Road User Cost Estimate: I-10 Katy Freeway from I-610 (West Loop) to I-45

1993

Texas Transportation Institute

ROAD USER COST ESTIMATE -- TxDOT PROJECT 271-7-210 I-10 KATY FREEWAY FROM I-610 (WEST LOOP) TO I-45

Background

Construction sequencing plans for I-10 Katy Freeway between I-610 West Loop and I-45 near downtown Houston are presently being prepared. The project includes the rehabilitation of the roadway pavement and the raising of several overpass structures. The Texas Department of Transportation (TxDOT) has requested that the Texas Transportation Institute (TTI) complete a road user cost analysis for two general traffic control options being considered for sequencing of the construction.

The two options differ significantly in the number of lanes available for use and the total time for project completion. The first option maintains the existing five lane cross section throughout the project and requires four separate phases. In each phase, the freeway lanes are narrowed (less than the desirable width of 12 feet) and the inside and outside shoulders are either completely eliminated or narrowed. The second proposed sequencing provides for completion of the rehabilitation project in only three phases. Each phase consists of only four narrow lanes as well as shoulder elimination. The reduction in the number of phases significantly reduces the amount of time required to complete the construction.

A road user cost estimate will be calculated for each of the two traffic control options. The latest traffic volume data will be used as inputs to the FREQ10PC freeway simulation model to determine the delays associated with each scenario. Comparisons of the differences in the delay are combined with the value of time to provide a daily user cost estimate for each phase. TxDOT can then apply these cost values to estimates of the time for each phase to determine the construction sequencing option that will incur the least total road user cost to be incurred on the public.

Freeway Simulation Model

The FREQ10PC model was used to simulate freeway operations for each phase of the two construction sequencing options on I-10 as described above. The computer program allows simulation of freeway traffic operations for a given set of geometric and demand input parameters. It is based upon a macroscopic deterministic approach which assumes that freeway operations can be simulated by disregarding the actual randomness of traffic demand and the behavior of individual vehicles. Inputs to the model includes geometric and traffic demand data. Model outputs include freeway travel time, ramp delay, total freeway travel time, total travel distance, average speed, gasoline consumed, vehicle emissions, and mainlane delay. The latest version of the model (REL T91) was used for this analysis.

The model was set up for the segment of I-10 from the T&NO Railroad overpass to the Houston Avenue overpass, a distance of approximately 4.2 miles. TTI had previously prepared spreadsheets of recent freeway mainlane and ramp data for this segment of I-10. This data was used as inputs to the model in one-hour intervals for typical weekdays, Saturdays, and Sundays for the eastbound and westbound directions. The FREQ10PC model was setup to simulate the existing traffic conditions as well as each phase of the two construction sequencing options.

Value of Time

Currently, the basis for determining value of time is a TTI report "The Value of Travel Time: New Estimates Developed Using a Speed Choice Model," Research Report No. 396-2F. This study derived the value of time using a speed choice model (HEEM) assuming a rational driver chooses a speed so that the total driving costs are minimized. Total driving costs include value of time and vehicle operating costs, accident costs, and traffic violation costs. The study recommends the following values of time (in 1985 dollars):

Drivers - \$ 8.03 per person-hour.

Passenger Car - \$10.44 per vehicle-hour (assumes 1.3 persons/vehicle)

The value of time may be adjusted using the current Consumer Price Index (CPI). Table 1 illustrates the CPI and the value of time from 1985 to 1992. Current CPI values may be obtained from the Wall Street Journal or other economic publications. For this study, the value of time was assumed at \$10.47 per person-hour and at \$13.09 per vehicle-hour.

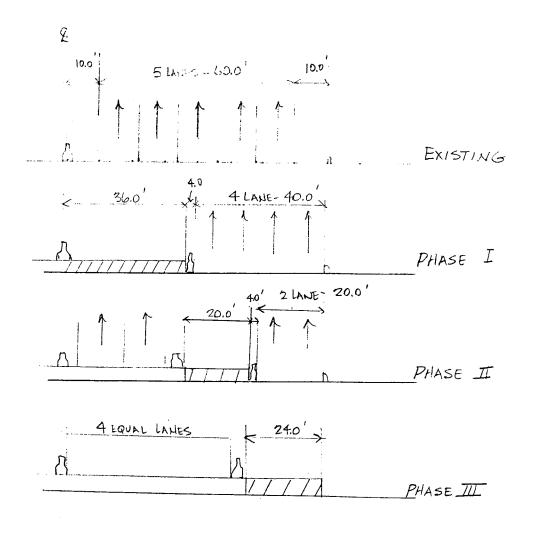
	Table 1. Annual Co	st for Value of Time	
		Value	of Time
Year	CPI ¹	Drivers ²	Passenger Cars ^{2,3}
1985	322.2	\$ 8.03	\$10.04
1986	238.4	8.24	10.30
1987	240.4	8.48	10.60
1988	118.24	8.82	11.03
1989	124.04	9.26	11.58
1990	130.74	9.76	12.20
1991	136.24	10.17	12.71
1992	140.3 ⁴	10.47	13.09

- Notes: 1 CPI values are annual percentages.
 - ² Costs represent only value of time.
 - ³ Passenger car cost based on drivers value of time x vehicle occupancy rate of 1.25.

Capacity Analysis

The determination of the capacity of the freeway sections has a major impact upon the results of the FREQ10PC simulation during the construction. Preliminary construction cross sections for each of the two alternatives were reviewed with respect to the lane width and clearances to lateral obstructions. Adjustment factors relating to these items were obtained from Table 3-2 of the Highway Capacity Manual and the reduced capacity for each phase was determined. The reduced capacity was then applied in the FREQ10 model to estimate the traffic flow conditions for each construction phase and scenario. The proposed cross sections and assumed capacities for the five lane and four lane scenarios as used for the simulation model are presented by Figures 1 and 2.

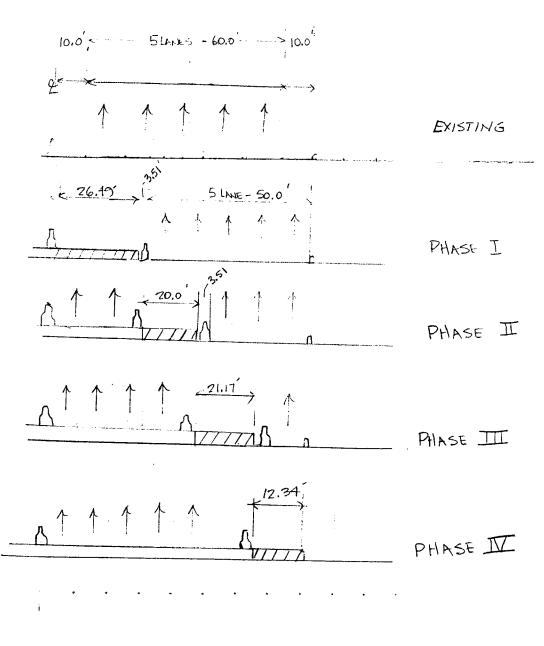
⁴ CPI base was changed in 1988. A multiplication factor of 2.99556 must be used with CPI published after 1988.



14-10 REHAB.

TCP CLOSING / LANE - MAINTAINING & LANES DURING CONSTRUCTION

Figure 1.



