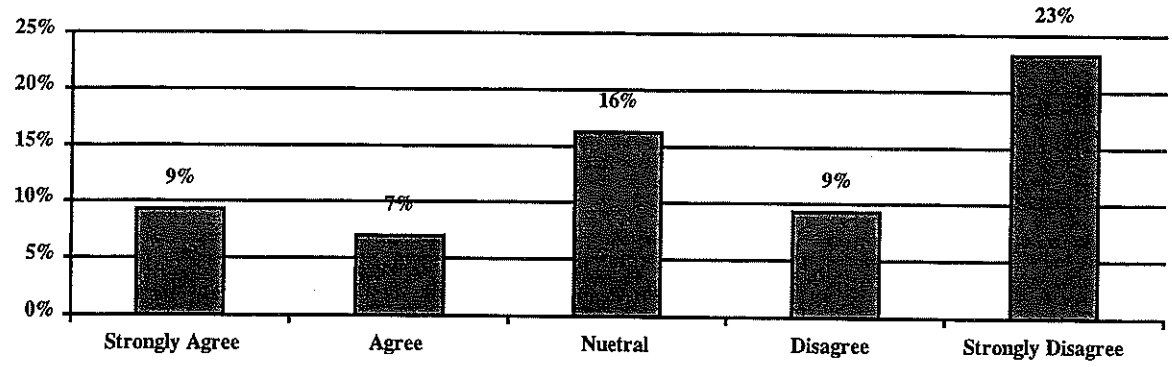
Source: CTTR, 1996

Figure B-4
"Since the development of the transit site, valuable improvements have been noticed on the area's highways."



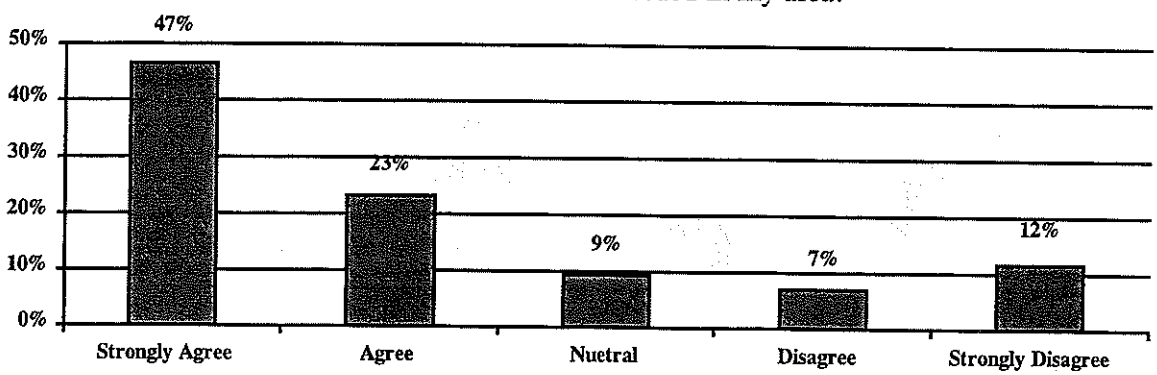
Source: CTTR, 1996

Figure B-5
"Since the development of the transit site, deterioration has been noticed on the area's businesses."



