
Traffic Impact Study

Fruita RV Campground & Storage Sites

Greenway Drive

Fruita Greenway Industrial Park



May 8, 2017

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1 Executive Summary

The addition of the RV site Project traffic in the near-term could be accommodated in a safe and efficient manner with the installation of the following features.

1. Construct the intersection south leg (Greenway Drive) in accordance with the ROW available and as approved with the previous CDOT approval. (see Section 9)
2. Construct the intersection north leg (Coulson) in accordance with the ROW available and removing the flare on the northeast corner (per CDOT email).
3. Construct a westbound left turn lane on US-6 between Greenway Drive & Willow Street, by installing a 4-ft wide raised concrete traffic separator within the existing median area. The final design configuration would be coordinated with CDOT through the Notice to Proceed process.

As documented in previous long-range traffic studies in this area, and in this Study, it is recommended that CDOT and the City of Fruita develop a long term plan for signalization for the intersection of US-6 & Greenway Drive/Coulson Street. Otherwise the main gateway to the Greenway Industrial Park may not be functional in the next 8 years, based on background traffic growth alone.

2 Introduction

This is a traffic impact study (Study) for two proposed RV sites (Project): one RV campground and one RV storage site. The following sections incorporate the traffic study requirements of the Colorado State Highway Access Code (SHAC), and the methodology review comments from Kent Harbert at CDOT.

The Project sites would directly access the existing local road known as Greenway Drive, which then connects to US-6 near Coulson Street. As documented in previous access permits for projects located in the Fruita Industrial Park, this is the only way to access US-6 due to the limitation of existing railroad crossings locations. The Greenway Drive access location is allowed under the current adopted access plan for US-6.

The attached Methodology includes a vicinity map and site plan concepts.

3 Existing Traffic Volumes & Conditions

Please see attached Methodology.

4 Future Background Traffic Volumes

Please see attached Methodology.

5 Project Trip Generation

Please see attached Methodology.

6 Total Traffic Volumes

Please see attached Methodology. *The CDOT Access Permit traffic volume should be 148 vph-pce (DHV).*

7 Turn Lane Warrants on US-6 at Greenway Drive

This segment of US-6 has a speed limit of 35 mph and an access classification of NR-B. The following table shows recommendations for turn lanes.

Table 1 – Comparison of Turning Volumes to Turn Lane Thresholds

Auxiliary Lane	Turning Volume 2017 & 2037 (VPH-PCE)	Turning Volume 2017 & 2037 (Actual VPH)	Thresholds	Lane Required for Project?
WB Left Turn Deceleration Lane (inbound)	21 vph (PM)	11 vph (PM)	More than 25 vph	Yes - existing 16-ft wide lane
EB Right Turn Deceleration Lane (inbound)	24 vph (PM)	13 vph (PM)	More than 50 vph	No – existing 8-ft wide shoulder
NB-WB Left Turn Acceleration Lane (outbound)	15 vph (PM)	8 vph (PM)	Generally not required if speed < 40 mph	No
NB-EB Right Turn Acceleration Lane (outbound)	12 vph (PM)	7 vph (PM)	If addressing specifically identified and documented safety and operation reasons, consider adequate gaps and access volume	No – existing 8-ft wide shoulder

None of the turn lanes would have traffic volumes above the CDOT thresholds or meet other CDOT criteria. In addition, it is important to recognize the physical constraints on this Section of US-6, as described below.

Eastbound Right Turn Accel and Decel lanes

As we know from every other study of this section of US-6 (I-70b interchange and points west), there is railroad ROW about 3-ft south of the south edge of pavement on US-6. The only way to construct these accel/decel lanes would be to either: 1) move all of US-6 through lanes about 20-ft north at a huge expense, or 2) Get ROW from the railroad (through condemnation). It is likely that CDOT or the City of Fruita would be willing to do this. Some drivers may choose to use the 8-ft wide shoulders to make right turns into or out of Greenway Drive, which would provide some safety benefit. These two auxiliary lanes are not possible or recommended.

Northbound to Westbound left turn Accel Lane

This lane would conflict with the existing eastbound left turn lane on US-6, so it is not feasible. This auxiliary lane is not possible or recommended.

Westbound left Turn Decel lane

This lane is in place between Coulson and Willow. The only question was related to its configuration. After working through this with CDOT, they decided to go with a raised concrete traffic separator with dedication to the Coulson left turn lane. This would convert the two access points on the north side of US-6 into right-in/right-out configurations (see next section).

8 Adjacent Access Points

CDOT had specific concern about the interaction of the Greenway Drive access on the south side of the highway and the three accesses (two streets and one driveway) along the north side of US-6. The adopted Access Control Plan is shown below. This identifies how these intersections would interact in the future. This will turn both access points on the north side of US-6 into RIRO and all left turning conflicts will be eliminated.

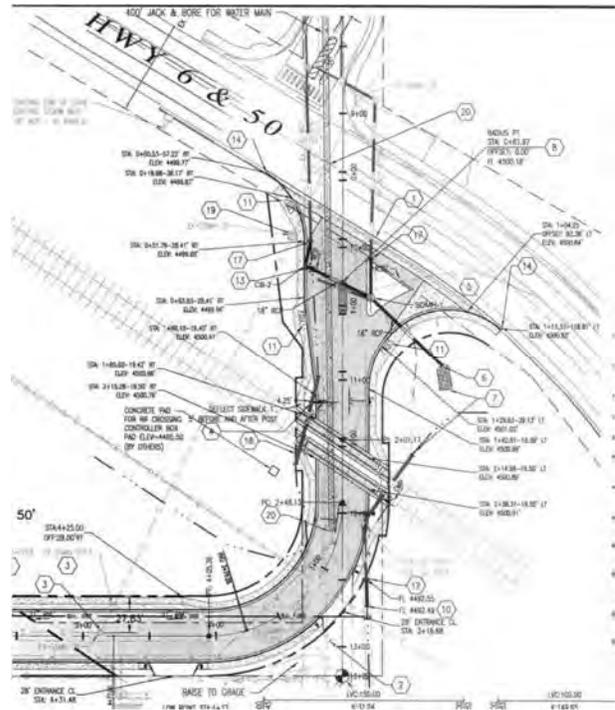


-  - Access to be Closed
-  - Access Proposed to Allow Right Turns In, Right Turns Out, and Left Turns In
-  - Access Proposed to Allow Right Turns In and Right Turns Out Only
-  - Full Movement Access

9 Intersection Geometry

The geometry of this intersection was determined by two previous governmental approvals. First, the PUC allowed Greenway Drive to cross the railroad tracks at the historic location. This action also created enough public road ROW to allow a reasonable intersection at US-6. Second, CDOT approved the intersection configuration as part of a previous access permit notice to proceed.

Recently CDOT indicated that they want the north leg to be configured to match the Greenway Drive alignment on the south side.



10 Intersection Sight Distance

The required distance was based on the State Highway Access Code. This segment of US-6 does not have any vertical curvature or grade, so adjustments to the required distance were not necessary. There is minor horizontal curvature to the east, as shown on the following Figure. Per SHAC Table 4-2 (with 35 mph, two-lane road, and multi-unit trucks) the required sight distance would be 595-ft. This sight distance to the west is unlimited, and the site distance to the east is at least 595-ft.



Sight Distance Point
– 595 feet to the east
of Greenway Drive

11 Intersection Level of Service (LOS) Analysis

11.1 General Information

The traffic analysis was conducted using the methodologies outlined in the Transportation Research Board's, *Highway Capacity Manual*, 2010 Edition. Highway Capacity Software (HCS7) was used to determine traffic operations.

The results of the intersection operational analyses was used to assess the Level of Service (LOS) experienced by drivers. The LOS describes the quality of traffic operating conditions, ranging from A to F, and is measured as the duration of delay a driver experiences at a given intersection. LOS A represents the most desirable conditions with free-flow movement of traffic and minimal delay to motorists. LOS F generally indicates severely congested conditions with excessive delays to motorists. Intermediate grades of B, C, D, and E reflect incremental increases in congestion. CDOT Region 5 has a LOS standard of D for all movements, meaning that CDOT would not permit an access that shows a LOS E or worse for any movement in the peak hour condition.

The duration of delay is measured differently for signalized intersections as compared to unsignalized intersections. The LOS delay range for an unsignalized intersection is typically shorter than at a signalized intersection primarily because at a stop sign, the traveling public has an expectation to experience less delay than at a signal. In addition, studies have shown that at unsignalized intersections drivers tend to become impatient with long delays and may use inadequate and unsafe gaps in the traffic stream to make left turns or enter the major street. The following table provides the delay thresholds for signalized and unsignalized intersections.

Table 2 – Intersection Delay & LOS Thresholds

Level of Service (LOS)	Signalized Intersections (seconds/vehicle)	Unsignalized Intersection (seconds/vehicle)
A	0.0 – 10.0	0.0 – 10.0
B	10.1 – 20.0	10.1 – 15.0
C	20.1 – 35.0	15.1 – 25.0
D	35.1 – 55.0	25.1 – 35.0
E	55.1 – 80.0	35.1 – 50.0
F	Greater than 80.0	Greater than 50.0

Source: Transportation Research Board, *Highway Capacity Manual*, 2010 Edition

The following assumptions were used in the traffic operational analysis.

- Peak Hour Factor (PHF) = 0.92
- Heavy Truck = 8%
- Pedestrian Volume = 10 crossings per hour (north leg - trail)

11.2 Traffic Operations Analysis Results with Project Traffic

The following tables show the operational analysis results for each movement, period, and traffic control option. Since PCE volumes were used, the truck factor was set to 0. The

same results occurred when non-PCE volumes were used and the truck factor was set to 50% for Project travel movements.

Table 3 – Pk. Hr. Intersection Operations – PCE Project Traffic

Location	Traffic Control	Year 2017	Year 2037
US-6 & Greenway Dr. - AM	<u>TWSC</u>		
Eastbound		A	F
Westbound		A	A
Northbound	Stop	C	N/A
Southbound	Stop	C	N/A
Critical Movement LOS & Delay (sec/veh)		D (26) SBL	N/A
US-6 & Greenway Dr. - PM	<u>TWSC</u>		
Eastbound		A	F
Westbound		A	A
Northbound	Stop	C	N/A
Southbound	Stop	C	N/A
Critical Movement LOS & Delay (sec/veh)		D (30) SBL	N/A

*N/A means the software was not able to calculate LOS or delay.

12 Peak Hour Traffic Signal Warrant Evaluation

This evaluation was based on PCE traffic volumes, which is conservative. As shown in the attachments, the peak hour signal warrant was not met in either 2017 condition (AM & PM). However, as supported by the operational analysis, the peak hour warrant would be met in both 2037 conditions. This was due to background traffic growth over time on the east, west, and north legs. Assuming no additional traffic on Greenway Drive, the an estimate of traffic signal timing would be year 2037 (AM) and year 2025 (PM).

Railroad Grade Crossing Considerations

There is 170-ft between the south edge of the US-6 eastbound through lane and the north limit of the grade crossing. This would accommodate 3 RV's towing a small car (53-ft long). The operational analysis showed the following northbound queue lengths (95th percentile):

- 2017 AM = Less than 1 vehicle
- 2017 PM = Less than 1 vehicle
- 2037 AM = Not calculated but likely more than 3 vehicles
- 2037 PM = Not calculated but likely more than 3 vehicles

These results also confirm the need for signalization at this intersection at some point in the future.

13 Recommendations

The addition of the RV site Project traffic in the near-term could be accommodated in a safe and efficient manner with the installation of the following features.

1. Construct the intersection south leg (Greenway Drive) in accordance with the ROW available and as approved with the previous CDOT approval. (see Section 9)
2. Construct the intersection north leg (Coulson) in accordance with the ROW available and removing the flare on the northeast corner (per CDOT email).
3. Construct a westbound left turn lane on US-6 between Greenway Drive & Willow Street, by installing a 4-ft wide raised concrete traffic separator within the existing median area. The final design configuration would be coordinated with CDOT through the Notice to Proceed process.

