MEMORANDUM

To: Alex Read, PE (Alaska Department of Transportation & Public Faculties)
From: Trevor Strait, PE, PTOE (HDL Engineering Consultants, LLC)
Thru: Stephanie Mormilo, PE (HDL Engineering Consultants, LLC)
Date: August 19, 2022
Project: AMATS: Mountain Air Drive Extension (CFHWY00710/0001690)
Subject: Rabbit Creek Intersection Analysis

The State of Alaska Department of Transportation and Public Facilities (DOT&PF), in coordination with the Municipality of Anchorage (MOA), is extending Mountain Air Drive from Rabbit Creek Road to Sandpiper Drive. This new connection will impact the volume of traffic using the Mountain Air Drive / Rabbit Creek Road intersection. DOT&PF has requested that HDL Engineering Consultants, LLC (HDL) evaluate traffic impacts to the Mountain Air Drive / Rabbit Creek Road intersection and identify potential improvements, if needed.

Existing Conditions

The existing northern portion of Mountain Air Drive currently provides access to only Bear Valley Elementary School and Fire Station 10. Figure 1 shows the project area and the intersection study area being analyzed.

Crash History

No crashes have been recorded at this intersection in the last 10 years. Prior to that, three crashes in total have been recorded going back to 1985, none of them intersection related.

Vehicle Speeds

Mountain Air Drive does not have a posted speed limit. Rabbit Creek has a posted speed limit of 45 miles per hour (MPH). Speed data collected by DOT&PF at locations along Rabbit Creek Road show the 85th percentile speed to be between 53-55 MPH.

Sight Distance

Rabbit Creek Road is in a horizontal and vertical curve through the intersection with Mountain Air Drive. A sight distance check was performed to verify minimum intersection sight distance is currently met or exceeded for the measured 85th percentile speed. Using the criteria in A Policy on Geometric Design of Highways and Streets, 2011 (PGDHS), it was found that the existing intersection meets the standards for intersection sight distance; 610 feet for left-turning vehicles and 530 feet for right-turning vehicles.

