

■ *Revised Traffic Impact Study*

*Buck Creek PUD  
Avon, Colorado*

*Prepared for:  
Tanavon Corporation*

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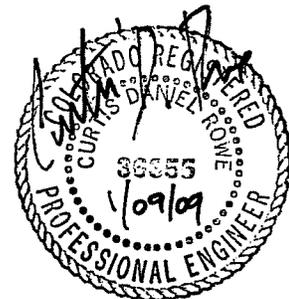
R E V I S E D  
T R A F F I C I M P A C T S T U D Y

**Buck Creek PUD**

Avon, Colorado

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## 1.0 EXECUTIVE SUMMARY

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The Buck Creek PUD development is proposed to be located on the northeast corner of Nottingham Road and Buck Creek Road in Avon, CO. The Buck Creek PUD development is anticipated to include 42 multi-family dwelling units, a 13,321 square foot Gore Range Natural Science School, 3,000 square feet of office, a 3,000 square foot Montessori School, and a fire station that will serve as a regional hub station. It is expected that the project would be complete within the next few years. Analysis was therefore completed for the existing plus project short term horizon, as well as the full area build out long-term horizon.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. Specifically, this revision has been prepared calculating the future background traffic in the study area based on actual anticipated build out completion of Wildwood (Mtn Star) and Wildridge developments rather than using the standard 2 percent annual traffic growth rate. This procedure will provide a more accurate estimate of future traffic volumes since no other developments or traffic is anticipated in the study area in the future. Town of Avon staff identified the existing intersection of Nottingham Road with Buck Creek Road, as well as the proposed access driveway along Buck Creek Road for incorporation into this traffic impact study.

Regional access to the site is expected to be provided by Interstate 70 and US Highway 6. Primary access to the site will be provided by Nottingham Road. Direct access to the project is proposed from one full movement access driveway along Buck Creek Road.

The entire Buck Creek PUD development is expected to generate approximately 792 daily weekday driveway trips. Of these, 102 trips are expected to occur during the weekday morning peak hour, while 97 trips are expected during the weekday afternoon peak hour.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, anticipated surrounding development areas, and the proposed access system for the project. Assignment of the project traffic was based upon the trip generation described previously and the distribution developed.

Based on the analysis presented in this report, Kimley-Horn believes the proposed Buck Creek PUD development will be successfully incorporated into the existing roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations:

- It is recommended that the proposed access driveway intersection along Buck Creek Road operate with stop control along the access driveway approach to the intersection. As such, a "STOP" (R1-1) sign should be placed along the project access driveway approach to the intersection in accordance with guidance provided in the MUTCD. The exiting vehicle queue is anticipated to be one vehicle (25 feet) at this access. No additional turn lane improvements were found to be required at this access intersection.
- It is recommended that Town of Avon staff monitor traffic volumes at the intersection of Buck Creek Road with Nottingham Road in the long term future to determine what improvements may be needed based on actual traffic volumes. Future improvements may include widening Nottingham Road to a three-lane roadway which would allow a two-stage left turn from Buck Creek Road or a single lane roundabout.
- All on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings, and conform to the Town of Avon standards, as well as the Manual on Uniform Traffic Control Devices - 2003 Edition (MUTCD).

## 2.0 INTRODUCTION

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Kimley-Horn and Associates, Inc. (Kimley-Horn) has prepared this report to document the results of a Traffic Impact Study of future traffic conditions associated with the proposed Buck Creek PUD development to be located on the northeast corner of the Nottingham Road and Buck Creek Road intersection in Avon, Colorado. The vicinity map illustrating the project site location is shown in **Figure 1**.

The Buck Creek PUD development is anticipated to include 42 multi-family dwelling units, a 13,321 square foot Gore Range Natural Science School, 3,000 square feet of office, a 3,000 square foot Montessori School, and a fire station that will serve as a regional hub station. It is expected that the project would be complete within the next few years. Analysis was therefore completed for the existing plus project short term horizon, as well as the full area build out long-term horizon. The conceptual site plan illustrating the development and access locations is shown in **Appendix A**.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. Specifically, this revision has been prepared calculating the future background traffic in the study area based on actual anticipated build out completion of Wildwood (Mtn Star) and Wildridge developments rather than using the standard 2 percent annual traffic growth rate. This procedure will provide a more accurate estimate of future traffic volumes since no other developments or traffic is anticipated in the study area in the future. Town of Avon staff identified the existing intersection of Nottingham Road with Buck Creek Road, as well as the proposed access driveway along Buck Creek Road for incorporation into this traffic impact study.

Regional access to the site is expected to be provided by Interstate 70 and US Highway 6. Primary access to the site will be provided by Nottingham Road. Direct access to the project is proposed from one full movement access driveway along Buck Creek Road.

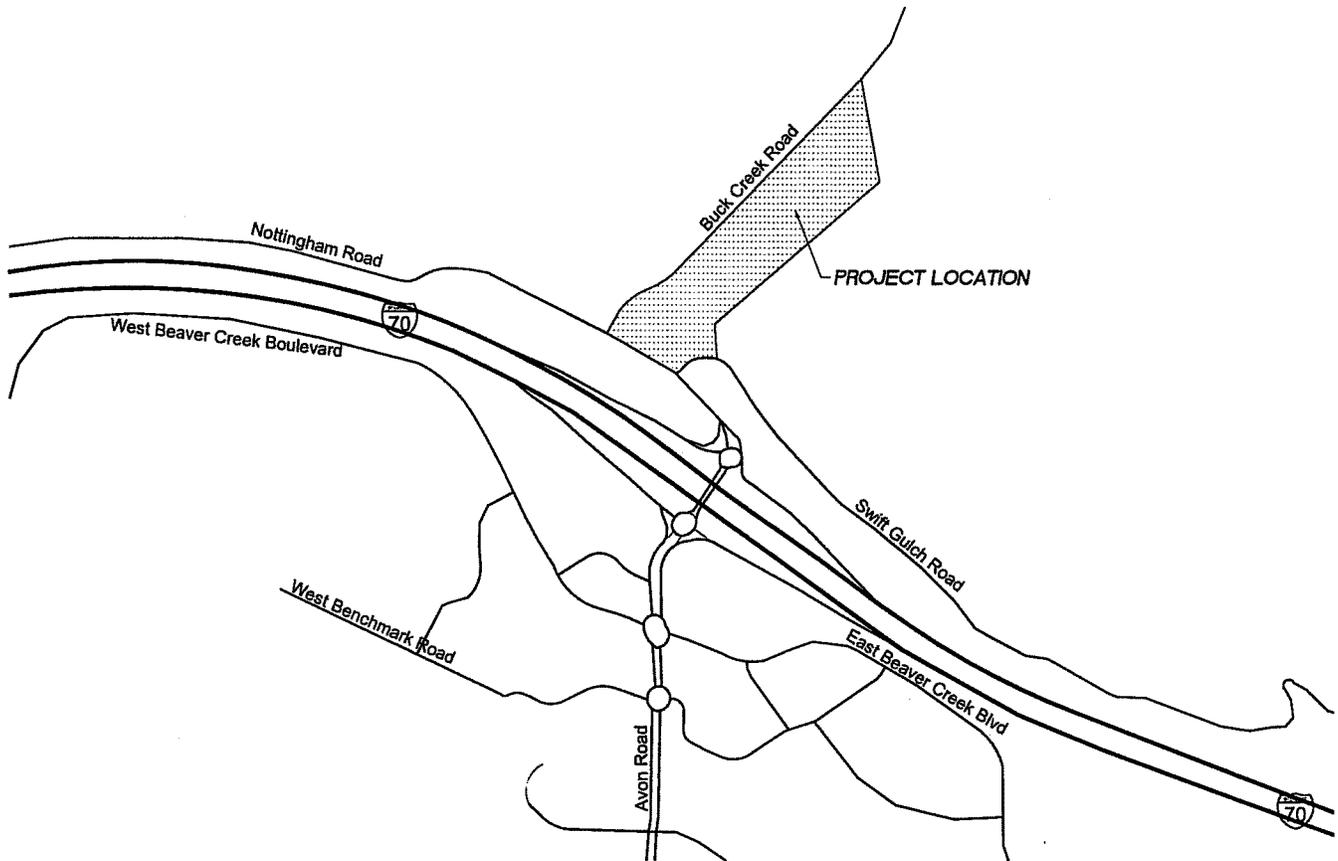


FIGURE 1  
BUCK CREEK PUD  
VICINITY MAP

## 3.0 EXISTING AND FUTURE CONDITIONS

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### 3.1 Existing Roadway Network

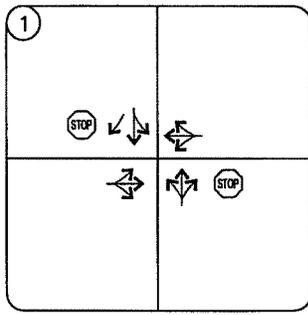
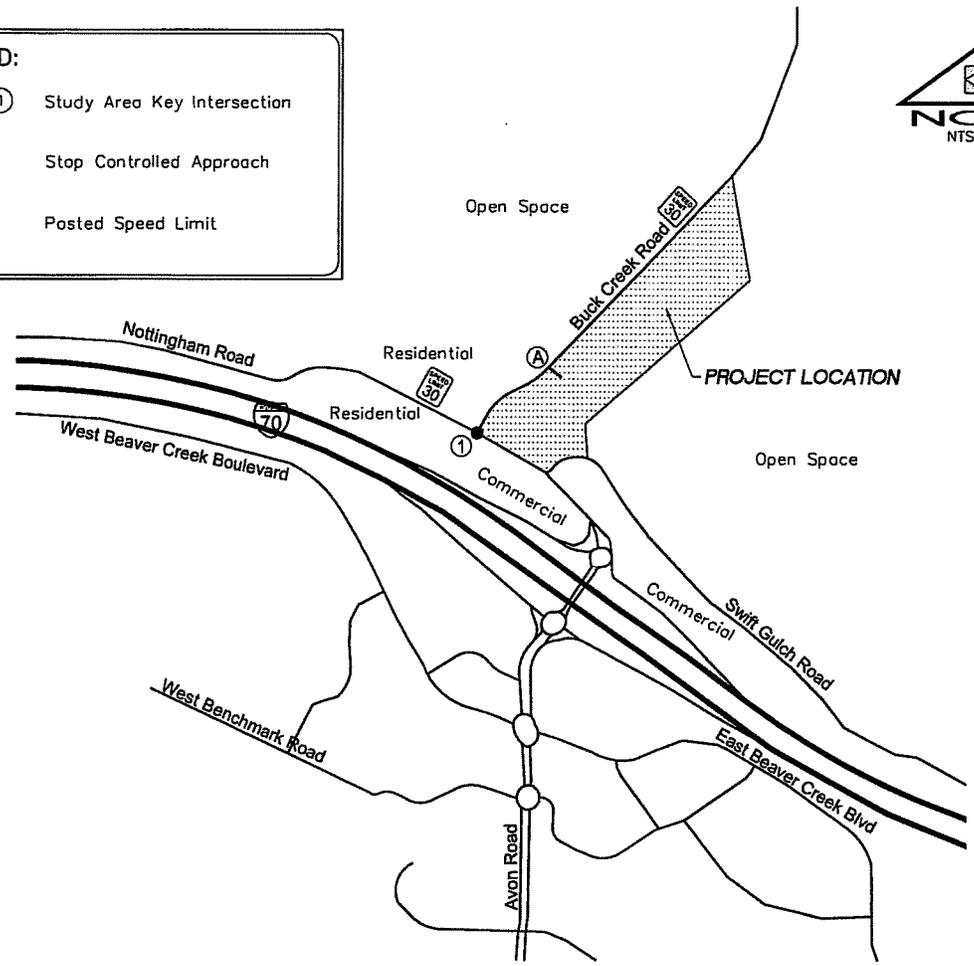
Nottingham Road borders the southern edge of the proposed Buck Creek PUD development and is anticipated to be utilized by project traffic wishing to access I-70 or the Town of Avon. Nottingham Road provides one lane of travel in each direction with a posted speed limit of 30 miles per hour adjacent to the site. Buck Creek Road borders the western edge of the Buck Creek PUD development and will provide direct access to the project from Nottingham Road and the residential development to the north. Buck Creek Road provides one lane of travel in each direction with a posted speed limit of 30 miles per hour adjacent to the project. The intersection of Nottingham Road with Buck Creek Road operates with two-way stop control along the Buck Creek approach. An access to an existing development aligns as the south leg of this intersection. The intersection consists of one lane approaches along Nottingham Road with an additional separate right turn lane constructed on the southbound Buck Creek approach. The existing intersection lane configuration and control for the key intersection of Nottingham Road with Buck Creek Road is shown in attached **Figure 2**.

### 3.2 Existing Study Area

The proposed development is generally bounded by open space and residential uses to the north, Buck Creek Road to the west, and residential uses to the south. The existing site is comprised primarily of vacant land.