As documented in previous long-range traffic studies in this area, and in this Study, it is recommended that CDOT and the City of Fruita develop a plan for signalization for the intersection of US-6 & Greenway Drive/Coulson Street. Otherwise the main gateway to the Greenway Industrial Park may not be functional in the next 8 years, based on background traffic growth alone.

Appendix

TIS Methodology

HCS Traffic Operations Analysis Output + Signal Warrants

TIS Methodology

MEMORANDUM

TO: Kent Harbert, PE, CDOT R3 Access Engineer
FROM: Skip Hudson, PE
COPY: Jim Atkinson, Vortex Engineering
DATE: May 5, 2017
PROJECT: Proposed RV Sites in Fruita Industrial Park (US-6 access at Greenway Dr.)
RE: Revision #2 - Methodology for Level 3 Traffic Study

This Methodology was originally submitted to CDOT on 3/10/17, and some initial comments were received. It took nearly two months to work through those comments with CDOT and City of Fruita. Then we received a new comment from CDOT on 5/5/17 that resulted in the need to recalculate all the traffic volumes. This memorandum has addressed all CDOT comments to date and it contains the methodology that will be used to prepare the traffic assessment (study) for the two proposed RV sites (Project) accessing the intersection of US-6 & Greenway Drive. The following sections incorporate the traffic study requirements of the Colorado State Highway Access Code (SHAC).

Project Access Location on US-6

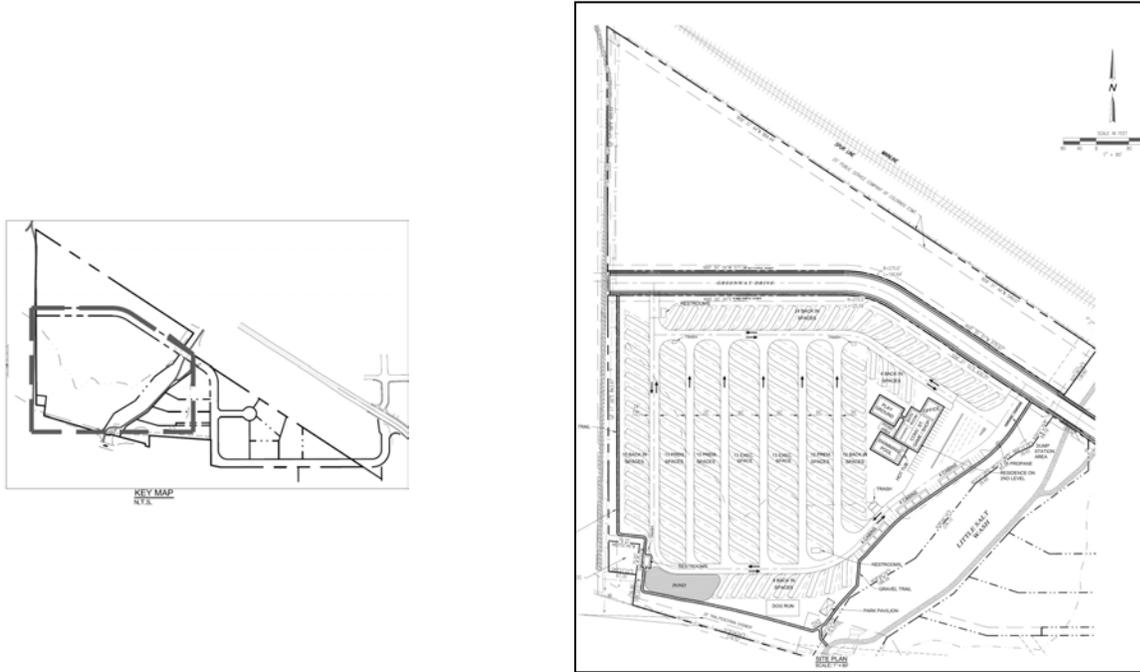
The Project site will directly access the existing local road known as Greenway Drive, which then connects to US-6 near Coulson Street. As documented in previous access permits for projects located in the Fruita Industrial Park, this is the only way to access US-6 due to the limitation of existing railroad crossings locations. The Greenway Drive access location is allowed under the current adopted access plan for US-6.



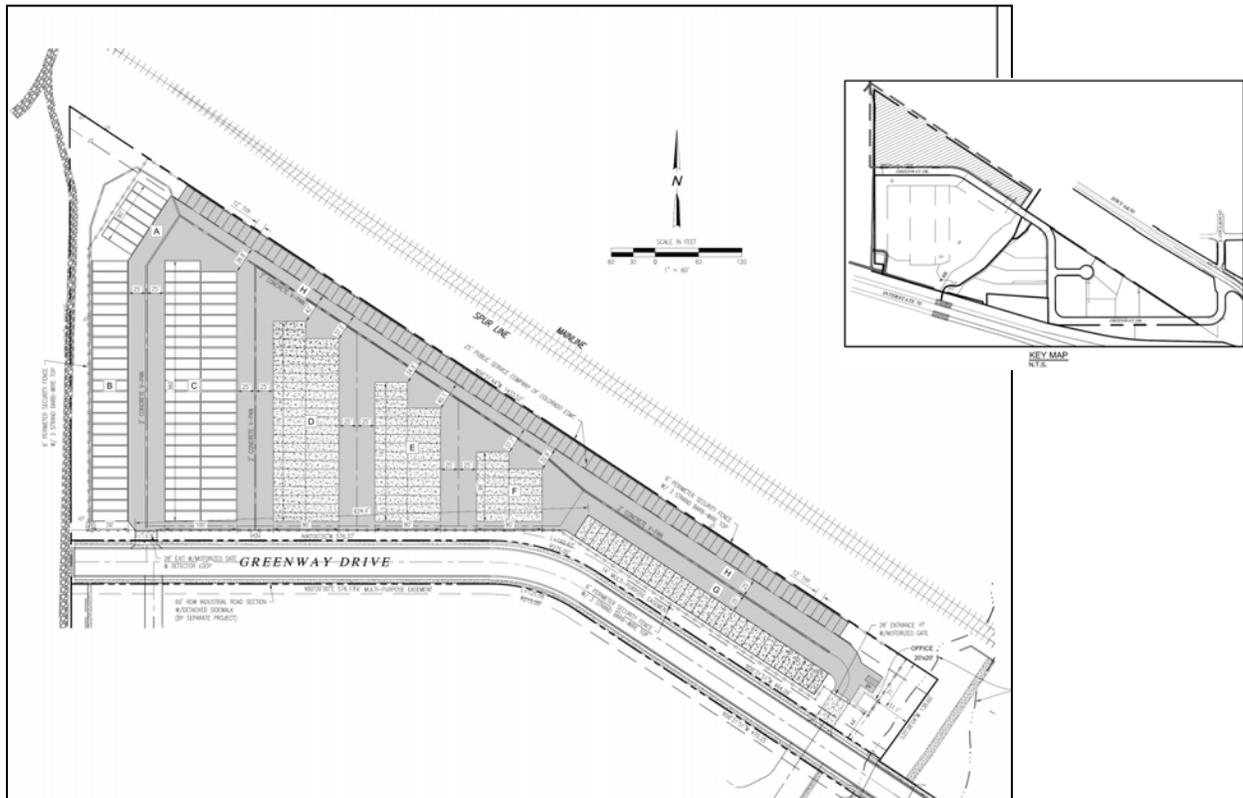
Project Description & Specific Site Locations

Both parts of the Project will be located within the Fruita Industrial Park, as shown in the following figures.

Fruita RV Park



Fruita RV Storage



Study Area

The study area will be the intersection of US-6A & Greenway Drive (MP 19.96 R). However, the access and US-6 median configurations were included in the discussion with CDOT because it was necessary to understand how access restrictions on this segment of US-6 would affect Project trip distributions. All of this was based on the US-6 Access Control Plan, which identified how adjacent access points should be configured.

Existing Conditions on State Highways in Study Area (2015)

CDOT data includes the following factors (OTIS).) Please see attachment A.

US-6

- Access Category = NR-B
- Speed Limit = 35 mph eastbound & westbound (CDOT data is wrong)
- AADT (August 2015) = 6,000 vpd
- Peak Season Adjustment factor = N/A (CDOT 2015 counts done in peak season)
- 20-yr factor = 1.77
- Peak to daily factor (DHV) = 10%
- Existing peak hour through volumes:
 - AM = 185 vph EB & 156 vph WB
 - PM = 231 vph EB & 265 vph WB

SH-340 (Coulson Street between Aspen Street & US-6)

- Peak Season Adjustment factor = N/A (CDOT 2015 counts done in peak season)
- 20-yr factor = 1.33
- Existing peak hour through volumes:
 - AM = 226 vph NB & 81 vph SB
 - PM = 186 vph NB & 184 vph SB

Study Time Periods

The following peak periods will be studied:

- Weekday AM Peak Hour (8:00 am to 9:00 am, per CDOT counts)
- Weekday PM Peak Hour (5:00 pm to 6:00 pm, per CDOT counts)

Future Background Traffic Volumes

There are three parts of this calculation, which will be combined for overall intersection background traffic volumes:

- Traffic growth of eastbound and westbound through movements on US-6
- Traffic growth of turns to/from Coulson Street (north leg)
- existing traffic generated by one small building on industrial lots adjacent to Greenway Drive (assumed 6 trips per hour evenly split between traffic movements)

Traffic growth of eastbound and westbound through movements on US-6

The Project would be constructed in 2017 (opening year), and the 20-yr condition would be 2037. The 20-yr factor of 1.77 equates to an average annual growth rate of 2.9%

- For year 2017, the 2-yr growth factor (2015-2017) = 1.059
- For year 2037, the 22-yr growth factor (2015-2037)= 1.876

These factors will be applied to the CDOT traffic volumes on US-6 from 2015 counts.

Traffic growth of turns to/from Coulson Street (North Leg of Intersection – SH-340)

The Project would be constructed in 2017 (opening year), and the 20-yr condition would be 2037. The 20-yr factor of 1.33 equates to an average annual growth rate of 1.4%

- For year 2017, the 2-yr growth factor (2015-2017) = 1.028
- For year 2037, the 22-yr growth factor (2015-2037)= 1.357

These factors will be applied to the CDOT traffic volumes on SH-340 from 2015 counts. The northbound and southbound through movements were converted to intersection turning volumes by applying turning splits from the 2009 intersection count.

Project Land Use Assumptions

The proposed Project has been approved by the City of Fruita and it will include a mixture of camping and storage spaces with various sizes.

Fruita RV Park

<u>NUMBER OF SITES</u>
64 BACK-IN SITES
26 EXECUTIVE SITES
38 PREMIUM SITES
14 PARK MODEL CABINS
142 TOTAL

Fruita RV Storage

TOTAL RV STORAGE SPACES:	
ENCLOSED:	77 (15'x50')
COVERED, PREMIUM:	87 (12'x45')
COVERED, STANDARD:	33 (12'x35')
OPEN PARKING:	91 (12'x25')

Project Trip Generation Calculation

The previously described land uses were grouped into the following categories for calculation purposes. Please see Attachment B for detailed calculations and reference information.

