12PD013

Skyline Village Apartments

Traffic Impact Study

Rapid City, South Dakota

Prepared by
HDR Engineering, Inc.

APRIL 2012

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

1.1 STUDY PURPOSE

The purpose of this traffic study is to determine the operational impacts to the existing street network surrounding the proposed Skyline Village Apartments development located near South U.S. Highway 16 (U.S. 16) and Catron Boulevard in Rapid City, South Dakota. The additional traffic generated by the development has a potential to affect traffic operations on the streets and highways adjacent to the development. This study will evaluate the site impacts on the adjoining road network and identify roadway improvements and/or traffic control improvements to offset the impacts caused by the proposed site. A study was completed in December 2011 for redevelopment and expansion of the nearby National American University (NAU) site. This study is based on data and analysis prepared independently from the NAU study.

The study area is shown in **Figure 1**. Intersections highlighted with a red circle are study intersections that may be impacted due to the planned development:

- U.S. 16/Promise Road
- Promise Road/U.S. 16 Service Road
- U.S. 16/Tucker Road
- Tucker Road/U.S. 16 Service Road
- Catron Boulevard/U.S. 16 Service Road
- Catron Boulevard/Vineyard Lane (optional)

The US 16/Catron Boulevard intersection may be slightly impacted by traffic generated by the proposed development. That intersection, however, has been the subject of intensive study, including the consideration of an interchange. US 16/Catron was not further analyzed as part of this study because the relatively low level of traffic generated by this site is deemed to fall within the traffic already forecast and analyzed as part of the previous study.

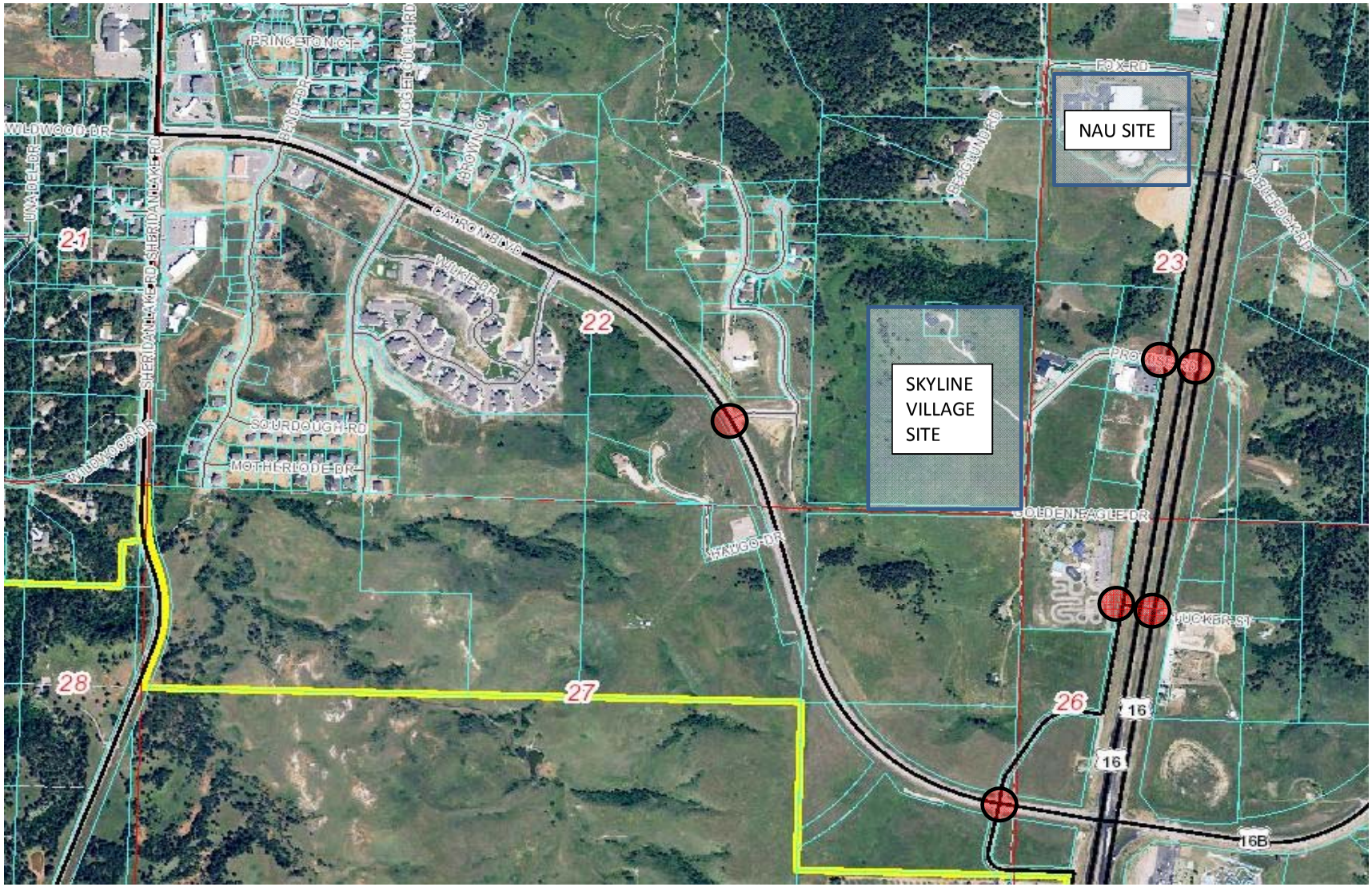
Steep terrain may make it difficult to build the roadway connection to Catron Boulevard/Vineyard Lane in time to coincide with construction of the proposed apartment development. Therefore, analyses have been prepared showing conditions with and without the Vineyard Lane connection. Figures showing conditions without the Vineyard Lane connection are identified by the addition of the letter “a” to the Figure number.

1.2 STUDY METHODOLOGY

The main objective of the study was to determine the traffic impacts on streets adjacent to the planned development. The following tasks were performed to determine these impacts:

- 2012 Existing AM and PM peak hour turning movement counts and a geometric inventory for the study area intersections were gathered by HDR.
- The site generated trips were estimated for the site.
- The site generated trips were distributed to the study area intersections.
- Existing build traffic volumes were developed that combined existing volumes and site generated trips.

- Future No Build traffic volumes (for year 2035) were projected.
- Future build traffic volumes were developed that combined future No Build volumes and site generated trips representing 2035 traffic volumes.
- Signal warrant, turn lane warrant and crash analyses were conducted.
- Capacity analyses were performed for four volume scenarios:
    - Existing traffic volumes
    - Existing build traffic volumes (year 2012 plus site generated trips)
    - Future No Build traffic volumes (year 2035)
    - Future build traffic volumes (year 2035 No Build volumes plus site generated trips)
- The impacts of the site generated trips on the surrounding street network were determined.
- Mitigation measures were identified to provide acceptable operations at the study area intersections, if needed. Applicable volume, turn lane warrants and signal warrants were reviewed for compliance, as necessary.



HDR

STUDY AREA

SKYLINE VILLAGE TRAFFIC IMPACT STUDY

APRIL, 2012

FIGURE 1

CHAPTER 2: EXISTING CONDITIONS

2.1 EXISTING ROADWAY NETWORK

The study area is located in southern Rapid City, South Dakota. The location of the existing site is west of U.S. 16, north of Tucker Street and south of Promise Road. Access to and from the site would be from U.S. Highway 16 via S. Highway 16 Service Road and from Catron Boulevard. Local street access will use Promise Road, Golden Eagle Drive, and Vineyard Lane. The roadway network is described below:

U.S. 16– The current lane configuration of U.S. 16 within the study area consists of a four-lane divided section with a wide grassed median.

- At the intersection with Promise Road there are two lanes in each direction. There are no designated turn lanes so the intersection operates with a combination left-turn/through lane and a combination right-turn/through lane in both the northbound and southbound directions. The median is wide enough to store up to two vehicles and provides for two-stage stop-controlled operations by allowing side street traffic the ability to cross U.S. 16 one direction at a time. The intersection is stop-controlled on Promise Road, yield-controlled in the median and is free-flow on U.S. 16.
- At the intersection with Tucker Street there are two lanes in each direction. There are no designated turn lanes so the intersection operates with a combination left-turn/through lane and a combination right-turn/through lane in both the northbound and southbound directions. The median is wide enough to store up to two vehicles and provides for two-stage stop-controlled operations by allowing side street traffic the ability to cross U.S. 16 one direction at a time. The intersection is stop-controlled on Tucker Street, yield-controlled in the median and free-flow on U.S. 16.

Catron Boulevard – The current lane configuration on Catron Boulevard within the study area consists of a three-lane section, with two eastbound lanes and one westbound lane. The outside eastbound lane serves as a climbing lane for heavy vehicles.

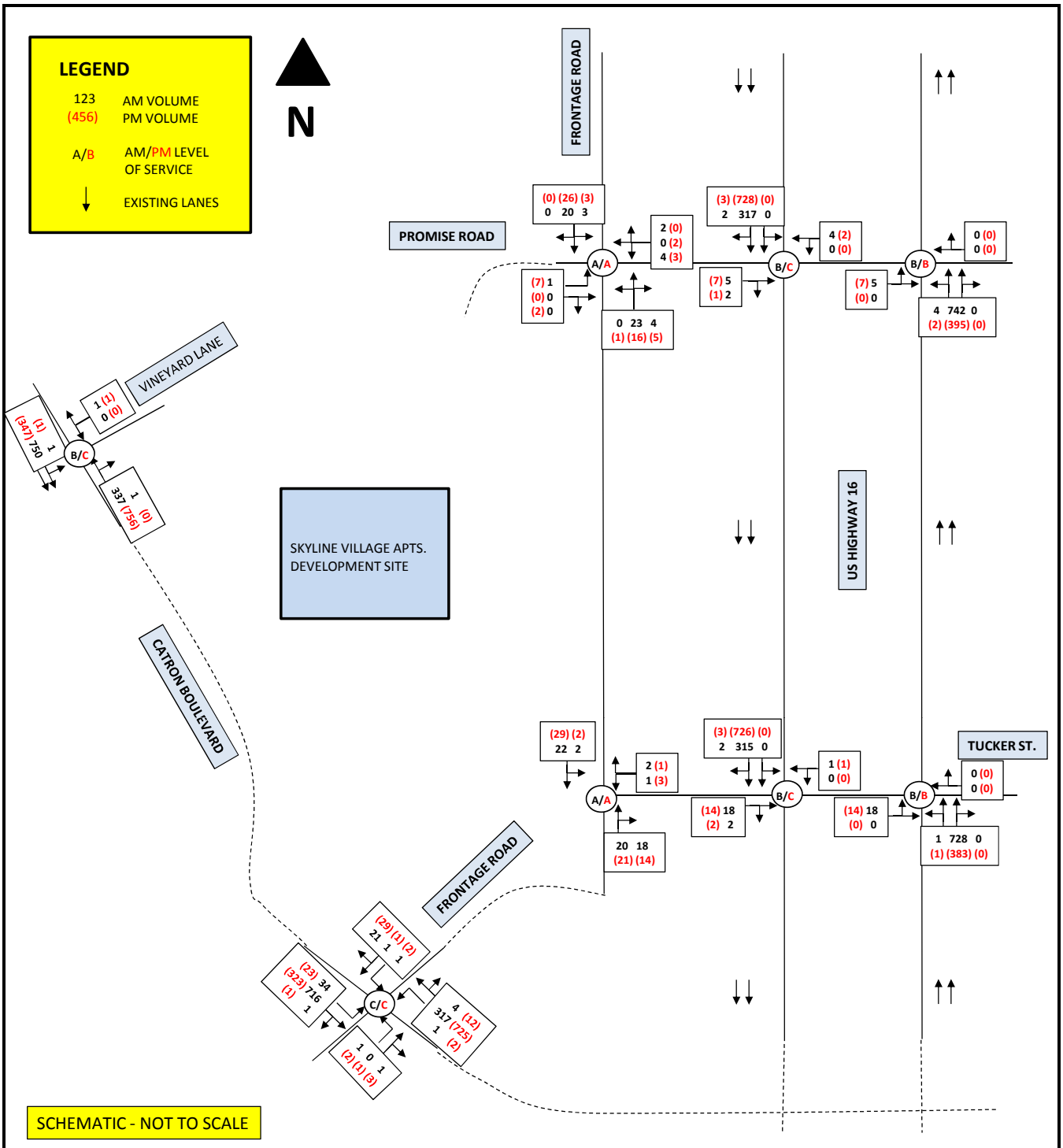
- At the intersection with the U.S. 16 frontage road, there are combination through-right lanes and separate left-turn lanes on Catron Boulevard. The north and south U.S. 16 frontage road approaches both have one separated left-turn lane and one combination through-right lane.
- At the intersection with Vineyard Lane, there are no separate turning lanes on Catron Boulevard. The Vineyard Lane approach has a single lane serving all movements.

S. Highway 16 Service Road – S. Highway 16 Service Road is a two-lane frontage road west of U.S. 16. It primarily serves several businesses and residential areas and runs parallel to U.S. 16.

Promise Road and Tucker Street – These roadways primarily serve commercial and residential areas along U.S. 16. Both of these intersections have single lane approaches at the intersection with U.S. 16, except the west leg of Promise Road, which has a separate left turn lane at its intersections with the US 16 Service Road.

2.2 EXISTING TRAFFIC VOLUMES

In order to identify the impacts associated with the proposed development, the existing traffic volumes were evaluated to determine the base condition. Existing turning movement counts were collected by HDR on March 27-29, 2012. Adjustment factors were obtained from SDDOT to account for seasonal variations in the traffic counts. Additionally, the counts were adjusted by 0.87 to represent peak summer demand along U.S. 16 as the result of tourism. The adjusted existing AM and PM peak hour volumes are shown in **Figures 2 and 2a** and are a conservative representation of the volumes along U.S. 16.



HDR

2012 EXISTING CONDITIONS VOLUMES AND LEVEL OF SERVICE

SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE: APRIL, 2012

FIGURE: 2

CHAPTER 3: TRAFFIC PROJECTIONS

3.1 BACKGROUND

The proposed development is a new building complex consisting of approximately 240 apartment dwelling units, with associated garage and outdoor parking. An additional 100 apartment dwelling units are anticipated in the vicinity of the subject property, although they are not part of this development proposal. The proposed site plan is shown in **Figure 3.**

3.2 TRIP GENERATION

The volume of traffic (trips) that a facility will generate is dependent upon many factors including, but not limited to: facility type, location, surrounding land uses, socioeconomic characteristics of area residents and traffic volumes on adjacent roadways.

Typically, trip generation used in traffic analyses is based on field studies of other similar land uses, preferably local studies. In the absence of local studies, trip generation rates are based on average rates documented for similar land uses throughout the United States. A widely used reference is the *Institute of Transportation Engineers' (ITE) Trip Generation Manual,* which provides trip rates for over 100 land use categories based on more than 3,000 individual trip generation studies conducted by agencies, developers and consulting firms. These rates, although gathered on a national scale, have proven to provide acceptable estimates of the average trip generation rates of many common land uses and are accepted by the South Dakota Department of Transportation (SDDOT).

The 8th Edition of the *Trip Generation Manual* was used for this study to estimate the number of trips that would be generated by the proposed development. A summary of the trip generation for the study is shown in **Table 1**. The table summarizes AM and PM trip generation for the site. Included are the specific land uses, trip variable (intensity), and total number of entering/exiting trips for both the AM and PM peak hours of adjacent street traffic. The total number of trips generated by the site is estimated to be 122 and 148 trips during the AM and PM peak hours, respectively. These figures include trips generated by the subject development and trips generated by anticipated adjacent development.

3.3 TRIP DISTRIBUTION AND ASSIGNMENT

The orientation of site generated traffic with respect to the surrounding roadway network is a function of trip purpose linkages and the accessibility of the existing streets. Trip distribution for this study was based on the existing distribution of traffic as determined from the existing counts and engineering judgment. The site generated trips were assigned to the street network based on the trip distribution, the directionality of the trips (entering vs. exiting), existing turning percentages at intersections and engineering judgment. Based on the existing traffic patterns, the site would be accessed from the U.S. 16/Promise Road, U.S. 16/Tucker Street, U.S. 16 Frontage Road/Catron Boulevard, and the possibly the Catron Boulevard/Vineyard Lane intersections. Trip distribution percentages are shown in **Figure 4**. The 2012 Build volumes with the site generated trip assignment for both the AM and PM peak hours are shown in **Figures 5 and 5a**.

