



July 24, 2025

Rebecca Bernier
Bluestone Engineering & Consulting
PO Box 19722
Reno, NV 89511

Trip Generation Comparison Letter for Sand Creek

Dear Ms. Bernier,

This letter provides a trip generation comparison analysis for the proposed Sand Creek Subdivision (formerly the northern portion of Old Stone Ranch) located in Churchill County, Nevada (APN's 08-792-141 and 08-792-95). The Tentative Subdivision Map for Sand Creek shows a total of 179 single family units. The Tentative Subdivision Map for Sand Creek is provided in **Attachment A**. This trip generation comparison analysis also includes the southern portion of Old Stone Ranch (formerly named Birch Lane) which now consists of 90 single family units.

The subject parcels were originally studied in the Sand Creek and Birch Lane traffic study dated April 2021 by Solaegui Engineers. The original traffic study is provided in **Attachment B**. This traffic study showed acceptable level of service operation at three study intersections and recommended that the Allen Road/Birch Lane intersection be improved to include separate left and right turn lanes at the west approach, an exclusive right turn lane with a minimum of 215 feet of deceleration length at the north approach, and an exclusive left turn lane with a minimum of 240 feet of combined storage/deceleration length at the south approach.

The subject parcels were then analyzed in the Old Stone Ranch addendum letter dated April 29, 2022 by Solaegui Engineers to address revised land uses. This addendum letter is provided in **Attachment C**. The revised land uses consisted of 506 multi-family units and 13 single family units on the northern Sand Creek parcels and 100 single family units on the southern Birch Lane portion of the site. These revised land uses resulted in lower trip generation and less traffic impact than reported in the original traffic study. The recommendation in the original study for improvements at the Allen Road/Birch Lane intersection remains but no additional recommendations were made in this addendum.

A final addendum letter for Old Stone Ranch was prepared by Solaegui Engineers on August 11, 2022 to address an additional study intersection (the Casey Road/Old Stone Parkway intersection) as required by the Churchill County Planning Commission. No changes were made to the approved land uses described in the previous addendum letter. This final addendum letter is provided in **Attachment D**.

This August 11, 2022 addendum letter showed acceptable level of service operation at the Casey Road/Old Stone Parkway intersection (now proposed as the Casey Road/Wildcat Parkway intersection on the Sand Creek Tentative Subdivision Map) and recommended it be improved to contain a separate westbound to southbound left turn lane with a minimum of 240 feet of combined storage/deceleration length.

Trip Generation Comparison

Trip generation estimates for the proposed uses are calculated using trip generation rates from the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 11th Edition*. The Single Family Detached Housing land use was used to estimate trip generation. Trip generation for the previously approved uses were taken directly from the April 29, 2022 traffic study addendum letter prepared by Solaegui Engineers. **Table 1** shows the Daily, AM peak hour, and PM peak hour trip generation estimates for the proposed and previously approved uses.

Table 1: Trip Generation Comparison

Land Use (ITE Code)	Size ¹	Trips				
		Daily	AM	AM In/Out	PM	PM In/Out
<i>Proposed Uses</i>						
Sand Creek - Single Family Detached Housing (210)	179 du	1,688	125	31 / 94	168	106 / 62
South Site – Single Family Detached Housing (210)	90 du	849	63	16 / 47	85	53 / 32
Total Proposed	269 du	2,537	188	47 / 141	253	159 / 94
<i>Previous Approved Uses</i>						
Single Family Housing	113 du	1,066	79	21 / 58	106	67 / 39
Multi-Family Housing	506 du	3,319	202	48 / 154	258	163 / 95
Total Previous	619 du	4,385	281	69 / 212	364	230 / 134
Difference		-1,848	-93	-22 / -71	-111	-71 / -40

Notes: 1. du = dwelling units

Source: GCW, 2025

As shown in the table, the proposed full project is expected to generate approximately 2,537 Daily, 188 AM peak hour, and 253 PM peak hour trips. This equates to fewer trips than the previous approved use by an estimated 1,848 Daily, 93 AM peak hour, and 111 PM peak hour trips. In all three time periods the proposed uses generate significantly lower trips than the previously approved uses.

Conclusion

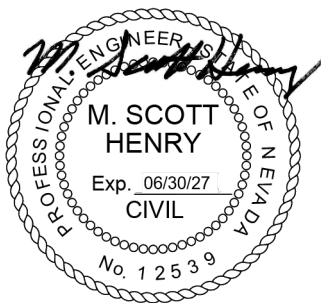
The proposed Sand Creek project with 179 single family units and the 90 single family units proposed on the southern portion are expected to generate fewer trips than the previously approved Old Stone Ranch land uses. Therefore, the proposed project would have less impact on the study intersections than the previously approved land uses.

The recommendation in the original Sand Creek and Birch Lane traffic study dated April 2021 for lane improvements at the Allen Road/Birch Lane intersection should remain.

The recommendation in the Old Stone Ranch addendum letter dated August 11, 2022 for lane improvements at the Casey Road/Old Stone Parkway intersection (now Casey Road/Wildcat Parkway intersection) should remain.

Please do not hesitate to contact us at 775.322.4300 with any questions.

Sincerely,
GCW, INC.



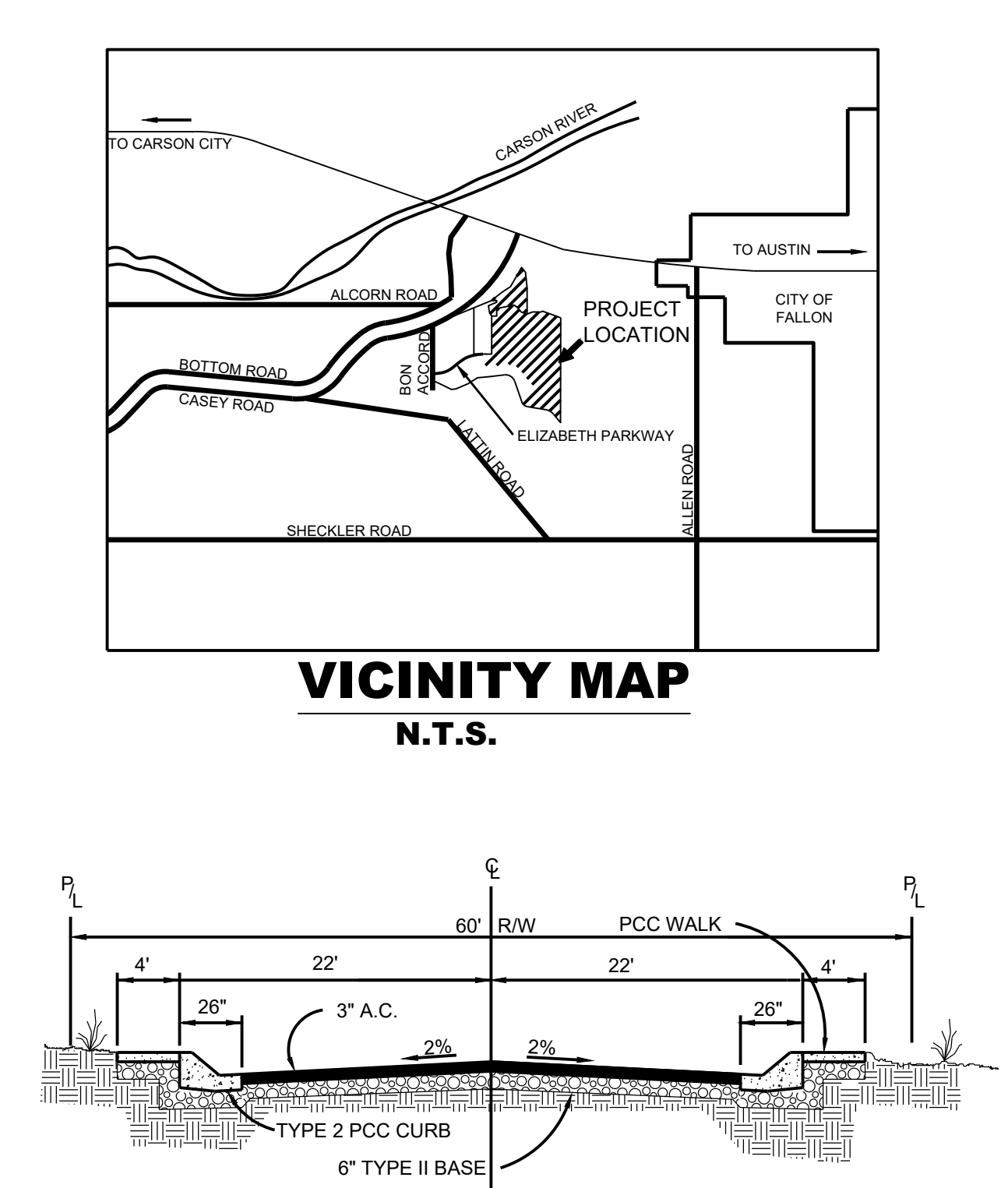
M.
Scott
Henry

Digitally
signed by
M. Scott
Henry
Date:
2025.07.24
16:45:31
-07'00'

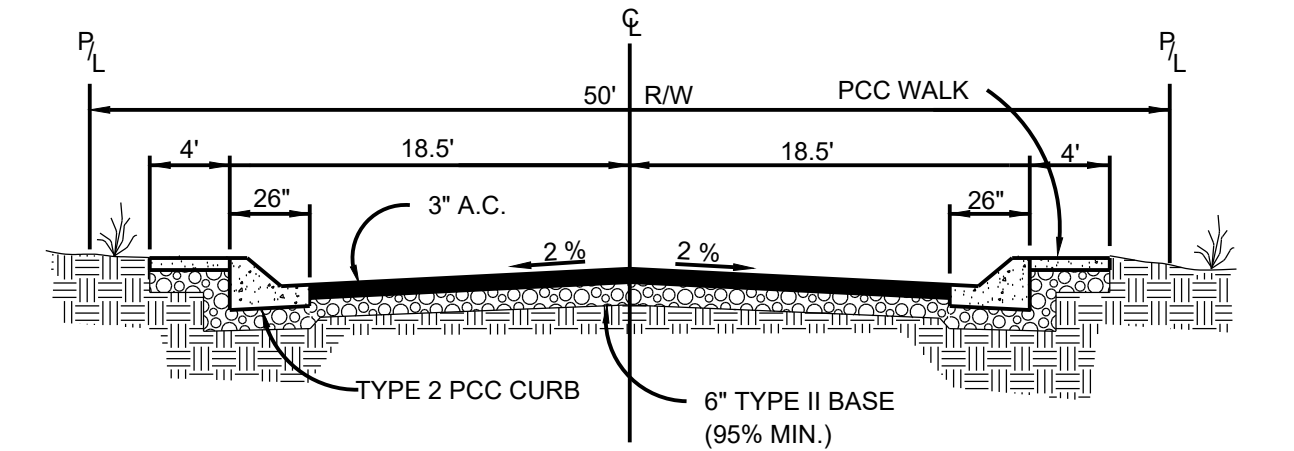
Scott Henry, PE
Project Engineer

Attachments:

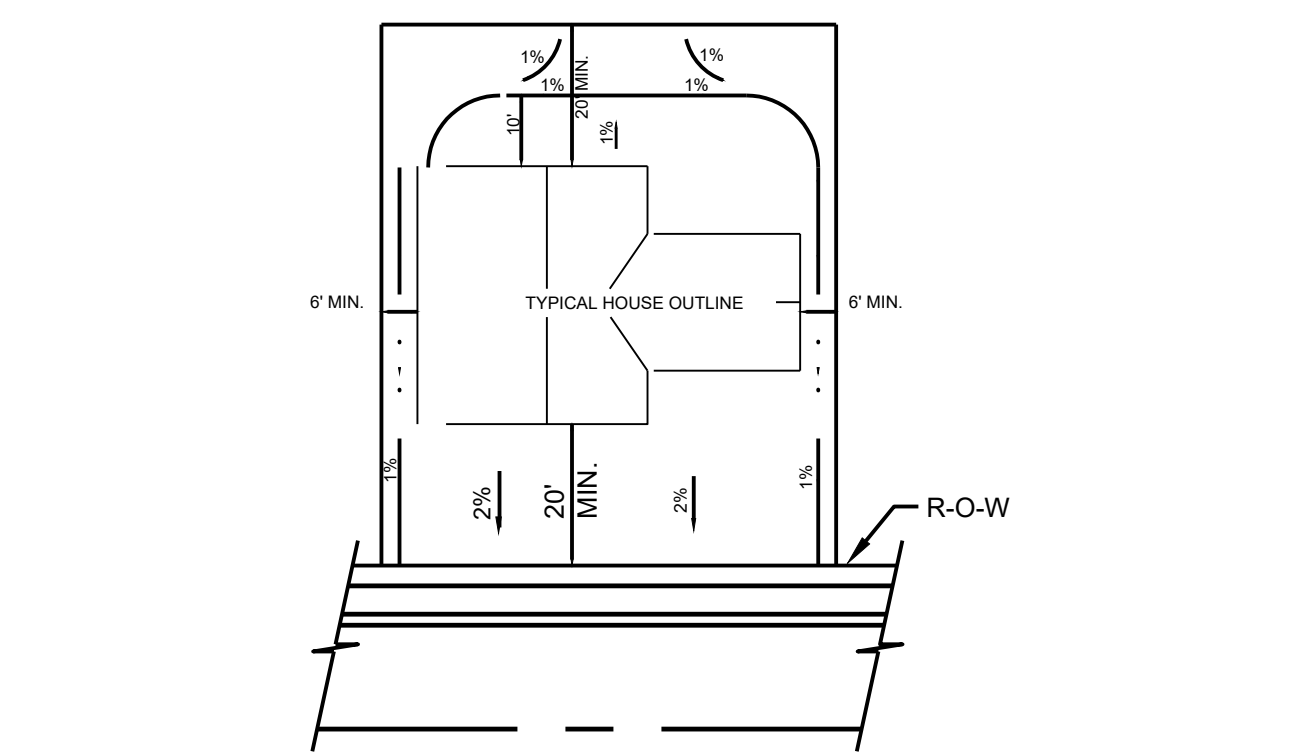
- A – Sand Creek Tentative Map
- B – Sand Creek and Birch Road Traffic Study
- C – Old Stone Ranch Addendum Letter 4/29/22
- D – Old Stone Ranch Addendum Letter 8/11/22



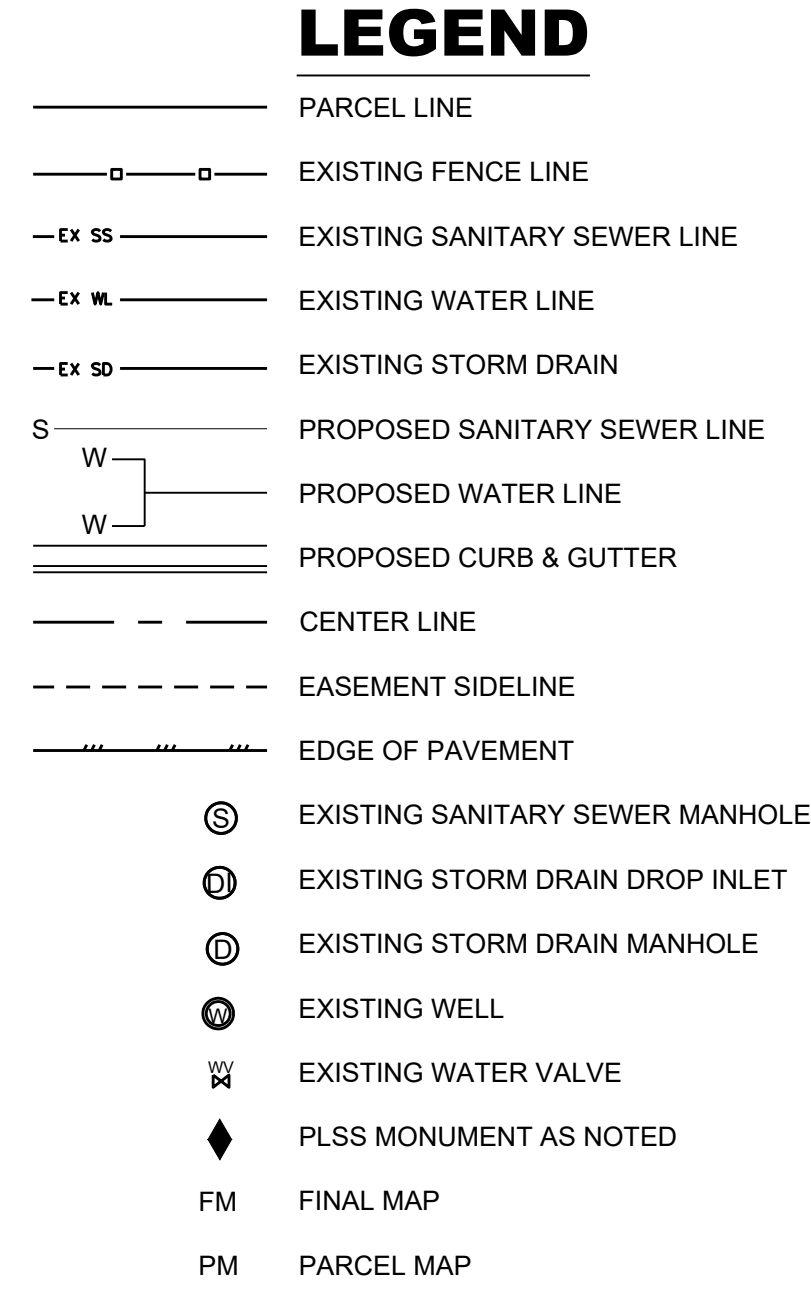
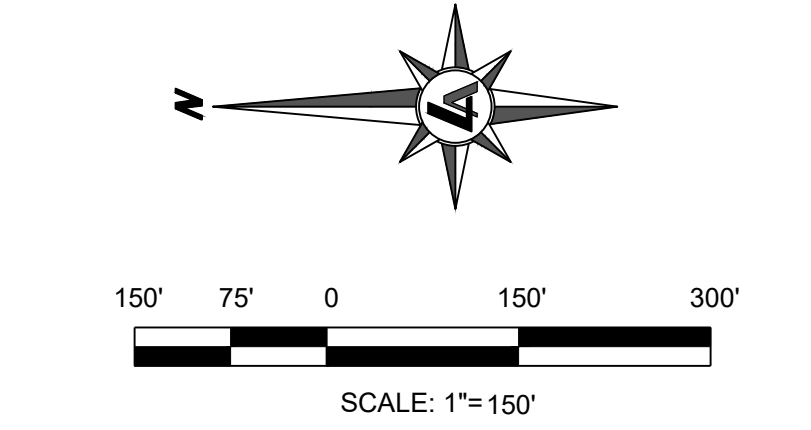
VICINITY MAP
N.T.S.



