

TRAFFIC ENGINEERS, INC.

THE TEAM YOU CAN DEPEND ON

8323 Southwest Freeway
Suite 200
Houston, TX 77074

Voice (713) 270-8145
Fax (713) 270-8148
www.trafficengineersinc.com

April 7, 2009

Mr. Mark Loethen, PE
City Engineer
City of Houston
Department of Public Works and Engineering
P.O. Box 1562
Houston, TX 77251-1562

Re: Supplement to Response to sixth driveway permit comments from City of Houston City Engineer, to accompany revised plans.

Dear Mr. Loethen:

This is in reference to your request for supplemental information regarding the proposed 1717 Bissonnet development.

Trip Generation Rates and Impact on surrounding intersections:

As was discussed, a stakeholders group/task force was organized by the administration in 2008 regarding high density development and impacts for surrounding residential areas. The recommendations from the stakeholders/task force and the Texas Transportation Institute (participant in the task force) concluded that where intersection level of service in study areas were shown to be lower than LOS D, particular attention to impacts of additional traffic be considered. One consideration when looking at high density development included the possibilities of development changes and traffic generation rates. This was especially discussed regarding the wide variation in ITE trip generation rates for high rise properties (apartments vs. condominiums vs. luxury condominiums for example). The outcome was that where calculations suggest that intersections are operating at or below LOS D or may be pushed lower in LOS such as to an LOS E or F, that the impact of trip generation rates in a range of 0.38 to 0.62 be tested to demonstrate a project's potential impact. Given your analysis that the current LOS for the Shepherd/Bissonnet intersection is at threshold between LOS E and F, the range of rates at 0.38 and 0.62 should be used to evaluate impacts.

While computation using an arbitrarily high trip generation rate is an interesting academic exercise, this rate is not supported in Trip Generation, An ITE Informational Report or by the local data collected by the COH (previously submitted) as being appropriate for this development. Both the ITE and the COH rates are virtually on top of one another (0.38 and 0.39, respectively).

Even if one chose to use the rates for ITE Land Use Code 233 Luxury Condominium/Townhouse, standard practice would call for use of the average generation rate of 0.55. There is no basis for presuming that the development might generate at the high end of 0.62 trips per unit. **But any use of the higher factor is more flawed, however, than just that.** ITE Land Use Code 233 Luxury Condominium/Townhouse describes Luxury Condominiums/Townhouses as "units in buildings with luxury facilities or services". As a result, if the 0.62 rate were applied to the residential units in the development, there would be no additional trips added for the amenities (restaurant, spa, and specialty retail, etc.). Those luxury facilities are already taken into account in the 0.62 rate.

TRAFFIC ENGINEERS, INC.

The difference between the 0.38 (ITE) or 0.39 (COH) rates and the 0.62 rate is that the former applies just to the residential component, to which must be separately added the other uses, and that the latter rate already includes trips associated with those other uses. If multiple land uses are provided, it is customary to calculate the trips for the separate land uses and compare the combined trips with the already combined Luxury Condo rate calculation and use the lesser.

It would not be proper to calculate a residential-only development using 0.62 or even 0.55 (the average for Luxury Condo). Neither number would apply if the development consisted of residences only. By definition, the higher rates include non-residential luxury facilities and services.

However, as you requested, we have analyzed the indicated PM peak hour trips using a higher factor. In fact, we used the ITE Land Use Code 233 Luxury Condominium/Townhouse **maximum rate** of 0.63 in order to compare that to the PM peak hour trips that were utilized in the TIA's earlier submitted in support of this proposed development. Multiplying the 0.63 factor by the 231 units in the proposed development indicates 145 trips during the PM peak hour. The earlier submitted TIA's used a 0.38 factor for the residential High-Rise Apartment component of the development, plus individual factors for the ancillary facilities (restaurant, spa, office, etc.) which, combined, indicated a total of 184 trips during the PM peak hour. Thus, the 0.63 factor (which already includes the ancillary uses) actually results in fewer PM peak hour trips than is calculated by analyzing the uses separately and adding them together as was done in the earlier submitted TIA's.

Capacity analysis is attached for the intersection of Bissonnet at Shepherd using a trip generation rate of 0.63 (the highest rate for ITE Land Use 233 Luxury Condominium/Townhouse) trips per dwelling unit during the PM peak hour. The PM peak hour LOS remains at LOS E even assuming a 0.63 trip rate for the high rise residential land use plus the amenity land uses.

PM Peak Hour Bissonnet at Shepherd	Future Traffic Without Development		Future Traffic With Development Assuming 0.38 Trip Rate for High Rise Apartments (ITE Rate) plus additional factors for Spa, Office, Restaurant, Retail and 5 Townhomes		Future Traffic With Development Assuming 0.63 Highest Trip Rate for Luxury Condominium /Townhouse, assuming standard practice of not adding luxury facilities and services such as Spa, Office, Restaurant, Retail, etc. separately		Future Traffic With Development Assuming 0.63 Highest Trip Rate for Luxury Condominium /Townhouse, <u>plus double counting and adding</u> additional factors for luxury facilities and services such as Spa, Office, Restaurant, Retail, etc.	
	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle
	E	72.9	E	77.2	E	75.4	E	78.0

The intersection of Bissonnet at Shepherd will operate at Level of Service E with or without this proposed development, whether the factor used is the correct factor, an arbitrarily selected higher factor, or a combined factor that double counts certain uses. No mitigation is recommended.