**LEGEND:**

- ① Study Area Key Intersection
- ⊘ STOP Stop Controlled Approach
- ⊠ 30 Posted Speed Limit



**FIGURE 2  
BUCK CREEK PUD  
EXISTING LANEAGE AND CONTROL**

### 3.3 Existing Traffic Volumes

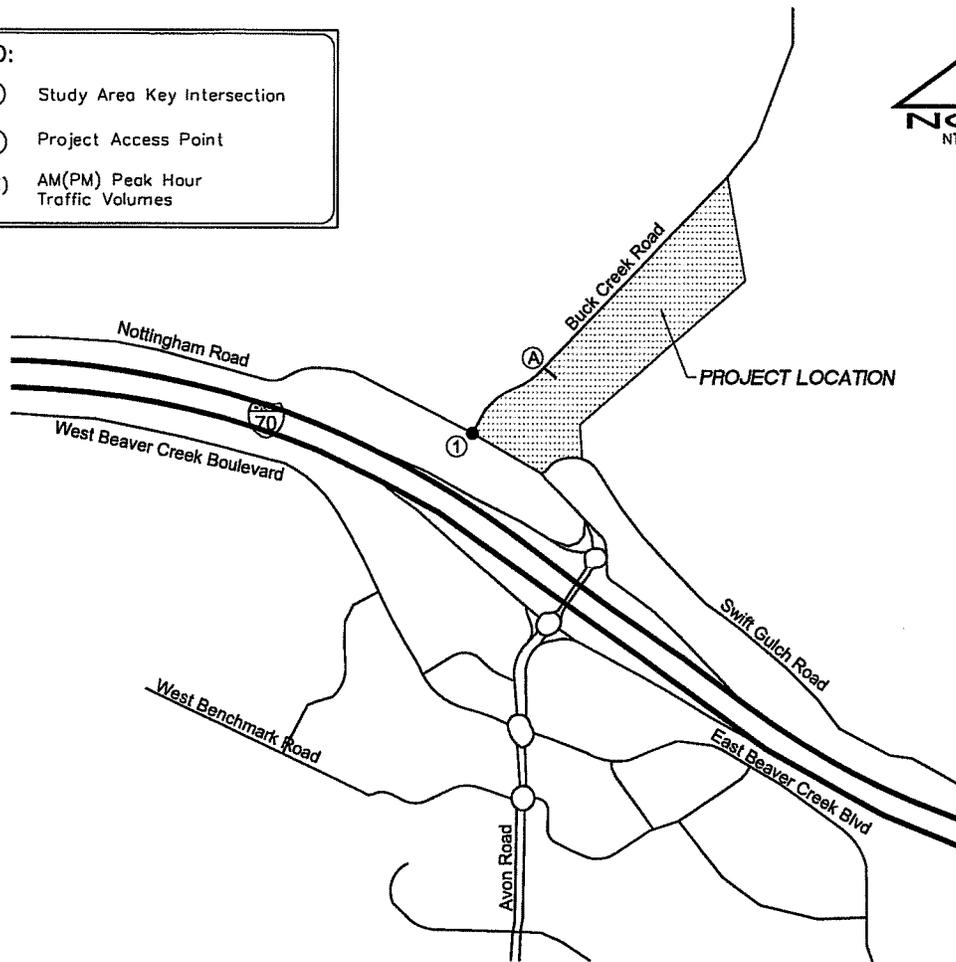
Existing peak hour turning movement counts were conducted at the study intersection (Nottingham Road and Buck Creek Road) on Thursday, April 3, 2008. The counts were conducted during the AM and PM peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. Existing turning movement counts are shown in **Figure 3** with count sheets provided in **Appendix B**.

### 3.4 Unspecified Development Traffic Growth

Instead of using the standard two percent annual average growth rate as provided in the Town of Avon Transportation Plan Update prepared by MK Centennial in November of 1996, the actual future traffic volumes from build out of Wildwood (Mtn Star) and Wildridge have been estimated through the project study area. This procedure will provide a more accurate estimate of future traffic volumes since no other developments or traffic is anticipated in the study area in the future. Wildwood (Mtn Star) presently has 50 developed lots with 44 undeveloped lots. Trip generation was calculated for the remaining 44 undeveloped single family lots and assigned to the street network and key intersection. It is anticipated that of the remaining Wildwood development, 90 percent of the traffic will access the project via Buck Creek Road, while the remaining 10 percent will use Nottingham Road. Wildridge presently has 301 developed units with 59 units remaining to be developed. Trip generation was calculated for the remaining 59 multi-family units and assigned to the study area street network. It is anticipated that all project traffic for the remainder of this development will use Nottingham Road for access. Traffic from these two developments was added to existing traffic to obtain future long term full area build out background traffic volumes shown in **Figure 4**. The traffic assignments and future traffic volume calculations are included in **Appendix C**.

**LEGEND:**

- ① Study Area Key Intersection
- (A) Project Access Point
- XX(X) AM(PM) Peak Hour Traffic Volumes



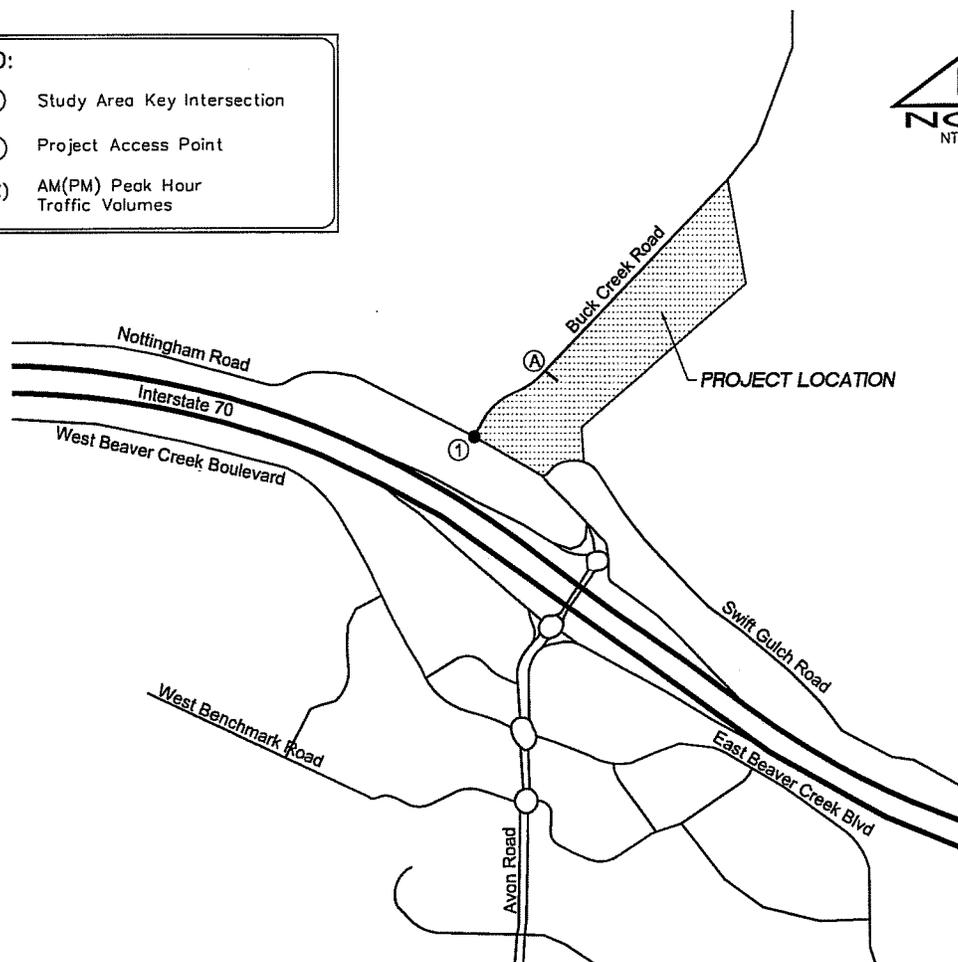
Thursday, April 3, 2008  
7:30-8:30 AM, 4:30-5:30 PM

①	
2(2) ↓ 0(0) ↓ 16(10)	28(36) ↖ 350(469) ← 1(5)
1(1) → 487(421) → 1(3) →	1(0) ↖ 0(0) ↑ 5(5) ↗

**FIGURE 3  
BUCK CREEK PUD  
EXISTING TRAFFIC VOLUMES**

**LEGEND:**

- ① Study Area Key Intersection
- (A) Project Access Point
- XX(X) AM(PM) Peak Hour Traffic Volumes



①	
2(2) ↓ 0(0) ↓ 41(22)	33(60) ← 359(498) ← 1(5)
1(1) → 514(438) → 1(3) ↓	1(0) ↑ 0(0) ↑ 5(5) ↑

**FIGURE 4  
BUCK CREEK PUD  
BUILDOUT BACKGROUND TRAFFIC VOLUMES**

## 4.0 PROJECT TRAFFIC CHARACTERISTICS

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### 4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land uses to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Report*<sup>1</sup> published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Report average rate equations that apply to Residential Condominium/Townhouse (230), Day Care Center (565), and Office Building (710) for traffic associated with the development. The Day Care Center (565) was determined to be the most applicable ITE land use for the proposed Montessori School since the peak hour operations of these two uses are believed to be quite similar. Since the ITE Trip Generation Report does not provide equations for the type of land use associated with the Gore Range Natural Science School or the Fire Station, future trip generation estimates for these land uses were based on information provided by the Gore Range Natural Science School's Executive Director and representatives from the Eagle River Fire Department.

#### Gore Range Natural Science School Anticipated Operations

Based on information obtained from the school, it is anticipated that at least one bus and sometimes two buses will arrive at the Gore Range Natural Science School each day. It is estimated that these buses would arrive during the morning peak hour of adjacent street traffic and depart prior to the afternoon peak hour of adjacent street traffic (around 3:00 PM). Approximately 40 visitors are anticipated at the Mountain Discovery Center each day. It was estimated that on average, two visitors would arrive in each vehicle for a total of 20 entering and 20 exiting vehicles per day. It was assumed that these visitors would begin arriving after morning peak hour of adjacent street traffic and that a maximum of 4 vehicles would depart

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<sup>1</sup> Institute of Transportation Engineers, *Trip Generation: An Information Report*, Seventh Edition, Washington DC, 2003.

during the afternoon peak hour of adjacent street traffic. Fifteen employees are anticipated each day at the Gore Range Natural Science School. It was estimated that one-quarter of these employees would carpool or use alternative transportation to travel to and from work. Therefore, it was estimated that a maximum of 11 vehicles would arrive at the school during the morning peak hour of adjacent street traffic and 11 vehicles would depart the school during the afternoon peak hour of adjacent street traffic. The school will also be available for evening programs. Ninety visitors maximum could be accommodated for each program and it was estimated that on average, two visitors would arrive in each car. Therefore, a maximum of 45 entering and 45 exiting vehicles would be anticipated for evening programs. However, it was assumed that these trips would occur outside of the afternoon peak hour of adjacent street traffic. This information is included in **Appendix D**.

#### Fire Station Anticipated Operations

Based on information provided by the Eagle River Fire Department, it is estimated that the fire station will generate approximately 96 trips per day. Of these trips, it is assumed that approximately 24 trips will occur during the morning peak hour and 12 trips will occur during the afternoon peak hour. The on-duty operational crew at the fire station will run in 48-hour shifts of 9 employees per shift. The arriving shift of 9 employees will enter the site prior to the morning peak hour (around 6:45 am) and the departing shift will typically leave the site during the morning peak hour (around 7:30 am). The operational crew would also typically make 1-2 trips per day that would not coincide with the morning and afternoon peak hours for groceries and other miscellaneous activities equating to a total of 20 trips per day. In addition to the on-duty operational crew, an eight (8) member apprentice crew will live at this station. One third (3) will leave at 6:30 AM (prior to the morning peak hour) to be on duty at another station. They will be at the station (not Avon) for 48 hours and then return roughly at 7:30 AM (during the AM peak hour). One third (3) will be on duty at Avon, and therefore will not leave the facility for 48 hours. The other 2 apprentice members will be off duty, and may come and go as they wish. Therefore, it is assumed that these 8 member apprentices would generate a total of 16 daily trips (three departing trips at 6:30 AM, three arriving trips at 7:30 AM, and 10 daily trips made by the remaining two off duty apprentices) and three (3) AM peak hour entering

trips. It is important to note that although it is understood that the shift change does not occur each day this provides a conservative estimate of daily trips.

The fire station will also employ approximately 10 people for administrative duties. These administrative employees will likely arrive during the morning peak period and depart during the afternoon peak period, equating to 10 entering trips during the morning peak hour and 10 exiting trips during the afternoon peak hour or 20 trips per day. There will also likely be 6 to 10 daily trips to be made by visitors of the Administrative Building. These trips are usually contractors needing permits or meetings with fire prevention staff. These trips are not anticipated during the morning and afternoon peak hours.

The Eagle River Fire District responded to approximately 930 calls from the Avon Fire Station in 2007. There were very high seasonal fluctuations in these numbers as responses are typically higher during holiday weekends and the peak wintertime ski season. Averaging these 930 responses over five months equates to an average of 6 responses per day or 6 trips exiting the fire station and 6 trips returning to the fire station per day. It is likely that no more than one response would occur during the typical morning or afternoon peak hours. Therefore, these assumptions were used to approximate the daily and peak hour trip generation corresponding to emergency response of the fire station.

Inspections occur periodically throughout the day, but do not coincide with the morning and afternoon peak periods. Inspections typically occur about 6 times each day, equating to 12 trips per day (6 entering and 6 exiting). The fire station is also likely to experience visits from contractors two to three times per day equating to approximately 3 entering and 3 exiting trips per day. These visits are not anticipated to coincide with the morning and afternoon peak periods. A board meeting will likely occur once per month around noon that will consist of 12 vehicles entering and 12 vehicles exiting the site prior to and after the meeting, respectively. However, since this is not a typical daily occurrence, these trips were not included in the daily traffic volume estimates.

### Buck Creek Development Trip Generation Results

The entire Buck Creek PUD development is expected to generate approximately 774 daily weekday driveway trips. Of these, 100 trips are expected to occur during the weekday morning peak hour, while 96 trips are expected during the weekday afternoon peak hour. **Table 1** summarizes the estimated trip generation for the proposed development. The trip generation worksheets are included in **Appendix D**. These calculations illustrate the equations used, directional distribution of trips, and number of daily trips.