TYPICAL 50' WIDE STREET SECTION
N.T.S.



TYPICAL FINISHED LOT GRADING
N.T.S.



PROJECT INFORMATION

A.P.N. 08-792-11 & 08-792-95
TOTAL AREA = 47.37 AC
ZONING: R-1
TOTAL NUMBER OF LOTS = 179 (3.8 UNITS/AC)
SIZE OF LOTS = 7,000 SQ.FT. MIN.
SIZE OF LOTS = 7,500 SQ.FT. MIN. CORNER LOT
COMMUNITY SEWAGE SYSTEM:
SUPPLIED BY CHURCHILL COUNTY
COMMUNITY WATER SYSTEM:
SUPPLIED BY CHURCHILL COUNTY

GENERAL NOTES

- NO PORTION OF THE DEVELOPMENT FALLS WITHIN ANY FEMA DESIGNATED FLOOD PLAN.
- IT IS THE OWNER'S INTENT TO HAVE CHURCHILL COUNTY, UPON AGREEMENT, ASSUME OWNERSHIP AND MAINTENANCE OF ALL ROAD IMPROVEMENTS WITH THE ESTABLISHMENT OF A SPECIAL ASSESSMENT DISTRICT (SAD).
- ALL PARCELS ARE NON WATER RIGHTED (TCID).
- THERE ARE NO EXISTING IRRIGATION STRUCTURES AND NO IRRIGATION IS PROPOSED.
- THERE ARE NO EXISTING BUILDINGS OR STRUCTURES. PREVIOUSLY THE SITE EXISTED AS AN IRRIGATED FIELD.
- ADJACENT ZONING INCLUDES R-1 TO THE NORTH AND WEST, AND E-1 TO THE NORTH, EAST, AND SOUTH.

PUBLIC & UTILITY EASEMENTS

10' ON EXTERIOR BOUNDARY
5' ON EACH SIDE OF INTERIOR LOT LINES
7.5' ALONG ROAD EASEMENTS
ALL EASEMENTS ARE ESTABLISHED AS INDICATED EXCEPT WHERE SUCH EASEMENT OVERLAYS AN EXISTING PUBLICLY MAINTAINED IRRIGATION OR DRAINAGE EASEMENT. IN SUCH CASE THE APPROPRIATE UTILITY EASEMENT SHALL LIE PERPENDICULAR AND CONTIGUOUS TO THE EXISTING EASEMENT.

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS N 89°31'55" E, BEING THE NORTH LINE OF THE NW 1/4 OF SECTION 35, T.19N., R.28E. M.D.M. AND IS BASED ON THE NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE NAD83(94) DETERMINED FROM REAL TIME KINEMATIC GPS OBSERVATIONS, OBSERVED DECEMBER 10, 2019 USING A SURVEY GRADE DUAL FREQUENCY GPS RECEIVER FROM CORS STATION FLN1 MODIFIED BY A COMBINED FACTOR OF 1.0001854204, SCALED FROM 0.00N ,0.00E AND CONVERTED TO U.S. SURVEY FEET. ALL DIMENSIONS ON THIS MAP ARE GROUND DISTANCES.

NOTE

I, DAVID C. CROOK, A PROFESSIONAL LAND SURVEYOR CERTIFY THAT THE ORIGINAL PARCEL DOES NOT EXCEED AN AVERAGE SLOPE OF 5% AND THAT IT DOES NOT LIE WITHIN THE 100 YEAR F.E.M.A. FLOOD PLAIN.

DAVID C. CROOK P.L.S. 10836

DEVELOPER

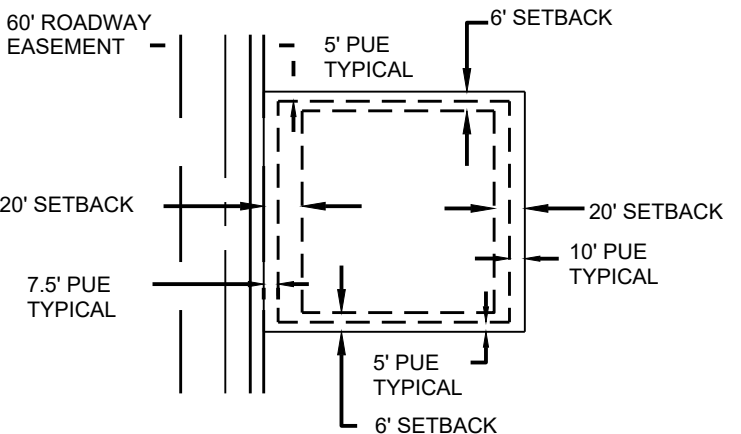
NEV DEV LLC
3305 U.S. HIGHWAY 50 E
FERNLEY, NV 89408
EMAIL: MCCREARYKIM@GMAIL.COM
PH: (775) 745-9056

OWNER

NEV DEV LLC
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FERNLEY, NV 89408
EMAIL: MCCREARYKIM@GMAIL.COM
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ENGINEER-SURVEYOR

LUMOS & ASSOCIATES, INC.
275 W. WILLIAMS AVENUE,
FALLON, NV 89406
PH: (775) 423-2188



TYPICAL LOT DETAIL
N.T.S.

TENTATIVE SUBDIVISION MAP

FOR

SAND CREEK SUBDIVISION

A PORTION OF THE NW 1/4 OF SECTION 35
AND THE SW 1/4 OF SECTION 26 T. 19 N.,
R. 28 E., M.D.M.

CHURCHILL COUNTY STATE OF NEVADA

275 W. WILLIAMS AVENUE
FALLON, NV 89406
TEL: 775.423.2188
LUMOSINC.COM

Drawn By : JLD
Sheet : 1 of 5
Job No. : 12144.000
Drawing No.: 12144000SURVEY



SANDCREEK
AND
BIRCH LANE
TRAFFIC STUDY

APRIL 2021



Prepared by:
Solaegui Engineers, Ltd.
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Sparks, Nevada 89431
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SANDCREEK AND BIRCH LANE

TRAFFIC STUDY

EXECUTIVE SUMMARY

The proposed Sandcreek and Birch Lane developments will be located in the City of Fallon, Nevada. The Sandcreek development is generally located north of Birch Lane, south of Casey Road, east of Eagle Rock Road, and west of Pine Road. The Birch Lane development is generally located north of Sheckler Road, south of Birch Lane, east of Lattin Road, and west of Allen Road. Both project sites are currently undeveloped land. The purpose of this study is to address the project's impact upon the adjacent street network. The US-50/Casey Road-Coleman Road intersection, US-50/Allen Road intersection, and Allen Road/Birch Lane intersection have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2041 base, and 2041 base plus project scenarios.

The proposed Sandcreek development will consist of the construction of 175 single family homes and the proposed Birch Lane development will consist of the construction of 102 duplex units, 300 multi-family dwelling units, a mini-storage facility containing 194 units, an RV storage facility containing 53 spaces, and open space. Project access will generally be provided from Birch Lane via Allen Road and the proposed Wildcat Parkway via Casey Road.

The Sandcreek development is anticipated to generate 1,740 average daily trips with 130 trips occurring during the AM peak hour and 174 trips occurring during the PM peak hour and the Birch Lane development is anticipated to generate 3,333 average daily trips with 219 trips occurring during the AM peak hour and 276 trips occurring during the PM peak hour. The combined projects are anticipated to generate a total of 5,073 average daily trips with 349 total trips occurring during the AM peak hour and 450 total trips occurring during the PM peak hour.

Traffic generated by the proposed Sandcreek and Birch Lane development will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Nevada Department of Transportation and City of Fallon requirements.

It is recommended that the Allen Road/Birch Lane intersection be improved to include separate left and right turn lanes at the west approach, an exclusive right turn lane with a minimum of 215 feet of deceleration length at the north approach, and an exclusive left turn lane with a minimum of 240 feet of combined storage/deceleration length at the south approach.

INTRODUCTION

STUDY AREA

The proposed Sandcreek and Birch Lane developments will be located in the City of Fallon, Nevada. The Sandcreek development is generally located north of Birch Lane, south of Casey Road, east of Eagle Rock Road, and west of Pine Road. The Birch Lane development is generally located north of Sheckler Road, south of Birch Lane, east of Lattin Road, and west of Allen Road. Figure 1 shows the approximate location of the project sites. The purpose of this study is to address the project's impact upon the adjacent street network. The US-50/Casey Road-Coleman Road intersection, US-50/Allen Road intersection, and Allen Road/Birch Lane intersection have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2041 base, and 2041 base plus project scenarios.

EXISTING AND PROPOSED LAND USES

Both project sites are currently undeveloped land. Adjacent properties generally include residential dwelling units with some agricultural land to the south. The proposed Sandcreek development will consist of the construction of 175 single family homes and the proposed Birch Lane development will consist of the construction of 102 duplex units, 300 multi-family dwelling units, a mini-storage facility containing 194 units, an RV storage facility containing 53 spaces, and open space. Project access will generally be provided from Birch Lane via Allen Road and the proposed Wildcat Parkway via Casey Road.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

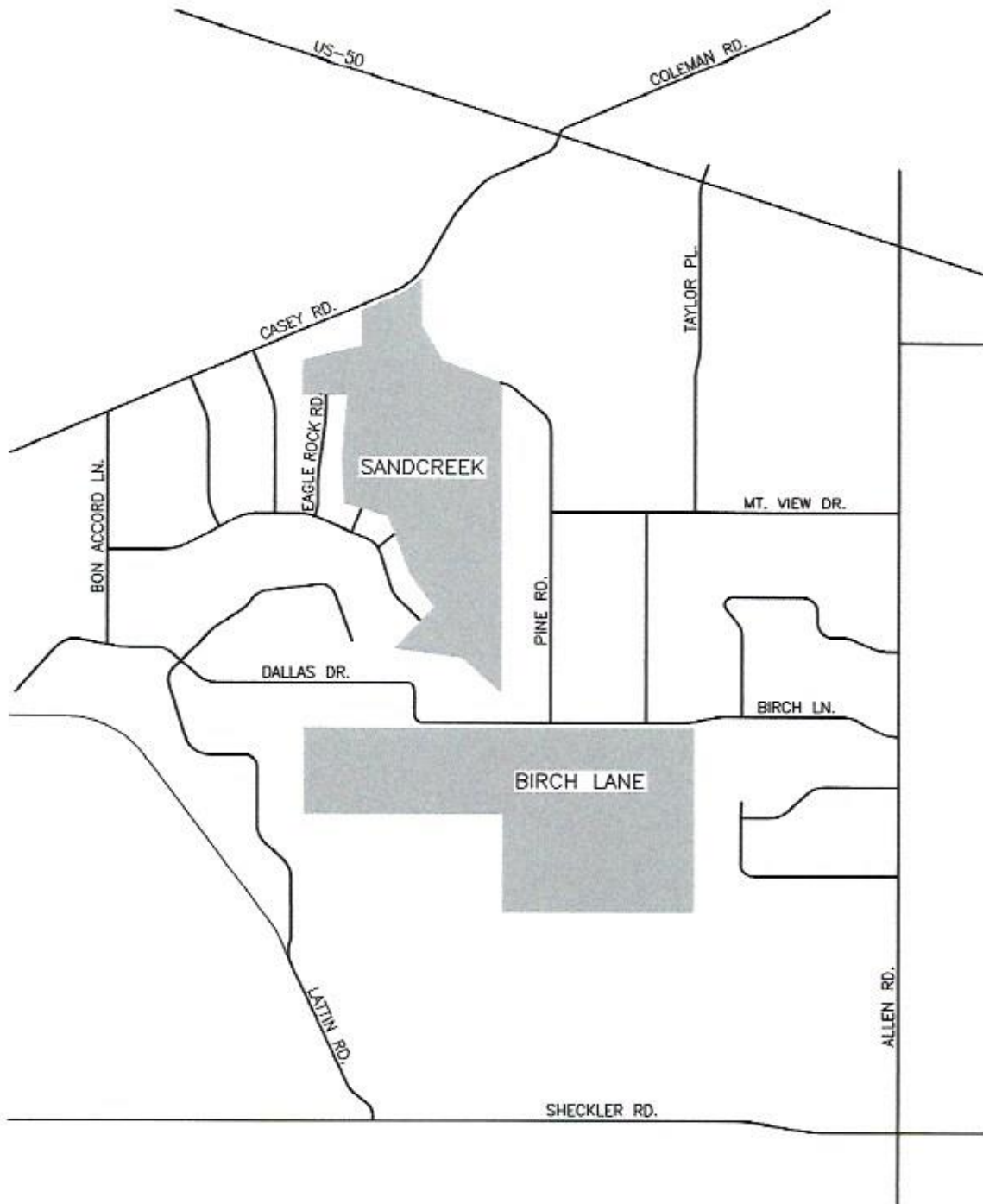
US-50 (Williams Avenue) is a four-lane roadway with two through lanes in each direction near the key intersections. The speed limit is posted for 35 miles per hour east of Casey Road and 45 miles per hour west of Casey Road. Roadway improvements include paved and graded shoulders with striped edgelines in some areas and curb, gutter, and sidewalk in other others. The roadway contains a center two-way left turn lane with some raised center median islands east of Casey Road.

Casey Road is a two-lane roadway with one through lane in each direction south of US-50. The speed limit is posted for 35 miles per hour. Roadway improvements generally include curb and gutter on the east side of the street and centerline striping just south of US-50. Casey Road contains graded shoulders on both sides of the street further south. Coleman Road aligns with Casey Road north of US-50.

Coleman Road is a two-lane roadway with one through lane in each direction north of US-50. The speed limit is posted for 35 miles per hour. Roadway improvements generally include graded shoulders with striped edgelines on both sides of the street and centerline striping just north of US-50. Coleman Road contains graded shoulders on both sides of the street further north. Casey Road aligns with Coleman Road south of US-50.

LEGEND

PROJECT SITES



SANDCREEK AND BIRCH LANE
VICINITY MAP
FIGURE 1

Allen Road is a two-lane roadway with one through lane in each direction north and south of US-50. The speed limit is posted for 25 miles per hour near US-50 and 35 miles per hour near Birch Lane. Roadway improvements on the segment of Allen Road north of US-50 generally include curb, gutter, and sidewalk on both sides of the street. Roadway improvements on the segment of Allen Road just south of US-50 generally include curb and gutter on both sides of the street with sidewalk in some areas. Allen Road contains graded shoulders in both sides of the street further south.