TCP W/ 5 LANES

Figure. 2-

The results of the simulation analysis are presented in Tables 2, 3, and 4. Each table presents the assumed freeway capacity and selected FREQ10PC outputs. These parameters (freeway travel time, freeway delay, and estimated fuel consumption) are typically used for comparison in alternative analyses. Each table includes these measures of effectiveness for the existing (non construction) traffic conditions, for each phase of the four and five lane alternatives, for typical weekdays, Saturdays, and Sundays. The study results indicate that more delay is incurred to motorists for the four lane alternative than that for the scenario that maintains the existing five lanes for all phases.

The delays calculated by the FREQ10PC simulation model are based upon an average speed of existing conditions as determined by the model. For this section of I-10, there is no congestion and the average speed exceeds the speed limit of 55 mph. The reduction in freeway capacity for the four lane scenarios does not cause any congestion. However, since the average speed does drop below the "normal" speed of 59 mph, delays above the existing conditions are incurred. These will be very insignificant and not noticed by the approximate 150,000 motorists using the roadway each day. The speeds will be presented in another section of the report.

User Costs Determination

Using the differences between the mainlane delays calculated by the FREQ10 model for the existing conditions and that for each construction phase, the additional delay to the motoring public can be estimated. Applying this additional delay to the current value of time (\$13.09/vehicle-hour), a monetary cost (road user cost) can be placed upon the motorists that travel I-10 between the T&NO Railroad and Houston Avenue overpass structures. Table 5 presents the user cost determinations for weekdays, Saturdays, and Sundays for the five and four lane scenarios for each phase.

	Table 2. Weekday	Results of FREQ10PC	Simulation Analysis	
Scenario	Capacity* (vph)	Freeway Travel Time+ (veh-hrs)	Mainlane Delay+ (veh-hrs)	Gasoline Consumed+ (gallons)
Existing				
Inbound	10,000	5,143	0.0	14,203
Outbound	10,000	5,869	0.0	16,002
Total		11,012	0.0	30,205
Maintain 5 Lanes Phase 1				
Inbound	8,100	5,221	63.54	14,030
Outbound	8,100	5,966	109.16	15,790
Total		11,187	172.70	29,820
Phase II				
Inbound	8,220	5,215	58.82	14,042
Outbound	8,220	5,959	102.61	15,805
Total		11,174	161.43	29,847
Phase III				
Inbound	8,100	5,221	63.54	14,030
Outbound	8,100	5,966	109.16	15,790
Total		11,187	172.70	29,820
Phase IV	0.7700	5 104	40.11	14.000
Inbound	8,700	5,194	42.11	14,088
Outbound	8,700	5,932	79.27 121.38	15,862
Total		11,126	121.38	29,950
Maintain 4 Lanes Phase 1				
Inbound	6,480	5,332	166.47	13,813
Outbound	6,480	6,404	408.67	15,615
Total	·	11,736	575.14	29,428
Phase II		-		
Inbound	7,040	5,280	117.29	13,902
Outbound	7,040	6,042	179.23	15,635
Total	·	11,322	296.52	29,537
Phase III	:			
Inbound	7,480	5,253	92.54	13,959
Outbound	7,480	6,008	147.19	15,704
Total	•	11,261	239.73	29,663

^{*} Estimated freeway capacity for the basic cross section. + 24-hour totals for typical weekday traffic.

,	Гable 3. Weekday	Results of FREQ10PC	Simulation Analysis	
Scenario	Capacity* (vph)	Freeway Travel Time + (veh-hrs)	Mainlane Delay+ (veh-hrs)	Gasoline Consumed+ (gallons)
Existing				
Inbound	10,000	3,579	0.0	10,319
Outbound	10,000	4,798	0.0	13,443
Total		8,377	0.0	23,762
Maintain 5 Lanes Phase 1				
Inbound	8,100	3,613	13.07	10,200
Outbound	8,100	4,859	76.92	13,293
Total		8,472	89.99	23,493
Phase II				
Inbound	8,220	3,611	11.70	10,208
Outbound	8,220	4,854	73.04	13,303
Total		8,465	84.74	23,511
Phase III				
Inbound	8,100	3,613	13.07	10,200
Outbound	8,100	4,859	76.92	13,293
Total		8,472	89.99	23,493
Phase IV				
Inbound	8,700	3,602	7.11	10,237
Outbound	8,700	4,838	58.92	13,344
Total		8,440	66.03	23,581
Maintain 4 Lanes Phase 1				
Inbound	6,480	3,655	43.32	10,084
Outbound	6,480	4,937	149.65	13,120
Total		8,592	192.97	23,204
Phase II				
Inbound	7,040	3,639	29.94	10,128
Outbound	7,040	4,906	119.57	13,187
Total	•	8,545	149.51	23,315
Phase III		, ,		·
Inbound	7,480	3,627	21.86	10,159
Outbound	7,480	4,885	99.82	13,233
Total	, · · -	8,512	121.68	23,392

^{*} Estimated freeway capacity for the basic cross section. + 24-hour totals for typical weekday traffic.

	Table 4. Weekday	Results of FREQ10PC	Simulation Analysis	
Scenario	Capacity* (vph)	Freeway Travel Time + (veh-hrs)	Mainlane Delay+ (veh-hrs)	Gasoline Consumed+ (gallons)
Existing				
Inbound	10,000	3,186	0.0	9,259
Outbound	10,000	3,844	0.0	10,929
Total		7,030	0.0	20,188
Maintain 5 Lanes Phase 1				
Inbound	8,100	3,214	38.57	9,156
Outbound	8,100	3,886	38.92	10,808
Total		7,100	77.49	19,964
Phase II				
Inbound	8,220	3,212	36.88	9,163
Outbound	8,220	3,883	36.50	10,816
Total Phase III		7,095	73.38	19,979
Inbound	8,100	3,214	38.57	9,156
Outbound	8,100 8,100	3,886	38.92	10,808
Total	0,100	7,100	77.49	19,964
Phase IV		7,100	//.42	15,504
Inbound	8,700	3,205	30.68	9,188
Outbound	8,700	3,872	28.07	10,847
Total	,	7,077	58.75	20,035
Maintain 4 Lanes Phase 1				
Inbound	6,480	3,248	69.88	9,055
Outbound	6,480	3,940	85.12	10,679
Total		7,188	155.00	19,734
Phase II				
Inbound	7,040	3,235	57.06	9,093
Outbound	7,040	3,918	65.81	10,729
Total		7,153	122.87	19,822
Phase III	- 46-			
Inbound	7,480	3,225	48.58	9,120
Outbound	7,480	3,904	53.35	10,764
Total		7,129	101.93	19,884

^{*} Estimated freeway capacity for the basic cross section. + 24-hour totals for typical weekday traffic.

Table 5.	Total Cost/Day of Road User Cost	per Phase
Scenario	Delay Cost (veh-hrs)	User Time Cost (\$/day)
WEEKDAYS		
Maintain 5 Lanes		
Phase I	172.70	\$2,261
Phase II	161.43	2,113
Phase III	172.70	2,261
Phase IV	121.38	1,589
Maintain 4 Lanes	·	
Phase I	575.14	\$7,529
Phase II	296.52	3,881
Phase III	239.73	3,138
SATURDAYS		
Maintain 5 Lanes		
Phase I	89.99	\$1,178
Phase II	84.74	1,109
Phase III	89.99	1,178
Phase IV	66,03	864
Maintain 4 Lanes		
Phase I	192.97	\$2,526
Phase II	149.51	1,957
Phase III	121.68	1,593
SUNDAYS		
Maintain 5 Lanes		
Phase I	77.49	\$1,014
Phase II	73.38	961
Phase III	77.49	1,014
Phase IV	58.75	769
Maintain 4 Lanes		
Phase I	155.00	\$2,029
Phase II	122.87	1,608
Phase III	101.93	1,334

To determine the sequencing that will be more cost efficient, additional steps should be applied to the costs per phase as presented. Once the number of days required for each phase has been estimated, the total user delay cost to the motoring public can be determined. The difference between the two scenarios combined with any construction cost savings of the four-lane option can then be used to determine the more cost effective construction sequencing.

