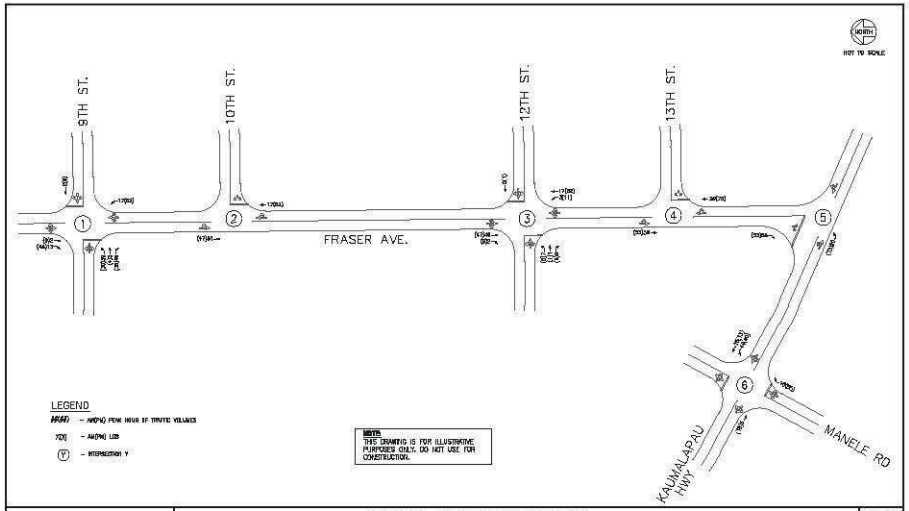
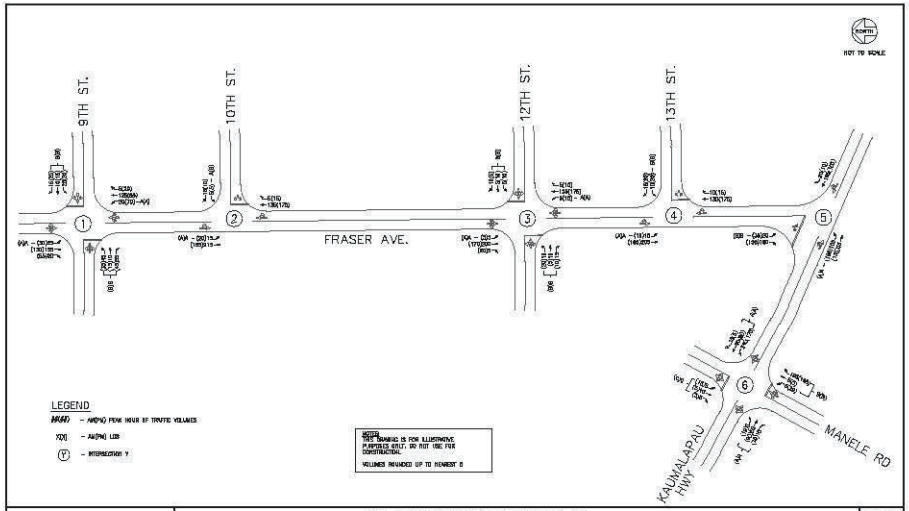


LANAI CITY EXPANSION	AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS & SURVEYORS • HONOLULU, HAWAII	FIGURE 4.1
	PROJECT-GENERATED TRAFFIC VOLUMES	



LANAI CITY EXPANSION	AUSTIN, TSUTSUMI & ASSOCIATES, INC. ENGINEERS & SURVEYORS • HONOLULU, HAWAII	FIGURE 4.2
	FUTURE YEAR 2024 LANE CONFIGURATION, TRAFFIC VOLUMES AND LOS	

Table 4.3: Existing, Base Year 2024 and Year 2024 with Project Level of Service Summary

Intersection	Existing Conditions						Base Year 2024						Year 2024 with Project					
	AM			PM			AM			PM			AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
1: Fraser Ave. & 9th St.																		
NB LT	0.0	0.00	A	7.4	0.00	A	7.6	0.00	A	7.5	0.01	A	7.6	0.02	A	7.8	0.06	A
EB LT/TH/RT	10.3	0.01	B	10.0	0.02	B	11.0	0.03	B	11.2	0.05	B	12.0	0.19	B	13.1	0.19	B
WB LT/TH/RT	9.9	0.04	A	9.6	0.04	A	11.3	0.09	B	10.7	0.09	B	12.2	0.10	B	12.8	0.12	B
SB LT	7.4	0.01	A	7.4	0.01	A	7.5	0.02	A	7.5	0.02	A	7.5	0.02	A	7.5	0.02	A
2: Fraser Ave. & 10th St.																		
WB LT/TH	8.8	0.01	A	8.9	0.01	A	9.4	0.03	A	9.5	0.02	A	9.7	0.03	A	10.0	0.02	B
SB LT	7.4	0.01	A	7.4	0.01	A	7.5	0.01	A	7.5	0.02	A	7.5	0.01	A	7.7	0.02	A
3: Fraser Ave. & 12th St.																		
NB LT	7.4	0.00	A	0.0	0.00	A	7.6	0.00	A	7.5	0.00	A	7.7	0.00	A	7.7	0.01	A
EB LT/TH/RT	9.6	0.01	A	9.7	0.02	A	10.7	0.03	B	10.6	0.04	B	11.0	0.06	B	11.7	0.07	B
WB LT/TH/RT	9.2	0.01	A	9.7	0.02	A	10.0	0.03	B	10.6	0.04	B	10.5	0.03	B	11.9	0.05	B
SB LT	7.4	0.00	A	7.4	0.00	A	7.5	0.00	A	7.5	0.00	A	7.5	0.00	A	7.6	0.00	A
4: Fraser Ave. & 13th St.																		
WB LT/TH	9.1	0.02	A	9.1	0.02	A	9.6	0.03	A	9.7	0.05	A	10.0	0.04	B	10.4	0.06	B
SB LT	7.4	0.01	A	7.4	0.00	A	7.5	0.01	A	7.5	0.01	A	7.5	0.01	A	7.7	0.01	A
5: Kaumalapau Hwy & Fraser Ave.																		
EB LT	7.6	0.04	A	7.4	0.04	A	7.8	0.07	A	7.6	0.07	A	7.9	0.08	A	7.8	0.12	A
SB LT/RT	9.5	0.11	A	9.4	0.10	A	10.7	0.20	B	10.8	0.19	B	11.2	0.27	B	11.7	0.27	B
6: Manele St. & Kaumalapau Hwy																		
NB LT/TH/RT	8.8	0.06	A	9.3	0.12	A	9.8	0.13	A	10.6	0.22	B	10.1	0.15	B	11.4	0.30	B
EB LT	0.0	0.00	A	7.3	0.00	A	7.4	0.00	A	7.4	0.01	A	7.5	0.00	A	7.4	0.01	A
WB LT	7.5	0.09	A	7.4	0.06	A	7.7	0.14	A	7.6	0.09	A	7.8	0.17	A	7.8	0.13	A
SB LT/TH/RT	0.0	0.00	A	11.2	0.02	B	14.5	0.05	B	14.3	0.07	B	16.7	0.07	C	17.9	0.09	C

5. CONCLUSIONS AND RECOMMENDATIONS

The project proposes to construct a residential development of 200 single family units, one-acre park, 1,500 square foot pavilion, comfort station, and 100 parking stalls for Lanai City. Of the 200 single-family homes, 133 will be comprised of affordable homes and 67 will be comprised of market-rate homes. As a conservative measure, a 1.1-acre park will be assumed to include the amenities identified. The proposed development is expected to be completed and fully occupied Year 2024.

5.1 Existing Conditions

All movements at each intersection currently operate at overall LOS B or better during the AM and PM peak hours of traffic. No major delays or queues were observed at the unsignalized intersections.

5.2 Base Year 2024

By Year 2024, traffic growth in the study area was estimated for Year 2024 by using the Lanai Community Plan Update published by the County of Maui Planning Department in December 2013, which resulted in an anticipated growth rate of approximately 5.7 per year to reach 6,000 residents by 2025. The Four Seasons Resort Lanai, The Lodge at Koele, is assumed to be completed with their renovation project by Year 2024 and will thus be occupied and operational in the Base Year 2024 scenario.

All study intersections are forecast to operate with LOS similar to existing conditions, with all movements operating at LOS B or better during the AM and PM peak hour of traffic.

5.3 Future Year 2024

The Project entails the development of 200 residential units, one-acre park, 1,500 square foot pavilion, comfort station, and 100 parking stalls. Of the 200 single-family homes, 133 will be comprised of affordable homes and 67 will be comprised of market-rate homes. As a conservative measure, a 1.1-acre park will be assumed to include the amenities identified. Vehicular traffic to the Project will be provided by two (2) existing accesses along Fraser Avenue at 9th Street and at 12th Street. The Project is anticipated to generate approximately 147(221) AM(PM) trips and study intersections are forecast to operate at conditions similar to Base Year 2024 during both peak hours with all manual turning movements operating at LOS C or better during the AM and PM peak hours of traffic.

5.4 Recommendations

No intersection improvements are recommended as a result of the Project.

6. REFERENCES

1. Transportation Research Board, Highway Capacity Manual, 6th Edition.
2. Federal Highway Administration, Manual on Uniform Traffic Control Devices, 2009.
3. Institute of Transportation Engineers, Trip Generation, 10th Edition, 2017.
4. County of Maui Planning Department, Lanai Community Plan Update, 2013.

APPENDICES

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX A

TRAFFIC COUNT DATA

AUSTIN TSUTSUMI & ASSOCIATES
501 Sumner Street, Suite 521
Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Fraser Ave - 9th St
Site Code : 00000000
Start Date : 8/10/2016
Page No : 1

Groups Printed- Class 1

	FRASER AVE Southbound				9TH ST Westbound				FRASER AVE Northbound				9TH ST Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	1	28	4	0	1	0	6	0	0	15	0	0	2	0	1	8	66
Total	1	28	4	0	1	0	6	0	0	15	0	0	2	0	1	8	66
07:00 AM	1	21	4	0	1	0	4	0	0	8	0	0	0	0	1	6	46
07:15 AM	2	23	0	0	2	2	6	0	2	18	0	0	0	1	0	9	65
07:30 AM	0	26	4	0	2	1	3	0	0	39	0	0	0	1	0	6	82
07:45 AM	1	27	8	0	3	1	3	0	0	14	0	0	0	0	1	0	58
Total	4	97	16	0	8	4	16	0	2	79	0	0	0	2	2	21	251
08:00 AM	1	20	7	3	3	0	6	0	4	21	0	0	0	0	0	2	67
08:15 AM	2	19	5	0	1	1	4	0	5	15	0	0	1	1	0	0	54
08:30 AM	0	9	3	0	0	0	4	0	2	7	0	0	0	2	2	1	30
Grand Total	8	173	35	3	13	5	36	0	13	137	0	0	3	5	5	32	468
Apprch %	3.7	79	16	1.4	24.1	9.3	66.7	0	8.7	91.3	0	0	6.7	11.1	11.1	71.1	
Total %	1.7	37	7.5	0.6	2.8	1.1	7.7	0	2.8	29.3	0	0	0.6	1.1	1.1	6.8	

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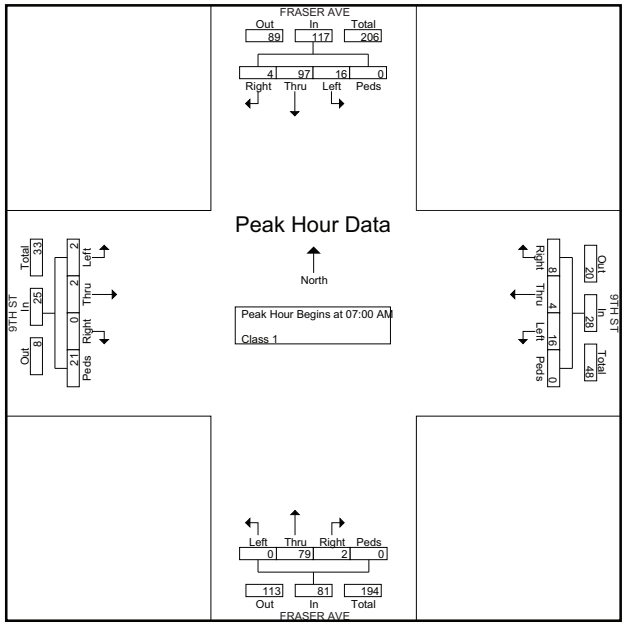
Site Code : 00000000
Start Date : 8/10/2016
Page No : 2

	FRASER AVE Southbound					9TH ST Westbound					FRASER AVE Northbound					9TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	21	4	0	26	1	0	4	0	5	0	8	0	0	8	0	0	**1**	6	7	46
07:15 AM	**2**	23	0	0	25	2	**2**	**6**	0	**10**	**2**	18	0	0	20	0	**1**	0	**9**	**10**	65
07:30 AM	0	26	4	0	30	2	1	3	0	6	0	**39**	0	0	**39**	0	1	0	6	7	**82**
07:45 AM	1	**27**	**8**	0	**36**	**3**	1	3	0	7	0	14	0	0	14	0	0	1	0	1	58
Total Volume	4	97	16	0	117	8	4	16	0	28	2	79	0	0	81	0	2	2	21	25	251
% App. Total	3.4	82.9	13.7	0		28.6	14.3	57.1	0		2.5	97.5	0	0		0	8	8	84		
PHF	.500	.898	.500	.000	.813	.667	.500	.667	.000	.700	.250	.506	.000	.000	.519	.000	.500	.500	.583	.625	.765



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501 Sumner Street, Suite 521
Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Fraser Ave - 10th St
Site Code : 00000000
Start Date : 8/10/2016
Page No : 1