Campground/RV Park (ITE LUC #416)

- 142 total sites
- Assume occupancy rate of 84%, which is the highest of two data points from studies of existing similar uses
 - Average Occupancy Rate = 66.5%
 - Maximum Ave Summer Holiday Occupancy Rate = 84%
- Assume 119 occupied sites for average summer condition, which is conservative

RV Storage

- 288 total spaces
- ITE does not provide data for this land use so there were two options for trip generation rates:
 - Option 1 = Use TurnKey Data from a data collection effort associated with a somewhat similar land use in Mesa County (Midlands Village Private RV Storage Yard)
 - Option 2 = Use ITE rates for “Mini-Warehouse” (LUC 151)
 - Based on the detailed calculations (attached), Option 1 provides the highest trip generation values, so they were used in this Study to be conservative

The following table summarizes the total base Project trips. In general, the higher of ITE rates or regression equations were used (if available). In general, the higher values were used when comparing peak hour of roadway to peak hour of generator (if available).

Total Base Weekday Project Trips in 2017 & 2037 (actual vehicles)

Period	Inbound	Outbound	Total
AM Peak Hour (vph)	37	25	62
PM Peak Hour (vph)	48	28	76

Trip Reduction Factors

Pass-by-Capture reduction factor: This factor was not used due to the land uses being “destination” type.

External Trip reduction factor (Internal Capture): In order to be conservative, this factor was not applied even though there could be some minor linkage of trips between the two land uses.

Passenger Car Equivalent (PCE)

A mix of different vehicle sizes will travel to/from the Project so the base Project trips shown above need to be converted to PCE’s. The PCE factor was based on the proposed mix of different size camping sites or storage spaces. AASHTO provides a length of 30-ft for Motor Home, and that any combination vehicle (e.g. car with boat, 5th Wheeler) is longer than 40-ft. The Project market analysis provided the number of annual visitations in year 5 of operation, which is divided into the different type of camping (and thus vehicle use). This provided the background for the PCE factor on arrival and departure days. The 2014 American Camper report provided the average duration of stay. Please see Attachment C for detailed calculations and reference information, which is summarized below.

- Weighted PCE factor for arrival and departure days = 2.74
- PCE factor for “stay” days = 1.0
- Average duration of visit = 4 days/3nights
- Weighted Average Overall PCE factor = 1.87 (Used for both RV Parking & Camping)

The following table summarizes the total adjusted Project trips in terms of PCE’s.

Total Adjusted Weekday Project Trips in 2017 & 2037 (PCE’s)

Period	Inbound	Outbound	Total
AM Peak Hour (vph)	69	47	116
PM Peak Hour (vph)	90	52	142

Project Trip Distribution & Assignment

The following steps were taken to determine Project trip distribution and assignment for the 2017 and 2037 Periods. Please see attachment A. Given the “origin/destination” nature of these land uses, the Study will assume that the Project trips would be “to/from” destination type trips.

CDOT Data on EB & WB through Movements (2015) – Informational Only

1. Obtain two-way hourly traffic counts on US-6, near the Project site. Source: CDOT OTIS – 2 days in 2015 (on SH-6 SE/O SH 340 - Station Id: 100254)
2. Determine the peak AM and PM Periods:

3. Calculate the average direction distribution (EB & WB) for the AM & PM peak periods
 - a. AM = 54% EB & 46% WB
 - b. PM = 48% EB & 52% WB

Peak Hour Traffic Counts (2009) – Basis for Project Trip Distribution

Attachment A shows the counts and the relative relationship between the two-way traffic volumes on the east, north, and west legs of the intersection. This distribution was consistent in both the AM and PM peak hour periods, and likely represents the “local” travel patterns.

- To/from the west on US-6 = 42%
- To/from the north on Coulson = 23%
- To/from the east on US-6 = 35%

In addition, a portion of the visitors would not be local and would travel to/from I-70. Given the future turn restrictions at the intersection of Willow St & US-6 (per ACP), most of these visitor trips would be to/from the north. The following table shows how these two sets of factors were combined to create the trip distribution assumptions in this Study (average value).

Project Trip Distribution Calculations

Direction	Local	Non-Local	Average
To/from the west	42%	10%	26%
To/from the north	23%	80%	52%
To/from the east	35%	10%	22%

Traffic Volume Calculations – US-6 & Greenway Drive

The following table provides the traffic volume calculations at this intersection. All Project traffic is in terms of PCE.

Description	AM Condition											
	Eastbound			Westbound			Northbound			Southbound		
	L	TH	R	L	TH	R	L	TH	R	L	TH	R
Existing Volumes (CDOT 2015)	183	185	0	0	156	43	0	0	0	44	0	45
Seasonally Adjusted base volumes	183	185	0	0	156	43	0	0	0	44	0	45
Trip Distribution % Inbound Phase 1	0%	0%	26%	22%	0%	0%	0%	0%	0%	0%	52%	0%
Trip Distribution % Outbound Phase 1	0%	0%	0%	0%	0%	0%	26%	52%	22%	0%	0%	0%
Driveway Enter "1" Yes, or "0" No Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
Trip Distribution % Inbound Phase 2	0%	0%	26%	22%	0%	0%	0%	0%	0%	0%	52%	0%
Trip Distribution % Outbound Phase 2	0%	0%	0%	0%	0%	0%	26%	52%	22%	0%	0%	0%
Driveway Enter "1" Yes, or "0" No Phase 2	0	0	0	0	0	0	0	0	0	0	0	0
Project Trip Volume Inbound - Phase 1	0	0	18	15	0	0	0	0	0	0	36	0
Project Trip Volume Outbound - Phase 1	0	0	0	0	0	0	12	24	10	0	0	0
Project Trip Volume Total - Phase 1	0	0	18	15	0	0	12	24	10	0	36	0
Project Trip Volume Inbound - Phase 2	0	0	18	15	0	0	0	0	0	0	36	0
Project Trip Volume Outbound - Phase 2	0	0	0	0	0	0	12	24	10	0	0	0
Project Trip Volume Total - Phase 2	0	0	18	15	0	0	12	24	10	0	36	0
Growth Factor Period 1	1.028	1.059	1.000	1.000	1.059	1.028	1.000	1.000	1.000	1.028	1.000	1.028
Growth Factor Period 2	1.357	1.876	1.000	1.000	1.876	1.357	1.000	1.000	1.000	1.357	1.000	1.357
Future Background Volume - Period 1	188	196	0	0	165	44	0	0	0	45	0	46
Future Background Volume - Period 2	248	347	0	0	293	58	0	0	0	60	0	61
Other Project Trip Assignment AM Period 1			1	1			1	1	1		1	
Other Project Trip Assignment AM Period 2			1	1			1	1	1		1	
Total Future Volume - Period 1	188	196	19	16	165	44	13	25	11	45	37	46
Total Future Volume - Period 2	248	347	19	16	293	58	13	25	11	60	37	61

Description	PM Condition											
	Eastbound			Westbound			Northbound			Southbound		
	L	TH	R	L	TH	R	L	TH	R	L	TH	R
Existing Volumes (CDOT 2015)	119	231	0	0	265	67	0	0	0	55	0	129
Seasonally Adjusted base volumes	119	231	0	0	265	67	0	0	0	55	0	129
Trip Distribution % Inbound Phase 1	0%	0%	26%	22%	0%	0%	0%	0%	0%	0%	52%	0%
Trip Distribution % Outbound Phase 1	0%	0%	0%	0%	0%	0%	26%	52%	22%	0%	0%	0%
Trip Distribution % Inbound Phase 2	0%	0%	26%	22%	0%	0%	0%	0%	0%	0%	52%	0%
Trip Distribution % Outbound Phase 2	0%	0%	0%	0%	0%	0%	26%	52%	22%	0%	0%	0%
Project Trip Volume Inbound - Phase 1	0	0	23	20	0	0	0	0	0	0	47	0
Project Trip Volume Outbound - Phase 1	0	0	0	0	0	0	14	27	11	0	0	0
Project Trip Volume Total - Phase 1	0	0	23	20	0	0	14	27	11	0	47	0
Project Trip Volume Inbound - Phase 2	0	0	23	20	0	0	0	0	0	0	47	0
Project Trip Volume Outbound - Phase 2	0	0	0	0	0	0	14	27	11	0	0	0
Project Trip Volume Total - Phase 2	0	0	23	20	0	0	14	27	11	0	47	0
Growth Factor Period 1	1.028	1.059	1.000	1.000	1.059	1.028	1.000	1.000	1.000	1.028	1.000	1.028
Growth Factor Period 2	1.357	1.876	1.000	1.000	1.876	1.357	1.000	1.000	1.000	1.357	1.000	1.357
Future Background Volume - Period 1	122	245	0	0	281	69	0	0	0	57	0	133
Future Background Volume - Period 2	161	433	0	0	497	91	0	0	0	75	0	175
Other Project Trip Assignment PM Period 1			1	1			1	1	1		1	
Other Project Trip Assignment PM Period 2			1	1			1	1	1		1	
Total Future Volume - Period 1	122	245	24	21	281	69	15	28	12	57	48	133
Total Future Volume - Period 2	161	433	24	21	497	91	15	28	12	75	48	175

Traffic Operations Analysis – US-6 & Greenway Drive

The Study will include a peak hour traffic operations and signal warrant evaluation.

Attachments

- A. CDOT OTIS and other traffic data
- B. Project Trip Generation Calculations
- C. PCE Factor Calculations

SH006A	MP	Length	Description	City	County:	Hwy Name	Comments
006A	18.16	0.353	RD SW (15.50 RD)	NONE	MESA	HIGHWAY 6 AND 50	15.50 RD (NE)
006A	18.54	0.145	CHANGE IN ROADWAY WIDTH OR DESIGNED SAFETY	NONE	MESA	HIGHWAY 6 AND 50	
006A	18.70	0.023	RD N AND S (16.00 RD)	NONE	MESA		16.00 RD (N)
006A	18.75	0.146	RD N AND S (16.00 RD)	NONE	MESA	HIGHWAY 6 AND 50	16.00 RD (NE)
006A	18.92	0.071	CHANGE IN ROADWAY WIDTH OR DESIGNED SAFETY	NONE	MESA	HIGHWAY 6 AND 50	
006A	19.00	0.17	MILEPOST 19	NONE	MESA	HIGHWAY 6 AND 50	
006A	19.17	0.035	ENTER FRUITA CITY LIMITS	FRUITA	MESA	HIGHWAY 6 AND 50	
006A	19.21	0.468	MAJOR STR (H-02-GH) BIG SALT WASH -- RD NE (OTTLEY AVE) (K.00 RD) (16.50 RD) -- REPLACED HISTORICAL STRID (H-02-V)	FRUITA	MESA		OTTLEY AVE (NE)
006A	19.66	0.111	MAJOR STR (H-02-GI) LITTLE SALT WASH - CHANGE SPEED LIMIT (35)	FRUITA	MESA	HIGHWAY 6 AND 50	
006A	19.78	0.113	RD E (ASPEN ST) -- OFFSET REFERENCE	FRUITA	MESA	HIGHWAY 6 AND 50	006A EXIT(19) 340A EXIT(0)ASPEN ST COULSON ST
006A	19.90	0.055	CHANGE IN ROADWAY SEPARATION	FRUITA	MESA	HIGHWAY 6 AND 50	
006A	19.96	0.044	340A JCT SH 340A NORTH (COULSON WAY)	FRUITA	MESA	HIGHWAY 6 AND 50	COULSON ST (N)
006A	20.00	0.102	MILEPOST 20	FRUITA	MESA	HIGHWAY 6 AND 50	WILLOW ST (S)
006A	20.09	0.001	MAJOR STRS (H-02-FL) SB AND (H-02-FK) NB - JCT SH 340A NORTH AND SOUTH - UNDERPASS SEPARATIONS	FRUITA	MESA	HIGHWAY 6 AND 50	
006A	20.09	0.092	CHANGE IN FEDERAL HIGHWAY (NHS)	FRUITA	MESA	HIGHWAY 6 AND 50	



A

WMS
7/21

19

Route 006A
From 19 To 20

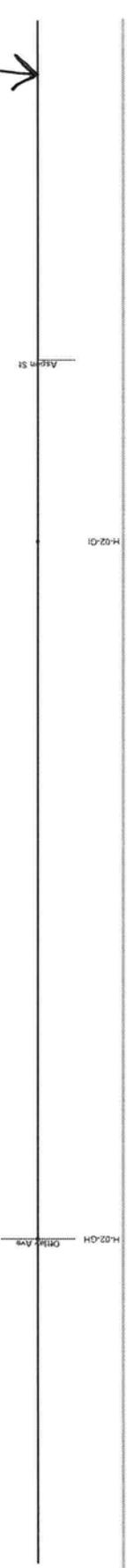


Ramps

Overpass

Underpass

Structures



CLASSIFICATION

Access Control	R-A: Regional Highway	NR-B: Non Rural Arterial
----------------	-----------------------	--------------------------

SAFETY

Primary Speed Limit	55	45	35
Secondary Speed Limit	60	55	35

TRAFFIC

AADT	6000	5100
DHV	10	
Off Peak Truck Percentage	7.7	8.1
Year 20 Factor	1.49	1.77



It may appear that information is missing from the straight line diagram. If so, reduce the number of miles/page and re-submit the request.

