

Appendix D
Traffic Impact Analysis



**PUBLIC WORKS
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Whitmore Track and Sports Field Traffic Impact Analysis

Purpose and Background

The Whitmore Park Track and Sports Field (Project) is to be located on the existing site of the Whitmore Regional Park, which is located outside of the Town's boundary at 575 Benton Crossing Road near Highway 395 in Mono County. The site is currently maintained by the Town of Mammoth Lakes under a lease agreement with Mono County. Benton Crossing Road is functionally classified as a Rural Minor Arterial and is owned and maintained by Mono County.

The existing Whitmore Regional Park site currently has 3 baseball fields, which are typically used by local high school and little league groups. The site also serves as the meeting place and starting point for the annual High Sierra Fall Century, which is a large-scale cycling event with over 600 participants.

The Project proposes to expand the existing Whitmore Regional Park by constructing a track facility that will include a ¼ mile running track, infield for soccer and football, small locker room, concession area and other track and field related features. The purpose of this report is to evaluate potential traffic impacts that may be caused by the construction of the new facility.

Base Traffic Conditions

Study Area

The study area includes Benton Crossing Road from the Whitmore Pool, northeast of the Project, to the intersection of Benton Crossing Road and Highway 395, southwest of the Project, as shown on the map in Attachment A. The study area encompasses all existing developed areas along Benton Crossing Road and all critical intersections, including Project driveways. Two existing interconnected driveways will be utilized for the Project. The first driveway is approximately 3000 feet northeast of the intersection of Benton Crossing Road and Highway 395. The second driveway is approximately 600 feet northeast of the first driveway.

Existing Traffic Volumes

Existing traffic volumes on Benton Crossing Road were collected using Jamar tube-style traffic counters during two separate periods during the summer of 2010. The first data collection period occurred between May 20th and 26th, 2010 at Station 1, located slightly northeast of Highway 395 on Benton Crossing Road

as shown on the map in Attachment A. Traffic volumes at Station 1 during the first study period are as follows:

Station 1:

- Average Daily Traffic (ADT) – 613 vehicles
- Peak Daily Traffic – Saturday, May 22, 2010 – 766 vehicles
- Peak Hour Traffic – 4:15 to 5:15 pm, Monday, May 24, 2010 – 92 vehicles

Traffic volumes for this data collection period from the permanent count station on Highway 395 near Highway 203 were provided by Caltrans. The peak daily traffic at this location was 411 vehicles in the northbound/eastbound direction and 420 vehicles in the southbound/eastbound direction for a two-way total of 831 vehicles.

The second data collection period occurred during the annual High Sierra Fall Century cycling event on September 11, 2010. The event typically draws over 600 participants, as well as many volunteers and spectators, and is thought to represent the peak traffic impact scenario on Benton Crossing Road and at the intersection of Benton Crossing Road and Highway 395.

Traffic data was collected during the event by two tube counters on Benton Crossing Road. Station 1 was installed in the approximate location that it was during the first data collection period and Station 2 was installed approximately 450 feet northeast of the Whitmore Pool, as shown in the map in Attachment A. Traffic volumes at during the second study period on September 11, 2010 are as follows:

Station 1:

- Peak Daily Traffic – 1856 vehicles
- Peak Hour Traffic – 6:30 to 7:30 am – 256 vehicles

Station 2:

- Peak Daily Traffic – 881 vehicles
- Peak Hour Traffic – 3:45 to 4:45 am, – 90 vehicles

Project Traffic

Trip Generation

Project traffic was first estimated using standard Institute of Transportation Engineers (ITE), 7th Edition, trip generation rates for a County Park (Land Use Code 412), which was thought to most closely represent the Project. Trip rates for the Project were calculated based on the net increase in site area of 3.7 acres associated with the Project. Per ITE, the Project would produce approximately 12.14 daily trips per acre and 2.24 peak hour trips per acre on a typical Saturday, resulting in a total additional 45.0 daily trips and 8.3 peak hour trips.