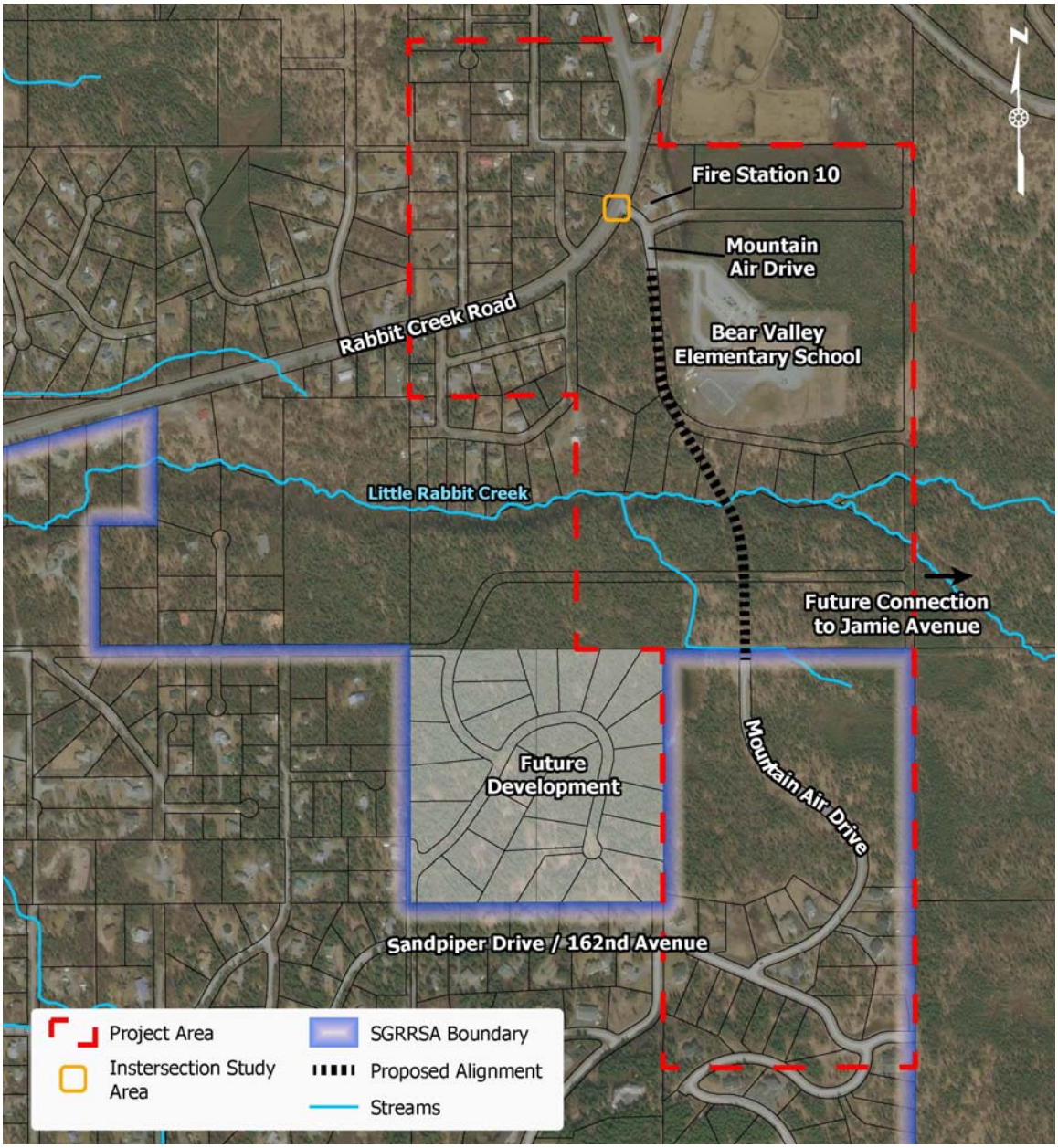


Figure 1 – Project Area

Traffic Volumes

Vehicle turning counts where collected in the field on October 12, 2021. It was found that the AM Peak occurred at 8:00-9:00 AM and the PM Peak occurred at 3:00-4:00 PM. These timeframes correspond directly with student drop-off and pick-up times at Bear Valley Elementary School. The student drop-off during the AM Peak was more focused around the school start time with the student pick-up times extended over a larger period in the PM. The turning counts collected were adjusted using seasonal and daily adjustment factors and are presented in Figure 2.

During the data collection it was observed that vehicles waiting to pick up children would queue from the Bear Valley Elementary School parking lot out to Rabbit Creek Road. This condition has the potential to impact the operations of the intersection.

