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**FROM:** Bill White  
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**DATE:** May 23, 2016

**JOB NO.:** 5594.002

**RE:** Windhaven Apartments, Summary Micro-simulation/SimTraffic Analysis

**CC:** Jay Bonnet, P.E. - Bonnett Engineering  
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Greg Figg - WSDOT

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Urgent     For Review     Please Comment     Please Reply     For Your Use

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This memorandum summarizes the micro-simulation analysis developed in SimTraffic for the Windhaven Apartments project proposed in Spokane, WA. Provided is additional information to support the *Windhaven Apartments Traffic Impact Analysis* (MMI, May 2016), as developed per the request of officials with the Washington State Department of Transportation (WSDOT) specifically for Francis Avenue study intersections. Source material such as project data, traffic forecasts, and comparative analyses can be reviewed with the project Traffic Impact Analysis (TIA), as this provides analytical results only and is not intended as a stand-alone document.

## SIMTRAFFIC ANALYSIS

SimTraffic (Trafficware, 2016) is a micro-simulation program used to review the cumulative impact of traffic within the context of roadway and intersection networks. This is somewhat different than the “spot” analyses provided through Highway Capacity Manual (HCM) methodologies and the software that generates HCM results (such as Synchro used with the Windhaven TIA). Cumulative results can be different with micro-simulation because the effect of the traffic influences from upstream and downstream intersections are addressed, whereas spot analysis focuses on traffic conditions predominantly at an intersection only. Spillback between intersections, spillback beyond turning bays, forced lane changes, unbalanced lane use for downstream turns, and other traffic flow interactions are examples of traffic conditions that can have a cumulative impact upon the operation of a single intersection.

Intersection delay, block time, and queue penalties are micro-simulation results requested by WSDOT for Francis Avenue study intersections. A description of intersection delay, block time, and queue penalties are as follows:

- **Block Time.** This represents the proportion of time during the peak hour that a turn lane is queued at the top or back of a storage area (i.e. lane length), thus access to the lane is effectively blocked. Or this represents the proportion of time that a turn lane is blocked due to queues in the adjacent through lane. Results are presented in terms of a percentage of time blocked during the peak hour. Block time is shown in Table 2.
- **Intersection Delay.** Presented by Table 1, this is the average delay experienced by vehicles at an intersection. Different than control delay (as presented by the TIA), this includes the effects of vehicle slow-downs and arrival/departure influences caused by

the factors mentioned previously (spillover, etc.). The information is presented as the average delay experienced by vehicles/drivers at an intersection in seconds.

- **Queue Penalty.** This is a rough measure of how many vehicles are impacted by blocking throughout the peak hour. As a quick way to quantify the effects of queuing at an intersection, this represents the vehicles that cannot access a turn lane because of queues or cannot make it through the intersection, because of volume/queuing, during the peak hour. The queue penalty is shown in Table 2.

Delay, block time, and queue penalty analyses were developed in SimTraffic assuming a 60 minute analysis using a 10 minute “seed” time. Five micro-simulation runs/iterations were performed for all analysis conditions. The results of these five runs were then averaged to generate information shown on the following pages. Note that summary worksheets and PDF reports for each run are attached to this memorandum for existing, future without, and future-with project analysis conditions.

The results of the delay analyses are provided on [Table 1](#) for the AM and PM peak hours of the typical weekday. The analysis was prepared based on existing traffic counts, future without-project traffic forecasts, and future with-project traffic forecasts. The “spot” HCM delay results are shown for from the TIA as a means for comparing/quantifying the incidental delay associated with off-intersection traffic impacts/influences. However, please note these are not direct comparisons as they are quantifying somewhat different aspects of intersection operation.

Table 1. Existing and Forecast Micro-Simulation Intersection Delays												
Year 2021 Condition	Existing Condition				Future Without Project Traffic				Future With Project Traffic			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
Signalized Intersections	Sim <sup>1</sup>	HCM <sup>2</sup>	Sim <sup>1</sup>	HCM <sup>2</sup>	Sim <sup>1</sup>	HCM <sup>2</sup>	Sim <sup>1</sup>	HCM <sup>2</sup>	Sim <sup>1</sup>	HCM <sup>2</sup>	Sim <sup>1</sup>	HCM <sup>2</sup>
Indian Trail Rd/Francis Ave	14.3	12.3	15.3	7.9	38.1	20.3	33.2	10.4	43.5	29.6	36.7	10.7
Alberta St/Francis Ave	56.6	36.4	92.4	32.2	76.3	65.6	132.3	53.7	76.0	78.3	149.9	59.4
Ash St/Francis Ave	16.9	22.3	17.1	20.4	16.6	26.1	19.0	21.3	19.5	28.9	20.6	21.5
Maple St/Francis Ave	14.5	17.4	78.5	38.8	11.3	17.6	117.9	51.4	11.8	17.6	116.8	54.0

1. Sim = SimTraffic Results  
2. HCM = Highway Capacity Manual Comparison

A comparison confirms that future without-project intersection delays are nearly 10 seconds higher, on average between intersections, versus existing intersection delays during the AM peak hour. Futures without project delays are nearly 25 seconds higher, as averaged between intersections, during the PM peak hour. This means the typical driver will experience an average delay of between 10 and 25 additional seconds per intersection by year 2021, assuming no project development.

Comparatively, a comparison of without and with-project conditions confirms a 2 second increase of average delay, between intersection, during the AM peak hour. Also an approximate 5 second increase is forecast between intersections during the PM peak hour. This means the typical driver will experience an average delay of between 2 and 5 additional seconds per intersection by year 2021, assuming no project development.

Also note that SimTraffic delays do tend to exceed HCM control delays, as one would expect, when other incidental delays are considered for study intersections.

Block time and queue penalty data are shown in [Table 2](#). The analysis was prepared initially based on existing counts, future without-project forecasts, and future-with project forecasts. However, there were minimal differences noted in results between the future without and future with-project conditions. As such, only existing and future-with project conditions are shown for the peak hours. Also, SimTraffic did not note blockage or excessive queues for a number of intersection movements. Thus, data was reported only for reasonably impacted movements at study intersections. Note the attached summary sheets and SimTraffic reports can be reviewed for all analysis conditions and all movements, as desired.

Table 2. Existing and Forecast Micro-Simulation Block Time and Queue Penalties								
Signalized Intersections	Existing Condition				Future-With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Queue <sup>1</sup>	%Block <sup>2</sup>	Queue <sup>1</sup>	%Block <sup>2</sup>	Queue <sup>1</sup>	%Block <sup>2</sup>	Queue <sup>1</sup>	%Block <sup>2</sup>
Indian Trail Rd/Francis Ave								
- Westbound Right-Turn Lane	0%	0	3%	9	0%	0	17%	53
- Eastbound Through	5%	4	2%	3	5%	4	2%	4
- Eastbound Left-Turn Lane	2%	5	19%	42	5%	13	25%	58
Alberta St/Francis Ave								
- Northbound Left-Turn	0%	0	4%	18	0%	0	4%	18
- Northbound Left-Turn/Through	8%	5	68%	127	8%	7	72%	158
- Southbound Through	13%	8	2%	1	13%	10	2%	1
- Southbound Left-Turn	3%	4	0%	0	3%	4	0%	0
- Westbound Through	0%	1	49%	69	1%	1	50%	75
- Westbound Left-Turn	1%	4	1%	6	5%	16	3%	24
- Eastbound Through	51%	9	21%	7	60%	19	33%	14
Ash St/Francis Ave								
- Eastbound Through	0%	0	1%	2	2%	8	2%	4
Maple St/Francis Ave								
- Northbound Left-Turn/Through	1%	1	65%	118	2%	1	72%	155
- Westbound Through	0%	0	5%	15	0%	0	36%	133
1. Queue = Queue Penalty								
2. %Block = Block Time								

As shown, queue penalties and block time increase between the existing and future with-project condition. A general description is provided on the intersection basis as follows:

- Indian Trail Road/Francis Avenue.** There is an existing average block time of 2 percent (between movements) during the AM peak hour and 8 percent during the PM peak hour. This increases overall in the future condition to 3 percent during the AM peak hour and 15 percent during the PM peak hour. There are currently a total of 9 vehicles impacted by queues in the AM peak hour and 54 vehicles during the PM peak hour (i.e. the queue penalty). This impact increases to 17 vehicles during the AM peak hour and 115 vehicles during the PM peak hour, in total.
- Alberta Street/Francis Avenue.** The average intersection block time is 31 percent during the AM peak hour and 21 percent during the PM peak hour; increasing in the forecast condition to 13 percent and 23 percent between the AM and PM peak hours, respectively. There are 31 total vehicles impacted by queues during the AM peak hour and 228 during the PM peak hour. This increases to 57 AM peak hour and 290 PM peak hour vehicles impacted by queues, as based on the future condition.
- Ash Street/Francis Avenue.** No block time or queue penalties were currently identified during the AM peak hour. However, there is an average 2 percent block and 8 vehicle queue penalty forecast during the AM peak hour, averaged at the intersection. The

existing block time increases from 1 to 2 percent, on average, between existing and forecast conditions with an associated queue penalty increase of 2 to 4 vehicles during the PM peak hour.

- **Maple Street/Francis Avenue.** The AM peak hour block time and queue penalty, at 1 percent and 1 vehicle, does not increase between the existing and future conditions. The PM peak hour block time does increase from 35 to 54 percent between the existing and future condition. The 133 vehicles currently impacted by queues increases to 288 vehicles during the forecast PM peak hour.

## SUMMARY

SimTraffic analyses confirms traffic growth will increase cumulative impacts upon study intersections located along Francis Avenue, as measured by gains in intersection delay, block time, and queue penalty. The typical driver will experience an average delay of between 12 and 30 additional seconds per intersection by year 2021, assuming development of all projected specified within the TIA. On average, blockage time is anticipated to increase between the peak hours by: up to 7 percent at the Indian Trail Road/Francis Avenue intersection, up to 3 percent at the Alberta Street/Francis Avenue intersection, up to 2 percent at the Ash Street/Francis Avenue intersection, and up to 19 percent at the Maple Street/Francis Avenue intersection, assuming; assuming development of all projected specified within the TIA. Finally, the number of vehicles impacted by queues between peak hours will elevate by up to: 61 for the Indian Trail Road/Francis Avenue intersection, 62 for the Alberta Street/Francis Avenue intersection, 8 for the Ash Street/Francis Avenue intersection, and 155 for the Maple Street/Francis Avenue intersection, assuming development of all projected specified within the TIA.

However, the analysis confirms marginal changes between the future without and with project conditions. Drivers are forecast to potentially experience an average delay increase of between 2 and 5 additional seconds per intersection by year 2021, along Francis Avenue, which is a moderate change. The difference in block time and queue penalties was not summarized as the differences were negligible (although they are attached for review, as needed). Thus, the SimTraffic analysis also confirms the project proposal will have a minimal impact upon cumulative traffic operations for intersections located along Francis Avenue.

We hope this provides sufficient information to help WSDOT with their consideration and comment on the Windhaven project. Please contact our office with questions or comments.