Birch Road is a two-lane roadway with one through lane in each direction west of Allen Road. The speed limit is posted for 25 miles per hour. Roadway improvements generally include graded shoulders on both sides of the street.

The US-50/Casey Road-Coleman Road intersection is a signalized four-leg intersection with protected left turn phasing at all approaches. The north and south approaches each contain one left turn lane, one through lane, and one right turn lane. The east and west approaches each contain one left turn lane, two through lanes, and one right turn lane. Pedestrian crosswalks exist at all approaches.

The US-50/Allen Road intersection is a signalized four-leg intersection with permissive left turn phasing at the north and south approaches and protected/permissive left turn phasing at the east and west approaches. The north contains one shared left turn-through-right turn lane. The south approach contains one shared left turn-through lane and one right turn lane. The east and west approaches each contain one left turn lane, one through lane, and one shared through-right turn lane. Pedestrian crosswalks exist at all approaches.

The Allen Road/Birch Lane intersection is an unsignalized three-leg intersection with stop sign control at the west approach. The north approach contains one shared through-right turn lane. The south approach contains one shared left turn-through lane. The west approach contains one shared left turn-right turn lane.

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed Sandcreek and Birch Lane developments on the adjacent street network, trip generation rates and peak hours had to be determined. Trip generation rates or equations were obtained from the Tenth Edition of *ITE Trip Generation* (2018) for Land Uses 151: Mini-Warehouse, 210: Single Family Detached Housing, and 220: Multifamily Housing (Low-Rise). *ITE Trip Generation* does not contain information for duplexes so trips generated by this land use were calculated using the single family detached housing land use. The mini-warehouse land use was used to calculate trips generated by both the mini-storage and RV storage facilities.

The proposed Sandcreek development will consist of the construction of 175 single family homes and the proposed Birch Lane development will consist of the construction of 102 duplex units, 300 multi-family dwelling units, a mini-storage facility containing 194 units, an RV storage facility containing 53 spaces, and open space.

Trip generation was calculated for an average weekday and the weekday peak hours occurring between 7:00 AM and 9:00 AM and 4:00 PM and 6:00 PM. These timeframes correspond to the peak hours of adjacent street traffic. Table 1 shows a summary of the average daily traffic (ADT) and peak hour volumes generated by the proposed Sandcreek and Birch Lane developments. The trip generation worksheets are included in the Appendix.

LAND USE	ADT	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
SANDCREEK Single Family (175 Dwelling Units)	1,740	32	98	130	110	64	174
BIRCH LANE							
Single Family (102 Dwelling Units)	1,059	19	58	77	65	39	104
Low-Rise Multifamily Housing (300 DU)	2,227	32	106	138	106	62	168
Mini-Warehouse (247 Units/Spaces)	47	2	2	4	2	2	4
Total Trips	3,333	53	166	219	173	103	276
Total Trips	5,073	85	264	349	383	167	450

As shown in Table 1, the Sandcreek development is anticipated to generate 1,740 average daily trips with 130 trips occurring during the AM peak hour and 174 trips occurring during the PM peak hour and the Birch Lane development is anticipated to generate 3,333 average daily trips with 219 trips occurring during the AM peak hour and 276 trips occurring during the PM peak hour. The combined projects are anticipated to generate a total of 5,073 average daily trips with 349 total trips occurring during the AM peak hour and 450 total trips occurring during the PM peak hour.

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key intersections was based on existing peak hour traffic patterns and the locations of attractions and productions in the area. Figure 2 shows the anticipated trip distribution for the project trips. The peak hour trips shown in Table 1 were subsequently assigned to the key intersections based on the trip distribution percentages. Figure 3 shows the trip assignment at the key intersections for the AM and PM peak hours.

EXISTING AND PROJECTED TRAFFIC VOLUMES

Existing peak hour traffic volumes at the US-50/Casey Road-Coleman Road intersection and Allen Road/Birch Lane intersection were obtained from weekday traffic counts conducted in April of 2021. Existing peak hour traffic volumes at the US-50/Allen Road intersection were obtained from the Golden Gate Petroleum Traffic Study dated May of 2020. Figure 4A shows the existing traffic volumes (raw counts) during the AM and PM peak hours.

The existing traffic counts were conducted during the COVID-19 pandemic which may have resulted in reduced traffic on the area streets. In order to more closely represent normal traffic conditions the existing traffic counts were compared with pre-pandemic traffic counts conducted by the Nevada Department of Transportation (NDOT). The pre-pandemic traffic counts were obtained from the NDOT Traffic Records Information Access (TRINA) application for count stations on US-50 and Allen Road near the site. The existing traffic counts were subsequently adjusted based on the traffic count comparison. Figure 4B shows the existing traffic volumes (adjusted counts) during the AM and PM peak hours. The adjusted traffic volumes were utilized in the analysis.

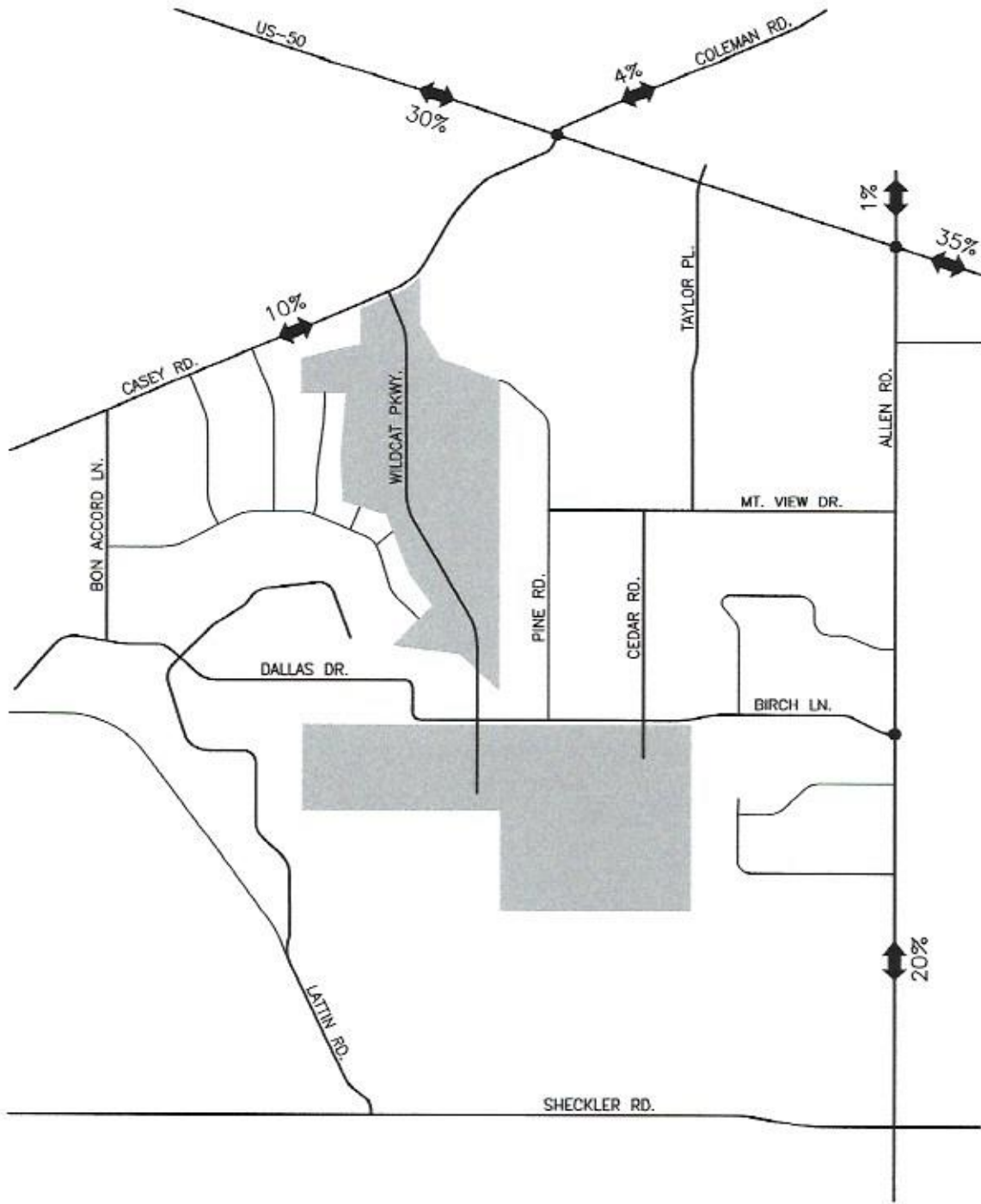
Figure 5 shows the existing plus project traffic volumes at the key intersections during the AM and PM peak hours. The existing plus project traffic volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the existing traffic volumes (adjusted counts) shown on Figure 4B.

Figure 6 shows the 2041 base traffic volumes at the key intersections during the AM and PM peak hours. The 2041 base volumes were estimated by applying a 0.6% average annual growth rate to the existing traffic volumes (adjusted counts) shown on Figure 4B. This growth rate was derived from 20-year historic traffic count data obtained from NDOT's Annual Traffic Reports for count stations on US-50 and Allen Road near the site.

Figure 7 shows the 2041 base plus project traffic volumes at the key intersections during the AM and PM peak hours. The 2041 base plus project traffic volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the 2041 base traffic volumes shown on Figure 6.