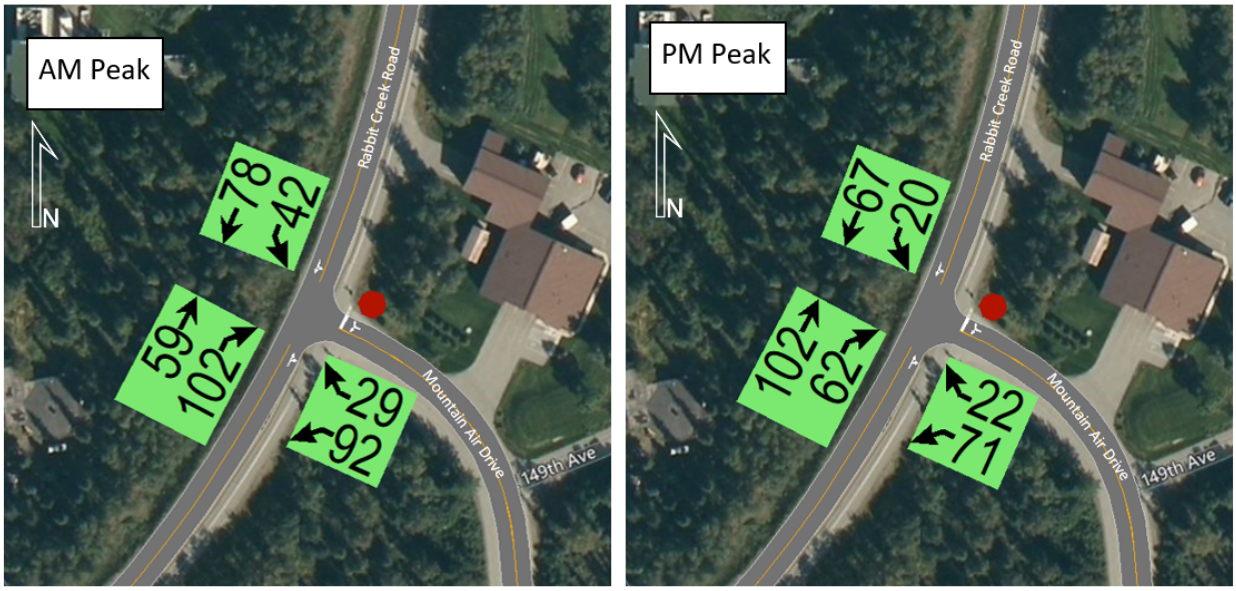


Figure 2 – Adjusted Vehicle Turning Counts

Future Conditions

The construction of this project will provide a new primary access for some residential areas, but will remain as a secondary access for most areas south of Rabbit Creek. A future extension of Jamie Avenue from the east would connect to the Bear Valley area, adding additional traffic. However, this future connection is not currently in any adopted plans or funding programs within the design life of the Mountain Air Drive Extension project (2048). A traffic forecasting analysis was performed using a background growth rate of 0.6% for Rabbit Creek Road and Bear Valley Elementary School traffic determined from the historical counts in the area. The future traffic on Mountain Air Drive approach was determined using assumptions on residential lot development, the amount of existing traffic generated per single family home in this area, and a determination of the portion of Bear Valley Elementary School traffic which will travel south on Mountain Air Drive. Figure 3 shows the forecasted turning movements in the design year.

In the design year, the Bear Valley Elementary School traffic still drives the peak periods. Outside of the school traffic, the intersection will continue to have relatively low volumes with little to no vehicle queues on Mountain Air Drive.

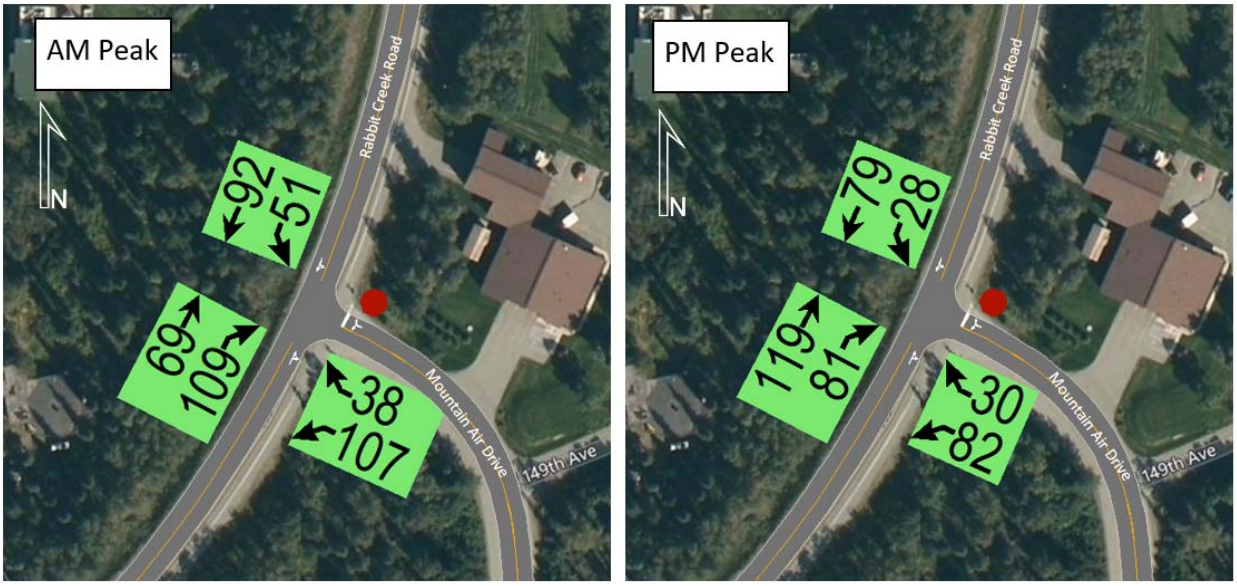


Figure 3 – Vehicle Turning Movements for 2048

Intersection Alternatives

Using the projected volumes, it was determined that the existing intersection configuration provides an acceptable Level of Service (LOS). However, we also evaluated several alternatives to see if improvements could be made to the existing configuration. Each alternative was looked at from both an operational and safety standpoint. The National Cooperative Highway Research Program (NCHRP) produced Report 457 that provides guidance when selecting potential improvements at an intersection. This report was used to evaluate the alternatives presented. A LOS analysis using design year peak volumes was run on each alternative to evaluate the operational impacts and the results are shown in Table 1.