**Table 1 -Buck Creek PUD Project Traffic Generation**

Lot & Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
<b>Multi-Family Residential (42 dwelling units)</b>							
Total	246	3	15	18	15	7	22
<b>Day Care Center (3,000 sf)</b>							
Total	238	20	18	38	20	23	43
<b>Office Building (3,000 sf)</b>							
Total	34	4	1	5	1	3	4
<b>Gore Range Natural Science School</b>							
Bus Traffic	8	2	2	4	0	0	0
Visitor Traffic	40	0	0	0	0	4	4
Employee Traffic	22	11	0	11	0	11	11
Evening Program Traffic	90	0	0	0	0	0	0
Total	160	13	2	15	0	15	15
<b>Fire Station</b>							
Operational Crew	20	0	9	9	0	0	0
Administrative Employees	20	10	0	10	0	10	10
Administrative Visitors	10	0	0	0	0	0	0
Emergency Vehicle Demand	12	1	1	2	1	1	2
Inspectors	12	0	0	0	0	0	0
Contractors	6	0	0	0	0	0	0
Apprentice Fire Fighters	16	3	0	0	0	0	0
Total	96	14	10	24	1	11	12
<b>Total</b>	<b>774</b>	<b>54</b>	<b>46</b>	<b>100</b>	<b>37</b>	<b>59</b>	<b>96</b>

## 4.2 Trip Distribution

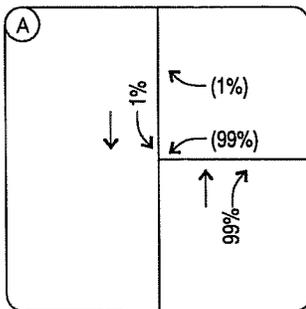
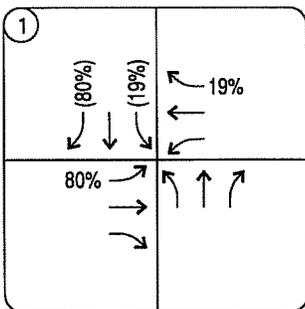
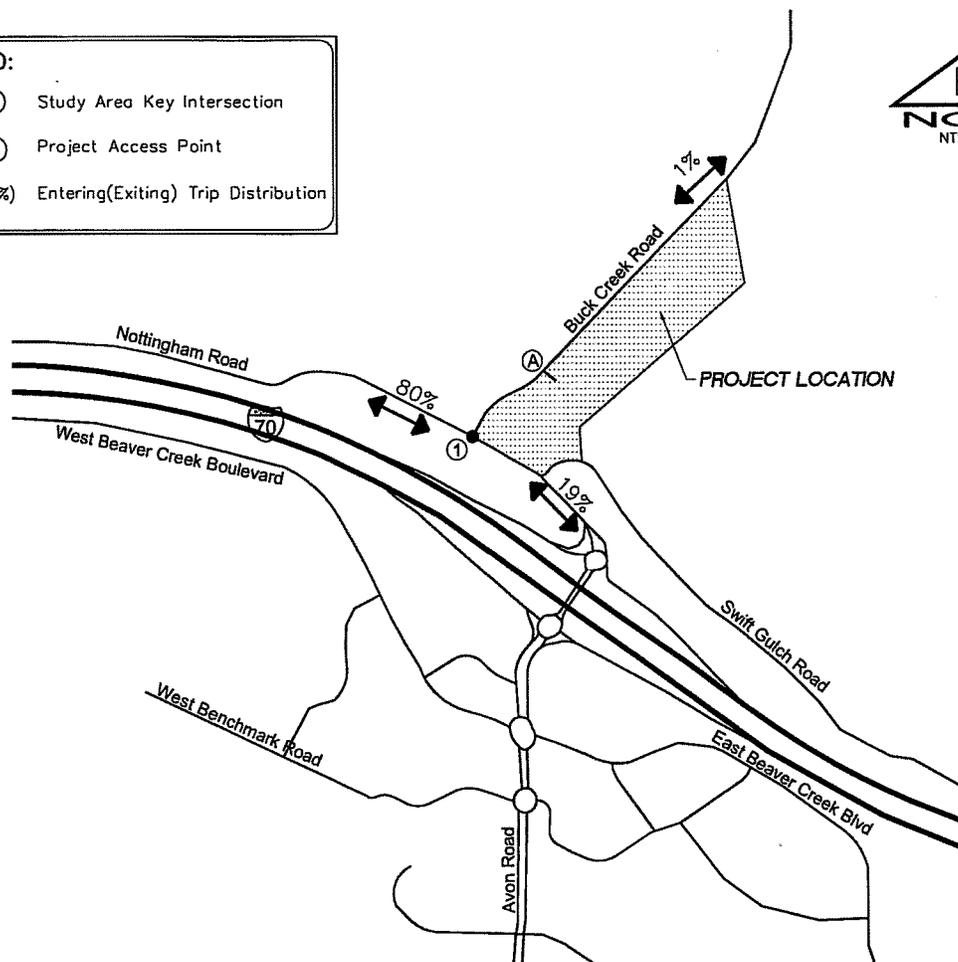
Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, anticipated surrounding development areas, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site in the same direction. In accordance with Town of Avon staff recommendations, separate trip distributions were prepared for the Montessori School and the other proposed land uses on the site. Figures 5 and 6 illustrate the expected project trip distribution for the Montessori School and other proposed uses included in the Buck Creek PUD, respectively.

## 4.3 Traffic Assignment and Total (Background Plus Project) Traffic

Traffic assignment was obtained by applying the project trip distributions to the estimated traffic generation of the development shown in Table 1. Project assignment for the site is shown in Figure 7. Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the existing plus project (short term) and full area buildout (long term) horizons. It is important to note that calendar years are no longer assigned to these volumes since the long term traffic is based on future area build out, independent of time or analysis year. These total traffic volumes for the project and study area are illustrated in Figure 8.

**LEGEND:**

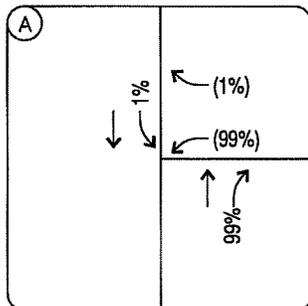
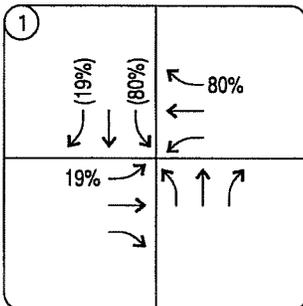
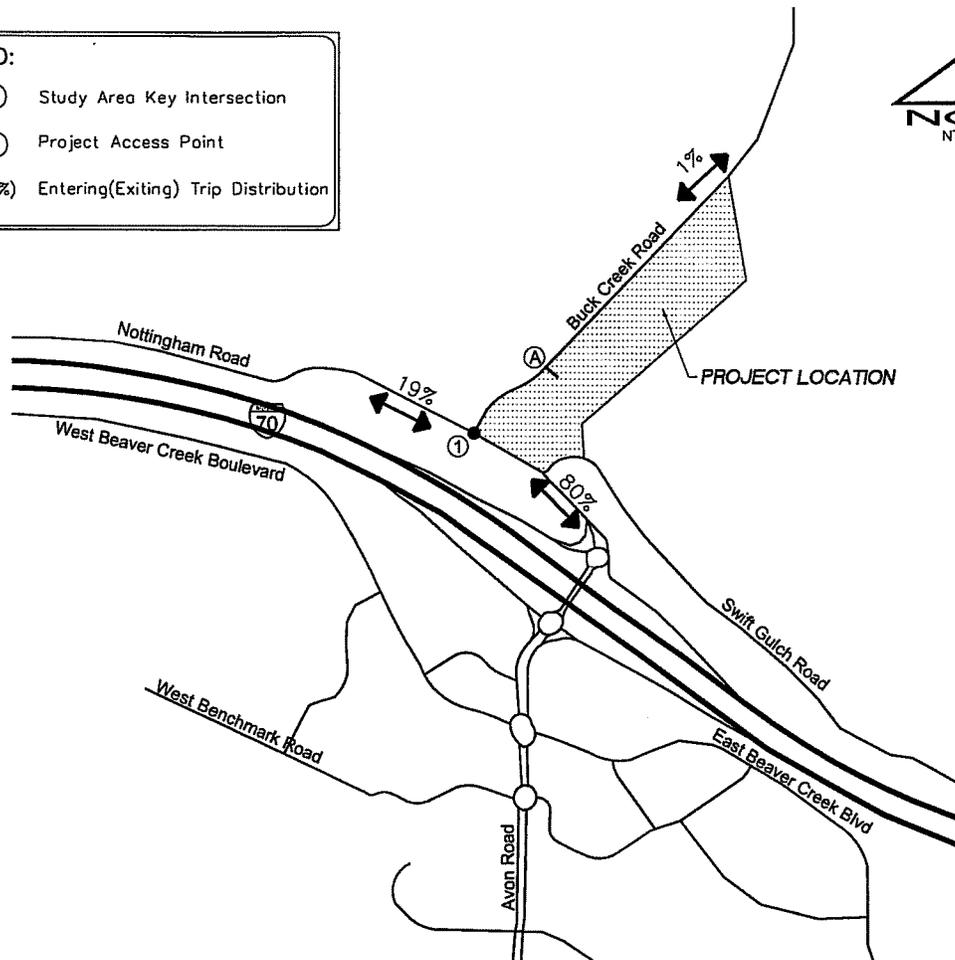
- ① Study Area Key Intersection
- (A) Project Access Point
- XX%(XX%) Entering(Exiting) Trip Distribution



**FIGURE 5  
BUCK CREEK PUD  
TRIP DISTRIBUTION FOR MONTESSORI SCHOOL**

**LEGEND:**

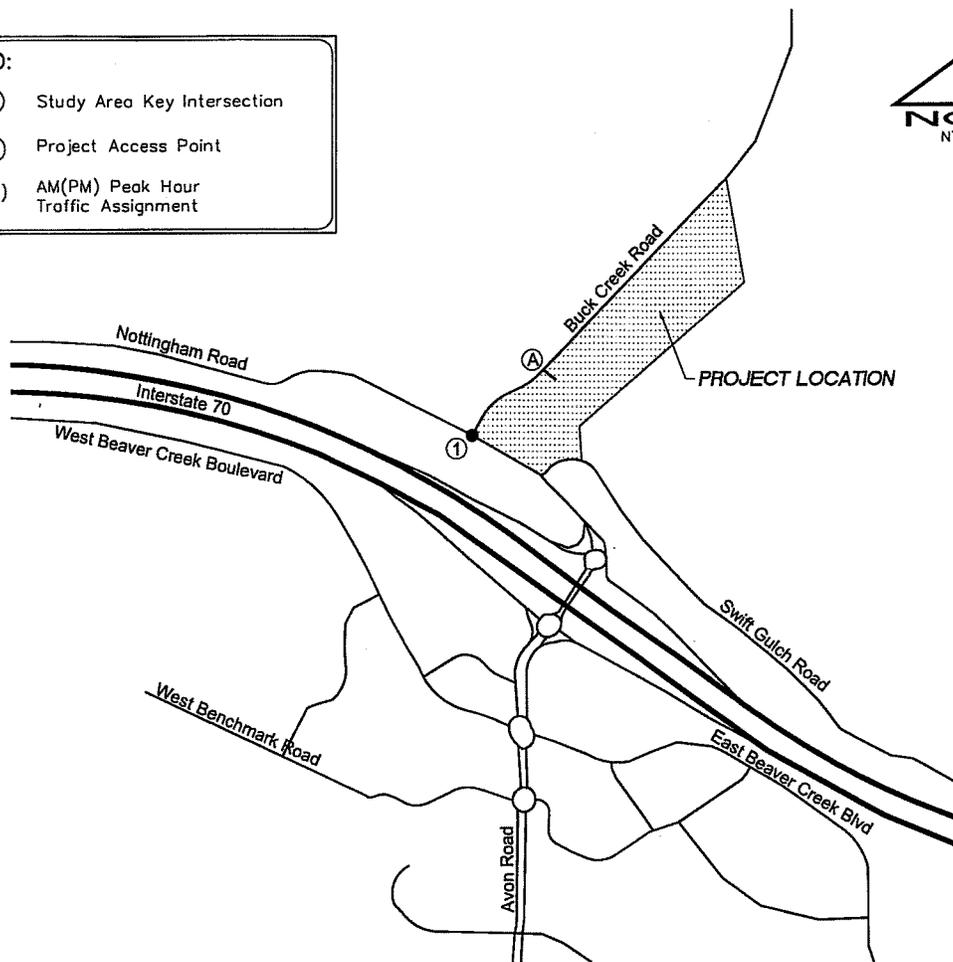
- (1) Study Area Key Intersection
- (A) Project Access Point
- XX%(XX%) Entering(Exiting) Trip Distribution



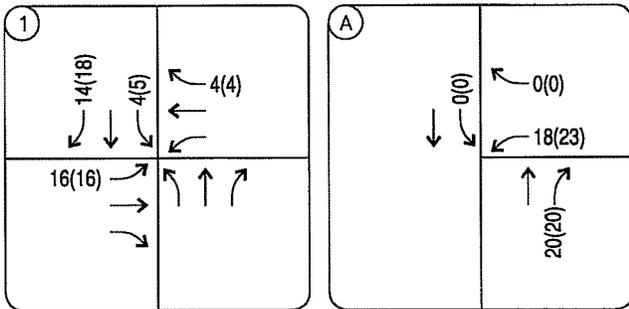
**FIGURE 6**  
**BUCK CREEK PUD**  
**TRIP DISTRIBUTION FOR ALL OTHER**  
**PROPOSED USES**

**LEGEND:**

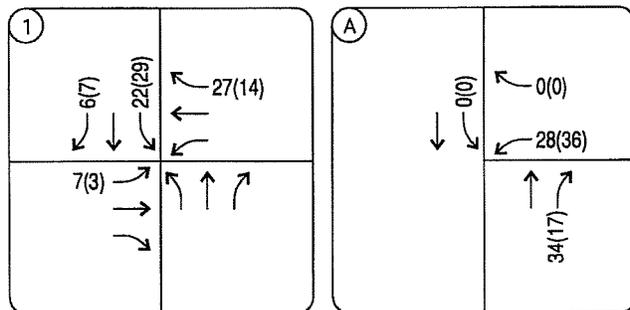
- ① Study Area Key Intersection
- (A) Project Access Point
- xx(xx) AM(PM) Peak Hour Traffic Assignment



