

**MPO/TIS Data and Network
Comparison Working Paper**

TAMPA INTERSTATE STUDY

State Project No. 99007-1402, WPI No. 7140004, FAP No. IR-9999(43)

**Prepared For
FLORIDA DEPARTMENT
of
TRANSPORTATION**

**Prepared By
GREINER, INC.**

May, 1990



C1104 B1, F2
C3010.62
May 31, 1990

MEMORANDUM

TO David Twiddy
FROM Ron Gregory *R. Gregory*
SUBJECT: Tampa Interstate Study, WPA #7140004, State Project #99007-1402,
FAP #IR-99999(43) - MPO/TIS Data and Network Comparison Working
Paper

Attached are ten (10) copies of the Working Paper concerning our evaluations of the recently announced revisions in the data sets used by the Hillsborough County MPO staff for their year 2010 traffic simulation model. We have not provided any alternate network or ZData file configurations as a result of this assessment; such changes, if necessary, should be jointly derived by the local governments and the FDOT.

If you require any further information concerning this assessment, please let me know.

xc Bob Longfield
Don Henderson

MPO/TIS DATA AND NETWORK COMPARISON

In accordance with your April 13 request and our subsequent discussions, this report summarizes our evaluation of the general impacts to the Tampa Interstate System based on the March 1990 revisions to the 2010 zonal planning data forecasts for the Tampa Urban Area. The revised 2010 forecasts were finalized by the Metropolitan Planning Organization (MPO) staff and formally introduced to the MPO members at the March 1990 meeting. Subsequent to the March meeting, the Greiner staff working on the North Tampa Parkway PD&E study had obtained a copy of the revised data set and had commenced to review the information for the purposes of the North Tampa Parkway study area. This re-evaluation, therefore, follows a normal review process typical of urban transportation system planning.

In accomplishing the re-evaluation assignment, we have replicated many of the preliminary analyses conducted previously as part of the initial TIS Master Plan Study. Specifically, these evaluations have included:

1. Application of the revised 2010 forecast data within the TIS travel forecast model to obtain a revised daily traffic assignment to the TIS Master Plan roadway network.
2. Manual balancing of the daily volumes resulting from the revised 2010 assignment using identical adjustment procedures to those applied in the TIS Phase I Study.
3. Direct comparison of the daily volumes presented in the Master Plan report with the revised values along the Interstate system.
4. Application of the FHWA approved, modified level of service values from the TIS Study effort to the revised daily volume forecasts to define general laneage requirements for initial assessment of the proposed improvements to the Interstate System.

Following the re-evaluation of the general laneage requirements using the balanced, revised traffic assignment volumes, the manner in which the interstate system was loading in the assignment suggested further system level and selected traffic analysis zone reviews prior to conducting any detailed Design Hour Volume capacity analyses along the TIS corridor. These reviews consisted generally of the following:

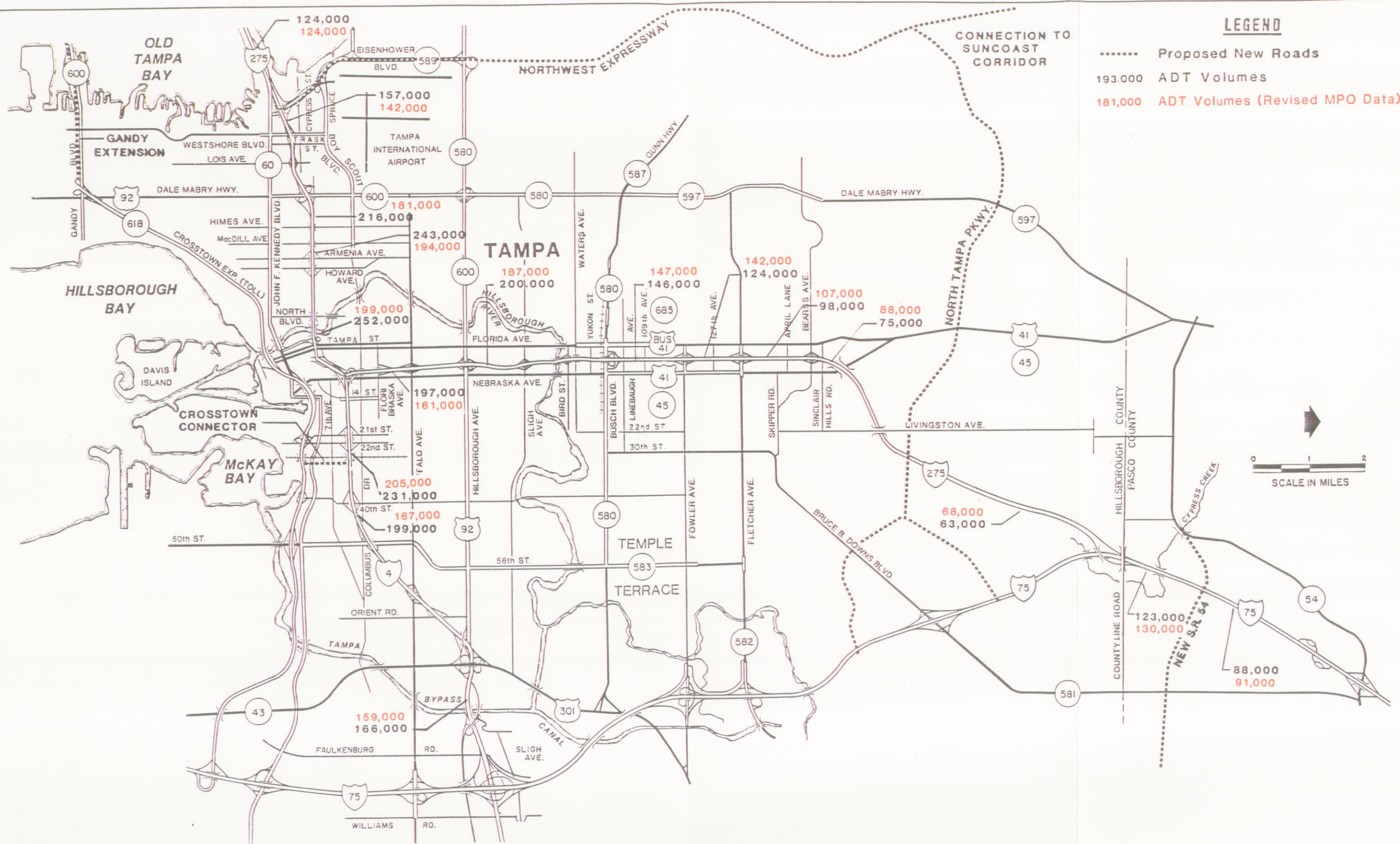
1. Examination of corridor level screenline volume comparisons for the interstate and the adjacent, parallel arterial/expressway system in the east-west travel direction from Westshore to Interstate 75.
2. Review of the trip generation levels from a number of major generator areas having a significant influence on the interstate system volumes.
3. Review of the specific land use and socioeconomic data changes in these special generator areas between the original TIS 2010 forecast and the current revised forecasts.