Groups Printed- Unshifted - Bank 1

	FRASER AVE Southbound				10TH ST. Westbound				FRASER AVE Northbound				Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	0	32	2	2	0	0	4	0	1	14	0	0	0	0	0	8	63
Total	0	32	2	2	0	0	4	0	1	14	0	0	0	0	0	8	63
07:00 AM	0	23	1	0	2	0	0	0	0	5	0	0	0	0	0	6	37
07:15 AM	0	26	0	0	2	0	0	0	0	19	0	0	0	0	0	9	56
07:30 AM	0	28	1	0	2	0	1	0	1	37	0	0	0	0	0	8	78
07:45 AM	0	26	5	0	2	0	0	2	1	12	0	1	0	0	0	0	49
Total	0	103	7	0	8	0	1	2	2	73	0	1	0	0	0	23	220
08:00 AM	0	24	1	2	0	0	0	0	1	23	0	0	0	0	0	1	52
08:15 AM	0	16	1	0	1	0	0	0	0	20	0	0	0	0	0	2	40
08:30 AM	0	13	1	0	0	0	1	0	0	8	0	0	0	0	0	1	24
Grand Total	0	188	12	4	9	0	6	2	4	138	0	1	0	0	0	35	399
Apprch %	0	92.2	5.9	2	52.9	0	35.3	11.8	2.8	96.5	0	0.7	0	0	0	100	
Total %	0	47.1	3	1	2.3	0	1.5	0.5	1	34.6	0	0.3	0	0	0	8.8	
Unshifted	0	188	12	4	9	0	6	2	4	138	0	1	0	0	0	35	399
% Unshifted	0	100	100	100	100	0	100	100	100	100	0	100	0	0	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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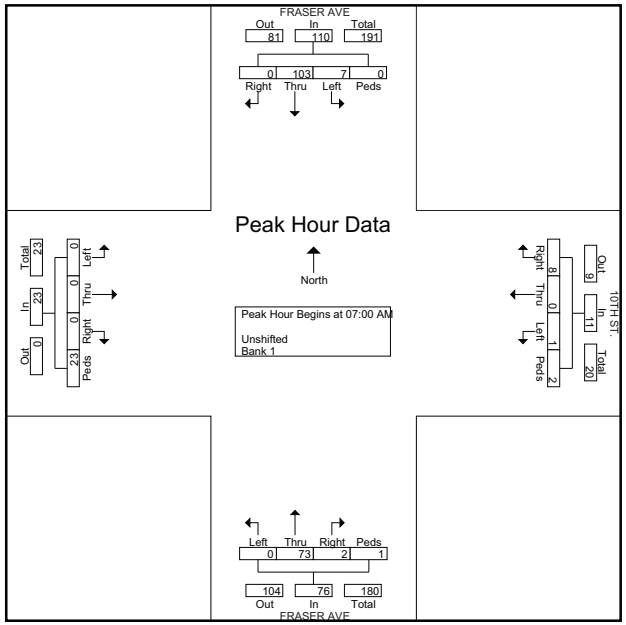
File Name : AM_Fraser Ave - 10th St
Site Code : 00000000
Start Date : 8/10/2016
Page No : 2

	FRASER AVE Southbound					10TH ST. Westbound					FRASER AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	23	1	0	24	**2**	0	0	0	2	0	5	0	0	5	0	0	0	6	6	37
07:15 AM	0	26	0	0	26	2	0	0	0	2	0	19	0	0	19	0	0	0	**9**	**9**	56
07:30 AM	0	**28**	1	0	29	2	0	**1**	0	3	**1**	**37**	0	0	**38**	0	0	0	8	8	**78**
07:45 AM	0	26	**5**	0	**31**	2	0	0	**2**	**4**	1	12	0	**1**	14	0	0	0	0	0	49
Total Volume	0	103	7	0	110	8	0	1	2	11	2	73	0	1	76	0	0	0	23	23	220
% App. Total	0	93.6	6.4	0		72.7	0	9.1	18.2		2.6	96.1	0	1.3		0	0	0	100		
PHF	.000	.920	.350	.000	.887	1.00	.000	.250	.250	.688	.500	.493	.000	.250	.500	.000	.000	.000	.639	.639	.705



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Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Fraser Ave - 12th St
Site Code : 00000000
Start Date : 8/10/2016
Page No : 1

Groups Printed- Unshifted - Bank 1

	FRASER AVE Southbound				12TH ST Westbound				FRASER AVE Northbound				12TH ST Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	5	34	0	0	1	0	0	0	1	13	0	0	1	0	0	5	60
Total	5	34	0	0	1	0	0	0	1	13	0	0	1	0	0	5	60
07:00 AM	0	21	1	1	0	0	0	1	1	6	0	0	1	1	0	2	35
07:15 AM	1	22	0	0	1	1	1	0	0	16	0	0	2	1	1	13	59
07:30 AM	0	27	0	0	2	0	0	0	1	35	0	1	0	1	0	5	72
07:45 AM	1	25	0	0	1	0	1	2	1	11	1	1	0	1	1	4	50
Total	2	95	1	1	4	1	2	3	3	68	1	2	3	4	2	24	216
08:00 AM	0	26	1	1	1	0	1	1	0	22	1	0	2	0	2	1	59
08:15 AM	2	18	0	0	0	2	1	1	1	17	1	0	0	0	1	3	47
08:30 AM	0	14	1	0	0	0	1	0	0	6	2	0	3	3	2	2	34
Grand Total	9	187	3	2	6	3	5	5	5	126	5	2	9	7	7	35	416
Apprch %	4.5	93	1.5	1	31.6	15.8	26.3	26.3	3.6	91.3	3.6	1.4	15.5	12.1	12.1	60.3	
Total %	2.2	45	0.7	0.5	1.4	0.7	1.2	1.2	1.2	30.3	1.2	0.5	2.2	1.7	1.7	8.4	
Unshifted	9	187	3	2	6	3	5	5	5	126	5	2	9	7	7	35	416
% Unshifted	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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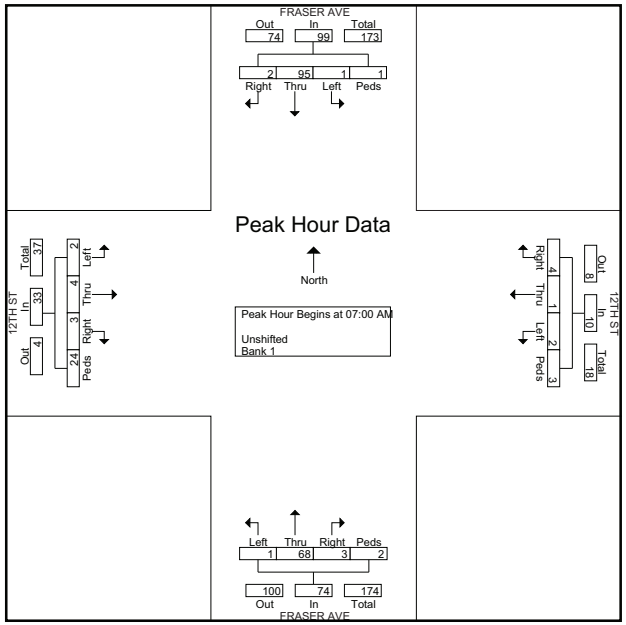
Page No : 2

	FRASER AVE Southbound					12TH ST Westbound					FRASER AVE Northbound					12TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	21	**1**	**1**	23	0	0	0	1	1	**1**	6	0	0	7	1	**1**	0	2	4	35
07:15 AM	**1**	22	0	0	23	1	**1**	**1**	0	3	0	16	0	0	16	**2**	1	**1**	**13**	**17**	59
07:30 AM	0	**27**	0	0	**27**	**2**	0	0	0	2	1	**35**	0	**1**	**37**	0	1	0	5	6	**72**
07:45 AM	1	25	0	0	26	1	0	1	**2**	**4**	1	11	**1**	1	14	0	1	1	4	6	50
Total Volume	2	95	1	1	99	4	1	2	3	10	3	68	1	2	74	3	4	2	24	33	216
% App. Total	2	96	1	1		40	10	20	30		4.1	91.9	1.4	2.7		9.1	12.1	6.1	72.7		
PHF	.500	.880	.250	.250	.917	.500	.250	.500	.375	.625	.750	.486	.250	.500	.500	.375	1.00	.500	.462	.485	.750



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Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Fraser Ave - 13th St
Site Code : 00000000
Start Date : 8/10/2016
Page No : 1

Groups Printed- Class 1

	FRASER AVE Southbound				13TH ST Westbound				FRASER AVE Northbound				Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	0	26	2	0	1	0	1	0	0	14	0	0	0	0	0	0	44
Total	0	26	2	0	1	0	1	0	0	14	0	0	0	0	0	0	44
07:00 AM	0	21	0	0	0	0	0	0	1	7	0	0	0	0	0	0	29
07:15 AM	0	27	1	0	4	0	2	0	1	13	0	0	0	0	0	0	48
07:30 AM	0	19	4	0	3	0	1	0	2	34	0	0	0	0	0	0	63
07:45 AM	0	25	2	0	2	0	2	0	1	16	0	0	0	0	0	0	48
Total	0	92	7	0	9	0	5	0	5	70	0	0	0	0	0	0	188
08:00 AM	0	22	3	0	1	0	3	0	2	19	0	0	0	0	0	0	50
08:15 AM	0	16	2	0	2	0	0	0	0	18	0	0	0	0	0	0	38
08:30 AM	0	17	1	0	1	0	1	0	1	4	0	0	0	0	0	0	25
Grand Total	0	173	15	0	14	0	10	0	8	125	0	0	0	0	0	0	345
Apprch %	0	92	8	0	58.3	0	41.7	0	6	94	0	0	0	0	0	0	
Total %	0	50.1	4.3	0	4.1	0	2.9	0	2.3	36.2	0	0	0	0	0	0	

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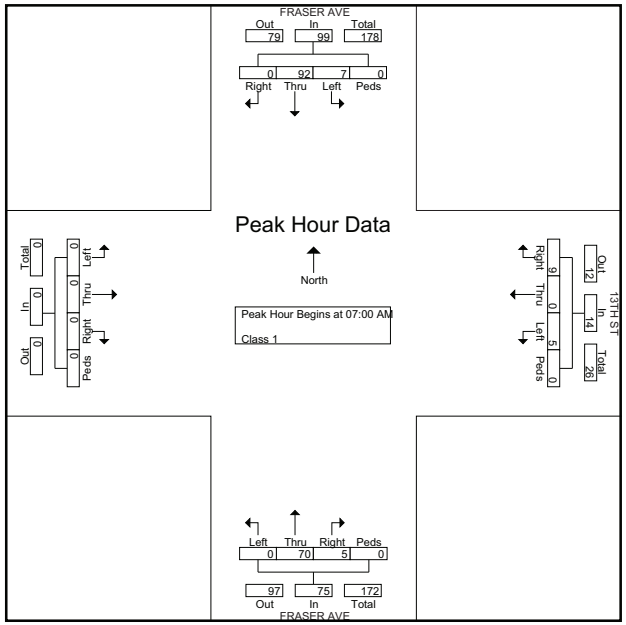
File Name : AM_Fraser Ave - 13th St
Site Code : 00000000
Start Date : 8/10/2016
Page No : 2

	FRASER AVE Southbound					13TH ST Westbound					FRASER AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	21	0	0	21	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	29
07:15 AM	0	**27**	1	0	**28**	**4**	0	**2**	0	**6**	1	13	0	0	14	0	0	0	0	0	48
07:30 AM	0	19	**4**	0	23	3	0	1	0	4	**2**	**34**	0	0	**36**	0	0	0	0	0	**63**
07:45 AM	0	25	2	0	27	2	0	2	0	4	1	16	0	0	17	0	0	0	0	0	48
Total Volume	0	92	7	0	99	9	0	5	0	14	5	70	0	0	75	0	0	0	0	0	188
% App. Total	0	92.9	7.1	0		64.3	0	35.7	0		6.7	93.3	0	0		0	0	0	0		
PHF	.000	.852	.438	.000	.884	.563	.000	.625	.000	.583	.625	.515	.000	.000	.521	.000	.000	.000	.000	.000	.746



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Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Fraser Ave - Kaumalapau Hwy
Site Code : 00000000
Start Date : 8/10/2016
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Groups Printed- Unshifted - Bank 1