Montessori School (Day Care Center) Traffic Assignment



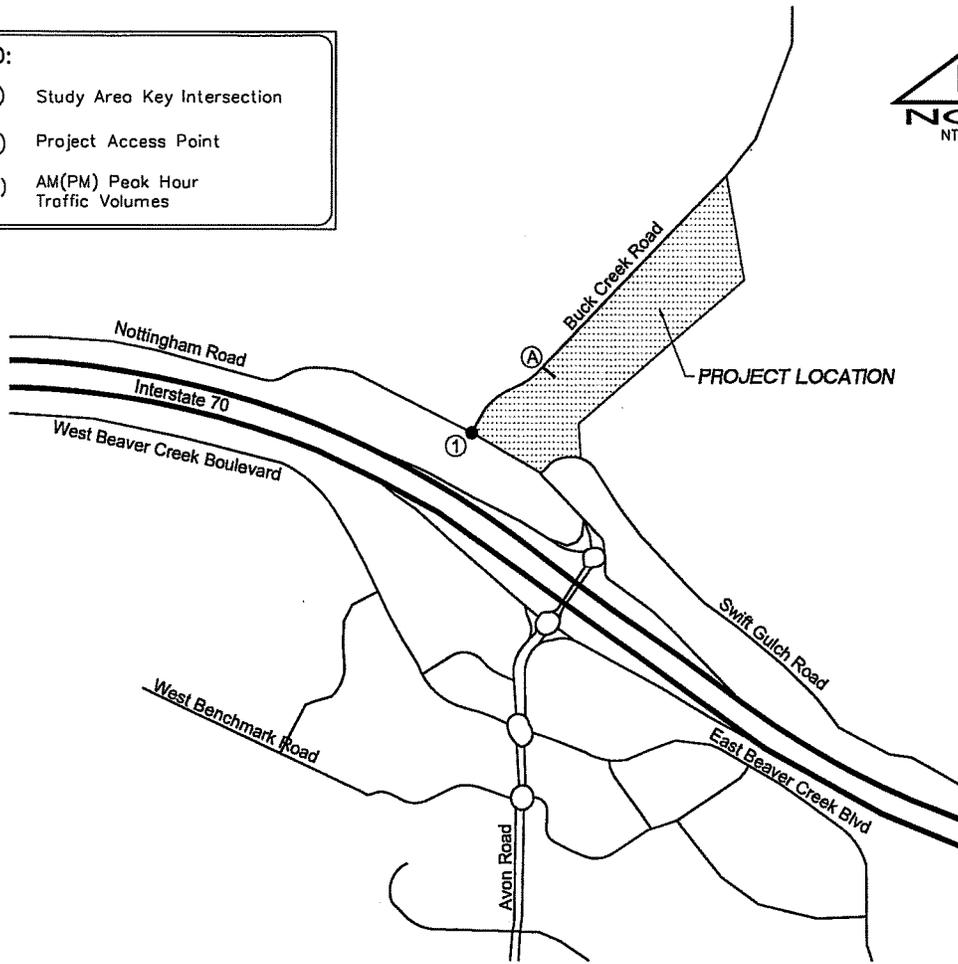
Traffic Assignment for All Other Uses



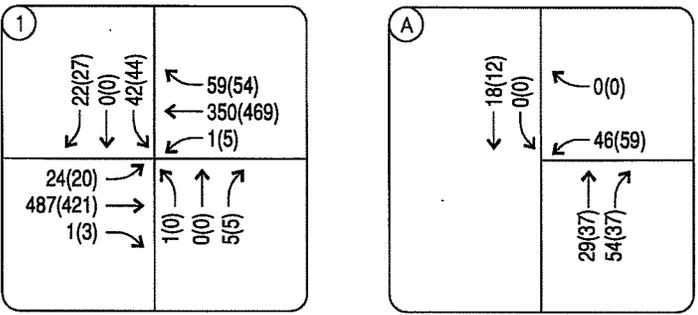
**FIGURE 7  
BUCK CREEK PUD  
PROJECT TRAFFIC ASSIGNMENT**

**LEGEND:**

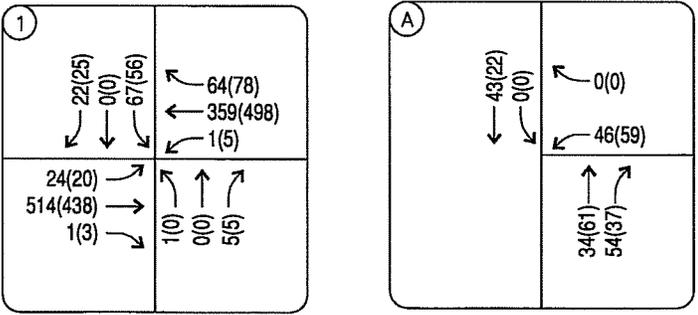
- (1) Study Area Key Intersection
- (A) Project Access Point
- XX(XX) AM(PM) Peak Hour Traffic Volumes



Existing Plus Project Traffic Volumes



Area Buildout Future Traffic Volumes



**FIGURE 8  
BUCK CREEK PUD  
TOTAL TRAFFIC VOLUMES**

## 5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2010 and 2030 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual*<sup>2</sup>.

### 5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, Kimley-Horn recommends intersection LOS D as the minimum threshold for acceptable operations. Table 2 shows the definition of level of service for signalized and unsignalized intersections.

Table 2 - Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.

<sup>2</sup> Transportation Research Board, *Highway Capacity Manual*, Special Report 209, Washington DC, 2000.

The study area intersection was analyzed based on average total delay analysis for unsignalized intersections. Under the unsignalized analysis, the level of service (LOS) for a two-way stop controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service for a two-way stop-controlled intersection is not defined for the intersection as a whole.

## 5.2 Key Intersection Operational Analysis

Calculations for the level of service are provided in **Appendix E**. The existing year analyses are based on the lane geometry and intersection control shown in **Figure 2**. A peak hour factor of 0.90 was used for all analysis. Level of service for the existing and proposed unsignalized intersections was calculated using HCS analysis software operating with stop control and Sidra for the single lane roundabout.

### **Nottingham Road and Buck Creek Road**

All movements at the existing two-way stop controlled intersection at Nottingham Road and Buck Creek Road currently operate at an acceptable level of service. These movements are anticipated to continue to operate at an acceptable level of service during both the AM and PM peak hours with the addition of project traffic to the existing traffic.

However, in the full area build out long term horizon, the southbound left/through movement is anticipated to operate at LOS E during the PM peak hour due to increased background traffic growth from Wildwood and Wildridge. However, this intersection is not anticipated to meet peak hour traffic signal warrants in the future. As documented in the Highway Capacity Manual, longer delays are often anticipated along minor street approaches to more major streets with a heavier through volume, and a LOS E with 37.6 seconds of delay is not unreasonable. Therefore, it is believed that drivers experiencing what they perceive to be excessive delays will reroute on the adjacent street network or stagger their travel times to not coincide with peak hour travel. It is recommended that the Town of Avon monitor traffic volumes at this intersection in the future to determine if and when improvements may be needed. Future improvements at this intersection in the full area build out long term horizon may include

widening Nottingham Road to a three-lane roadway to construct left turn lanes which would allow for a two-stage left turn from Buck Creek Road. This improvement would allow for acceptable operations for all movements in the morning and afternoon peak hours. In addition, it is understood that the Town of Avon has considered a roundabout for the intersection. If a roundabout were constructed, a single circulating lane with single approach lanes was found to provide acceptable operations at LOS A during both peak hours. Table 3 provides the results of the level of service.

**Table 3 – Nottingham Road & Buck Creek Road LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2008 Existing</b>				
<i>Eastbound Approach</i>	8.2	A	8.6	A
<i>Westbound Approach</i>	8.5	A	8.3	A
<i>Northbound Approach</i>	13.2	B	11.1	B
<i>Southbound Left/Through</i>	21.4	C	23.0	C
<i>Southbound Right</i>	10.6	B	11.7	B
<b>Short Term Existing Plus Project</b>				
<i>Eastbound Approach</i>	8.3	A	8.7	A
<i>Westbound Approach</i>	8.5	A	8.3	A
<i>Northbound Approach</i>	13.7	B	11.1	B
<i>Southbound Left/Through</i>	27.2	D	30.2	D
<i>Southbound Right</i>	10.9	B	12.1	B
<b>Long Term Area Buildout Plus Project</b>				
<i>Eastbound Approach</i>	8.4	A	8.9	A
<i>Westbound Approach</i>	8.6	A	8.4	A
<i>Northbound Approach</i>	14.2	B	11.3	B
<i>Southbound Left/Through</i>	34.8	D	37.6	E
<i>Southbound Right</i>	11.0	B	12.5	B
<b>Long Term Area Buildout Plus Project – 2 Stage Left</b>				
<i>Eastbound Approach</i>	8.4	A	8.9	A
<i>Westbound Approach</i>	8.6	A	8.4	A
<i>Northbound Approach</i>	12.8	B	11.3	B
<i>Southbound Left/Through</i>	19.5	C	19.8	C
<i>Southbound Right</i>	11.0	B	12.5	B
<b>Long Term Area Buildout Plus Project – Single Lane Roundabout</b>				
<i>Eastbound Approach</i>	3.7	A	3.6	A
<i>Westbound Approach</i>	2.7	A	2.7	A
<i>Northbound Approach</i>	2.7	A	2.7	A
<i>Southbound Approach</i>	13.4	B	12.2	B
	13.1	B	14.0	B

### Access Drive A & Buck Creek Road

It is anticipated that the future access driveway along Buck Creek Road will operate with stop-control along the access driveway approach to the intersection. It is recommended that a "STOP" (R1-1) sign should be placed along the project access driveway approach to the intersection in accordance with guidance provided in the MUTCD. All movements at this future intersection are anticipated to operate acceptably throughout the full area build out long term horizon. The exiting westbound vehicle queue is anticipated to be one vehicle (25 feet) at this access. Table 4 provides the results of the level of service at this intersection.

**Table 4 - Access Drive A & Buck Creek Road LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Existing Plus Project				
<i>Southbound Approach</i>	7.4	A	7.4	A
<i>Westbound Approach</i>	9.1	A	9.1	A
Full Area Build Out Plus Project				
<i>Southbound Approach</i>	7.4	A	7.4	A
<i>Westbound Approach</i>	9.3	A	9.4	A

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

---

Based on the analysis presented in this report, Kimley-Horn believes the proposed Buck Creek PUD development will be successfully incorporated into the roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations:

- It is recommended that the proposed access driveway intersection along Buck Creek Road operate with stop control along the access driveway approach to the intersection. As such, a "STOP" (R1-1) sign should be placed along the project access driveway approach to the intersection in accordance with guidance provided in the MUTCD. The exiting vehicle queue is anticipated to be one vehicle (25 feet) at this access. No additional turn lane improvements were found to be required at this access intersection.
- It is recommended that Town of Avon staff monitor traffic volumes at the intersection of Buck Creek Road with Nottingham Road in the long term future to determine what improvements may be needed based on actual traffic volumes. Future improvements may include widening Nottingham Road to a three-lane roadway which would allow a two-stage left turn from Buck Creek Road or a single lane roundabout.
- All on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings, and conform to the Town of Avon standards, as well as the Manual on Uniform Traffic Control Devices – 2003 Edition (MUTCD).



# APPENDICES



# APPENDIX A

## Conceptual Site Plan







# APPENDIX B

## Intersection Count Sheets

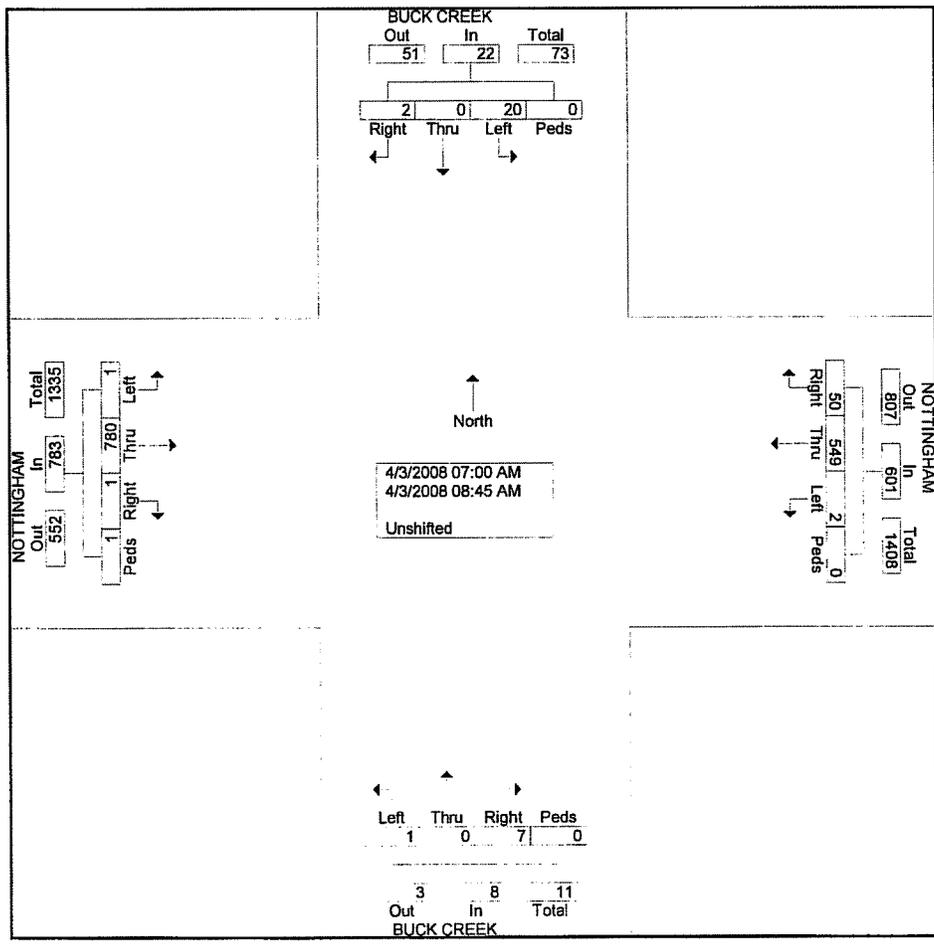




File Name : NOTTINGHAM&BUCKCREEKAM  
 Site Code : 00000000  
 Start Date : 4/3/2008  
 Page No : 1