Based on these latter comparisons and our subsequent discussions, sufficient preliminary conclusions could be drawn to clearly define the general nature of the impacts of the data forecast revisions on the TIS Master Plan recommendations. As such, the nature of the impacts fully suggested that further evaluation of the current 2010 volume assignments in corridors other than the Tampa Interstate System was needed as part of the urban area 2010 Transportation Plan Update before any adjustments to the TIS Master Plan recommendations could be considered. The following sections summarize the specific conditions resulting from the revised 2010 planning data forecasts that render further study of this issue moot at this time.

EXECUTIVE SUMMARY

The 2010 daily traffic volumes resulting from application of the TIS travel forecast model are presented for the study corridor on Exhibit 1. For comparison purposes, the daily 2010 volumes defined in the TIS Master Plan Study report are also presented to provide a direct correlation to the revised values. In general, review of this illustration indicates that:

1. The 2010 daily volume level north of Busch Boulevard on I-275 increased slightly in relation to the Master Plan volumes, but the increase is insufficient to alter the Master Plan laneage recommendations.
2. On I-275 from Busch Boulevard southward to Hillsborough Avenue, the revised 2010 daily volumes decreased slightly from the values defined in the Master Plan, but the change is insufficient to alter the Plan cross section recommendation.
3. Approaching downtown Tampa from the north on I-275 southward from Hillsborough Avenue, the magnitude of the 2010 daily volume decrease grows to approximately 36,000 vehicles per day (vpd) which could significantly impact the proposed laneage and cross section recommendations serving the downtown area for travel to and from the north.
4. From the Howard Franklin bridge eastward to Eisenhower Boulevard on I-275, no appreciable change occurred in the forecast volumes.
5. On I-275 from Eisenhower Boulevard eastward to downtown Tampa, daily volume decreases resulting from the revised planning data forecasts are obvious, with the decrease ranging from 15,000 vpd east of Eisenhower Boulevard to 53,000 vpd immediately west of the Ashley Street interchange. This magnitude of decrease could significantly alter the laneage and cross section recommendations contained in the TIS Master Plan.
6. On I-4 from I-75 to about Buffalo Avenue, relatively minor decreases in 2010 daily volumes occur that should not influence the general laneage recommendations in the Master Plan.
7. From Buffalo Avenue westward to downtown Tampa on I-4, the revised planning data forecasts produce daily 2010 volume levels that range from 17,000 vpd to 32,000 vpd lower than the TIS Master Plan volumes. This magnitude of decrease could have a significant impact on the cross section recommendations embodied in the Master Plan.



In general, the revised 2010 forecasts of land use and socioeconomic data within the urban area produce a total reduction of approximately 115,000 vpd on the interstate system approaching the Tampa Central Business District. Obviously this level of reduction in forecast travel is significant. From review of the daily volume reductions, cross section laneage decreases of up to two lanes in EACH travel direction might occur on the segment of I-275 between Dale Mabry Highway and downtown Tampa. The detailed, revised traffic assignment for 2010 also suggests that interchange ramp volumes in this section of I-275 would be less than these same ramps carry today.