LEGEND

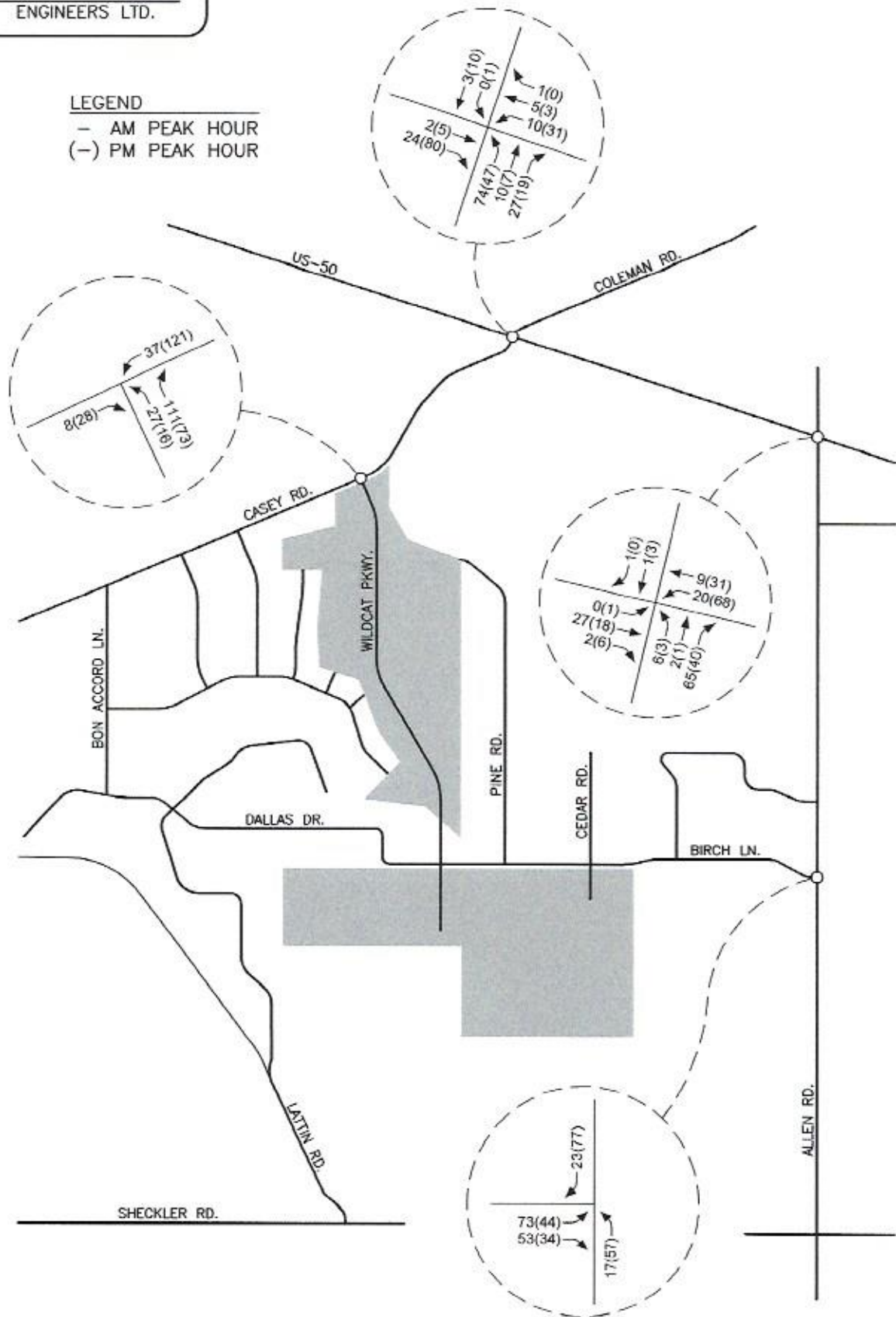
PROJECT SITES



SANDCREEK AND BIRCH LANE
TRIP DISTRIBUTION
FIGURE 2

LEGEND

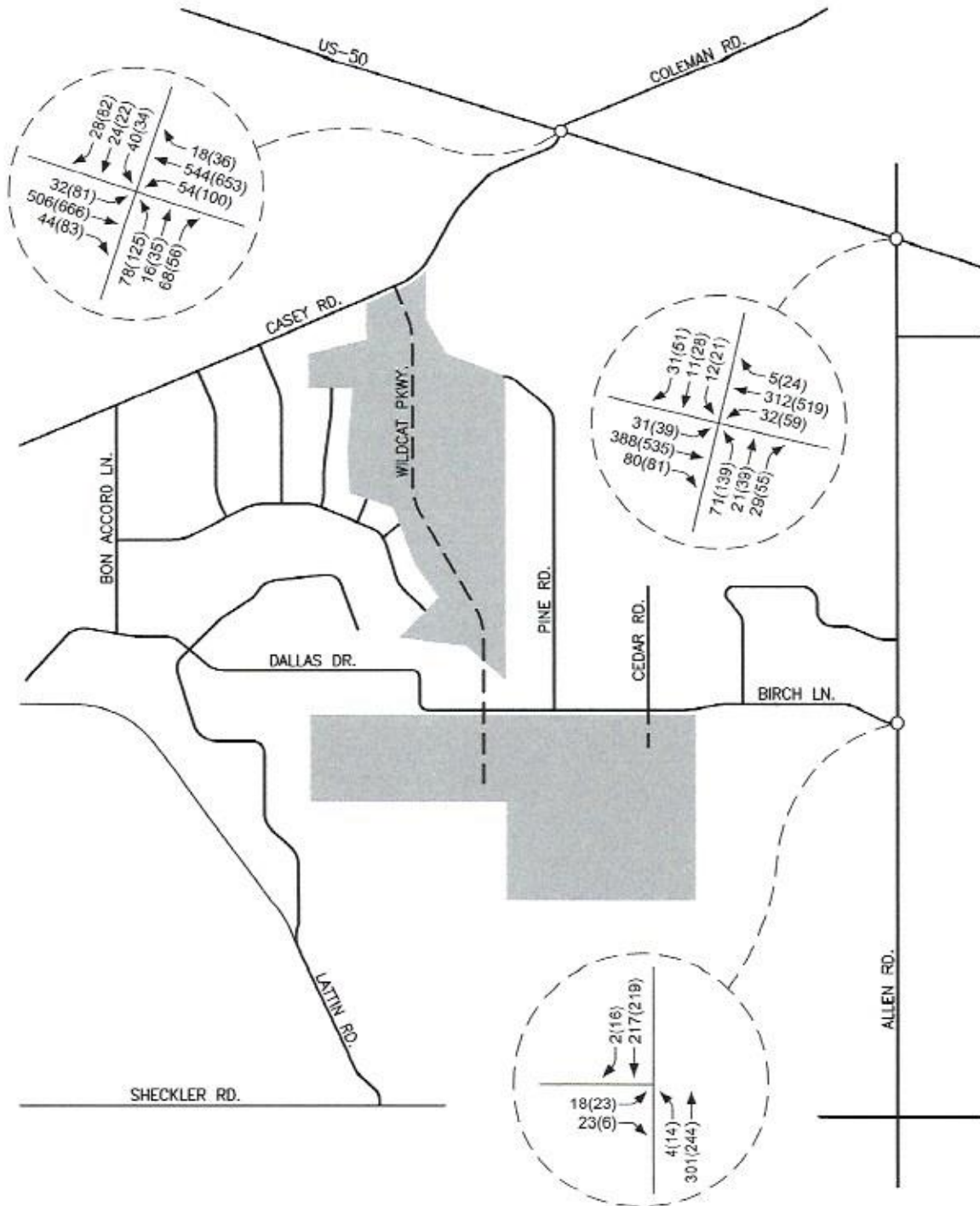
— AM PEAK HOUR
(-) PM PEAK HOUR



**SANDCREEK AND BIRCH LANE
TRIP ASSIGNMENT
FIGURE 3**

LEGEND

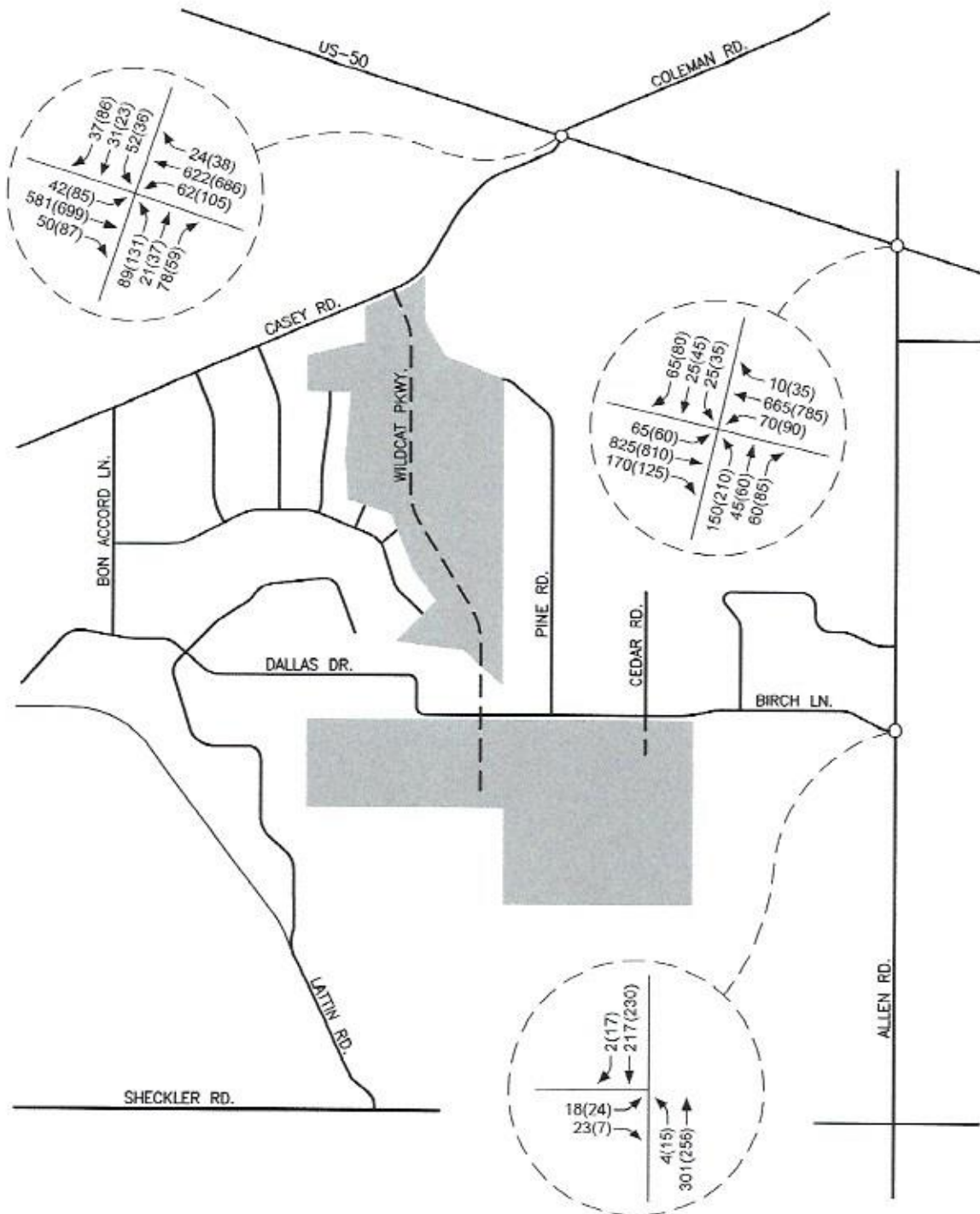
— AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
EXISTING TRAFFIC VOLUMES (RAW COUNTS)
FIGURE 4A

LEGEND

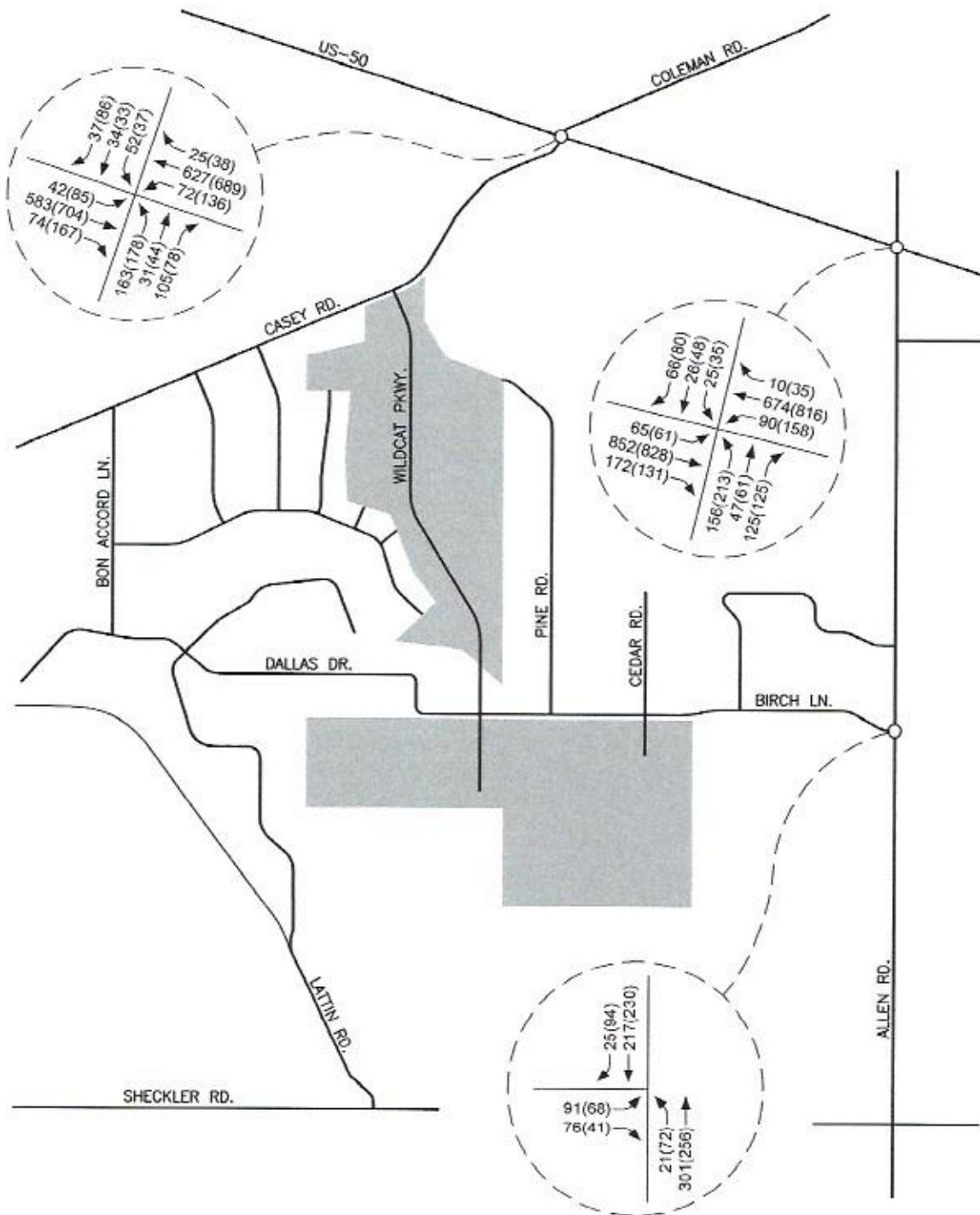
- AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
EXISTING TRAFFIC VOLUMES (ADJUSTED COUNTS)
FIGURE 4B

LEGEND

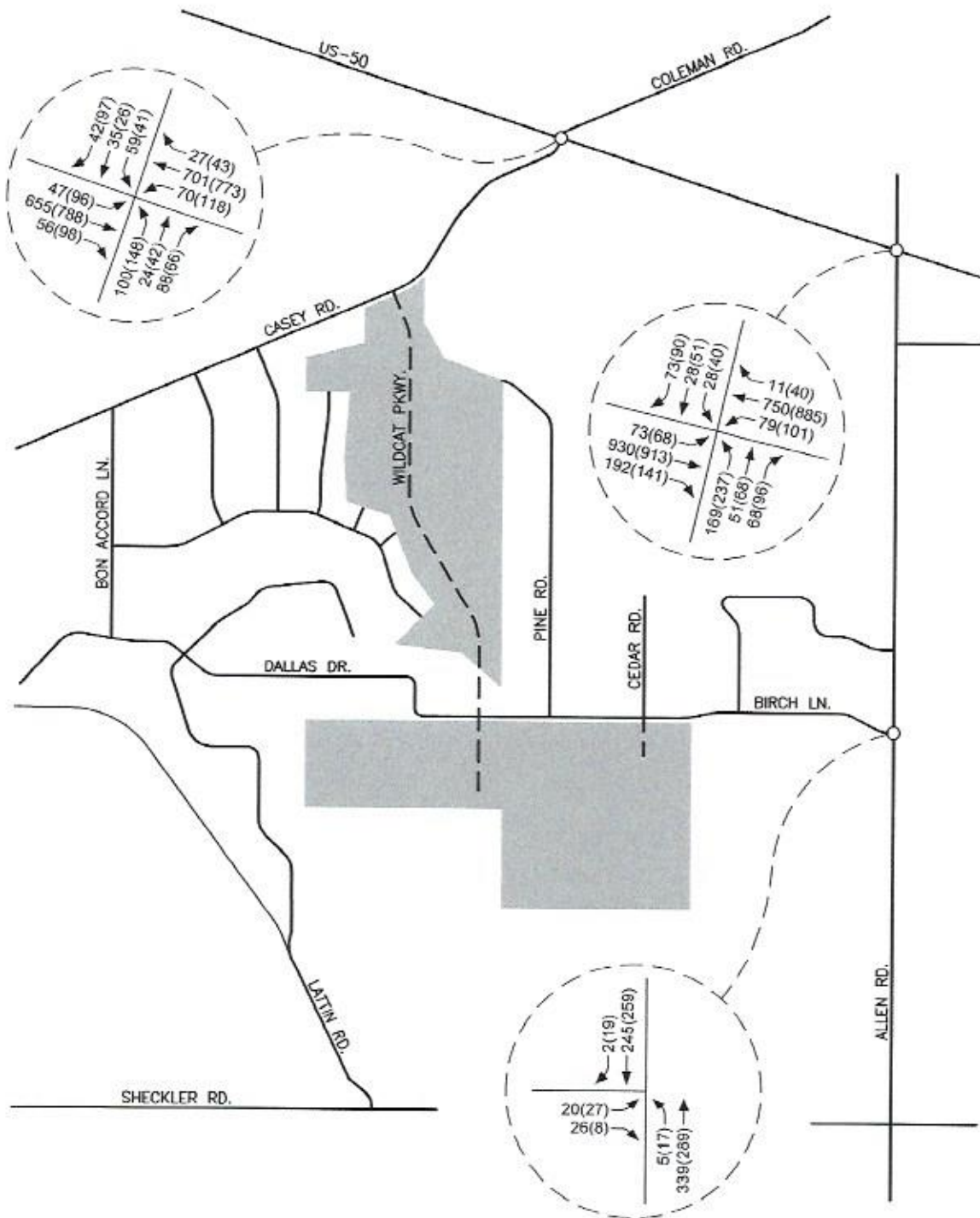
- AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
EXISTING PLUS PROJECT TRAFFIC VOLUMES
FIGURE 5

LEGEND

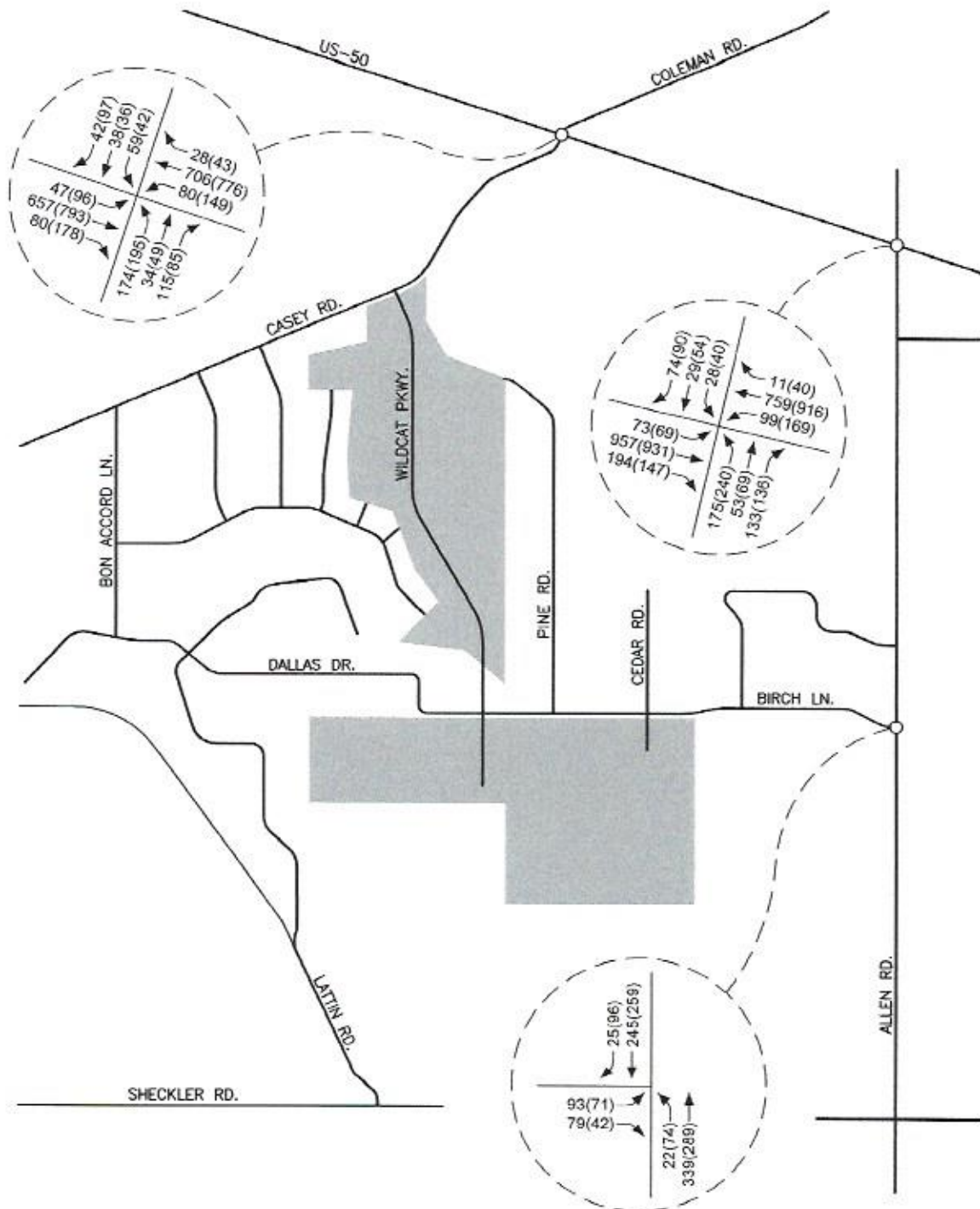
- AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
2041 BASE TRAFFIC VOLUMES
FIGURE 6

LEGEND

- AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
2041 BASE PLUS PROJECT TRAFFIC VOLUMES
FIGURE 7

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual (6th Edition)*, prepared by the Transportation Research Board, for unsignalized and signalized intersections using the latest version of the Highway Capacity software.