ALTERNATIVE	APPROACH DELAY, S (LOS)		
	Mountain Air WB	Rabbit Creek NB	Rabbit Creek SB
Existing Configuration	11.9 (B)		2.8 (A)
Mountain Air Right-Turn Pocket	11.3 (B)		2.8 (A)
Rabbit Creek Right-Turn Pocket	11.2 (B)		2.8 (A)
Rabbit Creek Left-Turn Pocket	11.9 (B)		2.8 (A)
Signalized	8.5 (A)	5.0 (A)	4.5 (A)
Roundabout	3.9 (A)	4.1 (A)	4.1 (A)

Table 1 – LOS Analysis of Alternatives

Existing Configuration

The existing configuration has the Mountain Air Drive approach stop controlled with single lane approaches and no turn pockets provided. The operational analysis shows that the intersection has an overall level of service (LOS) of B under design year traffic conditions in the AM Peak.

Right-Turn Pocket on Mountain Air Drive

The addition of a right-turn pocket on Mountain Air Drive would have little to no safety impact. If included, the design should take into consideration the driveway for Fire Station 10. Based on guidance from NCHRP 457, once the minor approach volumes reach 0.7 volume-to-capacity ratio, then a second approach lane may be considered. Based on the traffic projects, the volume-to-capacity ratio for the AM Peak in the design year for the Mountain Air approach will be 0.23, which does not reach the recommended requirement.

Right-Turn Pocket on Rabbit Creek Road

The addition of a right-turn pocket would have the benefit of separating out the traffic slowing to make a right turn from the vehicles traveling through the intersection. This would reduce the potential for rear-end crashes. Based on guidance from NCHRP 457, the northbound traffic on Rabbit Creek Road does not meet the warrants for adding a right-turn pocket to a two-lane roadway at the intersection. If included in the design, care should be given to managing speeds as a full-length, full-deceleration turn pocket can lead to higher speeds in the through lane.

Left-Turn Pocket on Rabbit Creek Road

The addition of a left-turn pocket would have the benefit of separating out the traffic slowing and stopped, waiting to make a left turn from the vehicles travelling through the intersection. This would reduce the potential for intersection related crashes and also reduce delay to vehicles southbound on Rabbit Creek Road traveling through the intersection. Field observations indicate that vehicles currently use the shoulder to bypass traffic waiting to make the left-turn movement onto Mountain Air Drive. Based on guidance from NCHRP 457, the southbound traffic on Rabbit Creek Road does not meet the warrants for adding a left-turn pocket to a two-lane roadway at the intersection. If included in the design, a left-turn pocket would reduce the shoulder bypass activity, however care should be given to managing speeds as a full-length, full-deceleration turn pocket can lead to higher speeds in the through lane.

Signalized Intersection

A signalized intersection can reduce the delay to the minor street by interrupting the flow on the major street. At this specific location, it could also improve the ability of emergency service vehicles to quickly and safely enter Rabbit Creek Road using signal preemption. When considering major intersection improvements, a warrant analysis for a signalized intersection should be performed prior to consideration of a roundabout. To determine if a signalized intersection is warranted, the Manual on Uniform Traffic Control Devices (MUTCD) provides eight different signal warrants. As part of this analysis, only signal warrants 1 through 3, which relate to traffic volume, were evaluated. The results of the warrant analysis are shown in Table 2.

SIGNAL WARRANT	WARRANT MET IN DESIGN YEAR?
Warrant 1: Eight-Hour Vehicular Volume	No
Warrant 2: Four-Hour Vehicular Volume	No
Warrant 3: Peak Hour	No

Table 2 – MUTCD Signal Warrant Analysis

Roundabout Intersection

A roundabout has the potential to drastically reduce the severity of intersection related crashes. It also can have an operational benefit over stop controlled or signalized intersections. DOT&PF has adopted a "Roundabout First" policy, which states that designers must provide a written justification of any decision to install a traffic signal instead of a single-lane roundabout. While this intersection does not meet warrants for a signalized intersection, we still evaluated the warrants for installation of a roundabout found in NCHRP 457 as a second check. The study intersection does not meet these warrants in the design year.