Because the Project trip generation numbers estimated using ITE standard trip rates do not appear to accurately reflect the potential increase in trips that could occur with the Project, traffic volume data collected during the High Sierra Fall Century event was used as a substitute to analyze potential impacts. Although the Fall Century event is considered to be a peak traffic scenario at this time, it is anticipated that the Project will occasionally hold events that will be similar in nature and will therefore produce similar traffic volumes and patterns.

Therefore, peak hour volumes collected at Station 1 during the Fall Century event were used to represent Project trips (256 trips) for the traffic impact analysis. The Project trips were added to the existing peak hour traffic volumes (92 vehicles) at Station 1 as collected during the first data collection period on Benton Crossing Road, as well as the peak hour volumes on Highway 395 (411 northbound/westbound; 420 southbound/eastbound).

Trip Distribution

Trips were assumed to have a 75% / 25% distribution at the intersection of Benton Crossing Road and Highway 395, with 75% of trips coming from/going to northbound/eastbound 395 and 25% of trips coming from/going to southbound/westbound 395. Project trips are split evenly between each Project driveway. Traffic distribution is shown in Attachment B.

Impact Analysis (Level of Service)

Trafficware Synchro 7 was used to analyze potential Level of Service (LOS) impacts resulting from the Project, including driveway LOS and LOS at the intersection of Benton Crossing Road and Highway 395. As shown in the Synchro analysis sheets provided in Attachment C, all driveway and intersection movements are expected to operate at LOS A with the exception of the southbound/eastbound left onto Highway 395 from Benton Crossing Road, which is expected to operate at LOS B.

Conclusion

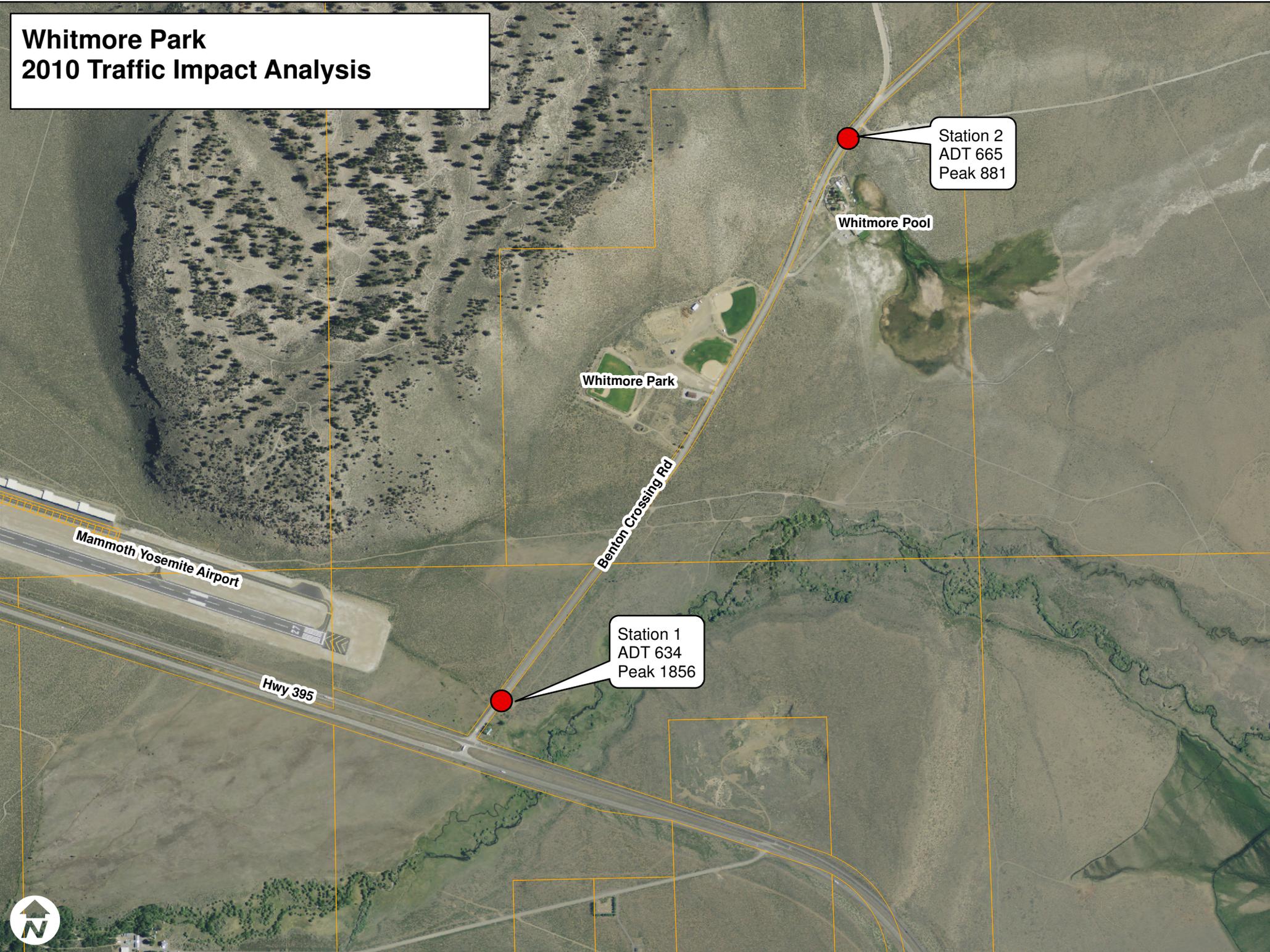
The Whitmore Track and Sports Field Project is expected to produce a minimal traffic impact within the study area. All intersections and roadways are expected to operate at a Level of Service well within the accepted County and State standards. All driveway and intersection movements are expected to operate at LOS A with the exception of the southbound/eastbound left onto Highway 395 from Benton Crossing Road, which is expected to operate at LOS B.