The result of capacity analysis is a level of service (LOS) rating for each signalized intersection or minor movement at partial stop controlled intersections. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the intersection or minor movement.

The *Highway Capacity Manual* defines level of service for partial stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for a partial stop controlled intersection as a whole. The unsignalized intersection level of service criteria are shown in Table 2.

TABLE 2 LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS	
LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Level of service for signalized intersections is stated in terms of the average control delay per vehicle for a peak 15 minute analysis period. The level of service criteria for signalized intersections is shown in Table 3.

TABLE 3 LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS	
LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

US-50 is maintained by the Nevada Department of Transportation and therefore LOS D is the policy level of service standard for the US-50/Casey Road-Coleman Road and US-50/Allen Road intersections. LOS C is the assumed policy level of service standard for the Allen Road/Birch Lane intersection.

Table 4 shows a summary of the AM and PM peak hour level of service and delay results at the key intersections for the existing, existing plus project, 2041 base, and 2041 base plus project scenarios. The intersection capacity worksheets are included in the Appendix.

TABLE 4 INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS								
INTERSECTION	EXISTING		EXISTING + PROJECT		2041 BASE		2041 BASE + PROJECT	
	AM	PM	AM	PM	AM	PM	AM	PM
US-50/Casey Road-Coleman (Signal)	C26.8	C30.3	C27.9	C31.7	C27.9	C32.4	C29.1	C34.4
US-50/Allen Road (Signal)	C20.6	C21.4	C21.1	C21.7	C22.5	C23.8	C23.1	C24.3
Allen Road/Birch Lane (Stop at West Leg) Eastbound Left-Right Northbound Left	B11.3 A7.7	B12.4 A7.8	B14.7 A7.8	C16.1 A8.2	B11.9 A7.8	B13.2 A7.9	C16.2 A7.9	C17.9 A8.3

US-50/Casey Road-Coleman Road Intersection

The US-50/Casey Road-Coleman Road intersection was analyzed as a signalized four-leg intersection with the existing signal phasing for all scenarios. The intersection currently operates at LOS C with a delay of 26.8 seconds per vehicle during the AM peak hour and 30.3 seconds per vehicle during the PM peak hour. For the existing plus project traffic volumes the intersection continues to operate at LOS C with delays slightly increasing to 27.9 seconds per vehicle during the AM peak hour and 31.7 seconds per vehicle during the PM peak hour. For the 2041 base traffic volumes the intersection is anticipated to operate at LOS C with a delay of 27.9 seconds per vehicle during the AM peak hour and 32.4 seconds per vehicle during the PM peak hour. For the 2041 base plus project traffic volumes the intersection continues to operate at LOS C with delays slightly increasing to 29.1 seconds per vehicle during the AM peak hour and 34.4 seconds per vehicle during the PM peak hour. The intersection was analyzed with the existing approach lanes for all scenarios. The US-50/Casey Road-Coleman Road intersection meets NDOT's policy LOS D standard for the existing, existing plus project, 2041 base, and 2041 base plus project volumes. No improvements are recommended at the US-50/Casey Road-Coleman Road intersection.

US-50/Allen Road Intersection

The US-50/Allen Road intersection was analyzed as a signalized four-leg intersection with the existing signal phasing for all scenarios. The intersection currently operates at LOS C with a delay of 20.6 seconds per vehicle during the AM peak hour and 21.4 seconds per vehicle during the PM peak hour. For the existing plus project traffic volumes the intersection continues to operate at LOS C with delays slightly increasing to 21.1 seconds per vehicle during the AM peak hour and 21.7 seconds per vehicle during the PM peak hour. For the 2041 base traffic volumes the intersection is anticipated to operate at LOS C with a delay of 22.5 seconds per vehicle during the AM peak hour and 32.6 seconds per vehicle during the PM peak hour. For the 2041 base plus project traffic volumes the intersection continues to operate at LOS C with delay remaining the same or slightly increasing. The intersection was analyzed with the existing approach lanes for all scenarios. The existing US-50/Allen Road intersection meets NDOT's policy LOS D standard for the existing, existing plus project, 2041 base, and 2041 base plus project traffic volumes. No improvements are recommended at the US-50/Allen Road intersection.

Allen Road/Birch Lane Intersection

The Allen Road/Birch Lane intersection was analyzed as an unsignalized three-leg intersection with stop control at the west approach for all scenarios. The intersection minor movements currently operate at LOS B or better during the AM and PM peak hours. For the existing plus project traffic volumes the intersection minor movements operate at LOS B or better during the AM peak hour and LOS C or better during the PM peak hour. For the 2041 base traffic volumes the intersection minor movements are anticipated to operate at LOS B or better during the AM and PM peak hours. For the 2041 base plus project traffic volumes the intersection minor movements operate at LOS C or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The Allen Road/Birch Lane intersection meets Churchill County's policy LOS C standard for the existing, existing plus project, 2041 base, and 2041 base plus project traffic volumes.

The need for an exclusive northbound to westbound left turn lane at the Allen Road/Birch Lane intersection was reviewed based on information presented in *AASHTO's A Policy on Geometric Design of Highways and Streets*. Table 9-23 of the AASHTO publication lists traffic volume thresholds and operating speeds which necessitate the need for left turn lanes on two-lane roads. The existing plus project traffic volumes exceed the traffic volume thresholds that trigger an exclusive left turn lane.

The need for an exclusive southbound right turn lane at the Allen Road/Birch Lane intersection was also reviewed. We are unaware of Churchill County standards that address exclusive right turn lanes. The need for an exclusive right turn lane was subsequently reviewed based on NDOT's access management standards. These standards provide warrants for the implementation of right turn lanes on two-lane roadways at unsignalized intersections. The turn lane warrants are evaluated based on through and turning movements as well as the 35 mile per hour speed limit for Allen Road. The results of the turn lane warrant review indicate that an exclusive right turn lane is warranted based on the existing plus project traffic volumes.

The length of the warranted left and right turn lanes was subsequently reviewed. The operational analysis indicates a 95th percentile queue length of less than one vehicle (25 feet) for the left turn movement and no queue length for the free right turn movement. In addition to storage, NDOT's access management standards indicate that 215 feet of deceleration length is needed for the left and right turn lanes based on the 35 mile per hour speed limit on Allen Road. The left turn lane should therefore contain a minimum of 240 feet of combined storage/deceleration length and the right turn lane should contain a minimum of 215 feet of deceleration length.

RECOMMENDATIONS

Traffic generated by the proposed Sandcreek and Birch Lane development will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Nevada Department of Transportation and City of Fallon requirements.

It is recommended that the Allen Road/Birch Lane intersection be improved to include separate left and right turn lanes at the west approach, an exclusive right turn lane with a minimum of 215 feet of deceleration length at the north approach, and an exclusive left turn lane with a minimum of 240 feet of combined storage/deceleration length at the south approach.

APPENDIX

Single-Family Detached Housing (210)

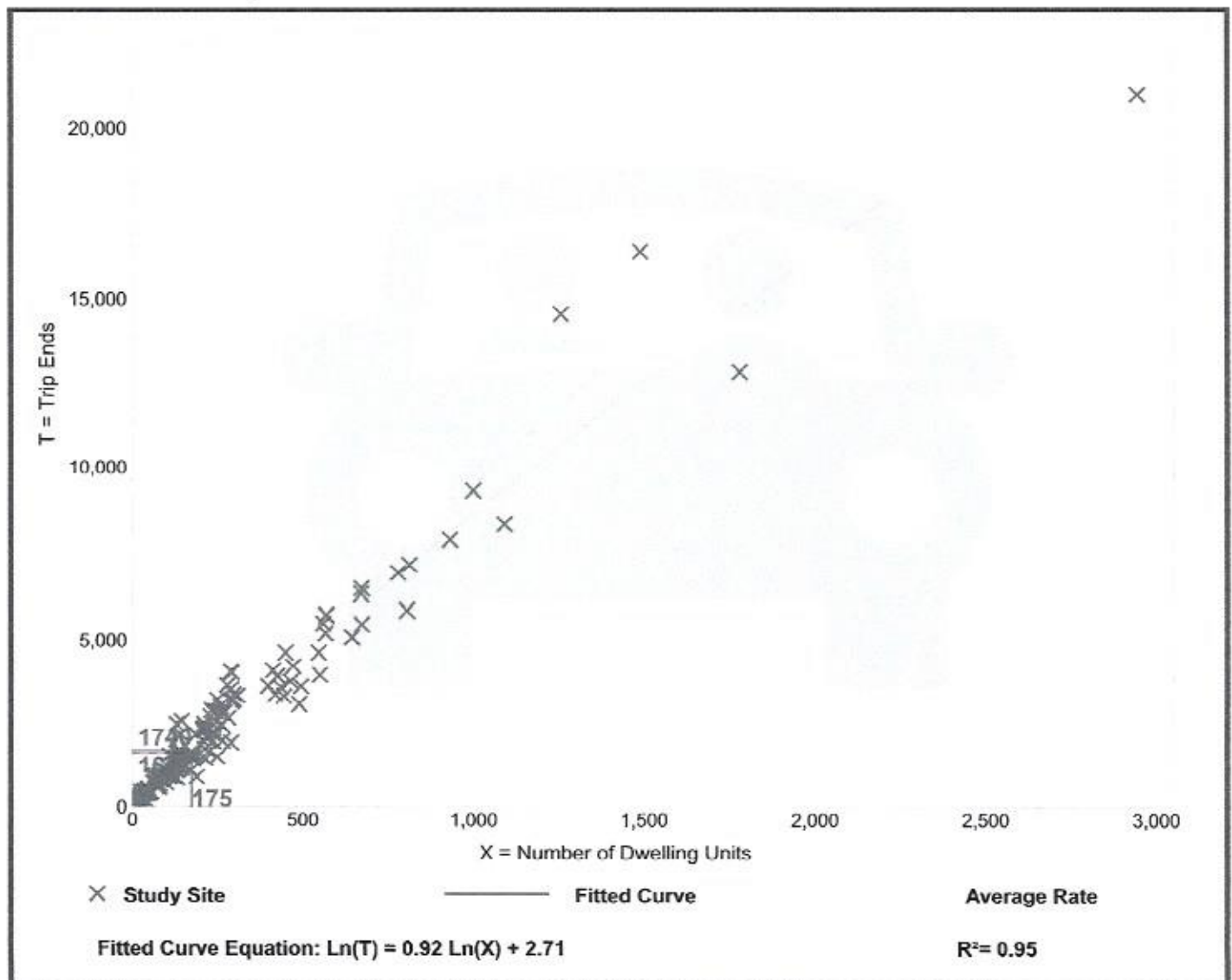
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

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

Setting/Location: General Urban/Suburban

Number of Studies: 173

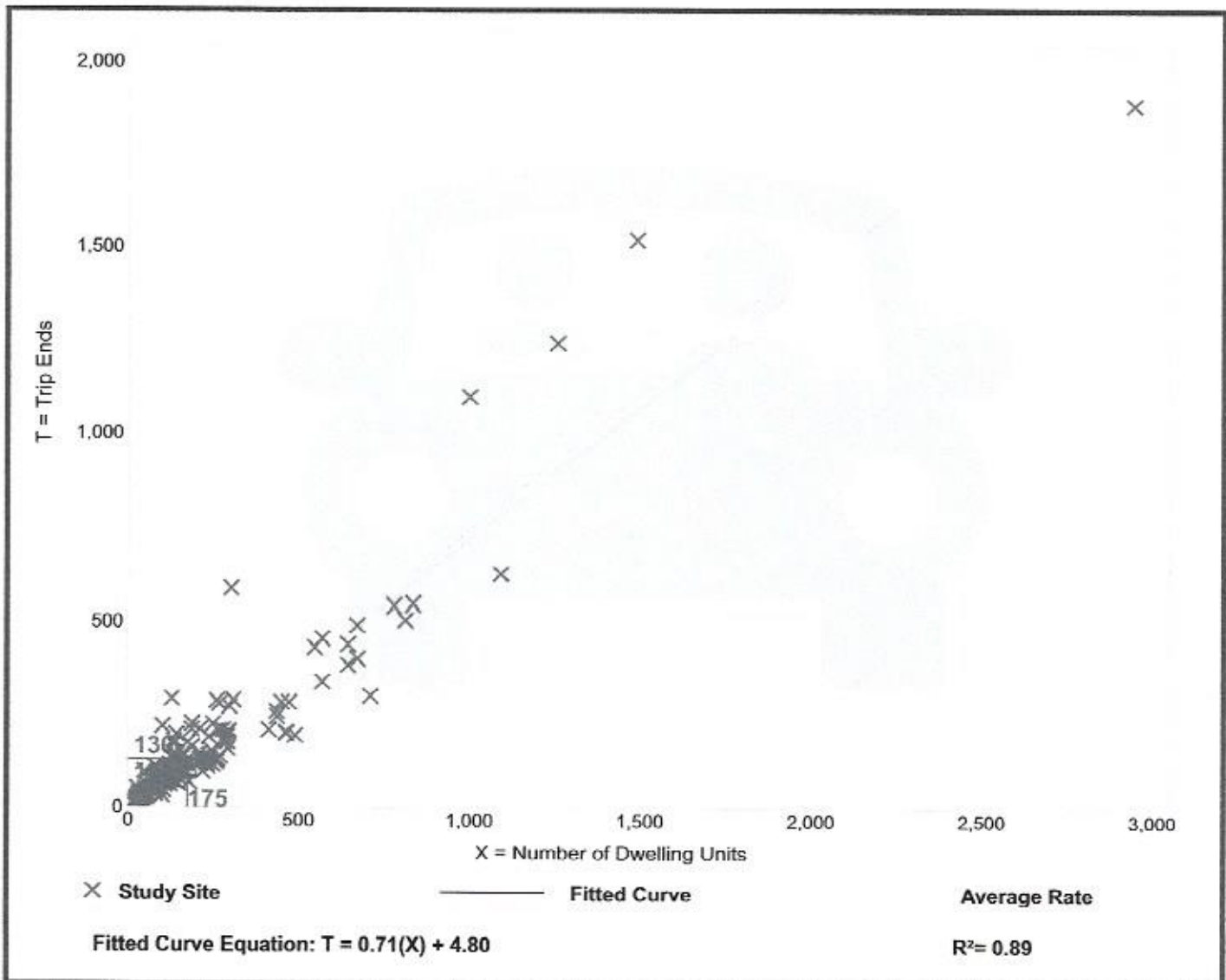
Avg. Num. of Dwelling Units: 219

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

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

Setting/Location: General Urban/Suburban

Number of Studies: 190

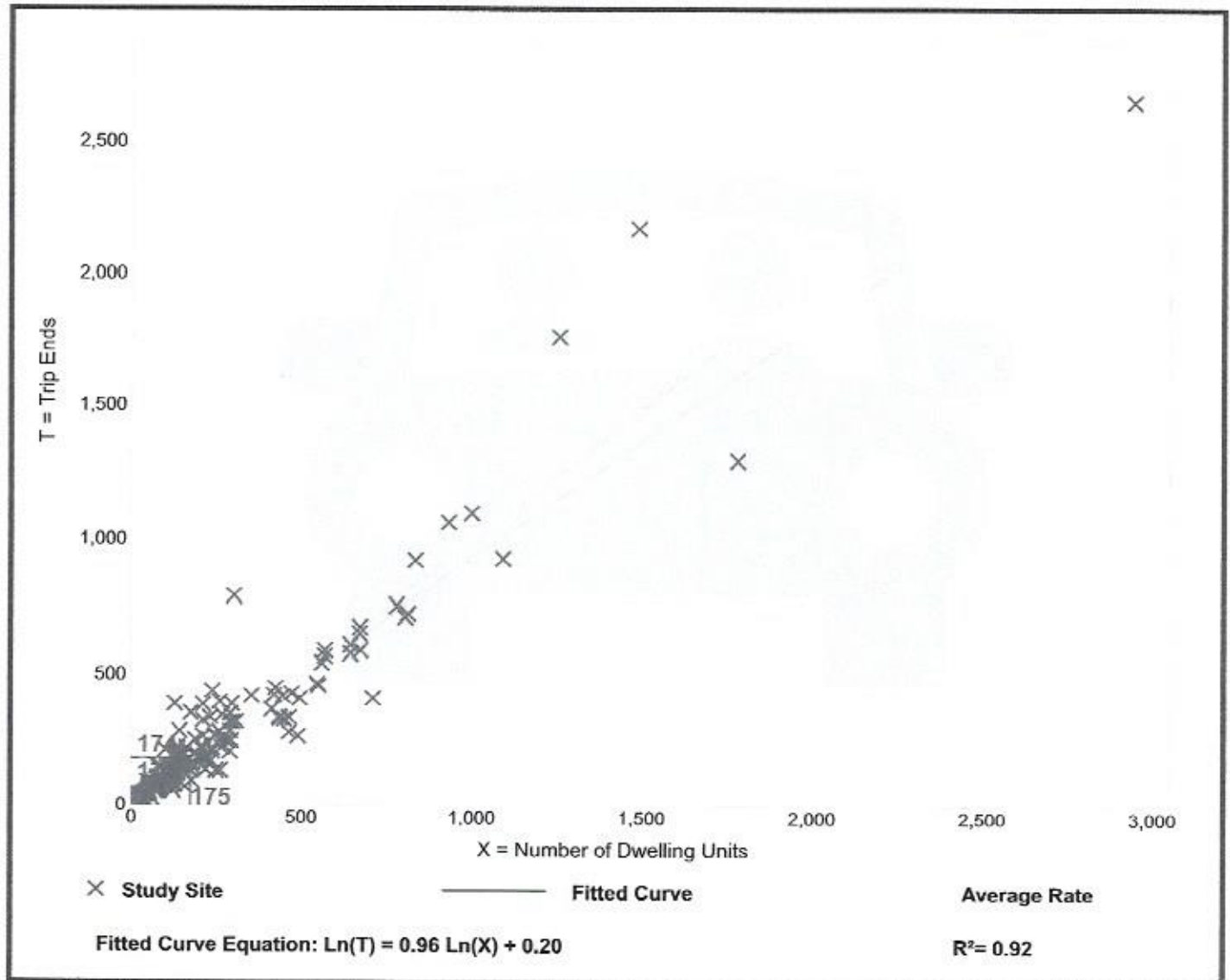
Avg. Num. of Dwelling Units: 242

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing (210)