Recommended Alternative

The recommended alternative is to keep the intersection at the current configuration. The addition of turn pockets at any of the approaches is not warranted based on NCHRP 457 and provide limited reduction in delay. Neither a signalized intersection nor roundabout are warranted as cost-effective. The existing configuration does not currently experience significant intersection-related crashes or operational delays. We also recommend direct coordination with Bear Valley Elementary School to discuss circulation options that will accommodate waiting parents during pick-up times to reduce the operational impact to both Mountain Air Drive and Rabbit Creek Road. An additional circulation driveway off Mountain Air Drive may improve onsite queueing and reduce conflicts. Walking routes were not evaluated by this study, this is separately managed through MOA and the Anchorage School District. Currently, the MOA Safe Routes to School Manual requires all elementary age students be transported to Bear Valley by bus or vehicle.

Attach: Appendix A: Traffic Growth Calculations (5 pages)
Appendix B: LOS Analysis Outputs (6 pages)

Appendix A
Traffic Growth Calculations

MEMORANDUM

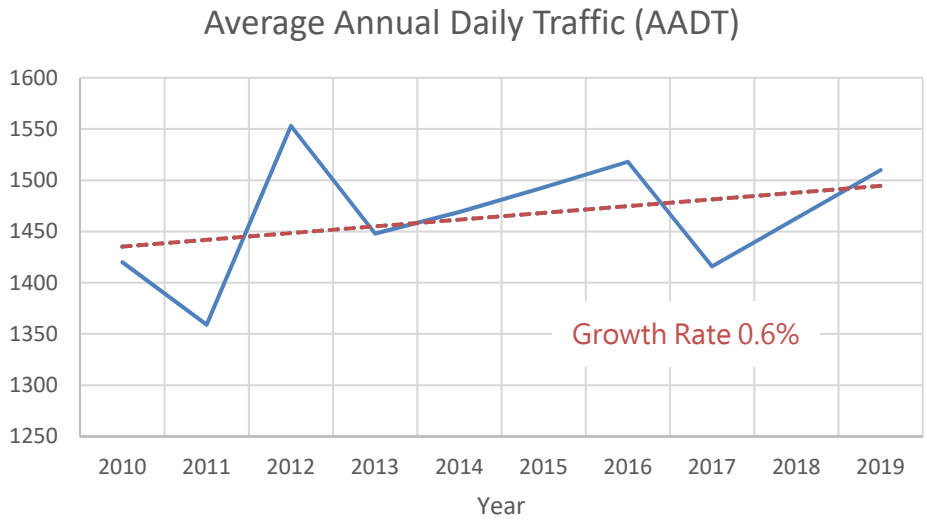
To: Julia Hanson, PE (Alaska Department of Transportation & Public Faculties)
From: Trevor Strait, PE, PTOE (HDL Engineering Consultants, LLC)
Thru: Stephanie Mormilo, PE (HDL Engineering Consultants, LLC)
Date: May 23, 2022
Project: AMATS: Mountain Air Drive Extension (CFHWY00710/0001690)
Subject: DRAFT Traffic Growth Calculations

Traffic Growth Calculations

This memo is to describe the process used to determine future traffic and turning movement volumes for Mountain Air Drive. The traffic forecasting for this analysis was done using three components: the historical traffic growth on Rabbit Creek Road, the change in traffic patterns assumed for Bear Valley Elementary School, and the future residential development assumed to occur following the construction of this project.

Rabbit Creek Road Historical Growth

To determine the background growth rate for predicted future traffic volumes on Rabbit Creek, AADT for years 2010-2019 were analyzed from the nearby Automated Traffic Recorder (ATR) on Rabbit Creek between Clarks Road and Old Rabbit Creek Road. The resulting Growth Rate was 0.6%. This growth rate was applied to a 20-year future design model.



Bear Valley Elementary School

The traffic associated with Bear Valley Elementary School contributes heavily to the volumes at the Rabbit Creek Road intersection. Initially, the school traffic was increased using the growth rate identified along Rabbit Creek Road. Following this, an analysis was performed to determine how much school traffic would travel south on Mountain Air Drive instead of using the intersection at Rabbit Creek Road. To assist with this analysis, turning movement data was collected at the intersection of Goldenview Drive and Rabbit Creek Road during the AM and PM peak periods. A portion of the traffic turning right onto eastbound Rabbit Creek Road and left onto southbound Goldenview Drive was assumed to be school related. Using GIS layers for the school boundary and property parcels, a ratio of vehicles expected to access the school from the south once Mountain Air Drive is constructed was determined. This was applied to the assumed current number of vehicles driving to the school from Goldenview Drive to predict the change in school driving routes.