TRIP GENERATION

SKYLINE VILLAGE APARTMENTS - RAPID CITY, SD

AM PEAK PERIOD

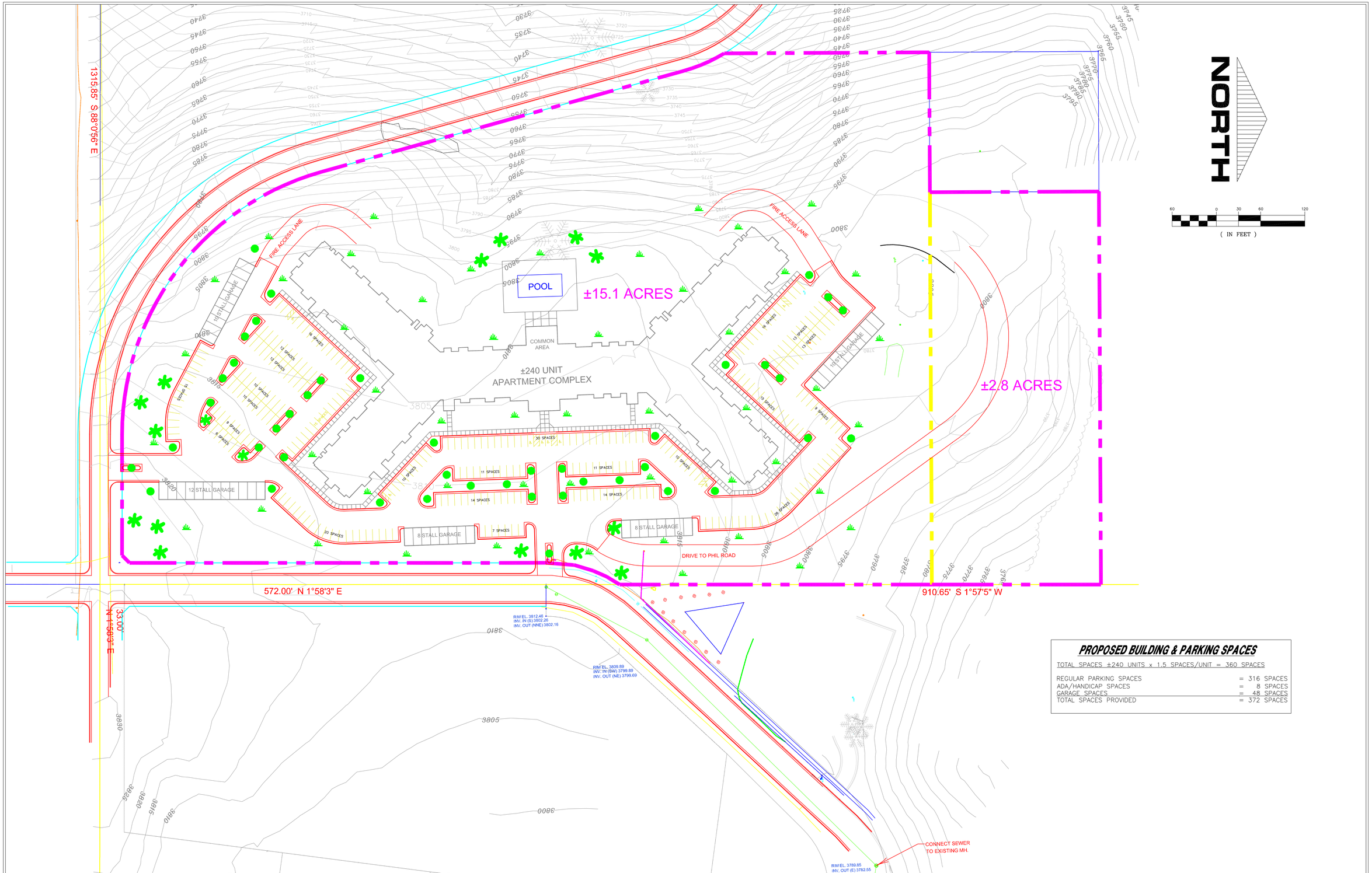
LAND USE	UNITS	UNIT TYPE	TRIP RATE	DIRECTION PERCENT IN	DIRECTION PERCENT OUT	GENERATED VOLUME IN	GENERATED VOLUME OUT	PASS-BY PERCENT	NET VOLUME IN	NET VOLUME OUT
Apartment Complex	240	dwelling units	0.36	31%	69%	26	59	0	26	59
Future Apartments	100	dwelling units	0.36	31%	69%	11	25	0	11	25
								TOTAL	38	84

PM PEAK PERIOD

LAND USE	UNITS	UNIT TYPE	TRIP RATE	DIRECTION PERCENT IN	DIRECTION PERCENT OUT	GENERATED VOLUME IN	GENERATED VOLUME OUT	PASS-BY PERCENT	NET VOLUME IN	NET VOLUME OUT
Apartment Complex	240	dwelling units	0.434	58%	42%	60	44	0	60	44
Future Apartments	100	dwelling units	0.434	58%	42%	25	18	0	25	18
								TOTAL	86	62

NOTE: Trip generation based on regression equations for Mid-Rise Apartments, 8th Edition ITE Trip Generation Manual - converted to equivalent trip rate for tabular display

12PD013



PROPOSED BUILDING & PARKING SPACES

TOTAL SPACES ±240 UNITS x 1.5 SPACES/UNIT = 360 SPACES

REGULAR PARKING SPACES	=	316 SPACES
ADA/HANDICAP SPACES	=	8 SPACES
GARAGE SPACES	=	48 SPACES
TOTAL SPACES PROVIDED	=	372 SPACES

REVISIONS:	DATE:

WLE

WILLADSEN LUND ENGINEERING
902 SOUTH CLEVELAND AVENUE
SIOUX FALLS, SOUTH DAKOTA 57103 (605)338-6950

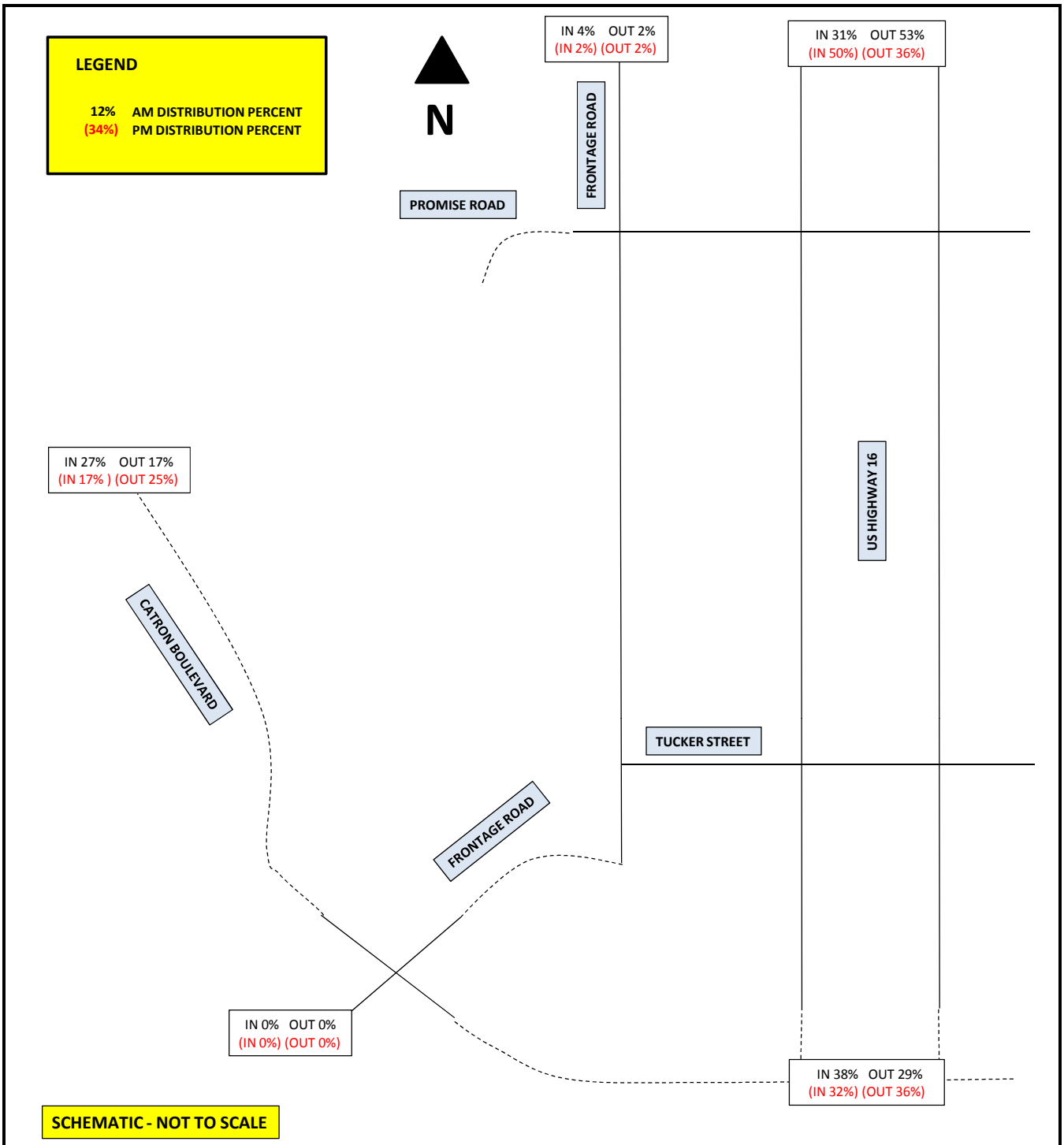
OWNER:

SKYLINE VILLAGE APARTMENTS

SKETCH PLAN

DRAWING No.	2011-069	SHEET
DRAWN BY	TWL	C1
APPROVED BY	EPW	
DATE	OCT2011	

12PD013



HDR

TRIP DISTRIBUTION

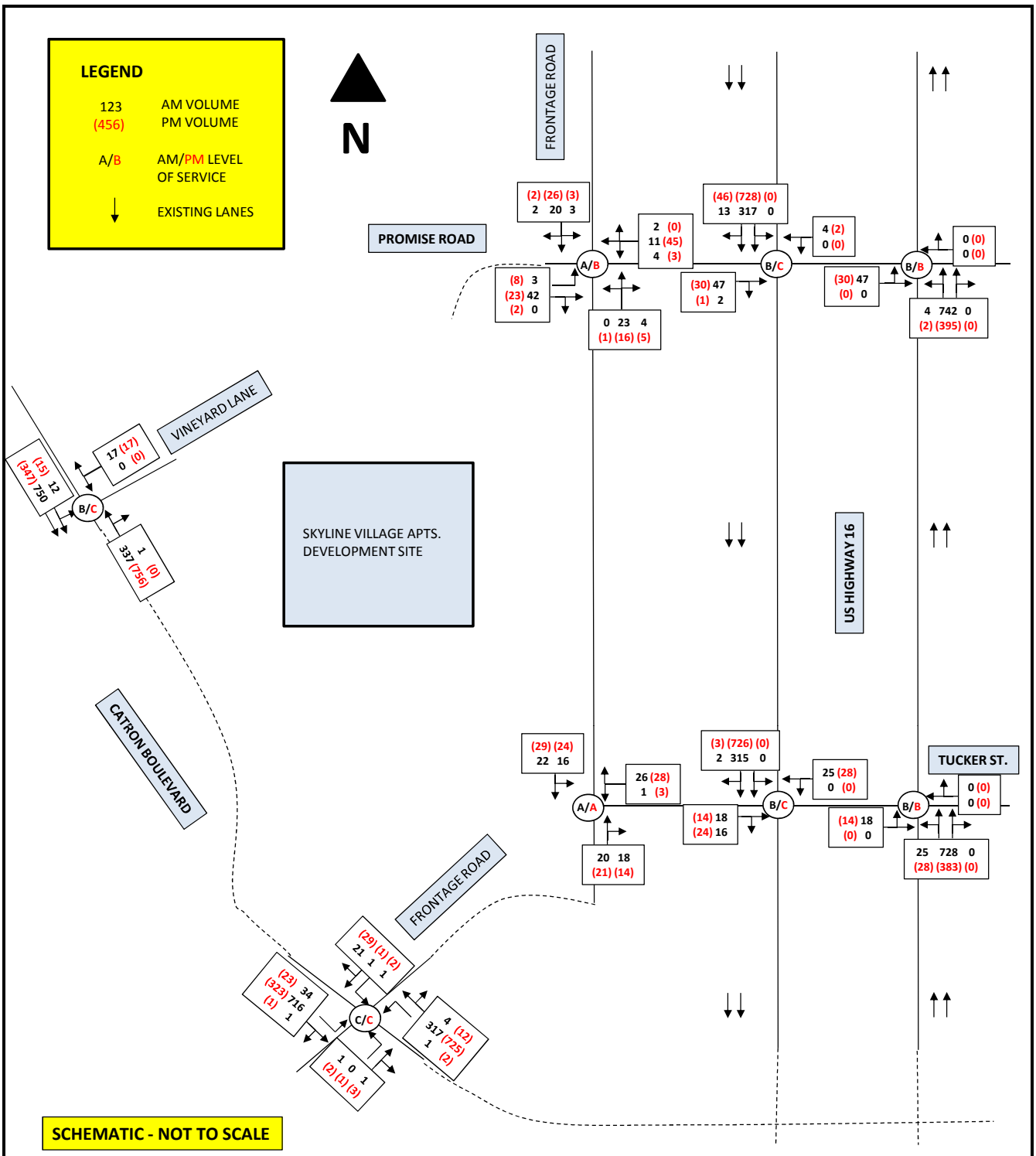
SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE:

APRIL, 2012

FIGURE:

4



HDR

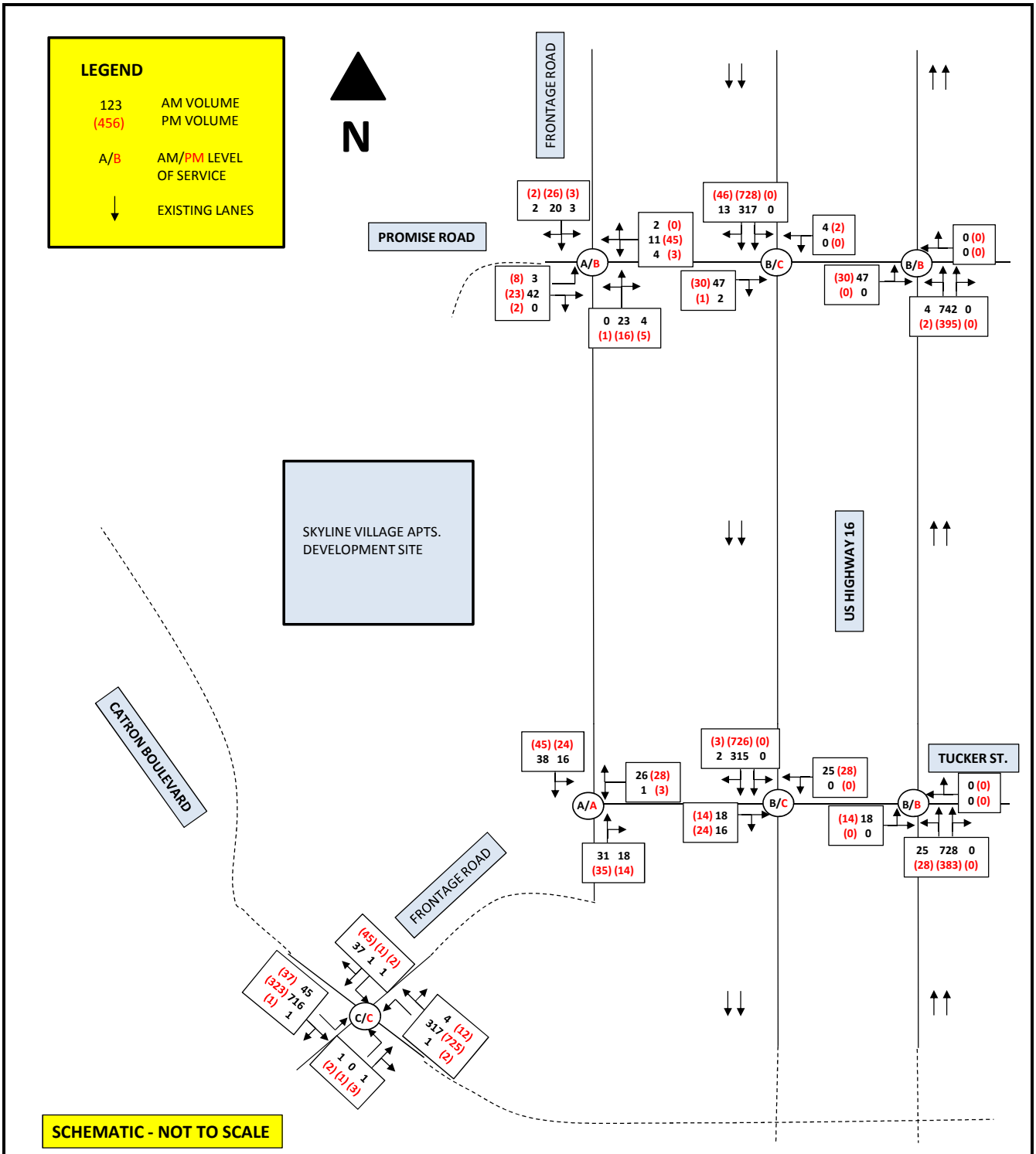
EXISTING + SITE TRAFFIC VOLUME AND LEVEL OF SERVICE