	FRASER AVE Southbound				KAUMALAPAU HWY Westbound				FRASER AVE Northbound				KAUMALAPAU HWY Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	24	0	2	0	5	19	0	0	1	0	0	0	0	5	8	0	64
Total	24	0	2	0	5	19	0	0	1	0	0	0	0	5	8	0	64
07:00 AM	20	0	1	0	2	33	0	0	0	0	0	0	0	7	6	0	69
07:15 AM	21	0	3	0	2	28	0	0	0	0	0	0	0	8	10	0	72
07:30 AM	19	0	1	0	5	23	0	0	0	0	0	0	0	11	27	0	86
07:45 AM	18	0	6	1	2	18	0	0	0	0	0	0	0	6	11	0	62
Total	78	0	11	1	11	102	0	0	0	0	0	0	0	32	54	0	289
08:00 AM	13	0	7	0	1	15	0	0	0	0	0	0	0	13	19	0	68
08:15 AM	15	0	2	0	1	19	0	0	0	0	0	0	0	16	16	0	69
08:30 AM	17	0	2	0	4	13	0	0	0	0	0	0	0	5	3	0	44
Grand Total	147	0	24	1	22	168	0	0	1	0	0	0	0	71	100	0	534
Apprch %	85.5	0	14	0.6	11.6	88.4	0	0	100	0	0	0	0	41.5	58.5	0	
Total %	27.5	0	4.5	0.2	4.1	31.5	0	0	0.2	0	0	0	0	13.3	18.7	0	
Unshifted	147	0	24	1	22	168	0	0	1	0	0	0	0	71	100	0	534
% Unshifted	100	0	100	100	100	100	0	0	100	0	0	0	0	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : AM_Fraser Ave - Kaumalapau Hwy
Site Code : 00000000
Start Date : 8/10/2016
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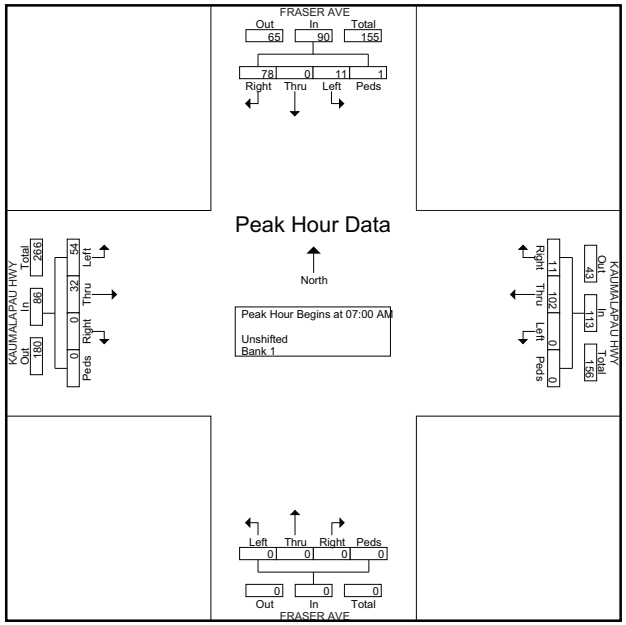
	FRASER AVE Southbound					KAUMALAPAU HWY Westbound					FRASER AVE Northbound					KAUMALAPAU HWY Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	20	0	1	0	21	2	**33**	0	0	**35**	0	0	0	0	0	0	7	6	0	13	69
07:15 AM	**21**	0	3	0	24	2	28	0	0	30	0	0	0	0	0	0	8	10	0	18	72
07:30 AM	19	0	1	0	20	**5**	23	0	0	28	0	0	0	0	0	0	**11**	**27**	0	**38**	**86**
07:45 AM	18	0	**6**	**1**	**25**	2	18	0	0	20	0	0	0	0	0	0	6	11	0	17	62
Total Volume	78	0	11	1	90	11	102	0	0	113	0	0	0	0	0	0	32	54	0	86	289
% App. Total	86.7	0	12.2	1.1		9.7	90.3	0	0		0	0	0	0		0	37.2	62.8	0		
PHF	.929	.000	.458	.250	.900	.550	.773	.000	.000	.807	.000	.000	.000	.000	.000	.000	.727	.500	.000	.566	.840



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Site Code : 00000000
Start Date : 8/10/2016
Page No : 1

Groups Printed- Class 1

	MANELE RD Southbound				KAUMALAPAU HWY Westbound				MANELE RD Northbound				KAUMALAPAU HWY Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:45 AM	3	0	1	2	3	15	22	2	11	0	2	2	1	2	0	0	66
Total	3	0	1	2	3	15	22	2	11	0	2	2	1	2	0	0	66
07:00 AM	1	1	1	0	3	14	37	2	2	2	0	0	2	11	0	0	76
07:15 AM	1	1	0	0	2	11	35	2	15	0	1	0	1	3	0	0	72
07:30 AM	0	2	0	0	1	9	34	3	32	0	1	0	0	6	0	0	88
07:45 AM	0	0	1	0	1	12	22	3	9	1	0	0	1	7	1	0	58
Total	2	4	2	0	7	46	128	10	58	3	2	0	4	27	1	0	294
08:00 AM	0	0	2	0	2	16	10	0	21	1	5	0	2	10	1	0	70
08:15 AM	0	1	0	0	3	9	19	0	18	0	1	0	3	10	1	1	66
08:30 AM	0	1	0	0	1	14	15	0	9	0	0	0	1	2	0	0	43
Grand Total	5	6	5	2	16	100	194	12	117	4	10	2	11	51	3	1	539
Apprch %	27.8	33.3	27.8	11.1	5	31.1	60.2	3.7	88	3	7.5	1.5	16.7	77.3	4.5	1.5	
Total %	0.9	1.1	0.9	0.4	3	18.6	36	2.2	21.7	0.7	1.9	0.4	2	9.5	0.6	0.2	

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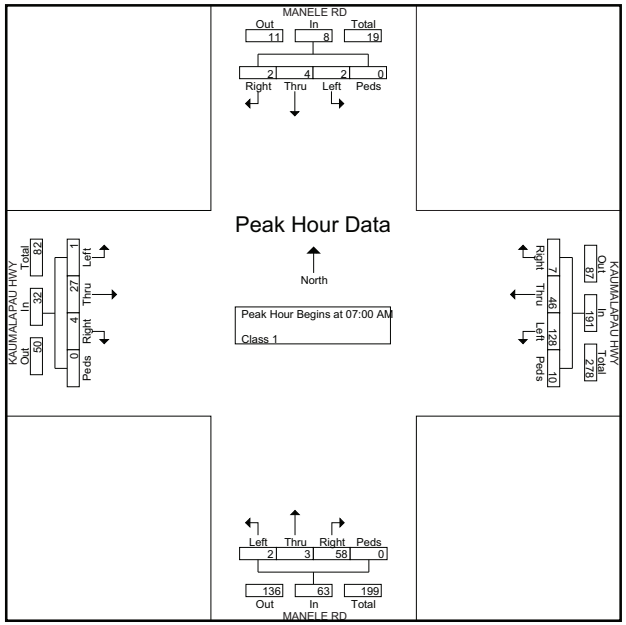
Site Code : 00000000
Start Date : 8/10/2016
Page No : 2

	MANELE RD Southbound					KAUMALAPAU HWY Westbound					MANELE RD Northbound					KAUMALAPAU HWY Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**1**	1	**1**	0	**3**	**3**	**14**	**37**	2	**56**	2	**2**	0	0	4	**2**	**11**	0	0	**13**	76
07:15 AM	1	1	0	0	2	2	11	35	2	50	15	0	**1**	0	16	1	3	0	0	4	72
07:30 AM	0	**2**	0	0	2	1	9	34	**3**	47	**32**	0	1	0	**33**	0	6	0	0	6	**88**
07:45 AM	0	0	1	0	1	1	12	22	3	38	9	1	0	0	10	1	7	**1**	0	9	58
Total Volume	2	4	2	0	8	7	46	128	10	191	58	3	2	0	63	4	27	1	0	32	294
% App. Total	25	50	25	0		3.7	24.1	67	5.2		92.1	4.8	3.2	0		12.5	84.4	3.1	0		
PHF	.500	.500	.500	.000	.667	.583	.821	.865	.833	.853	.453	.375	.500	.000	.477	.500	.614	.250	.000	.615	.835



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Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM_Fraser Ave - 10th St
Site Code : 00000000
Start Date : 8/9/2016
Page No : 1

Groups Printed- Unshifted - Bank 1

	FRASER AVE Southbound				10TH ST Westbound				FRASER AVE Northbound				Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:30 PM	0	15	0	0	1	0	0	0	1	10	0	0	0	0	0	0	27
01:45 PM	0	17	1	0	0	0	0	0	1	28	0	0	0	0	0	2	49
Total	0	32	1	0	1	0	0	0	2	38	0	0	0	0	0	2	76
02:00 PM	0	28	1	1	3	0	0	0	0	18	0	15	0	0	0	12	78
02:15 PM	0	12	6	0	0	0	0	0	4	18	0	0	0	0	0	0	40
02:30 PM	0	25	2	0	1	0	1	2	2	22	0	0	0	0	0	0	55
02:45 PM	0	11	2	0	0	0	0	0	1	11	0	0	0	0	0	0	25
Total	0	76	11	1	4	0	1	2	7	69	0	15	0	0	0	12	198
03:00 PM	0	18	1	0	1	0	1	0	0	15	0	0	0	0	0	0	36
03:15 PM	1	22	4	0	2	0	2	0	5	24	0	0	0	0	0	0	60
03:30 PM	0	21	1	0	6	0	2	0	1	23	0	0	0	0	0	0	54
03:45 PM	0	19	1	0	3	0	0	0	0	24	0	3	0	0	0	0	50
Total	1	80	7	0	12	0	5	0	6	86	0	3	0	0	0	0	200
04:00 PM	0	20	2	0	0	0	0	0	0	19	0	0	0	0	0	0	41
04:15 PM	0	19	2	0	1	0	0	0	0	27	0	0	0	0	0	0	49
04:30 PM	0	17	0	0	0	0	0	0	1	19	0	0	0	0	0	1	38
04:45 PM	0	26	3	0	3	0	0	0	0	21	0	0	0	0	0	0	53
Total	0	82	7	0	4	0	0	0	1	86	0	0	0	0	0	1	181
Grand Total	1	270	26	1	21	0	6	2	16	279	0	18	0	0	0	15	655
Apprch %	0.3	90.6	8.7	0.3	72.4	0	20.7	6.9	5.1	89.1	0	5.8	0	0	0	100	
Total %	0.2	41.2	4	0.2	3.2	0	0.9	0.3	2.4	42.6	0	2.7	0	0	0	2.3	
Unshifted	1	270	26	1	21	0	6	2	16	279	0	18	0	0	0	15	655
% Unshifted	100	100	100	100	100	0	100	100	100	100	0	100	0	0	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : PM_Fraser Ave - 10th St
Site Code : 00000000
Start Date : 8/9/2016
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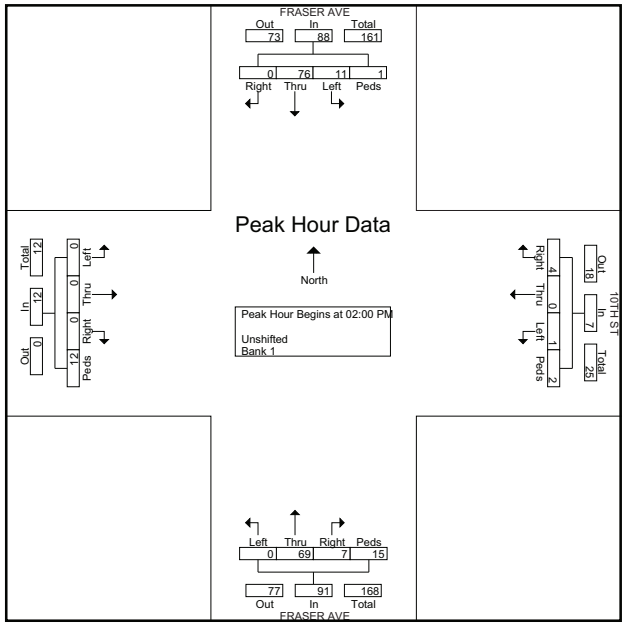
	FRASER AVE Southbound					10TH ST Westbound					FRASER AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	0	**28**	1	**1**	**30**	**3**	0	0	0	3	0	18	0	**15**	**33**	0	0	0	**12**	**12**	**78**
02:15 PM	0	12	**6**	0	18	0	0	0	0	0	**4**	18	0	0	22	0	0	0	0	0	40
02:30 PM	0	25	2	0	27	1	0	**1**	**2**	**4**	2	**22**	0	0	24	0	0	0	0	0	55
02:45 PM	0	11	2	0	13	0	0	0	0	0	1	11	0	0	12	0	0	0	0	0	25
Total Volume	0	76	11	1	88	4	0	1	2	7	7	69	0	15	91	0	0	0	12	12	198
% App. Total	0	86.4	12.5	1.1		57.1	0	14.3	28.6		7.7	75.8	0	16.5		0	0	0	100		
PHF	.000	.679	.458	.250	.733	.333	.000	.250	.250	.438	.438	.784	.000	.250	.689	.000	.000	.000	.250	.250	.635



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File Name : PM_Fraser Ave - 9th St
Site Code : 00000000
Start Date : 8/9/2016
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Groups Printed- Class 1

	FRASER AVE Southbound				9TH ST Westbound				FRASER AVE Northbound				9TH ST Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:30 PM	1	12	2	0	2	2	4	0	2	10	1	0	2	2	1	1	42
01:45 PM	0	16	5	1	6	1	2	0	2	25	3	0	1	2	1	3	68
Total	1	28	7	1	8	3	6	0	4	35	4	0	3	4	2	4	110
02:00 PM	0	22	7	2	6	0	4	0	6	17	1	0	2	0	0	23	90
02:15 PM	1	18	5	2	1	1	3	0	3	16	1	0	1	3	2	2	59
02:30 PM	0	21	1	0	4	1	4	2	1	19	2	0	0	2	0	0	57
02:45 PM	1	15	4	0	4	2	2	0	3	9	1	0	0	2	1	0	44
Total	2	76	17	4	15	4	13	2	13	61	5	0	3	7	3	25	250
03:00 PM	0	12	6	0	8	1	3	0	2	14	0	0	2	3	5	1	57
03:15 PM	3	24	5	0	3	1	4	0	5	20	3	0	0	1	0	3	72
03:30 PM	1	18	7	0	3	1	4	0	2	26	0	0	0	1	1	0	64
03:45 PM	0	17	5	0	3	2	3	0	2	26	0	0	0	0	2	0	60
Total	4	71	23	0	17	5	14	0	11	86	3	0	2	5	8	4	253
04:00 PM	2	21	4	0	1	1	2	0	3	15	0	0	0	0	2	0	51
04:15 PM	1	20	3	0	3	0	2	0	3	27	0	0	0	1	1	0	61
04:30 PM	3	14	3	2	6	1	3	0	2	20	0	0	0	2	2	2	60
04:45 PM	3	24	6	0	7	0	4	0	1	23	0	0	3	2	1	0	74
Total	9	79	16	2	17	2	11	0	9	85	0	0	3	5	6	2	246
05:00 PM	3	24	6	0	7	0	4	0	1	23	0	0	3	2	1	0	74
Grand Total	19	278	69	7	64	14	48	2	38	290	12	0	14	23	20	35	933
Apprch %	5.1	74.5	18.5	1.9	50	10.9	37.5	1.6	11.2	85.3	3.5	0	15.2	25	21.7	38	
Total %	2	29.8	7.4	0.8	6.9	1.5	5.1	0.2	4.1	31.1	1.3	0	1.5	2.5	2.1	3.8	