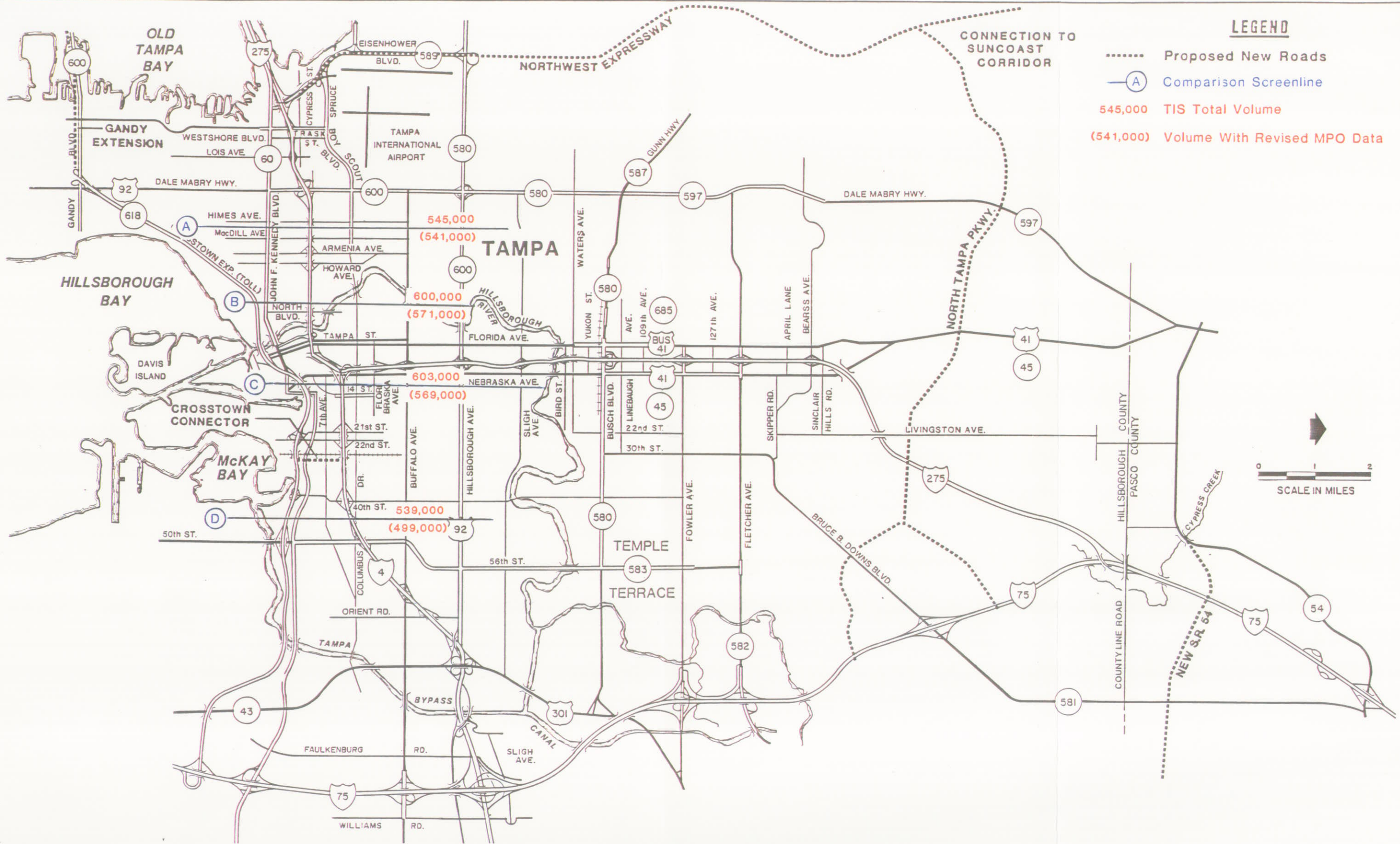
This initial impact review raised a basic question. Since the planning data forecast totals for the entire County are the same and only a redistribution of socioeconomic data occurred within the County, have significant volume increases resulted on other arterial and expressway routes paralleling the interstate system?

Exhibit 2 summarizes the evaluation of this question for the general east-west travel corridor bounded by Hillsborough Avenue on the north and the Crosstown Expressway/Swann Avenue on the south. For this analysis, four screenline segments (shown as A through D on Exhibit 2) were selected and the total east-west travel crossing these screenlines in both the TIS Master Plan assignment and in the revised 2010 assignment were tabulated. The values presented on Exhibit 2 indicate that the total corridor movements have decreased by less than 5 percent on the west side of I-275 and by less than 8 percent to the east of I-275. Thus, while significant volume reductions on the interstate system are noted from the assignments, very little change has occurred in total east-west movements within the overall corridor.

Further review of the detailed assignment volumes indicates that significant volume increases have occurred on Hillsborough and Buffalo Avenues. The magnitude of these increases, particularly along Buffalo Avenue, results in 2010 daily volume levels ranging to as much as 117,000 vpd, which is substantially more than the planned six-lane cross section can accommodate along these routes. In fact, limited access cross sections would be needed in many segments of these arterial routes to accommodate the forecast volumes at an acceptable level of service.

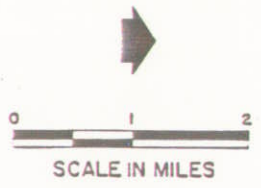
Consequently, the planning data forecast revisions for 2010 conditions have redistributed future travel away from the interstate system and onto parallel arterial routes. The magnitude of the shift suggests that a capacity reserve would be created along the interstate system given the TIS Master Plan improvement recommendations, while serious levels of congestion would occur on the parallel arterial system even with the current improvement proposals in place. The result would likely be that motorists would avoid the congested arterial routes and "return" to using the interstate system to the maximum extent possible to travel to and from their destinations IF THE LAND USE PATTERN AND DEVELOPMENT DENSITIES OCCUR AS ENVISIONED IN THE REVISED FORECASTS. The other possible situation is that the forecast land use pattern and associated development densities will not occur to the level embodied in the current revised data forecast based on some combination of concurrency and private sector frustration with localized traffic congestion.