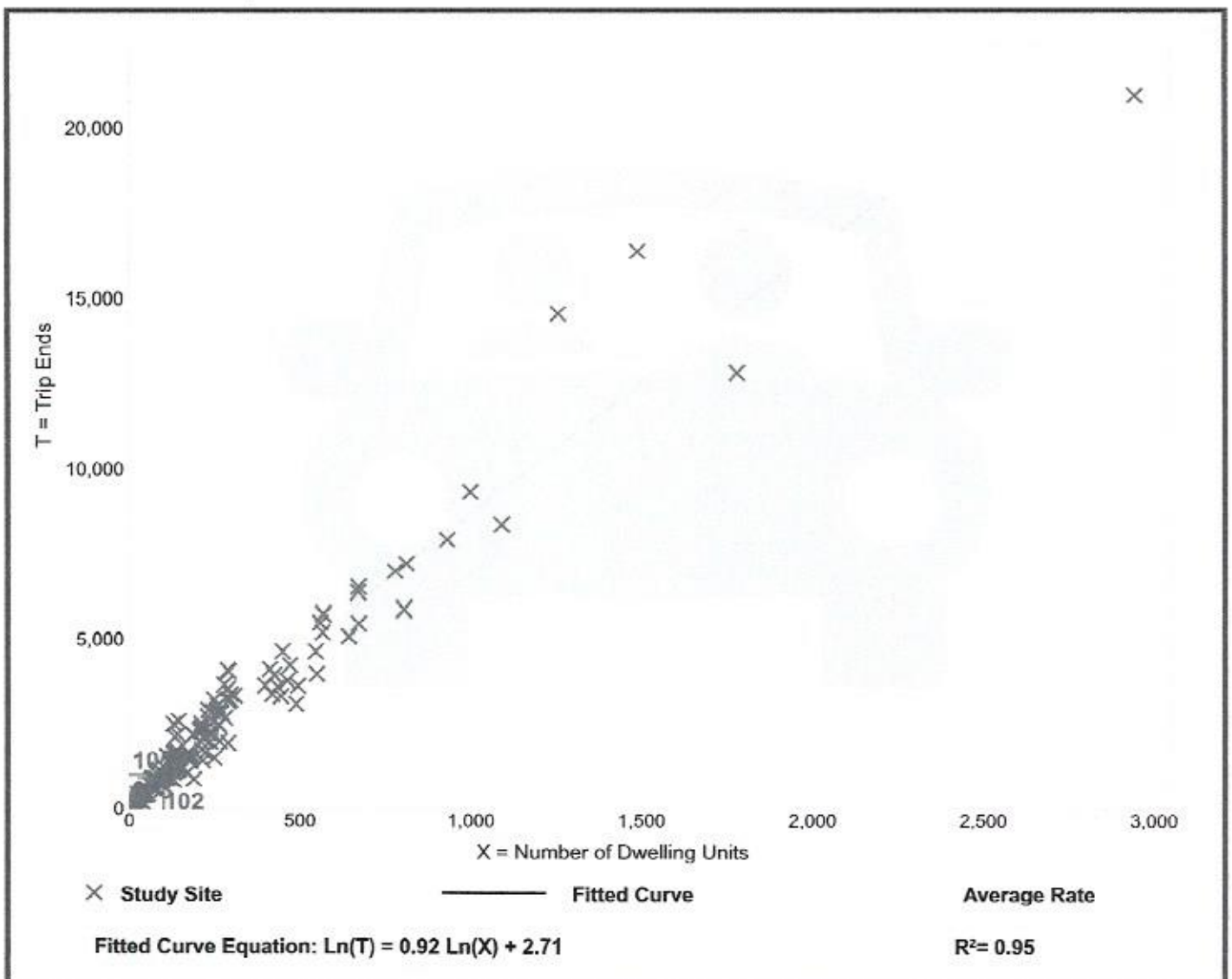
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 173

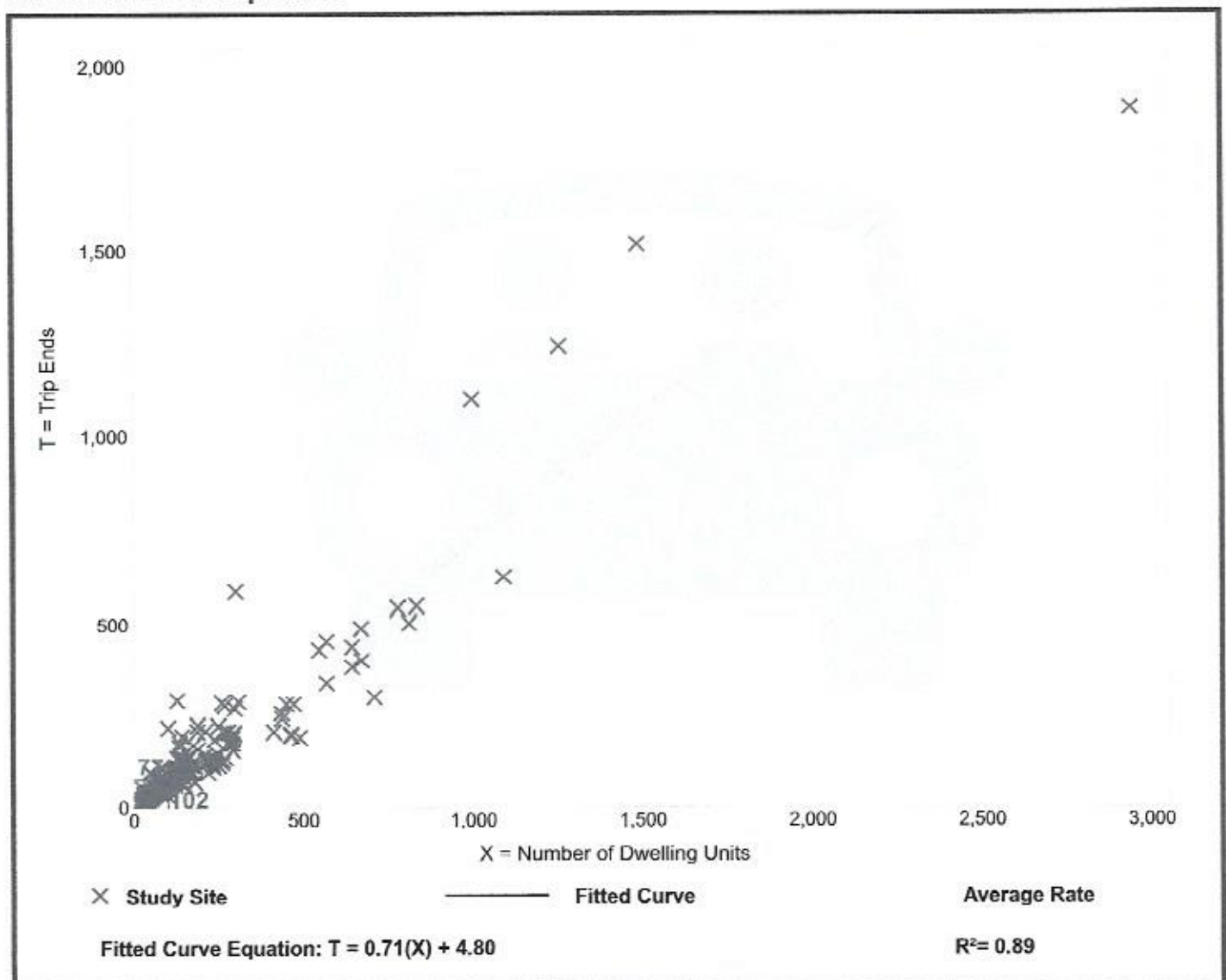
Avg. Num. of Dwelling Units: 219

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

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

Setting/Location: General Urban/Suburban

Number of Studies: 190

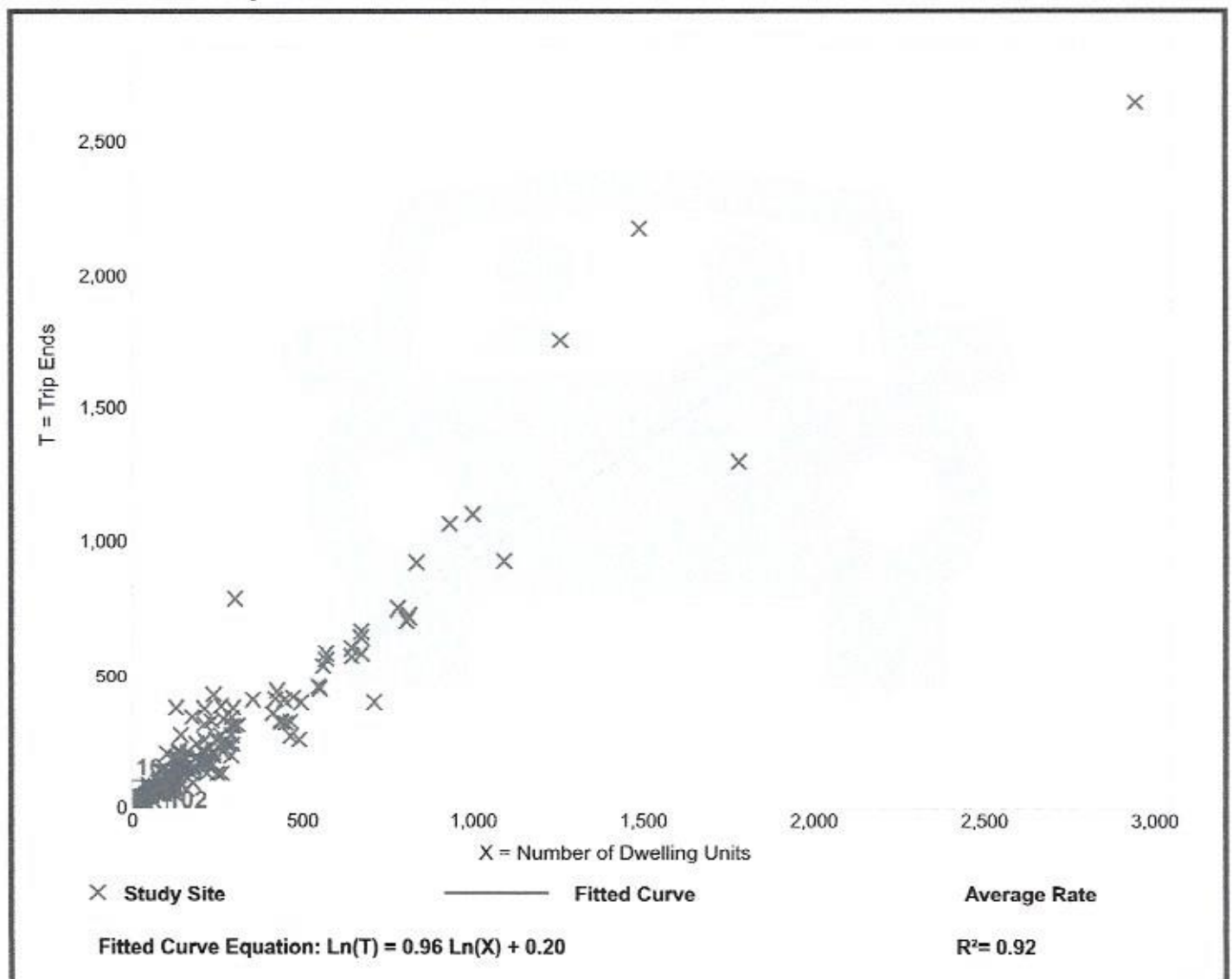
Avg. Num. of Dwelling Units: 242

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

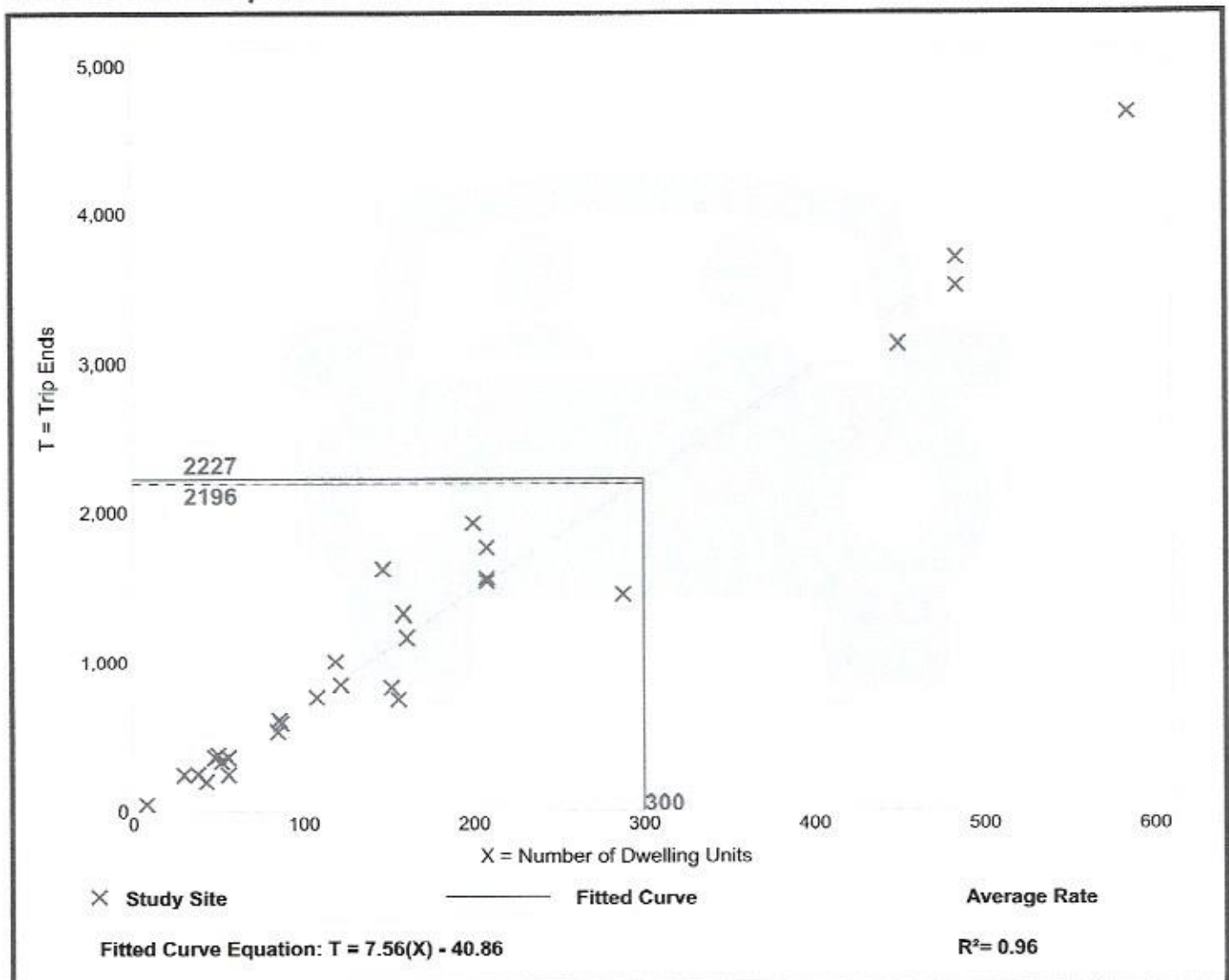
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