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Site Code : 00000000
Start Date : 8/9/2016
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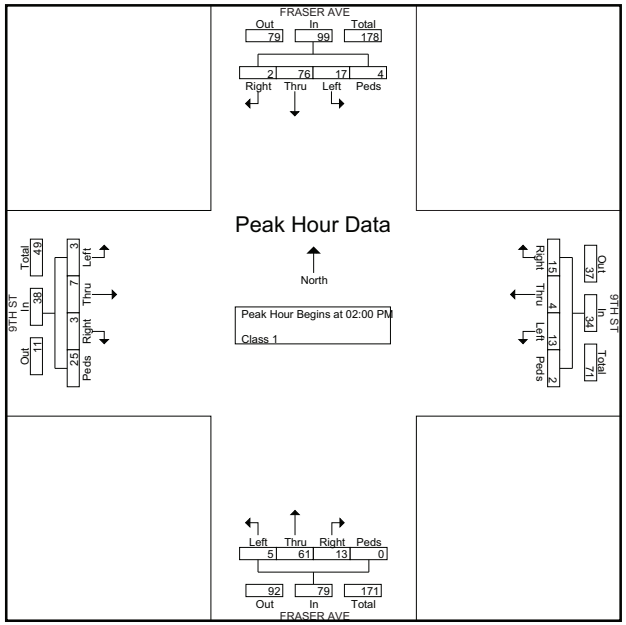
	FRASER AVE Southbound					9TH ST Westbound					FRASER AVE Northbound					9TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	0	**22**	**7**	**2**	**31**	**6**	0	**4**	0	10	**6**	17	1	0	**24**	**2**	0	0	**23**	**25**	**90**
02:15 PM	**1**	18	5	2	26	1	1	3	0	5	3	16	1	0	20	1	**3**	**2**	2	8	59
02:30 PM	0	21	1	0	22	4	1	4	**2**	**11**	1	**19**	**2**	0	22	0	2	0	0	2	57
02:45 PM	1	15	4	0	20	4	**2**	2	0	8	3	9	1	0	13	0	2	1	0	3	44
Total Volume	2	76	17	4	99	15	4	13	2	34	13	61	5	0	79	3	7	3	25	38	250
% App. Total	2	76.8	17.2	4		44.1	11.8	38.2	5.9		16.5	77.2	6.3	0		7.9	18.4	7.9	65.8		
PHF	.500	.864	.607	.500	.798	.625	.500	.813	.250	.773	.542	.803	.625	.000	.823	.375	.583	.375	.272	.380	.694



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File Name : PM_Fraser Ave - 12th St
Site Code : 00000000
Start Date : 8/9/2016
Page No : 1

Groups Printed- Unshifted - Bank 1

	FRASER AVE Southbound				12TH ST Westbound				FRASER AVE Northbound				12TH ST Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:30 PM	2	17	0	0	0	1	0	0	0	13	0	0	1	1	1	0	36
01:45 PM	1	14	0	0	0	1	0	0	0	28	0	0	1	0	0	1	46
Total	3	31	0	0	0	2	0	0	0	41	0	0	2	1	1	1	82
02:00 PM	2	27	1	4	0	1	1	3	0	20	0	1	0	0	1	10	71
02:15 PM	1	14	2	0	1	0	1	0	2	21	0	0	0	0	4	9	55
02:30 PM	2	25	0	0	1	1	3	0	2	21	0	0	0	1	3	0	59
02:45 PM	1	13	0	0	0	2	0	0	2	10	0	1	2	1	1	2	35
Total	6	79	3	4	2	4	5	3	6	72	0	2	2	2	9	21	220
03:00 PM	0	17	3	0	0	0	1	0	0	16	4	0	2	0	0	1	44
03:15 PM	1	19	1	0	1	1	1	0	2	22	3	0	0	1	0	0	52
03:30 PM	1	25	2	0	2	1	0	0	2	21	0	0	2	1	0	3	60
03:45 PM	0	17	1	2	0	0	1	0	1	26	0	0	1	0	1	0	50
Total	2	78	7	2	3	2	3	0	5	85	7	0	5	2	1	4	206
04:00 PM	2	15	0	0	0	0	0	0	0	16	2	0	0	1	1	0	37
04:15 PM	3	21	0	0	0	0	1	1	1	24	2	0	1	2	2	0	58
04:30 PM	0	17	1	0	0	0	0	0	6	20	0	0	1	1	0	2	48
04:45 PM	1	30	0	0	1	0	1	0	0	22	2	1	1	2	1	1	63
Total	6	83	1	0	1	0	2	1	7	82	6	1	3	6	4	3	206
Grand Total	17	271	11	6	6	8	10	4	18	280	13	3	12	11	15	29	714
Apprch %	5.6	88.9	3.6	2	21.4	28.6	35.7	14.3	5.7	89.2	4.1	1	17.9	16.4	22.4	43.3	
Total %	2.4	38	1.5	0.8	0.8	1.1	1.4	0.6	2.5	39.2	1.8	0.4	1.7	1.5	2.1	4.1	
Unshifted	17	271	11	6	6	8	10	4	18	280	13	3	12	11	15	29	714
% Unshifted	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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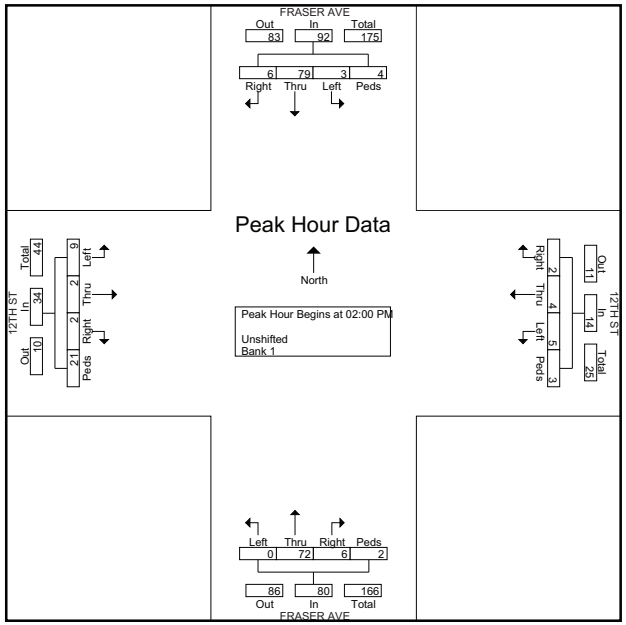
File Name : PM_Fraser Ave - 12th St
Site Code : 00000000
Start Date : 8/9/2016
Page No : 2

	FRASER AVE Southbound					12TH ST Westbound					FRASER AVE Northbound					12TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	**2**	**27**	1	**4**	**34**	0	1	1	**3**	**5**	0	20	0	**1**	21	0	0	1	**10**	11	**71**
02:15 PM	1	14	**2**	0	17	**1**	0	1	0	2	**2**	**21**	0	0	**23**	0	0	**4**	9	**13**	55
02:30 PM	2	25	0	0	27	1	1	**3**	0	5	2	21	0	0	23	0	**1**	3	0	4	59
02:45 PM	1	13	0	0	14	0	**2**	0	0	2	2	10	0	1	13	**2**	1	1	2	6	35
Total Volume	6	79	3	4	92	2	4	5	3	14	6	72	0	2	80	2	2	9	21	34	220
% App. Total	6.5	85.9	3.3	4.3		14.3	28.6	35.7	21.4		7.5	90	0	2.5		5.9	5.9	26.5	61.8		
PHF	.750	.731	.375	.250	.676	.500	.500	.417	.250	.700	.750	.857	.000	.500	.870	.250	.500	.563	.525	.654	.775



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Honolulu, HI 96817-5031
Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : PM_Fraser Ave - 13th St
Site Code : 00000000
Start Date : 8/9/2016
Page No : 1

Groups Printed- Class 1

	FRASER AVE Southbound				13TH ST Westbound				FRASER AVE Northbound				Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:30 PM	0	17	0	0	2	0	1	0	1	11	0	0	0	0	0	0	32
01:45 PM	0	16	0	0	1	1	1	0	2	27	0	0	0	0	0	0	48
Total	0	33	0	0	3	1	2	0	3	38	0	0	0	0	0	0	80
02:00 PM	0	20	2	0	1	0	3	0	2	16	0	0	0	0	0	0	44
02:15 PM	0	12	0	7	4	0	1	0	3	19	0	0	0	0	0	0	46
02:30 PM	0	23	1	0	2	0	3	0	0	17	0	0	0	0	0	0	46
02:45 PM	0	13	2	0	3	0	3	0	3	11	0	0	0	0	0	0	35
Total	0	68	5	7	10	0	10	0	8	63	0	0	0	0	0	0	171
03:00 PM	0	18	1	0	4	0	2	0	1	21	0	0	0	0	0	0	47
03:15 PM	0	19	2	0	4	0	1	0	2	19	0	0	0	0	0	0	47
03:30 PM	0	23	1	0	1	0	0	0	1	26	0	0	0	0	0	0	52
03:45 PM	0	16	1	0	2	0	1	0	1	23	0	0	0	0	0	0	44
Total	0	76	5	0	11	0	4	0	5	89	0	0	0	0	0	0	190
04:00 PM	0	15	0	0	3	0	1	0	0	15	0	0	0	0	0	0	34
04:15 PM	0	22	0	0	1	0	1	0	3	26	0	0	0	0	0	0	53
04:30 PM	0	16	2	0	2	0	1	0	4	18	0	0	0	0	0	0	43
04:45 PM	0	27	5	0	2	0	1	0	0	24	0	0	0	0	0	0	59
Total	0	80	7	0	8	0	4	0	7	83	0	0	0	0	0	0	189
Grand Total	0	257	17	7	32	1	20	0	23	273	0	0	0	0	0	0	630
Apprch %	0	91.5	6	2.5	60.4	1.9	37.7	0	7.8	92.2	0	0	0	0	0	0	
Total %	0	40.8	2.7	1.1	5.1	0.2	3.2	0	3.7	43.3	0	0	0	0	0	0	

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File Name : PM_Fraser Ave - 13th St
Site Code : 00000000
Start Date : 8/9/2016
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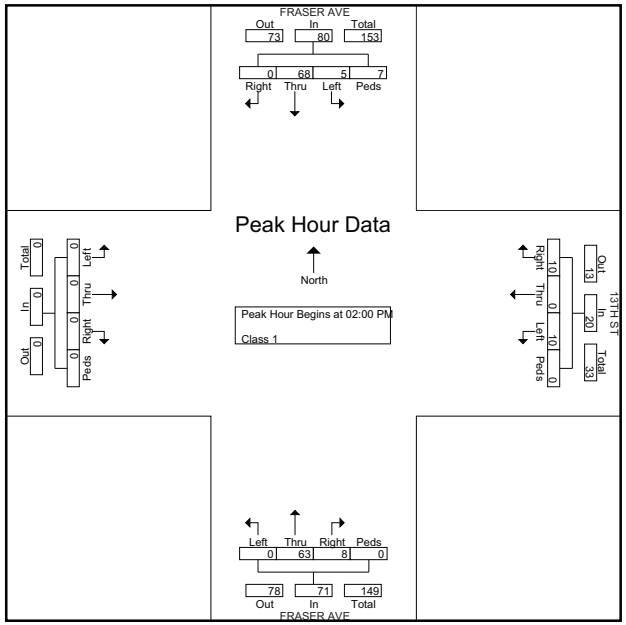
	FRASER AVE Southbound					13TH ST Westbound					FRASER AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	0	20	**2**	0	22	1	0	**3**	0	4	2	16	0	0	18	0	0	0	0	0	44
02:15 PM	0	12	0	**7**	19	**4**	0	1	0	5	**3**	**19**	0	0	**22**	0	0	0	0	0	**46**
02:30 PM	0	**23**	1	0	**24**	2	0	3	0	5	0	17	0	0	17	0	0	0	0	0	46
02:45 PM	0	13	2	0	15	3	0	3	0	**6**	3	11	0	0	14	0	0	0	0	0	35
Total Volume	0	68	5	7	80	10	0	10	0	20	8	63	0	0	71	0	0	0	0	0	171
% App. Total	0	85	6.2	8.8		50	0	50	0		11.3	88.7	0	0		0	0	0	0		
PHF	.000	.739	.625	.250	.833	.625	.000	.833	.000	.833	.667	.829	.000	.000	.807	.000	.000	.000	.000	.000	.929



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File Name : PM_Fraser Ave - Kaumalapau Hwy
Site Code : 00000000
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Groups Printed- Unshifted - Bank 1