A
2/10/11

CDOT Traffic Data (OTIS)

8/12/2015

Dir	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
P	6	5	3	10	15	65	186	167	165	199	210	185	211	211	220	219	222	226	178	106	65	42	27	7
S	9	8	15	21	29	40	102	123	152	149	167	194	238	231	222	283	272	265	203	155	117	83	36	9
C	15	13	18	31	44	105	288	290	337	348	377	379	449	442	442	502	494	491	381	261	182	125	63	16

8/13/2015

Dir	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
P	6	5	3	10	11	35	130	169	177	189	219	209	205	231	218	216	229	231	185	111	67	45	29	8
S	13	9	8	16	25	45	77	141	156	155	171	181	229	236	241	202	226	231	209	141	115	85	28	13
C	19	14	11	26	36	80	207	310	333	344	390	390	434	467	459	418	455	462	394	252	182	130	57	21

Total 2 Day AM =

P 362 EB
S 308 46% WB
C 670

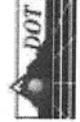
Total 2 Day PM =

P 457 48% EB
S 496 52% WB
C 953

[Handwritten signature]

A
3/21
1/15

SH340A	MP	Length	Description	City	County:	Hwy Name	Comments
340A	0.44	0.031	CHANGE IN ROADWAY WIDTH OR DESIGNED SAFETY	FRUITA	MESA	W ASPEN AVE and Coulson Street	←
340A	0.48	0.015	RAMPS ON AND OFF (FROM/TO I-70 WB) EXIT 0	FRUITA	MESA	W ASPEN AVE and Coulson Street	
340A	0.49	0.032	(GIS) Condition Location Marker	FRUITA	MESA	W ASPEN AVE and Coulson Street	
340A	0.51	0.047	FRUITA INTERCHANGE STR (H-02-FJ) -- JCT I-70 E AND W (FRUITA) OVERPASS SEPARATION	FRUITA	MESA	W ASPEN AVE and Coulson Street	340A EXIT(1) 070A EXIT(19)FRUITA 070A (SE)
340A	0.55	0.001	SOUTH SIDE (RAMP GORE SPLIT)	FRUITA	MESA	W ASPEN AVE and Coulson Street	
340A	0.55	0.019	SOUTH SIDE (RAMP GORE SPLIT) -- ROUNDABOUT	FRUITA	MESA	W ASPEN AVE and Coulson Street	
340A	0.57	0.087	RAMPS ON AND OFF (FROM/TO I-70 EB) EXIT 0	FRUITA	MESA	CO-340	
340A	0.65	0.005	(GIS) Condition Location Marker	FRUITA	MESA	CO-340	
340A	0.66	0.091	RD W (GRAND AVE) (RAPTOR RD)	FRUITA	MESA	CO-340	RAPTOR RD (W)
340A	0.73	0.015	(GIS) Condition Location Marker	FRUITA	MESA	CO-340	
340A	0.74	0.085	RD E AND W (JURASSIC RD)	FRUITA	MESA	CO-340	JURASSIC CT (E) KOKOPELLI BD (NE)
340A	0.81	0.091	RD E (KOKOPELLI BLVD)	FRUITA	MESA	CO-340	
340A	0.81	0.009	(GIS) Condition Location Marker	FRUITA	MESA	CO-340	
340A	0.88	0.1	(GIS) Condition Location Marker	FRUITA	MESA	CO-340	
340A	0.96	0.061	(GIS) Condition Location Marker	FRUITA	MESA	CO-340	
340A	1.00	0.039	MILEPOST 1	FRUITA	MESA	CO-340	



A
2/5

Skip Hudson

From: Harbert - CDOT, Kent <kent.harbert@state.co.us>
Sent: Monday, May 08, 2017 10:29 AM
To: Skip Hudson
Subject: Fwd: 6A & 340A
Attachments: OTIS 6A-340A Traffic Count map.docx; SLD-006A-19-20_20170504-112654 markup.pdf

FYI - Here's my correspondence with DTD about the traffic count information at US 6 and Coulson.

Thanks, *Kent*

T. Kent Harbert, PE
Access Engineer
CDOT Region 3, Traffic and Safety Residency



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Kent.Harbert@State.CO.US | www.codot.gov | www.cotrip.org



----- Forwarded message -----

From: Moss - CDOT, Aaron <aaron.moss@state.co.us>
Date: Fri, May 5, 2017 at 12:14 PM
Subject: Re: 6A & 340A
To: "Harbert - CDOT, Kent" <kent.harbert@state.co.us>
Cc: Gary Aucott - CDOT <gary.aucott@state.co.us>, Andi Staley - CDOT <andi.staley@state.co.us>, Daniel Roussin <Daniel.Roussin@state.co.us>, Phyllis Snider - CDOT <phyllis.snider@state.co.us>, Steven Abeyta - CDOT <steven.abeyta@state.co.us>, Leo Livecchi - CDOT <Leo.Livecchi@state.co.us>, Ted Howard - CDOT <ted.howard@state.co.us>

Hi Kent

Thanks for the recommendations; got the descriptions and lat/long updated (Gary/Ted: Those changes are reflected in DATALOAD_TRAFSTATION) so those changes will get reflected into Traffic Data Explorer. As far as the counts you had mentioned at 105366 for 2015, those counts were taken on Coulson (SH 340) between Aspen and SH 6. We have 105366 and 105367 on the short duration count season this year so I'll be able to double check that the AADT's are accurate for these two sites.

Aaron

A

5/11

On Fri, May 5, 2017 at 11:42 AM, Harbert - CDOT, Kent <kent.harbert@state.co.us> wrote:
Aaron, Gary:

We are working on the access permitting process for a development in Fruita. The development will access SH 6A on the south leg of the 6A/340A intersection. I have discovered some discrepancies and recommend the following corrections and adjustments:

- Straight Line Diagram, Route 006A, From 19 to 20: The speed limits in the secondary direction need to be corrected to conform to the strip map (file://public/trafcom/FieldOps/PDF/Stripmaps/SH006/M006A_019_1_1997-12-01.%205937.pdf). In the Traffic section the break between segments needs to be moved from the 6A/Aspen Avenue intersection to the 6A/340A intersection. The 6A/Aspen Street intersection was the 6A/340A intersection prior to 2004. See the attached markup.
- Straight Line Diagram, Route 340A, From 1 to 2: In 2004± the connection of SH 340 to US 6 was moved from the 6A/Aspen Street intersection to the 6A/Coulson Avenue intersection. This resulting in the shortening of SH 340 by about 0.1 mile. The straight line diagram needs to be updated accordingly, as shown on the strip map (file://public/trafcom/FieldOps/PDF/Stripmaps/SH340/M340A_000_1_2004-06-18.pdf).
- Traffic Data Explorer: Two of the traffic counter locations need to be changed physically and on the Traffic Data Explorer map. On US 6 Station 100253 was west of and Station 100254 was east of the 6A/340A intersection when that was the 6A/Aspen Street intersection. The connection of SH 340 to US 6 was moved from the 6A/Aspen Street intersection to the 6A/Coulson Avenue intersection in 2004±. Station 100254 should be moved to the east of the new 6A/340A intersection. On SH 340 Station 105366 was on Aspen Avenue between Coulson Street and the 6A/Aspen Avenue intersection. It should now be located on Coulson Street between Aspen Avenue and the 6A/Coulson Avenue intersection. See the attached Traffic Count map.

Traffic counts were taken at Station 105366 on SH 340 in 2015. These counts are suspect because the AADT of 3900 given for this location is considerably lower than the AADT of 6900 given for the adjacent Station 105367. Were the 2015 counts taken at the old location, which is no longer on the highway? This is important because the consultant for the development will be using that count in their analysis.

Thanks, *Kent*

T. Kent Harbert, PE
Access Engineer
CDOT Region 3, Traffic and Safety Residency



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A

6/11

Route 006A
From 19 To 20

- ◆ Ramps
- Overpass
- Underpass
- Structures

CLASSIFICATION

Access Control

R-A: Regional Highway

NR-B: Non Rural Arterial

SAFETY

Primary Speed Limit

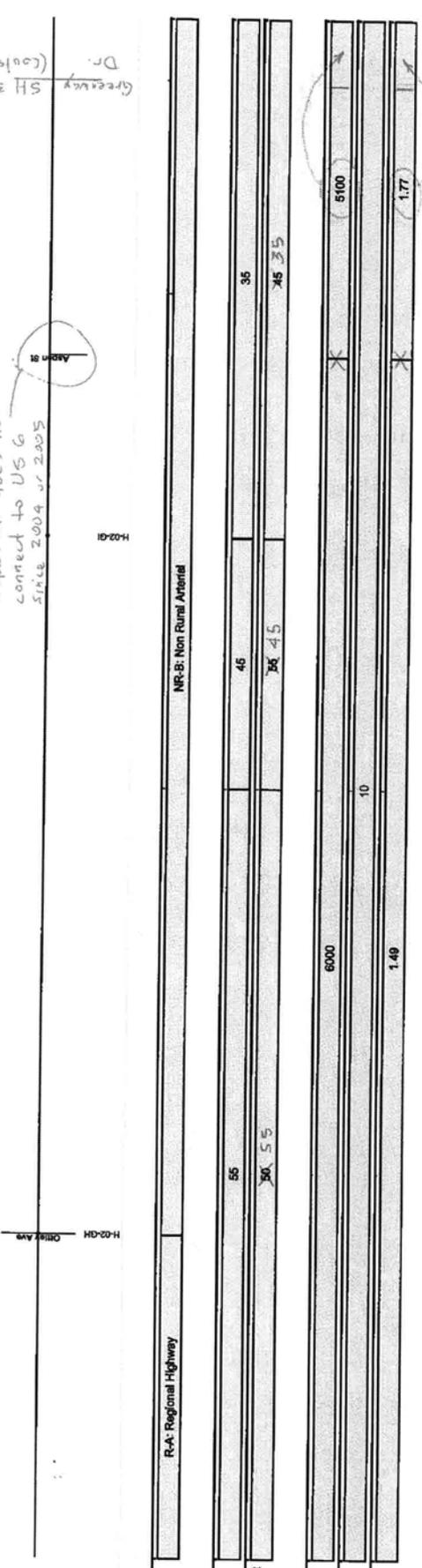
Secondary Speed Limit

TRAFFIC

AADT

DHV

Year 20 Factor



It may appear that information is missing from the straight line diagram. If so, reduce the number of miles/page and re-submit the request.