Based on the current status of the Tampa Urban Area Transportation Study 2010 Plan Update evaluations, we suggest the following course of action for the Department. The analyses performed and documented herein suggest that further refinements in socioeconomic data forecasts for 2010 conditions may be needed to balance transportation impacts with land use development. These analyses can most reasonably occur within the context of the plan update process as the travel impacts of the land



LEGEND

- Proposed New Roads
- A— Comparison Screenline
- 545,000 TIS Total Volume
- (541,000) Volume With Revised MPO Data



use revisions are examined during the alternative plan evaluations. Careful attention to this balancing situation should be given by Department representatives participating in the plan update. Consideration of changes to the TIS Master Plan improvement recommendations should not be undertaken until such time as reasonable 2010 travel conditions are achieved on the entire arterial and freeway/expressway network preferred by the Study Technical Committee during the plan update. Incorporation of Master Plan changes at this time without the benefit of these subsequent analyses appears premature.

OTHER STUDY EVALUATIONS

In addition to the traffic assignment evaluations summarized previously, a number of other analyses were performed in the execution of this re-evaluation process. These analyses only further support the stated conclusion and consisted of sample volume counts along the interstate to compare 1988 and 1990 conditions, detailed review of trip generation and socioeconomic data forecasts within selected areas that substantially influence local interstate system usage, and detailed route by route volume comparisons between the TIS Master Plan traffic assignment and the traffic assignment prepared using the revised planning data. The following paragraphs summarize these additional study analyses.

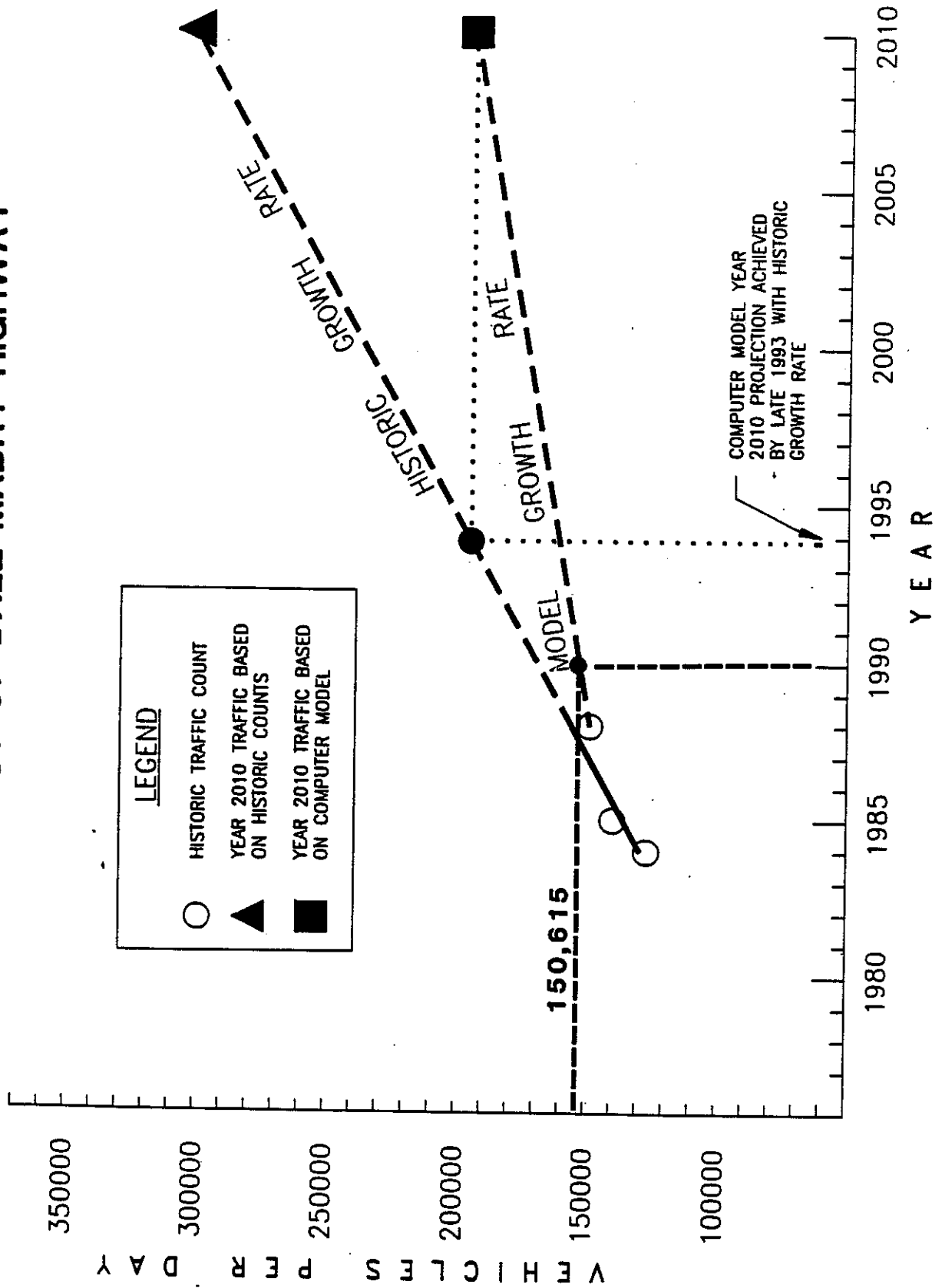
Traffic Count Program

When the traffic assignment comparisons produced a suggested 2010 daily volume decrease on the portion of both I-4 and I-275 approaching downtown Tampa, the question of consistency with historic volume trends arose during our joint study reviews. To respond to this issue, new daily volume counts were performed at three locations along the local interstate routes. Specifically, counts were conducted on I-275 immediately east of Dale Mabry Highway and immediately west of the Hillsborough River, and on I-4 west of 21st Street. The following tabulation contrasts these 1990 counts with the TIS counts conducted in the same locations.