Groups Printed- Unshifted

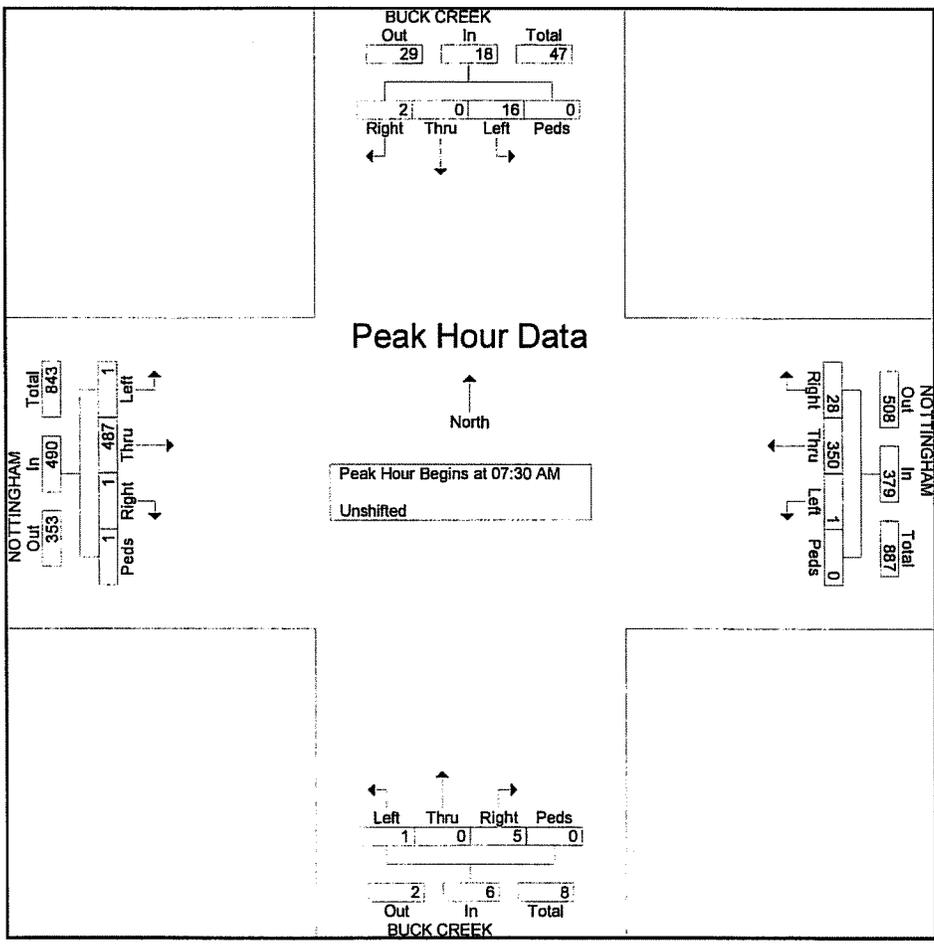
Start Time	BUCK CREEK Southbound				NOTTINGHAM Westbound				BUCK CREEK Northbound				NOTTINGHAM Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00 AM	0	0	0	0	0	43	6	0	0	0	0	0	0	40	0	0	89
07:15 AM	1	0	0	0	0	51	10	0	0	0	1	0	0	64	0	0	127
07:30 AM	3	0	1	0	0	62	6	0	0	0	1	0	1	101	0	0	175
07:45 AM	6	0	0	0	0	101	6	0	1	0	2	0	0	155	0	0	271
Total	10	0	1	0	0	257	28	0	1	0	4	0	1	360	0	0	662
08:00 AM	5	0	1	0	1	100	4	0	0	0	1	0	0	117	0	0	229
08:15 AM	2	0	0	0	0	87	12	0	0	0	1	0	0	114	1	1	218
08:30 AM	1	0	0	0	0	50	5	0	0	0	1	0	0	94	0	0	151
08:45 AM	2	0	0	0	1	55	1	0	0	0	0	0	0	95	0	0	154
Total	10	0	1	0	2	292	22	0	0	0	3	0	0	420	1	1	752
Grand Total	20	0	2	0	2	549	50	0	1	0	7	0	1	780	1	1	1414
Apprch %	90.9	0	9.1	0	0.3	91.3	8.3	0	12.5	0	87.5	0	0.1	99.6	0.1	0.1	
Total %	1.4	0	0.1	0	0.1	38.8	3.5	0	0.1	0	0.5	0	0.1	55.2	0.1	0.1	





File Name : NOTTINGHAM&BUCKCREEKAM  
 Site Code : 00000000  
 Start Date : 4/3/2008  
 Page No : 2

Start Time	BUCK CREEK Southbound					NOTTINGHAM Westbound					BUCK CREEK Northbound					NOTTINGHAM Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	3	0	1	0	4	0	62	6	0	68	0	0	1	0	1	1	101	0	0	102	175
07:45 AM	6	0	0	0	6	0	101	6	0	107	1	0	2	0	3	0	155	0	0	155	271
08:00 AM	5	0	1	0	6	1	100	4	0	105	0	0	1	0	1	0	117	0	0	117	229
08:15 AM	2	0	0	0	2	0	87	12	0	99	0	0	1	0	1	0	114	1	1	116	218
Total Volume	16	0	2	0	18	1	350	28	0	379	1	0	5	0	6	1	487	1	1	490	893
% App. Total	88.9	0	11.1	0		0.3	92.3	7.4	0		16.7	0	83.3	0		0.2	99.4	0.2	0.2		
PHF	.667	.000	.500	.000	.750	.250	.866	.583	.000	.886	.250	.000	.625	.000	.500	.250	.785	.250	.250	.790	.824



**All Traffic Data**  
Services Inc.

File Name : NOTTINGHAM&BUCKCREEKPM  
 Site Code : 00000000  
 Start Date : 4/3/2008  
 Page No : 1

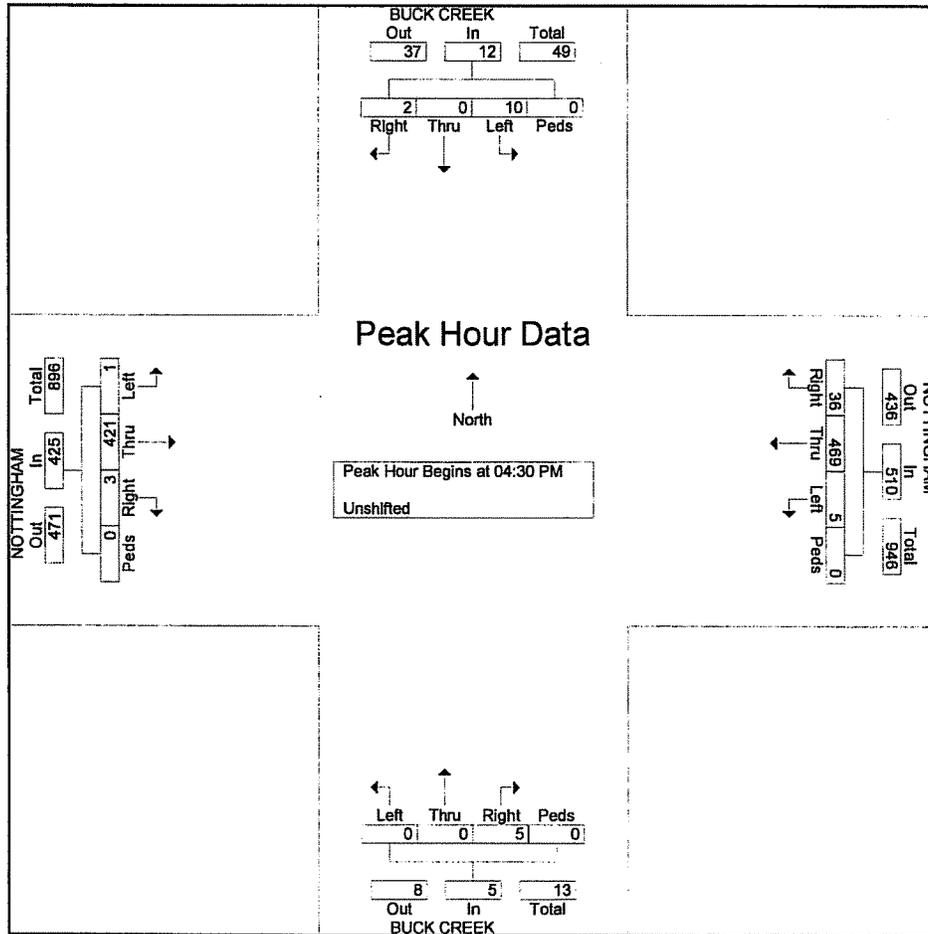
**Groups Printed- Unshifted**

Start Time	BUCK CREEK Southbound				NOTTINGHAM Westbound				BUCK CREEK Northbound				NOTTINGHAM Eastbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
04:00 PM	2	0	0	0	1	56	3	0	0	0	2	0	0	52	0	0	116
04:15 PM	3	0	0	0	1	58	5	0	0	0	1	0	0	79	0	0	147
04:30 PM	2	0	0	0	0	98	12	0	0	0	0	0	0	95	1	0	208
04:45 PM	5	0	0	0	2	141	9	0	0	0	0	0	0	110	1	0	268
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>353</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>336</b>	<b>2</b>	<b>0</b>	<b>739</b>
05:00 PM	1	0	1	0	2	128	8	0	0	0	2	0	0	101	1	0	244
05:15 PM	2	0	1	0	1	102	7	0	0	0	3	0	1	115	0	0	232
05:30 PM	1	0	1	0	2	74	12	0	1	0	1	0	1	87	0	0	180
05:45 PM	4	0	1	0	3	81	4	0	1	0	2	0	0	69	0	0	165
<b>Total</b>	<b>8</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>8</b>	<b>385</b>	<b>31</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>2</b>	<b>372</b>	<b>1</b>	<b>0</b>	<b>821</b>
<b>Grand Total</b>	<b>20</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>12</b>	<b>738</b>	<b>60</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>2</b>	<b>708</b>	<b>3</b>	<b>0</b>	<b>1560</b>
<b>Approch %</b>	<b>83.3</b>	<b>0</b>	<b>16.7</b>	<b>0</b>	<b>1.5</b>	<b>91.1</b>	<b>7.4</b>	<b>0</b>	<b>15.4</b>	<b>0</b>	<b>84.6</b>	<b>0</b>	<b>0.3</b>	<b>99.3</b>	<b>0.4</b>	<b>0</b>	
<b>Total %</b>	<b>1.3</b>	<b>0</b>	<b>0.3</b>	<b>0</b>	<b>0.8</b>	<b>47.3</b>	<b>3.8</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0.7</b>	<b>0</b>	<b>0.1</b>	<b>45.4</b>	<b>0.2</b>	<b>0</b>	



File Name : NOTTINGHAM&BUCKCREEKPM  
 Site Code : 00000000  
 Start Date : 4/3/2008  
 Page No : 2

Start Time	BUCK CREEK Southbound					NOTTINGHAM Westbound					BUCK CREEK Northbound					NOTTINGHAM Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	2	0	0	0	2	0	98	12	0	110	0	0	0	0	0	0	95	1	0	96	208
04:45 PM	5	0	0	0	5	2	141	9	0	152	0	0	0	0	0	0	110	1	0	111	268
05:00 PM	1	0	1	0	2	2	128	8	0	138	0	0	2	0	2	0	101	1	0	102	244
05:15 PM	2	0	1	0	3	1	102	7	0	110	0	0	3	0	3	1	115	0	0	116	232
Total Volume	10	0	2	0	12	5	469	36	0	510	0	0	5	0	5	1	421	3	0	425	952
% App. Total	83.3	0	16.7	0		1	92	7.1	0		0	0	100	0		0.2	99.1	0.7	0		
PHF	.500	.000	.500	.000	.600	.625	.832	.750	.000	.839	.000	.000	.417	.000	.417	.250	.915	.750	.000	.916	.888



# APPENDIX C

## Background Traffic Growth Calculations



TOWN of AVON  
 Current Percent Built  
 (as of January 1, 2008)

11/24/08

Subdivision	Block	Developed Lots	Undeveloped Lots	Total Lots	Percentage of Lots Developed
BM @ BC	1	40	15	55	73%
	2	60	7	67	90%
	3	6	0	6	100%
Subtotal		106	22	128	83%
Swift Gulch		1	0	1	100%
Subtotal		1	0	1	100%
Nottingham Station		5	2	7	71%
Subtotal		5	2	7	71%
Meyers Ranch		3	0	3	100%
Subtotal		3	0	3	100%
Riverfront Subdivision		3	6	9	33%
Subtotal		3	6	9	33%
White Annexation		1	1	2	50%
Subtotal		1	1	2	50%
Folsom Annexation		0	1	1	0%
Subtotal		0	1	1	0%
Wildwood (Mtn Star)		50	44	94	53%
Subtotal		50	44	94	53%
Wildridge	1	105	14	119	88%
	2	60	8	68	88%
	3	54	17	71	76%
	4	71	19	90	79%
	5	11	1	12	92%
Subtotal		301	59	360	84%
Eaglebend	FIL 1	18	2	20	90%
	FIL 2	21	0	21	100%
	FIL 3	4	0	4	100%
	FIL 4	2	0	2	100%
	RIVERSIDE	1	0	1	100%
Subtotal		46	2	48	96%
Village at Avon	FIL 1	4	22	26	15%
	FIL 2	5	8	13	38%
Subtotal		9	30	39	23%
McGrady Acres		1	5	6	17%
Subtotal		1	5	6	17%
Grand Total		526	132	698	75%



Project Buck Creek PUD  
 Subject Trip Generation for Single-Family Detached Housing -- Remaining Wildwood (Mtn. Star)  
 Designed by CDR Date January 08, 2009 Job No. 096119.001  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

**TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 7th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independant Variable - Dwelling Units (X)

X = 44

T = Average Vehicle Trip Ends

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 270)**

(T) = 0.70 (X) + 9.43	Directional Distribution:	25% ent.	75% exit.
(T) = 0.70 * (44.0) + 9.43	T = 40	Average Vehicle Trip Ends	
	10 entering	30	exiting
	10 + 30 = 40		