Existing

	AM Peak Hour, Run/Seed							PM Peak Hour, Run/Seed						
	1	2	3	4	5	Avg	HCM	1	2	3	4	5	Avg	HCM
Indian Trail/Francis Avenue	13.5	13.7	14.0	14.6	15.7	14.3	12.3	15.4	14.8	13.8	14.5	17.8	15.3	7.9
Alberta Street/Francis Avenue	44.3	37.2	87.8	57.1	56.8	56.6	36.4	105.0	86.5	74.8	87.7	107.8	92.4	32.2
Ash Street/Francis Avenue	17.2	16.9	16.7	17.2	16.6	16.9	22.3	18.0	16.0	16.7	17.3	17.7	17.1	20.4
Maple Street/Francis Avenue	14.4	13.6	15.4	14.2	14.7	14.5	17.4	48.9	120.3	55.7	61.0	106.7	78.5	38.8

AM Peak Hour							PM Peak Hour						
Indian Trail/Francis Avenue							Indian Trail/Francis Avenue						
	EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR		EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR
AM-1 - Queuing Penalty (%)	1%	7%	0%	0%	0%	0%	PM-1 - Queuing Penalty (%)	20%	2%	1%	4%	0%	0%
- Blocking Report (veh)	3	5	0	0	0	0	- Blocking Report (veh)	45	3	1	11	0	0
AM-2 - Queuing Penalty (%)	2%	5%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	29%	2%	0%	3%	0%	0%
- Blocking Report (veh)	5	4	0	0	0	0	- Blocking Report (veh)	65	2	0	9	0	0
AM-3 - Queuing Penalty (%)	2%	6%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	8%	2%	0%	2%	0%	0%
- Blocking Report (veh)	5	5	0	0	0	0	- Blocking Report (veh)	18	3	1	6	0	0
AM-4 - Queuing Penalty (%)	2%	6%	0%	0%	0%	0%	PM-4 - Queuing Penalty (%)	21%	2%	0%	2%	0%	0%
- Blocking Report (veh)	5	5	0	0	0	0	- Blocking Report (veh)	49	3	1	5	0	0
AM-5 - Queuing Penalty (%)	2%	3%	0%	0%	0%	0%	PM-5 - Queuing Penalty (%)	15%	2%	0%	5%	0%	0%
- Blocking Report (veh)	6	2	0	0	0	0	- Blocking Report (veh)	33	2	1	16	0	0
AM-Avg - Queuing Penalty (%)	2%	5%	0%	0%	0%	0%	PM-Avg - Queuing Penalty (%)	19%	2%	0%	3%	0%	0%
- Blocking Report (veh)	5	4	0	0	0	0	- Blocking Report (veh)	42	3	1	9	0	0

AM Peak Hour											PM Peak Hour										
Alberts Street/Francis Avenue											Alberts Street/Francis Avenue										
	EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR		EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR
AM-1 - Queuing Penalty (%)	0%	51%	0%	2%	0%	0%	0%	11%	3%	11%	PM-1 - Queuing Penalty (%)	0%	22%	0%	2%	55%	0%	6%	73%	1%	4%
- Blocking Report (veh)	0	9	0	5	0	0	0	8	4	8	- Blocking Report (veh)	0	7	0	13	78	0	25	136	1	1
AM-2 - Queuing Penalty (%)	0%	42%	0%	2%	0%	0%	0%	4%	2%	14%	PM-2 - Queuing Penalty (%)	0%	13%	0%	0%	54%	0%	2%	69%	0%	1%
- Blocking Report (veh)	0	8	0	7	1	0	0	3	3	11	- Blocking Report (veh)	0	4	0	0	77	0	9	128	0	0
AM-3 - Queuing Penalty (%)	0%	59%	0%	2%	0%	0%	0%	8%	3%	13%	PM-3 - Queuing Penalty (%)	0%	18%	0%	1%	40%	0%	5%	63%	0%	1%
- Blocking Report (veh)	0	11	0	5	1	0	0	5	4	10	- Blocking Report (veh)	0	6	0	6	57	0	22	116	0	0
AM-4 - Queuing Penalty (%)	0%	49%	0%	1%	0%	0%	0%	8%	2%	14%	PM-4 - Queuing Penalty (%)	0%	27%	0%	2%	45%	0%	5%	71%	0%	1%
- Blocking Report (veh)	0	9	0	2	1	0	0	6	3	0.11	- Blocking Report (veh)	0	9	0	13	64	0	21	132	0	1
AM-5 - Queuing Penalty (%)	0%	54%	0%	0%	0%	0%	0%	7%	3%	15%	PM-5 - Queuing Penalty (%)	0%	23%	0%	0%	50%	0%	3%	65%	0%	2%
- Blocking Report (veh)	0	10	0	0	1	0	0	5	5	12	- Blocking Report (veh)	0	8	0	0	70	0	14	122	0	1
AM-Avg - Queuing Penalty (%)	0%	51%	0%	1%	0%	0%	0%	8%	3%	13%	PM-Avg - Queuing Penalty (%)	0%	21%	0%	1%	49%	0%	4%	68%	0%	2%
- Blocking Report (veh)	0	9	0	4	1	0	0	5	4	8	- Blocking Report (veh)	0	7	0	6	69	0	18	127	0	1

AM Peak Hour								PM Peak Hour							
Alberta Street/Francis Avenue								Alberta Street/Francis Avenue							
	EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R		EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
AM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-1 - Queuing Penalty (%)	5%	0%	0%	0%	0%	0%	0%
- Blocking Report (veh)	1	0	0	0	0	0	0	- Blocking Report (veh)	10	0	0	0	0	0	0
AM-2 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
- Blocking Report (veh)	1	0	0	0	0	0	0	- Blocking Report (veh)	0	0	2	0	0	0	0
AM-3 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	0%	0%	1%	0%	0%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	3	0	0	0	0
AM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-4 - Queuing Penalty (%)	1%	0%	0%	0%	0%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	- Blocking Report (veh)	2	0	0	0	0	0	0
AM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	1	0	0	0	0
AM-Avg - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-Avg - Queuing Penalty (%)	1%	0%	0%	0%	0%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	- Blocking Report (veh)	2	0	1	0	0	0	0

AM Peak Hour									PM Peak Hour								
Alberta Street/Francis Avenue									Alberta Street/Francis Avenue								
	EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR		EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR
AM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-1 - Queuing Penalty (%)	0%	0%	4%	0%	0%	65%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	13	0	0	118	0	0
AM-2 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	0%	0%	10%	0%	0%	67%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	33	0	0	121	0	0
AM-3 - Queuing Penalty (%)	1%	0%	0%	0%	0%	2%	0%	0%	PM-3 - Queuing Penalty (%)	0%	0%	2%	0%	0%	62%	0%	0%
- Blocking Report (veh)	2	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	7	0	0	113	0	0
AM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-4 - Queuing Penalty (%)	0%	0%	4%	0%	0%	66%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	12	0	0	119	0	0
AM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-5 - Queuing Penalty (%)	0%	0%	3%	0%	0%	66%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	10	0	0	119	0	0
AM-Avg - Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-Avg - Queuing Penalty (%)	0%	0%	5%	0%	0%	65%	0%	0%
- Blocking Report (veh)	0	0	0	0	0	0	0	0	- Blocking Report (veh)	0	0	15	0	0	118	0	0

Future Without-Project

	AM Peak Hour, Run/Seed							PM Peak Hour, Run/Seed						
	1	2	3	4	5	Avg	HCM	1	2	3	4	5	Avg	HCM
Indian Trail/Francis Avenue	38.5	24.4	30.1	54.4	43.3	38.1	20.3	40.5	30.5	33.0	33.0	29.0	33.2	10.4
Alberta Street/Francis Avenue	71.8	80.6	74.4	78.5	76.3	76.3	65.6	142.6	120.1	135.6	131.6	131.5	132.3	53.7
Ash Street/Francis Avenue	15.5	16.9	16.5	16.9	16.6	16.5	26.1	18.5	19.5	19.6	18.8	18.5	19.0	21.3
Maple Street/Francis Avenue	11.3	10.9	11.5	10.9	12	11.3	17.6	117.6	102.3	114.0	130.8	124.8	117.9	51.4

AM Peak Hour							PM Peak Hour						
Indian Trail/Francis Avenue							Indian Trail/Francis Avenue						
	EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR		EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR
AM-1 - Queuing Penalty (%)	5%	1%	0%	0%	0%	0%	PM-1 - Queuing Penalty (%)	31%	2%	0%	24%	0%	0%
AM-1 - Blocking Report (veh)	13	1	0	0	0	0	PM-1 - Blocking Report (veh)	71	4	0	76	0	0
AM-2 - Queuing Penalty (%)	4%	4%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	14%	2%	0%	11%	0%	0%
AM-2 - Blocking Report (veh)	12	3	0	0	0	0	PM-2 - Blocking Report (veh)	34	3	4	34	0	0
AM-3 - Queuing Penalty (%)	2%	2%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	23%	3%	1%	14%	0%	0%
AM-3 - Blocking Report (veh)	5	2	0	0	0	0	PM-3 - Blocking Report (veh)	53	5	10	46	0	0
AM-4 - Queuing Penalty (%)	2%	2%	0%	0%	0%	0%	PM-4 - Queuing Penalty (%)	22%	3%	0%	13%	0%	0%
AM-4 - Blocking Report (veh)	7	2	0	0	0	0	PM-4 - Blocking Report (veh)	51	4	2	41	0	0
AM-5 - Queuing Penalty (%)	1%	2%	0%	0%	0%	0%	PM-5 - Queuing Penalty (%)	29%	3%	0%	8%	0%	0%
AM-5 - Blocking Report (veh)	2	2	0	0	0	0	PM-5 - Blocking Report (veh)	67	5	5	25	0	0
AM-Avg - Queuing Penalty (%)	3%	2%	0%	0%	0%	0%	PM-Avg - Queuing Penalty (%)	24%	3%	0%	14%	0%	0%
AM-Avg - Blocking Report (veh)	8	2	0	0	0	0	PM-Avg - Blocking Report (veh)	55	4	4	44	0	0

AM Peak Hour											PM Peak Hour										
Alberts Street/Francis Avenue											Alberts Street/Francis Avenue										
	EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR		EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR
AM-1 - Queuing Penalty (%)	0%	58%	0%	13%	0%	0%	0%	9%	4%	10%	PM-1 - Queuing Penalty (%)	0%	27%	0%	4%	51%	0%	3%	73%	0%	0%
AM-1 - Blocking Report (veh)	0	16	0	40	1	0	0	8	5	8	PM-1 - Blocking Report (veh)	0	11	0	28	74	0	15	157	0	0
AM-2 - Queuing Penalty (%)	0%	59%	0%	1%	1%	0%	0%	4%	3%	15%	PM-2 - Queuing Penalty (%)	0%	32%	0%	7%	48%	0%	4%	70%	0%	0%
AM-2 - Blocking Report (veh)	0	16	0	2	2	0	0	4	4	12	PM-2 - Blocking Report (veh)	0	12	0	51	70	0	18	151	0	0
AM-3 - Queuing Penalty (%)	0%	60%	0%	0%	1%	0%	0%	10%	8%	4%	PM-3 - Queuing Penalty (%)	0%	43%	0%	8%	46%	0%	2%	68%	0%	4%
AM-3 - Blocking Report (veh)	0	16	0	1	1	0	0	9	7	4	PM-3 - Blocking Report (veh)	0	17	0	59	66	0	8	147	0	2
AM-4 - Queuing Penalty (%)	0%	57%	0%	1%	2%	0%	0%	10%	2%	17%	PM-4 - Queuing Penalty (%)	0%	34%	0%	3%	52%	0%	8%	71%	2%	7%
AM-4 - Blocking Report (veh)	0	15	0	3	3	0	0	9	4	13	PM-4 - Blocking Report (veh)	0	13	0	23	75	0	37	154	2	3
AM-5 - Queuing Penalty (%)	0%	57%	0%	1%	2%	0%	0%	9%	0%	17%	PM-5 - Queuing Penalty (%)	0%	36%	0%	3%	48%	0%	6%	72%	0%	4%
AM-5 - Blocking Report (veh)	0	15	0	3	2	0	0	8	0	14	PM-5 - Blocking Report (veh)	0	14	0	25	70	0	27	154	0	1
AM-Avg - Queuing Penalty (%)	0%	58%	0%	3%	1%	0%	0%	8%	3%	13%	PM-Avg - Queuing Penalty (%)	0%	34%	0%	5%	49%	0%	5%	71%	0%	3%
AM-Avg - Blocking Report (veh)	0	16	0	10	2	0	0	8	4	10	PM-Avg - Blocking Report (veh)	0	13	0	37	71	0	21	153	0	1