TRAFFIC ENGINEERS, INC.

Driveway Spacing between 1717 Bissonnet (proposed) and Dunlavy/Bissonnet intersection: Concerns still exist regarding proposed turning movements into project site during PM peak conditions and impacts on stacking of WB Bissonnet traffic into Dunlavy/Bissonnet intersection. 2/26/09 Addendum to TIA discussed mitigation for this concern. Provide specific details and quantification of on-site and/or off-site mitigation measures proposed for the project to address this concern.

PM Peak Hour Bissonnet at	Future Traffic Without Development		Future Traffic With Development Assuming 0.38 Trip Rate for High Rise Apartments (ITE Rate) plus additional factors for Spa, Office, Restaurant, Retail and 5 Townhomes		Future Traffic With Development Assuming 0.63 Highest Trip Rate for Luxury Condominium /Townhouse, assuming standard practice of not adding luxury facilities and services such as Spa, Office, Restaurant, Retail, etc. separately		Future Traffic With Development Assuming 0.63 Highest Trip Rate for Luxury Condominium /Townhouse, <u>plus double counting and adding</u> additional factors for luxury facilities and services such as Spa, Office, Restaurant, Retail, etc.		Future Traffic With Development Assuming 0.63 Highest Trip Rate for Luxury Condominium /Townhouse, <u>plus double counting and adding</u> additional factors for luxury facilities and services such as Spa, Office, Restaurant, Retail, etc. with TWLTL Mitigation	
	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle	LOS	Delay Seconds/Vehicle
Ashby										
N/B	B	11.5	B	14.5	C	15.9	C	17.3	C	17.0
E/B	A	1.6	A	1.8	A	1.7	A	2.3	A	2.0
W/B	A	2.6	A	2.3	A	2.0	A	2.4	A	0.7
1717 Dwy										
N/B	C	18.6	C	21.8	C	20.4	D	29.1	C	20.4
E/B	A	3.2	A	1.4	A	1.3	A	1.9	A	1.2
W/B	A	0.9	A	4.3	A	4.2	A	6.3	A	1.8
Dunlavy										
N/B	A	7.2	A	7.7	A	9.8	B	11.1	A	6.7
S/B	B	12.2	C	19.0	B	14.3	C	19.7	B	11.4
E/B	A	2.3	A	5.1	A	4.0	A	5.3	A	1.9
W/B	A	3.7	A	3.9	A	3.7	A	4.6	A	3.9

Engineering plans for a Two Way Left Turn Lane on Bissonnet between Ashby and Dunlavy are attached for your review and approval. Our calculations show that there is not a delay or stacking issue if the proper factors (as described above) are employed. Even if an arbitrarily high or double counting factor is

TRAFFIC ENGINEERS, INC.

employed, the plan for the Two Way Left Turn Lane mitigates any issues and the applicant stands ready to implement it as requested by the City of Houston.

Attached are computer modeling and data:

- a) using the 0.63 factor with the standard practice (not adding in and double counting the associated facilities),
- b) using the 0.63 factor plus double counting and adding a second time the associated facilities,
- c) with the Two Way Left Turn Lane using the 0.63 factor plus double counting and adding a second time the associated facilities, and
- d) detailed plans of the Two Way Left Turn Lane.

Note that the computer modeling for the Future Traffic Without Development and Future Traffic With Development Assuming the 0.38 Factor were both already provided as part of the earlier TIA's submitted for this development.

We did not deduct for owner supplied trip information, internal capture, transit usage, or passby traffic though it is standard practice to do so. Therefore, in your review of our numbers, please keep in mind that the assumptions in both our original and supplemental TIAs are conservative by design and even with the higher volumes resulting from those assumptions, there is no significant traffic impact.

Sincerely,



Daniel F. Lynch, PE, PTOE
Senior Principal

April 1, 2009 Supplement to
February 26, 2009 Addendum to
1717 Bissonnet
Traffic Impact of Proposed Driveway
January, 2009

Assuming a 0.63 Generation Rate Double Count

PM Full Project

Wed Apr 1, 2009 13:14:59

Page 1-1

Scenario Report

Scenario: PM Full Project
Command: PM
Volume: PM
Geometry: Default Geometry
Impact Fee: Default Impact Fee
Trip Generation: PM
Trip Distribution: Default Trip Distribution
Paths: Default Path
Routes: Default Route
Configuration: Default Configuration

Trip Generation Report

Forecast for PM

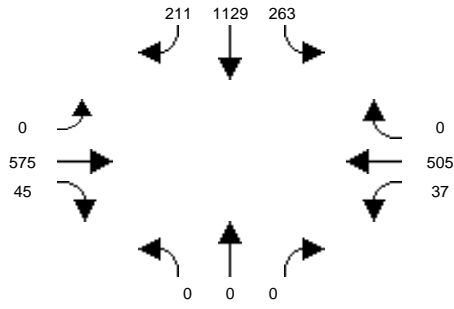
Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		1.00	High Rise Apar	90.00	53.00	90	53	143	76.1
1		1.00	Live/Work Town	3.00	2.00	3	2	5	2.7
1		1.00	Quality Rest.	25.00	12.00	25	12	37	19.7
1		1.00	Specialty Ret.	15.00	19.00	15	19	34	18.1
1		1.00	Spa 3250 ft	7.00	6.00	7	6	13	6.9
1		1.00	Office 6700 ft	2.00	8.00	2	8	10	5.3
1		-1.00	Mland Manor	35.00	19.00	-35	-19	-54	-28.7
	Zone 1 Subtotal					107	81	188	100.0
TOTAL						107	81	188	100.0