SKYLINE VILLAGE APARTMENT TRAFFIC IMPACT STUDY

DATE:
APRIL, 2012

FIGURE:
5

12PD013



HDR

EXISTING + SITE TRAFFIC VOLUME AND LEVEL OF SERVICE

SKYLINE VILLAGE APARTMENT TRAFFIC IMPACT STUDY

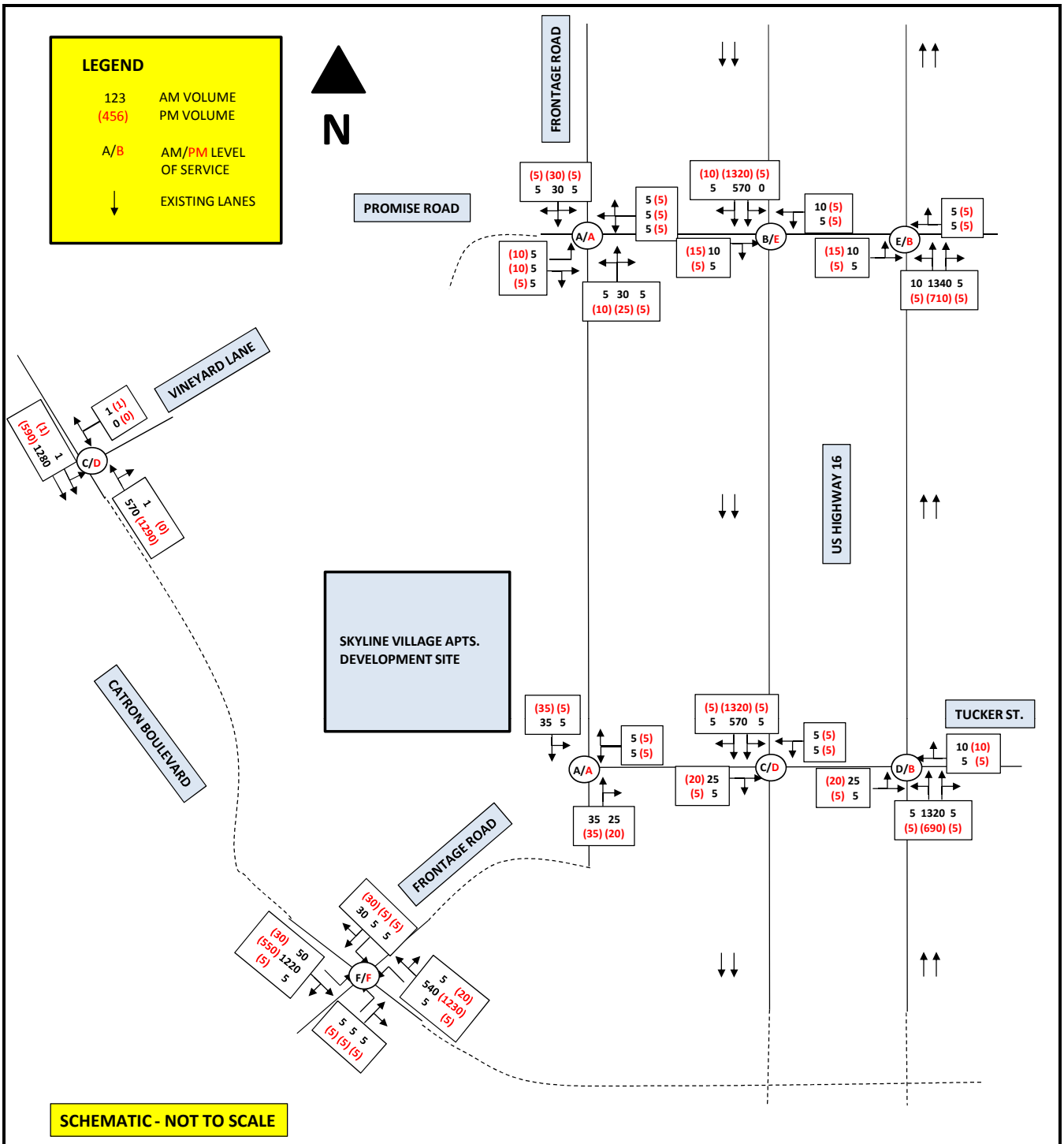
DATE: APRIL, 2012

FIGURE: 5a

3.4 FUTURE TRAFFIC VOLUMES (2035)

Future traffic volumes were evaluated to determine the long-term traffic demands on the roadway network. Based on projected growth trends in the study area, future year 2035 background (No Build) volumes were developed by HDR using forecast information obtained from the City of Rapid City and SDDOT. These volumes are shown in **Figures 6 and 6a** and are considered to be the study background (No Build) traffic volumes.

Year 2035 build traffic volumes were determined by adding the site generated trips to the 2035 background traffic volumes. The 2035 build traffic volumes are shown in **Figures 7 and 7a**.



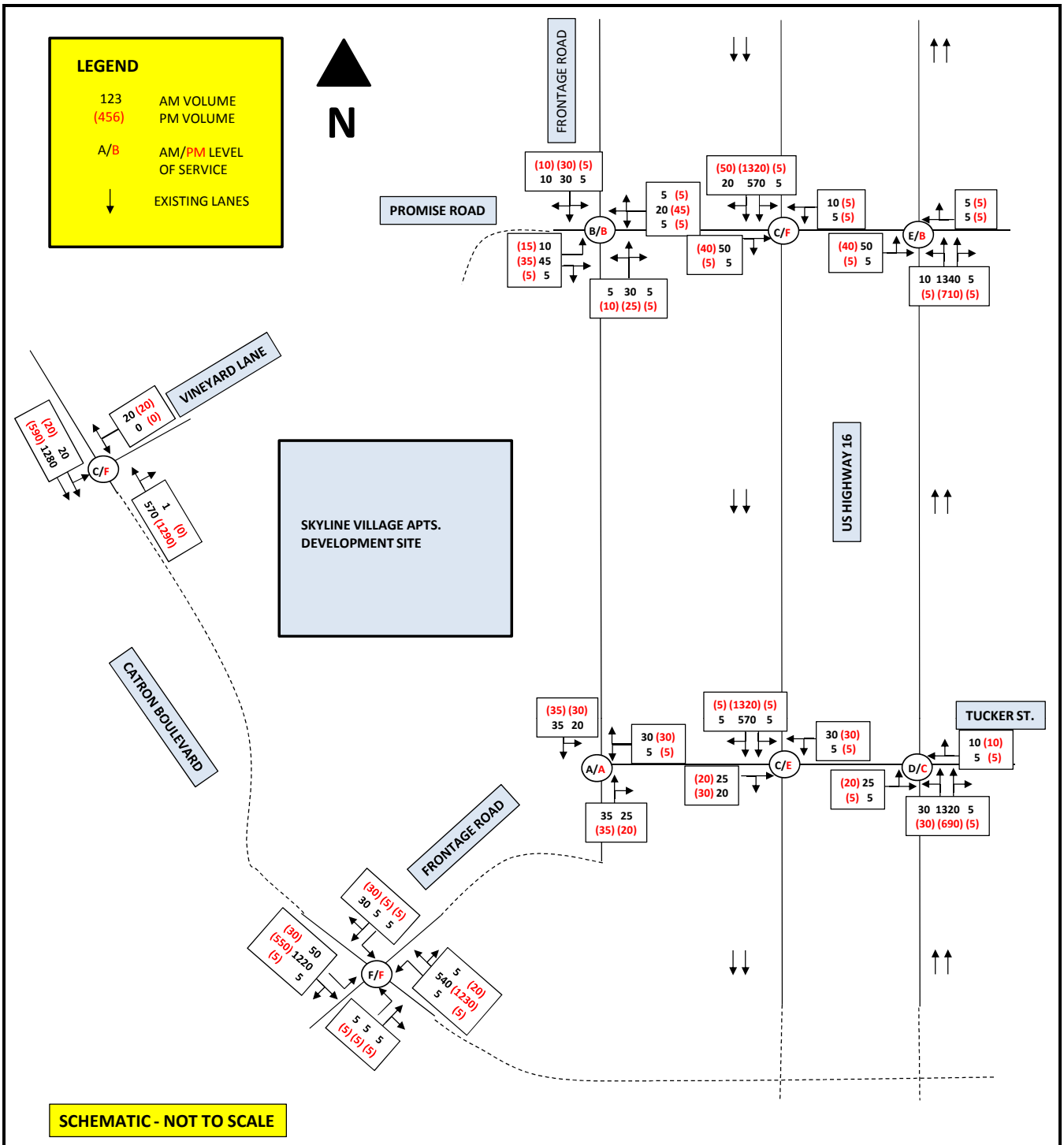
HDR

2035 NO-BUILD VOLUMES & LEVEL OF SERVICE

SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE: APRIL, 2012

FIGURE: 6



HDR

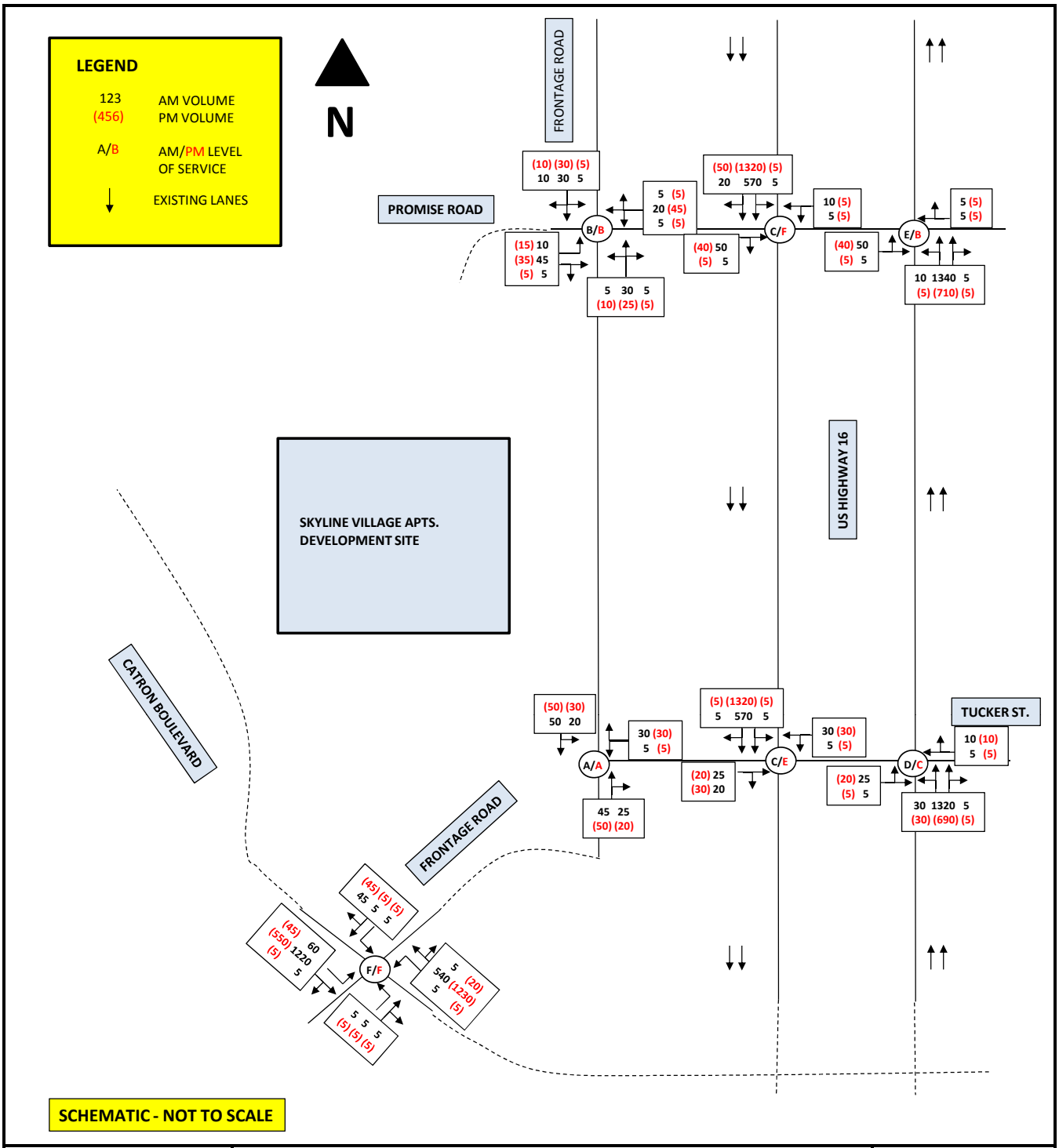
2035 BUILD VOLUMES & LEVEL OF SERVICE

SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE:
APRIL, 2012

FIGURE:
7

12PD013



HDR

2035 BUILD VOLUMES & LEVEL OF SERVICE

SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE:

APRIL, 2012

FIGURE:

7a

CHAPTER 4: OPERATIONAL ANALYSIS

4.1 ANALYSIS DESCRIPTION

Observations of traffic volumes provide an understanding of the general nature of traffic, but are insufficient to indicate either the ability of the street network to carry additional traffic or the quality of service provided by the street system. For this reason the concept of *level of service* (LOS) was developed to correlate numerical traffic operational data to subjective descriptions of traffic performance at intersections. Each lane of traffic has delay associated with it and therefore a correlating LOS. The weighted average delay for each of these lanes of traffic for a signalized intersection is the intersection LOS. LOS categories range from LOS 'A' (best) to 'F' (worst) as shown in **Table 3**.

Table 2. Level of Service Description

Level of Service	Signalized Intersection Control Delay (seconds)	Unsignalized Intersection Control Delay (seconds)	Intersection LOS Description
A	≤ 10.0	≤ 10.0	Free flow, insignificant delays.
B	10.1-20.0	10.1-15.0	Stable operation, minimal delays.
C	20.1-35.0	15.1-25.0	Stable operation, acceptable delays.
D	35.1-55.0	25.1-35.0	Restricted flow, regular delays.
E	55.1-80.0	35.1-50.0	Maximum capacity, extended delays. Volumes at or near capacity. Long queues form upstream from intersection.
F	> 80.0	> 50.0	Forced flow, excessive delays. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: *Highway Capacity Manual*, Transportation Research Board, 2000

The intersection capacity analyses were completed with Synchro 7.0 software. Synchro replicates the analysis procedures defined in the *2000 Highway Capacity Manual*. This manual provides procedures for the analysis of both signalized and unsignalized intersections. It should be noted that stop-controlled intersections are analyzed by identifying the amount of delay at each approach that conflict with other intersection movements (i.e. all movements except the free flow through lanes), thus approach LOS is reported for unsignalized intersections.

LOS 'C' has generally been established as the standard for planning of transportation facilities for peak hour traffic conditions. For this study, LOS 'C' for the overall intersection was used as the desirable standard with LOS 'D' as the minimum standard, as recommended by the SDDOT Design Manual.

Note that the level of service for stop-controlled intersections has been reported as the level of service for the worst stopped approach. Overall levels of service for stop-controlled intersections may be quite high (good) without reflecting the delay experienced by stopped vehicles. Reporting the level of service of worst stopped approach gives an indication of that delay, but

should not be interpreted as a need for improvement. Additional analysis will be provided related to any potential need for additional lanes or change of traffic control.

A review of the analyses for each summer peak volume scenario is provided below.

4.2 2012 EXISTING CONDITIONS ANALYSIS

Capacity analysis was performed using the existing AM and PM peak hour traffic volumes on the existing roadway network. All intersections operate at LOS 'C' or better.

4.3 2012 BUILD CONDITIONS ANALYSIS

A capacity analysis was performed using the year 2012 build traffic volumes (2012 existing volumes plus site generated trips) on the roadway network. This analysis assumes no geometric improvements at any of the study area intersections. All intersections would operate at LOS 'C' or better.

4.4 2035 NO BUILD CONDITIONS ANALYSIS

A capacity analysis was performed for the 2035 background No Build traffic volumes on the roadway network. This analysis assumes no geometric improvements at the study area intersections. Under these conditions, the stop-controlled approaches at U.S. 16/Promise Road operate at LOS E in the PM peak period at the intersection with U.S. 16 southbound and in the AM peak period at the intersection with U.S. 16 northbound. Likewise, the stop-controlled approaches at U.S. 16/Tucker Street operate at LOS D in the PM peak period at the intersection with U.S. 16 southbound and in the AM peak period at the intersection with U.S. 16 northbound. The stop-controlled approaches at Catron Boulevard/U.S. 16 Service Road operate at LOS F in both the AM and PM peak hours. All other stop-controlled approaches operate at LOS C or better.