AM Peak Hour								PM Peak Hour							
Alberta Street/Francis Avenue								Alberta Street/Francis Avenue							
	EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R		EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
AM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
AM-1 - Blocking Report (veh)	0	0	0	0	0	0	0	PM-1 - Blocking Report (veh)	0	0	0	0	0	0	0
AM-2 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	1%	0%	0%	0%	0%	0%	0%
AM-2 - Blocking Report (veh)	0	0	0	0	0	0	0	PM-2 - Blocking Report (veh)	1	0	0	0	0	0	0
AM-3 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
AM-3 - Blocking Report (veh)	0	0	0	0	0	0	0	PM-3 - Blocking Report (veh)	1	0	0	0	0	0	0
AM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
AM-4 - Blocking Report (veh)	0	0	0	0	0	0	0	PM-4 - Blocking Report (veh)	0	0	1	0	0	0	0
AM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
AM-5 - Blocking Report (veh)	0	0	0	0	0	0	0	PM-5 - Blocking Report (veh)	0	0	0	0	0	0	0
AM-Avg - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	PM-Avg - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
AM-Avg - Blocking Report (veh)	0	0	0	0	0	0	0	PM-Avg - Blocking Report (veh)	0	0	0	0	0	0	0

AM Peak Hour									PM Peak Hour								
Alberta Street/Francis Avenue									Alberta Street/Francis Avenue								
	EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR		EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR
AM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	73%	0%	0%
AM-1 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-1 - Blocking Report (veh)	0	0	137	0	0	154	0	0
AM-2 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	0%	0%	35%	0%	0%	65%	0%	0%
AM-2 - Blocking Report (veh)	2	0	0	0	0	0	0	0	PM-2 - Blocking Report (veh)	0	0	127	0	0	137	0	0
AM-3 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	0%	0%	39%	0%	0%	69%	0%	0%
AM-3 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-3 - Blocking Report (veh)	0	0	144	0	0	146	0	0
AM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	2%	0%	PM-4 - Queuing Penalty (%)	0%	0%	52%	0%	0%	72%	0%	0%
AM-4 - Blocking Report (veh)	2	0	0	0	0	0	0	0	PM-4 - Blocking Report (veh)	0	0	188	0	0	152	0	0
AM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-5 - Queuing Penalty (%)	0%	0%	20%	0%	0%	64%	0%	0%
AM-5 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-5 - Blocking Report (veh)	0	0	74	0	0	135	0	0
AM-Avg - Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-Avg - Queuing Penalty (%)	0%	0%	29%	0%	0%	69%	0%	0%
AM-Avg - Blocking Report (veh)	1	0	0	0	0	0	0	0	PM-Avg - Blocking Report (veh)	0	0	134	0	0	145	0	0

Future Wit-Project

	AM Peak Hour, Run/Seed							PM Peak Hour, Run/Seed						
	1	2	3	4	5	Avg	HCM	1	2	3	4	5	Avg	HCM
Indian Trail/Francis Avenue	35.7	52.8	46.8	41.9	40.2	43.5	29.6	36.2	40.4	35.3	37.5	34.3	36.7	10.7
Alberta Street/Francis Avenue	69.8	82.2	75.3	78.2	74.7	76.0	78.3	128.6	162.9	155.6	172.7	129.7	149.9	59.4
Ash Street/Francis Avenue	21.2	17.7	19.2	19.1	20.1	19.5	28.9	17.8	27.2	22.3	17.1	18.8	20.6	21.5
Maple Street/Francis Avenue	12.6	11.8	11.2	11.9	11.6	11.8	17.6	115.8	97.0	135.5	115.9	119.9	116.8	54.0

Indian Trail/Francis Avenue	AM Peak Hour						PM Peak Hour						
	EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR	EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR	
AM-1 - Queuing Penalty (%)	4%	3%	0%	0%	0%	0%	PM-1 - Queuing Penalty (%)	16%	3%	0%	16%	0%	0%
AM-1 - Blocking Report (veh)	10	2	0	0	0	0	PM-1 - Blocking Report (veh)	37	6	3	50	0	0
AM-2 - Queuing Penalty (%)	6%	3%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	32%	2%	0%	20%	0%	0%
AM-2 - Blocking Report (veh)	16	3	0	0	0	0	PM-2 - Blocking Report (veh)	74	3	5	63	0	0
AM-3 - Queuing Penalty (%)	8%	1%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	32%	2%	1%	16%	0%	0%
AM-3 - Blocking Report (veh)	22	1	0	0	0	0	PM-3 - Blocking Report (veh)	74	4	11	52	0	0
AM-4 - Queuing Penalty (%)	5%	2%	0%	0%	0%	0%	PM-4 - Queuing Penalty (%)	21%	2%	0%	16%	0%	0%
AM-4 - Blocking Report (veh)	15	2	0	0	0	0	PM-4 - Blocking Report (veh)	48	4	5	52	0	0
AM-5 - Queuing Penalty (%)	2%	3%	0%	0%	0%	0%	PM-5 - Queuing Penalty (%)	25%	1%	1%	16%	0%	0%
AM-5 - Blocking Report (veh)	4	3	0	0	0	0	PM-5 - Blocking Report (veh)	57	3	8	50	0	0
AM-Avg - Queuing Penalty (%)	5%	2%	0%	0%	0%	0%	PM-Avg - Queuing Penalty (%)	25%	2%	0%	17%	0%	0%
AM-Avg - Blocking Report (veh)	13	2	0	0	0	0	PM-Avg - Blocking Report (veh)	58	4	6	53	0	0

Alberts Street/Francis Avenue	AM Peak Hour										PM Peak Hour										
	EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR	EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR	
AM-1 - Queuing Penalty (%)	0%	59%	0%	3%	1%	0%	1%	9%	3%	9%	PM-1 - Queuing Penalty (%)	0%	36%	0%	0%	48%	0%	2%	71%	0%	1%
AM-1 - Blocking Report (veh)	0	19	0	10	1	0	2	8	5	7	PM-1 - Blocking Report (veh)	0	15	0	0	78	0	11	157	0	1
AM-2 - Queuing Penalty (%)	0%	60%	0%	9%	1%	0%	0%	9%	2%	13%	PM-2 - Queuing Penalty (%)	0%	36%	0%	3%	52%	0%	4%	74%	1%	2%
AM-2 - Blocking Report (veh)	0	19	0	29	1	0	0	8	3	10	PM-2 - Blocking Report (veh)	0	15	0	23	75	0	18	163	1	1
AM-3 - Queuing Penalty (%)	0%	59%	0%	7%	1%	0%	0%	5%	4%	17%	PM-3 - Queuing Penalty (%)	0%	36%	0%	3%	54%	0%	4%	69%	0%	3%
AM-3 - Blocking Report (veh)	0	19	0	22	1	0	0	4	6	14	PM-3 - Blocking Report (veh)	0	15	0	23	79	0	17	152	0	1
AM-4 - Queuing Penalty (%)	0%	60%	0%	5%	0%	0%	0%	10%	3%	11%	PM-4 - Queuing Penalty (%)	0%	34%	0%	4%	54%	0%	0%	73%	0%	2%
AM-4 - Blocking Report (veh)	0	19	0	15	0	0	0	9	4	9	PM-4 - Blocking Report (veh)	0	14	0	28	78	0	1	162	0	1
AM-5 - Queuing Penalty (%)	0%	60%	0%	1%	3%	0%	0%	7%	1%	15%	PM-5 - Queuing Penalty (%)	0%	24%	0%	6%	44%	0%	6%	71%	0%	1%
AM-5 - Blocking Report (veh)	0	19	0	2	4	0	0	6	2	12	PM-5 - Blocking Report (veh)	0	10	0	45	65	0	28	157	0	0
AM-Avg - Queuing Penalty (%)	0%	60%	0%	5%	1%	0%	0%	8%	3%	13%	PM-Avg - Queuing Penalty (%)	0%	33%	0%	3%	50%	0%	3%	72%	0%	2%
AM-Avg - Blocking Report (veh)	0	19	0	16	1	0	0	7	4	10	PM-Avg - Blocking Report (veh)	0	14	0	24	75	0	15	158	0	1

Alberta Street/Francis Avenue	AM Peak Hour							PM Peak Hour						
	EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R	EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
AM-1 - Queuing Penalty (%)	0%	2%	0%	0%	0%	0%	0%	PM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%
AM-1 - Blocking Report (veh)	0	9	0	0	0	0	0	PM-1 - Blocking Report (veh)	0	0	2	0	0	0
AM-2 - Queuing Penalty (%)	0%	1%	0%	0%	0%	0%	0%	PM-2 - Queuing Penalty (%)	7%	0%	0%	0%	0%	6%
AM-2 - Blocking Report (veh)	0	4	0	0	0	0	0	PM-2 - Blocking Report (veh)	17	0	0	0	2	17
AM-3 - Queuing Penalty (%)	0%	2%	0%	0%	0%	0%	0%	PM-3 - Queuing Penalty (%)	0%	0%	0%	0%	0%	1%
AM-3 - Blocking Report (veh)	1	10	0	0	0	0	0	PM-3 - Blocking Report (veh)	0	0	0	0	0	3
AM-4 - Queuing Penalty (%)	0%	1%	0%	0%	0%	0%	0%	PM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	0%
AM-4 - Blocking Report (veh)	0	4	0	0	0	0	0	PM-4 - Blocking Report (veh)	0	0	0	0	0	0
AM-5 - Queuing Penalty (%)	0%	2%	0%	0%	0%	0%	0%	PM-5 - Queuing Penalty (%)	2%	0%	0%	0%	0%	0%
AM-5 - Blocking Report (veh)	1	11	0	0	0	0	0	PM-5 - Blocking Report (veh)	4	0	0	0	0	0
AM-Avg - Queuing Penalty (%)	0%	2%	0%	0%	0%	0%	0%	PM-Avg - Queuing Penalty (%)	2%	0%	0%	0%	0%	1%
AM-Avg - Blocking Report (veh)	0	8	0	0	0	0	0	PM-Avg - Blocking Report (veh)	4	0	0	0	0	4

Alberta Street/Francis Avenue	AM Peak Hour								PM Peak Hour								
	EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR	EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR	
AM-1 - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-1 - Queuing Penalty (%)	0%	0%	14%	0%	0%	75%	0%	0%
AM-1 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-1 - Blocking Report (veh)	0	0	51	0	0	162	0	0
AM-2 - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-2 - Queuing Penalty (%)	0%	0%	53%	0%	0%	76%	0%	0%
AM-2 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-2 - Blocking Report (veh)	0	0	196	0	0	163	0	0
AM-3 - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-3 - Queuing Penalty (%)	0%	0%	42%	0%	0%	72%	0%	0%
AM-3 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-3 - Blocking Report (veh)	0	0	158	0	0	154	0	0
AM-4 - Queuing Penalty (%)	0%	0%	0%	0%	0%	3%	0%	0%	PM-4 - Queuing Penalty (%)	0%	0%	37%	0%	0%	70%	0%	0%
AM-4 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-4 - Blocking Report (veh)	0	0	141	0	0	150	0	0
AM-5 - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-5 - Queuing Penalty (%)	0%	0%	33%	0%	0%	67%	0%	0%
AM-5 - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-5 - Blocking Report (veh)	0	0	118	0	0	145	0	0
AM-Avg - Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-Avg - Queuing Penalty (%)	0%	0%	36%	0%	0%	72%	0%	0%
AM-Avg - Blocking Report (veh)	0	0	0	0	0	0	0	0	PM-Avg - Blocking Report (veh)	0	0	133	0	0	155	0	0

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	19.6	11.7	6.7	4.8	19.5	1.2	11.0	13.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.3	3.9	0.4	0.4
Total Del/Veh (s)	49.1	58.5	65.3	42.2	12.8	18.1	48.4	49.8	45.8	43.8	47.8	27.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	44.3