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 271)**

Ln(T) = 0.90 Ln(X) + 0.53	Directional Distribution:	63% ent.	37% exit.
Ln(T) = 0.90 * Ln(44.0) + 0.53	T = 51	Average Vehicle Trip Ends	
	32 entering	19	exiting
	32 + 19 = 51		

**Peak Hour of Generator, Saturday (page 275)**

(T) = 0.89 (X) + 10.93	Directional Distribution:	54% ent.	46% exit.
(T) = 0.89 * (44.0) + 10.93	T = 50	Average Vehicle Trip Ends	
	27 entering	23	exiting
	27 + 23 = 50		

**Weekday (page 269)**

Daily Weekday	Directional Distribution:	50% entering, 50% exiting	
Ln(T) = 0.92 Ln(X) + 2.71	T = 488	Average Vehicle Trip Ends	
Ln(T) = 0.92 * Ln(44.0) + 2.71	244 entering	244	exiting
	244 + 244 = 488		



Project Buck Creek PUD  
 Subject Trip Generation for Residential Condominium/Townhouse - Remaining Wildridge  
 Designed by CDR Date January 08, 2009 Job No. 96119.001  
 Checked by \_\_\_\_\_ Sheet No. 1 of 1

**TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 7th Edition, Average Rate Equations

Land Use Code - Residential Condominium/Townhouse (230)

Independant Variable - Dwelling Units (X)

X = 59

T = Average Vehicle Trip Ends

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 368)**

T = 0.44 * X		Directional Distribution:	17% ent.	83% exit.
T = 0.44 *	59.0	T = 26	Average Vehicle Trip Ends	
		4 entering	22	exiting
		4 + 22	=	26

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 369)**

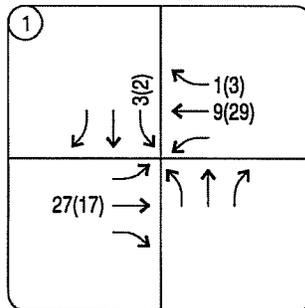
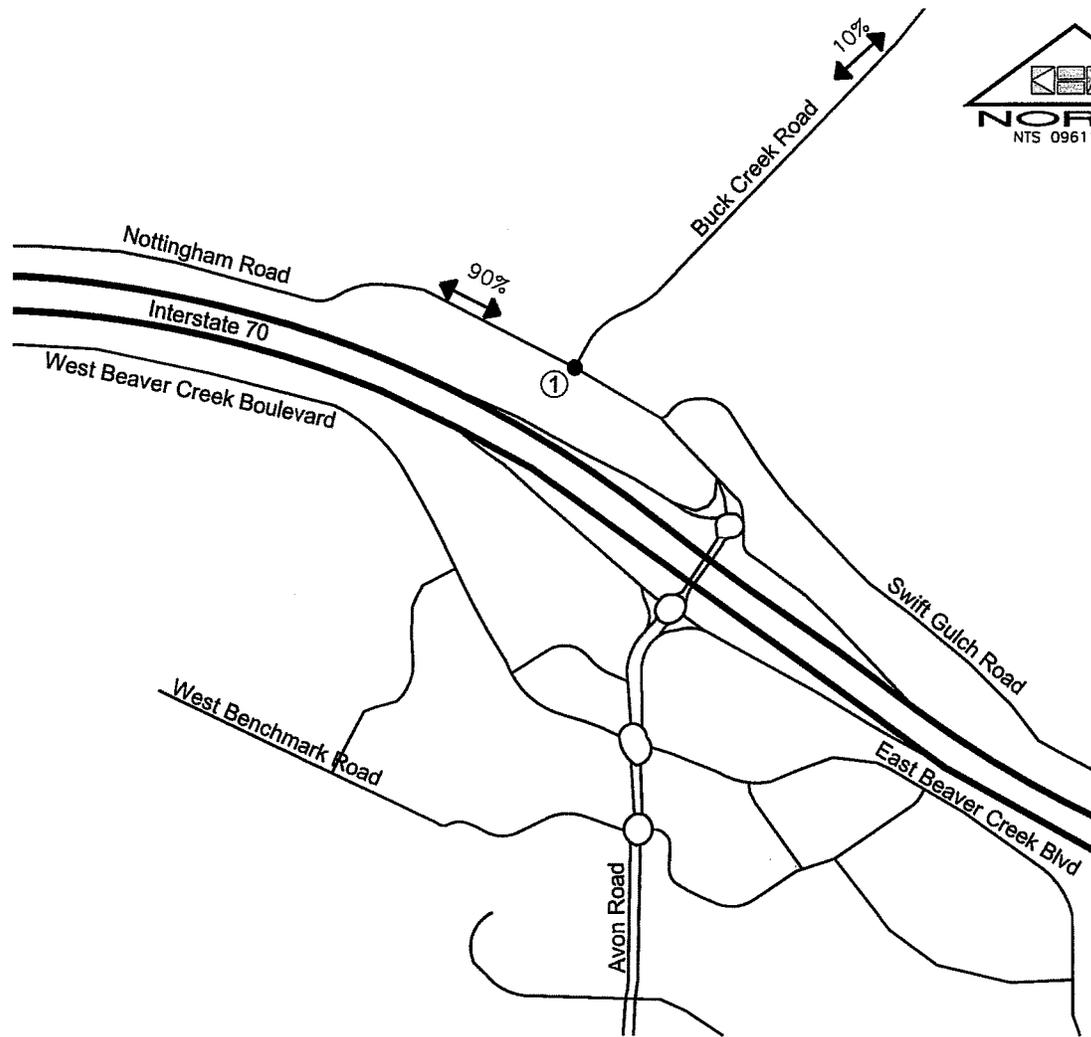
T = 0.52 * X		Directional Distribution:	67% ent.	33% exit.
T = 0.52 *	59.0	T = 31	Average Vehicle Trip Ends	
		21 entering	10	exiting
		21 + 10	=	31

**Weekday (page 367)**

Daily Weekday		Directional Distribution:	50% entering,	50% exiting
T = 5.86 * X		T = 346	Average Vehicle Trip Ends	
T = 5.86 *	59.0	173 entering	173	exiting
		173 + 173	=	346

**Peak Hour of Generator, Saturday (page 373)**

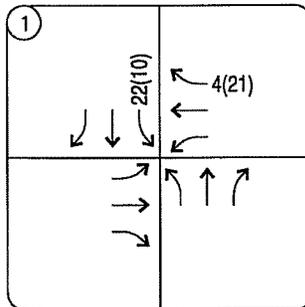
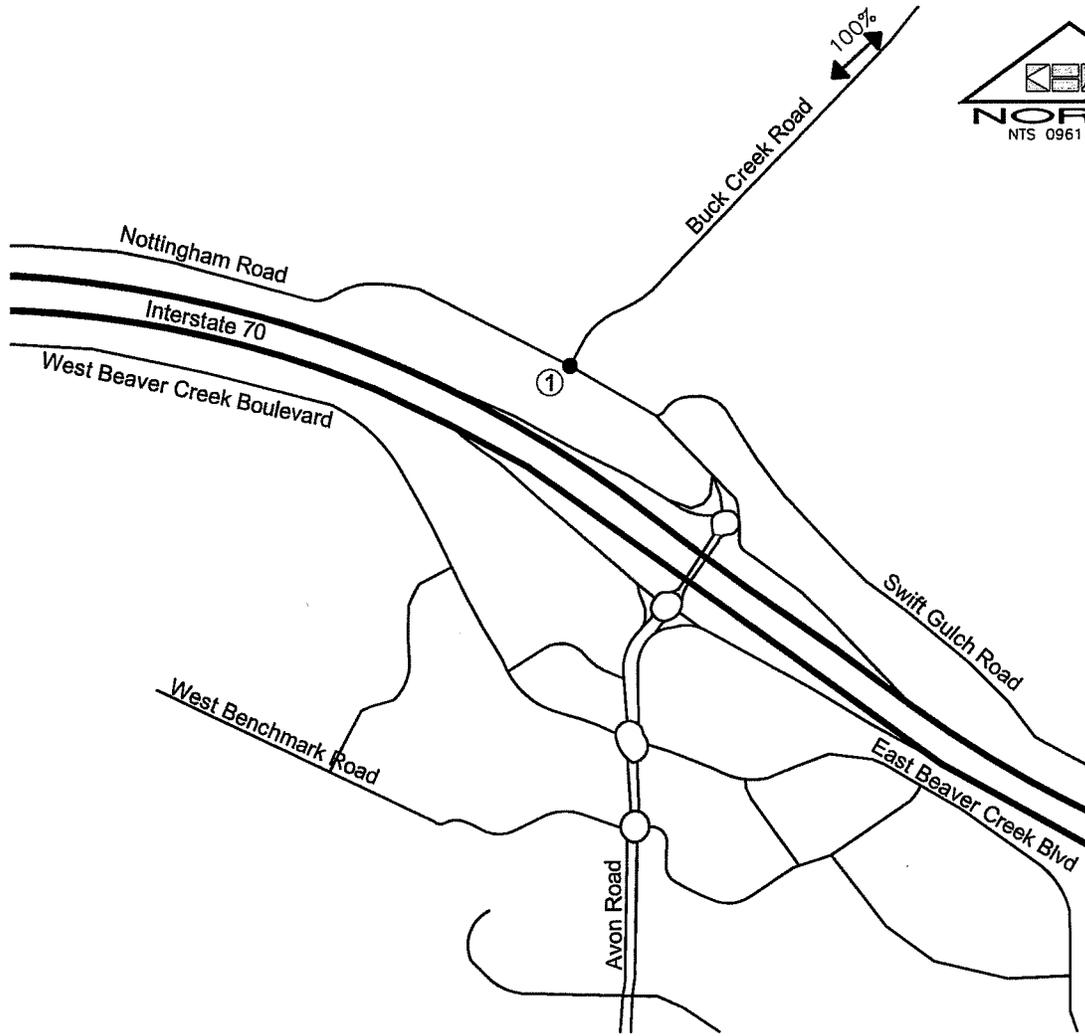
Daily Weekday		Directional Distribution:	54% ent.	46% exit.
T = 0.47 * X		T = 28	Average Vehicle Trip Ends	
T = 0.47 *	59.0	15 entering	13	exiting
		15 + 13	=	28



**LEGEND:**

- ① Study Area Key Intersection
- xx(xx) AM(PM) Peak Hour Traffic Volumes

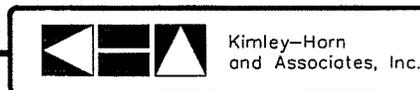
**WILDWOOD (MTN STAR)  
REMAINING TRAFFIC AT BUILDOUT**

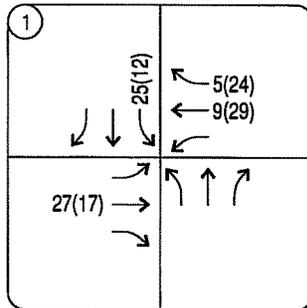
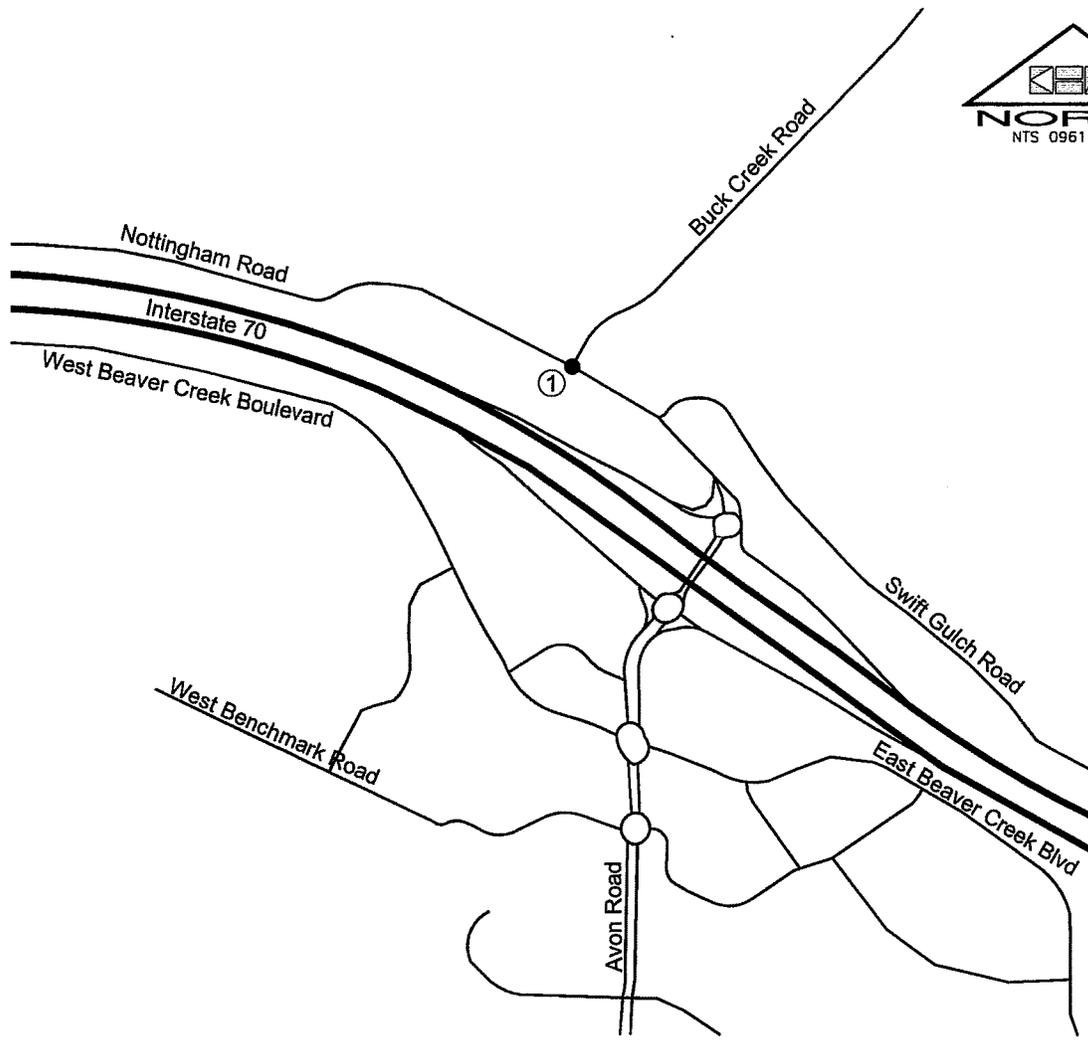