Other Considerations

Although Table 5 indicates higher user costs for the four lane alternative, freeway speeds do not decline significantly to cause congestion. Table 6 presents the average speeds as determined by the FREQ10PC model for each phase being considered. As indicated, there is not significant reduction in average speed over a 24-hour period to preclude implementing the four-lane alternative.

The Appendix includes the traffic demands as used for the FREQ10PC simulations. If the freeway mainlane volume for any hour is greater than the assumed capacities indicated on Figures 1 and 2, freeway congestion will develop. This is most critical for Phase I of the four-lane scenario during which the least amount of roadway capacity is available. An examination of the freeway data indicates volumes near the critical value (6480 vph) from 7:00 to 8:00 a.m. on weekdays. There may be some congestion during this hour, but it should not be significant. Diversion of motorists to other parallel roadways (i.e., Memorial Drive) will lessen this impact.

Recommendations

The results of the FREQ10PC simulation analysis indicate that freeway speeds will not be significantly impacted if the four lane alternative were implemented. Although there may be some delays incurred during the AM (and possible PM) peak hour, it is recommended that the four lane construction alternative be implemented. It is also recommended that the road user cost per day for each phase as presented in Table 5 be

used as minimum liquidated damages for the freeway portion of the project. As the traffic control plan is outlined in more detail, this study may need to be completed again for a more accurate value.

	Table 6. Estimated A	verage Freeway Speeds	
	Average 24-Hour	Speeds as Estimated by FR	EQ10PC in MPH
Scenario	Weekday	Saturday	Sunday
Existing			
Inbound	59.6	60.8	61.0
Outbound	59.2	60.0	60.4
Maintain 5 Lanes Phase 1			
Inbound	58.7	60.2	60.5
Outbound	58.2	59.3	59.8
Phase II			
Inbound	58.7	60.3	60.5
Outbound	58.3	59.3	59.8
Phase III			
Inbound	58.7	60.2	60.5
Outbound Phase IV	58.2	59.3	59.8
Inbound	59.0	60.4	60.6
Outbound	58.5	59.5	60.0
Maintain 4 Lanes Phase 1			
Inbound	57.5	59.5	59.8
Outbound	55.3	58.3	58.9
Phase II			
Inbound	58.0	59.8	60.1
Outbound	57.5	58.7	59.3
Phase III			
Inbound	58.3	60.0	60.2
Outbound	57.8	59.0	59.5



KATY FRWY (1-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL WEEKDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 1 OF 3

	M/L		5 5	310) (8)	8 5	22.10	5730	6290	5750	4890	4560	4620	7460	4370	777	0727	5420	2000	4260	2850	2340	1930	1580	980	78580
WASHINGTON Entry		Ş	3 5	S &	: 5	3 5	3 5	240	1290	930	909	260	049	650	650	099	730	006	940	280	320	220	190	150	100	10930
¥.	M/L	550	380	280	260	510	2110	5190	2000	4820	7590	4000	3980	3810	3720	3790	4010	4520	4060	3670	2530	2120	1740	1430	880	67650
WASHINGTON Exit		30	8	20	5	200	210	950	860	720	530	790	290	580	240	480	520	780	200	420	260	190	160	120	02	8470
MA	H/L	580	007	300	270	260	2320	5810	5860	5540	4820	0677	4570	4390	4260	4270	4530	2000	4560	4090	2790	2310	1900	1550	950	76120
AVL Entry		0	0	0	0	5	09	640	380	580	280	100	8	80	0	0	0	0	0	0	0	0	0	0	0	2220
# # # # # # #	M/L	580	700	300	270	550	2260	5170	5480	7660	4540	4390	4480	4310	4260	4270	4530	2000	4560	0607	2790	2310	1900	1550	950	73900
-610 SB Entry		120	8	2	8	200	02.2	1810	1530	1380	1380	1260	1220	1230	1260	1270	1230	1350	1530	1110	750	7490	450	390	240	21200
I-610 NB I-610 SB Entry Entry		140	100	2	20	9	150	769	1080	1120	890	910	980	1040	1100	066	1050	1020	1190	980	069	520	470	410	280	15780
; H	H/L	320	220	160	140	290	1340	2870	2870	2460	2270	2220	2280	2040	1900	2010	2250	2630	1840	2000	1350	1300	980	220	430	36920
-610 SB Exit		230	130	110	8	120	7.0	1600	2300	2390	2230	2000	2090	2050	2130	2020	1850	1640	1560	1640	1450	1050	026	730	450	31300
I-610 NB I-610 Exit E		190	120	110	110	130	330	780	1130	1160	1050	1010	1070	1370	1530	1530	1770	1640	2090	1480	1200	880	800	099	430	22570
-	*M/L*	240	025	380	340	240	2140	5250	9300	6010	5550	5230	2440	2460	2560	2560	5870	5910	2490	5120	4000	3230	2750	2140	1310	90790
TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	MG 00:5	5:00 PM	W4 00:9	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (1-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL WEEKDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 2 OF 3

TAYLOR			}	2 2	20	: R	2	340	570	570	360	350	400	780	780	067	570	280	620	520	350	270	230	140	100	7650
: : : : : :	M/L	079	077	310	340	610	2240	2490	5420	4940	7460	4270	4260	4280	4280	4290	4700	5570	5050	3950	2540	2140	1770	1470	096	74420
HEIGHTS Entry		80	9	70	07	70	8	240	360	360	380	007	077	067	7490	760	550	92	710	077	530	220	210	160	120	7370
	H/L	260	380	270	300	570	2150	5250	2060	4580	4080	3870	3820	3790	3790	3830	4150	0/87	4340	3510	2250	1920	1560	1310	840	67050
STUDEMONT Exit		8	22	07	30	07	140	550	1310	1160	750	640	700	200	710	099	029	720	992	089	530	410	350	300	160	12150
- LS	M/L	650	430	310	330	610	2290	5800	6370	5740	4830	4510	4520	7490	4500	4490	4820	2280	5100	4190	2780	2330	1910	1610	1000	79200
SHEPEHRD Entry		80	20	30	88	8	120	260	470	420	440	769	240	710	680	950	029	200	710	530	390	310	270	220	140	9020
S	M/L	570	380	280	220	520	2170	2540	2800	5320	4390	4020	3980	3780	3820	3870	4150	4890	4390	3660	2390	2020	1640	1390	860	70180
T.C.JESTER Entry		30	8	5	5	2	8	280	550	470	310	290	310	300	320	300	360	410	094	270	160	110	8	02	20	5280
-	M/L	240	360	270	240	200	2090	5260	5350	4850	4080	3730	3670	3480	3500	3570	3790	4480	3930	3390	2230	1910	1550	1320	810	94900
DURHAM Exit		20	30	30	30	30	8	350	200	069	009	920	700	710	630	950	089	920	992	610	670	320	280	180	120	9950
	M/L	290	390	300	270	530	2180	5610	6050	2540	7680	4350	4370	4190	4130	4190	0255	5130	0697	4000	2700	2230	1830	1500	930	74850
T.C.JESTER Exit		50	20	10	10	5	30	120	240	210	210	210	220	270	240	260	270	290	310	260	150	110	100	80	20	3730
T. TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (I-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL WEEKDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 3 OF 3