A
2/11

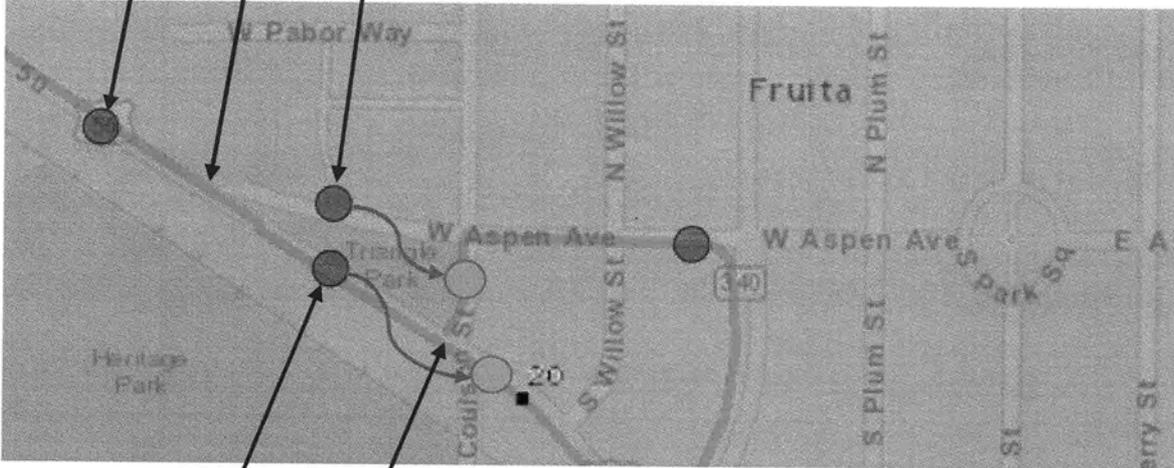
ON SH 6 NW/O SH 340, ASPEN AVE, FRUITA (Station Id: 100253)

Previous location of 6A/340A intersection

ON SH 340, ASPEN AVE E/O SH 6, FRUITA (Station Id: 105366)

Relocate and revise the description

ON SH 340, COULSON ST N/O SH 6, FRUITA (Station Id: 105366)



Current location of 6A/340A intersection

ON SH 6 SE/O SH 340, ASPEN AVE, FRUITA (Station Id: 100254)

Relocate and revise the description

ON SH 6 SE/O SH 340, COULSON ST, FRUITA (Station Id: 100254)

A

8/4

Background Traffic Data on SH-340 in Fruita

Direction	Counts by Hour & Direction - SH-340 Aspen Ave E/O of SH-6 - 7/08/15																							Totals	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		23
Primary Northbound NB	4	2	6	12	20	48	128	203	161	171	147	184	164	151	120	124	140	186	122	95	45	40	19	10	2,302
Secondary Northbound SB	7	4	6	12	12	10	59	77	61	89	93	106	145	141	120	152	147	184	101	80	69	40	27	19	1,761
Total	11	6	12	24	32	58	187	280	222	260	240	290	309	292	240	276	287	370	223	175	114	80	46	29	4,063

Peak

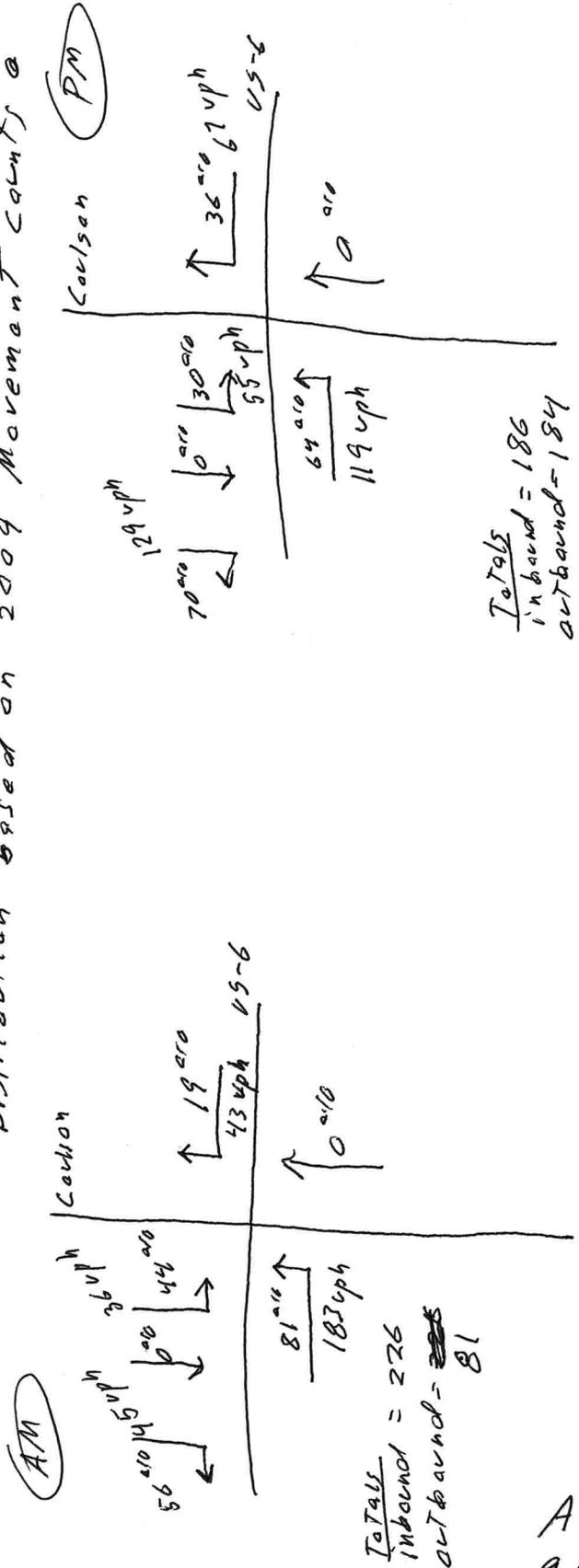
Direction	Counts by Hour & Direction - SH-340 Aspen Ave E/O of SH-6 - 7/09/15																							Totals	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		23
Primary Northbound NB	7	1	4	8	19	62	134	226	130	140	147	152	166	153	133	130	161	181	122	78	63	31	16	11	2,275
Secondary Northbound SB	11	4	3	11	12	18	45	81	63	64	87	94	130	133	114	135	148	181	85	78	68	52	29	15	1,661
Total	18	5	7	19	31	80	179	307	193	204	234	246	296	286	247	265	309	362	207	156	131	83	45	26	3,936

Peak

Summary

-The highest total volume occurred on 7/9/15 (AM) & 7/8/15 (PM), during annual peak travel season

Movement Splits - Volumes used for 2015
Distribution based on 2009 Movement Counts @



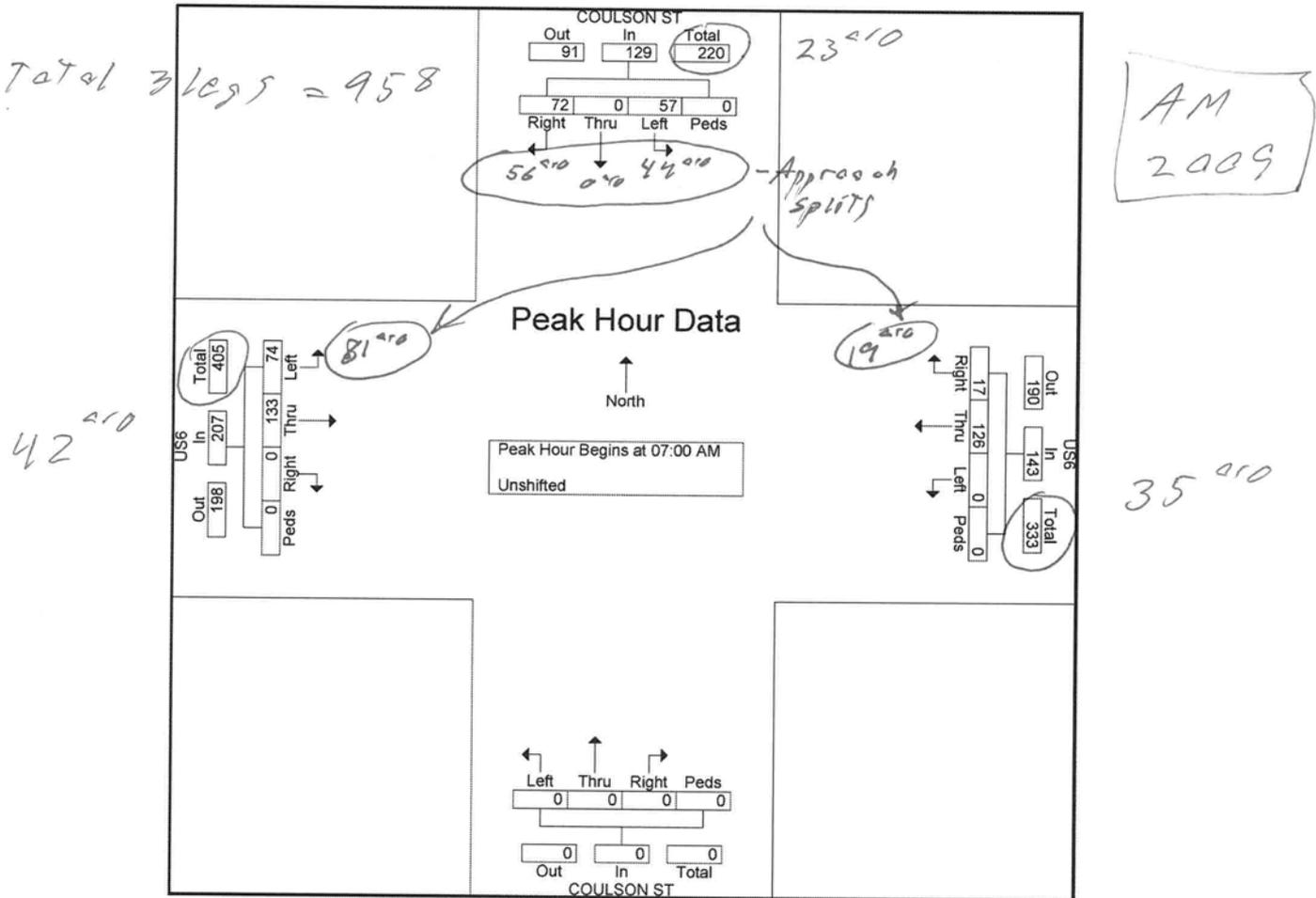
A
9/11



WWW.ALLTRAFFICDATA.NET

File Name : AM_10577 COULSON&US6
 Site Code : 00000000
 Start Date : 2/19/2009
 Page No : 2

Start Time	COULSON ST Southbound					US6 Westbound					COULSON ST Northbound					US6 Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	15	0	23	0	38	3	26	0	0	29	0	0	0	0	0	0	49	14	0	63	130
07:15 AM	17	0	12	0	29	5	35	0	0	40	0	0	0	0	0	0	42	16	0	58	127
07:30 AM	17	0	9	0	26	4	35	0	0	39	0	0	0	0	0	0	21	23	0	44	109
07:45 AM	23	0	13	0	36	5	30	0	0	35	0	0	0	0	0	0	21	21	0	42	113
Total Volume	72	0	57	0	129	17	126	0	0	143	0	0	0	0	0	0	133	74	0	207	479
% App. Total	55.8	0	44.2	0		11.9	88.1	0	0		0	0	0	0	0	0	64.3	35.7	0		
PHF	.783	.000	.620	.000	.849	.850	.900	.000	.000	.894	.000	.000	.000	.000	.000	.000	.679	.804	.000	.821	.921