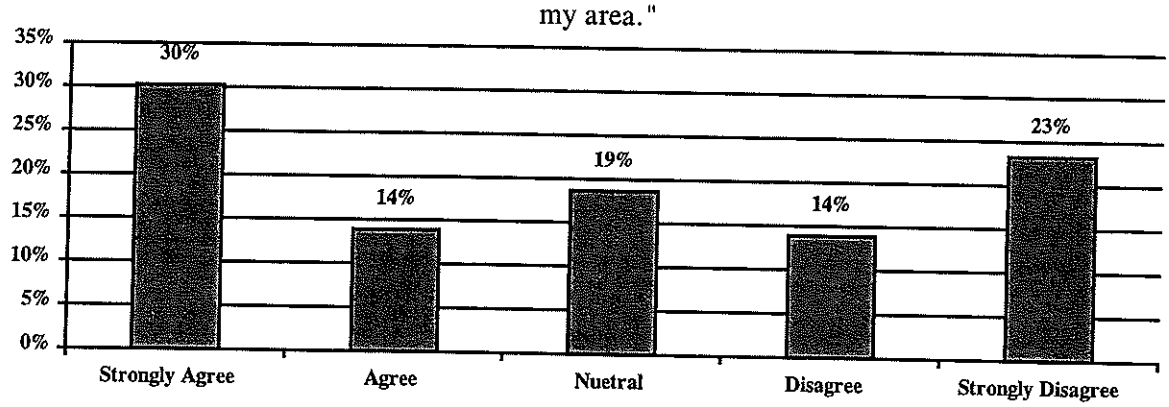
Source: CTTR, 1996

Figure B-6
"I feel that this transit site was needed in my area."



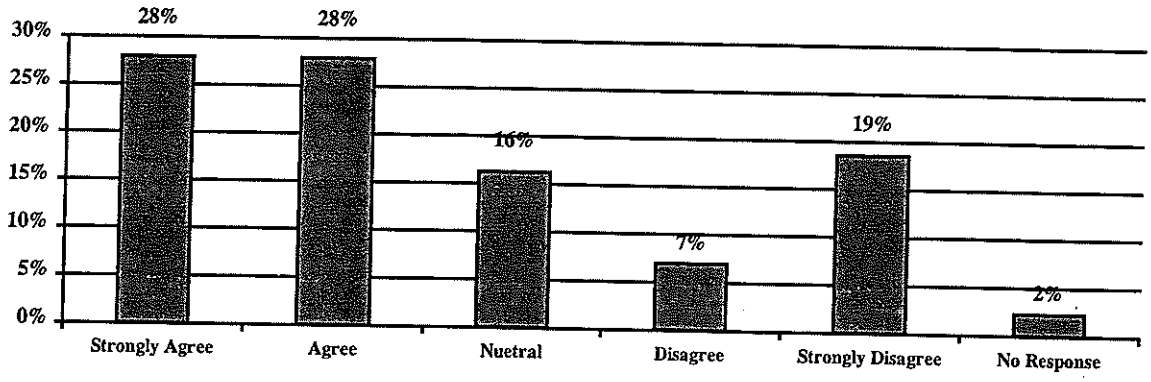
Source: CTTR, 1996

Figure B-7
"I feel that the development of the transit site has promoted business in my area."



Source: CTTR, 1996

Figure B-8
"I feel the site has enhanced the attractiveness of my neighborhood."



Source: CTTR, 1996

Appendix C - A Case Study: Land Value Assessment Near Transit Facilities
QUESTIONNAIRE

The following questions attempt to evaluate the changes that have occurred in your area since the transit center has opened. Your cooperation will be greatly appreciated and will contribute to our knowledge about transit centers' effect on neighborhoods.

LAND VALUE ASSESSMENT

1. Which transit site are you near ? _____
   a) Bellaire c) Kashmere Gardens e) Magnolia
   b) Southeast d) North Shepherd

2. Has your property value _____ since the development of the transit site?
   a) increased b) decreased c) no change

3. How much has the value of your property decreased since the opening of the transit site? _____

a)	none	g)	$11,000 - $12,999
b)	less than $499	h)	$13,000 - $15,999
c)	$500 - $1,999	i)	$16,000 - $18,999
d)	$2,000 - $4,999	j)	$19,000 - $21,999
e)	$5,000 - $7,999	k)	$22,000 - $24,999
f)	$8,000 - $10,999	l)	$25,000 - more

4. Do you feel the transit center has impacted the value of your property? _____
   a) yes c) somewhat yes e) don't know
   b) no d) somewhat no

5. Have you made any improvements to your property, since the development of the transit site?
   a) no b) If Yes, in what areas (i.e. new roof, paint -interior/exterior):