	TAVIOR	TAYLOD	F 3
	Entry		
7		M/L	
580	09	079	: : :
410	30	440	
230	20	320	
320	30	350	
290	20	640	
2170	8	2260	
5150	220	5370	
4850	340	5190	
4370	340	4710	
4100	340	0777	
3920	350	4270	
3860	390	4250	
3800	360	4160	
3800	350	4150	
3800	380	4180	
4130	420	4580	
4980	760	2440	
4430	430	4860	
3430	310	3740	
2190	230	2420	
1870	160	2030	
1540	130	1670	
1330	120	1450	
860	06	950	
02299	5740	72510	

KATY FRWY (I-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL SATURDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 1 OF 3

	M/L			009	380	710	006	1510	2110	2630	3410	3810	3820	3790	3190	3230	3760	3090	3200	2960	2320	2680	2410	2380	1710	55980
WASHINGTON Entry	•	001	3 8	? 9	30	50	3	120	190	240	320	330	360	360	310	300	300	270	300	240	150	160	140	110	100	4660
MAS	M/L	010	580	240	350	390	840	1390	1920	2390	3090	3480	3460	3430	2880	2930	3460	2820	2900	2720	2170	2520	2270	2270	1610	51320
WASHINGTON		80	; <u>c</u>	9	8	80	80	190	280	330	370	450	430	380	390	370	380	360	320	250	320	240	200	150	110	5800
WAS	1/ _M	066	630	580	380	420	920	1580	2200	2720	3460	3900	3890	3810	3270	3300	3840	3180	3220	2970	2490	2760	2470	2420	1720	57120
AVL Entry		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M/L	066	630	280	380	750	920	1580	2200	2720	3460	3900	3890	3810	3270	3300	3840	3180	3220	2970	2490	2760	2470	2420	1720	57120
-610 SB Entry		240	130	120	100	130	330	570	810	860	950	096	920	910	890	850	810	069	800	700	099	610	610	200	320	14470
I-610 NB I-610 SB Entry Entry		280	210	250	8	20	2	13	320	067	260	650	650	099	099	989	089	099	929	900	280	450	550	530	480	10950
I	M/L	470	290	210	190	240	520	840	1070	1370	1950	2290	2320	2240	1720	1770	2350	1830	1800	1670	1240	1700	1310	1390	920	31700
-610 SB Exit		390	230	190	110	110	230	530	880	1460	1670	1830	1970	1990	2040	2040	1800	1840	1680	1920	1770	1220	1200	1010	720	28830
I-610 NB I-61 Exit		370	240	210	140	130	200	390	280	880	1040	1110	1190	1200	1160	950	950	860	930	800	710	240	270	150	8	14470
; t	*H/L*	1230	760	610	055	780	950	1760	2540	3710	7660	5230	2480	5430	4920	4760	4770	4530	4410	4390	3720	3160	2780	2550	1730	75000
TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (1-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL SATURDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 2 OF 3

TAYLOR		: 6	3 8	? 5	8 8	9	8 8	22	120	120	190	230	240	270	Š	£ 5		8 8	310	98	220	2 2	1 8	071	110	4180
	M/L	1040		9,0	370	007	006	1550	2060	2370	3020	3390	3420	3540	2850	200	09%	2840	2940	2520	1890	2420	2150	2140	1590	51180
HEIGHTS Entry		130	110	110	20	20	9	120	170	150	230	290	300	370	360	410	350	350	330	250	260	240	220	190	180	5280
	H/L	930	280	530	320	350	840	1430	1890	2220	2790	3100	3120	3170	2490	2550	3110	2490	2610	2270	1630	2180	1930	1950	1410	45900
STUDEMONT Exit		180	110	100	2	9	80	160	270	340	780	550	950	230	950	900	520	200	530	240	530	700	077	390	320	0006
IS.	M/L	1110	200	630	390	410	920	1590	2160	2560	3270	3650	3740	3760	3110	3150	3630	2990	3140	2810	2160	2580	2370	2340	1730	24900
SHEPEHRD Entry		95	100	8	30	8	20	80	170	230	310	390	430	480	480	440	390	380	350	330	260	210	240	250	200	6100
6	M/L	920	909	550	360	380	870	1510	1990	2330	2960	3260	3310	3280	2630	2710	3240	2610	2790	2480	1900	2370	2130	2090	1530	48800
.C. JESTER Entry		9	30	8	2	82	07	100	120	180	180	190	200	180	200	190	150	170	180	140	150	100	100	2	09	2850
-	H/L	860	570	530	340	360	830	1410	1870	2150	2780	3070	3110	3100	2430	2520	3090	2440	2610	2340	1750	2270	2030	2020	1470	45950
DURHAM Exit		120	2	20	30	70	09	8	200	390	520	290	530	530	220	530	200	470	410	440	450	310	230	270	180	7620
	M/L	980	640	280	370	007	890	1500	2070	2540	3300	3660	3640	3630	2980	3050	3590	2910	3020	2780	2200	2580	2320	2290	1650	53570
T.C.JESTER Exit		30	30	70	10	10	10	6	07	80	110	150	180	160	210	180	170	180	180	180	120	100	06	06	09	2410
T TIME (Begin)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	M4 00:5	5:00 PM	Wd 00:9	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRUY (1-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL SATURDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 3 OF 3

(Begin) TAYLOR 12:00 AM 980 110 1090 1:00 AM 580 50 630 2:00 AM 340 370 400 5:00 AM 370 400 730 5:00 AM 370 400 920 6:00 AM 1500 100 1600 7:00 AM 1500 100 1600 7:00 AM 1500 170 2420 9:00 AM 2830 200 3380 1:00 AM 3160 220 3380 1:00 AM 320 220 3380 1:00 AM 3250 220 280 2:00 PM 2550 2810 2:00 PM 2550 280 3:00 PM 2540 220 5:00 PM 2550 280 5:00 PM 2560 2760 5:00 PM 2560 190 5:00 PM 2560 250 5:00 PM 2560 250 5:00 PM 2560 250 5:00 PM<	H/L 1090 730 630 630 370 400 400 2420 2420 2820 2820 2820 2450	110 100 100 100 170 170 170 170 170 170	980 630 630 340 340 370 1940 1940 1940 3160 2250 2250 2250 2250 2250 2250 2250 22
	2320	120	2200
	2320	120	2200
	2320	120	2200
	2320	120	2200
	2320	120	2200
		;	000
	1820	180	1640
	7420	2	707
	2,50	10 1	2260
	2820	190	2630
	2760	220	2540
	3370	210	3160
	9	}	
	2880	230	2650
	2810	250	2560
	3540	270	3270
	3440	260	3180
	3380	220	3160
	3030	200	2830
	2420	170	2250
	2090	150	1940
	1600	100	1500
	920	40	880
	007	30	370
	370	30	340
	630	20	280
	730	100	630
	1090	110	086
	A/L	;	
	5		7
		Entry	