4.5 2035 BUILD CONDITIONS ANALYSIS

A capacity analysis was performed using the year 2035 build traffic volumes (2035 background No Build volumes plus site generated trips) on the roadway network. This analysis assumes no geometric improvements at any of the study area intersections. Under these conditions, the stop-controlled approach at U.S. 16 southbound/Promise Road falls to LOS F in the PM peak period, and the stop-controlled approach at U.S. 16 southbound/Tucker Street falls to LOS E in the PM peak period. The stop-controlled approaches at U.S. 16 Service Road/Promise Road fall to LOS B in both peak periods. All other stop-controlled approaches operate at the same level of service as experienced in the 2035 No-Build condition.

4.6 CRASH ANALYSIS

The four year crash data was reviewed for the area. Three angle and two rear-end crashes were noted at the U.S. 16/Promise Road intersection in the years 2008-2011. The remaining 20 crashes in the study area were attributed to a mixture of animal hits and drivers leaving the road or hitting other vehicles during icy conditions. Note that the U.S. 16/Catron Boulevard intersection was not included in the crash analysis since the intersection configuration and safety have been the subject of separate specific studies. A summary of crashes has been included in the Appendix.

Fatal and serious injury crashes are the focus of the South Dakota Strategic Highway Safety Plan, currently under development. The crash summary shows no fatal incidents and two crashes with incapacitating injuries. The roadways in the study area generally provide a high design standard, although sections of the U.S. 16 Service Road may benefit from shoulder and inslope treatment.

4.7 SIGNAL WARRANTS

The traffic signal warrants detailed in the 2009 Manual on Uniform Traffic Control Devices (MUTCD) were utilized for this study. No location in the study area met a volume-based traffic signal warrant for 2012 or 2035 traffic conditions, as none of the minor street approaches meet the minimum traffic volume thresholds. Crash or system-type signal warrants were not applied, although they may be the basis for future signal consideration based on future crash or system conditions.

The U.S. 16/Promise Road intersection currently has a traffic signal which is activated only for emergency vehicle traffic from a fire station on Promise Road. This location could be upgraded to full-time signal operation at considerably less cost than a new signal location. This is also the site with the greatest likelihood of consolidating local traffic in the study area. Therefore, this location is recommended for continued monitoring and future consideration for signalization.

4.8 TURN LANE WARRANTS

Various guidelines, standards or warrants have been developed to aid in the decision to install dedicated turn lanes at intersections. The current version of the SDDOT Road Design Manual establishes three criterions for when turn lanes should be considered. The three criterions are listed below:

1. Vehicular Volume
2. Crash Experience
3. Special Cases

Criterion 1 is intended to be applied when the volume of intersecting traffic is the primary reason for considering the installation of a turn lane. Criterion 2 is used when there is a history of crashes that could be corrected by adding turn lanes. A condition of Criterion 2 is that the safety benefits should outweigh the associated improvement costs for adding the turn lanes and that the turn lanes do not adversely impact the operations of the roadway. Criterion 3 deals with special cases related to railroad crossings and geometric/safety concerns.

Based on Criterion 1, a southbound right-turn lane is warranted on U.S. 16 at Promise Road under the existing plus site operating conditions. Similarly, an eastbound left-turn lane is warranted at Catron Boulevard/Vineyard Lane under existing plus site operating conditions and a northbound left turn lane is warranted at U.S. 16/Tucker Street under existing plus site operating conditions.

Criterion 2 is not met for any location within the study area.

CHAPTER 5: FINDINGS AND RECOMMENDATIONS

This section summarizes the findings and recommendations based upon the proposed Skyline Village Apartment development near South U.S. 16 and Catron Boulevard in Rapid City.

5.1 FINDINGS

The general findings for each summer peak scenario are as follows:

- **Under the 2012 existing volume scenario and 2012 build scenario,** all study intersection operate at acceptable levels of service.
- **Under the 2035 No Build (background) volume scenario,** one stop-controlled approach at U.S. 16/Promise Road would operate at LOS 'E' during the AM and PM peak hours. One stop-controlled approach at U.S. 16/Tucker Street would operate at LOS 'D' during the AM and PM peak hours. The S. Highway 16 Service Road/Catron Boulevard stop-controlled approaches would operate at LOS 'F' during both peak periods. The stop-controlled approach at Catron Boulevard/Vineyard Lane would operate at LOS D during the PM peak hour. All other stop-controlled approaches would operate at LOS C or better.
- **Under the 2035 Build volume scenario,** the eastbound stop-controlled approach at U.S. 16/Promise Road would deteriorate to LOS 'F' during the PM peak hours. The eastbound stop-controlled approach at U.S. 16/Tucker Street would deteriorate to LOS 'E' during the PM peak hours. All other stop-controlled approaches would operate similar to the 2035 No-Build conditions.

No locations satisfied the necessary conditions to justify a traffic signal under any of the traffic scenarios considered in this study. The U.S. 16/Promise Road intersection, however, already is partially signalized for emergency vehicles and could be upgraded to provide general traffic operations.

Based on Criterion 1 for the turn lane warrants, a northbound left-turn lane along U.S. 16 is warranted at Tucker Street under existing plus site conditions. The warrant is met for the southbound right-turn lane at Promise Road under existing conditions. An eastbound left turn lane is warranted on Catron Boulevard at Vineyard Lane under existing plus site conditions. Criterion 2 is not met for either intersection based on the 5-year crash history.

5.2 RECOMMENDATIONS

No immediate changes are recommended within the study area as a result of the Skyline Village Apartments development. All intersections will operate under acceptable conditions with the addition of the site-generated traffic into existing traffic volumes.

Future operations are forecast to deteriorate whether or not the proposed development is built. Some stop-controlled approaches will experience more lengthy delays, although the delays will be similar to conditions experienced at thousands of other stop-controlled approaches on arterial roadways in South Dakota. It should be noted that, while individual stop-controlled approaches

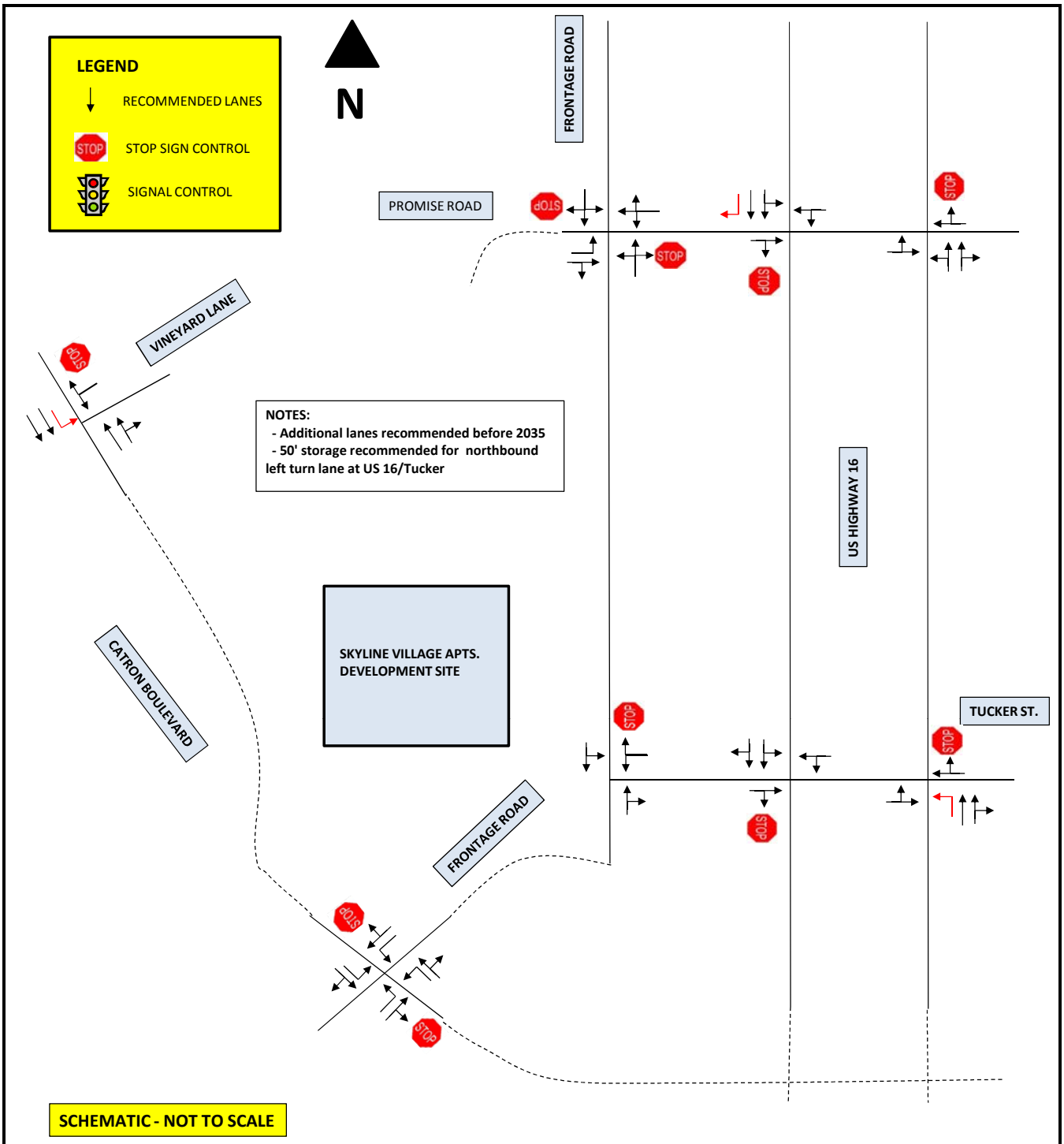
will experience low levels of service, overall intersection operations will still achieve level of service goals.

Additional turn lanes are warranted and recommended to meet future traffic demand:

- Southbound right turn lane – U.S. 16/Promise Road
- Northbound left turn lane – U.S. 16/Tucker Street
- Eastbound left turn lane – Catron Boulevard/Vineyard Lane (if local street connection exists)

It is also recommended that operations at U.S. 16/Promise Road be monitored for future need for full traffic signalization.

12PD013



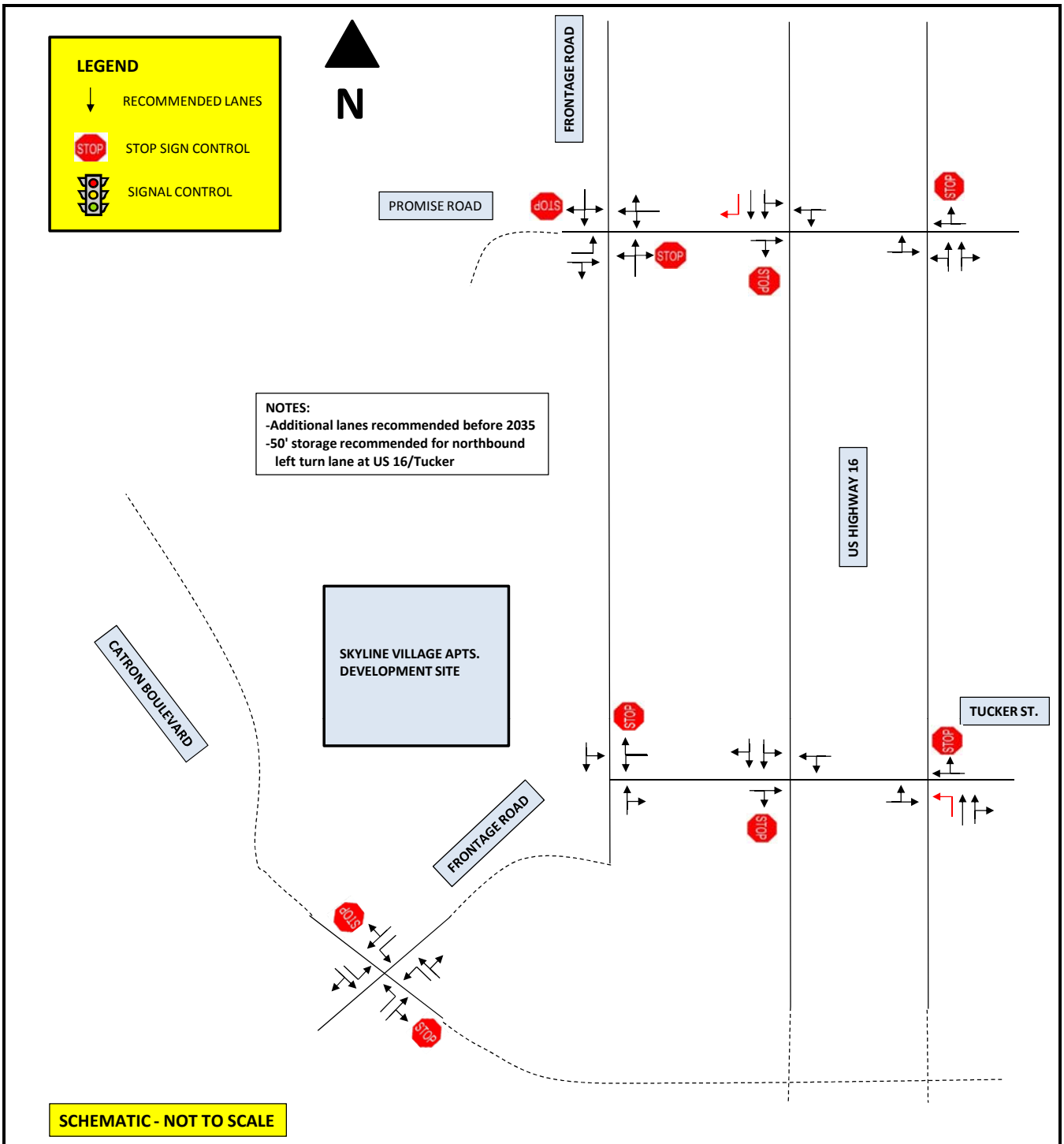
HDR

RECOMMENDED GEOMETRY AND CONTROL

SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE:
APRIL, 2012

FIGURE:
8



HDR

RECOMMENDED GEOMETRY AND CONTROL

SKYLINE VILLAGE APARTMENTS TRAFFIC IMPACT STUDY

DATE:
APRIL, 2012

FIGURE:
8a

APPENDIX

- Comment Reply Memo
- Synchro Summary Reports
    - 2012 Existing Conditions
    - 2012 Existing + Site Conditions
    - 2035 No Build Conditions
    - 2035 Build Conditions
- Crash Summary
- Turn Lane Criteria Summary

HDR | ONE COMPANY *Many Solutions*℠

Technical Memo

To:	Review participants		
From:	Rick Laughlin	Project:	Skyline Village Apartments TIS
CC:			
Date:	5/15/12	Job No:	

RE: Comments on draft report

Our thanks to all reviewers for their comments on our draft traffic impact study report. The comments and questions are addressed below:

- SDDOT comment – "Under Trip generation – The last paragraph notes the estimated trip generated by the site of 122 & 148 for respective AM & PM peak periods. From our review of 7th Edition, those numbers appear valid for only the 240 units. Please verify that trip generation rate being utilized is valid as there appears to be a vast difference from data from 8th Edition to the 7th Edition.

  Our trip generation is based on the Mid-Rise Apartment land use in the 8th Edition of the ITE Trip Generation Manual. This is the most up-to-date information available and the Mid-Rise Apartment use was chosen as the use that most closely fits the proposed development. The trip generation calculations were based on the ITE regression equations, but the calculations were converted to an equivalent average rate for easy display in the Trip Generation table.

- Numerous peak hour factors are 0.92 while others are lesser. As the base count data was not included, verify that numbers came from valid count data.

  Some of the movement volumes were synthesized from turning movement counts that included the service road and mainline, etc. In cases where the movement volume was synthesized, the default peak hour factor was applied. It appears that possible variation in the peak hour factor in these analyses will not materially affect the outcome.