 Turning Movement Report
 PM

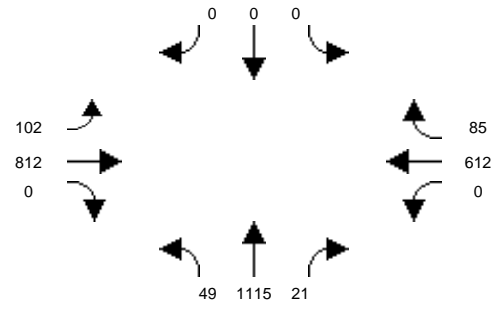
Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
#1 Bissonnet at Greenbriar													
Base	0	0	0	268	1152	215	0	587	46	38	515	0	2820
Added	0	0	0	0	0	0	0	43	0	0	32	0	75
Total	0	0	0	268	1152	215	0	630	46	38	547	0	2895
#2 Bissonnet at Shepherd													
Base	50	1137	21	0	0	0	104	828	0	0	624	87	2852
Added	0	0	0	0	0	0	0	43	0	0	32	0	75
Total	50	1137	21	0	0	0	104	871	0	0	656	87	2927
#3 Bissonnet at Hazard													
Base	10	148	29	58	92	44	51	703	6	28	590	25	1783
Added	0	0	0	0	0	0	0	43	0	0	32	0	75
Total	10	148	29	58	92	44	51	746	6	28	622	25	1858
#4 Bissonnet at Ashby													
Base	19	0	62	0	0	0	0	736	23	34	629	0	1505
Added	0	0	11	0	0	0	0	43	0	8	32	0	94
Total	19	0	73	0	0	0	0	779	23	42	661	0	1599
#5 Bissonnet at 1717 Bissonnet Driveway													
Base	9	0	10	0	0	0	0	781	18	18	645	0	1481
Added	41	0	41	0	0	0	0	0	54	54	0	0	190
Total	50	0	51	0	0	0	0	781	72	72	645	0	1671
#6 Bissonnet at Dunlavy													
Base	1	0	4	11	1	57	81	699	4	0	605	27	1489
Added	0	0	0	0	0	11	8	32	0	0	43	0	94
Total	1	0	4	11	1	68	89	731	4	0	648	27	1583
#7 Bissonnet at Mandell													
Base	47	139	133	36	48	31	14	632	4	19	551	31	1684
Added	0	0	0	0	0	0	0	32	0	0	43	0	75
Total	47	139	133	36	48	31	14	664	4	19	594	31	1759
#11 Bissonnet at Montrose													
Base	45	745	4	204	516	86	122	579	55	8	413	274	3052
Added	0	0	0	0	0	0	0	32	0	0	43	0	75
Total	45	745	4	204	516	86	122	611	55	8	456	274	3127

Intersection Graphic Report
Entered Volume (Base Alternative)
PM Full Project

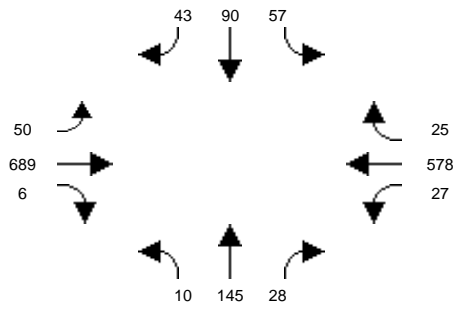
Intersection #1: Bissonnet at Greenbriar



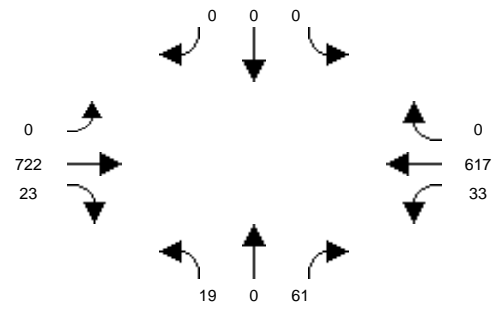
Intersection #2: Bissonnet at Shepherd



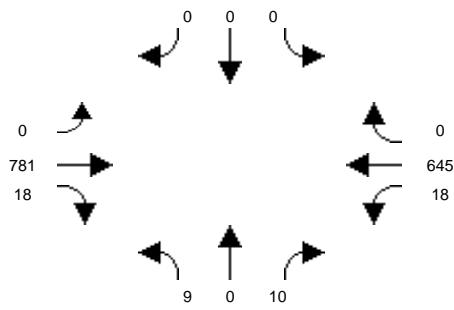
Intersection #3: Bissonnet at Hazard



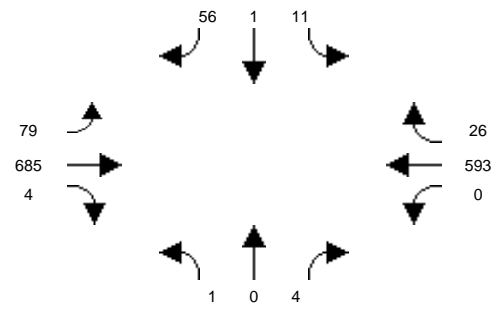
Intersection #4: Bissonnet at Ashby



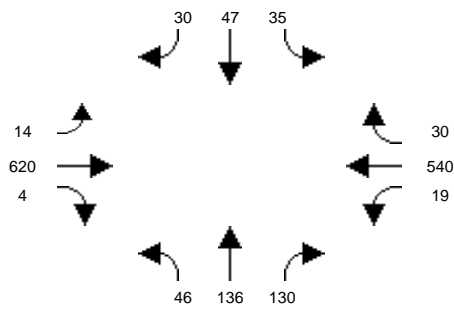
Intersection #5: Bissonnet at 1717 Bissonnet Driveway