50630

3630

47000

24 HOURS

KATY FRWY (I-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL SUNDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 1 OF 3

TON	3	m/L	110 1170	60 920				20 410	Ī		100 1660					200 3080											
WASHINGTON			1060	860	240						1560					2880					2910 2					1180	
WASHINGTON	!		8	9	20	20	3 8	3 9	20	8	100	190	250	250	270	230	240	300	310	270	250	170	110	120	22	20	
3	M/L		1150	920	260	440	410	630	1020	1080	1660	2900	7460	2160	2460	3110	3370	3490	2990	3260	3160	2360	2410	2210	1890	1230	
AVL Entry	•		6	0	10	10	. 6	. 6	10	20	20	160	330	230	150	180	190	260	230	230	180	150	8	8	10	0	
	M/L		1150	920	780	430	700	620	1010	1060	1610	2740	4130	1930	2310	2930	3180	3230	2760	3030	2980	2210	2320	2150	1880	1230	
I-610 SB Entry			230	140	120	80	8	160	210	260	220	240	640	610	640	730	970	902	99	8	700	530	700	350	270	170	
1-610 NB Entry			400	280	250	220	110	20	09	120	190	280	370	780	450	510	470	200	540	520	240	530	380	290	290	210	
	M/L		520	200	410	130	210	410	740	680	1200	1920	3120	840	1220	1690	2090	2030	1560	1810	1740	1150	1540	1510	1320	850	
1-610 SB Exit			530	330	200	190	100	100	140	350	7067	840	1300	2530	1930	1510	1600	1560	1600	1590	1550	1520	1140	840	220	570	
I-610 NB I-6 Exit			8	100	20	80	33	20	30	100	120	290	240	099	520	420	300	760	430	270	380	310	170	150	130	130	
	H/L		1130	930	099	400	340	530	910	1130	1810	3050	5160	4030	3670	3650	3990	4050	3590	3670	3670	2980	2850	2500	2170	1550	
TIME (Begin)		;	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	

KATY FRUY (1-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL SUNDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 2 OF 3

								Exit				EXIT
	M/L		M/L	 	M/L		M/L		1/W		¥/Ł	
12:00 AM 70	1100	120	980	20	1030	140	1170	200	020	140	1110	: 5
1:00 AM 30	890	99	830	30	860	100	096	140	820	2 2	040	3 5
2:00 AM 30	23	8	069	30	720	130	850	120	730	1,	2 78	
3:00 AM 20	430	40	390	8	410	150	260	2	067	. 5	550	2 5
4:00 AM 10	400	30	370	5	380	210	590	8	260	3 9		א ה
5:00 AM 10	909	30	570	20	290	260	850	20	800	2 2	830	S 2
6:00 AM 20	086	07	076	40	980	110	1090	8	1010	20	1060	30
7:00 AM 30	1030	80	950	2	1020	99	1080	140	0%6	8	1030	20
8:00 AM . 60	1600	100	1500	80	1580	120	1700	200	1500	10	1600	8
9:00 AM 110	2750	210	2540	120	2660	140	2800	280	2520	120	2640	110
10:00 AM 140	4270	290	3980	140	4120	200	4320	420	3900	220	4120	200
11:00 AM 140	1930	280	1650	120	1770	200	1970	380	1590	230	1820	220
12:00 PM 150	2280	370	1910	170	2080	270	2350	450	1900	270	2170	250
1:00 PM 160	2920	370	2550	180	2730	360	3090	550	2540	280	2820	220
2:00 PM 170	3140	350	2790	160	2950	280	3230	200	2730	340	3070	240
3:00 PM 180	3220	330	2890	170	3060	300	3360	094	2900	220	3170	270
4:00 PM 180	2730	340	2390	150	2540	270	2810	430	2380	260	2640	250
5:00 PM 170	3050	350	2700	140	2840	260	3100	200	2600	270	2870	240
6:00 PM 160	3000	370	2630	160	2790	260	3050	470	2580	210	2790	230
7:00 PM 110	2230	260	1970	100	2070	180	2250	370	1880	9	2070	190
8:00 PM 90	2310	230	2080	88	2160	170	2330	280	2050	170	2220	170
9:00 PM 70	2110	190	1920	2	1990	150	2140	280	1850	160	2010	120
10:00 PM 60	1830	130	1700	99	1760	130	1890	220	1670	130	1800	5
11:00 PM 40	1200	80	1120	07	1160	80	1240	150	1090	8	1180	8
24 HOURS 2210	46770	4730	42040	2210	44250	4530	78780	6780	42000	3940	45940	3330

KATY FRWY (I-10) EASTBOUND --- SILBER TO TAYLOR --- TYPICAL SUNDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 3 OF 3

8		M/L	1080	006	830	540	009	840	1070	1030	1620	2640	4090	1760	2140	2870	3090	3090	2600	2850	2760	2010	2210	2010	1780	1160	45570
TAYLOR	Entry		2	70	30	23	8	20	07	20	110	110	170	160	220	270	260	190	210	220	200	130	160	120	8	9	2960
	•	H/L	1010	860	800	520	580	820	1030	980	1510	2530	3920	1600	1920	2600	2830	2900	2390	2630	2560	1880	2050	1890	1700	1100	42610
	TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL WEEKDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 1 OF 3

	¥		370	350	300	007	1240	3770	5510	4810	3860	3590	3980	3560	3930	4270	4560	4600	4590	4540	3420	2660	2460	2020	1320	70690
T.C.JESTER Exit		07	5 02	8	50	20	8	260	430	330	270	300	330	340	330	350	7,40	580	902	390	220	190	160	130	8	9809
1	M/L	650	360	370	320	420	1330	4030	2940	5140	4130	3890	4310	3900	4260	4620	2000	5180	5290	4930	3670	2850	2620	2150	1410	76770
SHEPHERD Exit		50	30	07	02	8	100	330	610	280	530	240	730	069	099	650	029	089	902	200	370	270	210	150	100	9230
	M/L	002	390	410	340	077	1430	4360	6550	5720	7660	4430	5040	4590	4920	5270	5670	2860	2990	5430	0707	3120	2830	2300	1510	86000
STUDEMONT Entry		180	140	120	9	07	110	320	580	520	097	780	260	099	630	099	740	870	860	630	087	390	350	230	220	10350
S	H/1	520	250	230	280	400	1320	4040	5970	5200	4200	3950	4480	3930	4290	4610	7630	0667	5130	4800	3560	2730	2480	2010	1290	75650
HEIGHTS Exit	1 1 1 1 1 1	80	20	07	0,4	0,4	110	360	040	670	760	200	009	009	260	580	580	900	570	027	360	290	260	200	130	8820
	H/L	900	300	330	320	077	1430	7400	6610	5870	0697	4450	5080	4530	4850	5190	5510	5590	5700	5270	3920	3020	2740	2210	1420	84470
TAYLOR		20	30	30	8	30	8	330	650	550	700	410	480	450	420	097	240	009	550	420	340	250	180	160	100	7540
	M/L	550	270	300	300	410	1340	4070	2960	5320	4290	4040	7600	4080	4430	4730	0265	7667	5150	4850	3580	2770	2560	2050	1320	76930
TAYLOR Exit		09	30	30	30	07	120	270	360	360	320	300	360	350	330	360	055	420	420	310	240	170	160	130	100	5710
	M/L	610	300	330	330	450	1460	4340	6320	2680	4610	4340	4960	4430	4760	2090	5410	5410	5570	5160	3820	2940	2720	2180	1420	82640
TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL WEEKDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 2 OF 3