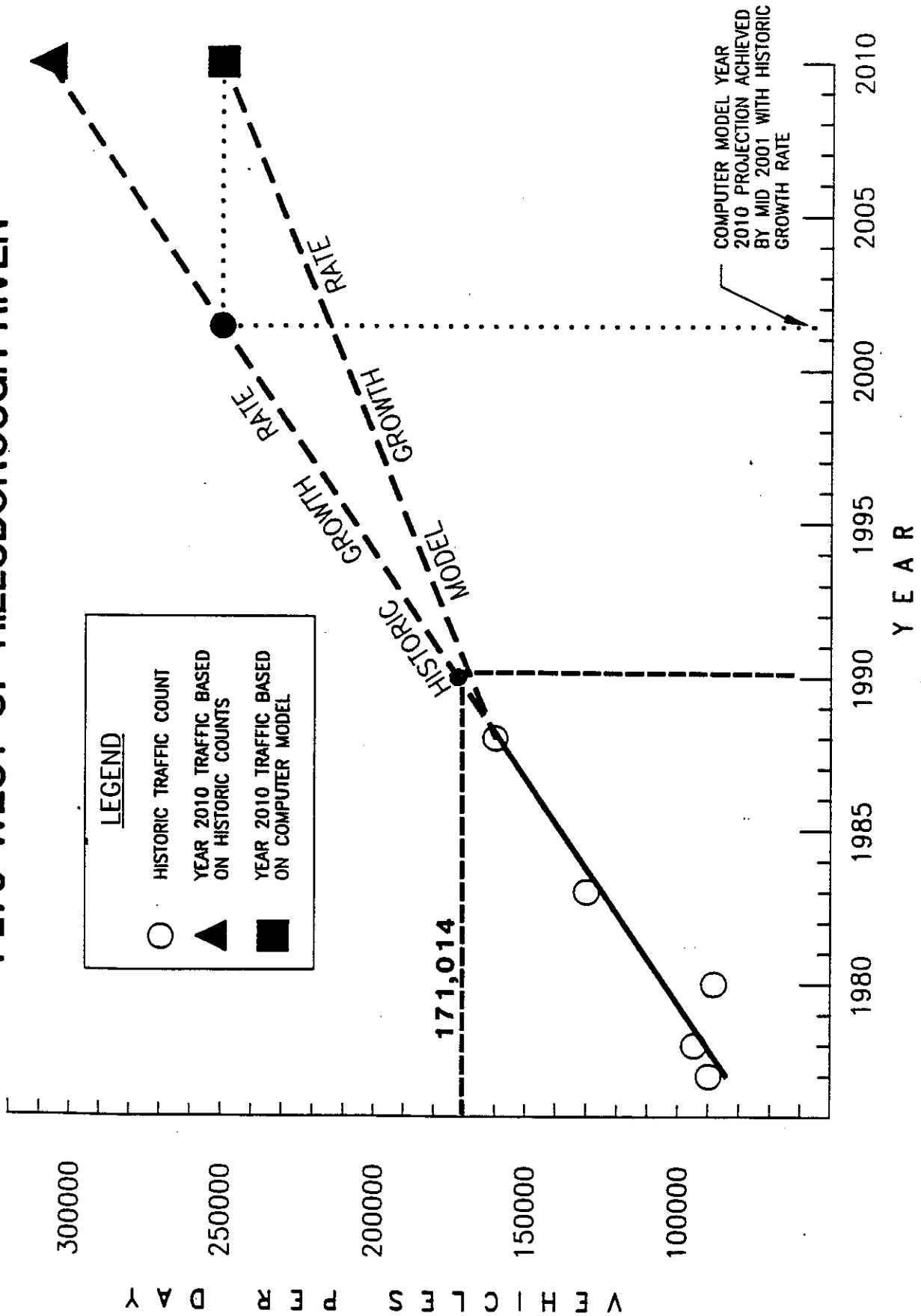
<u>Location</u>	<u>1988 Count</u>	<u>1990 Count</u>	<u>% Change</u>
East of Dale Mabry	149,000	150,600	+1.1
W. of Hillsborough River	160,000	171,000	+6.9
W. of 21st Street	119,000	127,500	+7.1

Exhibits 3, 4, and 5 present the 1990 count data in relation to the historic volume trend and the TIS model growth trend defined during the Master Plan Study. As both the previous tabulation and these growth trend illustrations demonstrate, daily volumes along the interstate system continue to increase regardless of the fact that extensive peak hour congestion presently occurs along the corridor. Obviously, the peak hour of travel on these capacity constrained routes has continued to spread and the relative attractiveness of the routes has continued to increase.