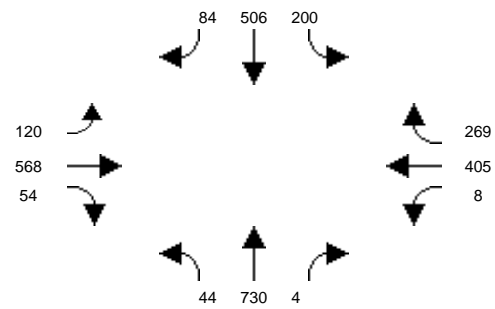
Intersection #6: Bissonnet at Dunlavy



Intersection #7: Bissonnet at Mandell

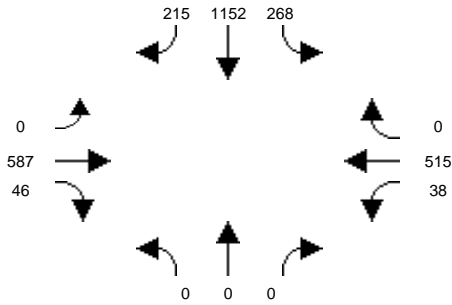


Intersection #11: Bissonnet at Montrose

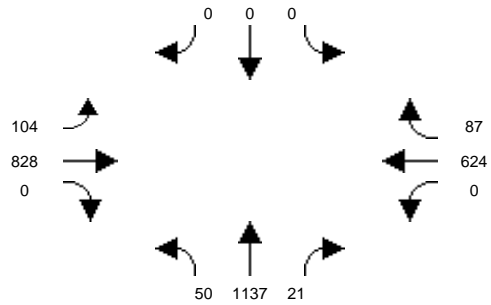


Intersection Graphic Report
Final Volume (Base Alternative)
PM Full Project

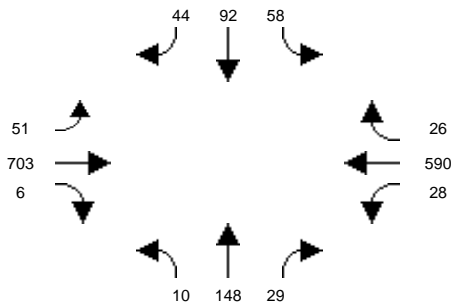
Intersection #1: Bissonnet at Greenbriar



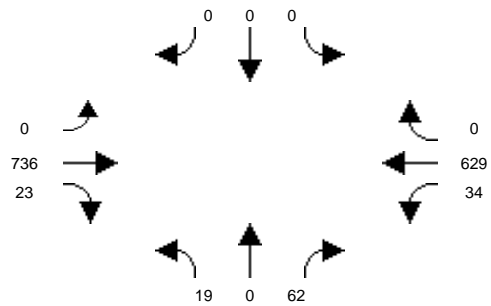
Intersection #2: Bissonnet at Shepherd



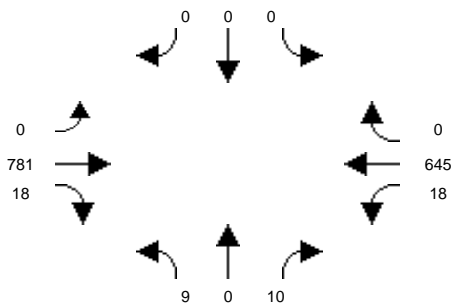
Intersection #3: Bissonnet at Hazard



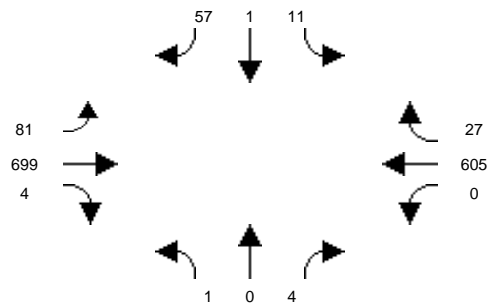
Intersection #4: Bissonnet at Ashby



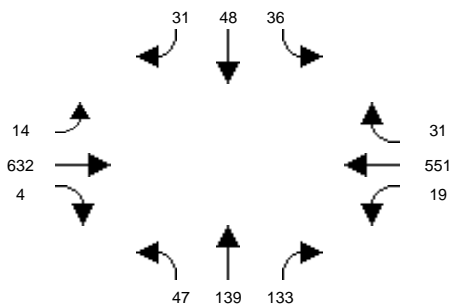
Intersection #5: Bissonnet at 1717 Bissonnet Driveway