Recommendations

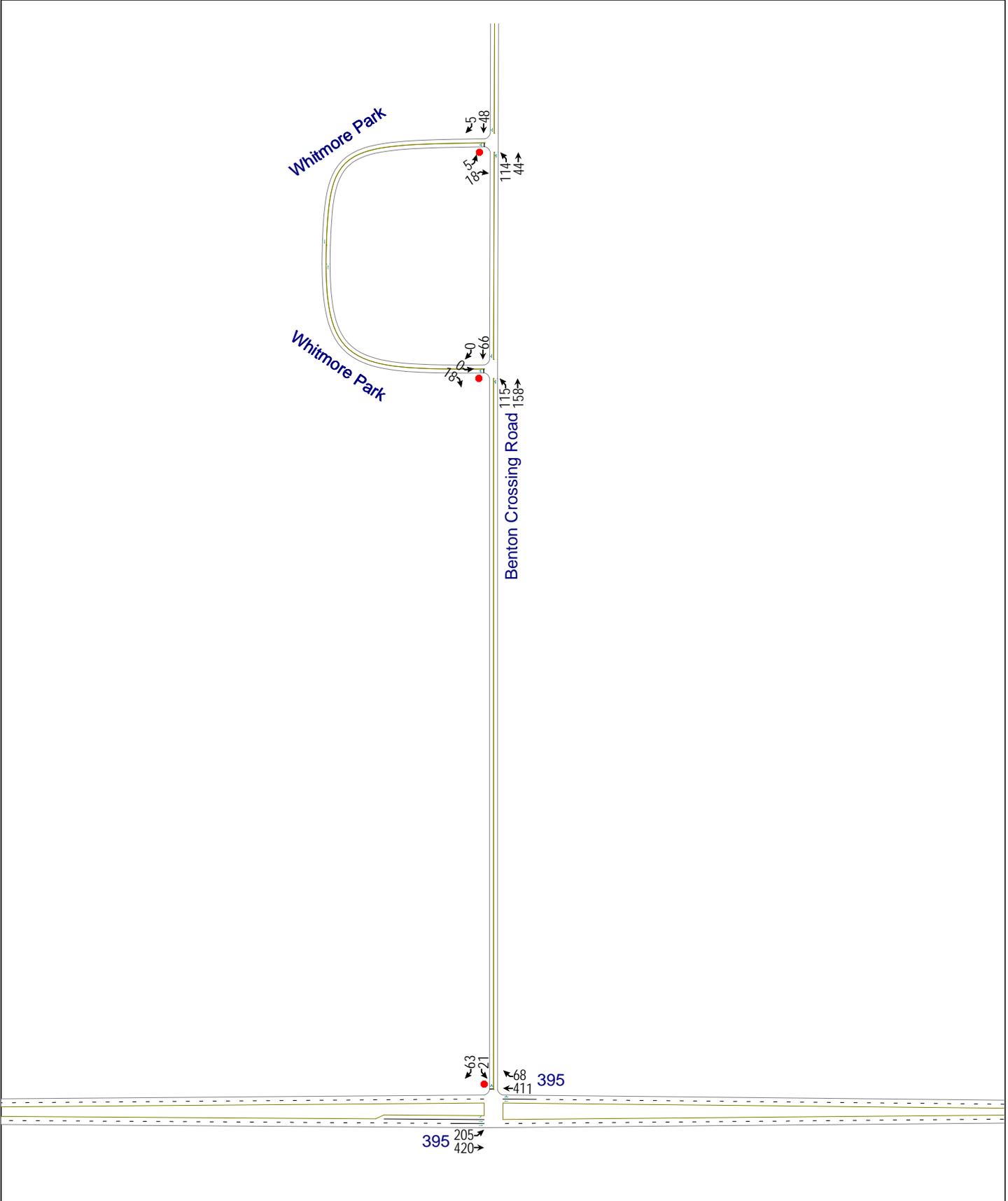
The Project applicant may wish to consider making the interconnected Project driveways a one-way loop to optimize traffic flow and minimize potential queuing on Benton Crossing Road. This may also allow for a reconfiguration of the planned parking that would provide opportunity to add additional parking spots if necessary.