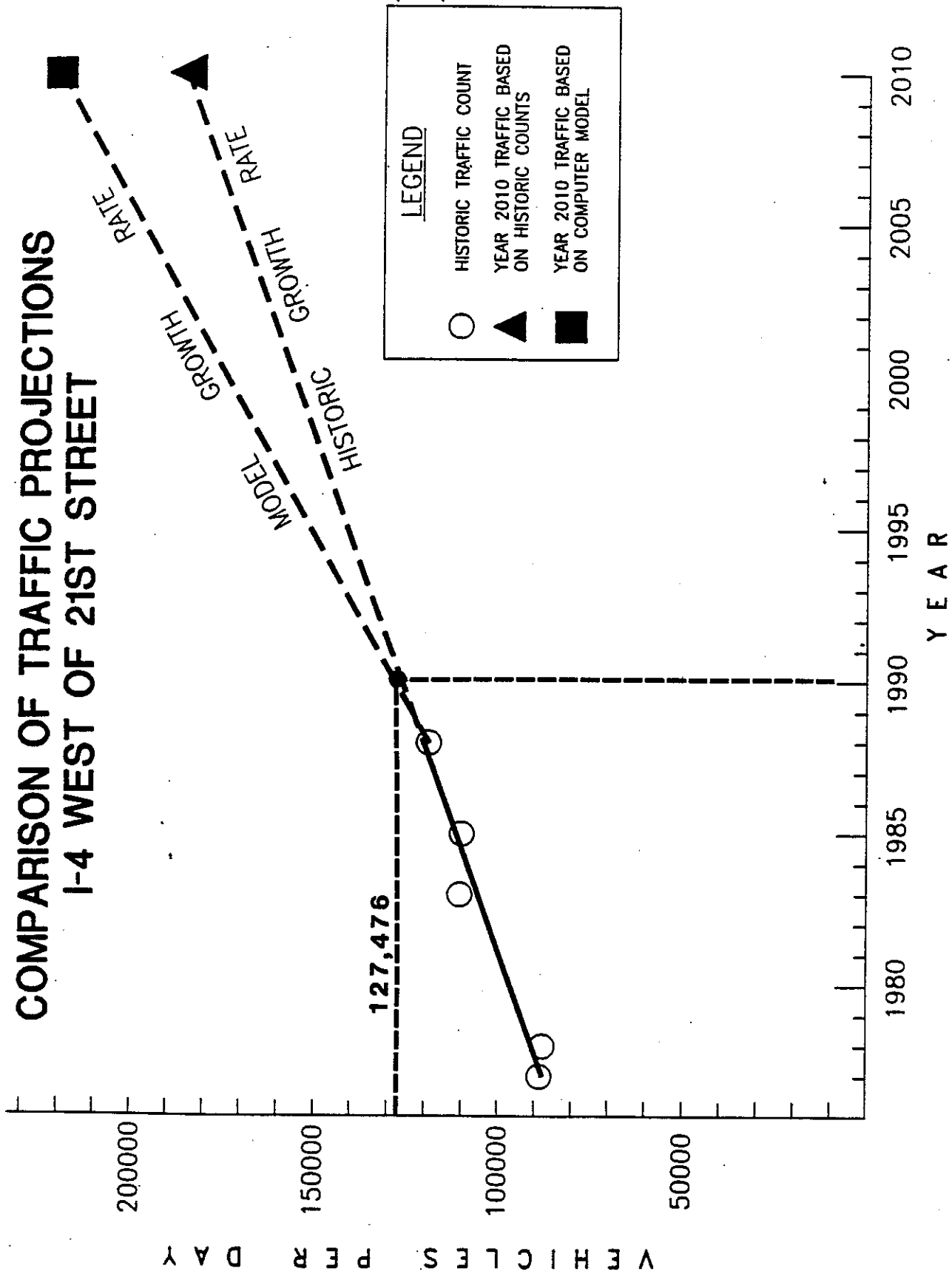
COMPARISON OF TRAFFIC PROJECTIONS I-275 EAST OF DALE MABRY HIGHWAY



COMPARISON OF TRAFFIC PROJECTIONS I-275 WEST OF HILLSBOROUGH RIVER



COMPARISON OF TRAFFIC PROJECTIONS I-4 WEST OF 21ST STREET



Trip Generation And Socioeconomic Data Review

For selected zones within the general study area near the Interstate corridor, comparisons of total zonal trip generation were undertaken as a follow-up to the general volume comparisons described previously. These detailed zonal level comparisons were performed in an attempt to trace the source of the volume differences along the interstate system. With the section of I-275 from Eisenhower Blvd. to downtown Tampa representing the segment having the greatest differences between the 2010 TIS Master Plan volumes and the 2010 Revised MPO Assignment volumes, attention was focused in this western portion of the interstate corridor area.

Table 1 presents a comparison of 2010 trip ends for selected traffic analysis zones (TAZ) in the general Westshore area, the Tampa Bay Center area, the Tampa International Airport area, and the Rocky Point area. Exhibit 6 graphically illustrates the location of these zones for reference in defining the evaluation areas. As shown, the core area of the Westshore Business area (defined by the first group of TAZs in Table 1) demonstrates that the revised MPO data has produced a decrease of almost 98,500 vpd in the number of trips assigned to the major street network. Conversely, the generation in the general area of Tampa Bay Center has increased by over 109,000 vpd under the revised MPO planning data. Both the TIA and the Rocky Point office area also experience decreases in the level of trip generation under the revised MPO data. Thus, the resulting decrease in the traffic assignment in the Westshore area and the increase in the assignment along Buffalo Ave. and Hillsborough Blvd. are direct results of planning data changes in these general areas.

Table 2 presents the subsequent comparisons of selected employment forecasts for these same Westshore, Tampa Bay Center, Airport, and Rocky Point area zones. Based on the nature of the land uses in these zones, only employment data were compared. Additionally, two MPO 2010 data sets for the zones are shown in the table. The first, the 2010 MPO data represents the data set transmitted to us initially for this analysis while the "2010, MPO(2)" represents a revised data set provided by the MPO staff following meeting discussions on apparent zonal data inconsistencies.