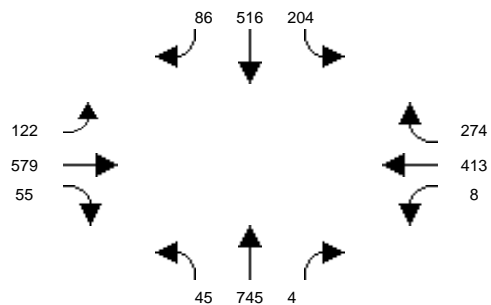
Intersection #6: Bissonnet at Dunlavy



Intersection #7: Bissonnet at Mandell

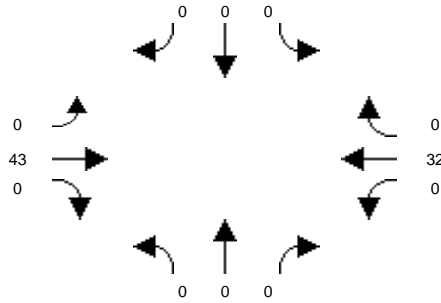


Intersection #11: Bissonnet at Montrose

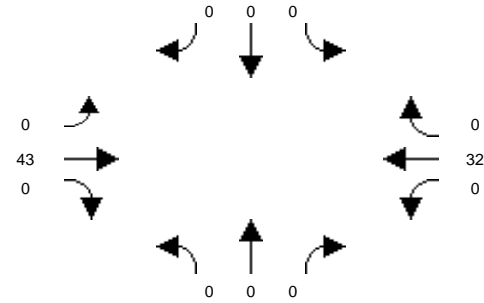


Intersection Graphic Report
Added Volume (Future Alternative)
PM Full Project

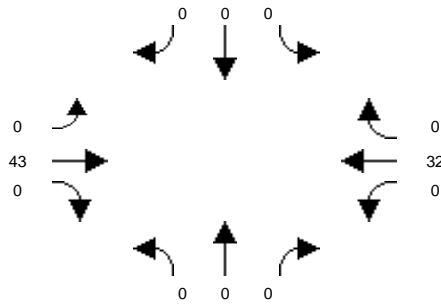
Intersection #1: Bissonnet at Greenbriar



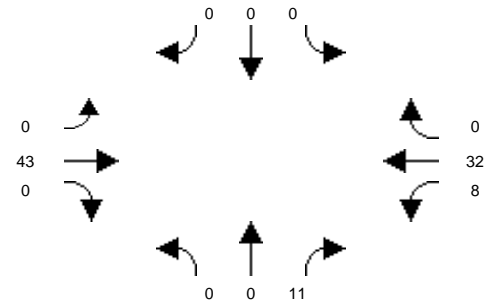
Intersection #2: Bissonnet at Shepherd



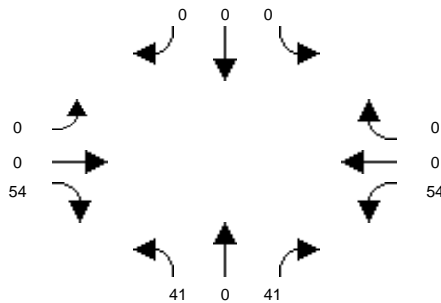
Intersection #3: Bissonnet at Hazard



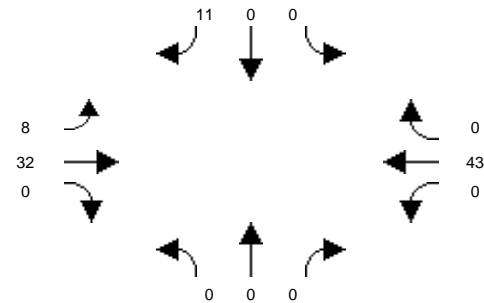
Intersection #4: Bissonnet at Ashby



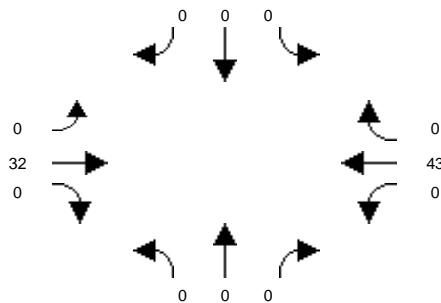
Intersection #5: Bissonnet at 1717 Bissonnet Driveway



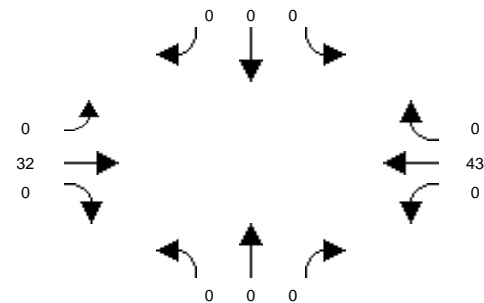
Intersection #6: Bissonnet at Dunlavy



Intersection #7: Bissonnet at Mandell

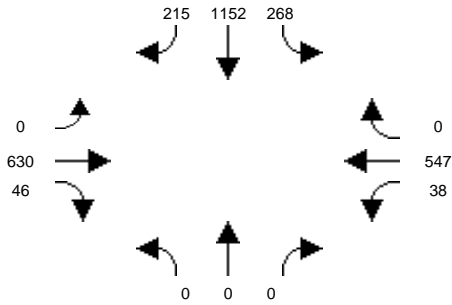


Intersection #11: Bissonnet at Montrose

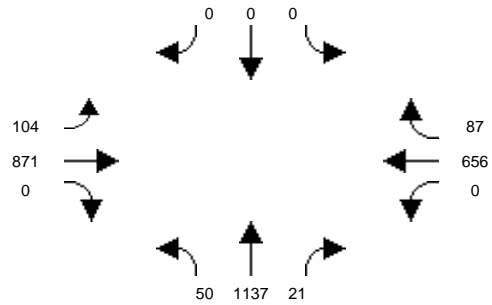


Intersection Graphic Report
Final Volume (Future Alternative)
PM Full Project

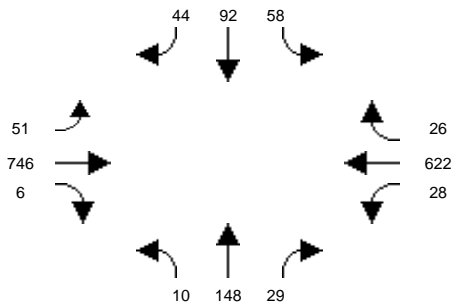
Intersection #1: Bissonnet at Greenbriar