Volumes not used

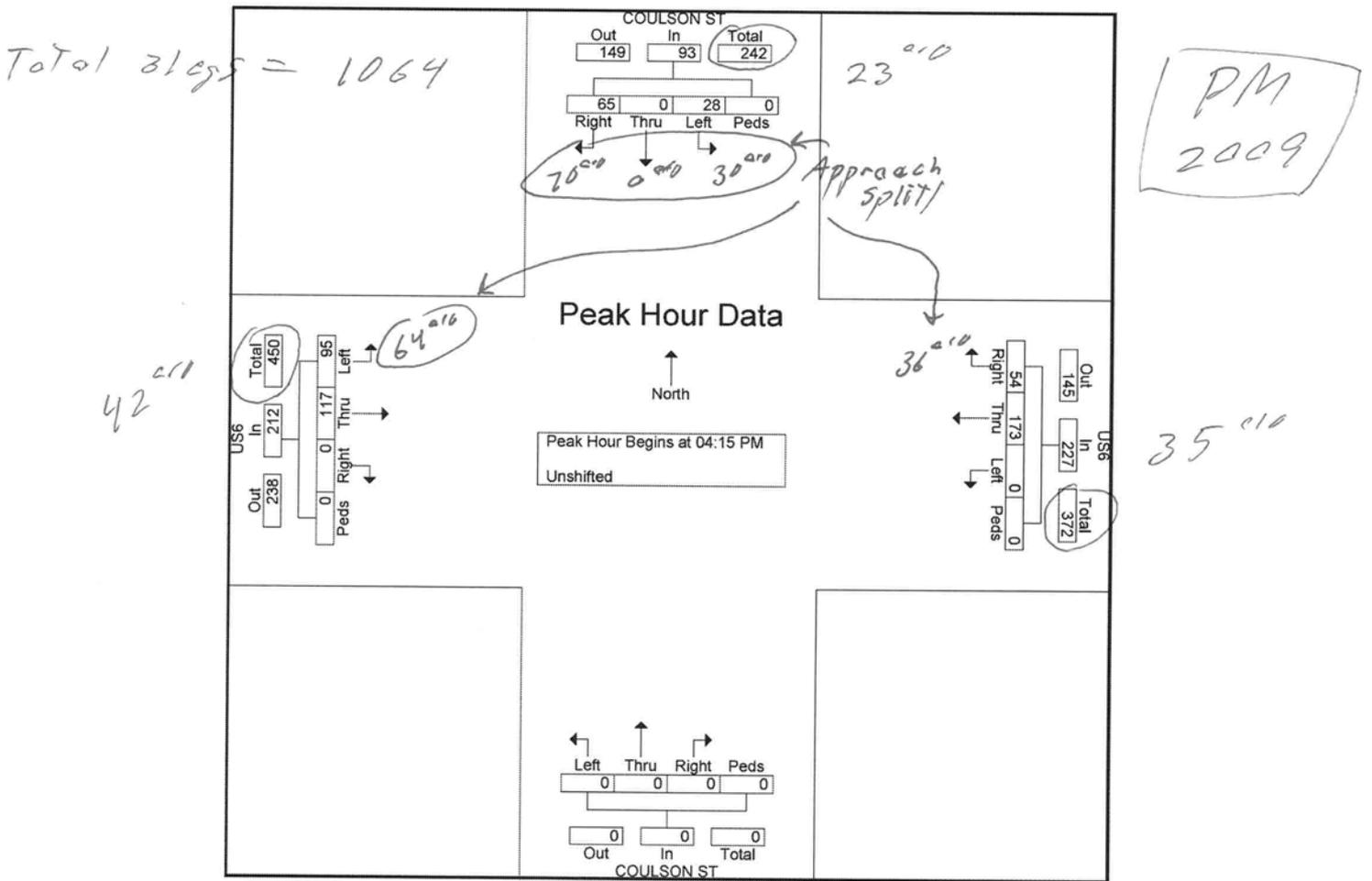
*AM
A
10/11*



WWW.ALLTRAFFICDATA.NET

File Name : PM_10577 COULSON&US6
 Site Code : 00000000
 Start Date : 2/19/2009
 Page No : 2

Start Time	COULSON ST Southbound					US6 Westbound					COULSON ST Northbound					US6 Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	13	0	9	0	22	15	47	0	0	62	0	0	0	0	0	0	32	19	0	51	135
04:30 PM	17	0	8	0	25	22	52	0	0	74	0	0	0	0	0	0	26	25	0	51	150
04:45 PM	19	0	5	0	24	10	26	0	0	36	0	0	0	0	0	0	30	26	0	56	116
05:00 PM	16	0	6	0	22	7	48	0	0	55	0	0	0	0	0	0	29	25	0	54	131
Total Volume	65	0	28	0	93	54	173	0	0	227	0	0	0	0	0	0	117	95	0	212	532
% App. Total	69.9	0	30.1	0		23.8	76.2	0	0		0	0	0	0	0	0	55.2	44.8	0		
PHF	.855	.000	.778	.000	.930	.614	.832	.000	.000	.767	.000	.000	.000	.000	.000	.000	.914	.913	.000	.946	.887

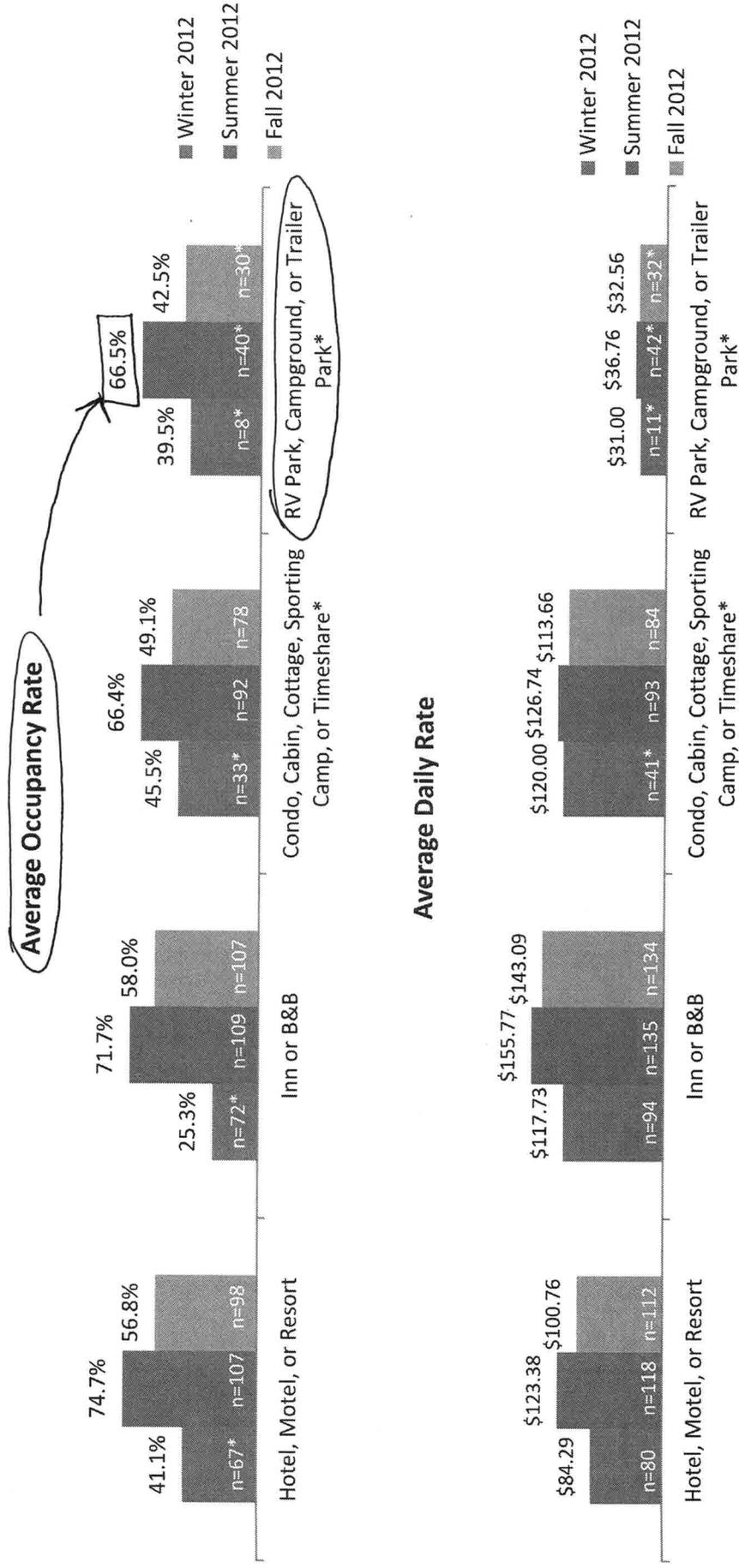


Values not used

BMA
 A
 11/4 2009

Occupancy and Daily Rates – 2012

- Not surprisingly, 2012 showed occupancy rates that were highest during the summer months and lowest during the winter months. Summer occupancy rates reached a high of 74.7% for HMR properties.
- Average daily rates followed occupancy rates, with the highest rates seen during the summer months and the lowest rates seen in the winter. The one exception to this was for the CCC properties, where winter rates were higher than fall season rates.



*Please note small sample size. Data should be used for directional purposes only.
 Q9. What was your overall average occupancy rate for each of the following time periods?
 Q10. What was your average daily rate (ADR) for each of the following time periods?

Campground and RV Park Occupancy Levels Surge Despite Higher Gas Prices

Aug 31, 2005, 01:00 ET from Woodall's

VENTURA, Calif., Aug. 31 /PRNewswire/ -- Despite the current fuel price run-up, RVers are enthusiastic heading into the Labor Day weekend. Nearly seven out of ten RV owners surveyed in March 2005 said they would use their vehicles more this summer compared to last year; approximately half expect to travel more total miles; and about a fourth of respondents plan to use their vehicles the same amount. Only about four percent plan to use their vehicles less. (Source: 2005 Spring/Summer Campfire Canvass Survey of 444 RV owners conducted in March by Robert Hitlin Research Associates.)

Those numbers are holding up according to the Woodall's/ARVC RV Park and Campground Survey. Fourth of July weekend occupancy rates averaged an increase of about 6 percent overall when compared to the same time last year. The travel industry had predicted a 2.3 percent increase in summer leisure travel overall, which means RV Travel is up nearly triple the rate of other travel options. Occupancy rates stayed significantly higher through Sunday, indicating that most campers extended their stay until Monday of the long weekend. All of this means that RVers are traveling more often and using the weekends for vacation getaways.

Campgrounds and RV Parks were at near capacity for the Fourth of July, 87 percent on Saturday and Sunday with some parks reporting 100% occupancy. With an overall average of 84 percent occupancy for the long weekend, those statistics bode well for the upcoming Labor Day weekend. Currently occupancy levels are still holding at an average of 6 percent higher than last year. What is more promising is that reservation levels are still 6 percent higher than last year.

"Frequent mini-vacations are a rising trend among RVers and the top reason they plan to travel more this summer," said Joe Daquino, Multimedia Division Vice President/Woodall's Publisher. "Nearly a fourth of RVers surveyed plan to travel closer to home this season. Whether traveling 5 or 500 miles, RVers enjoy the same quality time with loved ones, taking advantage of closer-to-home recreation opportunities and destinations or staying in one place to cut fuel costs."

Even as fuel prices increase, the difference isn't enough to put a family on a plane and in a hotel. "For a 200-mile RV trip at 10 mpg, for example, the added cost of 20 gallons of fuel would only be \$20 if the cost per gallon rose by 1 dollar," said Daquino.

Dr. Edward Mahoney of Michigan State University estimates that between May and August there were 124,865,541 site nights available for occupancy in commercial RV parks and campgrounds. There are a little over one million sites available in 8,000 commercial RV parks and campgrounds throughout the United States.

"With 8,000 parks nationwide, RVers have the flexibility to modify the distance or length of their trips," said Linda Profaizer, President of the National Association of RV Parks & Campgrounds. "This versatility throughout the United States allows RVers to keep costs down by simply choosing a location closer to home."