Of significance in this comparison is the relationship of the three 2010 forecasts to the 1988 data. The 1988 employment data was tabulated after the TIS 2010 forecasts were prepared, thereby highlighting some inconsistencies in those original forecasts. However, the two revised MPO forecasts for 2010 highlight other significant changes, including:

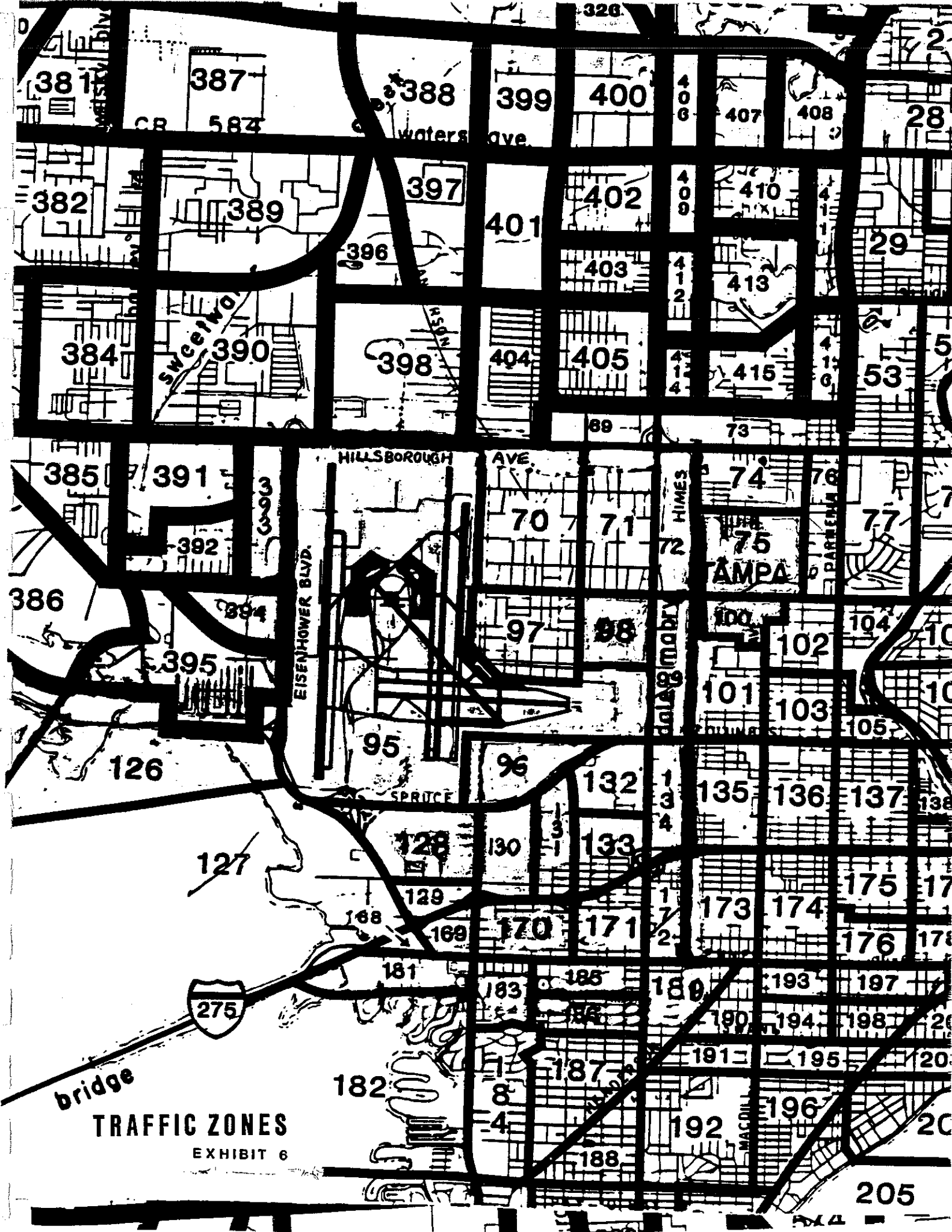
1. A decrease of about 7,000 in the total employment forecast for the core area of Westshore between the TIS and MPO(2) forecasts, with the major adjustment occurring in TAZ 169 (Westshore Mall) where virtually no growth is anticipated over the planning period by the MPO staff.
2. Conversely, TAZ 100 (Tampa Bay Center) is now forecast by the MPO to experience an increase of almost 3,000 commercial employees over the planning period. A question of equity between these two zones and of relative impact on the adjacent street system of this growth could be logically raised.
3. An increase of over 6,000 total employees in TAZ 75 (Tampa Bay Commerce Park and St. Joseph Hospital) in relation to the 1988 existing employment, while the total employment forecast in the core office zone in Westshore (TAZ 130) has been decreased by about 5,000 employees from the TIS

Table 1

TOTAL 2010 DAILY TRIP COMPARISON

AREA	ZONE	2010B*	2010D*	NET DIFFERENCE
WESTSHORE	96	64,790	47,205	(17,585)
	128	52,016	58,685	6,669
	130	80,420	26,155	(54,265)
	131	42,030	16,034	(25,996)
	169	44,033	25,262	(18,771)
	170	12,663	24,180	11,517
		=====	=====	=====
	SUBTOTAL	295,952	197,521	(98,431)
TAMPA BAY CENTER	75	34,947	106,701	71,754
	98	13,151	30,346	17,195
	100	33,792	54,252	20,460
		=====	=====	=====
	SUBTOTAL	81,890	191,299	109,409
AIRPORT	95	83,448	69,369	(14,079)
ROCKY POINT	126	44,913	32,891	(12,022)
		=====	=====	=====
		128,361	102,260	(26,101)