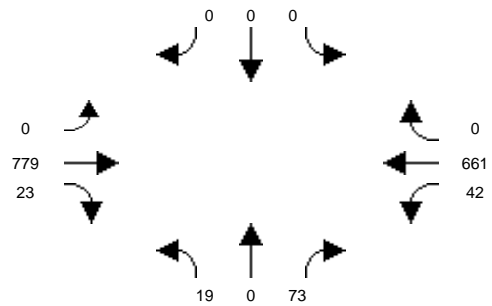
Intersection #2: Bissonnet at Shepherd



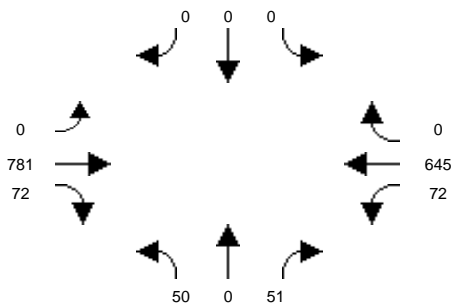
Intersection #3: Bissonnet at Hazard



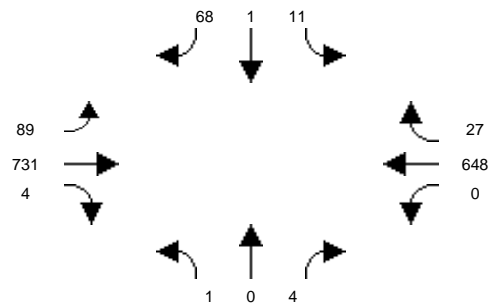
Intersection #4: Bissonnet at Ashby



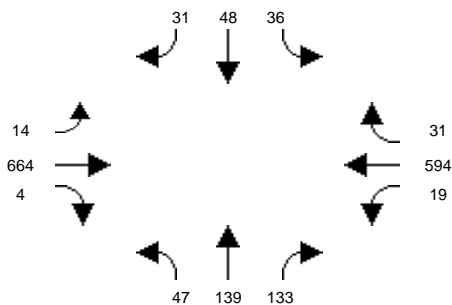
Intersection #5: Bissonnet at 1717 Bissonnet Driveway



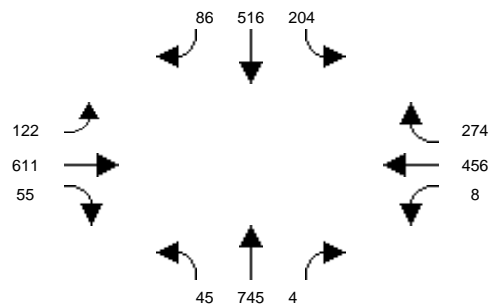
Intersection #6: Bissonnet at Dunlavy



Intersection #7: Bissonnet at Mandell

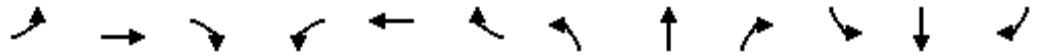


Intersection #11: Bissonnet at Montrose



HCM Signalized Intersection Capacity Analysis
 2: Bissonnet & Shepherd

Synchro Report
 Assuming 0.63 Double Count



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	871	0	0	656	87	50	1137	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frpb, ped/bikes	1.00	1.00			1.00			1.00				
Flpb, ped/bikes	1.00	1.00			1.00			1.00				
Frt	1.00	1.00			0.98			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1805	1881			1854			3558				
Flt Permitted	0.06	1.00			1.00			1.00				
Satd. Flow (perm)	121	1881			1854			3558				
Peak-hour factor, PHF	0.77	0.85	1.00	1.00	0.82	0.82	0.83	0.83	0.83	1.00	1.00	1.00
Adj. Flow (vph)	135	1025	0	0	800	106	60	1370	25	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	1	0	0	0	0
Lane Group Flow (vph)	135	1025	0	0	902	0	0	1454	0	0	0	0
Confl. Peds. (#/hr)							2					
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt						Perm					
Protected Phases	5	2			6			8				
Permitted Phases	2						8					
Actuated Green, G (s)	69.8	69.8			57.9			40.0				
Effective Green, g (s)	70.9	70.9			59.0			41.1				
Actuated g/C Ratio	0.59	0.59			0.49			0.34				
Clearance Time (s)	5.1	5.1			5.1			5.1				
Vehicle Extension (s)	3.0	3.0			3.0			3.0				
Lane Grp Cap (vph)	182	1111			912			1219				
v/s Ratio Prot	0.05	c0.54			c0.49							
v/s Ratio Perm	0.39							0.41				
v/c Ratio	0.74	0.92			0.99			1.19				
Uniform Delay, d1	51.0	22.1			30.2			39.5				
Progression Factor	0.78	0.64			0.97			1.00				
Incremental Delay, d2	9.9	8.6			25.0			95.0				
Delay (s)	49.7	22.8			54.2			134.4				
Level of Service	D	C			D			F				
Approach Delay (s)		25.9			54.2			134.4			0.0	
Approach LOS		C			D			F			A	