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

Setting/Location: General Urban/Suburban

Number of Studies: 42

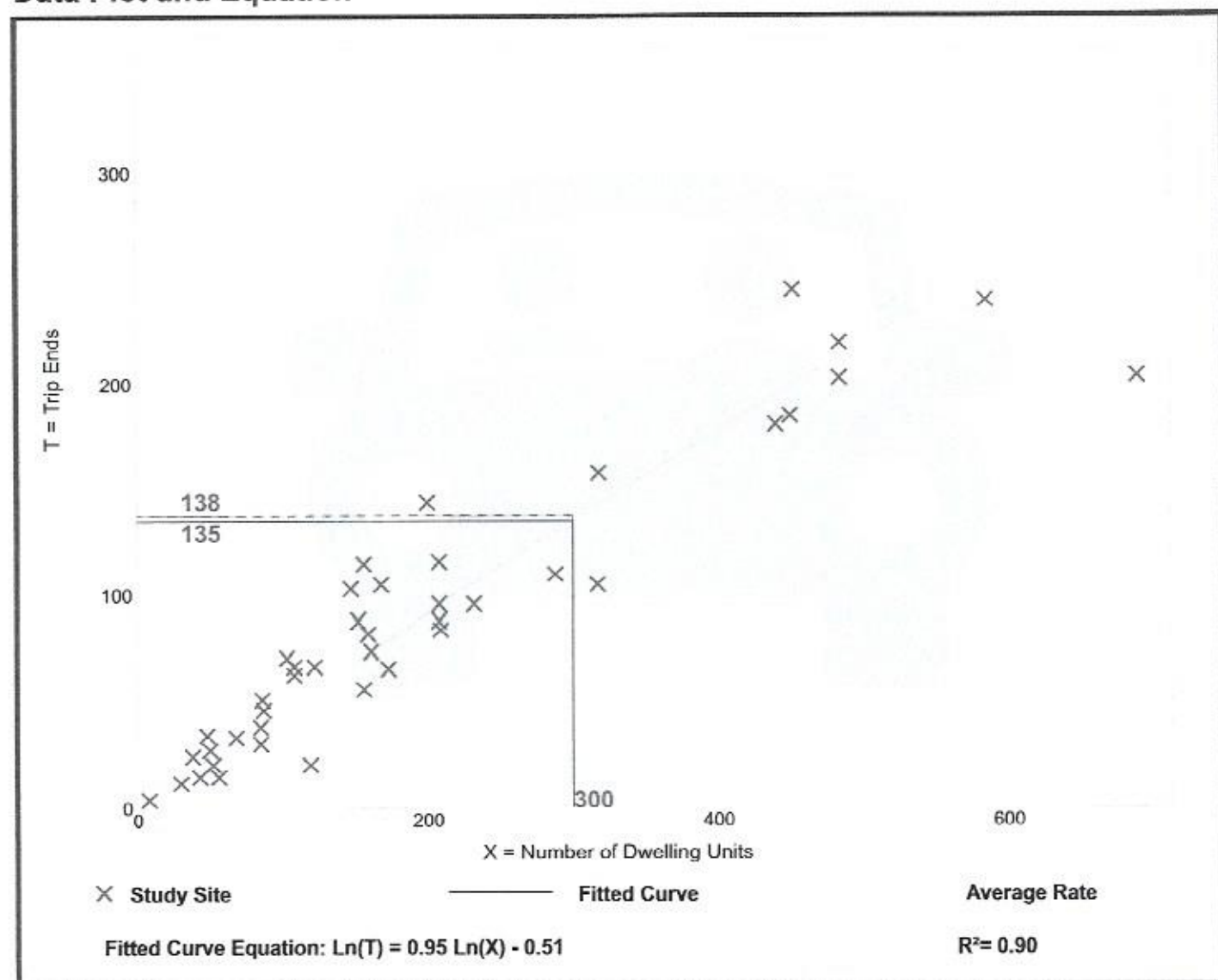
Avg. Num. of Dwelling Units: 199

Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

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

Setting/Location: General Urban/Suburban

Number of Studies: 50

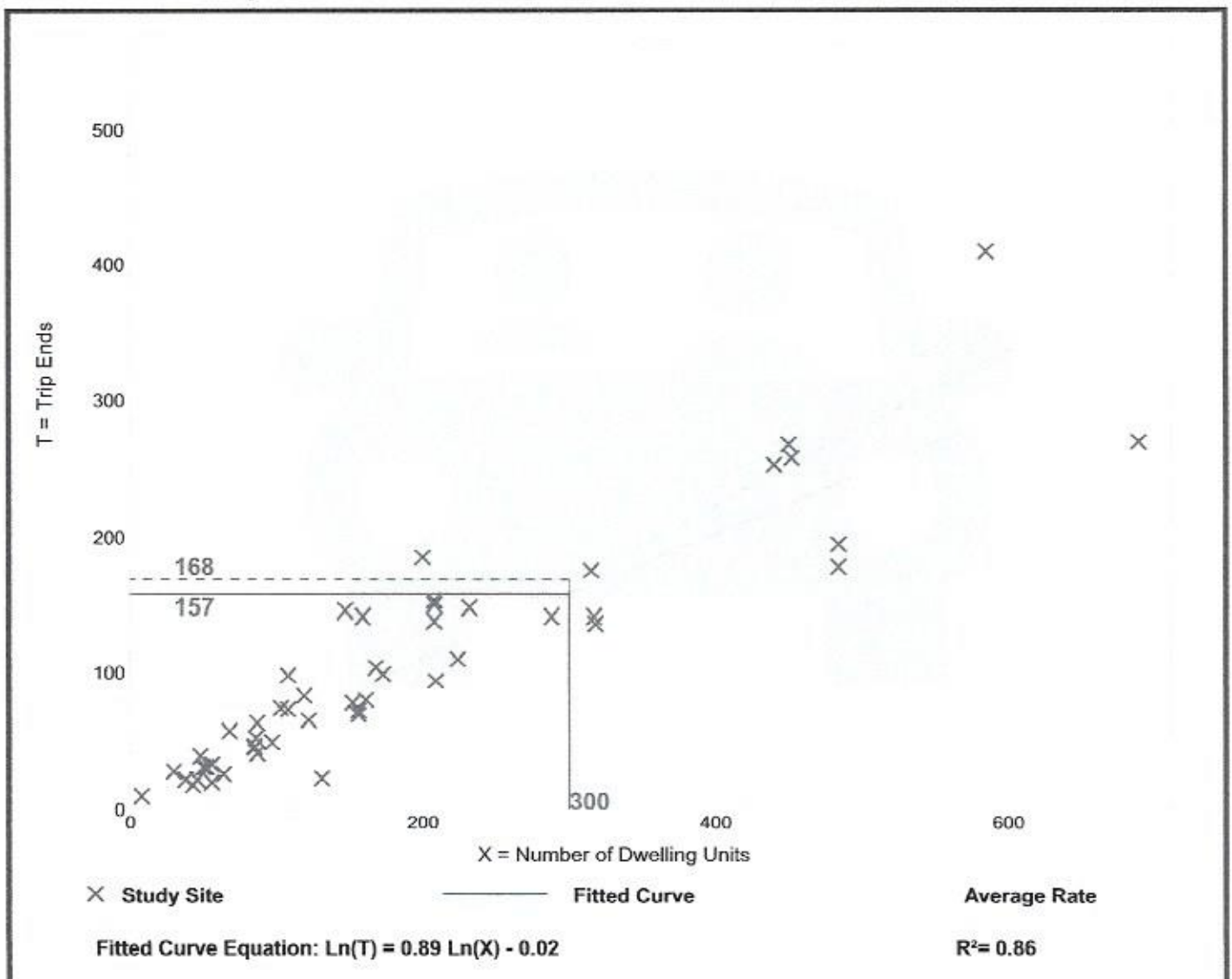
Avg. Num. of Dwelling Units: 187

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



Mini-Warehouse (151)

Vehicle Trip Ends vs: Occupied Storage Units (100s)
On a: Weekday

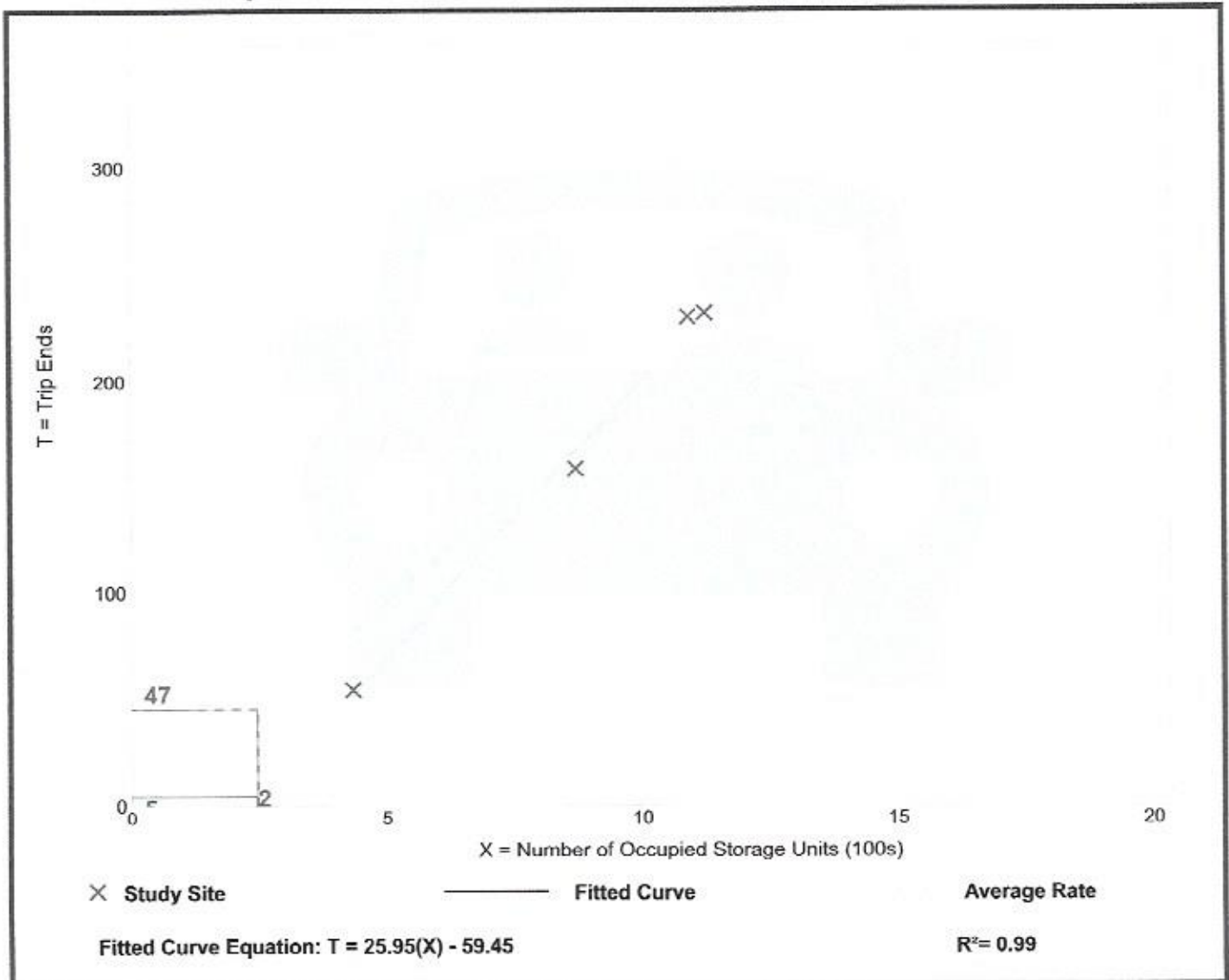
Setting/Location: General Urban/Suburban
Number of Studies: 4
Avg. Num. of Occupied Storage Units (100s): 9
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Occupied Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
19.19	12.90 - 21.06	3.03

Data Plot and Equation

Caution – Small Sample Size



Mini-Warehouse (151)

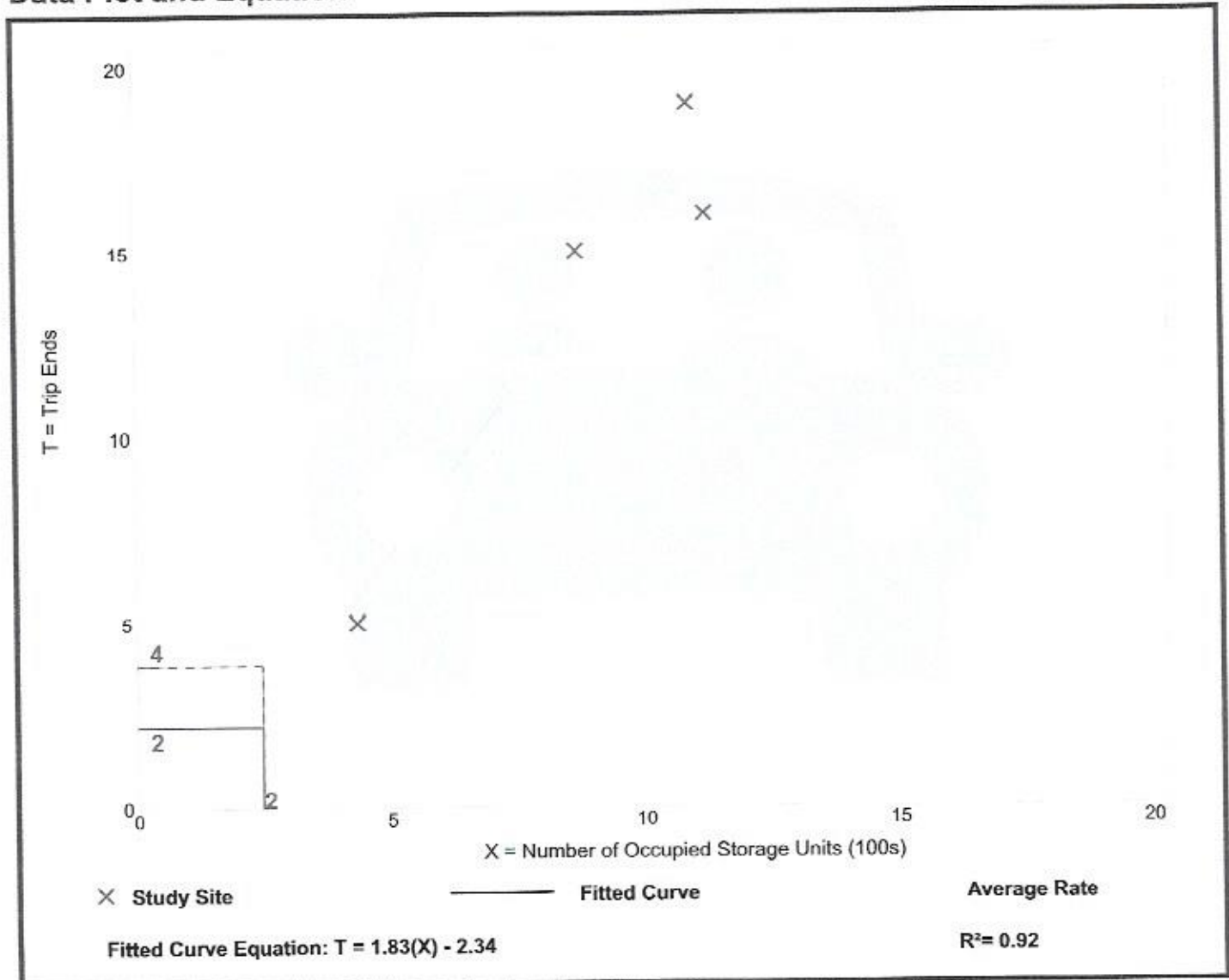
Vehicle Trip Ends vs: Occupied Storage Units (100s)
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 4
 Avg. Num. of Occupied Storage Units (100s): 9
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Occupied Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
1.56	1.15 - 1.74	0.24

Data Plot and Equation

Caution – Small Sample Size



Mini-Warehouse (151)