Appendix Part 1
Synchro Summary Reports

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	0	4	0	2	0	23	4	3	20	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.59	0.59	0.59	0.42	0.42	0.42
Hourly flow rate (vph)	1	0	0	4	0	2	0	39	7	7	48	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2			0			36	13	0	38	12	1
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2			0			36	13	0	38	12	1
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	96	99	99	95	100
cM capacity (veh/h)	1620			1623			928	878	1085	926	880	1083

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	1	0	7	46	55
Volume Left	1	0	4	0	7
Volume Right	0	0	2	7	0
cSH	1620	1700	1623	904	885
Volume to Capacity	0.00	0.00	0.00	0.05	0.06
Queue Length 95th (ft)	0	0	0	4	5
Control Delay (s)	7.2	0.0	4.8	9.2	9.3
Lane LOS	A		A	A	A
Approach Delay (s)	7.2		4.8	9.2	9.3
Approach LOS				A	A

Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	5	2	0	4	0	0	0	0	0	317	2
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.87	0.87	0.87
Hourly flow rate (vph)	0	5	2	0	4	0	0	0	0	0	364	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	368	366	183	187	367	0	367			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	368	366	183	187	367	0	367			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	99	100	100	99	100	100			100		
cM capacity (veh/h)	560	561	828	749	561	1084	1188			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	8	4	182	184
Volume Left	0	0	0	0
Volume Right	2	0	0	2
cSH	618	561	1579	1700
Volume to Capacity	0.01	0.01	0.00	0.11
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	10.9	11.5	0.0	0.0
Lane LOS	B	B		
Approach Delay (s)	10.9	11.5	0.0	
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	18.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	0	0	0	4	742	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	0	0	0	0	5	989	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	505	1000	0	1000	1000	495	0			989		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	505	1000	0	1000	1000	495	0			989		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	449	241	1084	197	241	520	1579			694		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	5	0	500	495
Volume Left	5	0	5	0
Volume Right	0	0	0	0
cSH	449	1700	1579	1700
Volume to Capacity	0.01	0.00	0.00	0.29
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	13.1	0.0	0.1	0.0
Lane LOS	B	A	A	
Approach Delay (s)	13.1	0.0	0.1	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/6/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	2	20	18	2	22
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.70	0.70	0.44	0.44
Hourly flow rate (vph)	1	2	29	26	5	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	101	41			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	41			54	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	895	1029			1551	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	3	54	55
Volume Left	1	0	5
Volume Right	2	26	0
cSH	981	1700	1551
Volume to Capacity	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.7	0.0	0.6
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	0.6
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	18	2	0	1	0	0	0	0	0	315	2
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	20	2	0	1	0	0	0	0	0	414	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	416	416	209	219	417	0	417			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	416	416	209	219	417	0	417			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	96	100	100	100	100	100			100		
cM capacity (veh/h)	520	526	797	696	525	1084	1138			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	22	1	207	210
Volume Left	0	0	0	0
Volume Right	2	0	0	3
cSH	545	525	1579	1700
Volume to Capacity	0.04	0.00	0.00	0.12
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	11.9	11.9	0.0	0.0
Lane LOS	B	B		
Approach Delay (s)	11.9	11.9	0.0	
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	18.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	0	0	0	0	0	1	728	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	0	0	0	1	899	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	452	901	0	901	901	449	0			899		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	452	901	0	901	901	449	0			899		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	96	100	100	100	100	100	100			100		
cM capacity (veh/h)	491	276	1084	233	276	557	1579			751		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	20	0	451	449
Volume Left	20	0	1	0
Volume Right	0	0	0	0
cSH	491	1700	1579	1700
Volume to Capacity	0.04	0.00	0.00	0.26
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	12.6	0.0	0.0	0.0
Lane LOS	B	A	A	
Approach Delay (s)	12.6	0.0	0.0	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	716	1	1	317	4	1	0	1	1	1	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	778	1	1	345	4	1	0	1	1	1	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	349			779			1223	1204	779	1202	1202	347
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			779			1223	1204	779	1202	1202	347
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	100	99	99	97
cM capacity (veh/h)	1210			838			147	178	396	157	179	696

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	37	779	1	349	1	1	1	24
Volume Left	37	0	1	0	1	0	1	0
Volume Right	0	1	0	4	0	1	0	23
cSH	1210	1700	838	1700	147	396	157	615
Volume to Capacity	0.03	0.46	0.00	0.21	0.01	0.00	0.01	0.04
Queue Length 95th (ft)	2	0	0	0	1	0	1	3
Control Delay (s)	8.1	0.0	9.3	0.0	29.7	14.1	28.1	11.1
Lane LOS	A		A		D	B	D	B
Approach Delay (s)	0.4		0.0		21.9		11.8	
Approach LOS					C		B	

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/6/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	337	1	1	750
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.78	0.78	0.88	0.88
Hourly flow rate (vph)	0	4	432	1	1	852
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	861	433			433	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	861	433			433	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	294	571			1123	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	433	285	568
Volume Left	0	0	1	0
Volume Right	4	1	0	0
cSH	571	1700	1123	1700
Volume to Capacity	0.01	0.25	0.00	0.33
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	11.3	0.0	0.0	0.0
Lane LOS	B		A	
Approach Delay (s)	11.3	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	2	3	2	0	1	16	5	3	26	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.40	0.40	0.40	0.92	0.92	0.92	0.68	0.68	0.68	0.62	0.62	0.62
Hourly flow rate (vph)	18	0	5	3	2	0	1	24	7	5	42	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2			5			67	46	2	63	49	2
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2			5			67	46	2	63	49	2
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	99	99	95	100
cM capacity (veh/h)	1620			1616			881	835	1082	897	832	1082

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	18	5	5	32	47
Volume Left	18	0	3	1	5
Volume Right	0	5	0	7	0
cSH	1620	1700	1616	883	838
Volume to Capacity	0.01	0.00	0.00	0.04	0.06
Queue Length 95th (ft)	1	0	0	3	4
Control Delay (s)	7.2	0.0	4.3	9.2	9.5
Lane LOS	A		A	A	A
Approach Delay (s)	5.6		4.3	9.2	9.5
Approach LOS				A	A

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	7	1	0	2	0	0	0	0	0	728	3
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	8	1	0	2	0	0	0	0	0	958	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	961	960	481	484	962	0	962			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	961	960	481	484	962	0	962			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	97	100	100	99	100	100			100		
cM capacity (veh/h)	209	255	531	454	255	1084	711			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	9	2	479	483
Volume Left	0	0	0	0
Volume Right	1	0	0	4
cSH	273	255	1579	1700
Volume to Capacity	0.03	0.01	0.00	0.28
Queue Length 95th (ft)	2	1	0	0
Control Delay (s)	18.6	19.3	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	18.6	19.3	0.0	
Approach LOS	C	C		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	0	0	0	0	2	395	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	8	0	0	0	0	0	2	459	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234	464	0	464	464	230	0			459		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234	464	0	464	464	230	0			459		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	700	493	1084	481	493	773	1579			1098		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	8	0	232	230
Volume Left	8	0	2	0
Volume Right	0	0	0	0
cSH	700	1700	1579	1700
Volume to Capacity	0.01	0.00	0.00	0.14
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	10.2	0.0	0.1	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.2	0.0	0.0	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/6/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	1	21	14	2	29
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.75	0.75	0.59	0.59
Hourly flow rate (vph)	3	1	28	19	3	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	93	37			47	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93	37			47	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	905	1035			1561	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	47	53
Volume Left	3	0	3
Volume Right	1	19	0
cSH	934	1700	1561
Volume to Capacity	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.9	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	0.5
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	14	2	0	1	0	0	0	0	0	726	3
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	2	0	1	0	0	0	0	0	789	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	791	791	396	404	792	0	792			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	791	791	396	404	792	0	792			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	95	100	100	100	100	100			100		
cM capacity (veh/h)	279	321	603	510	320	1084	824			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	17	1	395	398
Volume Left	0	0	0	0
Volume Right	2	0	0	3
cSH	341	320	1579	1700
Volume to Capacity	0.05	0.00	0.00	0.23
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	16.1	16.3	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	16.1	16.3	0.0	
Approach LOS	C	C		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	0	0	0	0	0	1	383	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	15	0	0	0	0	0	1	485	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	245	487	0	487	487	242	0			485		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245	487	0	487	487	242	0			485		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	98	100	100	100	100	100	100			100		
cM capacity (veh/h)	688	479	1084	463	479	758	1579			1074		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	15	0	244	242
Volume Left	15	0	1	0
Volume Right	0	0	0	0
cSH	688	1700	1579	1700
Volume to Capacity	0.02	0.00	0.00	0.14
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	10.3	0.0	0.0	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.3	0.0	0.0	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/6/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	323	1	2	725	12	2	1	3	2	1	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	351	1	2	788	13	2	1	3	2	1	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	801			352			1226	1207	352	1204	1201	795
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	801			352			1226	1207	352	1204	1201	795
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			98	99	100	99	99	92
cM capacity (veh/h)	822			1207			139	177	692	156	179	388

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	352	2	801	2	4	2	33
Volume Left	25	0	2	0	2	0	2	0
Volume Right	0	1	0	13	0	3	0	32
cSH	822	1700	1207	1700	139	401	156	373
Volume to Capacity	0.03	0.21	0.00	0.47	0.02	0.01	0.01	0.09
Queue Length 95th (ft)	2	0	0	0	1	1	1	7
Control Delay (s)	9.5	0.0	8.0	0.0	31.4	14.1	28.5	15.6
Lane LOS	A		A		D	B	D	C
Approach Delay (s)	0.6		0.0		19.8		16.4	
Approach LOS					C		C	

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/6/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	756	0	1	347
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	0	4	831	0	1	369
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1017	831			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1017	831			831	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	233	313			797	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	831	124	246
Volume Left	0	0	1	0
Volume Right	4	0	0	0
cSH	313	1700	797	1700
Volume to Capacity	0.01	0.49	0.00	0.14
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	16.7	0.0	0.1	0.0
Lane LOS	C		A	
Approach Delay (s)	16.7	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	42	0	4	11	2	0	23	4	3	20	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.59	0.59	0.59	0.42	0.42	0.42
Hourly flow rate (vph)	3	46	0	4	12	2	0	39	7	7	48	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	14			46			102	75	46	100	74	13
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			46			102	75	46	100	74	13
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	95	99	99	94	100
cM capacity (veh/h)	1604			1562			832	811	1024	840	813	1067

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	3	46	18	46	60
Volume Left	3	0	4	0	7
Volume Right	0	0	2	7	5
cSH	1604	1700	1562	837	832
Volume to Capacity	0.00	0.03	0.00	0.05	0.07
Queue Length 95th (ft)	0	0	0	4	6
Control Delay (s)	7.2	0.0	1.7	9.5	9.7
Lane LOS	A		A	A	A
Approach Delay (s)	0.5		1.7	9.5	9.7
Approach LOS				A	A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	14.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	47	2	0	4	0	0	0	0	0	317	13
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.87	0.87	0.87
Hourly flow rate (vph)	0	51	2	0	4	0	0	0	0	0	364	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	374	372	190	210	379	0	379			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374	372	190	210	379	0	379			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	91	100	100	99	100	100			100		
cM capacity (veh/h)	555	557	820	676	552	1084	1176			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	53	4	182	197
Volume Left	0	0	0	0
Volume Right	2	0	0	15
cSH	564	552	1579	1700
Volume to Capacity	0.09	0.01	0.00	0.12
Queue Length 95th (ft)	8	1	0	0
Control Delay (s)	12.0	11.6	0.0	0.0
Lane LOS	B	B		
Approach Delay (s)	12.0	11.6	0.0	
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	0	0	0	0	0	4	742	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	51	0	0	0	0	0	5	989	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	505	1000	0	1000	1000	495	0			989		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	505	1000	0	1000	1000	495	0			989		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	89	100	100	100	100	100	100			100		
cM capacity (veh/h)	449	241	1084	197	241	520	1579			694		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	51	0	500	495
Volume Left	51	0	5	0
Volume Right	0	0	0	0
cSH	449	1700	1579	1700
Volume to Capacity	0.11	0.00	0.00	0.29
Queue Length 95th (ft)	10	0	0	0
Control Delay (s)	14.1	0.0	0.1	0.0
Lane LOS	B	A	A	
Approach Delay (s)	14.1	0.0	0.1	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	26	20	18	16	22
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.70	0.70	0.44	0.44
Hourly flow rate (vph)	1	28	29	26	36	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	164	41			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	164	41			54	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			98	
cM capacity (veh/h)	807	1029			1551	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	54	86
Volume Left	1	0	36
Volume Right	28	26	0
cSH	1019	1700	1551
Volume to Capacity	0.03	0.03	0.02
Queue Length 95th (ft)	2	0	2
Control Delay (s)	8.6	0.0	3.2
Lane LOS	A		A
Approach Delay (s)	8.6	0.0	3.2
Approach LOS	A		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/11/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	26	31	18	16	38
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.70	0.70	0.44	0.44
Hourly flow rate (vph)	1	28	44	26	36	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	216	57			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216	57			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			98	
cM capacity (veh/h)	754	1009			1531	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	70	123
Volume Left	1	0	36
Volume Right	28	26	0
cSH	997	1700	1531
Volume to Capacity	0.03	0.04	0.02
Queue Length 95th (ft)	2	0	2
Control Delay (s)	8.7	0.0	2.3
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	2.3
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	18	16	0	25	0	0	0	0	0	315	2
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	20	17	0	27	0	0	0	0	0	414	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	429	416	209	234	417	0	417			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	429	416	209	234	417	0	417			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	96	98	100	95	100	100			100		
cM capacity (veh/h)	489	526	797	666	525	1084	1138			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	37	27	207	210
Volume Left	0	0	0	0
Volume Right	17	0	0	3
cSH	626	525	1579	1700
Volume to Capacity	0.06	0.05	0.00	0.12
Queue Length 95th (ft)	5	4	0	0
Control Delay (s)	11.1	12.2	0.0	0.0
Lane LOS	B	B		
Approach Delay (s)	11.1	12.2	0.0	
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	18.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	0	0	0	0	0	25	728	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	0	0	0	31	899	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	511	960	0	960	960	449	0			899		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511	960	0	960	960	449	0			899		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	96	100	100	100	100	100	98			100		
cM capacity (veh/h)	439	250	1084	208	250	557	1579			751		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	20	0	480	449
Volume Left	20	0	31	0
Volume Right	0	0	0	0
cSH	439	1700	1579	1700
Volume to Capacity	0.04	0.00	0.02	0.26
Queue Length 95th (ft)	3	0	1	0
Control Delay (s)	13.6	0.0	0.7	0.0
Lane LOS	B	A	A	
Approach Delay (s)	13.6	0.0	0.3	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	716	1	1	317	4	1	0	1	1	1	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	778	1	1	345	4	1	0	1	1	1	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	349			779			1223	1204	779	1202	1202	347
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			779			1223	1204	779	1202	1202	347
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	100	99	99	97
cM capacity (veh/h)	1210			838			147	178	396	157	179	696

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	37	779	1	349	1	1	1	24
Volume Left	37	0	1	0	1	0	1	0
Volume Right	0	1	0	4	0	1	0	23
cSH	1210	1700	838	1700	147	396	157	615
Volume to Capacity	0.03	0.46	0.00	0.21	0.01	0.00	0.01	0.04
Queue Length 95th (ft)	2	0	0	0	1	0	1	3
Control Delay (s)	8.1	0.0	9.3	0.0	29.7	14.1	28.1	11.1
Lane LOS	A		A		D	B	D	B
Approach Delay (s)	0.4		0.0		21.9		11.8	
Approach LOS					C		B	

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	716	1	1	317	4	1	0	1	1	1	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	778	1	1	345	4	1	0	1	1	1	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	349			779			1240	1204	779	1202	1202	347
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349			779			1240	1204	779	1202	1202	347
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	100	99	99	94
cM capacity (veh/h)	1210			838			139	178	396	157	179	696

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	37	779	1	349	1	1	1	41
Volume Left	37	0	1	0	1	0	1	0
Volume Right	0	1	0	4	0	1	0	40
cSH	1210	1700	838	1700	139	396	157	647
Volume to Capacity	0.03	0.46	0.00	0.21	0.01	0.00	0.01	0.06
Queue Length 95th (ft)	2	0	0	0	1	0	1	5
Control Delay (s)	8.1	0.0	9.3	0.0	31.1	14.1	28.1	10.9
Lane LOS	A		A		D	B	D	B
Approach Delay (s)	0.4		0.0		22.6		11.4	
Approach LOS					C		B	

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	17	337	1	12	750
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.78	0.78	0.88	0.88
Hourly flow rate (vph)	0	68	432	1	14	852
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	886	433			433	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	886	433			433	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	88			99	
cM capacity (veh/h)	280	571			1123	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	68	433	298	568
Volume Left	0	0	14	0
Volume Right	68	1	0	0
cSH	571	1700	1123	1700
Volume to Capacity	0.12	0.25	0.01	0.33
Queue Length 95th (ft)	10	0	1	0
Control Delay (s)	12.2	0.0	0.5	0.0
Lane LOS	B		A	
Approach Delay (s)	12.2	0.0	0.2	
Approach LOS	B			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	23	2	3	45	0	1	16	5	3	26	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.40	0.40	0.40	0.92	0.92	0.92	0.68	0.68	0.68	0.62	0.62	0.62
Hourly flow rate (vph)	20	58	5	3	49	0	1	24	7	5	42	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	49			62			180	155	60	172	158	49
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	49			62			180	155	60	172	158	49
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	99	99	94	100
cM capacity (veh/h)	1558			1540			737	725	1005	757	723	1020

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	20	62	52	32	50
Volume Left	20	0	3	1	5
Volume Right	0	5	0	7	3
cSH	1558	1700	1540	775	740
Volume to Capacity	0.01	0.04	0.00	0.04	0.07
Queue Length 95th (ft)	1	0	0	3	5
Control Delay (s)	7.3	0.0	0.5	9.8	10.2
Lane LOS	A		A	A	B
Approach Delay (s)	1.8		0.5	9.8	10.2
Approach LOS				A	B