Intersection Summary				
HCM Average Control Delay		78.0	HCM Level of Service	E
HCM Volume to Capacity ratio		1.04		
Actuated Cycle Length (s)		120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		89.1%	ICU Level of Service	E
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis

2: Bissonnet & Shepherd

Synchro Report
Assuming 0.63 Standard Practice



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	851	0	0	638	87	50	1137	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.95				
Frpb, ped/bikes	1.00	1.00			1.00			1.00				
Flpb, ped/bikes	1.00	1.00			1.00			1.00				
Frt	1.00	1.00			0.98			1.00				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1805	1881			1853			3558				
Flt Permitted	0.06	1.00			1.00			1.00				
Satd. Flow (perm)	121	1881			1853			3558				
Peak-hour factor, PHF	0.77	0.85	1.00	1.00	0.82	0.82	0.83	0.83	0.83	1.00	1.00	1.00
Adj. Flow (vph)	135	1001	0	0	778	106	60	1370	25	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	1	0	0	0	0
Lane Group Flow (vph)	135	1001	0	0	880	0	0	1454	0	0	0	0
Confl. Peds. (#/hr)							2					
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt						Perm					
Protected Phases	5	2			6			8				
Permitted Phases	2						8					
Actuated Green, G (s)	69.5	69.5			57.6			40.3				
Effective Green, g (s)	70.6	70.6			58.7			41.4				
Actuated g/C Ratio	0.59	0.59			0.49			0.34				
Clearance Time (s)	5.1	5.1			5.1			5.1				
Vehicle Extension (s)	3.0	3.0			3.0			3.0				
Lane Grp Cap (vph)	182	1107			906			1228				
v/s Ratio Prot	0.05	c0.53			c0.47							
v/s Ratio Perm	0.39							0.41				
v/c Ratio	0.74	0.90			0.97			1.18				
Uniform Delay, d1	49.9	21.7			29.8			39.3				
Progression Factor	0.77	0.63			0.96			1.00				
Incremental Delay, d2	10.3	7.3			21.4			91.3				
Delay (s)	48.9	21.1			50.1			130.6				
Level of Service	D	C			D			F				
Approach Delay (s)		24.4			50.1			130.6			0.0	
Approach LOS		C			D			F			A	

Intersection Summary

HCM Average Control Delay	75.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

1: Bissonnet & Greenbriar Performance by approach

Approach	EB	WB	SB	All
Delay / Veh (s)	25.5	15.7	26.1	23.6
Vehicles Entered	673	674	1608	2955
Vehicles Exited	674	671	1610	2955
Hourly Exit Rate	674	671	1610	2955
Input Volume	676	706	1635	3017
% of Volume	100	95	98	98
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

2: Bissonnet & Shepherd Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	32.8	33.6	62.2	45.2
Vehicles Entered	964	711	1196	2871
Vehicles Exited	965	711	1190	2866
Hourly Exit Rate	965	711	1190	2866
Input Volume	975	743	1208	2926
% of Volume	99	96	99	98
Denied Entry Before	1	1	0	2
Denied Entry After	0	5	0	5

3: Bissonnet & Hazard Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	11.1	10.4	20.5	34.4	14.2
Vehicles Entered	894	651	194	196	1935
Vehicles Exited	895	652	195	197	1939
Hourly Exit Rate	895	652	195	197	1939
Input Volume	892	677	187	194	1950
% of Volume	100	96	104	102	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

4: Bissonnet & Ashby Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	2.3	2.4	17.3	3.1
Vehicles Entered	845	672	88	1605
Vehicles Exited	845	672	87	1604
Hourly Exit Rate	845	672	87	1604
Input Volume	834	696	92	1622
% of Volume	101	97	95	99
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

5: Bissonnet & 1717 Bissonnet Dwy Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	1.9	6.3	29.1	5.3
Vehicles Entered	865	695	93	1653
Vehicles Exited	865	694	93	1652
Hourly Exit Rate	865	694	93	1652
Input Volume	852	717	101	1670
% of Volume	102	97	92	99
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

6: Bissonnet & Dunlavy Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	5.3	4.6	11.1	19.7	5.7
Vehicles Entered	839	653	4	79	1575
Vehicles Exited	839	655	5	79	1578
Hourly Exit Rate	839	655	5	79	1578
Input Volume	832	675	5	80	1592
% of Volume	101	97	100	99	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

7: Bissonnet & Mandell Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	25.2	45.7	34.7	40.0	34.8
Vehicles Entered	764	626	320	116	1826
Vehicles Exited	758	623	322	117	1820
Hourly Exit Rate	758	623	322	117	1820
Input Volume	753	644	319	115	1831
% of Volume	101	97	101	102	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

11: Bissonnet & Montrose Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	16.5	41.9	27.7	20.9	26.3
Vehicles Entered	833	733	776	784	3126
Vehicles Exited	834	724	777	783	3118
Hourly Exit Rate	834	724	777	783	3118
Input Volume	833	738	794	806	3171
% of Volume	100	98	98	97	98
Denied Entry Before	0	1	0	1	2
Denied Entry After	0	1	0	0	1

1: Bissonnet & Greenbriar Performance by approach

Approach	EB	WB	SB	All
Delay / Veh (s)	26.6	17.0	25.8	23.9
Vehicles Entered	658	693	1640	2991
Vehicles Exited	657	693	1638	2988
Hourly Exit Rate	657	693	1638	2988
Input Volume	676	706	1635	3017
% of Volume	97	98	100	99
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	1