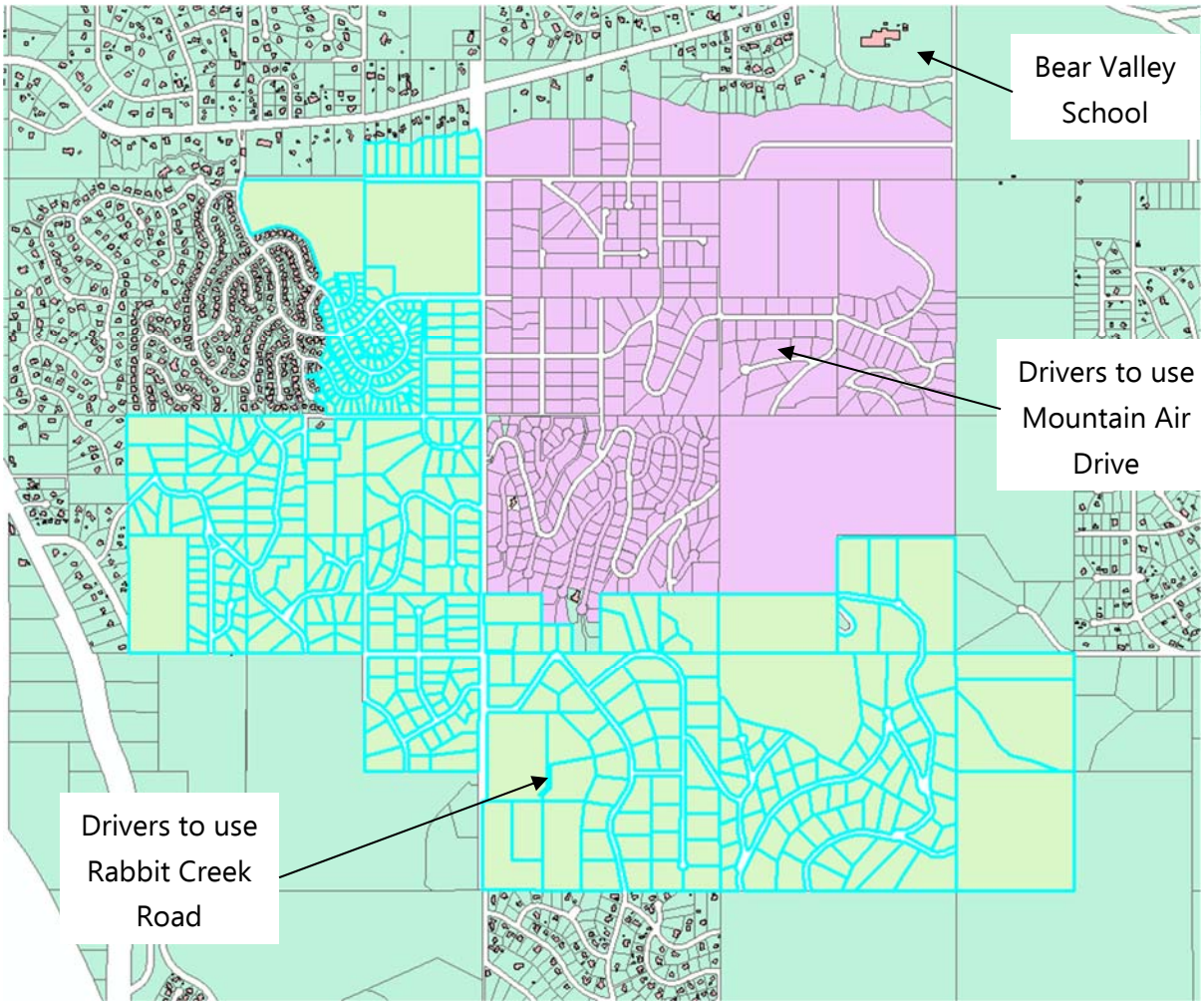


Figure 1 – Parcels within the school boundary that will access the school from the south on Mountain Air Drive once construction is complete

Future Development

The Mountain Air Drive Extension provides access to some additional area for residential development. Figure 2 shows the parcels that are expected to use Mountain Air Drive as their primary access to Rabbit Creek Road. GIS data from the MOA was used to determine the following for each included parcel:

- Development status
- Zoning designation

Using the zoning data, assumptions were made for each undivided parcel on how many subdivided lots were likely. In some cases, data was available for planned subdivisions. This information was then combined with assumptions of single family home development rates to determine the overall expected number of single family homes from this area.