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	14.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	30	1	0	2	0	0	0	0	0	728	46
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	33	1	0	2	0	0	0	0	0	958	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	989	988	509	496	1018	0	1018			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	989	988	509	496	1018	0	1018			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	87	100	100	99	100	100			100		
cM capacity (veh/h)	200	246	509	409	236	1084	677			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	34	2	479	539
Volume Left	0	0	0	0
Volume Right	1	0	0	61
cSH	250	236	1579	1700
Volume to Capacity	0.13	0.01	0.00	0.32
Queue Length 95th (ft)	11	1	0	0
Control Delay (s)	21.6	20.4	0.0	0.0
Lane LOS	C	C		
Approach Delay (s)	21.6	20.4	0.0	
Approach LOS	C	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	0	0	0	0	0	2	395	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	33	0	0	0	0	0	2	459	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234	464	0	464	464	230	0			459		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234	464	0	464	464	230	0			459		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	95	100	100	100	100	100	100			100		
cM capacity (veh/h)	700	493	1084	481	493	773	1579			1098		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	33	0	232	230
Volume Left	33	0	2	0
Volume Right	0	0	0	0
cSH	700	1700	1579	1700
Volume to Capacity	0.05	0.00	0.00	0.14
Queue Length 95th (ft)	4	0	0	0
Control Delay (s)	10.4	0.0	0.1	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.4	0.0	0.0	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	28	21	14	24	29
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.75	0.75	0.59	0.59
Hourly flow rate (vph)	3	30	28	19	41	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	168	37			47	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168	37			47	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			97	
cM capacity (veh/h)	801	1035			1561	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	34	47	90
Volume Left	3	0	41
Volume Right	30	19	0
cSH	1006	1700	1561
Volume to Capacity	0.03	0.03	0.03
Queue Length 95th (ft)	3	0	2
Control Delay (s)	8.7	0.0	3.4
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	3.4
Approach LOS	A		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/11/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	28	35	14	24	45
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.75	0.75	0.59	0.59
Hourly flow rate (vph)	3	30	47	19	41	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	214	56			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	214	56			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			97	
cM capacity (veh/h)	754	1011			1537	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	34	65	117
Volume Left	3	0	41
Volume Right	30	19	0
cSH	978	1700	1537
Volume to Capacity	0.03	0.04	0.03
Queue Length 95th (ft)	3	0	2
Control Delay (s)	8.8	0.0	2.7
Lane LOS	A		A
Approach Delay (s)	8.8	0.0	2.7
Approach LOS	A		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	14	24	0	28	0	0	0	0	0	726	3
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	26	0	30	0	0	0	0	0	789	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	806	791	396	428	792	0	792			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	806	791	396	428	792	0	792			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	95	96	100	90	100	100			100		
cM capacity (veh/h)	253	321	603	471	320	1084	824			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	41	30	395	398
Volume Left	0	0	0	0
Volume Right	26	0	0	3
cSH	455	320	1579	1700
Volume to Capacity	0.09	0.10	0.00	0.23
Queue Length 95th (ft)	7	8	0	0
Control Delay (s)	13.7	17.4	0.0	0.0
Lane LOS	B	C		
Approach Delay (s)	13.7	17.4	0.0	
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	0	0	0	0	0	28	383	0	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	15	0	0	0	0	0	35	485	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	313	556	0	556	556	242	0			485		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313	556	0	556	556	242	0			485		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	97	100	100	100	100	100	98			100		
cM capacity (veh/h)	605	428	1084	407	428	758	1579			1074		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	15	0	278	242
Volume Left	15	0	35	0
Volume Right	0	0	0	0
cSH	605	1700	1579	1700
Volume to Capacity	0.03	0.00	0.02	0.14
Queue Length 95th (ft)	2	0	2	0
Control Delay (s)	11.1	0.0	1.1	0.0
Lane LOS	B	A	A	
Approach Delay (s)	11.1	0.0	0.6	
Approach LOS	B	A		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	323	1	2	725	12	2	1	3	2	1	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	351	1	2	788	13	2	1	3	2	1	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	801			352			1226	1207	352	1204	1201	795
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	801			352			1226	1207	352	1204	1201	795
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			98	99	100	99	99	92
cM capacity (veh/h)	822			1207			139	177	692	156	179	388

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	352	2	801	2	4	2	33
Volume Left	25	0	2	0	2	0	2	0
Volume Right	0	1	0	13	0	3	0	32
cSH	822	1700	1207	1700	139	401	156	373
Volume to Capacity	0.03	0.21	0.00	0.47	0.02	0.01	0.01	0.09
Queue Length 95th (ft)	2	0	0	0	1	1	1	7
Control Delay (s)	9.5	0.0	8.0	0.0	31.4	14.1	28.5	15.6
Lane LOS	A		A		D	B	D	C
Approach Delay (s)	0.6		0.0		19.8		16.4	
Approach LOS					C		C	

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	323	1	2	725	12	2	1	3	2	1	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	351	1	2	788	13	2	1	3	2	1	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	801			352			1274	1238	352	1234	1232	795
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	801			352			1274	1238	352	1234	1232	795
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			98	99	100	99	99	87
cM capacity (veh/h)	822			1207			120	167	692	146	168	388

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	352	2	801	2	4	2	50
Volume Left	40	0	2	0	2	0	2	0
Volume Right	0	1	0	13	0	3	0	49
cSH	822	1700	1207	1700	120	387	146	377
Volume to Capacity	0.05	0.21	0.00	0.47	0.02	0.01	0.01	0.13
Queue Length 95th (ft)	4	0	0	0	1	1	1	11
Control Delay (s)	9.6	0.0	8.0	0.0	35.5	14.4	30.0	16.0
Lane LOS	A		A		E	B	D	C
Approach Delay (s)	1.0		0.0		21.4		16.6	
Approach LOS					C		C	

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	17	756	0	15	347
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	0	68	831	0	16	369
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1047	831			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1047	831			831	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			98	
cM capacity (veh/h)	219	313			797	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	68	831	139	246
Volume Left	0	0	16	0
Volume Right	68	0	0	0
cSH	313	1700	797	1700
Volume to Capacity	0.22	0.49	0.02	0.14
Queue Length 95th (ft)	20	0	2	0
Control Delay (s)	19.7	0.0	1.3	0.0
Lane LOS	C		A	
Approach Delay (s)	19.7	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	5	5	5	5	5	30	5	5	30	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.59	0.59	0.59	0.42	0.42	0.42
Hourly flow rate (vph)	5	5	5	5	5	5	8	51	8	12	71	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	11			11			86	41	8	69	41	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			11			86	41	8	69	41	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	94	99	99	92	99
cM capacity (veh/h)	1608			1608			829	846	1074	869	846	1074

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	5	11	16	68	95
Volume Left	5	0	5	8	12
Volume Right	0	5	5	8	12
cSH	1608	1700	1608	866	872
Volume to Capacity	0.00	0.01	0.00	0.08	0.11
Queue Length 95th (ft)	0	0	0	6	9
Control Delay (s)	7.2	0.0	2.4	9.5	9.6
Lane LOS	A		A	A	A
Approach Delay (s)	2.4		2.4	9.5	9.6
Approach LOS				A	A

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	15.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	10	5	5	10	0	0	0	0	5	570	5
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.87	0.87	0.87
Hourly flow rate (vph)	0	11	5	5	11	0	0	0	0	6	655	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	675	670	330	350	672	0	661			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	675	670	330	350	672	0	661			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	97	99	99	97	100	100			100		
cM capacity (veh/h)	331	375	665	561	374	1084	923			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	16	16	333	333
Volume Left	0	5	6	0
Volume Right	5	0	0	6
cSH	439	421	1579	1700
Volume to Capacity	0.04	0.04	0.00	0.20
Queue Length 95th (ft)	3	3	0	0
Control Delay (s)	13.5	13.9	0.2	0.0
Lane LOS	B	B	A	
Approach Delay (s)	13.5	13.9	0.1	
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	5	0	0	5	5	10	1340	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	11	5	0	0	5	5	13	1787	7	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	928	1820	0	1819	1817	897	0			1793		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	928	1820	0	1819	1817	897	0			1793		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	95	93	100	100	93	98	99			100		
cM capacity (veh/h)	205	76	1084	46	76	283	1579			341		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	16	11	907	900
Volume Left	11	0	13	0
Volume Right	0	5	0	7
cSH	131	120	1579	1700
Volume to Capacity	0.12	0.09	0.01	0.53
Queue Length 95th (ft)	10	7	1	0
Control Delay (s)	36.3	37.8	0.2	0.0
Lane LOS	E	E	A	
Approach Delay (s)	36.3	37.8	0.1	
Approach LOS	E	E		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	35	25	5	35
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.70	0.70	0.44	0.44
Hourly flow rate (vph)	5	5	50	36	11	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	170	68			86	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170	68			86	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	814	995			1511	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	86	91
Volume Left	5	0	11
Volume Right	5	36	0
cSH	896	1700	1511
Volume to Capacity	0.01	0.05	0.01
Queue Length 95th (ft)	1	0	1
Control Delay (s)	9.1	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	25	5	5	5	0	0	0	0	5	570	5
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	27	5	5	5	0	0	0	0	7	750	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	769	766	378	407	770	0	757			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	769	766	378	407	770	0	757			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	92	99	99	98	100	100			100		
cM capacity (veh/h)	286	330	619	489	328	1084	850			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	33	11	382	382
Volume Left	0	5	7	0
Volume Right	5	0	0	7
cSH	358	393	1579	1700
Volume to Capacity	0.09	0.03	0.00	0.22
Queue Length 95th (ft)	7	2	0	0
Control Delay (s)	16.1	14.4	0.2	0.0
Lane LOS	C	B	A	
Approach Delay (s)	16.1	14.4	0.1	
Approach LOS	C	B		

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		27.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	5	0	0	5	10	5	1320	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	0	0	5	11	6	1630	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	841	1648	0	1648	1645	818	0			1636		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	841	1648	0	1648	1645	818	0			1636		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	89	94	100	100	94	97	100			100		
cM capacity (veh/h)	238	98	1084	62	98	319	1579			392		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	33	16	821	821
Volume Left	27	0	6	0
Volume Right	0	11	0	6
cSH	192	182	1579	1700
Volume to Capacity	0.17	0.09	0.00	0.48
Queue Length 95th (ft)	15	7	0	0
Control Delay (s)	27.6	26.7	0.1	0.0
Lane LOS	D	D	A	
Approach Delay (s)	27.6	26.7	0.1	
Approach LOS	D	D		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	1220	5	5	540	5	5	5	5	5	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	1326	5	5	587	5	5	5	5	5	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	592			1332			2071	2041	1329	2043	2041	590
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	592			1332			2071	2041	1329	2043	2041	590
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			83	90	97	85	90	94
cM capacity (veh/h)	983			518			33	53	189	35	53	508

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	54	1332	5	592	5	11	5	38
Volume Left	54	0	5	0	5	0	5	0
Volume Right	0	5	0	5	0	5	0	33
cSH	983	1700	518	1700	33	83	35	227
Volume to Capacity	0.06	0.78	0.01	0.35	0.17	0.13	0.15	0.17
Queue Length 95th (ft)	4	0	1	0	13	11	12	15
Control Delay (s)	8.9	0.0	12.0	0.0	136.5	55.1	124.5	24.0
Lane LOS	A		B		F	F	F	C
Approach Delay (s)	0.3		0.1		82.2		36.5	
Approach LOS					F		E	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	570	1	1	1280
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.78	0.78	0.88	0.88
Hourly flow rate (vph)	0	4	731	1	1	1455
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1461	731			732	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1461	731			732	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	120	364			868	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	732	486	970
Volume Left	0	0	1	0
Volume Right	4	1	0	0
cSH	364	1700	868	1700
Volume to Capacity	0.01	0.43	0.00	0.57
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	15.0	0.0	0.0	0.0
Lane LOS	C		A	
Approach Delay (s)	15.0	0.0	0.0	
Approach LOS	C			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	10	5	5	5	5	10	25	5	5	30	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.40	0.40	0.40	0.92	0.92	0.92	0.68	0.68	0.68	0.62	0.62	0.62
Hourly flow rate (vph)	25	25	12	5	5	5	15	37	7	8	48	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	11			38			133	103	31	120	107	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			38			133	103	31	120	107	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	95	99	99	94	99
cM capacity (veh/h)	1608			1573			782	772	1043	807	769	1074

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	25	38	16	59	65
Volume Left	25	0	5	15	8
Volume Right	0	12	5	7	8
cSH	1608	1700	1573	801	802
Volume to Capacity	0.02	0.02	0.00	0.07	0.08
Queue Length 95th (ft)	1	0	0	6	7
Control Delay (s)	7.3	0.0	2.4	9.9	9.9
Lane LOS	A		A	A	A
Approach Delay (s)	2.9		2.4	9.9	9.9
Approach LOS				A	A

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	15	5	5	5	0	0	0	0	5	1320	10
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	16	5	5	5	0	0	0	0	7	1737	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1759	1757	875	895	1763	0	1750			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1759	1757	875	895	1763	0	1750			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	81	98	97	93	100	100			100		
cM capacity (veh/h)	51	84	292	196	83	1084	354			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	22	11	875	882
Volume Left	0	5	7	0
Volume Right	5	0	0	13
cSH	102	117	1579	1700
Volume to Capacity	0.21	0.09	0.00	0.52
Queue Length 95th (ft)	19	8	0	0
Control Delay (s)	49.7	39.1	0.1	0.0
Lane LOS	E	E	A	
Approach Delay (s)	49.7	39.1	0.1	
Approach LOS	E	E		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	5	0	0	5	5	5	710	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	16	5	0	0	5	5	6	826	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433	843	0	843	840	416	0			831		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433	843	0	843	840	416	0			831		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	97	98	100	100	98	99	100			100		
cM capacity (veh/h)	494	298	1084	253	299	586	1579			797		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	22	11	419	419
Volume Left	16	0	6	0
Volume Right	0	5	0	6
cSH	424	396	1579	1700
Volume to Capacity	0.05	0.03	0.00	0.25
Queue Length 95th (ft)	4	2	0	0
Control Delay (s)	13.9	14.4	0.1	0.0
Lane LOS	B	B	A	
Approach Delay (s)	13.9	14.4	0.1	
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	35	20	5	35
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.75	0.75	0.59	0.59
Hourly flow rate (vph)	5	5	47	27	8	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	136	60			73	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136	60			73	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	852	1005			1526	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	73	68
Volume Left	5	0	8
Volume Right	5	27	0
cSH	923	1700	1526
Volume to Capacity	0.01	0.04	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	20	5	5	5	0	0	0	0	5	1320	5
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	5	5	5	0	0	0	0	5	1435	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1451	1448	720	745	1451	0	1440			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1451	1448	720	745	1451	0	1440			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	83	99	98	96	100	100			100		
cM capacity (veh/h)	88	130	370	259	129	1084	467			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	27	11	723	723
Volume Left	0	5	5	0
Volume Right	5	0	0	5
cSH	149	172	1579	1700
Volume to Capacity	0.18	0.06	0.00	0.43
Queue Length 95th (ft)	16	5	0	0
Control Delay (s)	34.5	27.3	0.1	0.0
Lane LOS	D	D	A	
Approach Delay (s)	34.5	27.3	0.0	
Approach LOS	D	D		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	5	0	0	5	10	5	690	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	22	5	0	0	5	11	6	873	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	463	892	0	892	889	440	0			880		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	463	892	0	892	889	440	0			880		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	95	98	100	100	98	98	100			100		
cM capacity (veh/h)	465	278	1084	232	280	565	1579			764		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	27	16	443	443
Volume Left	22	0	6	0
Volume Right	0	11	0	6
cSH	410	422	1579	1700
Volume to Capacity	0.07	0.04	0.00	0.26
Queue Length 95th (ft)	5	3	0	0
Control Delay (s)	14.4	13.9	0.1	0.0
Lane LOS	B	B	A	
Approach Delay (s)	14.4	13.9	0.1	
Approach LOS	B	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	550	5	5	1230	20	5	5	5	5	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	598	5	5	1337	22	5	5	5	5	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	1359			603			2049	2035	601	2030	2027	1348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1359			603			2049	2035	601	2030	2027	1348
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			82	90	99	85	90	82
cM capacity (veh/h)	506			974			30	53	501	37	54	185