   _____

6. Since the development of the transit site, valuable improvements have been noticed on the _____:

		AGREE				DISAGREE
a.	Roads	1	2	3	4	5
b.	Highways	1	2	3	4	5
c.	Traffic	1	2	3	4	5
d.	Creation of new businesses	1	2	3	4	5
e.	Neighborhood environment	1	2	3	4	5

7. During the development of the transit site, deterioration has been noticed on the ___:

		AGREE				DISAGREE
a.	Roads	1	2	3	4	5
b.	Highways	1	2	3	4	5
c.	Businesses	1	2	3	4	5
d.	Residences	1	2	3	4	5
e.	Neighborhood environment	1	2	3	4	5

The following questions attempt to evaluate the feelings of residents and businesses in proximity to transit sites:

ATTITUDES

		AGREE				DISAGREE
1.	Do you favor this transit site being located in your area?	1	2	3	4	5
2.	Do you feel that this transit site was needed?	1	2	3	4	5
3.	Do you feel that the transit site has enhanced the attractiveness of your neighborhood?	1	2	3	4	5
4.	Do you feel that the development of the transit site deprived your neighborhood of existing businesses?	1	2	3	4	5
5.	Do you feel that the development of the transit site will promote businesses in your area?	1	2	3	4	5

RELATIVENESS

1. How many days a week do you use the transit site? _____
   a) 1 - 2 b) 3 - 4 c) 5 - 6
   d) 7 e) never

2. Do you _____ in this area?
   a) live b) live & work c) own a business/work

3. Do you _____ your property?
   a) own b) mortgage c) lease d) rent

4. How long have you resided or done business in this area? _____
   a) 1 yr or less d) 6 yrs - 7 yrs g) 12 yrs - 13 yrs
   b) 2 yrs - 3 yrs e) 8 yrs - 9 yrs h) 14 yrs - 15 yrs
   c) 4 yrs - 5 yrs f) 10 yrs - 11 yrs i) 16 yrs or more

5. What is your address? _____
   zip code

SOCIO-ECONOMIC STATUS

1. What is your age category? _____

a)	18 - 24	c)	31 - 39	e)	50 - 59	g)	70 - 79
b)	25 - 30	d)	40 - 49	f)	60 - 69	h)	80 - above

2. Are you _____?

a) female b) male

3. What is your annual income range? _____

a)	$10,000 or less	e)	$28,000 - $33,999	i)	$52,000 - $57,999
b)	$11,000 - $15,999	f)	$34,000 - $39,999	j)	$58,000 - $63,999
c)	$16,000 - $21,999	g)	$40,000 - $45,999	k)	$64,000 - $69,999
d)	$22,000 - $27,999	h)	$46,000 - $51,999	l)	$70,000 - above

4. What is your ethnic background? _____

a)	African American	c)	Anglo-Saxon	e)	Hispanic
b)	American Indian	d)	Asian/Pacific Islander	f)	Other

Your Comments Are Important To Us.....

1) What advice would you give METRO?

_____

_____

_____

2) What advice or suggestions do you have regarding transit centers?

_____

_____

_____

THANK YOU!

Card Number:
TSU/CTTR/CL/95

Responses to Questionnaire

Section: Land Value Assessment

		Count	Percent
1.	A.	12	27.91
	B.	10	23.26
	C.	12	27.91
	D.	5	11.63
	E.	2	4.65
	99.	2	4.65
2.	A.	12	27.91
	B.	3	6.98
	C.	26	60.47
	99.	2	4.65
3.	A.	21	48.84
	B.	1	2.33
	C.	1	2.33
	D.	1	2.33
	E.	1	2.33
	F.	1	2.33
	G.	2	4.65
	H.	2	4.65
	I.	2	4.65
	99.	11	25.58
4.	A.	8	18.6
	B.	13	30.23
	C.	3	6.98
	D.	1	2.33
	E.	15	34.88
	99.	3	6.98
5a.	A.	17	39.53
	B.	26	60.47
5b.	A.	9	20.93
	B.	11	25.58
	C.	0	0
	D.	2	4.65
	E.	2	4.65
	F.	2	4.65