* 2010B = BASED ON ZDATA USED FOR TIS MASTER PLAN
 2010D = BASED ON REVISED MPO ZDATA RECEIVED APRIL 1990



TRAFFIC ZONES

EXHIBIT 6

Table 2

SELECTED ZONE EMPLOYMENT COMPARISONS

ZONE	INDUSTRIAL				COMMERCIAL				SERVICE				TOTAL			
	2010				2010				2010				2010			
	1988	TIS	MPO	MPO(2)	1988	TIS	MPO	MPO(2)	1988	TIS	MPO	MPO(2)	1988	TIS	MPO	MPO(2)
96	0	0	0	0	201	835	211	211	39	9,960	9,000	9,000	240	10,795	9,211	9,211
128	284	0	240	240	838	164	848	848	8,137	8,672	10,000	9,000	9,259	8,836	11,088	10,088
130	185	0	140	140	322	171	332	832	3,178	13,866	4,000	8,000	3,685	14,037	4,472	8,972
131	101	0	60	60	158	185	168	668	1,952	6,369	2,500	3,750	2,211	6,554	2,728	4,478
169	48	0	40	40	2,077	2,811	2,087	2,087	491	2,018	600	600	2,616	4,829	2,727	2,727
170	56	0	50	50	540	219	550	550	681	1,097	3,000	3,000	1,277	1,316	3,600	3,600
171	54	0	50	50	626	263	636	636	619	520	3,000	1,000	1,299	783	3,686	1,686
SUBTOTAL	728	0	580	580	4,762	4,648	4,832	5,832	15,097	42,502	32,100	34,350	20,587	47,150	37,512	40,762
70	3,207	1,058	5,613	5,613	825	1,827	1,772	1,772	1,094	603	2,364	1,364	5,126	3,488	9,749	8,749
71	803	752	1,187	1,187	1,739	1,942	3,502	2,002	1,251	754	2,711	1,711	3,793	3,448	7,400	4,900
75	24	463	0	0	2,345	541	6,627	6,627	5,768	3,831	8,198	8,198	8,137	4,835	14,825	14,825
98	0	0	0	0	0	0	0	0	3,266	1,055	4,559	3,559	3,266	1,055	4,559	3,559
100	0	0	0	0	2,749	2,893	5,733	5,733	472	524	115	115	3,221	3,417	5,848	5,848
SUBTOTAL	4,034	2,273	6,800	6,800	7,658	7,203	17,634	16,134	11,851	6,767	17,947	14,947	23,543	16,243	42,381	37,881
95	0	0	0	0	449	72	1,270	1,270	3,611	8,879	4,500	4,500	4,060	8,951	5,770	5,770
126	570	0	500	500	874	266	884	1,384	3,659	7,328	4,250	5,000	5,103	7,594	5,634	6,884
SUBTOTAL	570	0	500	500	1,323	338	2,154	2,654	7,270	16,207	8,750	9,500	9,163	16,545	11,404	12,654

* TIS = DATA USED IN TIS MASTER PLAN

MPO = MPO Zdata REVISION OF 4/9/90

MPO(2) = SECOND REVISION TO MPO Zdata ON 5/1/90

forecast. While these may be offsetting adjustments, the question of relative impact on the major street system is pertinent.

4. A forecast increase of only about 1,800 total employees in the Rocky Point area over 1988 conditions of which over one-half of this growth has occurred this year in the Waterford Plaza building alone.
5. An increase of only 750 hotel rooms in the general Westshore area during a period when the Airport is anticipating more than a doubling in enplanement levels and when the MPO 2010 travel forecast shows about a 17 percent decrease in trips to/from TIA. This would appear to be somewhat inconsistent, since not all of the new trips to and from the Airport are likely to want to stay in the downtown Tampa area even with the new convention center.

CONCLUSIONS AND RECOMMENDATIONS

From the preceding evaluation, the revised 2010 zonal level land use and socioeconomic data prepared by the MPO staff has embodied an extensive redistribution of employment throughout the urban area. Discussions with the MPO staff on this subject suggest that:

1. Little contact was made with the development community regarding their plans in an attempt to avoid biasing the forecasts based on developer "wish-lists." This procedure may have overlooked expansion plans for established areas and over-predicted development potential in growing areas of the community.
2. The transportation impacts of the redistribution of employment within the urban area have not yet been incorporated into the revised forecasts. As this analysis has shown, future travel problems may have been compounded in areas of the City and County where existing and proposed transportation improvements may be inadequate to accommodate the increased travel demands at an acceptable level of service. Conversely, areas planned for substantial capacity improvements may have been overlooked in terms of their potential to serve increased land use densities with reasonable levels of service.
3. Until the comparison of land use impacts on the existing plus committed major street system and on reasonable alternative system plans is completed within the context of the current urban area plan update, the true need for adjustments in the 2010 land use and socioeconomic data forecasts and/or in the Recommended Plan improvements cannot be fully determined.

The evaluation of the TIS recommendations in relation to the Revised 2010 MPO land use and socioeconomic data forecasts for Hillsborough County clearly indicates that any change in the laneage or cross section recommendations at this time is premature. Alternative plan analysis and evaluation activities within the current 2010 Urban Area Transportation Plan Update Study must first reconcile the apparent demand imbalance between the arterial/collector system and the freeway/expressway system. The Department representatives participating in the Update Study should encourage all study participants to review this aspect of the Plan reevaluation carefully. In areas where demand levels for 2010 travel exceed the "buildout" capacity of the

roadway system and where major transit improvements are not proposed, refinement of the land use and socioeconomic data forecast should be encouraged. Hillsborough County may be approaching the point during this plan update where the requirements of concurrency must apply equally to land use development and to transportation system improvements. If the transportation system has achieved maximum reasonable expansion, development may need to be constrained.