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	603	5	1359	5	11	5	38
Volume Left	33	0	5	0	5	0	5	0
Volume Right	0	5	0	22	0	5	0	33
cSH	506	1700	974	1700	30	96	37	137
Volume to Capacity	0.06	0.35	0.01	0.80	0.18	0.11	0.15	0.28
Queue Length 95th (ft)	5	0	0	0	14	9	12	27
Control Delay (s)	12.6	0.0	8.7	0.0	152.0	47.4	119.5	41.2
Lane LOS	B		A		F	E	F	E
Approach Delay (s)	0.6		0.0		82.2		51.0	
Approach LOS					F		F	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	1	1290	0	1	590
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	0	4	1418	0	1	628
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1734	1418			1418	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1734	1418			1418	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	79	126			476	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	4	1418	210	418
Volume Left	0	0	1	0
Volume Right	4	0	0	0
cSH	126	1700	476	1700
Volume to Capacity	0.03	0.83	0.00	0.25
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	34.4	0.0	0.1	0.0
Lane LOS	D		A	
Approach Delay (s)	34.4	0.0	0.0	
Approach LOS	D			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	45	5	5	20	5	5	30	5	5	30	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.59	0.59	0.59	0.42	0.42	0.42
Hourly flow rate (vph)	11	49	5	5	22	5	8	51	8	12	71	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			54			168	111	52	140	111	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			54			168	111	52	140	111	24
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	93	99	98	91	98
cM capacity (veh/h)	1587			1551			717	771	1016	776	771	1052

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	11	54	33	68	107
Volume Left	11	0	5	8	12
Volume Right	0	5	5	8	24
cSH	1587	1700	1551	787	820
Volume to Capacity	0.01	0.03	0.00	0.09	0.13
Queue Length 95th (ft)	1	0	0	7	11
Control Delay (s)	7.3	0.0	1.2	10.0	10.0
Lane LOS	A		A	B	B
Approach Delay (s)	1.2		1.2	10.0	10.0
Approach LOS				B	B

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	50	5	5	10	0	0	0	0	5	570	20
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.87	0.87	0.87
Hourly flow rate (vph)	0	54	5	5	11	0	0	0	0	6	655	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	684	678	339	372	690	0	678			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	684	678	339	372	690	0	678			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	85	99	99	97	100	100			100		
cM capacity (veh/h)	326	371	657	492	366	1084	910			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	60	16	333	351
Volume Left	0	5	6	0
Volume Right	5	0	0	23
cSH	386	400	1579	1700
Volume to Capacity	0.15	0.04	0.00	0.21
Queue Length 95th (ft)	14	3	0	0
Control Delay (s)	16.0	14.4	0.2	0.0
Lane LOS	C	B	A	
Approach Delay (s)	16.0	14.4	0.1	
Approach LOS	C	B		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	5	0	0	5	5	10	1340	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	54	5	0	0	5	5	13	1787	7	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	928	1820	0	1819	1817	897	0			1793		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	928	1820	0	1819	1817	897	0			1793		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	74	93	100	100	93	98	99			100		
cM capacity (veh/h)	205	76	1084	46	76	283	1579			341		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	60	11	907	900
Volume Left	54	0	13	0
Volume Right	0	5	0	7
cSH	178	120	1579	1700
Volume to Capacity	0.34	0.09	0.01	0.53
Queue Length 95th (ft)	35	7	1	0
Control Delay (s)	35.2	37.8	0.2	0.0
Lane LOS	E	E	A	
Approach Delay (s)	35.2	37.8	0.1	
Approach LOS	E	E		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	30	35	25	20	35
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.70	0.70	0.44	0.44
Hourly flow rate (vph)	5	33	50	36	45	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	238	68			86	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	238	68			86	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			97	
cM capacity (veh/h)	727	995			1511	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	86	125
Volume Left	5	0	45
Volume Right	33	36	0
cSH	946	1700	1511
Volume to Capacity	0.04	0.05	0.03
Queue Length 95th (ft)	3	0	2
Control Delay (s)	9.0	0.0	2.9
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	2.9
Approach LOS	A		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/11/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	30	45	25	20	50
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.70	0.70	0.44	0.44
Hourly flow rate (vph)	5	33	64	36	45	114
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	287	82			100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	287	82			100	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			97	
cM capacity (veh/h)	682	978			1493	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	100	159
Volume Left	5	0	45
Volume Right	33	36	0
cSH	921	1700	1493
Volume to Capacity	0.04	0.06	0.03
Queue Length 95th (ft)	3	0	2
Control Delay (s)	9.1	0.0	2.3
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	2.3
Approach LOS	A		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	25	20	5	30	0	0	0	0	5	570	5
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	27	22	5	33	0	0	0	0	7	750	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	783	766	378	423	770	0	757			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	783	766	378	423	770	0	757			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	92	96	99	90	100	100			100		
cM capacity (veh/h)	262	330	619	464	328	1084	850			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	49	38	382	382
Volume Left	0	5	7	0
Volume Right	22	0	0	7
cSH	416	343	1579	1700
Volume to Capacity	0.12	0.11	0.00	0.22
Queue Length 95th (ft)	10	9	0	0
Control Delay (s)	14.8	16.8	0.2	0.0
Lane LOS	B	C	A	
Approach Delay (s)	14.8	16.8	0.1	
Approach LOS	B	C		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	5	0	0	5	10	30	1320	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	0	0	5	11	37	1630	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	902	1710	0	1710	1707	818	0			1636		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902	1710	0	1710	1707	818	0			1636		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	87	94	100	100	94	97	98			100		
cM capacity (veh/h)	210	88	1084	55	88	319	1579			392		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	33	16	852	821
Volume Left	27	0	37	0
Volume Right	0	11	0	6
cSH	171	170	1579	1700
Volume to Capacity	0.19	0.10	0.02	0.48
Queue Length 95th (ft)	17	8	2	0
Control Delay (s)	31.0	28.4	0.6	0.0
Lane LOS	D	D	A	
Approach Delay (s)	31.0	28.4	0.3	
Approach LOS	D	D		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	1220	5	5	540	5	5	5	5	5	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	1326	5	5	587	5	5	5	5	5	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	592			1332			2071	2041	1329	2043	2041	590
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	592			1332			2071	2041	1329	2043	2041	590
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			83	90	97	85	90	94
cM capacity (veh/h)	983			518			33	53	189	35	53	508

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	54	1332	5	592	5	11	5	38
Volume Left	54	0	5	0	5	0	5	0
Volume Right	0	5	0	5	0	5	0	33
cSH	983	1700	518	1700	33	83	35	227
Volume to Capacity	0.06	0.78	0.01	0.35	0.17	0.13	0.15	0.17
Queue Length 95th (ft)	4	0	1	0	13	11	12	15
Control Delay (s)	8.9	0.0	12.0	0.0	136.5	55.1	124.5	24.0
Lane LOS	A		B		F	F	F	C
Approach Delay (s)	0.3		0.1		82.2		36.5	
Approach LOS					F		E	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	60	1220	5	5	540	5	5	5	5	5	5	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	1326	5	5	587	5	5	5	5	5	5	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	592			1332			2109	2062	1329	2065	2062	590
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	592			1332			2109	2062	1329	2065	2062	590
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			81	89	97	84	89	90
cM capacity (veh/h)	983			518			29	51	189	34	51	508

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	65	1332	5	592	5	11	5	54
Volume Left	65	0	5	0	5	0	5	0
Volume Right	0	5	0	5	0	5	0	49
cSH	983	1700	518	1700	29	80	34	267
Volume to Capacity	0.07	0.78	0.01	0.35	0.19	0.14	0.16	0.20
Queue Length 95th (ft)	5	0	1	0	14	11	13	19
Control Delay (s)	8.9	0.0	12.0	0.0	154.7	57.1	131.4	21.9
Lane LOS	A		B		F	F	F	C
Approach Delay (s)	0.4		0.1		89.7		31.9	
Approach LOS					F		D	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	20	570	1	20	1280
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.78	0.78	0.88	0.88
Hourly flow rate (vph)	0	80	731	1	23	1455
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1504	731			732	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1504	731			732	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			97	
cM capacity (veh/h)	109	364			868	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	80	732	508	970
Volume Left	0	0	23	0
Volume Right	80	1	0	0
cSH	364	1700	868	1700
Volume to Capacity	0.22	0.43	0.03	0.57
Queue Length 95th (ft)	21	0	2	0
Control Delay (s)	17.7	0.0	0.7	0.0
Lane LOS	C		A	
Approach Delay (s)	17.7	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
11: Promise Road & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	35	5	5	45	5	10	25	5	5	30	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.40	0.40	0.40	0.92	0.92	0.92	0.68	0.68	0.68	0.62	0.62	0.62
Hourly flow rate (vph)	38	88	12	5	49	5	15	37	7	8	48	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	54			100			272	234	94	251	238	52
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			100			272	234	94	251	238	52
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	94	99	99	92	98
cM capacity (veh/h)	1551			1493			618	648	963	653	645	1016

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	38	100	60	59	73
Volume Left	38	0	5	15	8
Volume Right	0	12	5	7	16
cSH	1551	1700	1493	667	703
Volume to Capacity	0.02	0.06	0.00	0.09	0.10
Queue Length 95th (ft)	2	0	0	7	9
Control Delay (s)	7.4	0.0	0.7	10.9	10.7
Lane LOS	A		A	B	B
Approach Delay (s)	2.0		0.7	10.9	10.7
Approach LOS				B	B

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	17.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	40	5	5	5	0	0	0	0	5	1320	50
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	43	5	5	5	0	0	0	0	7	1737	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1786	1783	901	909	1816	0	1803			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1786	1783	901	909	1816	0	1803			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	46	98	96	93	100	100			100		
cM capacity (veh/h)	48	81	281	129	77	1084	338			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	49	11	875	934
Volume Left	0	5	7	0
Volume Right	5	0	0	66
cSH	88	96	1579	1700
Volume to Capacity	0.56	0.11	0.00	0.55
Queue Length 95th (ft)	63	9	0	0
Control Delay (s)	88.9	47.0	0.1	0.0
Lane LOS	F	E	A	
Approach Delay (s)	88.9	47.0	0.1	
Approach LOS	F	E		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
13: Promise Road & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	5	0	0	5	5	5	710	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.86	0.86	0.86	0.92	0.92	0.92
Hourly flow rate (vph)	43	5	0	0	5	5	6	826	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433	843	0	843	840	416	0			831		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433	843	0	843	840	416	0			831		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	91	98	100	100	98	99	100			100		
cM capacity (veh/h)	494	298	1084	253	299	586	1579			797		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	49	11	419	419
Volume Left	43	0	6	0
Volume Right	0	5	0	6
cSH	460	396	1579	1700
Volume to Capacity	0.11	0.03	0.00	0.25
Queue Length 95th (ft)	9	2	0	0
Control Delay (s)	13.8	14.4	0.1	0.0
Lane LOS	B	B	A	
Approach Delay (s)	13.8	14.4	0.1	
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	30	35	20	30	35
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.75	0.75	0.59	0.59
Hourly flow rate (vph)	5	33	47	27	51	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	221	60			73	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	221	60			73	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			97	
cM capacity (veh/h)	742	1005			1526	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	73	110
Volume Left	5	0	51
Volume Right	33	27	0
cSH	957	1700	1526
Volume to Capacity	0.04	0.04	0.03
Queue Length 95th (ft)	3	0	3
Control Delay (s)	8.9	0.0	3.6
Lane LOS	A		A
Approach Delay (s)	8.9	0.0	3.6
Approach LOS	A		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
16: Tucker Street & Frontage Road

4/11/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	30	50	20	30	50
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.75	0.75	0.59	0.59
Hourly flow rate (vph)	5	33	67	27	51	85
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	266	80			93	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266	80			93	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			97	
cM capacity (veh/h)	698	980			1501	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	93	136
Volume Left	5	0	51
Volume Right	33	27	0
cSH	927	1700	1501
Volume to Capacity	0.04	0.05	0.03
Queue Length 95th (ft)	3	0	3
Control Delay (s)	9.1	0.0	3.0
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	3.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: Tucker Street & US 16 Southbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	20	30	5	30	0	0	0	0	5	1320	5
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	33	5	33	0	0	0	0	5	1435	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1465	1448	720	772	1451	0	1440			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1465	1448	720	772	1451	0	1440			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	83	91	98	75	100	100			100		
cM capacity (veh/h)	72	130	370	229	129	1084	467			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	54	38	723	723
Volume Left	0	5	5	0
Volume Right	33	0	0	5
cSH	212	138	1579	1700
Volume to Capacity	0.26	0.28	0.00	0.43
Queue Length 95th (ft)	25	26	0	0
Control Delay (s)	27.7	40.8	0.1	0.0
Lane LOS	D	E	A	
Approach Delay (s)	27.7	40.8	0.0	
Approach LOS	D	E		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	5	0	0	5	10	30	690	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	22	5	0	0	5	11	38	873	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	526	956	0	955	953	440	0			880		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	526	956	0	955	953	440	0			880		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	95	98	100	100	98	98	98			100		
cM capacity (veh/h)	411	251	1084	205	252	565	1579			764		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	27	16	475	443
Volume Left	22	0	38	0
Volume Right	0	11	0	6
cSH	365	399	1579	1700
Volume to Capacity	0.07	0.04	0.02	0.26
Queue Length 95th (ft)	6	3	2	0
Control Delay (s)	15.7	14.4	0.8	0.0
Lane LOS	C	B	A	
Approach Delay (s)	15.7	14.4	0.4	
Approach LOS	C	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/9/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	550	5	5	1230	20	5	5	5	5	5	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	598	5	5	1337	22	5	5	5	5	5	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	1359			603			2049	2035	601	2030	2027	1348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1359			603			2049	2035	601	2030	2027	1348
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			82	90	99	85	90	82
cM capacity (veh/h)	506			974			30	53	501	37	54	185

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	603	5	1359	5	11	5	38
Volume Left	33	0	5	0	5	0	5	0
Volume Right	0	5	0	22	0	5	0	33
cSH	506	1700	974	1700	30	96	37	137
Volume to Capacity	0.06	0.35	0.01	0.80	0.18	0.11	0.15	0.28
Queue Length 95th (ft)	5	0	0	0	14	9	12	27
Control Delay (s)	12.6	0.0	8.7	0.0	152.0	47.4	119.5	41.2
Lane LOS	B		A		F	E	F	E
Approach Delay (s)	0.6		0.0		82.2		51.0	
Approach LOS					F		F	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: Catron Boulevard & Frontage Road

4/11/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	550	5	5	1230	20	5	5	5	5	5	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	598	5	5	1337	22	5	5	5	5	5	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					607							
pX, platoon unblocked												
vC, conflicting volume	1359			603			2098	2068	601	2062	2060	1348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1359			603			2098	2068	601	2062	2060	1348
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			99			77	89	99	84	89	74
cM capacity (veh/h)	506			974			24	49	501	34	49	185

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	49	603	5	1359	5	11	5	54
Volume Left	49	0	5	0	5	0	5	0
Volume Right	0	5	0	22	0	5	0	49
cSH	506	1700	974	1700	24	89	34	145
Volume to Capacity	0.10	0.35	0.01	0.80	0.23	0.12	0.16	0.38
Queue Length 95th (ft)	8	0	0	0	17	10	13	40
Control Delay (s)	12.9	0.0	8.7	0.0	198.2	51.1	131.6	44.1
Lane LOS	B		A		F	F	F	E
Approach Delay (s)	1.0		0.0		100.1		52.0	
Approach LOS					F		F	

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/9/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	17	756	0	15	347
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	0	68	831	0	16	369
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1047	831			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1047	831			831	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			98	
cM capacity (veh/h)	219	313			797	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	68	831	139	246
Volume Left	0	0	16	0
Volume Right	68	0	0	0
cSH	313	1700	797	1700
Volume to Capacity	0.22	0.49	0.02	0.14
Queue Length 95th (ft)	20	0	2	0
Control Delay (s)	19.7	0.0	1.3	0.0
Lane LOS	C		A	
Approach Delay (s)	19.7	0.0	0.5	
Approach LOS	C			

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/12/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	50	5	5	10	0	0	0	0	5	570	20
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.87	0.87	0.87
Hourly flow rate (vph)	0	54	5	5	11	0	0	0	0	6	655	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	672	667	328	372	690	0	678			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	672	667	328	372	690	0	678			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	86	99	99	97	100	100			100		
cM capacity (veh/h)	333	377	668	493	366	1084	910			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2	SB 3
Volume Total	60	16	224	437	23
Volume Left	0	5	6	0	0
Volume Right	5	0	0	0	23
cSH	392	400	1579	1700	1700
Volume to Capacity	0.15	0.04	0.00	0.26	0.01
Queue Length 95th (ft)	13	3	0	0	0
Control Delay (s)	15.8	14.4	0.2	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	15.8	14.4	0.1		
Approach LOS	C	B			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/12/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	5	0	0	5	10	30	1320	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	27	5	0	0	5	11	37	1630	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	902	1710	0	1710	1707	818	0			1636		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902	1710	0	1710	1707	818	0			1636		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	87	94	100	100	94	97	98			100		
cM capacity (veh/h)	210	88	1084	55	88	319	1579			392		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3
Volume Total	33	16	37	1086	549
Volume Left	27	0	37	0	0
Volume Right	0	11	0	0	6
cSH	171	170	1579	1700	1700
Volume to Capacity	0.19	0.10	0.02	0.64	0.32
Queue Length 95th (ft)	17	8	2	0	0
Control Delay (s)	31.0	28.4	7.3	0.0	0.0
Lane LOS	D	D	A		
Approach Delay (s)	31.0	28.4	0.2		
Approach LOS	D	D			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/13/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	20	570	1	20	1280
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.78	0.78	0.88	0.88
Hourly flow rate (vph)	0	80	731	1	23	1455
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1504	731			732	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1504	731			732	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			97	
cM capacity (veh/h)	109	364			868	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	80	732	23	727	727
Volume Left	0	0	23	0	0
Volume Right	80	1	0	0	0
cSH	364	1700	868	1700	1700
Volume to Capacity	0.22	0.43	0.03	0.43	0.43
Queue Length 95th (ft)	21	0	2	0	0
Control Delay (s)	17.7	0.0	9.3	0.0	0.0
Lane LOS	C		A		
Approach Delay (s)	17.7	0.0	0.1		
Approach LOS	C				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Promise Road & US 16 Southbound