Attachment A

Whitmore Park 2010 Traffic Impact Analysis



Attachment B



Attachment C

Whitmore Track and Sports Complex
Traffic Impact Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	205	420	411	68	21	63
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	223	457	447	74	23	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage (veh)		2	2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	521				1158	260
vC1, stage 1 conf vol					484	
vC2, stage 2 conf vol					674	
vCu, unblocked vol	521				1158	260
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	79				93	91
cM capacity (veh/h)	1042				328	738
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	223	228	228	298	223	91
Volume Left	223	0	0	0	0	23
Volume Right	0	0	0	0	74	68
cSH	1042	1700	1700	1700	1700	563
Volume to Capacity	0.21	0.13	0.13	0.18	0.13	0.16
Queue Length 95th (ft)	20	0	0	0	0	14
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	12.6
Lane LOS	A					B
Approach Delay (s)	3.1			0.0		12.6
Approach LOS						B
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			39.9%		ICU Level of Service	A
Analysis Period (min)			15			

Whitmore Track and Sports Complex
Traffic Impact Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	18	114	44	48	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	20	124	48	52	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	351	55	58			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	351	55	58			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	92			
cM capacity (veh/h)	595	1012	1547			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	25	172	58			
Volume Left	5	124	0			
Volume Right	20	0	5			
cSH	878	1547	1700			
Volume to Capacity	0.03	0.08	0.03			
Queue Length 95th (ft)	2	7	0			
Control Delay (s)	9.2	5.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	5.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization		25.3%		ICU Level of Service		A
Analysis Period (min)			15			

Whitmore Track and Sports Complex
Traffic Impact Analysis

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	18	115	158	66	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	20	125	172	72	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	493	72	72			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	493	72	72			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	92			
cM capacity (veh/h)	491	991	1528			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	20	297	72			
Volume Left	0	125	0			
Volume Right	20	0	0			
cSH	991	1528	1700			
Volume to Capacity	0.02	0.08	0.04			
Queue Length 95th (ft)	2	7	0			
Control Delay (s)	8.7	3.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	3.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization		31.3%		ICU Level of Service		A
Analysis Period (min)			15			