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	20.1	23.9	37.9	8.2	25.1	16.4	8.2	17.2

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	24.8	5.4	12.5	5.8	45.9	29.7	24.7	14.4

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	210.7



Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	158	145	120	98	281	273
Average Queue (ft)	39	76	78	48	51	179	186
95th Queue (ft)	79	127	117	91	82	263	259
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	1	7					
Queuing Penalty (veh)	3	5					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	788	837	199	262	181	175	254	125	249
Average Queue (ft)	20	496	520	86	98	118	87	146	58	94
95th Queue (ft)	81	698	715	156	178	173	180	230	112	185
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		51		2	0		0	11	3	11
Queuing Penalty (veh)		9		5	0		0	8	4	8

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	153	340	318	153	137	132	293	201	190	218
Average Queue (ft)	54	170	201	73	71	41	143	136	133	82
95th Queue (ft)	115	304	323	130	124	114	217	196	192	140
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		1								

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	189	136	115	93	136	132	30	168	227	265
Average Queue (ft)	109	66	61	31	71	63	2	69	110	143
95th Queue (ft)	184	126	116	63	117	114	14	146	184	219
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								1		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 44

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.7	0.0	0.0	0.2	0.0	0.0	0.2	0.0
Total Del/Veh (s)	20.9	11.5	7.6	4.8	19.6	0.8	13.6	13.7

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.2	3.9	0.4	0.4
Total Del/Veh (s)	46.8	48.4	56.4	39.7	12.8	18.5	42.2	49.6	31.9	40.1	46.5	22.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	37.2

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.9	24.1	37.3	7.3	24.8	16.4	9.0	16.9

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	25.2	5.2	13.5	11.9	18.0	25.9	19.8	13.6

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	199.2

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	137	158	95	116	338	306
Average Queue (ft)	43	72	80	46	61	168	176
95th Queue (ft)	84	123	135	91	105	268	270
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	5					
Queuing Penalty (veh)	5	4					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	679	732	200	238	240	174	228	124	216
Average Queue (ft)	28	420	442	98	92	119	55	117	64	87
95th Queue (ft)	125	643	670	185	186	195	131	187	111	167
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		42		2	0		0	4	2	14
Queuing Penalty (veh)		8		7	1		0	3	3	11

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	158	306	391	132	155	152	320	180	208	141
Average Queue (ft)	50	154	185	81	57	36	157	127	137	84
95th Queue (ft)	126	266	322	126	122	106	262	180	203	136
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		1								

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	LT	T	TR
Maximum Queue (ft)	265	162	164	92	138	194	129	183	220
Average Queue (ft)	114	77	77	34	90	89	52	95	133
95th Queue (ft)	197	132	136	74	129	161	105	156	199
Link Distance (ft)	256	256	256		287	287	1256	1256	1256
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	1								
Storage Bay Dist (ft)				300					
Storage Blk Time (%)							0		
Queuing Penalty (veh)							0		

Zone Summary

Zone wide Queuing Penalty: 43

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.6	11.8	7.5	4.3	20.3	1.0	15.7	14.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	3.8	0.4	0.2
Total Del/Veh (s)	127.3	139.9	167.8	47.3	12.6	15.2	43.3	53.1	36.0	49.8	45.4	29.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	87.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.9	20.8	38.0	7.0	26.7	16.9	7.0	16.7

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	28.1	5.8	14.0	11.5	26.3	28.5	27.2	15.4

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	326.7

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	98	134	129	134	144	339	354
Average Queue (ft)	49	78	83	53	60	185	191
95th Queue (ft)	89	126	126	99	107	278	272
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	6					
Queuing Penalty (veh)	5	5					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1207	1191	197	330	290	174	250	124	233
Average Queue (ft)	36	1007	1041	96	105	120	80	139	70	109
95th Queue (ft)	142	1361	1380	168	205	206	186	228	134	195
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		6	8							
Queuing Penalty (veh)		44	64							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		2	0		0	8	3	13
Queuing Penalty (veh)	0	11		5	1		0	5	4	10

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	301	263	322	132	165	128	254	214	214	130
Average Queue (ft)	77	162	178	74	61	24	143	131	137	72
95th Queue (ft)	195	281	309	113	127	84	229	186	180	108
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0									
Queuing Penalty (veh)	0									

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	271	156	154	75	141	142	30	161	201	239
Average Queue (ft)	121	75	83	37	89	86	3	76	111	149
95th Queue (ft)	225	132	137	73	136	149	17	145	167	225
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	2									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 157



4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.5	0.0	0.0	0.2	0.0	0.0	0.3	0.0
Total Del/Veh (s)	21.6	11.8	6.9	5.4	20.9	1.3	15.3	14.6

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	3.9	0.5	0.3
Total Del/Veh (s)	71.8	83.2	88.1	36.9	14.0	10.4	44.5	56.8	36.2	46.5	48.4	32.7

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	57.1

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.9	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	18.2	22.2	50.2	6.9	25.3	16.2	9.7	17.2

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	27.6	5.1	12.5	10.5	19.4	28.0	25.7	14.2

Total Zone Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	249.1

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	74	136	188	116	140	320	309
Average Queue (ft)	44	76	86	53	56	189	199
95th Queue (ft)	73	127	142	106	101	297	283
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	6					
Queuing Penalty (veh)	5	5					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1194	1182	199	229	264	174	268	125	185
Average Queue (ft)	26	638	656	87	92	122	66	149	80	107
95th Queue (ft)	123	1180	1197	163	169	212	165	245	136	174
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		2	4							
Queuing Penalty (veh)		19	32							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		49		1	0		0	8	2	14
Queuing Penalty (veh)		9		2	1		0	6	3	11

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	249	252	370	245	134	141	265	223	244	203
Average Queue (ft)	60	157	188	99	53	38	163	124	138	82
95th Queue (ft)	147	256	312	188	110	104	247	200	213	153
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	LT	T	TR
Maximum Queue (ft)	242	164	166	142	136	176	209	231	227
Average Queue (ft)	110	65	65	38	85	77	61	110	145
95th Queue (ft)	201	108	115	99	122	139	133	176	214
Link Distance (ft)	256	256	256		287	287	1256	1256	1256
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)				300					
Storage Blk Time (%)							1		
Queuing Penalty (veh)							0		

Zone Summary

Zone wide Queuing Penalty: 91

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.4	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Total Del/Veh (s)	23.0	10.8	6.8	4.3	23.8	1.1	17.1	15.7

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	3.8	0.4	0.4
Total Del/Veh (s)	84.3	83.5	99.7	42.3	13.7	18.6	40.8	45.6	33.3	33.7	47.1	23.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	56.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.8	26.8	37.1	6.6	24.1	16.4	7.7	16.6

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	28.7	5.0	14.1	8.3	24.5	26.4	22.3	14.7

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	247.5

**Intersection: 4: Francis Ave #14 & Indian Trail Road**

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	112	100	80	94	381	348
Average Queue (ft)	42	63	62	45	49	193	202
95th Queue (ft)	77	97	96	76	86	310	304
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	3					
Queuing Penalty (veh)	6	2					

**Intersection: 5: Alberta St & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1054	1099	156	202	237	174	263	125	194
Average Queue (ft)	28	655	668	96	84	112	67	132	77	100
95th Queue (ft)	107	1062	1084	155	163	189	158	217	133	179
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		54		0	0		0	7	3	15
Queuing Penalty (veh)		10		0	1		0	5	5	12

**Intersection: 6: Ash St #4S & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	249	271	321	132	112	89	271	250	223	146
Average Queue (ft)	79	150	183	73	52	21	136	119	129	75
95th Queue (ft)	162	260	303	121	99	65	217	185	186	130
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
Existing - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	236	117	156	75	139	159	29	187	182	220
Average Queue (ft)	132	64	69	35	89	74	1	64	120	148
95th Queue (ft)	205	109	121	71	135	135	10	140	182	217
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 40

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.8	0.0	0.0	0.0	0.3
Total Del/Veh (s)	30.2	8.2	10.4	19.3	16.8	0.4	6.0	15.1

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	2.8	1.6	0.0	0.4	0.5	0.5	4.0	0.2	0.2
Total Del/Veh (s)	32.6	35.8	35.8	128.8	122.4	149.7	186.2	204.5	196.9	48.2	47.5	26.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	105.0

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	23.4	24.2	32.8	5.5	30.9	23.7	23.1	18.0

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.1	2.5	0.0	0.0	0.0	0.0	0.0	0.9
Total Del/Veh (s)	59.9	12.2	24.7	26.0	84.4	94.5	96.9	48.9

Total Zone Performance

Denied Del/Veh (s)	5.6
Total Del/Veh (s)	683.6

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	99	162	116	175	465	280	169	175
Average Queue (ft)	71	60	63	87	124	55	74	93
95th Queue (ft)	110	120	112	153	324	235	128	143
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	20	2			0	4		
Queuing Penalty (veh)	45	3			1	11		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	406	383	200	1202	1243	174	1204	124	134
Average Queue (ft)	47	258	269	143	825	852	166	850	34	51
95th Queue (ft)	150	377	377	246	1229	1243	198	1221	78	105
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		22		2	55		6	73	1	4
Queuing Penalty (veh)		7		13	78		25	136	1	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	322	366	260	222	155	153	244	179	197	343
Average Queue (ft)	116	117	140	119	75	77	130	128	134	135
95th Queue (ft)	247	240	235	185	129	134	219	175	189	244
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	5									
Queuing Penalty (veh)	10									



Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	279	251	283	286	357	357	32	83	140	699	661	659
Average Queue (ft)	207	125	118	80	254	254	1	5	59	409	421	441
95th Queue (ft)	305	221	245	175	343	343	10	33	148	600	609	609
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	16	0	0	0	4	3						
Queuing Penalty (veh)	47	0	1	0	27	24						
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	4					65		
Queuing Penalty (veh)				0	13					118		

Zone Summary

Zone wide Queuing Penalty: 561

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.1
Total Del/Veh (s)	42.4	7.8	8.5	17.8	17.6	0.8	7.0	14.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.5	0.6	3.7	0.3	0.4
Total Del/Veh (s)	32.7	33.4	28.5	93.2	101.1	106.5	141.0	139.1	135.7	49.2	44.3	25.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	86.5

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	15.1	18.3	35.7	6.2	25.9	23.6	21.0	16.0

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	2.1	0.7	0.0	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	45.9	10.1	28.9	28.1	264.2	294.1	299.5	120.3

Total Zone Performance

Denied Del/Veh (s)	2.0
Total Del/Veh (s)	830.0

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	290	133	162	543	280	148	214
Average Queue (ft)	77	86	63	74	110	42	64	91
95th Queue (ft)	109	198	109	127	296	203	125	163
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	29	2				3		
Queuing Penalty (veh)	65	2				9		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	394	375	199	980	994	174	1324	92	116
Average Queue (ft)	32	220	238	138	677	713	167	715	32	49
95th Queue (ft)	111	349	359	230	910	946	208	1102	71	88
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		13		0	54		2	69	0	1
Queuing Penalty (veh)		4		0	77		9	128	0	0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	153	192	212	264	187	172	183	237	258	322
Average Queue (ft)	62	86	114	151	91	86	102	138	145	129
95th Queue (ft)	132	170	205	264	156	162	164	203	215	228
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	279	188	194	286	376	364	216	205	140	1345	1335	1344
Average Queue (ft)	183	100	92	172	279	284	34	27	52	1102	1092	1091
95th Queue (ft)	262	172	173	346	404	394	136	126	143	1557	1558	1554
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	3			0	10	12	0			44	32	29
Queuing Penalty (veh)	8			0	71	81	0			0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	10				0	67		
Queuing Penalty (veh)				1	33				0	121		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	766	234	234
Average Queue (ft)	255	265	21	17
95th Queue (ft)	731	749	117	97
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	11	10	1	1
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 611