	FRASER AVE Southbound				KAUMALAPAU HWY Westbound				Northbound				KAUMALAPAU HWY Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:30 PM	6	0	0	0	0	8	0	0	0	0	0	0	0	6	7	0	27
01:45 PM	8	0	6	0	1	18	0	0	0	0	0	0	0	14	23	0	70
Total	14	0	6	0	1	26	0	0	0	0	0	0	0	20	30	0	97
02:00 PM	21	0	4	0	1	10	0	0	0	0	0	0	0	15	15	0	66
02:15 PM	13	0	3	0	0	22	0	0	0	0	0	0	0	22	19	0	79
02:30 PM	15	0	7	0	0	15	0	0	0	0	0	0	0	18	15	0	70
02:45 PM	12	0	6	0	3	7	0	0	0	0	0	0	0	19	8	0	55
Total	61	0	20	0	4	54	0	0	0	0	0	0	0	74	57	0	270
03:00 PM	15	0	2	0	4	9	0	0	0	0	0	0	0	19	15	0	64
03:15 PM	14	0	4	0	2	11	0	0	0	0	0	0	0	14	18	0	63
03:30 PM	18	0	7	0	5	13	0	0	0	0	0	0	0	10	19	0	72
03:45 PM	12	0	6	0	6	9	0	0	0	0	0	0	0	23	15	0	71
Total	59	0	19	0	17	42	0	0	0	0	0	0	0	66	67	0	270
04:00 PM	10	0	7	0	5	9	0	0	0	0	0	0	0	14	9	0	54
04:15 PM	16	0	8	0	3	9	0	0	0	0	0	0	0	17	21	0	74
04:30 PM	9	0	6	0	2	6	0	0	0	0	0	0	0	26	16	0	65
04:45 PM	19	0	9	0	6	3	0	0	0	0	0	0	0	15	14	0	66
Total	54	0	30	0	16	27	0	0	0	0	0	0	0	72	60	0	259
Grand Total	188	0	75	0	38	149	0	0	0	0	0	0	0	232	214	0	896
Apprch %	71.5	0	28.5	0	20.3	79.7	0	0	0	0	0	0	0	52	48	0	
Total %	21	0	8.4	0	4.2	16.6	0	0	0	0	0	0	0	25.9	23.9	0	
Unshifted	188	0	75	0	38	149	0	0	0	0	0	0	0	232	214	0	896
% Unshifted	100	0	100	0	100	100	0	0	0	0	0	0	0	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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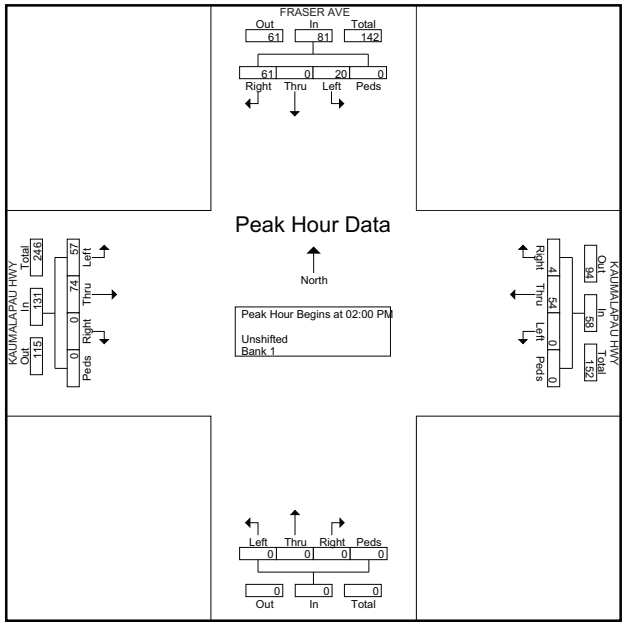
Site Code : 00000000
Start Date : 8/9/2016
Page No : 2

	FRASER AVE Southbound					KAUMALAPAU HWY Westbound					Northbound					KAUMALAPAU HWY Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	**21**	0	4	0	**25**	1	10	0	0	11	0	0	0	0	0	0	15	15	0	30	66
02:15 PM	13	0	3	0	16	0	**22**	0	0	**22**	0	0	0	0	0	0	**22**	**19**	0	**41**	**79**
02:30 PM	15	0	**7**	0	22	0	15	0	0	15	0	0	0	0	0	0	18	15	0	33	70
02:45 PM	12	0	6	0	18	**3**	7	0	0	10	0	0	0	0	0	0	19	8	0	27	55
Total Volume	61	0	20	0	81	4	54	0	0	58	0	0	0	0	0	0	74	57	0	131	270
% App. Total	75.3	0	24.7	0		6.9	93.1	0	0		0	0	0	0		0	56.5	43.5	0		
PHF	.726	.000	.714	.000	.810	.333	.614	.000	.000	.659	.000	.000	.000	.000	.000	.000	.841	.750	.000	.799	.854



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File Name : PM_Manele Rd - Kaumalapau Hwy
Site Code : 00000000
Start Date : 8/9/2016
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Groups Printed- Class 1

	MANELE RD Southbound				KAUMALAPAU HWY Westbound				MANELE RD Northbound				KAUMALAPAU HWY Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
01:30 PM	0	0	2	0	2	4	10	0	9	2	2	0	0	5	2	0	38
01:45 PM	1	1	1	0	4	8	12	0	33	0	2	0	1	4	1	0	68
Total	1	1	3	0	6	12	22	0	42	2	4	0	1	9	3	0	106
02:00 PM	1	0	0	0	0	6	25	0	20	0	2	0	3	12	2	0	71
02:15 PM	0	0	4	0	1	9	23	2	27	0	3	0	1	10	0	0	80
02:30 PM	0	0	2	0	1	9	20	0	21	1	2	0	0	9	1	0	66
02:45 PM	0	1	1	0	0	7	13	0	21	0	6	0	0	7	2	0	58
Total	1	1	7	0	2	31	81	2	89	1	13	0	4	38	5	0	275
03:00 PM	1	0	2	0	0	6	19	1	25	1	0	0	1	7	0	0	63
03:15 PM	0	0	2	0	3	7	14	1	24	2	0	0	0	5	2	0	60
03:30 PM	0	1	3	0	1	3	27	0	17	1	1	0	1	11	0	0	66
03:45 PM	0	0	1	0	0	9	13	0	29	0	1	0	2	9	0	0	64
Total	1	1	8	0	4	25	73	2	95	4	2	0	4	32	2	0	253
04:00 PM	1	1	0	0	2	4	13	1	17	1	1	0	5	8	0	0	54
04:15 PM	0	1	0	0	2	4	18	1	28	2	1	0	5	11	0	0	73
04:30 PM	0	1	1	0	1	5	9	0	32	0	0	0	0	11	1	0	61
04:45 PM	0	2	1	0	0	4	18	0	25	1	1	0	0	2	1	0	55
Total	1	5	2	0	5	17	58	2	102	4	3	0	10	32	2	0	243
Grand Total	4	8	20	0	17	85	234	6	328	11	22	0	19	111	12	0	877
Apprch %	12.5	25	62.5	0	5	24.9	68.4	1.8	90.9	3	6.1	0	13.4	78.2	8.5	0	
Total %	0.5	0.9	2.3	0	1.9	9.7	26.7	0.7	37.4	1.3	2.5	0	2.2	12.7	1.4	0	

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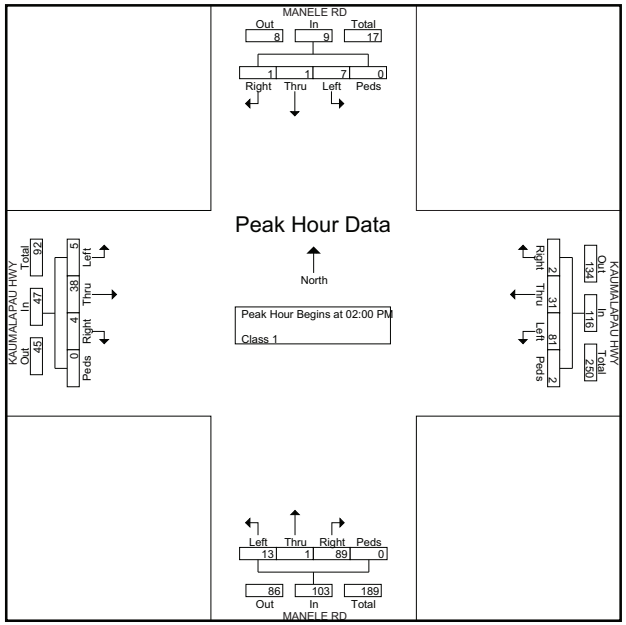
	MANELE RD Southbound					KAUMALAPAU HWY Westbound					MANELE RD Northbound					KAUMALAPAU HWY Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	**1**	0	0	0	1	0	6	**25**	0	31	20	0	2	0	22	**3**	**12**	**2**	0	**17**	71
02:15 PM	0	0	**4**	0	**4**	**1**	**9**	23	**2**	**35**	**27**	0	3	0	**30**	1	10	0	0	11	**80**
02:30 PM	0	0	2	0	2	1	9	20	0	30	21	**1**	2	0	24	0	9	1	0	10	66
02:45 PM	0	**1**	1	0	2	0	7	13	0	20	21	0	**6**	0	27	0	7	2	0	9	58
Total Volume	1	1	7	0	9	2	31	81	2	116	89	1	13	0	103	4	38	5	0	47	275
% App. Total	11.1	11.1	77.8	0		1.7	26.7	69.8	1.7		86.4	1	12.6	0		8.5	80.9	10.6	0		
PHF	.250	.250	.438	.000	.563	.500	.861	.810	.250	.829	.824	.250	.542	.000	.858	.333	.792	.625	.000	.691	.859



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APPENDIX B

LEVEL OF SERVICE CRITERIA

ENCLOSURE B – LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 6th Edition)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec./veh.)
A	< 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	> 80.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6th Edition)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	> 50

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

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APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing AM Conditions

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	2	0	16	4	8	0	79	0	16	97	4
Future Vol, veh/h	2	2	0	16	4	8	0	79	0	16	97	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	2	0	17	4	9	0	86	0	17	105	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	234	227	107	228	229	86	109	0	0	86	0	0
Stage 1	141	141	-	86	86	-	-	-	-	-	-	-
Stage 2	93	86	-	142	143	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	721	672	947	727	671	973	1481	-	-	1510	-	-
Stage 1	862	780	-	922	824	-	-	-	-	-	-	-
Stage 2	914	824	-	861	779	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	704	664	947	718	663	973	1481	-	-	1510	-	-
Mov Cap-2 Maneuver	704	664	-	718	663	-	-	-	-	-	-	-
Stage 1	862	771	-	922	824	-	-	-	-	-	-	-
Stage 2	901	824	-	848	770	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	9.9	0	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	683	766	1510	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.04	0.012	-	-
HCM Control Delay (s)	0	-	-	10.3	9.9	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	8	73	2	7	103
Future Vol, veh/h	1	8	73	2	7	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	79	2	8	112

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	208	80	0	0	81	0
Stage 1	80	-	-	-	-	-
Stage 2	128	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	780	980	-	-	1517	-
Stage 1	943	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	775	980	-	-	1517	-
Mov Cap-2 Maneuver	775	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	898	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	952	1517	-
HCM Lane V/C Ratio	-	-	0.01	0.005	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	4	3	2	1	4	1	68	3	1	95	2
Future Vol, veh/h	2	4	3	2	1	4	1	68	3	1	95	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	3	2	1	4	1	74	3	1	103	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	186	185	104	188	185	76	105	0	0	77	0	0
Stage 1	106	106	-	78	78	-	-	-	-	-	-	-
Stage 2	80	79	-	110	107	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	775	709	951	772	709	985	1486	-	-	1522	-	-
Stage 1	900	807	-	931	830	-	-	-	-	-	-	-
Stage 2	929	829	-	895	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	770	708	951	764	708	985	1486	-	-	1522	-	-
Mov Cap-2 Maneuver	770	708	-	764	708	-	-	-	-	-	-	-
Stage 1	899	806	-	930	829	-	-	-	-	-	-	-
Stage 2	923	828	-	886	806	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	9.2	0.1	0.1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1486	-	-	789	865	1522	-	-
HCM Lane V/C Ratio	0.001	-	-	0.012	0.009	0.001	-	-
HCM Control Delay (s)	7.4	0	-	9.6	9.2	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	9	70	5	7	92
Future Vol, veh/h	5	9	70	5	7	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	10	76	5	8	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	195	79	0	0	81	0
Stage 1	79	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	794	981	-	-	1517	-
Stage 1	944	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	789	981	-	-	1517	-
Mov Cap-2 Maneuver	789	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	903	1517	-
HCM Lane V/C Ratio	-	-	0.017	0.005	-
HCM Control Delay (s)	-	-	9.1	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	32	102	11	11	78
Future Vol, veh/h	54	32	102	11	11	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	35	111	12	12	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	123	0	-	0	270	117
Stage 1	-	-	-	-	117	-
Stage 2	-	-	-	-	153	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1464	-	-	-	719	935
Stage 1	-	-	-	-	908	-
Stage 2	-	-	-	-	875	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1464	-	-	-	690	935
Mov Cap-2 Maneuver	-	-	-	-	690	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	875	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	896
HCM Lane V/C Ratio	0.04	-	-	-	0.108
HCM Control Delay (s)	7.6	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	27	4	128	46	0	2	0	58	0	0	0
Future Vol, veh/h	0	27	4	128	46	0	2	0	58	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	29	4	139	50	0	2	0	63	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	50	0	0	33	0	0	359	359	31	391	361	50
Stage 1	-	-	-	-	-	-	31	31	-	328	328	-
Stage 2	-	-	-	-	-	-	328	328	-	63	33	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1557	-	-	1579	-	-	596	568	1043	568	566	1018
Stage 1	-	-	-	-	-	-	986	869	-	685	647	-
Stage 2	-	-	-	-	-	-	685	647	-	948	868	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1557	-	-	1579	-	-	554	516	1043	496	514	1018
Mov Cap-2 Maneuver	-	-	-	-	-	-	554	516	-	496	514	-
Stage 1	-	-	-	-	-	-	986	869	-	685	588	-
Stage 2	-	-	-	-	-	-	623	588	-	891	868	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.5	8.8	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1013	1557	-	-	1579	-	-	-
HCM Lane V/C Ratio	0.064	-	-	-	0.088	-	-	-
HCM Control Delay (s)	8.8	0	-	-	7.5	0	-	0
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0.3	-	-	-

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APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing PM Conditions