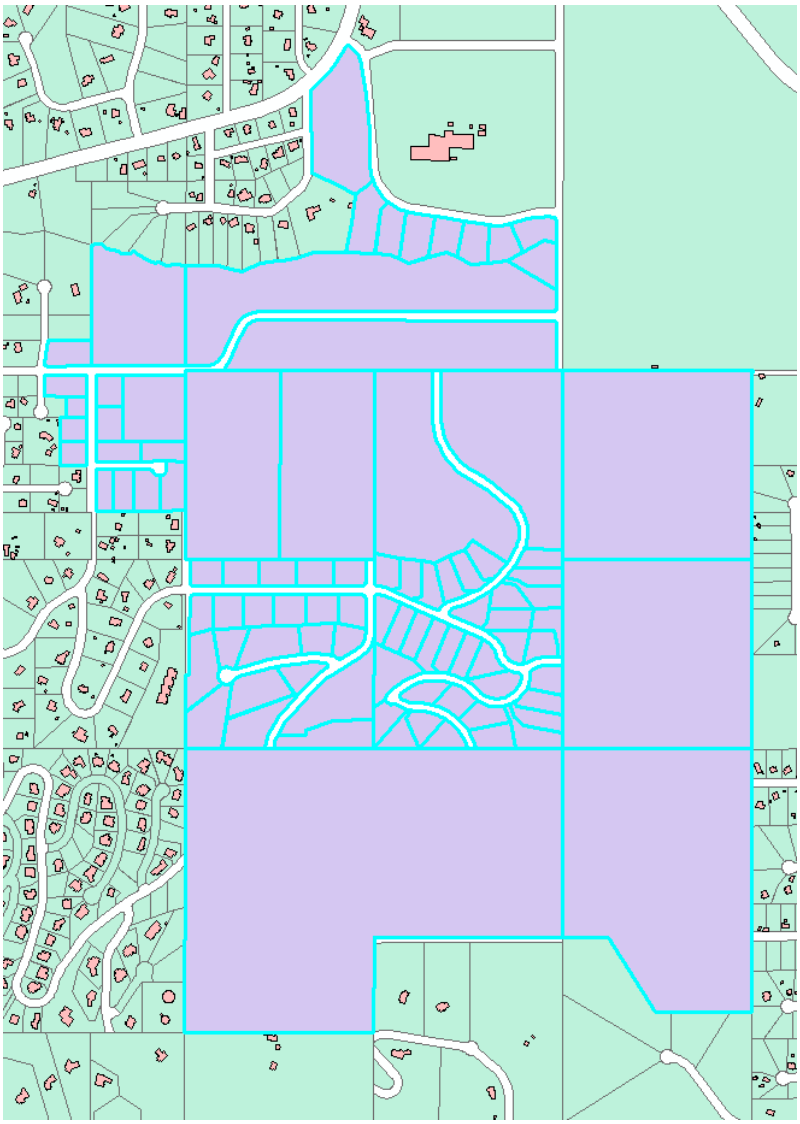


Figure 2 – Highlighted Parcels Expected to Use Mountain Air Drive as Primary Access

	Construction (2028)	Mid-Life (2038)	Design (2048)
Existing Development	33	33	48
Future Construction On Subdivided Lots	5	15	25
Future Construction In Planned Subdivisions	0	10	20
Future Construction On Undeveloped Parcels	0	0	19
Total	38	58	112

Table 1 – Expected Single Family Homes in Development Area

An initial review of ITE Trip Generation data for expected single family home vehicle usage appeared high for this part of Anchorage. Given the distance to potential destinations, drivers from this area tend to consolidate trips, where possible. The nearby Bear Valley area provided a good way to assess driver behavior in the area. The Bear Valley area has 226 single family homes with only one access route on Clarks Road. The Department of Transportation and Public Facilities (DOT&PF) collects traffic data on Clarks Road, which allowed us to determine that, on average, a single family home generates 5.1 trips per day. This rate was then applied to the expected single family homes expected to use Mountain Air Drive as their primary route.

Results

Future traffic volumes were determined by combining the three analysis listed above. The projected AADTs on Mountain Air Drive and turning movement volumes at the Rabbit Creek intersection are shown in Tables 2 & 3, respectively.