2: Bissonnet & Shepherd Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	32.1	43.7	77.4	53.8
Vehicles Entered	949	734	1194	2877
Vehicles Exited	953	735	1185	2873
Hourly Exit Rate	953	735	1185	2873
Input Volume	975	743	1208	2926
% of Volume	98	99	98	98
Denied Entry Before	2	4	0	6
Denied Entry After	1	4	8	13

3: Bissonnet & Hazard Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	10.0	9.6	20.4	28.0	12.6
Vehicles Entered	866	669	188	188	1911
Vehicles Exited	866	667	188	187	1908
Hourly Exit Rate	866	667	188	187	1908
Input Volume	892	677	187	194	1950
% of Volume	97	99	101	96	98
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

4: Bissonnet & Ashby Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	2.0	0.7	17.0	2.4
Vehicles Entered	796	679	101	1576
Vehicles Exited	797	678	101	1576
Hourly Exit Rate	797	678	101	1576
Input Volume	834	696	92	1622
% of Volume	96	97	110	97
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

5: Bissonnet & 1717 Bissonnet Dwy Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	1.2	1.8	20.4	2.7
Vehicles Entered	825	689	109	1623
Vehicles Exited	825	689	108	1622
Hourly Exit Rate	825	689	108	1622
Input Volume	852	717	101	1670
% of Volume	97	96	107	97
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

6: Bissonnet & Dunlavy Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	1.9	3.9	6.7	11.4	3.2
Vehicles Entered	812	645	6	82	1545
Vehicles Exited	812	644	6	82	1544
Hourly Exit Rate	812	644	6	82	1544
Input Volume	832	675	5	80	1592
% of Volume	98	95	120	102	97
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

7: Bissonnet & Mandell Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	25.7	40.8	39.6	40.0	34.3
Vehicles Entered	734	607	310	119	1770
Vehicles Exited	737	607	310	120	1774
Hourly Exit Rate	737	607	310	120	1774
Input Volume	753	644	319	115	1831
% of Volume	98	94	97	104	97
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

11: Bissonnet & Montrose Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	16.2	49.9	28.3	22.2	28.4
Vehicles Entered	827	710	810	792	3139
Vehicles Exited	827	708	809	794	3138
Hourly Exit Rate	827	708	809	794	3138
Input Volume	833	738	794	806	3171
% of Volume	99	96	102	99	99
Denied Entry Before	0	1	0	0	1
Denied Entry After	0	0	0	0	0

1: Bissonnet & Greenbriar Performance by approach

Approach	EB	WB	SB	All
Delay / Veh (s)	25.9	16.9	24.7	23.2
Vehicles Entered	644	675	1619	2938
Vehicles Exited	643	674	1617	2934
Hourly Exit Rate	643	674	1617	2934
Input Volume	656	688	1635	2979
% of Volume	98	98	99	98
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

2: Bissonnet & Shepherd Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	31.4	38.8	66.7	47.9
Vehicles Entered	943	716	1183	2842
Vehicles Exited	945	715	1178	2838
Hourly Exit Rate	945	715	1178	2838
Input Volume	955	725	1208	2888
% of Volume	99	99	98	98
Denied Entry Before	5	2	0	7
Denied Entry After	1	4	12	17

3: Bissonnet & Hazard Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	10.5	10.9	22.0	31.2	13.9
Vehicles Entered	861	645	186	197	1889
Vehicles Exited	862	647	187	198	1894
Hourly Exit Rate	862	647	187	198	1894
Input Volume	872	662	187	194	1915
% of Volume	99	98	100	102	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

4: Bissonnet & Ashby Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	1.7	2.0	15.9	2.6
Vehicles Entered	799	661	85	1545
Vehicles Exited	800	660	86	1546
Hourly Exit Rate	800	660	86	1546
Input Volume	814	681	87	1582
% of Volume	98	97	99	98
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

5: Bissonnet & 1717 Bissonnet Dwy Performance by approach

Approach	EB	WB	NB	All
Delay / Veh (s)	1.3	4.2	20.4	3.2
Vehicles Entered	818	674	53	1545
Vehicles Exited	817	677	54	1548
Hourly Exit Rate	817	677	54	1548
Input Volume	827	692	55	1574
% of Volume	99	98	98	98
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0

6: Bissonnet & Dunlavy Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	4.0	3.7	9.8	14.3	4.4
Vehicles Entered	800	633	5	79	1517
Vehicles Exited	799	633	5	79	1516
Hourly Exit Rate	799	633	5	79	1516
Input Volume	809	655	5	75	1544
% of Volume	99	97	100	105	98
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

7: Bissonnet & Mandell Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	23.6	38.5	37.4	38.7	32.2
Vehicles Entered	724	606	316	114	1760
Vehicles Exited	726	605	316	115	1762
Hourly Exit Rate	726	605	316	115	1762
Input Volume	728	624	319	115	1786
% of Volume	100	97	99	100	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0

11: Bissonnet & Montrose Performance by approach

Approach	EB	WB	NB	SB	All
Delay / Veh (s)	15.0	53.4	27.4	22.3	28.7
Vehicles Entered	814	711	785	818	3128
Vehicles Exited	812	698	784	817	3111
Hourly Exit Rate	812	698	784	817	3111
Input Volume	815	718	794	806	3133
% of Volume	100	97	99	101	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	1	0	0	1