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.6	0.0	0.0	0.0	0.2
Total Del/Veh (s)	22.4	7.4	10.5	16.9	17.9	1.0	6.2	13.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.6	0.6	0.5	3.9	0.3	0.2
Total Del/Veh (s)	31.9	36.1	31.7	54.5	55.1	53.5	186.5	196.6	159.1	45.1	47.2	38.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	74.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.8	20.3	34.5	5.4	28.7	24.1	19.8	16.7

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.8	3.3	0.0	0.0	0.0	0.0	0.0	1.1
Total Del/Veh (s)	56.6	11.8	25.5	24.2	103.8	116.6	114.7	55.7

Total Zone Performance

Denied Del/Veh (s)	4.1
Total Del/Veh (s)	584.9

**Intersection: 4: Francis Ave #14 & Indian Trail Road**

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	162	122	429	593	280	156	180
Average Queue (ft)	61	60	62	92	121	44	82	100
95th Queue (ft)	98	117	101	208	362	209	146	164
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	8	2			0	2		
Queuing Penalty (veh)	18	3			1	6		

**Intersection: 5: Alberta St & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	441	444	200	590	673	174	1588	95	115
Average Queue (ft)	47	244	255	137	386	421	173	943	38	54
95th Queue (ft)	136	370	383	244	570	599	182	1625	79	98
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		18		1	40		5	63	0	1
Queuing Penalty (veh)		6		6	57		22	116	0	0

**Intersection: 6: Ash St #4S & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	218	236	235	264	160	173	231	202	203	302
Average Queue (ft)	73	102	126	142	65	69	118	138	142	139
95th Queue (ft)	181	202	229	236	116	132	196	197	199	244
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1						
Queuing Penalty (veh)				3						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	L	LT	T	TR
Maximum Queue (ft)	274	194	245	286	357	341	31	140	836	737	777
Average Queue (ft)	197	120	102	102	249	250	1	65	478	479	495
95th Queue (ft)	288	181	179	229	327	341	10	151	733	719	726
Link Distance (ft)	256	256	256		287	287	232		1256	1256	1256
Upstream Blk Time (%)	8		0	0	2	4					
Queuing Penalty (veh)	24		0	0	14	25					
Storage Bay Dist (ft)				300				115			
Storage Blk Time (%)				0	2			0	62		
Queuing Penalty (veh)				1	6			0	113		

Zone Summary

Zone wide Queuing Penalty: 420

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.8	0.0	0.0	0.0	0.3
Total Del/Veh (s)	34.7	7.2	10.2	17.2	17.6	0.3	8.5	14.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0	0.0	0.7	0.6	0.9	4.1	0.1	0.3
Total Del/Veh (s)	37.3	39.5	37.4	71.9	69.3	76.3	215.0	220.9	202.6	46.7	50.5	33.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	87.7

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	22.0	18.3	31.2	5.6	30.3	23.2	20.2	17.3

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	5.7	3.6	0.0	0.0	0.0	0.0	0.0	1.3
Total Del/Veh (s)	63.5	14.2	25.4	26.6	112.9	129.0	130.8	61.0

Total Zone Performance

Denied Del/Veh (s)	4.8
Total Del/Veh (s)	622.0



Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	282	189	152	528	280	246	250
Average Queue (ft)	72	91	73	80	121	28	98	113
95th Queue (ft)	109	207	146	133	313	167	177	199
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	21	2			0	2		
Queuing Penalty (veh)	49	3			1	5		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	386	398	200	800	824	175	1816	92	97
Average Queue (ft)	65	270	283	134	511	545	168	1071	41	50
95th Queue (ft)	190	377	393	248	743	792	205	1975	81	88
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								3		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		27		2	45		5	71	0	1
Queuing Penalty (veh)		9		13	64		21	132	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	306	339	255	214	137	167	285	200	243	243
Average Queue (ft)	115	111	120	130	82	72	123	135	138	116
95th Queue (ft)	251	239	225	205	129	130	214	201	210	208
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	1									
Queuing Penalty (veh)	2									

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	279	260	274	286	357	394	61	139	139	808	820	804
Average Queue (ft)	235	143	137	106	248	262	3	6	55	534	533	547
95th Queue (ft)	303	229	242	269	363	371	24	48	145	752	743	749
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	18	0	0	0	4	7						
Queuing Penalty (veh)	51	1	1	0	26	48						
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	4					66		
Queuing Penalty (veh)				0	12					119		

Zone Summary

Zone wide Queuing Penalty: 557

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	0.3	0.7	0.0	0.0	0.0	0.3
Total Del/Veh (s)	28.1	7.8	8.6	19.0	18.2	1.0	8.0	14.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.4	0.4	0.0	1.1	1.1	0.9	4.0	0.2	0.4
Total Del/Veh (s)	36.6	37.5	32.7	109.8	112.5	103.7	223.9	227.2	239.0	30.4	45.8	17.1

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	107.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	18.3	18.3	33.1	5.7	26.7	24.1	31.3	17.7

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	5.5	3.2	0.0	0.0	0.0	0.0	0.0	1.1
Total Del/Veh (s)	51.3	11.5	23.5	22.2	234.8	260.2	255.9	106.7

Total Zone Performance

Denied Del/Veh (s)	5.1
Total Del/Veh (s)	822.7

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	220	129	362	505	280	187	208
Average Queue (ft)	66	70	61	78	152	65	80	95
95th Queue (ft)	106	153	108	179	418	261	143	157
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	15	2			0	5		
Queuing Penalty (veh)	33	2			1	16		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	400	417	200	1314	1320	174	1840	74	116
Average Queue (ft)	50	252	252	115	706	742	164	1066	28	44
95th Queue (ft)	163	361	365	233	1291	1322	217	1895	59	82
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								2		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		23		0	50		3	65		2
Queuing Penalty (veh)		8		0	70		14	122		1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	178	240	278	256	135	138	270	242	364	371
Average Queue (ft)	71	115	131	142	78	81	114	149	155	169
95th Queue (ft)	138	217	227	247	124	122	211	234	255	312
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				1						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
Existing - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	NB	NB	NB	NB	B476
Directions Served	L	T	T	T	T	TR	T	L	LT	T	TR	T
Maximum Queue (ft)	280	227	222	286	356	357	30	140	1326	1324	1282	81
Average Queue (ft)	185	116	108	92	241	253	2	75	1011	1001	1004	5
95th Queue (ft)	267	200	199	228	351	361	12	170	1328	1314	1276	34
Link Distance (ft)	256	256	256		287	287	232		1256	1256	1256	691
Upstream Blk Time (%)	4			0	3	5			2	1	1	
Queuing Penalty (veh)	11			0	21	32			0	0	0	
Storage Bay Dist (ft)				300				115				
Storage Blk Time (%)				0	3			0	66			
Queuing Penalty (veh)				0	10			0	119			

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B472
Directions Served	T	T
Maximum Queue (ft)	32	35
Average Queue (ft)	1	1
95th Queue (ft)	11	12
Link Distance (ft)	691	219
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 461

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	4.0	0.1	4.1
Total Delay (hr)	0.6	1.8	1.1	0.4	33.1	1.6	38.5

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	31.6	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.7	50.1	8.8	2.7	3.3	0.2	1.9	0.5	1.0	0.8	1.5	0.2

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	37.8
Total Delay (hr)	71.8

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.3	1.2	1.1	1.0	2.1	3.9	0.9	15.5

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.0	1.7	2.2	0.1	0.2	3.7	1.2	11.3

**Total Zone Performance**

Denied Delay (hr)	42.0
Total Delay (hr)	137.0

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	142	174	121	119	1047	1058
Average Queue (ft)	47	60	104	59	58	597	638
95th Queue (ft)	95	117	161	111	111	1126	1124
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)						0	3
Queuing Penalty (veh)						3	17
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	5	1					
Queuing Penalty (veh)	13	1					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1196	1196	200	304	297	174	226	124	258
Average Queue (ft)	31	936	958	112	139	144	69	138	54	95
95th Queue (ft)	127	1335	1339	208	255	233	161	218	114	189
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		7	8							
Queuing Penalty (veh)		55	62							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		58		13	0		0	9	4	10
Queuing Penalty (veh)		16		40	1		0	8	5	8

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	152	276	296	177	142	75	240	249	218	196
Average Queue (ft)	59	156	171	63	57	25	138	139	143	74
95th Queue (ft)	129	278	283	137	110	67	204	206	208	142
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	261	143	168	93	162	161	30	136	212	268
Average Queue (ft)	135	79	82	32	91	73	4	74	106	150
95th Queue (ft)	221	130	126	64	141	137	19	133	160	216
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	2									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 230



**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	0.6	1.8	1.0	0.5	19.6	0.9	24.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	41.1	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.9	59.9	8.0	1.7	3.9	0.2	2.2	0.2	0.9	0.9	1.5	0.3

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	46.8
Total Delay (hr)	80.6

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.6	1.4	1.0	1.2	2.6	4.0	1.0	16.9

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.8	1.8	2.5	0.3	0.2	3.4	0.9	10.9

**Total Zone Performance**

Denied Delay (hr)	47.0
Total Delay (hr)	132.9

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	138	152	90	134	576	597
Average Queue (ft)	51	60	94	49	56	412	446
95th Queue (ft)	90	111	148	84	101	566	592
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	4	4					
Queuing Penalty (veh)	12	3					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1197	1213	199	243	251	174	270	125	203
Average Queue (ft)	25	1046	1050	105	116	152	70	119	59	110
95th Queue (ft)	105	1442	1449	172	193	231	154	201	126	193
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		17	20							
Queuing Penalty (veh)		129	151							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		1	1		0	4	3	15
Queuing Penalty (veh)	0	16		2	2		0	4	4	12

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	162	267	297	137	178	176	341	189	216	140
Average Queue (ft)	59	163	191	66	72	33	161	138	138	78
95th Queue (ft)	121	267	304	125	132	102	259	190	200	132
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	264	154	138	122	180	158	31	151	173	190
Average Queue (ft)	135	84	81	39	104	80	4	56	92	128
95th Queue (ft)	228	143	126	92	153	138	21	108	139	187
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	2									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 336

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.5	0.0	0.5
Total Delay (hr)	0.4	1.8	1.3	0.5	25.0	1.1	30.1

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	28.3	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.2	52.4	8.5	1.5	3.9	0.2	2.7	0.3	1.1	1.1	1.2	0.2

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	31.1
Total Delay (hr)	74.4

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.4	1.0	1.3	1.2	2.2	3.9	1.4	16.5

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	1.8	1.7	2.2	0.2	0.2	4.1	1.3	11.5

**Total Zone Performance**

Denied Delay (hr)	31.8
Total Delay (hr)	132.5

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	90	144	159	149	135	827	826
Average Queue (ft)	42	59	105	63	65	478	518
95th Queue (ft)	87	108	155	117	112	779	790
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	5	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1196	1193	197	217	230	174	303	124	219
Average Queue (ft)	52	960	976	90	128	157	92	147	65	82
95th Queue (ft)	163	1301	1314	145	188	227	187	234	121	159
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		7	8							
Queuing Penalty (veh)		52	64							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		60		0	1		0	10	5	4
Queuing Penalty (veh)		16		1	1		0	9	7	4

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	232	299	311	153	214	231	313	256	203	282
Average Queue (ft)	64	141	164	72	76	44	155	146	145	101
95th Queue (ft)	149	278	301	130	149	135	243	215	209	179
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	268	152	142	93	199	178	30	163	207	264
Average Queue (ft)	134	73	77	37	98	90	5	76	116	154
95th Queue (ft)	215	131	131	76	176	167	23	138	169	227
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	1									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 161

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	10.5	0.6	11.1
Total Delay (hr)	0.5	2.0	1.3	0.5	47.1	3.0	54.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.8	38.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	56.9	7.8	1.6	4.0	0.2	2.4	0.4	1.1	1.0	1.6	0.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	42.8
Total Delay (hr)	78.5