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	7	3	13	4	15	5	61	13	17	76	2
Future Vol, veh/h	3	7	3	13	4	15	5	61	13	17	76	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	8	3	14	4	16	5	66	14	18	83	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	213	210	84	209	204	73	85	0	0	80	0	0
Stage 1	120	120	-	83	83	-	-	-	-	-	-	-
Stage 2	93	90	-	126	121	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	744	687	975	748	692	989	1512	-	-	1518	-	-
Stage 1	884	796	-	925	826	-	-	-	-	-	-	-
Stage 2	914	820	-	878	796	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	720	677	975	731	682	989	1512	-	-	1518	-	-
Mov Cap-2 Maneuver	720	677	-	731	682	-	-	-	-	-	-	-
Stage 1	881	786	-	922	824	-	-	-	-	-	-	-
Stage 2	892	818	-	856	786	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.6	0.5	1.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1512	-	-	739	824	1518	-	-
HCM Lane V/C Ratio	0.004	-	-	0.019	0.042	0.012	-	-
HCM Control Delay (s)	7.4	0	-	10	9.6	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰		↑			↰
Traffic Vol, veh/h	1	4	69	7	11	76
Future Vol, veh/h	1	4	69	7	11	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	4	75	8	12	83

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	186	79	0	0	83	0
Stage 1	79	-	-	-	-	-
Stage 2	107	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	803	981	-	-	1514	-
Stage 1	944	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	797	981	-	-	1514	-
Mov Cap-2 Maneuver	797	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	917	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	938	1514	-
HCM Lane V/C Ratio	-	-	0.006	0.008	-
HCM Control Delay (s)	-	-	8.9	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	2	2	5	4	2	0	72	6	3	79	6
Future Vol, veh/h	9	2	2	5	4	2	0	72	6	3	79	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	2	2	5	4	2	0	78	7	3	86	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	181	181	90	180	181	82	93	0	0	85	0	0
Stage 1	96	96	-	82	82	-	-	-	-	-	-	-
Stage 2	85	85	-	98	99	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	781	713	968	782	713	978	1501	-	-	1512	-	-
Stage 1	911	815	-	926	827	-	-	-	-	-	-	-
Stage 2	923	824	-	908	813	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	775	712	968	777	712	978	1501	-	-	1512	-	-
Mov Cap-2 Maneuver	775	712	-	777	712	-	-	-	-	-	-	-
Stage 1	911	813	-	926	827	-	-	-	-	-	-	-
Stage 2	916	824	-	902	811	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.7	0	0.3
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1501	-	-	788	780	1512	-	-
HCM Lane V/C Ratio	-	-	-	0.018	0.015	0.002	-	-
HCM Control Delay (s)	0	-	-	9.7	9.7	7.4	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰		↑			↱
Traffic Vol, veh/h	10	10	63	8	5	68
Future Vol, veh/h	10	10	63	8	5	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	68	9	5	74

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	157	73	0	0	77	0
Stage 1	73	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	834	989	-	-	1522	-
Stage 1	950	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	831	989	-	-	1522	-
Mov Cap-2 Maneuver	831	-	-	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	903	1522	-
HCM Lane V/C Ratio	-	-	0.024	0.004	-
HCM Control Delay (s)	-	-	9.1	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	57	74	54	4	20	61
Future Vol, veh/h	57	74	54	4	20	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	62	80	59	4	22	66

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	63	0	-	0	265	61
Stage 1	-	-	-	-	61	-
Stage 2	-	-	-	-	204	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1540	-	-	-	724	1004
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	830	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1540	-	-	-	694	1004
Mov Cap-2 Maneuver	-	-	-	-	694	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	830	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1540	-	-	-	904
HCM Lane V/C Ratio	0.04	-	-	-	0.097
HCM Control Delay (s)	7.4	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	38	4	81	31	2	13	1	89	7	1	1
Future Vol, veh/h	5	38	4	81	31	2	13	1	89	7	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	41	4	88	34	2	14	1	97	8	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	36	0	0	45	0	0	265	265	43	313	266	35
Stage 1	-	-	-	-	-	-	53	53	-	211	211	-
Stage 2	-	-	-	-	-	-	212	212	-	102	55	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1575	-	-	1563	-	-	688	640	1027	640	640	1038
Stage 1	-	-	-	-	-	-	960	851	-	791	728	-
Stage 2	-	-	-	-	-	-	790	727	-	904	849	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1575	-	-	1563	-	-	655	602	1027	552	602	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-	655	602	-	552	602	-
Stage 1	-	-	-	-	-	-	957	848	-	789	687	-
Stage 2	-	-	-	-	-	-	743	686	-	815	846	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	5.3	9.3	11.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	952	1575	-	-	1563	-	-	588
HCM Lane V/C Ratio	0.118	0.003	-	-	0.056	-	-	0.017
HCM Control Delay (s)	9.3	7.3	0	-	7.4	0	-	11.2
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0.1

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
CIVIL ENGINEERS • SURVEYORS

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2024 without Project AM Peak Conditions

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	5	5	25	10	15	5	125	5	25	155	10
Future Vol, veh/h	5	5	5	25	10	15	5	125	5	25	155	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	5	27	11	16	5	136	5	27	168	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	390	379	174	382	382	139	179	0	0	141	0	0
Stage 1	228	228	-	149	149	-	-	-	-	-	-	-
Stage 2	162	151	-	233	233	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	569	553	869	576	551	909	1397	-	-	1442	-	-
Stage 1	775	715	-	854	774	-	-	-	-	-	-	-
Stage 2	840	772	-	770	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	540	539	869	557	537	909	1397	-	-	1442	-	-
Mov Cap-2 Maneuver	540	539	-	557	537	-	-	-	-	-	-	-
Stage 1	772	700	-	851	771	-	-	-	-	-	-	-
Stage 2	810	769	-	743	697	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	11.3	0.3	1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1397	-	-	618	625	1442	-	-
HCM Lane V/C Ratio	0.004	-	-	0.026	0.087	0.019	-	-
HCM Control Delay (s)	7.6	0	-	11	11.3	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	15	115	5	15	160
Future Vol, veh/h	5	15	115	5	15	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	16	125	5	16	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	334	128	0	0	130	0
Stage 1	128	-	-	-	-	-
Stage 2	206	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	661	922	-	-	1455	-
Stage 1	898	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	653	922	-	-	1455	-
Mov Cap-2 Maneuver	653	-	-	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	836	1455	-
HCM Lane V/C Ratio	-	-	0.026	0.011	-
HCM Control Delay (s)	-	-	9.4	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	10	5	5	5	10	5	110	5	5	150	5
Future Vol, veh/h	5	10	5	5	5	10	5	110	5	5	150	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	11	5	5	5	11	5	120	5	5	163	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	317	311	166	317	311	123	168	0	0	125	0	0
Stage 1	176	176	-	133	133	-	-	-	-	-	-	-
Stage 2	141	135	-	184	178	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	636	604	878	636	604	928	1410	-	-	1462	-	-
Stage 1	826	753	-	870	786	-	-	-	-	-	-	-
Stage 2	862	785	-	818	752	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	620	599	878	619	599	928	1410	-	-	1462	-	-
Mov Cap-2 Maneuver	620	599	-	619	599	-	-	-	-	-	-	-
Stage 1	823	750	-	867	783	-	-	-	-	-	-	-
Stage 2	843	782	-	798	749	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	10	0.3	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1410	-	-	657	735	1462	-	-
HCM Lane V/C Ratio	0.004	-	-	0.033	0.03	0.004	-	-
HCM Control Delay (s)	7.6	0	-	10.7	10	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	15	110	10	15	145
Future Vol, veh/h	10	15	110	10	15	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	120	11	16	158

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	316	126	0	0	131	0
Stage 1	126	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	677	924	-	-	1454	-
Stage 1	900	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	669	924	-	-	1454	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	842	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	802	1454	-
HCM Lane V/C Ratio	-	-	0.034	0.011	-
HCM Control Delay (s)	-	-	9.6	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	55	165	20	20	125
Future Vol, veh/h	85	55	165	20	20	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	60	179	22	22	136

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	201	0	-	0	434	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	244	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1371	-	-	-	579	852
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1371	-	-	-	539	852
Mov Cap-2 Maneuver	-	-	-	-	539	-
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	797	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1371	-	-	-	789
HCM Lane V/C Ratio	0.067	-	-	-	0.2
HCM Control Delay (s)	7.8	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	45	10	200	75	15	5	5	90	5	10	5
Future Vol, veh/h	5	45	10	200	75	15	5	5	90	5	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	49	11	217	82	16	5	5	98	5	11	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	98	0	0	60	0	0	597	597	55	640	594	90
Stage 1	-	-	-	-	-	-	65	65	-	524	524	-
Stage 2	-	-	-	-	-	-	532	532	-	116	70	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1495	-	-	1544	-	-	415	416	1012	388	418	968
Stage 1	-	-	-	-	-	-	946	841	-	537	530	-
Stage 2	-	-	-	-	-	-	531	526	-	889	837	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1495	-	-	1544	-	-	356	353	1012	306	354	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	356	353	-	306	354	-
Stage 1	-	-	-	-	-	-	943	838	-	535	451	-
Stage 2	-	-	-	-	-	-	439	448	-	795	834	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	5.3	9.8	14.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	854	1495	-	-	1544	-	-	402
HCM Lane V/C Ratio	0.127	0.004	-	-	0.141	-	-	0.054
HCM Control Delay (s)	9.8	7.4	0	-	7.7	0	-	14.5
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.5	-	-	0.2

AUSTIN, TSUTSUMI & ASSOCIATES, INC.
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APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2024 without Project PM Peak Conditions

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	15	5	20	10	25	10	95	20	30	120	5
Future Vol, veh/h	5	15	5	20	10	25	10	95	20	30	120	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	16	5	22	11	27	11	103	22	33	130	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	354	346	133	345	337	114	135	0	0	125	0	0
Stage 1	199	199	-	136	136	-	-	-	-	-	-	-
Stage 2	155	147	-	209	201	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	601	577	916	609	584	939	1449	-	-	1462	-	-
Stage 1	803	736	-	867	784	-	-	-	-	-	-	-
Stage 2	847	775	-	793	735	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	561	559	916	577	565	939	1449	-	-	1462	-	-
Mov Cap-2 Maneuver	561	559	-	577	565	-	-	-	-	-	-	-
Stage 1	797	718	-	860	778	-	-	-	-	-	-	-
Stage 2	805	769	-	752	717	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	10.7	0.6	1.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1449	-	-	607	696	1462	-	-
HCM Lane V/C Ratio	0.008	-	-	0.045	0.086	0.022	-	-
HCM Control Delay (s)	7.5	0	-	11.2	10.7	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Vol, veh/h	5	10	110	15	20	120
Future Vol, veh/h	5	10	110	15	20	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	120	16	22	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	302	128	0	0	136	0
Stage 1	128	-	-	-	-	-
Stage 2	174	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	690	922	-	-	1448	-
Stage 1	898	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	679	922	-	-	1448	-
Mov Cap-2 Maneuver	679	-	-	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	856	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	824	1448	-
HCM Lane V/C Ratio	-	-	0.02	0.015	-
HCM Control Delay (s)	-	-	9.5	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	5	5	10	10	5	5	115	10	5	125	10
Future Vol, veh/h	15	5	5	10	10	5	5	115	10	5	125	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	5	5	11	11	5	5	125	11	5	136	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	301	298	142	298	298	131	147	0	0	136	0	0
Stage 1	152	152	-	141	141	-	-	-	-	-	-	-
Stage 2	149	146	-	157	157	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	651	614	906	654	614	919	1435	-	-	1448	-	-
Stage 1	850	772	-	862	780	-	-	-	-	-	-	-
Stage 2	854	776	-	845	768	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	635	609	906	642	609	919	1435	-	-	1448	-	-
Mov Cap-2 Maneuver	635	609	-	642	609	-	-	-	-	-	-	-
Stage 1	847	769	-	859	777	-	-	-	-	-	-	-
Stage 2	834	773	-	831	765	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	10.6	0.3	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1435	-	-	669	668	1448	-	-
HCM Lane V/C Ratio	0.004	-	-	0.041	0.041	0.004	-	-
HCM Control Delay (s)	7.5	0	-	10.6	10.6	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Vol, veh/h	20	20	100	15	10	110
Future Vol, veh/h	20	20	100	15	10	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	22	109	16	11	120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	259	117	0	0	125	0
Stage 1	117	-	-	-	-	-
Stage 2	142	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	730	935	-	-	1462	-
Stage 1	908	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	724	935	-	-	1462	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	885	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	816	1462	-
HCM Lane V/C Ratio	-	-	0.053	0.007	-
HCM Control Delay (s)	-	-	9.7	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	90	135	105	10	35	95
Future Vol, veh/h	90	135	105	10	35	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	147	114	11	38	103

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	125	0	-	0	463	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1462	-	-	-	557	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1462	-	-	-	516	931
Mov Cap-2 Maneuver	-	-	-	-	516	-
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1462	-	-	-	765
HCM Lane V/C Ratio	0.067	-	-	-	0.185
HCM Control Delay (s)	7.6	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	75	10	130	70	5	20	5	140	15	5	5
Future Vol, veh/h	10	75	10	130	70	5	20	5	140	15	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	82	11	141	76	5	22	5	152	16	5	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	81	0	0	93	0	0	476	473	88	549	476	79
Stage 1	-	-	-	-	-	-	110	110	-	361	361	-
Stage 2	-	-	-	-	-	-	366	363	-	188	115	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1517	-	-	1501	-	-	499	490	970	446	488	981
Stage 1	-	-	-	-	-	-	895	804	-	657	626	-
Stage 2	-	-	-	-	-	-	653	625	-	814	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1517	-	-	1501	-	-	452	439	970	343	437	981
Mov Cap-2 Maneuver	-	-	-	-	-	-	452	439	-	343	437	-
Stage 1	-	-	-	-	-	-	888	798	-	652	565	-
Stage 2	-	-	-	-	-	-	580	564	-	676	794	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	4.8	10.6	14.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1517	-	-	1501	-	-	415
HCM Lane V/C Ratio	0.217	0.007	-	-	0.094	-	-	0.065
HCM Control Delay (s)	10.6	7.4	0	-	7.6	0	-	14.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.8	0	-	-	0.3	-	-	0.2