; ; ;	M/L	390	210	230	150	220	720	2400	3610	2950	2500	2540	2950	2640	2990	3140	3240	2780	2660	2680	2610	2030	1870	1520	1000	48030
-610 SB Exit		150	8	8	20	8	140	610	1100	1160	1050	096	1080	1090	1160	1040	1070	1150	1130	066	260	530	097	410	290	16610
I-610 NB I-610 SB Exit Exit		230	130	110	130	150	390	910	1170	1280	1220	1180	1300	1320	1420	1410	1370	1240	1070	1410	910	800	760	280	380	20870
	M/L	<u>و</u>	430	420	330	430	1250	3920	5880	5390	4770	0897	5330	5050	5570	5590	2680	5170	0987	5080	4280	3360	3090	2510	1670	85510
AVL Exit		0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	420	810	430	920	240	110	2	6	0	2920
	H/L	240	430	420	330	430	1250	3920	5880	5390	4770	7680	5330	5050	5570	2800	6100	5980	5290	2200	4520	3470	3160	2520	1670	88430
WASHINGTON		20	30	30	8	07	80	210	350	400	430	520	280	290	640	610	630	089	290	260	390	260	250	210	120	8220
M	M/L	720	400	390	310	390	1170	3710	5530	0667	4340	4160	4740	7490	4930	5190	5470	5300	4730	5140	4130	3210	2910	2310	1550	80210
WASHINGTON		30	20	20	30	9	190	067	026	810	780	520	290	260	250	280	029	1010	1490	069	230	150	120	100	99	10420
MA	M/L	750	420	410	340	450	1360	4200	9200	5800	4820	0897	5330	5050	2480	5770	6140	6310	6220	5830	4360	3360	3030	2410	1610	90630
T.C. JESTER Entry	; ; ; ; ;	20	10	10	5	9	07	130	250	240	180	200	260	240	230	210	220	230	260	180	150	8	8	20	07	3350
Ė	M/L	730	410	400	330	440	1320	4070	6250	2260	7640	4480	2070	4810	5250	2560	5920	9080	2960	2650	4210	3270	2940	2360	1570	87280
DURHAM	1	120	2	20	30	04	88	300	240	730	780	890	1090	1250	1320	1290	1360	1480	1370	1110	790	610	480	340	250	16590
TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL WEEKDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 3 OF 3

	H/L	910	240	520	380	510	1460	0777	9530	5850	5200	2460	6230	6040	6430	0099	6570	2690	2470	5750	2420	4140	3820	3030	1980	98730
1-610 SB Entry		200	150	140	120	180	510	1320	1300	1360	1280	1360	1380	1370	1400	1400	1330	1160	1250	1110	066	730	650	240	350	21580
1-610 NB Entry		320	180	150	110	110	230	720	1380	1540	1420	1560	1900	2030	2040	2060	2000	1750	1560	1960	1820	1380	1300	970	630	29120
TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRUY (I-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL SATURDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 1 OF 3

	H/L	1010	099	029	450	400	860	1830	2440	3280	3590	3780	3540	3720	3440	3640	3780	3610	4180	3650	3170	2620	2460	2410	1610	90809
T.C.JESTER Exit		06	2	9	2	30	20	8	140	180	180	200	230	310	250	270	250	230	300	260	190	140	140	120	110	3900
1.0	M/L	1100	730	730	027	430	910	1910	2580	3460	3770	3980	3770	4030	3690	3910	4030	3840	4480	3910	3360	2760	2600	2530	1720	94700
SHEPHERD Exit		06	80	99	20	07	20	100	210	290	430	027	510	280	077	420	390	360	390	330	300	200	200	170	120	9539
ż	M/L	1190	810	280	520	720	096	2010	2790	3750	4200	4450	7580	7,620	4130	4330	4420	4200	0287	4240	3660	2960	2800	2700	1840	20990
STUDEMONT Entry		260	230	200	2	0,	8	140	290	360	410	077	520	610	260	610	290	260	450	480	380	350	350	320	290	8590
STU	H/L	930	580	290	450	430	880	1870	2500	3390	3790	4010	3760	4010	3570	3720	3830	3640	4420	3760	3280	2610	2450	2380	1550	95400
HEIGHTS Exit		170	100	120	2	09	100	150	200	310	420	077	067	025	027	450	400	380	350	360	390	230	260	240	210	0069
- -	H/L	1100	089	710	520	067	980	2020	2700	3700	4210	4450	4250	4480	4040	4170	4230	4020	4770	4120	3670	2900	2710	2620	1760	69300
TAYLOR Entry		80	99	2	30	30	07	130	200	310	230	230	310	700	310	330	300	300	290	280	300	260	190	160	140	5100
	M/L	1020	950	940	067	095	940	1890	2500	3390	3920	4160	3940	4080	3730	3840	3930	3720	7480	3840	3370	2640	2520	2460	1620	64200
TAYLOR Exit		07	02	8	8	30	80	180	240	250	220	200	250	240	220	240	300	280	280	210	16 0	110	110	8	2	3860
! ! ! !	H/L	1060	040	099	510	067	1020	2070	2740	3640	4140	4360	4190	4320	3950	7080	4230	4000	4760	4050	3530	2750	2630	2550	1690	09089
TIME (Begin)		12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	24 HOURS

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL SATURDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 2 OF 3