	G.	3	6.98
6a.	A.	9	20.93
	B.	10	23.26
	C.	5	11.63
	D.	3	6.98
	E.	5	11.63
	99.	11	25.58
6b.	A.	7	16.28
	B.	5	11.63
	C.	7	16.28
	D.	2	4.65
	E.	10	23.26
	99.	12	27.91
6c.	A.	7	16.28
	B.	2	4.65
	C.	9	20.93
	D.	3	6.98
	E.	10	23.26
	99.	12	27.91
6d.	A.	11	25.58
	B.	2	4.65
	C.	4	9.30
	D.	5	11.63
	E.	9	20.93
	99.	12	27.91
6e.	A.	9	20.93
	B.	4	9.30
	C.	9	20.93
	D.	4	9.30
	E.	8	18.60
	99.	9	20.93
7a.	A.	6	13.95
	B.	3	6.98
	C.	7	16.28
	D.	4	9.30
	E.	10	23.26
	99.	13	30.23
7b	A.	5	11.63

	B.	1	2.33
	C.	8	18.60
	D.	6	13.95
	E.	8	18.60
	99.	15	34.88
7c.	A.	4	9.30
	B.	3	6.98
	C.	7	16.28
	D.	4	9.30
	E.	10	23.26
	99.	15	34.88
7d.	A.	7	16.28
	B.	2	4.65
	C.	9	20.93
	D.	3	6.98
	E.	10	23.26
	99.	12	27.91
7e.	A.	6	13.95
	B.	5	11.63
	C.	7	16.28
	D.	2	4.65
	E.	10	23.26
	99.	13	30.23

Section: Attitudes

1.	A.	19	44.19
	B.	10	23.26
	C.	6	13.95
	D.	3	6.98
	E.	5	11.63
2.	A.	20	46.51
	B.	10	23.26
	C.	4	9.30
	D.	3	6.98
	E.	5	11.63
	99.	1	2.33
3.	A.	12	27.91
	B.	12	27.91

	C.	7	16.28
	D.	3	6.98
	E.	8	18.60
	99.	1	2.33
4.	A.	2	4.65
	B.	1	2.33
	C.	3	6.98
	D.	13	30.23
	E.	21	48.84
	99.	3	6.98
5.	A.	13	30.23
	B.	6	13.95
	C.	8	18.60
	D.	6	13.95
	E.	10	23.26

Section: Relativity

1.	A.	2	4.65
	B.	4	9.30
	C.	5	11.63
	D.	1	2.33
	E.	31	72.09
2.	A.	34	79.07
	B.	5	11.63
	C.	1	2.33
	D.	3	6.98
3.	A.	35	81.40
	B.	3	6.98
	C.	1	2.33
	D.	4	9.30
4.	A.	2	4.65
	B.	3	6.98
	C.	2	4.65
	D.	1	2.33
	E.	2	4.65
	F.	2	4.65
	H.	1	2.33
	I.	30	69.77

5.	99.	43	100

Section: Socio-Economic

1.	B.	3	6.98
	C.	7	16.28
	D.	14	32.56
	E.	5	11.63
	F.	7	16.28
	G.	4	9.30
	H.	3	6.98
2.	A.	27	62.79
	B.	13	30.23
	99.	3	6.98
3.	A.	5	11.63
	B.	7	16.28
	C.	5	11.63
	D.	2	4.65
	E.	5	11.63
	F.	3	6.98
	G.	2	4.65
	H.	2	4.65
	I.	3	6.98
	J.	1	2.33
	K.	1	2.33
	L.	3	6.98
	M.	4	9.30
4.	A.	27	62.79
	C.	10	23.26
	E.	4	9.30
	F.	1	2.33
	99.	1	2.33