"RVers know that RV vacations deliver excellent overall value," said Profaizer. For example, RV travelers spend on average only about \$24 per night for a site at a full-service campground. They tend to buy groceries and cook their meals in the RV instead of paying high restaurant prices. Most of these goods are purchased in the communities around the campground where they spend about \$91 per night according to the Recreation Industries Research Center at Michigan State University. The direct spending figure does not include the campground fees paid to the commercial campgrounds.

With an average of \$324.39 spent per campsite spent in the local community on a holiday weekend, it is estimated that the economic impact of the Fourth of July weekend was \$272 million.

Last year Woodall's/ARVC RV Park and Campground Survey estimated that more than \$3.8 billion was spent by RVers and campers in local communities as they visited the nation's commercial RV parks and campgrounds from Memorial Day to Labor Day. That amount should reach over \$4 billion for the same time period in 2005.

About Woodall's

Woodall (Woodall's) Publications Corporation is a multimedia publisher producing annual directories, regional monthly publications, a variety of specific-interest books and online publications, each designed to reach different segments of the RV and camping consumer marketplace. The Woodall's Campground Directory is the official directory of the Family Motor Coach Association, Camping World's President Club and Family Campers and RVers. For more information on Woodall's publications, call 800-323-9076 or visit <http://www.woodalls.com>

← source

← 84 %

Max.
Ave.
Summer
Holiday
occupancy
Rate

WA 101
B

2/4

Option 1 - TurnKey Trip Gen Rates for RV Storage

Land Use	Size	Units	Weekday AM Peak Hour																				
			Weekday AM Peak Hour of Adj Street Traffic (7-9 am)				Weekday AM Peak Hour of Generator				Use												
			Rate / Equation	# Trips Rate Eq	% IN	% OUT	Total	IN	OUT	Rate / Equation	# Trips Rate Eq	% IN	% OUT	Total	IN	OUT							
416 - Campground/RV Park N/A - RV Storage	119.0 7.6	Occ Spot acre	0.21 / 0.02 /	T = 0.16 (X) + 2.93	25	22	36%	64%	25	9	16	0.25 / 3.51 /	Ln(T) = 0.81 Ln(X) + -0.50	30	29	62%	38%	30	19	11	35	19	16
		Total					25	9	16					57	37	20					62	37	25

Notes:

For #416, the total number of spots = 142, the occupancy factor = 84%
For RV Storage, trip rates come from study of similar use in Mesa County

Option 2 - ITE "mini-warehouse storage" Trip Gen Rates for RV Storage

Land Use	Size	Units	Weekday AM Peak Hour																				
			Weekday AM Peak Hour of Adj Street Traffic (7-9 am)				Weekday AM Peak Hour of Generator				Use												
			Rate / Equation	# Trips Rate Eq	% IN	% OUT	Total	IN	OUT	Rate / Equation	# Trips Rate Eq	% IN	% OUT	Total	IN	OUT							
416 - Campground/RV Park 151 - Mini-Warehouse	119.0 288.0	Occ Spot Units	0.21 / 0.02 /	T = 0.16 (X) + 2.93	25	22	36%	64%	25	9	16	0.25 / 0.03 /	Ln(T) = 0.81 Ln(X) + -0.50	30	29	62%	38%	30	19	11	35	19	16
		Total					31	12	19					39	24	15					44	24	20

Base Trip Generation
(Vehicles)

B
B/4

USE
←

Option 1 - TurnKey Trip Gen Rates for RV Storage

Land Use	Size	Units	Weekday PM Peak Hour															
			Weekday PM Peak Hour of Adj Street Traffic (4-6 pm)				Weekday PM Peak Hour of Generator				Use							
			Rate / Equation	# Trips Rate Eq	% IN	% OUT	Rate / Equation	# Trips Rate Eq	% IN	% OUT	Total	IN	OUT	Total	IN	OUT		
416 - Campground/RV Park	119.0	Occ Spot	0.27 / $\ln(T) = 0.71 \ln(X) + -0.06$	32	28	65%	35%	0.41 /	49	-NA-	62%	38%	49	30	19	49	30	19
N/A - RV Storage	7.6	acre					3.51 /	27	-NA-	67%	33%	27	18	9	27	18	9	
Total				32	21								76	48	28	76	48	28

Notes:

For #416, the total number of spots = 142, the occupancy factor = 84%
 For RV Storage, trip rates come from study of similar use in Mesa County

← Use

Option 2 - ITE "mini-warehouse storage" Trip Gen Rates for RV Storage

Land Use	Size	Units	Weekday PM Peak Hour															
			Weekday PM Peak Hour of Adj Street Traffic (4-6 pm)				Weekday PM Peak Hour of Generator				Use							
			Rate / Equation	# Trips Rate Eq	% IN	% OUT	Rate / Equation	# Trips Rate Eq	% IN	% OUT	Total	IN	OUT	Total	IN	OUT		
416 - Campground/RV Park	119.0	Occ Spot	0.27 / $\ln(T) = 0.71 \ln(X) + -0.06$	32	28	65%	35%	0.41 /	49	-NA-	62%	38%	49	30	19	49	30	19
151 - Mini-Warehouse	288.0	Units	0.02 /	6	3	48%	52%	0.03 /	9	-NA-	47%	53%	9	4	5	9	4	5
Total				38	24								58	34	24	58	34	24

13
4/4

Passenger Car Equivalent Calculation - RV Park

Arrival and Departure Calculation

Camper Type	Vehicle type	PCE Factor	Annual Total by Year 5
RV	RV with Tow Vehicle	3	16,000
Bikers/Tenters	Passenger cars with trailer	2	1,300
Camping Cabins	Passenger cars	1	1,800
	Weighted PCE factor	2.74	

Trips Between Arrival & Departure

Passenger cars	1.0
-----------------------	------------

Weighted Average

According to the "2014 American Camper Report" by COLEMAN COMPANY, INC. AND THE OUTDOOR FOUNDATION, the average length of stay for RV campers is 4 day/3 nights

Day	PCE Factor
1 (arrival)	2.74
2	1
3	1
4 (departure)	2.74

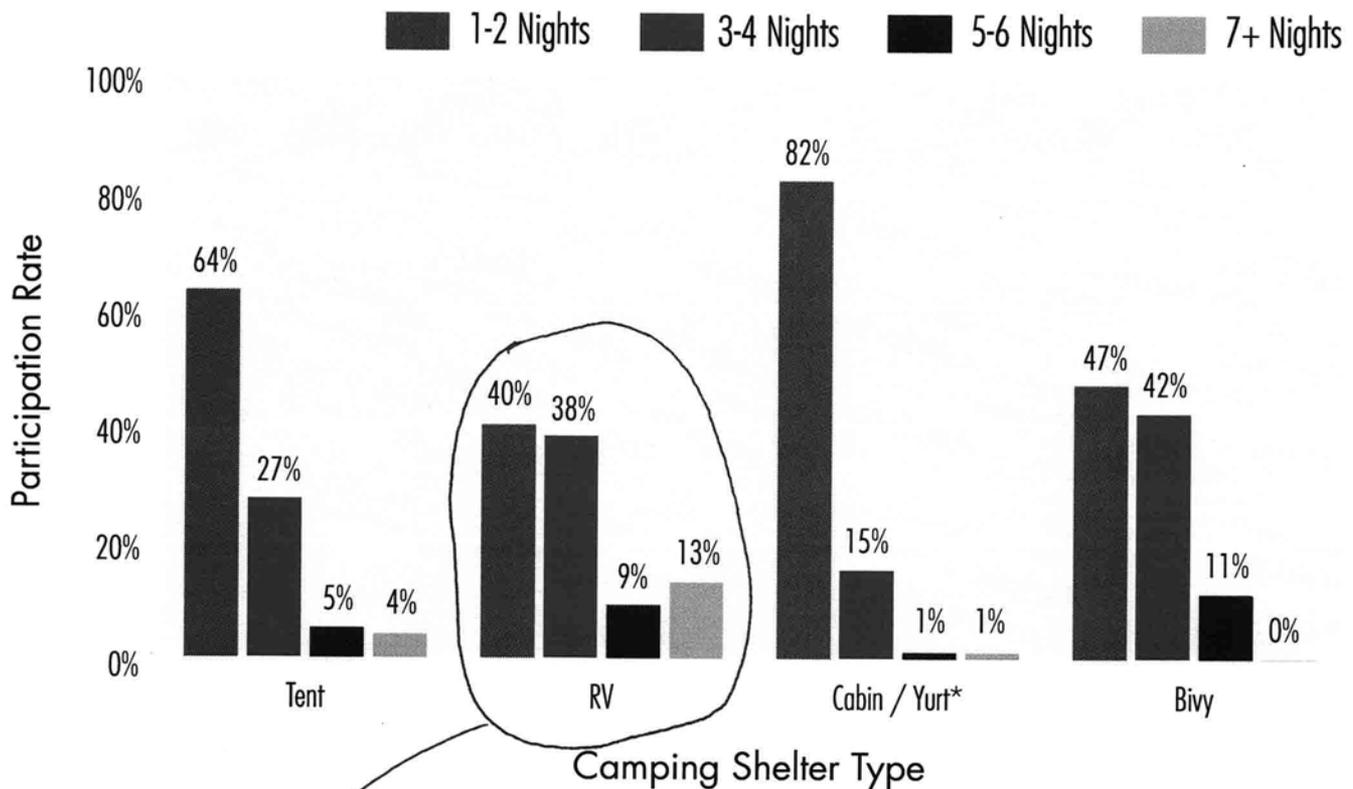
Ave = 1.87

C
1/2

Length of Most Recent Trip by Type of Camping Shelter

Camper, Ages 18+

On their most recent trip, most campers, regardless of their chosen camping shelter, spent one to two nights in the outdoors. RV campers stayed the longest, with 13 percent camping for seven or more nights. Cabin/yurt campers stayed for the shortest period of time, with 82 percent spending one to two nights outside.



© The Coleman Company and The Outdoor Foundation

*Yurt and cabin camping participants have been combined to determine length of stay due to the small number of these types of campers.

Assume Average = 4 days / 3 night

C
2/2

HCS Traffic Operations Analysis Output & Traffic Signal Warrants

HCS7 Two-Way Stop-Control Report

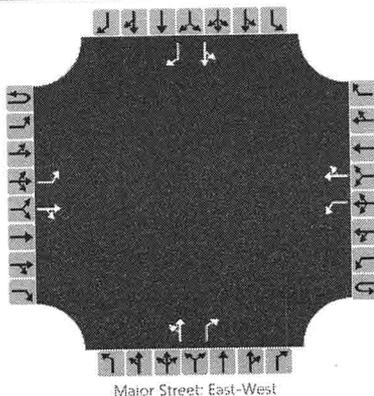
General Information

Analyst	Hudson
Agency/Co.	TurnKey Consulting
Date Performed	5/2/2017
Analysis Year	2017
Time Analyzed	2017 AM
Intersection Orientation	East-West
Project Description	Fruita RV Sites

Site Information

Intersection	US6_Greenway Dr/Coulson
Jurisdiction	CDOT & Fruita
East/West Street	US-6
North/South Street	Greenway Dr/Coulson
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



*PCE Proj
Vol*

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Priority																
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1		0	1	1	
Configuration		L		TR		L		TR		LT		R		LT		R
Volume, V (veh/h)		188	196	19		16	165	44		13	25	11		45	37	46
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				Yes				Yes		
Median Type/Storage						Left Only								1		