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.9	1.5	1.4	1.4	2.4	3.3	1.1	16.9

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.9	1.5	2.4	0.2	0.2	3.7	1.0	10.9

**Total Zone Performance**

Denied Delay (hr)	53.9
Total Delay (hr)	160.7

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	124	166	142	122	1070	1061
Average Queue (ft)	43	61	111	71	69	819	842
95th Queue (ft)	84	111	160	120	114	1134	1133
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)						1	2
Queuing Penalty (veh)						9	14
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	7	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1189	1205	199	254	248	174	313	124	313
Average Queue (ft)	50	1020	1034	95	129	156	72	151	69	126
95th Queue (ft)	175	1405	1422	166	219	238	172	257	130	221
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		13	16							
Queuing Penalty (veh)		101	121							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		57		1	2		0	10	2	17
Queuing Penalty (veh)		15		3	3		0	9	4	13

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	153	282	325	151	159	159	311	203	209	211
Average Queue (ft)	51	170	200	81	75	43	171	120	129	85
95th Queue (ft)	113	278	305	129	140	110	280	176	182	157
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								



Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	256	119	143	107	181	157	30	147	173	240
Average Queue (ft)	134	65	68	39	102	83	3	71	97	142
95th Queue (ft)	236	111	132	85	158	146	17	126	149	222
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	1									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 303

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	5.1	0.0	5.2
Total Delay (hr)	0.4	1.9	1.2	0.5	37.4	1.8	43.3

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.5	27.2	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.3	55.0	7.6	2.1	3.7	0.1	2.1	0.4	1.1	0.9	1.5	0.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	31.5
Total Delay (hr)	76.3

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.8	1.4	1.2	1.1	2.4	3.6	1.1	16.6

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	1.9	2.5	0.3	0.2	3.9	1.4	12.0

**Total Zone Performance**

Denied Delay (hr)	36.7
Total Delay (hr)	148.1

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	93	149	205	132	115	1003	1012
Average Queue (ft)	45	69	109	68	66	668	716
95th Queue (ft)	69	127	174	111	104	976	986
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	1	2					
Queuing Penalty (veh)	2	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1201	1203	200	253	252	174	266	125	205
Average Queue (ft)	57	993	1009	113	122	147	69	135	57	110
95th Queue (ft)	187	1420	1439	185	208	220	171	222	115	195
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		11	14							
Queuing Penalty (veh)		87	105							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	57		1	2		0	9	0	17
Queuing Penalty (veh)	0	15		3	2		0	8	0	14

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	238	292	300	137	159	92	282	221	237	178
Average Queue (ft)	63	163	183	79	54	27	160	127	141	86
95th Queue (ft)	151	277	297	131	116	72	264	184	203	138
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								

Queuing and Blocking Report  
 Future Without-Project - AM Peak Hour

5/24/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	201	172	132	136	182	169	38	198	183	270
Average Queue (ft)	122	84	84	43	96	85	4	68	110	156
95th Queue (ft)	203	136	124	92	160	132	22	137	163	239
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								1		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 238

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.2	0.0	77.0	85.5	0.0	0.1	46.5
Total Del/Veh (s)	32.8	10.0	10.9	82.2	18.0	7.5	40.5

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	6.2	22.2	68.1	17.6	22.3	15.6	4.0	0.3	0.3
Total Del/Veh (s)	52.8	40.0	37.9	192.8	169.3	187.9	262.8	261.8	274.4	48.2	37.5	29.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	13.3
Total Del/Veh (s)	142.6

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	21.7	19.5	31.4	6.5	29.7	25.9	32.1	18.5

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.1	1.8	0.0	0.0	0.0	0.0	0.0	0.7
Total Del/Veh (s)	57.1	11.6	44.1	50.2	285.3	253.6	243.4	117.6

**Total Zone Performance**

Denied Del/Veh (s)	120.2
Total Del/Veh (s)	1176.4

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	323	266	1099	1097	280	208	201
Average Queue (ft)	84	101	79	525	958	261	103	110
95th Queue (ft)	114	230	162	1268	1404	376	184	183
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	6			
Queuing Penalty (veh)				1	57			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	31	2			0	24		
Queuing Penalty (veh)	71	4			5	76		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	438	458	200	1416	1428	175	1840	73	94
Average Queue (ft)	51	279	287	133	1103	1120	173	1273	23	55
95th Queue (ft)	152	398	408	238	1711	1693	177	2039	56	93
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					12	16		28		
Queuing Penalty (veh)					97	125		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		27		4	51		3	73		0
Queuing Penalty (veh)		11		28	74		15	157		0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	286	289	286	263	193	211	205	217	238	338
Average Queue (ft)	105	113	130	118	91	95	119	141	139	193
95th Queue (ft)	224	216	235	210	152	174	190	203	211	316
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1						
Queuing Penalty (veh)				3						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	0								
Queuing Penalty (veh)	0	0								

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	273	244	253	286	405	357	324	306	140	1336	1325	1326
Average Queue (ft)	212	117	107	209	340	343	174	164	71	1110	1081	1032
95th Queue (ft)	293	197	207	390	420	401	382	354	166	1581	1580	1534
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	11	0	0	0	38	44	16	12		36	22	18
Queuing Penalty (veh)	36	0	0	0	284	334	120	92		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	38					73		
Queuing Penalty (veh)				1	136					154		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	766	234	234
Average Queue (ft)	217	227	34	29
95th Queue (ft)	717	740	163	151
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	14	14	7	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1881

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.1	0.0	19.0	21.0	0.0	0.0	11.7
Total Del/Veh (s)	28.8	8.8	13.1	54.6	20.2	10.8	30.5

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.5	0.0	0.0	0.9	0.5	0.1	93.7	80.2	90.2	3.9	0.3	0.1
Total Del/Veh (s)	61.7	40.7	35.5	120.0	91.6	114.9	329.4	336.3	332.9	31.8	41.6	23.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	18.0
Total Del/Veh (s)	120.1

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	23.3	22.1	30.1	5.4	30.0	25.0	36.8	19.5

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	7.2	3.4	0.0	0.0	0.0	0.0	0.0	1.3
Total Del/Veh (s)	61.0	13.1	42.3	45.0	223.8	224.9	233.2	102.3

**Total Zone Performance**

Denied Del/Veh (s)	68.1
Total Del/Veh (s)	1032.8



Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	178	136	952	1091	280	208	202
Average Queue (ft)	70	65	65	193	457	140	117	133
95th Queue (ft)	103	126	108	568	1130	371	184	205
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)					1			
Queuing Penalty (veh)					5			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	14	2			0	11		
Queuing Penalty (veh)	34	3			4	34		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	396	433	200	930	984	175	1854	70	95
Average Queue (ft)	54	297	310	152	686	719	169	1656	26	45
95th Queue (ft)	152	392	398	241	966	1007	196	2274	61	85
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								73		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	32		7	48		4	70		0
Queuing Penalty (veh)	0	12		51	70		18	151		0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	320	321	286	262	141	118	222	242	237	369
Average Queue (ft)	108	135	146	134	80	63	135	135	136	229
95th Queue (ft)	248	262	252	223	125	113	213	203	196	371
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	1	0								
Queuing Penalty (veh)	1	0								

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	297	251	266	286	376	394	305	344	140	1326	1325	1323
Average Queue (ft)	221	134	128	193	317	317	163	153	58	931	898	895
95th Queue (ft)	299	216	233	370	430	440	373	365	151	1513	1496	1463
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	14	0	0	0	35	39	16	13		16	7	5
Queuing Penalty (veh)	43	0	0	0	262	294	122	101		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	35					65		
Queuing Penalty (veh)				2	125					137		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476
Directions Served	T	T
Maximum Queue (ft)	178	137
Average Queue (ft)	20	12
95th Queue (ft)	92	70
Link Distance (ft)	691	691
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 1472

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.2	0.0	67.4	61.3	0.0	0.0	35.4
Total Del/Veh (s)	29.5	9.2	12.0	64.8	19.2	9.0	33.0

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	9.9	20.5	0.2	78.7	76.7	68.0	3.9	0.2	0.3
Total Del/Veh (s)	88.6	54.7	56.8	150.3	131.7	121.1	299.9	323.7	311.8	47.4	47.0	29.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	23.2
Total Del/Veh (s)	135.6

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.5	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	24.4	22.2	30.6	5.3	31.7	26.1	35.0	19.6

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.6	2.6	0.0	0.0	0.0	0.0	0.0	0.9
Total Del/Veh (s)	62.0	12.9	45.5	47.4	245.2	261.4	249.7	114.0

**Total Zone Performance**

Denied Del/Veh (s)	125.8
Total Del/Veh (s)	1112.1

**Intersection: 4: Francis Ave #14 & Indian Trail Road**

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	99	184	141	1072	1087	280	234	249
Average Queue (ft)	79	77	74	345	775	242	109	135
95th Queue (ft)	109	146	124	910	1347	399	186	215
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	1			
Queuing Penalty (veh)				0	14			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	23	3			1	14		
Queuing Penalty (veh)	53	5			10	46		

**Intersection: 5: Alberta St & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	635	585	199	1400	1401	174	1836	124	223
Average Queue (ft)	72	367	369	153	907	932	170	1427	32	69
95th Queue (ft)	197	551	548	243	1607	1606	189	2392	76	154
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					6	7		62		
Queuing Penalty (veh)					43	58		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		43		8	46		2	68		4
Queuing Penalty (veh)		17		59	66		8	147		2

**Intersection: 6: Ash St #4S & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	298	292	295	203	157	120	280	262	284	391
Average Queue (ft)	117	125	138	111	76	62	131	135	149	209
95th Queue (ft)	240	249	259	184	132	114	220	216	220	344
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	0								0
Queuing Penalty (veh)	1	0								0

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	282	266	258	286	395	376	324	305	140	1326	1336	1328
Average Queue (ft)	226	141	135	214	352	350	161	145	51	1004	998	996
95th Queue (ft)	299	239	241	387	394	388	347	339	148	1487	1482	1465
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	18	0	0	0	39	43	11	9		29	24	22
Queuing Penalty (veh)	58	1	0	0	298	322	81	66		0	0	0
Storage Bay Dist (ft)				300						115		
Storage Blk Time (%)				0	39				0	69		
Queuing Penalty (veh)				1	143				0	146		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	803	234	253
Average Queue (ft)	224	224	45	38
95th Queue (ft)	771	771	194	180
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	20	18	13	13
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1647

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.2	0.0	18.9	46.7	0.0	0.1	21.9
Total Del/Veh (s)	33.7	7.7	14.2	61.1	18.8	9.9	33.0

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	2.9	1.3	6.2	51.1	46.9	36.4	3.9	0.4	0.4
Total Del/Veh (s)	70.2	47.0	45.1	135.2	111.7	118.4	328.0	343.1	315.4	51.4	45.9	38.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	10.0
Total Del/Veh (s)	131.6

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	24.5	24.2	32.5	5.4	30.2	25.2	27.5	18.8

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	8.0	4.0	0.0	0.0	0.0	0.0	0.0	1.5
Total Del/Veh (s)	67.5	14.8	51.6	56.1	271.1	309.9	307.3	130.8

**Total Zone Performance**

Denied Del/Veh (s)	64.9
Total Del/Veh (s)	1200.7

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	303	150	1064	1112	280	218	263
Average Queue (ft)	72	75	61	225	706	196	113	128
95th Queue (ft)	109	193	102	748	1427	408	184	210
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	4			
Queuing Penalty (veh)				0	34			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	22	3			0	13		
Queuing Penalty (veh)	51	4			2	41		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	546	515	200	1193	1200	174	1840	124	183
Average Queue (ft)	65	320	340	126	835	857	168	1658	34	65
95th Queue (ft)	191	484	494	238	1038	1071	208	2089	84	134
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								46		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		34		3	52		8	71	2	7
Queuing Penalty (veh)		13		23	75		37	154	2	3