	Construction (2028)	Mid-Life (2038)	Design (2048)
North Of Bear Valley Elementary School	854	996	1,315
South Of Bear Valley Elementary School	439	556	847

Table 2 – Projected AADTs on Mountain Air Drive

	Mountain Air WB		Rabbit Creek NB		Rabbit Creek SB	
	LT	**RT**	**THRU**	**RT**	**LT**	**THRU**
Construction (2028)	79	32	61	91	44	82
Mid-Life (2038)	86	34	65	97	47	87
Design (2048)	107	38	69	109	51	92

Table 3 – Projected Turning Movements During the AM Peak Period at the Rabbit Creek Road / Mountain Air Drive Intersection

Appendix B
LOS Analysis Outputs

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	107	38	69	109	51	92
Future Vol, veh/h	107	38	69	109	51	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	41	75	118	55	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	344	134	0	0	193	0
Stage 1	134	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	652	915	-	-	1380	-
Stage 1	892	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	625	915	-	-	1380	-
Mov Cap-2 Maneuver	625	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	682	1380	-
HCM Lane V/C Ratio	-	-	0.231	0.04	-
HCM Control Delay (s)	-	-	11.9	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	107	38	69	109	51	92
Future Vol, veh/h	107	38	69	109	51	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	41	75	118	55	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	344	134	0	0	193	0
Stage 1	134	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	652	915	-	-	1380	-
Stage 1	892	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	625	915	-	-	1380	-
Mov Cap-2 Maneuver	625	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	625	915	1380	-
HCM Lane V/C Ratio	-	-	0.186	0.045	0.04	-
HCM Control Delay (s)	-	-	12.1	9.1	7.7	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	0.1	-

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	107	38	69	109	51	92
Future Vol, veh/h	107	38	69	109	51	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	100	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	41	75	118	55	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	285	75	0	0	193	0
Stage 1	75	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	705	986	-	-	1380	-
Stage 1	948	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	675	986	-	-	1380	-
Mov Cap-2 Maneuver	675	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	790	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	736	1380	-
HCM Lane V/C Ratio	-	-	0.214	0.04	-
HCM Control Delay (s)	-	-	11.2	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	107	38	69	109	51	92
Future Vol, veh/h	107	38	69	109	51	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	41	75	118	55	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	344	134	0	0	193	0
Stage 1	134	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	652	915	-	-	1380	-
Stage 1	892	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	626	915	-	-	1380	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	792	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	682	1380	-
HCM Lane V/C Ratio	-	-	0.231	0.04	-
HCM Control Delay (s)	-	-	11.9	7.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Intersection Delay, s/veh	4.0
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	157	193	155
Demand Flow Rate, veh/h	160	196	158
Vehicles Circulating, veh/h	76	56	118
Vehicles Exiting, veh/h	176	220	118
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.9	4.1	4.1
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	160	196	158
Cap Entry Lane, veh/h	1277	1303	1223
Entry HV Adj Factor	0.981	0.982	0.981
Flow Entry, veh/h	157	193	155
Cap Entry, veh/h	1253	1280	1200
V/C Ratio	0.125	0.150	0.129
Control Delay, s/veh	3.9	4.1	4.1
LOS	A	A	A
95th %tile Queue, veh	0	1	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	107	38	69	109	51	92
Future Volume (veh/h)	107	38	69	109	51	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	41	75	118	55	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	198	70	197	311	411	379
Arrive On Green	0.16	0.16	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1267	448	655	1030	386	1256
Grp Volume(v), veh/h	158	0	0	193	155	0
Grp Sat Flow(s),veh/h/ln	1726	0	0	1685	1642	0
Q Serve(g_s), s	1.4	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.0	1.5	1.5	0.0
Prop In Lane	0.73	0.26		0.61	0.35	
Lane Grp Cap(c), veh/h	269	0	0	508	789	0
V/C Ratio(X)	0.59	0.00	0.00	0.38	0.20	0.00
Avail Cap(c_a), veh/h	5256	0	0	6146	5992	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.5	0.0	0.0	4.6	4.4	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	0.0	0.0	5.0	4.5	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	158		193			155
Approach Delay, s/veh	8.5		5.0			4.5
Approach LOS	A		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		9.5			9.5	7.1
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		60.5			60.5	50.5
Max Q Clear Time (g_c+I1), s		3.5			3.5	3.4
Green Ext Time (p_c), s		1.1			0.9	0.5

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.