**LEGEND:**

-  Study Area Key Intersection
- $xx(xx)$  AM(PM) Peak Hour Traffic Volumes

**WILDRIDGE  
REMAINING TRAFFIC AT BUILDOUT**

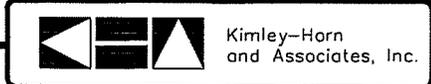




**LEGEND:**

- ① Study Area Key Intersection
- xx(xx) AM(PM) Peak Hour Traffic Volumes

**WILDWOOD (MTN STAR) AND WILDRIDGE  
REMAINING TRAFFIC AT BUILDOUT**



# APPENDIX D

## Trip Generation Worksheets





Project Buck Creek PUD  
 Subject Trip Generation for Residential Condominium/Townhouse  
 Designed by CDR Date January 08, 2009 Job No. 96119.001  
 Checked by \_\_\_\_\_ Sheet No. 1 of 1

**TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 7th Edition, Average Rate Equations

Land Use Code - Residential Condominium/Townhouse (230)

Independant Variable - Dwelling Units (X)

X = 42

T = Average Vehicle Trip Ends

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 368)**

		Directional Distribution:	17% ent.	83% exit.
T = 0.44 * X		T = 18	Average Vehicle Trip Ends	
T = 0.44 *	42.0	3 entering	15	exiting
		3 + 15	=	18

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 369)**

		Directional Distribution:	67% ent.	33% exit.
T = 0.52 * X		T = 22	Average Vehicle Trip Ends	
T = 0.52 *	42.0	15 entering	7	exiting
		15 + 7	=	22

**Weekday (page 367)**

		Directional Distribution:	50% entering,	50% exiting
Daily Weekday		T = 246	Average Vehicle Trip Ends	
T = 5.86 * X		123 entering	123	exiting
T = 5.86 *	42.0	123 + 123	=	246

**Peak Hour of Generator, Saturday (page 373)**

		Directional Distribution:	54% ent.	46% exit.
Daily Weekday		T = 20	Average Vehicle Trip Ends	
T = 0.47 * X		11 entering	9	exiting
T = 0.47 *	42.0	11 + 9	=	20



Project Cottonwood PUD  
 Subject Trip Generation for Day Care Center  
 Designed by ELG Date April 22, 2008 Job No. 096119.000  
 Checked by \_\_\_\_\_ Sheet No. 1 of 1

**TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 7th Edition

Land Use Code - Day Care Center, (565)

Independent Variable - 1,000 Sq. Feet Gross Floor Area (X)

$X = 3.000$

T = Average Vehicle Trip Ends

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 1036), Average Rate**

$T = 12.79 (X)$   
 $T = 12.79 * 3.0$

Directional Distribution: 53% ent. 47% exit.  
 T = 38 Average Vehicle Trip Ends  
 20 entering 18 exiting  
 20 + 18 = 38

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 1037), Fitted Curve**

$\ln(T) = 0.67 \ln(X) + 3.02$   
 $\ln(T) = 0.67 * \ln(3.000) + 3.02$

Directional Distribution: 47% ent. 53% exit.  
 T = 43 Average Vehicle Trip Ends  
 20 entering 23 exiting  
 20 + 23 = 43

**Weekday (page 1035), Average Rate**

Daily Weekday  
 $T = 79.26 (X)$   
 $T = 79.26 * 3.0$

Directional Distribution: 50% entering, 50% exiting  
 T = 238 Average Vehicle Trip Ends  
 119 entering 119 exiting  
 119 + 119 = 238



Project Cottonwood PUD  
 Subject Trip Generation for Office Building  
 Designed by ELG Date April 22, 2008 Job No. 096119.000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. 1 of 1

**TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 7th Edition, Average Rates

Land Use Code - General Office Building (710)

Independent Variable - 1000 Square Feet (X)

X = 3.000

T = Average Vehicle Trip Ends

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Page 1159)**

(T) = 1.55 (X)		Directional Distribution:	88% ent.	12% exit.
(T) = 1.55 *	(3.0)	T = 5	Average Vehicle Trip Ends	
		4 entering	1	exiting
		4 + 1	= 5	

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 1160)**

(T) = 1.49 (X)		Directional Distribution:	17% ent.	83% exit.
(T) = 1.49 *	(3.0)	T = 4	Average Vehicle Trip Ends	
		1 entering	3	exiting
		1 + 3	= 4	

**Weekday (page 1158)**

Daily Weekday		Directional Distribution:	50% ent.	50% exit.
(T) = 11.01 (X)		T = 33	Average Vehicle Trip Ends	
(T) = 11.01 *	(3.0)	17 entering	17	exiting
		17 + 16	= 33	

**Saturday, Peak Hour of Generator (page 1162)**

Daily Weekday		Directional Distribution:	54% ent.	46% exit.
(T) = 0.41 (X)		T = 1	Average Vehicle Trip Ends	
(T) = 0.41 *	(3.0)	1 entering	0	exiting
		1 + 0	= 1	

Project Cottonwood PUD  
 Subject Trip Generation for Gore Range Natural Science School  
 Designed by ELG Date April 22, 2008 Job No. 096119.000  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. 1 of 1

**TRIP GENERATION TECHNIQUES**

Assumptions based on Information Provided by the Executive Director of the Gore Range Natural Science School

Proposed Uses:

- Building A: Learning Studio
- Building B: Mountain Discovery Center
- Building C: Educator Residence
- Building D: Field Studies Base Camp
- Building E: Mountain Research Laboratory

Traffic Contributors:

1. Bus Traffic (1 bus/day between 9 a.m. - 3 p.m. and occasionally 2 buses/day between 11 a.m. - 2 p.m.)
2. Visitor Traffic (40 Visitors/day, 2 visitors/car between 9 a.m. - 4 p.m. and about 4-8 visitors/hour)
3. Employee Traffic (15 employees, of which 4 employees use alternative modes of transportation, between 7-8:30 a.m. and 4:30-6 p.m.)
4. Evening Program Traffic (90 visitors maximum, 2 visitors/car between 6:30-7 p.m. arrival and 9 p.m. departure)

**Bus Traffic**

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**

Directional Distribution: 50% ent. 50% exit.

T = 4 Average Vehicle Trip Ends

2 entering 2 exiting

2 + 2 = 4

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**

Directional Distribution: - ent. - exit.

T = 0 Average Vehicle Trip Ends

0 entering 0 exiting

0 + 0 = 0

**Weekday**

Directional Distribution: 50% ent. 50% exit.

T = 8 Average Vehicle Trip Ends

4 entering 4 exiting

4 + 4 = 8

**Visitor Traffic**

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**

Directional Distribution: - ent. - exit.

T = 0 Average Vehicle Trip Ends  
0 entering 0 exiting

$$0 + 0 = 0$$

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**

Directional Distribution: 0% ent. 100% exit.

T = 4 Average Vehicle Trip Ends  
0 entering 4 exiting

$$0 + 4 = 4$$

**Weekday**

Directional Distribution: 50% ent. 50% exit.

T = 40 Average Vehicle Trip Ends  
20 entering 20 exiting

$$20 + 20 = 40$$

**Employee Traffic**

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**

Directional Distribution: 100% ent. 0% exit.

T = 11 Average Vehicle Trip Ends  
11 entering 0 exiting

$$11 + 0 = 11$$

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**

Directional Distribution: 0% ent. 100% exit.

T = 11 Average Vehicle Trip Ends  
0 entering 11 exiting

$$0 + 11 = 11$$

**Weekday**

Directional Distribution: 50% ent. 50% exit.

T = 22 Average Vehicle Trip Ends  
11 entering 11 exiting

$$11 + 11 = 22$$

**Evening Program Traffic**

**Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**

Directional Distribution:        -    ent.    -    exit.

T =     0        Average Vehicle Trip Ends

   0    entering        0    exiting

   0    +        0    =        0

**Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.**

Directional Distribution:        -    ent.    -    exit.

T =     0        Average Vehicle Trip Ends

   0    entering        0    exiting

   0    +        0    =        0

**Weekday**

Directional Distribution:        50% ent.    50% exit.

T =     90        Average Vehicle Trip Ends

   45    entering        45    exiting

   45    +        45    =        90

# APPENDIX E

## Intersection Analysis Worksheets



## TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information		
Agency/Co.	ELG		Intersection	Nottingham Rd/Buck Creek Rd	
Date Performed	KHA		Jurisdiction	City of Avon	
Analysis Time Period	4/21/2008		Analysis Year	2008	
Project Description: Cottonwood PUD					
East/West Street: Nottingham Road			North/South Street: Buck Creek Road		
Intersection Orientation: East-West			Study Period (hrs): 0.25		

### Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound			
	Movement	1	2	3	4	5	6
	L	T	R	L	T	R	
Volume (veh/h)	1	487	1	1	350	28	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	1	541	1	1	388	31	
Percent Heavy Vehicles	2	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration	LTR			LTR			
Upstream Signal		0			0		

Minor Street	Northbound			Southbound			
	Movement	7	8	9	10	11	12
	L	T	R	L	T	R	
Volume (veh/h)	1	0	5	16	0	2	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	1	0	5	17	0	2	
Percent Heavy Vehicles	2	2	2	2	2	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	1	0	0	1	1	
Configuration		LTR		LT		R	

### Delay, Queue Length, and Level of Service

Approach	Eastbound		Northbound			Southbound			
	Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR		LT		R	
v (veh/h)	1	1		6		17		2	
C (m) (veh/h)	1140	1027		446		236		647	
v/c	0.00	0.00		0.01		0.07		0.00	
95% queue length	0.00	0.00		0.04		0.23		0.01	
Control Delay (s/veh)	8.2	8.5		13.2		21.4		10.6	
LOS	A	A		B		C		B	
Approach Delay (s/veh)	--	--		13.2		20.3			
Approach LOS	--	--		B		C			

**TWO-WAY STOP CONTROL SUMMARY**

General Information			Site Information		
Analyst	ELG		Intersection	Nottingham Rd/Buck Creek Rd	
Agency/Co.	KHA		Jurisdiction	City of Avon	
Date Performed	4/21/2008		Analysis Year	2008	
Analysis Time Period	PM Existing				
Project Description <i>Cottonwood PUD</i>					
East/West Street: <i>Nottingham Road</i>			North/South Street: <i>Buck Creek Road</i>		
Intersection Orientation: <i>East-West</i>			Study Period (hrs): <i>0.25</i>		

**Vehicle Volumes and Adjustments**

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	1	421	3	5	469	36
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	1	467	3	5	521	40
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LTR</i>			<i>LTR</i>		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	5	10	0	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	5	11	0	2
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		<i>LTR</i>		<i>LT</i>		<i>R</i>

**Delay, Queue Length, and Level of Service**

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LTR</i>	<i>LTR</i>		<i>LTR</i>		<i>LT</i>		<i>R</i>
v (veh/h)	1	5		5		11		2
C (m) (veh/h)	1010	1092		595		211		541
v/c	0.00	0.00		0.01		0.05		0.00
95% queue length	0.00	0.01		0.03		0.16		0.01
Control Delay (s/veh)	8.6	8.3		11.1		23.0		11.7
LOS	A	A		B		C		B
Approach Delay (s/veh)	--	--		11.1		21.3		
Approach LOS	--	--		B		C		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Project Name	CDR	Intersection	Nottingham Rd/Buck Creek Rd
Agency/Co.	KHA	Jurisdiction	Town of Avon
Date Performed	01/09/09	Analysis Year	Existing Plus Project
Analysis Time Period	AM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Nottingham Road</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street Movement	Eastbound			Westbound		
	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	24	487	1	1	350	59
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	26	541	1	1	388	65
Percent Heavy Vehicles	2	—	—	2	—	—
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LTR</i>			<i>LTR</i>		
Upstream Signal		0			0	

Minor Street Movement	Northbound			Southbound		
	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	5	42	0	22
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	1	0	5	46	0	24
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		<i>LTR</i>		<i>LT</i>		<i>R</i>

### Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
			7	8	9	10	11	12
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LTR</i>			<i>LTR</i>		<i>LT</i>		<i>R</i>
v (veh/h)	26	1		6		46		24
C (m) (veh/h)	1108	1027		419		208		633
v/c	0.02	0.00		0.01		0.22		0.04
95% queue length	0.07	0.00		0.04		0.82		0.12
Control Delay (s/veh)	8.3	8.5		13.7		27.2		10.9
Level of Service	<i>A</i>			<i>B</i>		<i>D</i>		<i>B</i>
Approach Delay (s/veh)	—	—		13.7			21.6	
Approach LOS	—	—		<i>B</i>			<i>C</i>	

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Nottingham Rd/Buck Creek Rd
Agency/Co.	KHA	Jurisdiction	Town of Avon
Date Performed	01/09/09	Analysis Year	Existing Plus Project
Analysis Time Period	PM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Nottingham Road</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	20	421	3	5	469	54
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	22	467	3	5	521	60
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LTR</i>			<i>LTR</i>		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	5	44	0	27
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	5	48	0	30
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach	<i>N</i>			<i>N</i>		
Storage	0			0		
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		<i>LTR</i>		<i>LT</i>		<i>R</i>

### Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound			
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	<i>LTR</i>	<i>LTR</i>		<i>LTR</i>		<i>LT</i>		<i>R</i>	
v (veh/h)	22	5		5		48		30	
C (m) (veh/h)	993	1092		595		190		534	
v/c	0.02	0.00		0.01		0.25		0.06	
95% queue length	0.07	0.01		0.03		0.96		0.18	
Control Delay (s/veh)	8.7	8.3		11.1		30.2		12.1	
LOS	<i>A</i>	<i>A</i>		<i>B</i>		<i>D</i>		<i>B</i>	
Approach Delay (s/veh)	--	--		11.1			23.3		
Approach LOS	--	--		<i>B</i>			<i>C</i>		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Nottingham Rd/Buck Creek Rd
Agency/Co.	KHA	Jurisdiction	Town of Avon
Date Performed	01/09/09	Analysis Year	Full Buildout Plus Project
Analysis Time Period	AM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Nottingham Road</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street Movement	Eastbound			Westbound		
	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	24	514	1	1	359	64
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	26	571	1	1	398	71
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LTR</i>			<i>LTR</i>		
Upstream Signal		0			0	

Minor Street Movement	Northbound			Southbound		
	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	5	67	0	22
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	1	0	5	74	0	24
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	<i>0</i>			<i>0</i>		
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		<i>LTR</i>		<i>LT</i>		<i>R</i>

### Delay, Queue Length, and Level of Service

Approach Movement	Eastbound	Westbound	Northbound			Southbound			
	1	4	7	8	9	10	11	12	
Lane Configuration	<i>LTR</i>	<i>LTR</i>		<i>LTR</i>		<i>LT</i>		<i>R</i>	
v (veh/h)	26	1		6		74		24	
C (m) (veh/h)	1093	1001		399		193		622	
v/c	0.02	0.00		0.02		0.38		0.04	
95% queue length	0.07	0.00		0.05		1.68		0.12	
Control Delay (s/veh)	8.4	8.6		14.2		34.8		11.0	
LOS	<i>A</i>	<i>A</i>		<i>B</i>		<i>D</i>		<i>B</i>	
Approach Delay (s/veh)	--	--		14.2			29.0		
Approach LOS	--	--		<i>B</i>			<i>D</i>		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Nottingham Rd/Buck Creek Rd
Agency/Co.	KHA	Jurisdiction	Town of Avon
Date Performed	01/09/09	Analysis Year	Full Buildout Plus Project
Analysis Time Period	PM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Nottingham Road</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	20	438	3	5	498	78
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	22	486	3	5	553	86
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	5	56	0	25
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	5	62	0	27
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		LTR		LT		R

### Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound			
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LTR	LTR		LTR		LT		R	
v (veh/h)	22	5		5		62		27	
C (m) (veh/h)	945	1074		580		171		504	
v/c	0.02	0.00		0.01		0.36		0.05	
95% queue length	0.07	0.01		0.03		1.53		0.17	
Control Delay (s/veh)	8.9	8.4		11.3		37.6		12.5	
LOS	A	A		B		E		B	
Approach Delay (s/veh)	--	--		11.3			30.0		
Approach LOS	--	--		B			D		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Nottingham Rd/Buck Creek Rd
Agency/Co.	KHA	Jurisdiction	Town of Avon
Date Performed	01/09/09	Analysis Year	FB + Project - 2 Stage Gap
Analysis Time Period	AM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Nottingham Road</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street Movement	Eastbound			Westbound		
	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	24	514	1	1	359	64
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	26	571	1	1	398	71
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street Movement	Northbound			Southbound		
	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	5	67	0	22
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	1	0	5	74	0	24
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		LTR		LT		R

### Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
			7	8	9	10	11	12
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	26	1		6		74		24
C (m) (veh/h)	1093	1001		468		322		622
v/c	0.02	0.00		0.01		0.23		0.04
95% queue length	0.07	0.00		0.04		0.87		0.12
Control Delay (s/veh)	8.4	8.6		12.8		19.5		11.0
LOS	A	A		B		C		B
Approach Delay (s/veh)	--	--		12.8		17.4		
Approach LOS	--	--		B		C		

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Nottingham Rd/Buck Creek Rd
Agency/Co.	KHA	Jurisdiction	Town of Avon
Date Performed	01/09/09	Analysis Year	FB + Project - 2 Stage Gap
Analysis Time Period	PM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Nottingham Road</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>East-West</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	20	438	3	5	498	78
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	22	486	3	5	553	86
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	5	56	0	25
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	5	62	0	27
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach	N			N		
Storage	0			0		
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration		LTR		LT		R

### Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LTR			LT	R	
v (veh/h)	22	5	5			62	27	
C (m) (veh/h)	945	1074	580			305	504	
v/c	0.02	0.00	0.01			0.20	0.05	
95% queue length	0.07	0.01	0.03			0.75	0.17	
Control Delay (s/veh)	8.9	8.4	11.3			19.8	12.5	
LOS	A	A	B			C	B	
Approach Delay (s/veh)	--	--	11.3			17.6		
Approach LOS	--	--	B			C		

**SIDRA  
INTERSECTION**

**Movement Summary**

**Nottingham Buck Creek Total Traffic - Single Lane Roundabout**

**AM Peak Hour**

**Roundabout**

**Vehicle Movements**

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
<b>New S leg</b>										
3L	L	1	50.0	0.021	18.4	LOS B	4	0.67	0.78	26.7
8T	T	1	50.0	0.021	11.3	LOS B	4	0.67	0.69	30.1
8R	R	6	16.7	0.021	12.4	LOS B	4	0.67	0.60	29.4
<b>Approach</b>		<b>10</b>	<b>30.0</b>	<b>0.021</b>	<b>13.4</b>	<b>LOS B</b>	<b>4</b>	<b>0.67</b>	<b>0.65</b>	<b>28.9</b>
<b>East Approach</b>										
1L	L	1	50.0	0.333	12.4	LOS B	74	0.17	0.65	29.6
6T	T	399	2.0	0.328	2.0	LOS A	74	0.17	0.23	25.1
6R	R	71	1.4	0.329	6.4	LOS A	74	0.17	0.47	33.1
<b>Approach</b>		<b>472</b>	<b>2.1</b>	<b>0.328</b>	<b>2.7</b>	<b>LOS A</b>	<b>74</b>	<b>0.17</b>	<b>0.27</b>	<b>26.1</b>
<b>New N leg</b>										
7L	L	74	1.4	0.119	14.8	LOS B	20	0.53	0.73	28.5
4T	T	1	50.0	0.118	7.6	LOS A	20	0.53	0.65	31.9
4R	R	24	4.0	0.118	8.7	LOS A	20	0.53	0.60	31.4
<b>Approach</b>		<b>101</b>	<b>3.0</b>	<b>0.119</b>	<b>13.1</b>	<b>LOS B</b>	<b>20</b>	<b>0.53</b>	<b>0.70</b>	<b>29.2</b>
<b>West Approach</b>										
5L	L	27	3.7	0.458	12.7	LOS B	97	0.29	0.65	29.2
2T	T	571	1.9	0.454	2.3	LOS A	97	0.29	0.26	24.8
2R	R	1	50.0	0.500	6.6	LOS A	97	0.29	0.52	32.5
<b>Approach</b>		<b>600</b>	<b>2.2</b>	<b>0.454</b>	<b>2.7</b>	<b>LOS A</b>	<b>97</b>	<b>0.29</b>	<b>0.28</b>	<b>25.0</b>
<b>All Vehicles</b>		<b>1183</b>	<b>2.5</b>	<b>0.500</b>	<b>3.7</b>	<b>LOS A</b>	<b>97</b>	<b>0.26</b>	<b>0.32</b>	<b>25.8</b>

Symbols which may appear in this table:

Following Degree of Saturation  
 # x = 1.00 for Short Lane with resulting Excess Flow  
 \* x = 1.00 due to minimum capacity

Following LOS  
 # - Based on density for continuous movements

Following Queue  
 # - Density for continuous movement

**SIDRA  
INTERSECTION**

# Movement Summary

## Nottingham Buck Creek Total Traffic - Single Lane Roundabout

### PM Peak Hour

Roundabout

### Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
<b>New S leg</b>										
3L	L	1	50.0	0.019	17.2	LOS B	4	0.63	0.75	27.3
8T	T	1	50.0	0.019	10.1	LOS B	4	0.63	0.65	30.9
8R	R	6	16.7	0.019	11.2	LOS B	4	0.63	0.58	30.1
<b>Approach</b>		<b>10</b>	<b>30.0</b>	<b>0.019</b>	<b>12.2</b>	<b>LOS B</b>	<b>4</b>	<b>0.63</b>	<b>0.63</b>	<b>29.6</b>
<b>East Approach</b>										
1L	L	6	16.7	0.429	12.4	LOS B	110	0.17	0.64	29.6
6T	T	553	2.0	0.433	2.0	LOS A	110	0.17	0.23	25.1
6R	R	87	2.3	0.433	6.3	LOS A	110	0.17	0.47	33.1
<b>Approach</b>		<b>646</b>	<b>2.2</b>	<b>0.433</b>	<b>2.7</b>	<b>LOS A</b>	<b>110</b>	<b>0.17</b>	<b>0.26</b>	<b>26.0</b>
<b>New N leg</b>										
7L	L	62	1.6	0.124	16.0	LOS B	21	0.62	0.78	27.9
4T	T	1	50.0	0.125	8.9	LOS A	21	0.62	0.74	31.5
4R	R	28	3.6	0.123	9.9	LOS A	21	0.62	0.65	31.0
<b>Approach</b>		<b>92</b>	<b>3.3</b>	<b>0.124</b>	<b>14.0</b>	<b>LOS B</b>	<b>21</b>	<b>0.62</b>	<b>0.74</b>	<b>28.8</b>
<b>West Approach</b>										
5L	L	22	4.3	0.390	12.6	LOS B	78	0.25	0.65	29.3
2T	T	487	2.1	0.388	2.2	LOS A	78	0.25	0.26	24.9
2R	R	3	25.0	0.400	6.5	LOS A	78	0.25	0.50	32.6
<b>Approach</b>		<b>514</b>	<b>2.3</b>	<b>0.388</b>	<b>2.7</b>	<b>LOS A</b>	<b>78</b>	<b>0.25</b>	<b>0.27</b>	<b>25.1</b>
<b>All Vehicles</b>		<b>1262</b>	<b>2.5</b>	<b>0.433</b>	<b>3.6</b>	<b>LOS A</b>	<b>110</b>	<b>0.24</b>	<b>0.31</b>	<b>25.8</b>

Symbols which may appear in this table:

Following Degree of Saturation

# x = 1.00 for Short Lane with resulting Excess Flow

\* x = 1.00 due to minimum capacity

Following LOS

# - Based on density for continuous movements

Following Queue

# - Density for continuous movement

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Access & Buck Creek Road
Agency/Co.	Kimley-Horn	Jurisdiction	Town of Avon
Date Performed	1/09/2009	Analysis Year	Existing Plus Project
Analysis Time Period	AM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Access</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street Movement	Northbound			Southbound		
	1 L	2 T	3 R	4 L	5 T	6 R
Volume (veh/h)		29	54	0	18	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	32	60	0	20	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street Movement	Eastbound			Westbound		
	7 L	8 T	9 R	10 L	11 T	12 R
Volume (veh/h)				46		0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	51	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

### Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
			7	8	9	10	11	12
Movement	1	4						
Lane Configuration		LT		LR				
v (veh/h)		0		51				
C (m) (veh/h)		1515		925				
v/c		0.00		0.06				
95% queue length		0.00		0.17				
Control Delay (s/veh)		7.4		9.1				
LOS		A		A				
Approach Delay (s/veh)	--	--		9.1				
Approach LOS	--	--		A				

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Access & Buck Creek Road
Agency/Co.	Kimley-Horn	Jurisdiction	Town of Avon
Date Performed	1/09/2009	Analysis Year	Existing Plus Project
Analysis Time Period	PM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Access</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound			
	Movement	1	2	3	4	5	6
		L	T	R	L	T	R
Volume (veh/h)			37	37	0	12	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	41	41	0	13	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	<i>Undivided</i>						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		

Minor Street	Eastbound			Westbound			
	Movement	7	8	9	10	11	12
		L	T	R	L	T	R
Volume (veh/h)					59		0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	65	0	0	
Percent Heavy Vehicles	0	0	0	0	0	0	0
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized				0			0
Lanes	0	0	0	0	0	0	0
Configuration					LR		

### Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound			
	Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR					
v (veh/h)		0		65					
C (m) (veh/h)		1528		933					
v/c		0.00		0.07					
95% queue length		0.00		0.22					
Control Delay (s/veh)		7.4		9.1					
LOS		A		A					
Approach Delay (s/veh)	--	--		9.1					
Approach LOS	--	--		A					

## TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information			
Analyst	CDR			Intersection	Access & Buck Creek Road		
Agency/Co.	Kimley-Horn			Jurisdiction	Town of Avon		
Date Performed	1/09/2009			Analysis Year	Full Buildout Plus Project		
Analysis Time Period	AM Peak Hour						
Project Description <i>Buck Creek PUD</i>							
East/West Street: <i>Access</i>				North/South Street: <i>Buck Creek Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		34	54	0	43		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	37	60	0	47	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	<i>Undivided</i>						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				46		0	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	51	0	0	
Percent Heavy Vehicles	0	0	0	0	0	0	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		0		51			
C (m) (veh/h)		1509		887			
v/c		0.00		0.06			
95% queue length		0.00		0.18			
Control Delay (s/veh)		7.4		9.3			
LOS		A		A			
Approach Delay (s/veh)	--	--		9.3			
Approach LOS	--	--		A			

## TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	CDR	Intersection	Access & Buck Creek Road
Agency/Co.	Kimley-Horn	Jurisdiction	Town of Avon
Date Performed	1/09/2009	Analysis Year	Full Buildout Plus Project
Analysis Time Period	PM Peak Hour		

Project Description <i>Buck Creek PUD</i>	
East/West Street: <i>Access</i>	North/South Street: <i>Buck Creek Road</i>
Intersection Orientation: <i>North-South</i>	Study Period (hrs): <i>0.25</i>

### Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		61	37	0	22	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	67	41	0	24	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				59		0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	65	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

### Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		0		65				
C (m) (veh/h)		1495		890				
v/c		0.00		0.07				
95% queue length		0.00		0.24				
Control Delay (s/veh)		7.4		9.4				
LOS		A		A				
Approach Delay (s/veh)	--	--		9.4				
Approach LOS	--	--		A				