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	236	244	288	267	139	146	181	229	256	317
Average Queue (ft)	118	124	141	129	79	76	124	138	142	155
95th Queue (ft)	243	239	259	225	128	121	179	203	207	266
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				1						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	283	262	274	286	376	405	305	306	140	1345	1325	1345
Average Queue (ft)	238	139	134	234	359	364	249	249	70	1127	1132	1124
95th Queue (ft)	315	237	228	387	367	385	360	361	159	1605	1603	1568
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	22	0	0	0	52	60	25	24		49	39	31
Queuing Penalty (veh)	70	1	1	0	391	450	186	185		0	0	0
Storage Bay Dist (ft)				300						115		
Storage Blk Time (%)				0	52				0	72		
Queuing Penalty (veh)				1	187				0	152		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	789	803	271	253
Average Queue (ft)	347	354	72	70
95th Queue (ft)	935	941	253	248
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	29	30	25	26
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 2063



**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.1	0.0	15.4	19.0	0.0	0.0	10.1
Total Del/Veh (s)	33.9	9.1	12.2	50.7	20.3	10.1	29.0

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.8	2.2	9.3	122.6	116.3	111.9	4.0	0.2	0.2
Total Del/Veh (s)	72.8	45.7	45.0	132.6	105.9	122.2	347.1	369.9	344.2	29.8	48.3	35.8

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	24.3
Total Del/Veh (s)	131.5

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	19.3	26.3	35.5	6.1	28.5	24.4	31.2	18.5

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	3.7	1.5	0.0	0.0	0.0	0.0	0.0	0.6
Total Del/Veh (s)	51.1	11.4	35.0	37.5	282.2	306.1	317.9	124.8

**Total Zone Performance**

Denied Del/Veh (s)	72.0
Total Del/Veh (s)	1166.7

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	99	206	171	1130	1096	280	185	244
Average Queue (ft)	80	87	62	234	537	170	111	127
95th Queue (ft)	112	183	107	788	1249	387	172	197
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				1	3			
Queuing Penalty (veh)				5	25			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	29	3			0	8		
Queuing Penalty (veh)	67	5			5	25		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	448	477	200	1352	1357	175	1835	125	180
Average Queue (ft)	53	326	329	137	775	805	171	1680	32	70
95th Queue (ft)	149	443	452	228	1281	1322	193	2137	75	127
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								75		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	36		3	48		6	72	0	4
Queuing Penalty (veh)	0	14		25	70		27	154	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	178	273	294	267	170	203	313	219	265	344
Average Queue (ft)	72	132	163	149	91	78	122	131	150	196
95th Queue (ft)	144	236	270	250	152	148	215	208	236	349
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
 Future Without-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	285	211	197	286	381	364	324	236	140	1350	1344	1340
Average Queue (ft)	205	121	105	180	316	313	63	53	81	1160	1149	1146
95th Queue (ft)	285	192	177	362	424	411	193	161	176	1535	1533	1520
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	6			0	20	23	1	0		50	37	34
Queuing Penalty (veh)	18			0	154	174	7	2		0	0	0
Storage Bay Dist (ft)				300						115		
Storage Blk Time (%)				0	20				0	64		
Queuing Penalty (veh)				1	74				0	135		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	789	813	234	258
Average Queue (ft)	339	351	75	80
95th Queue (ft)	918	931	251	267
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	33	33	24	25
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 992

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	22.3	0.7	23.1
Total Delay (hr)	0.6	1.8	1.3	0.6	38.7	1.7	44.6

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.9	59.3	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	55.9	8.4	1.9	4.1	0.1	2.3	0.3	1.1	1.3	1.8	0.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	70.6
Total Delay (hr)	78.7

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	9.1	1.8	1.2	1.3	2.2	3.9	1.2	20.8

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	1.6	3.3	0.3	0.2	4.1	0.9	12.0

**Total Zone Performance**

Denied Delay (hr)	93.7
Total Delay (hr)	156.1

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	124	181	136	138	907	922
Average Queue (ft)	48	62	105	66	68	679	709
95th Queue (ft)	79	109	161	117	121	937	934
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	1	1					
Queuing Penalty (veh)	4	1					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1195	1208	199	226	252	174	268	125	333
Average Queue (ft)	43	1020	1029	118	125	152	75	135	77	119
95th Queue (ft)	160	1320	1322	191	202	230	168	206	130	231
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		11	13							
Queuing Penalty (veh)		87	97							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		60		2	1		0	8	4	17
Queuing Penalty (veh)		19		5	2		0	7	6	13

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	423	468	189	136	168	309	257	269	138
Average Queue (ft)	111	242	261	79	55	36	151	135	154	85
95th Queue (ft)	273	364	389	152	106	98	262	213	222	139
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	2								
Queuing Penalty (veh)	0	8								

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	221	104	117	96	229	194	48	155	225	244
Average Queue (ft)	132	59	58	42	135	120	5	79	113	147
95th Queue (ft)	209	92	104	97	200	179	24	143	187	231
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 249

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	5.9	0.2	6.2
Total Delay (hr)	0.5	1.8	1.2	0.6	33.4	1.4	39.0

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.1	67.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.3	52.7	8.7	1.8	4.1	0.1	2.8	0.4	1.4	1.3	1.3	0.3

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	73.8
Total Delay (hr)	76.2

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	8.7	1.7	1.1	1.0	2.1	3.9	1.0	19.6

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	1.6	3.0	0.3	0.2	3.5	0.9	11.1

**Total Zone Performance**

Denied Delay (hr)	80.0
Total Delay (hr)	146.0

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	155	158	94	96	799	872
Average Queue (ft)	45	60	98	55	65	620	647
95th Queue (ft)	84	121	144	90	93	855	890
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	6	1					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1200	1198	199	210	227	174	268	125	227
Average Queue (ft)	47	981	1004	105	123	163	91	154	74	103
95th Queue (ft)	147	1308	1318	171	191	228	196	235	133	202
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		7	7							
Queuing Penalty (veh)		52	55							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		0	1		1	15	6	11
Queuing Penalty (veh)	0	19		1	2		1	13	8	9

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	462	405	148	147	139	263	256	279	205
Average Queue (ft)	97	216	226	76	54	37	158	138	151	81
95th Queue (ft)	233	370	365	130	101	103	230	216	235	150
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		2								
Queuing Penalty (veh)		10								



Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	231	117	100	121	190	227	31	136	164	221
Average Queue (ft)	136	59	65	40	113	106	4	70	102	128
95th Queue (ft)	217	99	109	91	170	174	20	121	153	202
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								1		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 177

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	14.6	0.4	15.0
Total Delay (hr)	0.5	1.9	0.9	0.5	36.8	1.5	42.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.4	61.1	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	50.2	7.4	2.1	4.0	0.2	2.1	0.5	1.1	1.1	1.3	0.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	69.6
Total Delay (hr)	71.2

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	9.8	1.9	1.0	1.0	2.4	3.7	1.3	21.1

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	1.6	3.0	0.3	0.2	3.8	1.0	11.5

Total Zone Performance

Denied Delay (hr)	84.6
Total Delay (hr)	146.0

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	142	230	130	116	868	833
Average Queue (ft)	54	75	108	59	47	657	680
95th Queue (ft)	93	137	173	108	89	909	913
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	4	4					
Queuing Penalty (veh)	10	3					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1172	1200	199	226	244	174	360	125	202
Average Queue (ft)	31	950	968	106	122	155	71	140	65	89
95th Queue (ft)	127	1269	1290	178	205	234	157	234	119	163
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		0	1							
Queuing Penalty (veh)		3	8							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	58		2	1		0	8	5	8
Queuing Penalty (veh)	0	18		7	2		0	7	7	7

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	476	509	150	165	124	358	211	203	196
Average Queue (ft)	100	243	261	70	46	28	164	131	134	87
95th Queue (ft)	234	390	420	117	110	99	285	198	192	152
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	2								
Queuing Penalty (veh)	0	8								

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	267	124	115	134	172	182	30	163	210	322
Average Queue (ft)	134	53	58	41	124	109	4	78	102	144
95th Queue (ft)	210	103	111	100	176	174	21	141	161	237
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	3									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								3		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 84

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	21.0	1.3	22.4
Total Delay (hr)	0.5	1.6	1.0	0.5	38.3	2.1	44.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.5	35.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.9	41.1	6.6	1.8	4.2	0.2	2.7	0.4	1.0	1.2	1.7	0.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	43.9
Total Delay (hr)	61.9

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	7.9	2.0	1.2	1.2	2.0	3.9	1.2	19.4

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.5	1.4	3.2	0.3	0.2	4.0	1.0	11.7

Total Zone Performance

Denied Delay (hr)	66.4
Total Delay (hr)	136.9

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	98	132	172	119	116	849	870
Average Queue (ft)	46	59	95	50	60	675	715
95th Queue (ft)	84	104	155	91	97	900	941
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	3	3					
Queuing Penalty (veh)	8	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1169	1178	198	249	244	174	245	125	288
Average Queue (ft)	44	821	845	102	128	148	93	142	71	111
95th Queue (ft)	159	1242	1255	155	209	221	180	216	131	196
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		0	0							
Queuing Penalty (veh)		0	1							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	56		0	0		0	6	4	15
Queuing Penalty (veh)	0	18		0	1		0	5	6	12

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	366	428	157	169	127	267	229	247	203
Average Queue (ft)	99	206	242	77	55	29	139	135	144	96
95th Queue (ft)	233	326	381	134	109	81	234	198	216	165
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		1								
Queuing Penalty (veh)		6								

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	227	93	116	97	184	166	30	133	170	313
Average Queue (ft)	120	58	59	43	119	105	4	78	107	152
95th Queue (ft)	200	91	117	86	165	161	19	135	158	240
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)									2	
Queuing Penalty (veh)									0	

Zone Summary

Zone wide Queuing Penalty: 60

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	16.3	0.6	17.0
Total Delay (hr)	0.5	1.8	1.2	0.6	36.9	1.9	42.8

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.6	39.9	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.9	47.9	5.9	1.8	3.9	0.2	2.3	0.3	1.0	0.7	1.4	0.3

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	50.0
Total Delay (hr)	66.7

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	8.3	1.9	1.3	1.0	2.2	3.7	1.0	19.4

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	1.4	3.0	0.3	0.2	3.8	1.0	11.4

**Total Zone Performance**

Denied Delay (hr)	67.1
Total Delay (hr)	140.3



**Intersection: 4: Francis Ave #14 & Indian Trail Road**

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	93	148	208	131	141	881	902
Average Queue (ft)	45	67	96	60	66	660	696
95th Queue (ft)	79	129	154	107	122	909	921
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	7	2					

**Intersection: 5: Alberta St & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1174	1173	192	223	248	174	250	125	183
Average Queue (ft)	47	893	919	99	119	146	89	153	56	108
95th Queue (ft)	161	1155	1169	151	201	227	187	234	109	175
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		0	1							
Queuing Penalty (veh)		2	4							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		0	1		0	9	1	14
Queuing Penalty (veh)	0	19		1	2		0	8	1	11

**Intersection: 6: Ash St #4S & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	318	345	364	135	143	119	287	237	221	176
Average Queue (ft)	97	221	243	80	44	23	161	133	143	85
95th Queue (ft)	226	343	367	143	94	72	239	194	209	147
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		1								
Queuing Penalty (veh)		4								

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	247	137	116	146	184	177	52	117	179	197
Average Queue (ft)	125	52	50	50	115	107	5	59	102	132
95th Queue (ft)	211	95	89	103	161	166	26	100	161	190
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 62

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	44.2	41.2	0.0	0.0	0.1	23.8
Total Del/Veh (s)	27.5	9.7	11.7	72.4	15.8	0.9	7.5	36.2