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APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2024 with Project AM Peak Conditions

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	10	55	25	10	15	20	125	5	25	155	20
Future Vol, veh/h	45	10	55	25	10	15	20	125	5	25	155	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	11	60	27	11	16	22	136	5	27	168	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	429	418	179	452	427	139	190	0	0	141	0	0
Stage 1	233	233	-	183	183	-	-	-	-	-	-	-
Stage 2	196	185	-	269	244	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	536	526	864	518	520	909	1384	-	-	1442	-	-
Stage 1	770	712	-	819	748	-	-	-	-	-	-	-
Stage 2	806	747	-	737	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	503	506	864	461	500	909	1384	-	-	1442	-	-
Mov Cap-2 Maneuver	503	506	-	461	500	-	-	-	-	-	-	-
Stage 1	757	697	-	805	735	-	-	-	-	-	-	-
Stage 2	767	734	-	661	689	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	12.2	1	0.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1384	-	-	636	551	1442	-	-
HCM Lane V/C Ratio	0.016	-	-	0.188	0.099	0.019	-	-
HCM Control Delay (s)	7.6	0	-	12	12.2	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	15	135	5	15	215
Future Vol, veh/h	5	15	135	5	15	215
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	16	147	5	16	234

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	416	150	0	0	152	0
Stage 1	150	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	593	896	-	-	1429	-
Stage 1	878	-	-	-	-	-
Stage 2	779	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	585	896	-	-	1429	-
Mov Cap-2 Maneuver	585	-	-	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	779	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	791	1429	-
HCM Lane V/C Ratio	-	-	0.027	0.011	-
HCM Control Delay (s)	-	-	9.7	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	10	15	5	5	10	5	125	5	5	200	5
Future Vol, veh/h	10	10	15	5	5	10	5	125	5	5	200	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	11	16	5	5	11	5	136	5	5	217	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	387	381	220	392	381	139	222	0	0	141	0	0
Stage 1	230	230	-	149	149	-	-	-	-	-	-	-
Stage 2	157	151	-	243	232	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	572	552	820	567	552	909	1347	-	-	1442	-	-
Stage 1	773	714	-	854	774	-	-	-	-	-	-	-
Stage 2	845	772	-	761	713	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	558	548	820	544	548	909	1347	-	-	1442	-	-
Mov Cap-2 Maneuver	558	548	-	544	548	-	-	-	-	-	-	-
Stage 1	770	711	-	851	771	-	-	-	-	-	-	-
Stage 2	826	769	-	732	710	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	10.5	0.3	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1347	-	-	643	682	1442	-	-
HCM Lane V/C Ratio	0.004	-	-	0.059	0.032	0.004	-	-
HCM Control Delay (s)	7.7	0	-	11	10.5	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	15	130	10	15	205
Future Vol, veh/h	10	15	130	10	15	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	141	11	16	223

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	402	147	0	0	152	0
Stage 1	147	-	-	-	-	-
Stage 2	255	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	604	900	-	-	1429	-
Stage 1	880	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	596	900	-	-	1429	-
Mov Cap-2 Maneuver	596	-	-	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	747	1429	-
HCM Lane V/C Ratio	-	-	0.036	0.011	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	105	55	165	20	20	180
Future Vol, veh/h	105	55	165	20	20	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	114	60	179	22	22	196

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	201	0	-	0	478	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1371	-	-	-	546	852
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	761	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1371	-	-	-	499	852
Mov Cap-2 Maneuver	-	-	-	-	499	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	761	-

Approach	EB	WB	SB
HCM Control Delay, s	5.2	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1371	-	-	-	796
HCM Lane V/C Ratio	0.083	-	-	-	0.273
HCM Control Delay (s)	7.9	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1.1

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	50	10	245	90	15	5	5	105	5	10	5
Future Vol, veh/h	5	50	10	245	90	15	5	5	105	5	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	54	11	266	98	16	5	5	114	5	11	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	114	0	0	65	0	0	716	716	60	767	713	106
Stage 1	-	-	-	-	-	-	70	70	-	638	638	-
Stage 2	-	-	-	-	-	-	646	646	-	129	75	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1475	-	-	1537	-	-	345	356	1005	319	357	948
Stage 1	-	-	-	-	-	-	940	837	-	465	471	-
Stage 2	-	-	-	-	-	-	460	467	-	875	833	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1475	-	-	1537	-	-	285	289	1005	239	290	948
Mov Cap-2 Maneuver	-	-	-	-	-	-	285	289	-	239	290	-
Stage 1	-	-	-	-	-	-	936	834	-	463	384	-
Stage 2	-	-	-	-	-	-	362	381	-	767	830	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	5.5	10.1	16.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1475	-	-	1537	-	-	330
HCM Lane V/C Ratio	0.152	0.004	-	-	0.173	-	-	0.066
HCM Control Delay (s)	10.1	7.5	0	-	7.8	0	-	16.7
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.6	-	-	0.2

APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2024 with Project PM Peak Conditions

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	35	15	45	20	15	25	70	95	20	30	130	55
Future Vol, veh/h	35	15	45	20	15	25	70	95	20	30	130	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	16	49	22	16	27	76	103	22	33	141	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	525	514	171	536	533	114	201	0	0	125	0	0
Stage 1	237	237	-	266	266	-	-	-	-	-	-	-
Stage 2	288	277	-	270	267	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	463	464	873	455	453	939	1371	-	-	1462	-	-
Stage 1	766	709	-	739	689	-	-	-	-	-	-	-
Stage 2	720	681	-	736	688	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	408	425	873	390	415	939	1371	-	-	1462	-	-
Mov Cap-2 Maneuver	408	425	-	390	415	-	-	-	-	-	-	-
Stage 1	720	691	-	695	648	-	-	-	-	-	-	-
Stage 2	641	640	-	661	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	12.8	2.9	1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1371	-	-	550	526	1462	-	-
HCM Lane V/C Ratio	0.055	-	-	0.188	0.124	0.022	-	-
HCM Control Delay (s)	7.8	0	-	13.1	12.8	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Vol, veh/h	5	10	170	15	20	165
Future Vol, veh/h	5	10	170	15	20	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	185	16	22	179

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	416	193	0	0	201	0
Stage 1	193	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	593	849	-	-	1371	-
Stage 1	840	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	582	849	-	-	1371	-
Mov Cap-2 Maneuver	582	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	814	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	736	1371	-
HCM Lane V/C Ratio	-	-	0.022	0.016	-
HCM Control Delay (s)	-	-	10	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	5	10	10	10	5	15	175	10	5	170	20
Future Vol, veh/h	20	5	10	10	10	5	15	175	10	5	170	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	5	11	11	11	5	16	190	11	5	185	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	442	439	196	442	445	196	207	0	0	201	0	0
Stage 1	206	206	-	228	228	-	-	-	-	-	-	-
Stage 2	236	233	-	214	217	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	526	512	845	526	508	845	1364	-	-	1371	-	-
Stage 1	796	731	-	775	715	-	-	-	-	-	-	-
Stage 2	767	712	-	788	723	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	507	503	845	508	499	845	1364	-	-	1371	-	-
Mov Cap-2 Maneuver	507	503	-	508	499	-	-	-	-	-	-	-
Stage 1	786	728	-	765	706	-	-	-	-	-	-	-
Stage 2	741	703	-	769	720	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	11.9	0.6	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1364	-	-	572	548	1371	-	-
HCM Lane V/C Ratio	0.012	-	-	0.067	0.05	0.004	-	-
HCM Control Delay (s)	7.7	0	-	11.7	11.9	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰		↑			↕
Traffic Vol, veh/h	20	20	175	15	10	160
Future Vol, veh/h	20	20	175	15	10	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	22	190	16	11	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	394	198	0	0	206	0
Stage 1	198	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	611	843	-	-	1365	-
Stage 1	835	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	606	843	-	-	1365	-
Mov Cap-2 Maneuver	606	-	-	-	-	-
Stage 1	827	-	-	-	-	-
Stage 2	837	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	705	1365	-
HCM Lane V/C Ratio	-	-	0.062	0.008	-
HCM Control Delay (s)	-	-	10.4	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	165	135	105	10	35	150
Future Vol, veh/h	165	135	105	10	35	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	179	147	114	11	38	163

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	125	0	-	0	625	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	505	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1462	-	-	-	449	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1462	-	-	-	389	931
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1462	-	-	-	737
HCM Lane V/C Ratio	0.123	-	-	-	0.273
HCM Control Delay (s)	7.8	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.1

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	95	10	170	85	5	20	5	195	15	5	5
Future Vol, veh/h	10	95	10	170	85	5	20	5	195	15	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	103	11	185	92	5	22	5	212	16	5	5

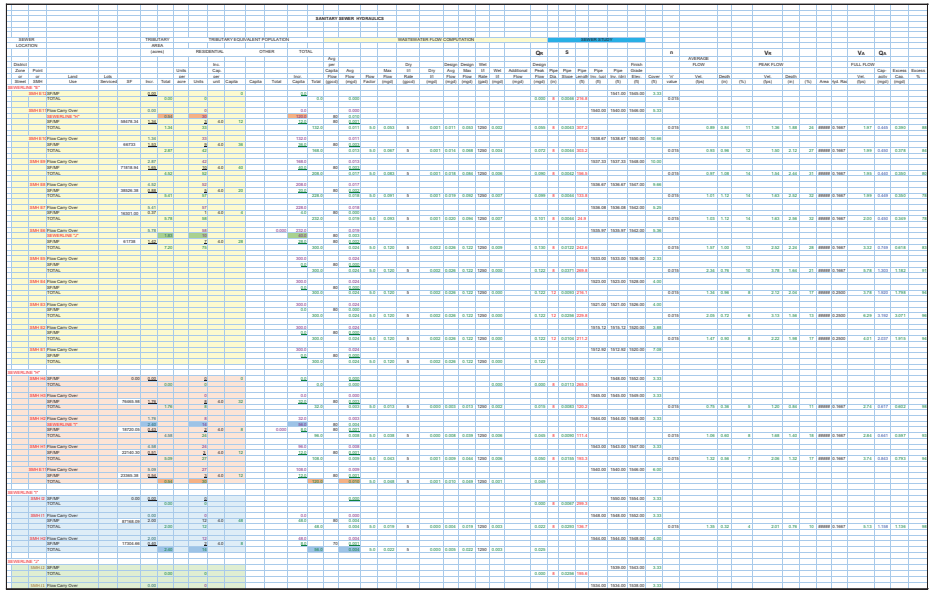
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	97	0	0	114	0	0	601	598	109	704	601	95
Stage 1	-	-	-	-	-	-	131	131	-	465	465	-
Stage 2	-	-	-	-	-	-	470	467	-	239	136	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1496	-	-	1475	-	-	412	416	945	352	414	962
Stage 1	-	-	-	-	-	-	873	788	-	578	563	-
Stage 2	-	-	-	-	-	-	574	562	-	764	784	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1496	-	-	1475	-	-	362	358	945	241	356	962
Mov Cap-2 Maneuver	-	-	-	-	-	-	362	358	-	241	356	-
Stage 1	-	-	-	-	-	-	866	782	-	573	488	-
Stage 2	-	-	-	-	-	-	489	487	-	584	778	-

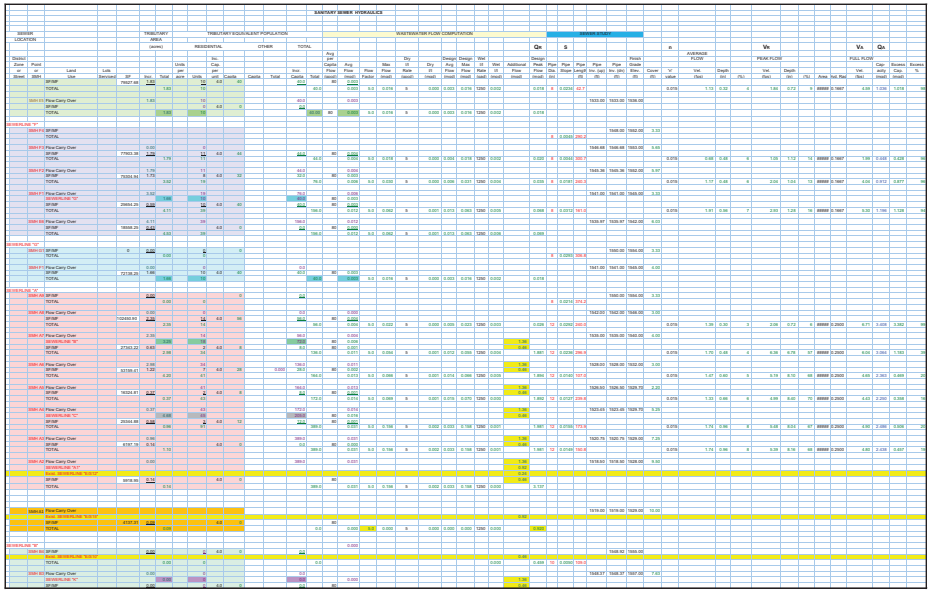
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	5.1	11.4	17.9
HCM LOS			B	C