4/12/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	40	5	5	5	0	0	0	0	5	1320	50
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	0	43	5	5	5	0	0	0	0	7	1737	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1753	1750	868	909	1816	0	1803			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1753	1750	868	909	1816	0	1803			0		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	100	49	98	96	93	100	100			100		
cM capacity (veh/h)	51	85	295	134	77	1084	338			1579		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2	SB 3
Volume Total	49	11	586	1158	66
Volume Left	0	5	7	0	0
Volume Right	5	0	0	0	66
cSH	92	98	1579	1700	1700
Volume to Capacity	0.53	0.11	0.00	0.68	0.04
Queue Length 95th (ft)	59	9	0	0	0
Control Delay (s)	82.1	46.4	0.1	0.0	0.0
Lane LOS	F	E	A		
Approach Delay (s)	82.1	46.4	0.0		
Approach LOS	F	E			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
18: Tucker Street & US 16 Northbound

4/12/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	5	0	0	5	10	30	690	5	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	22	5	0	0	5	11	38	873	6	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	526	956	0	955	953	440	0			880		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	526	956	0	955	953	440	0			880		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	95	98	100	100	98	98	98			100		
cM capacity (veh/h)	411	251	1084	205	252	565	1579			764		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3
Volume Total	27	16	38	582	297
Volume Left	22	0	38	0	0
Volume Right	0	11	0	0	6
cSH	365	399	1579	1700	1700
Volume to Capacity	0.07	0.04	0.02	0.34	0.17
Queue Length 95th (ft)	6	3	2	0	0
Control Delay (s)	15.7	14.4	7.3	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	15.7	14.4	0.3		
Approach LOS	C	B			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: Vineyard Lane & Catron Boulevard

4/13/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	20	1290	0	20	590
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.91	0.91	0.94	0.94
Hourly flow rate (vph)	0	80	1418	0	21	628
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1774	1418			1418	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1774	1418			1418	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	37			96	
cM capacity (veh/h)	71	126			476	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	80	1418	21	314	314
Volume Left	0	0	21	0	0
Volume Right	80	0	0	0	0
cSH	126	1700	476	1700	1700
Volume to Capacity	0.63	0.83	0.04	0.18	0.18
Queue Length 95th (ft)	82	0	3	0	0
Control Delay (s)	73.1	0.0	12.9	0.0	0.0
Lane LOS	F		B		
Approach Delay (s)	73.1	0.0	0.4		
Approach LOS	F				

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

Appendix Part 2
Crash Summary

CRASH SUMMARY

SKYLINE VILLAGE APARTMENTS TIS

LOCATION	OBJECT I.D.	WEATHER	DRIVER CONTRIB.	MANNER OF COLLISION	VEHICLE MOVEMENT	JUNCTION	INJURY	LIGHT	ROAD SURFACE	FIRST EVENT	DATE	TIME
US 16/PROMISE RD	18410	CLEAR	N/A	ANGLE	STRAIGHT	T	NONE	DAY	DRY	2-VEHICLE	5/5/2009	1:20 PM
	51068	CLEAR	FAIL YIELD	ANGLE	STRAIGHT	4-WAY	POSSIBLE	DAY	DRY	2-VEHICLE	2/9/2011	2:15 PM
	51369	CLEAR	FAIL YIELD	ANGLE	STRAIGHT	T	POSSIBLE	DARK-LIGHTED	DRY	2-VEHICLE	2/12/2011	5:20 PM
	41186	CLEAR	FOLLOW TOO CLOSE	REAR	STRAIGHT	T	INCAPACITATING	DAY	DRY	2-VEHICLE	9/1/2010	8:28 AM
	42014	CLEAR	FOLLOW TOO CLOSE	REAR	STRAIGHT	INT. RELATED	POSSIBLE	DAY	DRY	2-VEHICLE	9/24/2010	7:20 AM
	23516	CLEAR	ILLNESS	FIXED OBJECT	STRAIGHT	NO	NONE	DARK	DRY	FIXED OBJ.	9/17/2009	8:05 PM
	57233	CLEAR	ANIMAL	ANIMAL	STRAIGHT	NO	NONE	DARK	DRY	ANIMAL	7/16/2011	11:55 PM
BETWEEN PROMISE & TUCKER	34791	CLOUDY	OUT OF LANE	FIXED OBJECT	STRAIGHT	NO	NONE	DAY	WET	FIXED OBJ.	3/10/2010	10:14 AM
	26536	CLEAR	ANIMAL	ANIMAL	STRAIGHT	NO	NONE	DARK	DRY	ANIMAL	11/8/2009	6:28 PM
BETWEEN TUCKER & CATRON	40552	CLEAR	FOLLOW TOO CLOSE	ROLLOVER	CROSSOVER	CROSSOVER	NON-INCAPACITATING	DAY	DRY	ROLLOVER	8/11/2010	12:48 PM
	60332	CLEAR	ANIMAL	ANIMAL	STRAIGHT	NO	NONE	DARK	DRY	ANIMAL	9/15/2011	10:03 PM
	11211	CLEAR	N/A	MOVE. OBJ.	STRAIGHT	NO	NONE	DAY	DRY	MOVE. OBJ.	11/12/2008	11:00 AM
BETWEEN FRONTAGE & VINEYARD	7403	CLEAR	ANIMAL	ANIMAL	STRAIGHT	NO	NONE	DARK	DRY	ANIMAL	8/30/2008	8:15 PM
	52819	SLEET	SWERVING	ROLLOVER	STRAIGHT	NO	NON-INCAPACITATING	DARK	ICY	ROLLOVER	3/27/2011	1:31 AM
	42687	CLEAR	OUT OF LANE	HEAD-ON	STRAIGHT	NO	INCAPACITATING	DUSK	DRY	2-VEHICLE	9/24/2010	7:32 PM
	61091	CLEAR	RUN OFF ROAD	OFF-ROAD	STRAIGHT	NO	NON-INCAPACITATING	DAY	DRY	1-VEHICLE	10/5/2011	4:51 PM
	11527	CLOUDY	ANIMAL	ANIMAL	STRAIGHT	NO	NONE	DARK	DRY	ANIMAL	11/4/2008	6:04 AM
	59207	CLEAR	FOLLOW TOO CLOSE	REAR	STRAIGHT	NO	NONE	DAY	DRY	2-VEHICLE	9/3/2011	1:35 PM
	19515	CLEAR	ANIMAL	ANIMAL	STRAIGHT	NO	NON-INCAPACITATING	DARK	DRY	ANIMAL	5/3/2009	4:43 AM
	11562	CLOUDY	TOO FAST	GUARDRAIL	STRAIGHT	NO	NONE	DAY	ICY	FIXED OBJ.	11/7/2008	8:45 AM
	15642	CLOUDY	TOO FAST	HEAD-ON	STRAIGHT	NO	POSSIBLE	DAY	SNOW	2-VEHICLE	2/13/2009	7:01 AM
	36760	CLOUDY	ANIMAL	ANIMAL	STRAIGHT	NO	NONE	DAY	DRY	ANIMAL	5/15/2010	8:39 AM
CATRON/VINEYARD	24864	CLOUDY	N/A	ANGLE	STRAIGHT	INT. RELATED	NONE	DAY	ICY	2-VEHICLE	10/11/2009	5:02 PM
	24865	ICE	TOO FAST	ANGLE	STRAIGHT	INT. RELATED	NONE	DAY	ICY	2-VEHICLE	10/11/2009	5:13 PM
	7401	CLEAR	ANIMAL	ANIMAL	STRAIGHT	T	NONE	DARK	DRY	ANIMAL	8/29/2008	8:25 PM

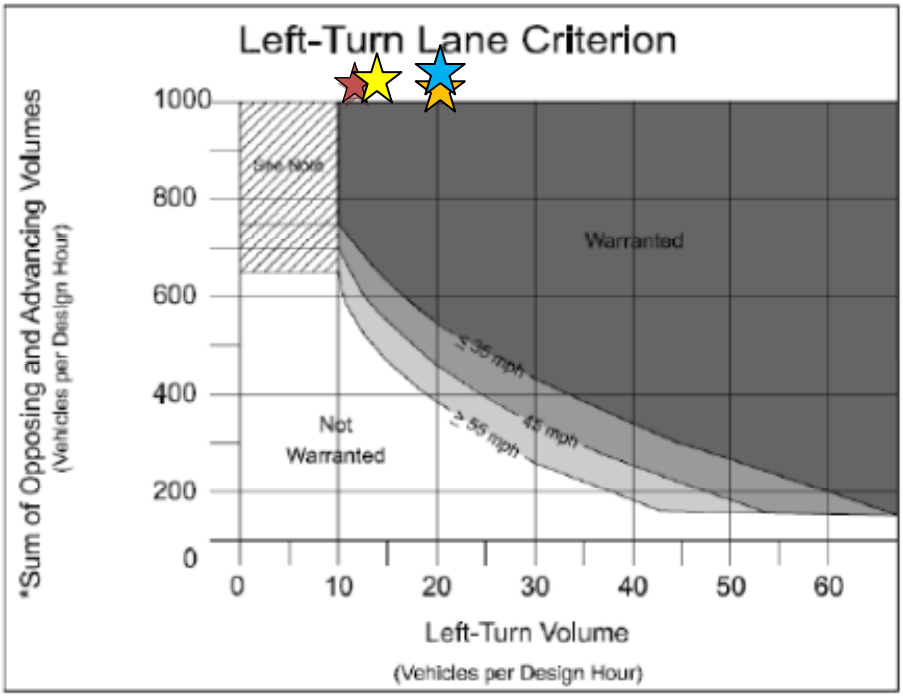
Appendix Part 3
Turn Lane Criteria Summary

Turn Lane Criteria Analysis
Skyline Village Apartments TIS

SDDOT turn lane warrants were used to consider the need for turning lanes at study area intersections. Three locations were found to satisfy a criterion for turn lane installation. The analyses are summarized below:

Location 1 – Catron Boulevard/Vineyard Lane

Condition	Left-turn	Advancing	Opposing	Advance + Opposing
Existing+site AM	12	750	337	1087
Existing+site PM	15	347	756	1103
2035+site AM	20	1280	570	1850
2035+site PM	20	590	1290	1880



Source: Oregon DOT Analysis Procedures Manual 2006

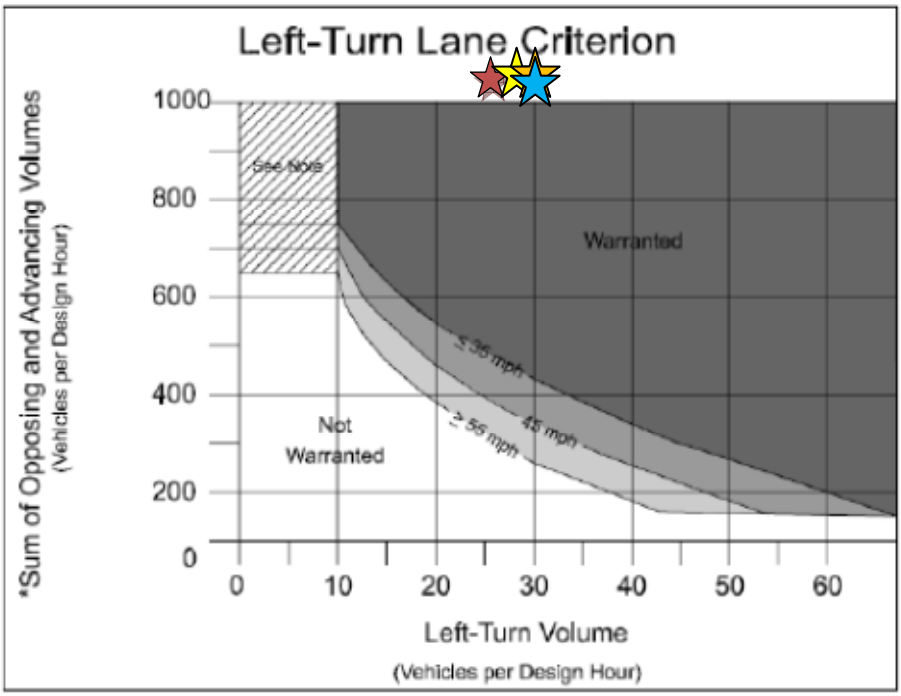
*(Advancing Vol/ # of Advancing Through Lanes)+
(Opposing Vol/ # of Opposing Through Lanes)

Note: The criterion is not met from zero to ten left turn vehicles per hour, but careful consideration should be given to installing a left turn lane due to the increased potential for accidents in the through lanes. While the turn volumes are low, the adverse safety and operational impacts may require installation of a left turn. The final determination will be based on a field study.

Figure 15-1 Left Turn Lane Warrants

Location 2 – U.S. 16 northbound/Tucker Street

Condition	Left-turn	Advancing	Opposing	Advance + Opposing
Existing+site AM	25	728	315	1043
Existing+site PM	28	383	726	1109
2035+site AM	30	1320	570	1890
2035+site PM	30	690	1320	2010



Source: Oregon DOT Analysis Procedures Manual 2008

*(Advancing Vol/ # of Advancing Through Lanes)+
(Opposing Vol/ # of Opposing Through Lanes)

Note: The criterion is not met from zero to ten left turn vehicles per hour, but careful consideration should be given to installing a left turn lane due to the increased potential for accidents in the through lanes. While the turn volumes are low, the adverse safety and operational impacts may require installation of a left turn. The final determination will be based on a field study.

Figure 15-1 Left Turn Lane Warrants

Location 3 – U.S. 16 southbound/Promise Road

Condition	Right-turn	Approaching Outside Lane
Existing+site AM	13	220
Existing+site PM	46	510
2035+site AM	20	400
2035+site PM	50	920

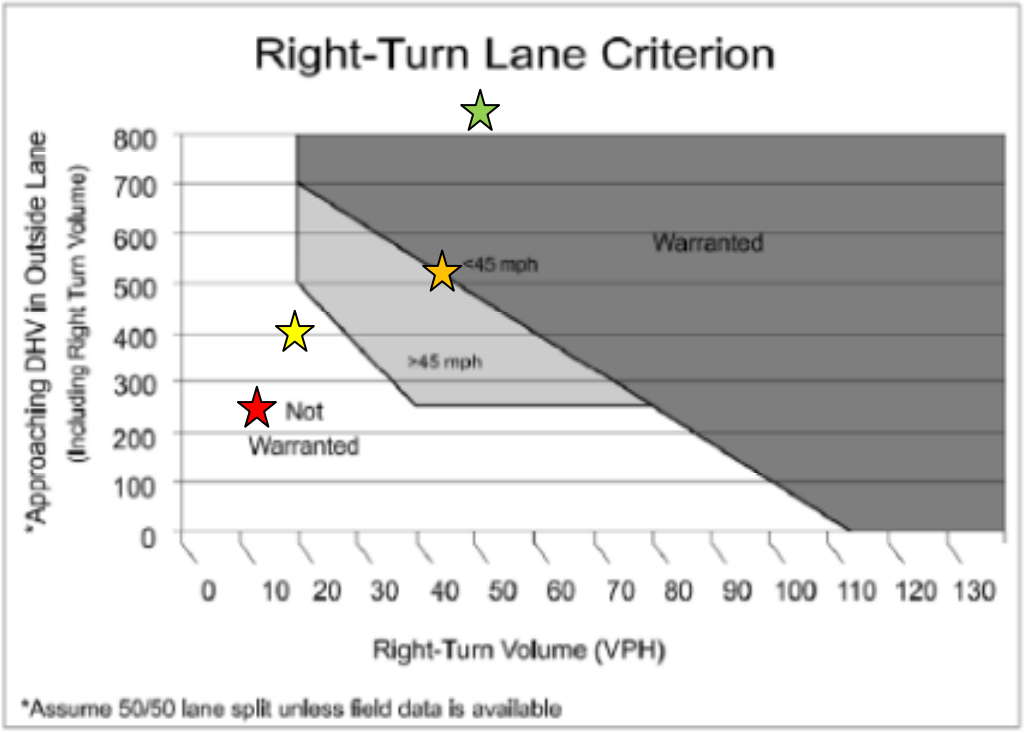


Figure 15-2 Right Turn Lane Warrants