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.8	4.2	0.0	61.0	80.3	81.0	3.7	0.4	0.2
Total Del/Veh (s)	67.9	45.6	50.1	135.5	115.9	125.4	322.5	298.7	299.9	49.3	40.4	28.1

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	15.4
Total Del/Veh (s)	128.6

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	21.5	26.2	32.9	5.4	30.4	23.4	26.6	17.8

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.7	1.6	0.0	0.0	0.0	0.0	0.0	0.7
Total Del/Veh (s)	50.0	11.7	31.1	34.0	290.3	277.4	284.0	115.8

**Total Zone Performance**

Denied Del/Veh (s)	83.3
Total Del/Veh (s)	971.4

**Intersection: 4: Francis Ave #14 & Indian Trail Road**

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	284	136	1114	1091	280	208	210
Average Queue (ft)	71	89	72	231	895	252	91	105
95th Queue (ft)	111	200	112	813	1425	390	161	166
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				1	4			
Queuing Penalty (veh)				5	41			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	16	3			0	16		
Queuing Penalty (veh)	37	6			3	50		

**Intersection: 5: Alberta St & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	483	491	200	1410	1415	175	1816	111	115
Average Queue (ft)	94	324	341	142	787	811	169	1536	34	58
95th Queue (ft)	229	458	474	248	1452	1461	211	2271	72	99
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					5	7		52		
Queuing Penalty (veh)					41	54		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		36		0	48		2	71	0	1
Queuing Penalty (veh)		15		0	70		11	157	0	1

**Intersection: 6: Ash St #4S & Francis Ave #14**

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	198	254	290	260	160	154	266	257	233	362
Average Queue (ft)	86	140	161	142	74	64	133	145	141	163
95th Queue (ft)	165	252	278	241	137	122	226	219	209	282
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	268	228	247	286	376	378	250	216	140	1363	1325	1326
Average Queue (ft)	193	121	106	172	314	313	42	41	52	1121	1086	1079
95th Queue (ft)	265	200	197	362	419	420	151	136	147	1532	1537	1510
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	3		0	0	14	19	0	0		47	34	25
Queuing Penalty (veh)	10		0	0	105	148	3	0		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	14				0	75		
Queuing Penalty (veh)				1	50				0	162		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	784	803	271	253
Average Queue (ft)	311	319	58	62
95th Queue (ft)	898	911	226	229
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	26	26	19	20
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 974

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	46.8	37.8	0.0	0.0	0.0	21.9
Total Del/Veh (s)	35.4	9.6	13.1	81.9	19.3	0.8	9.2	40.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	1.0	0.0	106.9	122.4	131.0	4.0	0.3	0.3
Total Del/Veh (s)	60.1	45.7	42.5	196.0	188.1	231.6	343.5	348.3	322.0	43.2	43.4	31.0

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	23.0
Total Del/Veh (s)	162.9

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	1.2	1.7	0.0	0.0	1.7	0.8
Total Del/Veh (s)	35.7	22.9	35.4	13.2	29.7	23.1	57.5	27.2

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	17.4	11.0	0.0	0.0	0.0	0.0	0.0	3.8
Total Del/Veh (s)	75.2	14.4	53.3	54.2	221.2	183.3	182.4	97.0

**Total Zone Performance**

Denied Del/Veh (s)	112.0
Total Del/Veh (s)	1014.3

Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	339	276	1095	1109	280	183	195
Average Queue (ft)	83	97	77	251	1015	280	113	130
95th Queue (ft)	115	219	158	872	1278	280	179	187
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	7			
Queuing Penalty (veh)				3	68			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	32	2			0	20		
Queuing Penalty (veh)	74	3			5	63		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	515	516	200	1432	1431	175	1840	110	136
Average Queue (ft)	63	320	323	149	1174	1193	166	1557	31	58
95th Queue (ft)	170	460	461	242	1774	1737	205	2185	69	107
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					14	19		54		
Queuing Penalty (veh)					113	153		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		36		3	52		4	74	1	2
Queuing Penalty (veh)		15		23	75		18	163	1	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	436	421	275	290	284	255	199	499	425
Average Queue (ft)	199	133	153	141	131	129	129	135	204	265
95th Queue (ft)	309	291	297	244	260	268	205	192	419	439
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1	2	4			0	
Queuing Penalty (veh)				5	9	18			2	
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	7	0							0	6
Queuing Penalty (veh)	17	0							2	17

Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	281	195	256	286	406	380	324	306	140	1326	1293	1256
Average Queue (ft)	262	125	129	247	359	359	280	273	67	827	790	788
95th Queue (ft)	301	198	231	389	396	370	388	389	167	1261	1209	1164
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	37		0	1	52	60	45	44		1	0	0
Queuing Penalty (veh)	120		0	0	409	465	352	343		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				1	52					76		
Queuing Penalty (veh)				2	194					163		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B472
Directions Served	T	T
Maximum Queue (ft)	25	33
Average Queue (ft)	1	1
95th Queue (ft)	8	11
Link Distance (ft)	691	219
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 2897



**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.0	0.0	20.4	28.9	0.0	0.0	0.0	14.5
Total Del/Veh (s)	40.6	9.6	12.6	67.3	20.7	1.3	10.7	35.3

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	8.0	4.1	0.0	69.4	65.0	67.0	4.0	0.1	0.3
Total Del/Veh (s)	71.2	44.8	42.3	203.8	193.5	249.6	280.9	294.0	284.6	48.4	48.9	30.2

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	15.4
Total Del/Veh (s)	155.6

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	2.1	2.9	0.0	0.0	0.0	1.2
Total Del/Veh (s)	22.7	25.1	32.8	12.8	31.5	25.0	39.1	22.3

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	6.1	2.4	0.0	0.0	0.0	0.0	0.0	1.0
Total Del/Veh (s)	61.6	11.5	48.5	50.3	322.0	308.8	321.2	135.5

**Total Zone Performance**

Denied Del/Veh (s)	70.3
Total Del/Veh (s)	1155.3

Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	197	137	1070	1096	280	222	272
Average Queue (ft)	79	91	63	224	867	252	122	139
95th Queue (ft)	114	179	107	711	1312	391	194	218
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	2			
Queuing Penalty (veh)				0	18			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	32	2			1	16		
Queuing Penalty (veh)	74	4			11	52		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	486	458	200	1421	1430	175	1836	124	132
Average Queue (ft)	47	329	333	143	1273	1283	162	1328	42	50
95th Queue (ft)	141	431	422	244	1615	1613	212	2272	86	103
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					15	17		37		
Queuing Penalty (veh)					124	141		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		36		3	54		4	69	0	3
Queuing Penalty (veh)		15		23	79		17	152	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	193	274	295	265	298	301	247	229	217	422
Average Queue (ft)	89	131	150	137	138	133	135	139	146	205
95th Queue (ft)	174	244	272	229	260	262	217	207	201	355
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1	1	1				
Queuing Penalty (veh)				3	5	5				
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										1
Queuing Penalty (veh)										3

Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	295	176	193	286	405	376	310	275	140	1363	1325	1341
Average Queue (ft)	226	114	103	234	356	348	181	159	66	1236	1224	1210
95th Queue (ft)	305	174	172	383	401	387	356	311	163	1512	1498	1496
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	16			0	42	46	13	10		59	38	34
Queuing Penalty (veh)	51			0	329	362	104	78		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	42					72		
Queuing Penalty (veh)				2	156					154		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	789	234	234
Average Queue (ft)	343	334	24	24
95th Queue (ft)	836	827	140	140
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	11	11	7	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1962

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	18.8	0.2	19.1
Total Delay (hr)	0.6	1.8	1.1	0.5	35.9	1.9	41.9

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	2.1	66.2	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	55.1	8.7	2.2	4.1	0.1	3.0	0.4	1.0	1.0	1.3	0.4

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Delay (hr)	73.5
Total Delay (hr)	78.2

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	8.2	1.7	0.9	1.1	2.5	3.7	1.0	19.1

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	1.5	3.0	0.3	0.2	4.3	1.1	11.9

**Total Zone Performance**

Denied Delay (hr)	92.6
Total Delay (hr)	151.0

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	122	173	140	116	882	966
Average Queue (ft)	49	66	110	55	60	652	688
95th Queue (ft)	84	114	161	94	98	908	939
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	5	2					
Queuing Penalty (veh)	13	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1185	1198	199	272	304	174	395	125	223
Average Queue (ft)	37	1007	1019	109	131	148	86	169	64	104
95th Queue (ft)	144	1383	1391	196	238	237	160	289	112	191
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		14	18							
Queuing Penalty (veh)		111	136							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		60		5	2		0	10	3	11
Queuing Penalty (veh)		19		15	3		0	9	4	9

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	269	325	355	133	131	194	267	309	282	129
Average Queue (ft)	108	207	220	63	53	31	170	132	138	66
95th Queue (ft)	238	333	333	110	102	104	247	217	206	109
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		1								
Queuing Penalty (veh)		4								

Queuing and Blocking Report  
 Future With-Project - AM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	249	126	134	73	203	200	30	143	163	204
Average Queue (ft)	122	58	58	32	120	101	3	78	114	149
95th Queue (ft)	218	119	118	60	177	161	17	142	168	206
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								3		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 325

**4: Francis Ave #14 & Indian Trail Road Performance by movement**

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	28.4	27.5	0.0	0.0	0.0	15.8
Total Del/Veh (s)	34.4	8.1	14.1	66.0	17.8	0.9	6.9	34.3

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	2.0	1.0	0.4	38.5	40.6	36.8	4.0	0.2	0.3
Total Del/Veh (s)	67.5	37.3	33.2	152.8	125.9	127.4	291.0	298.5	281.2	47.4	45.4	24.5

**5: Alberta St & Francis Ave #14 Performance by movement**

Movement	All
Denied Del/Veh (s)	8.1
Total Del/Veh (s)	129.7

**6: Ash St #4S & Francis Ave #14 Performance by movement**

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	23.8	22.8	32.4	6.1	33.0	24.5	26.9	18.8

**7: Maple St #3N & Francis Ave #14 Performance by movement**

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	15.6	10.4	0.0	0.0	0.0	0.0	0.0	3.4
Total Del/Veh (s)	61.4	12.7	41.0	43.6	271.5	275.4	270.4	119.9

**Total Zone Performance**

Denied Del/Veh (s)	60.9
Total Del/Veh (s)	954.4

Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	173	158	1088	1106	280	174	222
Average Queue (ft)	81	73	59	363	769	243	98	112
95th Queue (ft)	114	150	110	995	1320	400	151	176
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	2			
Queuing Penalty (veh)				2	25			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	25	1			1	16		
Queuing Penalty (veh)	57	3			8	50		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	380	405	200	1394	1398	175	1835	71	106
Average Queue (ft)	48	254	272	147	907	936	170	1476	32	52
95th Queue (ft)	151	345	371	231	1597	1600	200	2130	66	90
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					3	4		40		
Queuing Penalty (veh)					27	30		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		24		6	44		6	71		1
Queuing Penalty (veh)		10		45	65		28	157		0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	305	233	278	256	176	142	274	247	242	325
Average Queue (ft)	114	129	139	143	96	88	126	155	158	173
95th Queue (ft)	245	235	255	237	146	144	218	222	229	281
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	2									
Queuing Penalty (veh)	4									



Queuing and Blocking Report  
 Future With-Project - PM Peak Hour

5/23/2016

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	287	197	262	286	405	394	305	305	140	1350	1325	1344
Average Queue (ft)	222	118	121	212	346	338	131	116	64	1112	1095	1089
95th Queue (ft)	315	181	211	386	411	413	302	287	155	1469	1454	1438
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	15		0	1	32	35	8	7		29	17	18
Queuing Penalty (veh)	48		0	0	250	274	60	52		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				1	32				0	67		
Queuing Penalty (veh)				3	118				0	145		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	793	59	134
Average Queue (ft)	143	143	3	9
95th Queue (ft)	577	572	24	64
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	5	5		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1461