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

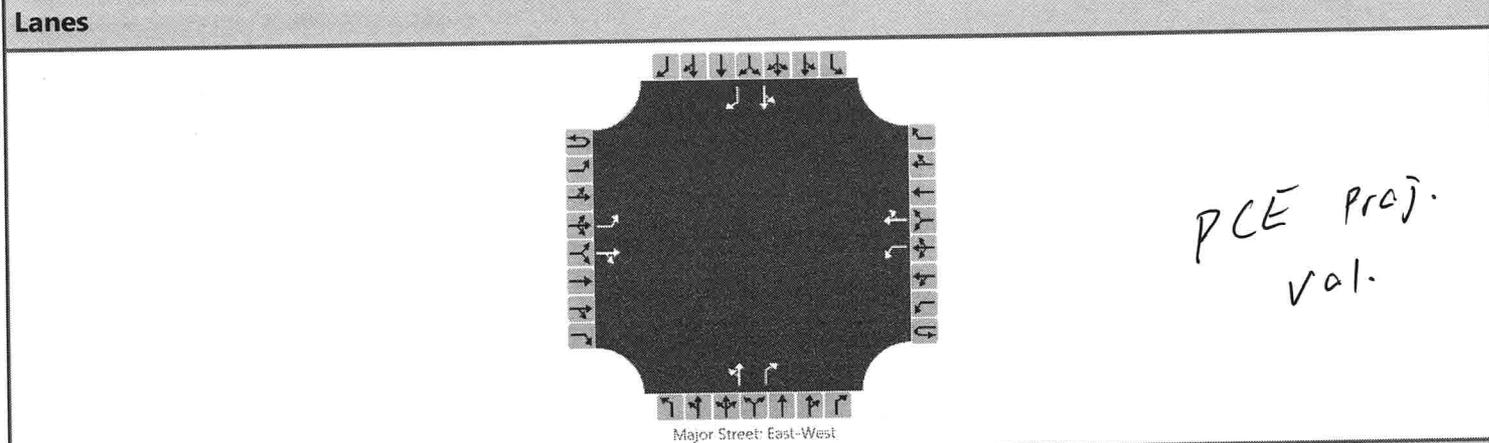
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		204				17				41		12		89		50	
Capacity, c (veh/h)		1353				1345				246		802		259		843	
v/c Ratio		0.15				0.01				0.17		0.01		0.34		0.06	
95% Queue Length, Q ₉₅ (veh)		0.5				0.0				0.6		0.0		1.5		0.2	
Control Delay (s/veh)		8.1				7.7				22.5		9.6		26.0		9.5	
Level of Service, LOS		A				A				C		A		D		A	
Approach Delay (s/veh)		3.8				0.5				19.6				20.1			
Approach LOS										C				C			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Hudson	Intersection	US6_Greenway Dr/Coulson
Agency/Co.	TurnKey Consulting	Jurisdiction	CDOT & Fruita
Date Performed	5/2/2017	East/West Street	US-6
Analysis Year	2017	North/South Street	Greenway Dr/Coulson
Time Analyzed	2017 PM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Fruita RV Sites		



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume, V (veh/h)		122	245	24		21	281	69		15	28	12		57	48	133
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0			0			
Right Turn Channelized		No			No					Yes			Yes			
Median Type/Storage		Left Only									1					

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1			4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10			4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2			2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20			2.20				3.50	4.00	3.30		3.50	4.00	3.30

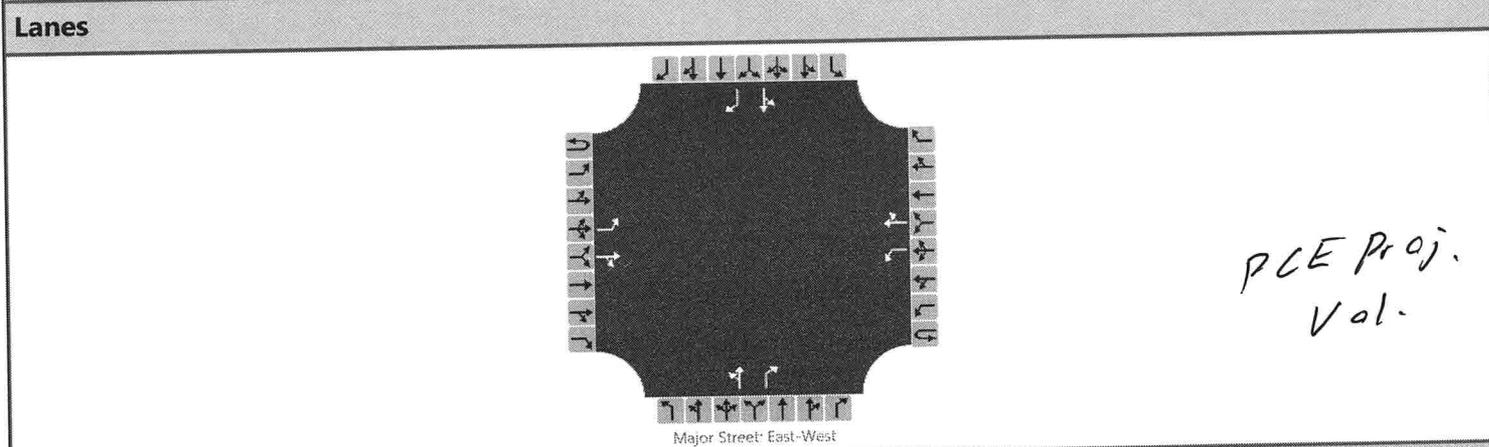
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		133			23				46		13		114		145
Capacity, c (veh/h)		1190			1281				213		748		256		705
v/c Ratio		0.11			0.02				0.22		0.02		0.44		0.21
95% Queue Length, Q ₉₅ (veh)		0.4			0.1				0.8		0.1		2.1		0.8
Control Delay (s/veh)		8.4			7.9				26.4		9.9		29.8		11.4
Level of Service, LOS		A			A				D		A		D		B
Approach Delay (s/veh)		2.6			0.4				22.8			19.5			
Approach LOS		C			C				C			C			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Hudson	Intersection	US6_Greenway Dr/Coulson
Agency/Co.	TurnKey Consulting	Jurisdiction	CDOT & Fruita
Date Performed	5/2/2017	East/West Street	US-6
Analysis Year	2037	North/South Street	Greenway Dr/Coulson
Time Analyzed	2037 AM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Fruita RV Sites		



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	1	1	0	0	1	1	0		0	1	1		0	1	1	
Configuration		L		TR		L		TR		LT		R		LT		R	
Volume, V (veh/h)		1652	347	19		16	293	58		13	25	11		60	37	61	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized		No				No				Yes				Yes			
Median Type/Storage		Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

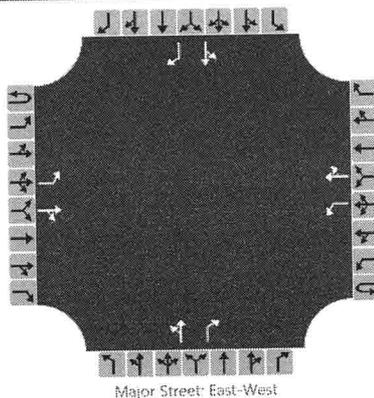
Flow Rate, v (veh/h)		1796				17				41		12		105		66
Capacity, c (veh/h)		1189				1172						635				698
v/c Ratio		1.51				0.01						0.02				0.09
95% Queue Length, Q ₉₅ (veh)		83.9				0.0						0.1				0.3
Control Delay (s/veh)		246.6				8.1						10.8				10.7
Level of Service, LOS		F				A						B				B
Approach Delay (s/veh)		201.8				0.3										
Approach LOS																

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Hudson	Intersection	US6_Greenway Dr/Coulson
Agency/Co.	TurnKey Consulting	Jurisdiction	CDOT & Fruita
Date Performed	5/2/2017	East/West Street	US-6
Analysis Year	2037	North/South Street	Greenway Dr/Coulson
Time Analyzed	2037 PM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Fruita RV Sites		

Lanes



PCE
Proj
Vol

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Priority																	
Number of Lanes	0	1	1	0	0	1	1	0		0	1	1		0	1	1	
Configuration		L		TR		L		TR		LT		R		LT		R	
Volume, V (veh/h)		2121	433	24		21	497	91		15	28	12		75	48	175	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized		No				No				Yes				Yes			
Median Type/Storage		Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

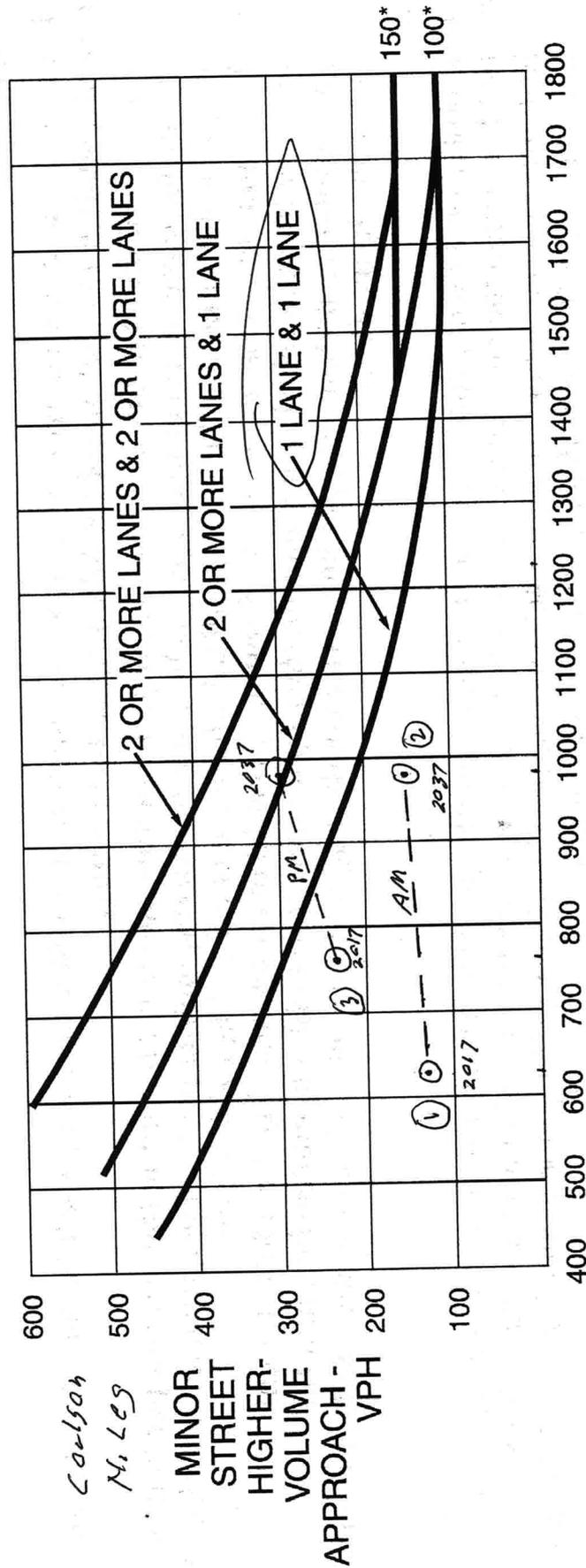
Flow Rate, v (veh/h)		2305				23				46		13		134		190	
Capacity, c (veh/h)		955				1077						574				511	
v/c Ratio		2.41				0.02						0.02				0.37	
95% Queue Length, Q ₉₅ (veh)		173.7				0.1						0.1				1.7	
Control Delay (s/veh)		651.4				8.4						11.4				16.1	
Level of Service, LOS		F				A						B				C	
Approach Delay (s/veh)		535.9				0.3											
Approach LOS																	

4/4

Condition	Major	Minor
2017 - AM	628 vph	128 vph ①
- PM	762 vph	238 vph ③
2037 - AM	981 vph	158 vph ②
- PM	1,227 vph	298 vph ④

(Project PCE Volumes)

Figure 4C-3. Warrant 3, Peak Hour



MAJOR STREET—TOTAL OF BOTH APPROACHES— 05-6
VEHICLES PER HOUR (VPH)

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.