M/1 M/1 <th>1.0.</th> <th>C. JESTER Entry</th> <th>MAS</th> <th>WASHINGTON Exit</th> <th>MAS</th> <th>WASHINGTON</th> <th>; ; ; ; ;</th> <th>AVL Exit</th> <th><u></u></th> <th>I-610 NB I-610 SB Exit Exit</th> <th>-610 SB Exit</th> <th></th>	1.0.	C. JESTER Entry	MAS	WASHINGTON Exit	MAS	WASHINGTON	; ; ; ; ;	AVL Exit	<u></u>	I-610 NB I-610 SB Exit Exit	-610 SB Exit	
36 1280 80 1200 1110 1310 950 1310 340 260 30 866 40 820 130 950 0 950 230 210 10 780 40 740 770 810 950 160 250 160 10 450 30 450 30 450 30 460 10 450 160 950 160 960 10 950 160 960 10 950 160 960 10 950 160 960 10 960 10 960 10 960 10 960 10 960 10 960 10 960 10 460 40 460 40 460 40 460 40 460 40 460 40 460 460 460 460 460 460 460 460 460 460 460 460	M/L		M/L		N/L		M/L		M/L		:	M/L
36 660 40 820 450 950 450 650 450	1250	30	1280	80	1200	110	1310	0	1310	340	260	710
2 7 7 81 61 7 7 81 61 7 7 81 61 7 7 81 61 62 7 61 61 62 7 7 81 7	830	30	860	40	820	130	950	0	950	230	210	510
10 520 30 490 30 520 640 940	260	50	780	07	240	2	810	0	810	230	160	420
10 450 420 460 460 450	510	9	520	30	067	30	520	0	520	160	8	270
10 910 883 36 880 10 850 250 250 750	077	£	450	20	420	07	097	5	450	130	9	260
40 1960 170 170 100 1890 40 1850 410 240 410 240 410 <td>006</td> <td>t</td> <td>910</td> <td>80</td> <td>830</td> <td>30</td> <td>960</td> <td>10</td> <td>850</td> <td>220</td> <td>2</td> <td>260</td>	006	t	910	80	830	30	960	10	850	220	2	260
80 2750 2230 180 2710 70 2640 610 350 120 3710 240 3470 260 3730 140 3590 850 550 140 4200 310 3890 350 4240 170 6070 550 650 160 4470 270 4220 350 4620 220 4410 1140 650 160 4470 270 4220 420 420 420 500 420 420 500 420 500 420 500 420 <t< td=""><td>1920</td><td>07</td><td>1960</td><td>170</td><td>1790</td><td>100</td><td>1890</td><td>07</td><td>1850</td><td>410</td><td>240</td><td>1200</td></t<>	1920	07	1960	170	1790	100	1890	07	1850	410	240	1200
120 3710 240 3470 260 3730 140 3590 6410 6190 6410 6190 6410 6190 6410 6190 6410 6190 6410 6190 6410 6190 6410 6410 6410 6410 642	2670	80	2750	220	2530	180	2710	2	2640	610	360	1670
140 4200 310 3890 350 4240 170 4070 950 650 180 4490 270 4220 390 4610 200 4410 1140 650 180 4470 250 4220 460 4620 220 4780 1130 740 180 4840 250 4590 420 5010 220 4780 1120 800 170 4840 250 450 4590 4590 250 4780 1150 800 130 4530 450 4590 4590 250 4490 1150 750 130 4530 450 450 450 450 1150 450 130 4570 450 450 450 450 450 450 130 4560 450 450 450 450 450 450 130 4560 450 450	3590	120	3710	240	3470	260	3730	140	3590	850	290	2150
160 4490 270 4220 4610 200 4410 1140 690 180 4470 250 4220 4620 220 4700 1180 740 160 4840 250 450 420 5010 230 4780 1320 800 170 430 250 420 390 4590 220 4780 1320 800 170 4530 250 4200 390 4590 240 1320 800 130 4530 250 4200 390 4690 250 4100 720 130 4530 450 250 4430 1160 4710 <td>0907</td> <td>140</td> <td>4200</td> <td>310</td> <td>3890</td> <td>350</td> <td>4240</td> <td>170</td> <td>4070</td> <td>950</td> <td>650</td> <td>2470</td>	0907	140	4200	310	3890	350	4240	170	4070	950	650	2470
180 4470 250 4220 4620 6220 4	4330	160	0677	270	4220	390	4610	200	4410	1140	069	2580
160 4840 250 4590 420 5010 230 4780 1220 800 170 4300 230 4070 420 4490 200 4290 1130 740 140 4450 250 420 4590 250 4440 1150 750 130 4530 450 4590 250 4440 1150 660 130 4530 450 4530 250 4430 1160 650 110 4560 350 4530 170 4710 1160 660 110 4260 142 250 4370 116 4210 660 110 4260 142 250 4370 150 640 560 100 3680 140 250 430 150 2840 770 440 110 2840 150 2930 100 2920 450 460	7500	180	7470	250	4220	700	4620	220	4400	1180	740	2480
170 4300 230 4070 420 4490 200 4290 1130 4290 1130 4290 1130 4290 1130 4290 1130 4290 1130 4290 1130 4290 1150 4290 1150 4290 1150 4230 1150 4290 4230 4290 4230 429	7680	160	4840	220	4590	420	5010	230	4780	1220	800	2760
140 4450 250 4200 390 4590 240 4350 720 130 4530 220 4310 380 4690 250 4440 1150 680 130 4300 230 4070 360 4430 200 4230 1090 680 120 4770 230 4540 340 4880 170 4710 1140 640 110 4260 140 3540 250 4370 130 840 580 460 100 3680 140 3540 200 130 3610 770 460 460 50 2840 110 2730 180 2910 90 2920 770 460 50 2840 1970 120 2090 10 2090 520 440 5130 72270 3840 68430 5410 74040 21410 21410 21410	4130	170	4300	230	0207	420	7490	200	4290	1130	240	2420
130 4530 220 4310 380 4690 250 4440 1150 680 130 4300 230 4070 360 4430 200 4230 1090 660 110 4260 140 4120 340 480 170 4710 1140 690 110 4260 140 4120 250 4370 130 4220 1010 640 110 4260 140 3540 200 3740 130 3610 640 580 70 3680 110 2730 180 2910 770 400 400 70 2870 150 2930 10 2920 770 400 70 2870 150 2930 10 2920 770 400 80 2870 150 2090 2090 520 40 40 80 2870 160 200 <t< td=""><td>4310</td><td>140</td><td>4450</td><td>250</td><td>4200</td><td>390</td><td>4590</td><td>240</td><td>4350</td><td>1090</td><td>720</td><td>2540</td></t<>	4310	140	4450	250	4200	390	4590	240	4350	1090	720	2540
130 4300 230 4070 360 4430 200 4230 1090 660 110 4770 230 4540 340 4880 170 4710 1140 690 110 4260 140 4120 250 4370 150 4220 1010 640 100 3680 140 3540 200 3740 130 3610 840 580 50 2840 110 2890 310 3200 100 3100 3700 450 50 2840 110 2730 150 2930 10 2920 500 500 50 2840 70 120 2090 7141 18080 11520 440	7400	130	4530	220	4310	380	7690	250	0555	1150	680	2610
120 4770 230 4540 340 4880 170 4710 1140 690 110 4260 140 4120 250 4370 150 4220 1010 640 100 3480 140 3540 200 3740 130 3610 840 580 70 3810 120 2890 310 3200 100 3100 460 70 2870 110 2730 180 2910 90 2820 770 460 70 2870 150 2930 10 2920 920 500 50 2040 70 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 440	4170	130	4300	230	0207	360	4430	200	4230	1090	099	2480
110 4260 140 4120 250 4370 150 4220 1010 640 100 3580 140 3540 200 3740 130 3610 840 580 70 3010 120 2890 310 3200 100 3100 750 490 50 2840 110 2730 180 2910 90 2820 770 460 70 2870 150 2930 10 2920 920 500 50 2040 70 1970 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 440	7650	120	4770	230	4540	340	4880	170	4710	1140	069	2880
100 3680 140 3540 200 3740 130 3610 840 580 70 3010 120 2890 310 3200 100 3100 770 490 50 2840 110 2730 180 2910 90 2820 770 460 70 2870 90 2780 150 2930 10 2920 920 500 50 2040 70 1970 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 440	4150	110	4260	140	4120	250	4370	150	4220	1010	940	2570
70 3010 120 2890 310 3200 100 3100 750 490 50 2840 110 2730 180 2910 90 2820 770 460 70 2870 90 2780 150 2930 10 2920 920 500 50 2040 70 1970 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 4	3580	100	3680	140	3540	200	3740	130	3610	840	580	2190
50 2840 110 2730 180 2910 90 2820 770 460 70 2870 90 2780 150 2930 10 2920 920 500 50 2040 70 1970 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 4	2940	2	3010	120	2890	310	3200	100	3100	33	067	1860
70 2870 90 2780 150 2930 10 2920 920 500 50 2040 70 1970 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 4	2790	20	2840	110	2730	180	2910	8	2820	222	760	1590
50 2040 70 1970 120 2090 0 2090 520 440 2130 72270 3840 68430 5610 74040 2630 71410 18080 11520 4	2800	2	2870	8	2780	150	2930	5	2920	920	200	1500
2130 72270 3840 68430 5610 74040 2630 71410 18080 11520	1990	20	2040	2	1970	120	2090	0	2090	520	077	1130
	70140	2130	72270	3840	68430	5610	24040	2630	71410	18080	11520	41810