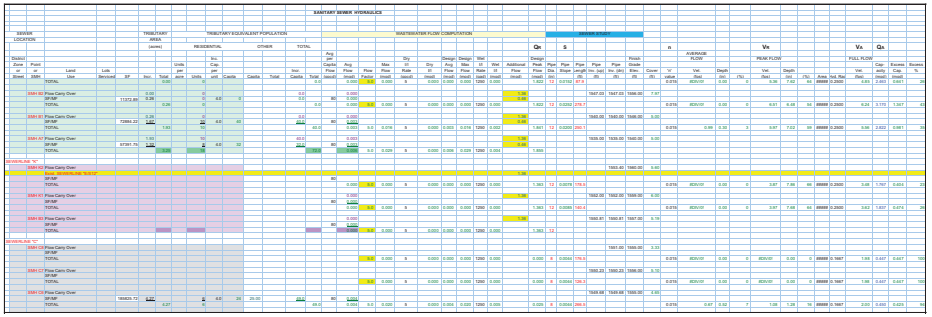
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	798	1496	-	-	1475	-	-	307
HCM Lane V/C Ratio	0.3	0.007	-	-	0.125	-	-	0.089
HCM Control Delay (s)	11.4	7.4	0	-	7.8	0	-	17.9
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.3	0	-	-	0.4	-	-	0.3

APPENDIX A

Wastewater Demand Calculations




SANITARY SEWER HYDRAULICS


SANITARY SEWER HYDRAULICS

APPENDIX B

Drainage Calculations

Project Title: Lanai City 200 Unit Subdivision | **Job No.: 1-22770 E** | **Page: 1 of 2**
Location: Lanai City, Lanai | **Prep by: IS/DY** | **Date: 01/28/19**
Item: Existing Drainage Calculations | **Check by: MHO** | **Date: 01/28/19**

1. Purpose: Determine existing peak flow for Lanai City 200 Unit Subdivion.
2. Reference: "Rules for the Design of Storm Drainage Facilities in the County of Maui", Department of Public Works, County of Maui, 7/14/1995

3. Hydrologic Criteria
   - A. Recurrence Interval, Tm
     - i. For overall peak flow: Drainage Area <= 100 acres, Tm = 10 years, 1 hour storm
     - ii. For on-site peak flow for basin sizing: Drainage Area <= 100 acres, Tm = 50 years, 1 hour storm
   - B. Runoff Quantity --> Rational Method

4. Solution
   - A. Rational Method

     Q=CIA
     Q = flow rate in cubic feet per second (cfs)
     C = runoff coefficient
     I = rainfall intensity in (in/hr) for a duration equal to the time of concentration
     A = drainage area in acres

   - B. 1 Hour Rainfall (from Plate 6)

Yr. Storm Event	I
10	2.00
50	2.75

   - C. Runoff Coefficient (C) from Table 2

Condition	Abbrev.	C
Unimproved Areas	UA	0.30
Commercial	CO	0.85

   - D. Drainage Area and Weighted C (refer to Figure 1)

Drainage Area (DA)	Condition	Area (sf.)	Area (ac.)	Weighted C
1	UA	557,897	12.81	0.32
	CO	22,601	0.52	
2	UA	682,706	15.67	0.30
	CO	-	-	
3	UA	639,454	14.68	0.31
	CO	13,760	0.32	
4	UA	91,345	2.10	0.30
	CO	-	-	
5	UA	33,678	0.77	0.30
	CO	-	-	
6	UA	92,471	2.12	0.30
	CO	-	-	
7	UA	21,716	0.50	0.76
	CO	106,694	2.45	
8	UA	100,617	2.31	0.67
	CO	211,476	4.85	
9	UA	113,422	2.60	0.51
	CO	72,699	1.67	
10	UA	43,243	0.99	0.44
	CO	15,228	0.35	
11	UA	150,113	3.45	0.53
	CO	105,145	2.41	
12	UA	18,281	0.42	0.3
	CO	-	-	
13	UA	47,564	1.09	0.47
	CO	20,951	0.48	
14	UA	30,792	0.71	0.58
	CO	32,568	0.75	
15	UA	116,328	2.67	0.3
	CO	-	-	

E. Time of Concentration (Tc) and Rainfall Intensity I (in./hr.) from Plates 1 and 2

Drainage Area (DA)	Start Elev.	End Elev.	Slope (ft./ft.)	L (ft.)	Tc (min.)	I (in./hr.) at Tm=10yr	I (in./hr.) at Tm=50yr
1	1,562	1,527	0.029	1,190	25	3.00	4.20
2	1,561	1,532	0.029	987	21	3.20	4.45
3	1,558	1,522	0.027	1,318	26	2.95	4.10
4	1,540	1,525	0.027	555	18	3.40	4.70
5	1,536	1,528	0.020	397	17	3.50	4.80
6	1,536	1,519	0.031	555	18	3.40	4.80
7	1,554	1,523	0.053	580	16	3.60	4.95
8	1,603	1,526	0.088	875	17	3.50	4.80
9	1,608	1,548	0.124	483	13	3.90	5.30
10	1,608	1,555	0.052	1,025	20	3.30	4.60
11	1,608	1,558	0.050	992	21	3.20	4.45
12	1,565	1,556	0.031	290	14	3.72	5.20
13	1,568	1,556	0.026	468	17	3.50	4.80
14	1,568	1,561	0.030	233	13	3.80	5.30
15	1,563	1,533	0.032	944	22	3.10	4.30

F. Peak Flow Q (cfs) at Recurrance Interval, 10 years

Drainage Area (DA)	Q (cfs)	C	I (in./hr.)	A (ac.)
1	12.85	0.32	3.00	13.33
2	15.05	0.30	3.20	15.67
3	13.78	0.31	2.95	15.00
4	2.14	0.30	3.40	2.10
5	0.81	0.30	3.50	0.77
6	2.17	0.30	3.40	2.12
7	8.03	0.76	3.60	2.95
8	16.87	0.67	3.50	7.16
9	8.58	0.51	3.90	4.27
10	1.96	0.44	3.30	1.34
11	12.03	0.53	3.90	5.86
12	0.42	0.30	3.30	0.42
13	2.36	0.47	3.20	1.57
14	3.15	0.58	3.72	1.45
15	2.80	0.30	3.50	2.67

G. Peak Flow Q (cfs) at Recurrance Interval, 50 years

Drainage Area (DA)	Q (cfs)	C	I (in./hr.)	A (ac.)
1	17.99	0.32	4.20	13.33
2	20.92	0.30	4.45	15.67
3	19.16	0.31	4.10	15.00
4	2.96	0.30	4.70	2.10
5	1.11	0.30	4.80	0.77
6	3.06	0.30	4.80	2.12
7	11.05	0.76	4.95	2.95
8	23.13	0.67	4.80	7.16
9	11.66	0.51	5.30	4.27
10	2.74	0.44	4.60	1.34
11	13.73	0.53	4.45	5.86
12	0.65	0.30	5.20	0.42
13	3.53	0.47	4.80	1.57
14	4.49	0.58	5.30	1.45
15	3.44	0.30	4.30	2.67

1. Purpose: Determine proposed peak flow, increase in peak flow from exist. and basin sizes for Lanai City 200 Unit Subdivion.
2. Reference: "Rules for the Design of Storm Drainage Facilities in the County of Maui", Department of Public Works, County of Maui, 7/14/1995
3. Hydrologic Criteria
   - A. Recurrence Interval, Tm
     - i. For overall peak flow: Drainage Area <= 100 acres, Tm = 10 years, 1 hour storm
     - ii. For on-site peak flow for basin sizing: Drainage Area <= 100 acres, Tm = 50 years, 1 hour storm
   - B. Runoff Quantity --> Rational Method
4. Solution
   - A. Rational Method

     Q=CIA

     Q = flow rate in cubic feet per second (cfs)

     C = runoff coefficient

     I = rainfall intensity in (in/hr) for a duration equal to the time of concentration

     A = drainage area in acres

   - B. 1 Hour Rainfall (from Plate 6)

Yr. Storm Event	I
10	2.00
50	2.75

   - C. Runoff Coefficient (C) from Table 2

Condition	Abbrev.	C
Unimproved Areas	UA	0.30
Commercial	CO	0.85
Residential Areas	RA	0.50

   - D. Weighted Runoff Coefficient (C)

Drainage Area (DA)	Condition	C	Area (sf.)	Weighted C
1	UA	0.30	-	0.50
	CO	0.85	-	
	RA	0.50	626,912	
2	UA	0.30	-	0.50
	CO	0.85	-	
	RA	0.50	578,007	
3	UA	0.30	-	0.50
	CO	0.85	-	
	RA	0.50	479,131	
4	UA	0.30	-	0.50
	CO	0.85	-	
	RA	0.50	244,494	
5	UA	0.30	91,345	0.30
	CO	0.85	-	
	RA	0.50	-	
6	UA	0.30	33,678	0.30
	CO	0.85	-	
	RA	0.50	-	
7	UA	0.30	92,471	0.30
	CO	0.85	-	
	RA	0.50	-	

D. Weighted Runoff Coefficient (C) Cont.

8	UA	0.30	21,716	0.76
	CO	0.85	106,694	
	RA	0.50	-	
9	UA	0.30	100,617	0.67
	CO	0.85	211,476	
	RA	0.50	-	
10	UA	0.30	113,422	0.51
	CO	0.85	72,699	
	RA	0.50	-	
11	UA	0.30	43,243	0.44
	CO	0.85	15,228	
	RA	0.50	-	
12	UA	0.30	150,113	0.53
	CO	0.85	105,145	
	RA	0.50	-	
13	UA	0.30	18,281	0.30
	CO	0.85	-	
	RA	0.50	-	
14	UA	0.30	47,564	0.47
	CO	0.85	20,951	
	RA	0.50	-	
15	UA	0.30	30,792	0.58
	CO	0.85	32,568	
	RA	0.50	-	
16	UA	0.30	116,328	0.30
	CO	0.85	-	
	RA	0.50	-	

F. Time of Concentration (Tc) and Rainfall Intensity I (in./hr.) from Plates 1 and 2

Drainage Area (DA)	Start Elev.	End Elev.	Slope (ft./ft.)	L (ft.)	Tc (min.)	I (in./hr.) at Tm=10yr	I (in./hr.) at Tm=50yr
1	1,560	1,527	0.025	1,326	5	5.10	7.00
2	1,559	1,534	0.027	927	5	5.10	7.00
3	1,558	1,535	0.023	980	5	5.10	7.00
4	1,544	1,520	0.033	734	5	5.10	7.00
5	1,540	1,525	0.027	555	18	3.40	4.70
6	1,536	1,528	0.020	397	17	3.50	4.80
7	1,536	1,519	0.031	555	18	3.40	4.80
8	1,554	1,523	0.053	580	16	3.60	4.95
9	1,603	1,526	0.088	875	17	3.50	4.80
10	1,608	1,548	0.124	483	13	3.90	5.30
11	1,608	1,555	0.052	1,025	20	3.30	4.60
12	1,608	1,558	0.050	992	21	3.20	4.45
13	1,565	1,556	0.031	290	14	3.72	5.20
14	1,568	1,556	0.026	468	17	3.50	4.80
15	1,568	1,561	0.030	233	13	3.80	5.30
16	1,563	1,533	0.032	944	22	3.10	4.30

G. Peak Flow Q (cfs) at Recurrance Interval, 10 years

Drainage Area (DA)	Q (cfs)	C	I (in./hr.)	A (ac.)
1	36.70	0.50	5.10	14.39
2	33.84	0.50	5.10	13.27
3	28.05	0.50	5.10	11.00
4	14.31	0.50	5.10	5.61
5	2.14	0.30	3.40	2.10
6	0.81	0.30	3.50	0.77
7	2.17	0.30	3.40	2.12
8	8.03	0.76	3.60	2.95
9	16.87	0.67	3.50	7.16
10	8.58	0.51	3.90	4.27
11	1.96	0.44	3.30	1.34
12	9.87	0.53	3.20	5.86
13	0.47	0.30	3.72	0.42
14	2.58	0.47	3.50	1.57
15	3.22	0.58	3.80	1.45
16	2.48	0.30	3.10	2.67

H. Peak Flow Q (cfs) at Recurrance Interval, 50 years

Prop. Drainage Area (DA)	Q (cfs)	C	I (in./hr.)	A (ac.)
1	50.37	0.50	7.00	14.39
2	46.44	0.50	7.00	13.27
3	38.50	0.50	7.00	11.00
4	19.64	0.50	7.00	5.61
5	2.96	0.30	4.70	2.10
6	1.11	0.30	4.80	0.77
7	3.06	0.30	4.80	2.12
8	11.05	0.76	4.95	2.95
9	23.13	0.67	4.80	7.16
10	11.66	0.51	5.30	4.27
11	2.74	0.44	4.60	1.34
12	13.73	0.53	4.45	5.86
13	0.65	0.30	5.20	0.42
14	3.53	0.47	4.80	1.57
15	4.49	0.58	5.30	1.45
16	3.44	0.30	4.30	2.67

I. On-site Increase in Q (cfs) at Recurrance Interval, 10 years

Basin	Exist. Q (cfs)	Prop. Drainage Area (DA)	Total Prop A (ac)	Prop. Q (cfs)	Delta (cfs)
1	15.65	1, 16	17.06	39.18	**23.53**
2	21.78	2, 6, 13, 14, 15	17.49	40.91	**19.13**
3	32.09	3, 4, 5, 7, 11, 12	28.03	58.50	**26.42**

J. On-site Increase in Q (cfs) at Recurrance Interval, 50 years

Basin	Exist. Q (cfs)	Prop. Drainage Area (DA)	Total Prop A (ac)	Prop. Q (cfs)	Delta (cfs)
1	21.43	1, 16	17.06	53.82	**32.38**
2	30.72	2, 6, 13, 14, 15	17.49	56.24	**25.52**
3	41.64	3, 4, 5, 7, 11, 12	28.03	80.62	**38.99**

K. Basin Sizing

Basin	Minimum Required Basin Q10 (cfs)	Minimum Required Basin Vol.	Basin Length (ft)	Basin Width (ft)	Basin Depth (ft)	Basin Volume (ft^2)	Basin Volume (ft^3)
1	32.38	58,287	145	80	5	58,000	2,148
2	25.52	45,934	140	70	5	49,000	1,815
3	38.99	70,174	150	100	5	75,000	2,778