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL SATURDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 3 OF 3

1/H	1750	1140	1010	290	510	1010	2210	3270	4190	4850	5320	5520	6050	5560	5770	5700	5680	5740	5280	4330	3550	3280	3100	2450
1-610 SB Entry	350	240	230	170	140	250	580	810	980	1030	1100	1290	1310	1280	1290	1180	1350	1120	1080	800	710	029	240	450
1-610 NB 1-610 SB Entry Entry	069	390	360	150	110	200	430	790	1060	1350	1640	1750	1980	1860	1940	1910	1850	1740	1630	1340	980	1020	1060	900
TIME (Begin)	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	MG 00:7	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM

87860

18920

27130

24 HOURS

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL SUNDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 1 OF 3

: : : :		M/L	030	952	069	230	240	320	840	1330	1670	2280	2590	2730	3510	3490	3890	3790	2610	3510	3580	2960	2600	2030	2070	860	79480
	T.C.JESTER Exit		06	80	8	50	8	ន	07	9	2	120	130	170	150	150	210	210	220	200	230	160	160	9	8	09	2840
	:	M/L	1020	81 0	230	250	260	350	880	1390	1740	2400	2720	2900	3660	3640	4100	0007	2830	3710	3810	3120	2760	2130	2150	920	52320
	SHEPHERD Exit		8	8	8	33	04	02	07	9	100	170	230	260	260	310	340	320	280	280	220	210	220	150	130	2	4000
	ij	M/L	1110	890	860	280	300	370	920	1450	1840	2570	2950	3160	3920	3950	0777	4320	3110	3990	4030	3330	2980	2280	2280	066	56320
2	SIUDEMONT		270	260	220	9	22	09	8	130	190	270	340	380	780	067	430	780	200	510	430	410	300	260	220	140	7010
10 - 3841	is S	M/L	840	630	079	180	250	310	830	1320	1650	2300	2610	2780	3440	3460	4010	3840	2610	3480	3600	2920	2680	2020	2060	820	49310
UET CUTO	Exit		170	100	120	9	30	30	20	110	130	210	260	270	350	380	360	340	370	400	420	330	240	240	170	120	5260
	_	M/L	1010	73.0	760	240	280	340	880	1430	1780	2510	2870	3050	3790	3840	4370	4180	2980	3880	4020	3250	2920	2260	2230	026	54570
TAYLOR	Entry		100	80	09	8	0 2	80	07	8	110	150	250	250	310	320	250	260	270	320	280	220	170	190	120	2	4010
		M/L	910	650	200	210	260	310	840	1350	1670	2360	2620	2800	3480	3520	4120	3920	2710	3560	3740	3000	2750	2070	2110	006	50560
TAYLOR	Exit			20	200	20	20	20	140	190	190	170	160	190	190	170	190	230	220	220	160	130	8	88	29	20	3020
		M/L	076	029	720	230	280	380	086	1540	1860	2530	2780	2990	3670	3690	4310	4150	2930	3780	3900	3130	2840	2150	2180	950	53580
	TIME (Begin)	; ; ; ; ; ;	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	K4 HOURS

KATY FRWY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL SUNDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 2 OF 3

					MOVEMBER	1 1775	PAGE A CP	1					
TIME (Begin)	DURHAM Entry	7.1	T.C.JESTER Entry	M	WASHINGTON	Y.	WASHINGTON Entry		AVL Exit		I-610 NB I-610 SB Exit Exit	-610 SB Exit	
		M/L		H/L	; ; ;	H/L		1/1		¥/L			M/L
12:00 AM	320	1250	07	1290	8	1230	150	1380	0	1380	380	380	069
1:00 AM	280	1010	8	1040	0,7	1000	100	1100	0	1100	220	560	280
2:00 AM	260	950	20	980	22	910	8	1000	0	1000	220	190	230
3:00 AM	8	310	9	320	8	530	09	350	0	350	120	150	80
4:00 AM	20	290	10	300	20	280	30	310	0	310	8	09	160
5:00 AM	20	370	9	380	82	360	30	390	0	390	5	2	240
6:00 AM	2	910	20	930	20	880	07	920	0	920	200	9	99
7:00 AM	120	1450	30	1480	8	1390	20	1440	0	1440	270	130	1040
8:00 AM	180	1850	9	1910	100	1810	110	1920	0	1920	380	180	1360
9:00 AM	230	2510	100	2610	170	2440	130	2570	0	2570	290	240	1740
10:00 AM	360	2950	100	3050	150	2900	210	3110	0	3110	720	700	1990
11:00 AM	760	3220	120	3340	150	3190	180	3370	0	3370	730	520	2120
12:00 PM	630	4140	180	4320	190	4130	240	4370	0	4370	930	009	2840
1:00 PM	200	4190	130	4320	160	4160	200	4360	0	4360	980	989	2700
2:00 PM	620	4510	140	4650	160	0677	220	4710	0	4710	1310	650	2750
3:00 PM	009	4390	120	4510	180	4330	280	4610	0	4610	1290	570	2750
4:00 PM	650	3260	120	3380	220	3160	280	3440	0	3440	1280	230	1570
5:00 PM	900	4110	130	4240	190	4050	250	4300	0	4300	1040	610	2650
6:00 PM	520	4100	8	4190	140	4050	220	4270	0	4270	066	570	2710
7:00 PM	700	3360	2	3430	130	3300	150	3450	0	3450	840	280	2030
8:00 PM	410	3010	9	3070	100	2970	120	3090	0	3090	089	097	1950
9:00 PM	380	2410	20	5460	06	2370	150	2520	0	2520	610	007	1510
10:00 PM	270	2340	20	2390	09	2330	88	2410	0	2410	200	330	1580
11:00 PM	220	1080	07	1120	20	1070	80	1150	0	1150	360	280	510
24 HOURS	8490	57970	1740	59710	2620	57090	3450	60540	0	99209	14860	8940	36740

KATY FRUY (1-10) WESTBOUND --- SILBER TO TAYLOR --- TYPICAL SUNDAY SOURCE: TEXAS TRANSPORTATION INSTITUTE REVISED NOVEMBER, 1992 PAGE 3 OF 3

#M/L* 380	g	. ! 4	-410 NB 1-410 co		THE TENT OF THE TE	1992	PAGE 3 OF 3
	Entry	-	io se Entry				
	- :			*H/L*			
	800		380	1800			i
	480		280	1350			
1 2 2 3 4 5 7 7 7 7 7 1 1 1 2 2 2 2 1 1 1 1 1 1 1 1	360		230	1180			
1 2 2 3 4 4 3 7 7 7 11 11 12 12 12 13 15 15 15 15 15 15 15 15 15 15 15 15 15	300		130	510			
	120		100	380			
	80		120	077			
	130		160	950			
	210		250	1500			
	370		380	2110			
	620		009	2960			
	890		089	3560			
	1070		750	3940			
	1200		890	4930			
	1410		950	2060			
	1460		910	5120			
	1600		1060	5410			
	2980		1060	5610			
	1950		1020	5620			
	1510		950	5170			
	1420		730	4180			
	1010		570	3530			
	850		580	2940			
	710		077	2730			
	530		310	1350			

72330

13530

22060

24 HOURS