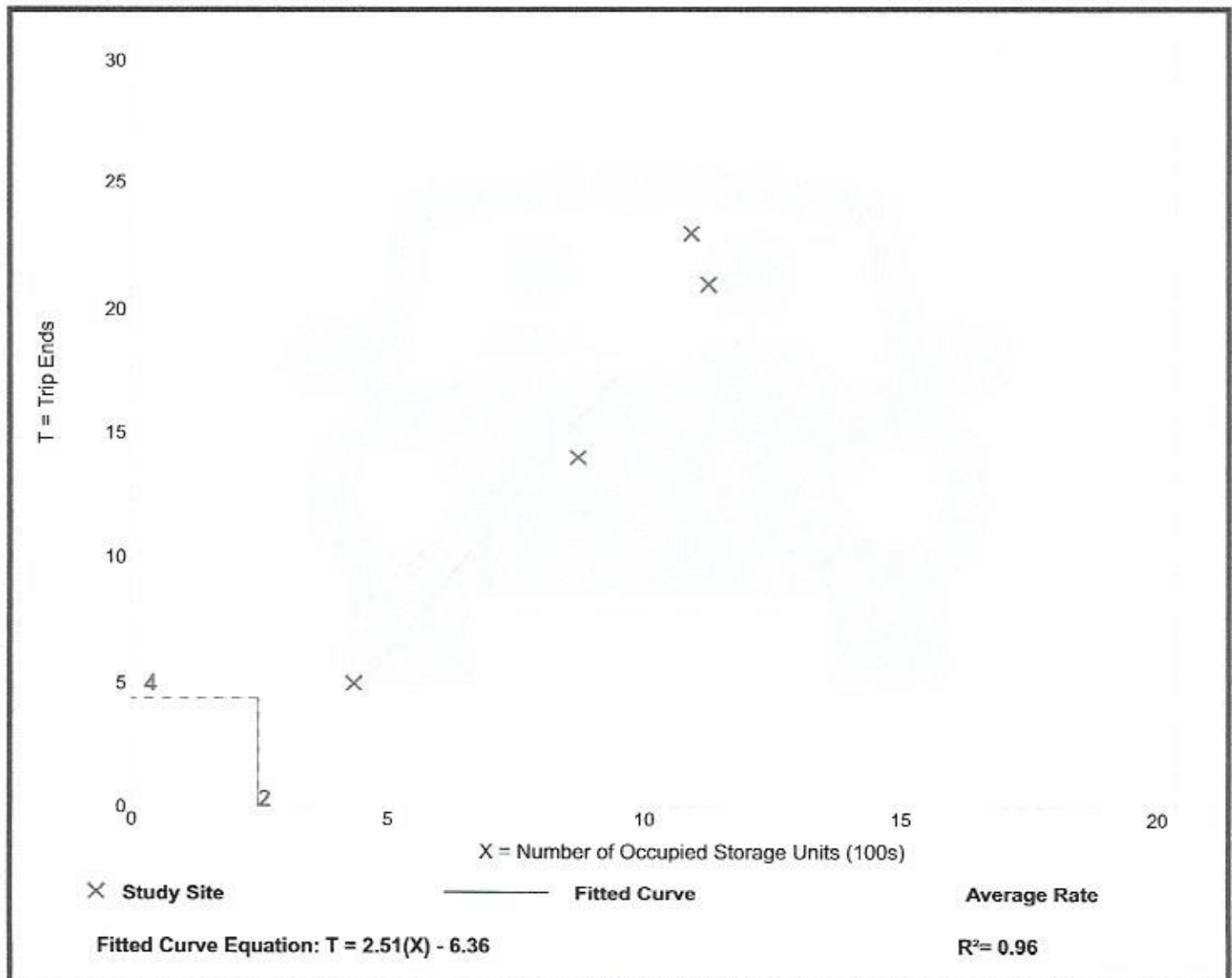
Vehicle Trip Ends vs: Occupied Storage Units (100s)
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 4
 Avg. Num. of Occupied Storage Units (100s): 9
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Occupied Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
1.79	1.15 - 2.11	0.35

Data Plot and Equation

Caution – Small Sample Size



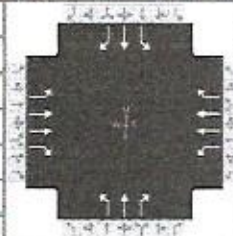
HCS7 Signalized Intersection Results Summary

General Information

Agency	Solaegui Engineers		
Analyst	MSH	Analysis Date	Apr 20, 2021
Jurisdiction	NDOT	Time Period	AM Peak Hour
Urban Street		Analysis Year	Existing
Intersection	US-50 & Casey	File Name	UsCa21ax.xus
Project Description			

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.92
Analysis Period	1> 7:00



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	42	581	50	62	622	24	89	21	78	52	31	37

Signal Information

Cycle, s	90.0	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	30.0	6.0	2.0	25.0	0.0				
				Yellow	4.0	4.0	4.0	0.0	4.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	1.0	0.0				

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	12.0	35.0	12.0	35.0	13.0	32.0	11.0	30.0
Change Period, (Y+R), s	5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.0	3.1	3.0	3.1	3.3	3.1	3.3
Queue Clearance Time (g _s), s	4.2	15.5	5.3	16.6	6.3	5.2	4.7	3.5
Green Extension Time (g _e), s	0.0	3.2	0.0	3.1	0.1	0.3	0.0	0.3
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.04	1.00	0.06	0.01	0.00	1.00	0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	46	632	43	67	676	21	97	23	74	57	34	35
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1724	1545	1767	1724	1545	1810	1856	1532	1810	1856	1567
Queue Service Time (g _s), s	2.2	13.5	1.7	3.3	14.6	0.8	4.3	0.8	3.2	2.7	1.2	1.5
Cycle Queue Clearance Time (g _c), s	2.2	13.5	1.7	3.3	14.6	0.8	4.3	0.8	3.2	2.7	1.2	1.5
Green Ratio (g/C)	0.08	0.33	0.33	0.08	0.33	0.33	0.14	0.30	0.30	0.07	0.28	0.28
Capacity (c), veh/h	137	1149	515	137	1149	515	261	557	460	121	515	435
Volume-to-Capacity Ratio (X)	0.332	0.549	0.084	0.490	0.588	0.040	0.370	0.041	0.161	0.469	0.065	0.080
Back of Queue (Q), ft/ln (95 th percentile)	44	237.4	27.4	66.1	255	12.8	85.1	15.4	51.8	54.6	23.7	24.1
Back of Queue (Q), veh/ln (95 th percentile)	1.7	9.1	1.1	2.6	9.7	0.5	3.4	0.6	2.0	2.2	0.9	1.0
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	39.3	24.5	20.6	39.8	24.9	20.3	34.8	22.3	23.2	40.5	23.9	24.0
Incremental Delay (d ₂), s/veh	0.5	0.3	0.0	1.0	0.5	0.0	0.3	0.0	0.1	1.1	0.0	0.0
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	39.8	24.8	20.6	40.8	25.4	20.3	35.1	22.3	23.2	41.5	23.9	24.0
Level of Service (LOS)	D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	25.5	C		26.6	C		29.1	C		31.9	C	
Intersection Delay, s/veh / LOS	26.8						C					

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.12	B	2.44	B	2.45	B
Bicycle LOS Score / LOS	1.08	A	1.12	A	0.81	A	0.69	A

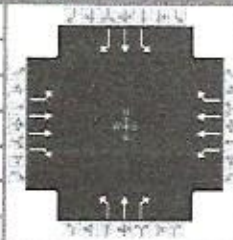
HCS7 Signalized Intersection Results Summary

General Information

Agency	Solaegui Engineers		
Analyst	MSH	Analysis Date	Apr 20, 2021
Jurisdiction	NDOT	Time Period	PM Peak Hour
Urban Street		Analysis Year	Existing
Intersection	US-50 & Casey	File Name	UsCa21px.xus
Project Description			

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.92
Analysis Period	1> 7:00



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	85	699	87	105	686	38	131	37	59	36	23	86

Signal Information

Cycle, s	95.0	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								
				Green	8.0	3.0	30.0	6.0	3.0	25.0	
				Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
				Red	1.0	0.0	1.0	1.0	0.0	1.0	

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	13.0	35.0	16.0	38.0	14.0	33.0	11.0	30.0
Change Period, (Y+R _c), s	5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.3
Queue Clearance Time (g _s), s	6.8	20.4	7.8	19.1	8.9	4.7	4.0	5.9
Green Extension Time (g _e), s	0.0	3.3	0.0	3.5	0.1	0.4	0.0	0.4
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.23	0.90	0.18	0.10	0.00	1.00	0.00

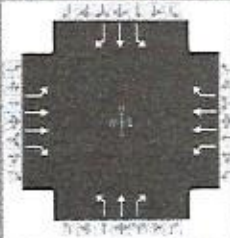
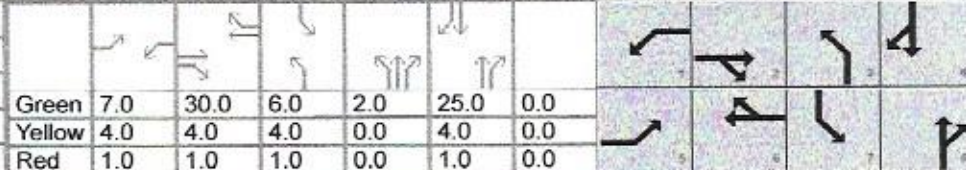
Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	92	760	84	114	746	36	142	40	59	39	25	83
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1724	1544	1767	1724	1547	1810	1856	1532	1810	1856	1566
Queue Service Time (g _s), s	4.8	18.4	3.7	5.8	17.1	1.5	6.9	1.5	2.7	2.0	1.0	3.9
Cycle Queue Clearance Time (g _c), s	4.8	18.4	3.7	5.8	17.1	1.5	6.9	1.5	2.7	2.0	1.0	3.9
Green Ratio (g/C)	0.08	0.32	0.32	0.12	0.35	0.35	0.15	0.29	0.29	0.06	0.26	0.26
Capacity (c), veh/h	149	1089	487	205	1198	537	267	547	452	114	488	412
Volume-to-Capacity Ratio (X)	0.621	0.698	0.172	0.558	0.623	0.067	0.534	0.074	0.130	0.342	0.051	0.200
Back of Queue (Q), ft/ln (95 th percentile)	105.5	315.3	59.8	119	291.8	23.4	138.4	29.5	43.9	39.8	19.2	64.5
Back of Queue (Q), veh/ln (95 th percentile)	4.1	12.0	2.4	4.6	11.1	0.9	5.5	1.2	1.7	1.6	0.7	2.6
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh	42.0	28.5	23.5	39.7	25.8	20.7	37.5	24.1	24.6	42.6	26.1	27.2
Incremental Delay (d ₂), s/veh	5.8	1.7	0.1	2.0	0.8	0.0	1.1	0.0	0.0	0.7	0.0	0.1
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	47.8	30.2	23.6	41.7	26.6	20.7	38.6	24.2	24.6	43.3	26.2	27.3
Level of Service (LOS)	D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	31.3	C		28.3	C		32.8	C		31.4	C	
Intersection Delay, s/veh / LOS	30.3						C					

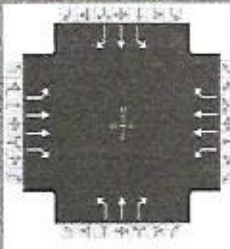
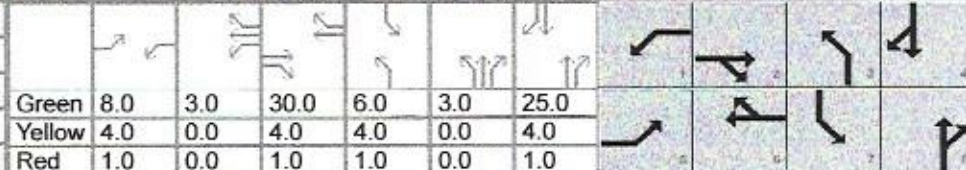
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS	1.26	A		1.23	A		0.89	A		0.73	A	

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information											
Agency		Solaegui Engineers				Duration, h		0.250									
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other							
Jurisdiction		NDOT		Time Period		AM Peak Hour		PHF		0.92							
Urban Street				Analysis Year		Existing + Project		Analysis Period		1> 7:00							
Intersection		US-50 & Casey		File Name		UsCa21aw.xus											
Project Description																	
Demand Information						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h						42	583	74	72	627	25	163	31	105	52	34	37
Signal Information																	
Cycle, s		90.0	Reference Phase		2	Green	7.0	30.0	6.0	2.0	25.0	0.0					
Offset, s		0	Reference Point		End	Yellow	4.0	4.0	4.0	0.0	4.0	0.0					
Uncoordinated		Yes	Simult. Gap E/W		On	Red	1.0	1.0	1.0	0.0	1.0	0.0					
Force Mode		Fixed	Simult. Gap N/S		On												
Timer Results						EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase						5	2	1	6	3	8	7	4				
Case Number						2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0				
Phase Duration, s						12.0	35.0	12.0	35.0	13.0	32.0	11.0	30.0				
Change Period, (Y+R _c), s						5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s						3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.3				
Queue Clearance Time (g _s), s						4.2	15.5	5.8	16.8	10.4	6.6	4.7	3.5				
Green Extension Time (g _e), s						0.0	3.3	0.0	3.2	0.1	0.4	0.0	0.4				
Phase Call Probability						1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability						1.00	0.05	1.00	0.06	1.00	0.00	1.00	0.00				
Movement Group Results						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h						46	634	70	78	682	22	177	34	103	57	37	35
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1724	1545	1767	1724	1545	1810	1856	1532	1810	1856	1567
Queue Service Time (g _s), s						2.2	13.5	2.8	3.8	14.8	0.9	8.4	1.2	4.6	2.7	1.3	1.5
Cycle Queue Clearance Time (g _c), s						2.2	13.5	2.8	3.8	14.8	0.9	8.4	1.2	4.6	2.7	1.3	1.5
Green Ratio (g/C)						0.08	0.33	0.33	0.08	0.33	0.33	0.14	0.30	0.30	0.07	0.28	0.28
Capacity (c), veh/h						137	1149	515	137	1149	515	261	557	460	121	515	435
Volume-to-Capacity Ratio (X)						0.332	0.551	0.135	0.569	0.593	0.042	0.678	0.061	0.225	0.469	0.072	0.080
Back of Queue (Q), ft/ln (95 th percentile)						44	238.1	44.7	81.5	257.1	13.5	180	22.9	73.9	54.6	26.1	24.1
Back of Queue (Q), veh/ln (95 th percentile)						1.7	9.1	1.8	3.2	9.8	0.5	7.2	0.9	2.9	2.2	1.0	1.0
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh						39.3	24.5	20.9	40.0	24.9	20.3	36.5	22.5	23.6	40.5	23.9	24.0
Incremental Delay (d ₂), s/veh						0.5	0.3	0.0	3.5	0.6	0.0	5.7	0.0	0.1	1.1	0.0	0.0
Initial Queue Delay (d ₃), s/veh						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh						39.8	24.8	21.0	43.6	25.5	20.3	42.2	22.5	23.7	41.5	24.0	24.0
Level of Service (LOS)						D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS						25.4	C		27.2	C		34.0	C		31.7	C	
Intersection Delay, s/veh / LOS						27.9						C					
Multimodal Results						EB			WB			NB			SB		
Pedestrian LOS Score / LOS						2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS						1.11	A		1.13	A		1.01	A		0.70	A	

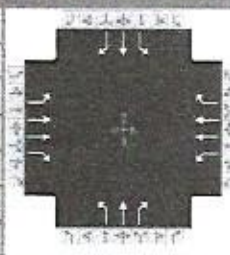
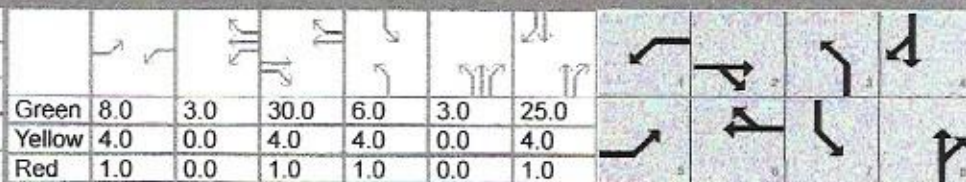
HCS7 Signalized Intersection Results Summary

General Information					Intersection Information											
Agency	Solaegui Engineers				Duration, h	0.250										
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other									
Jurisdiction	NDOT		Time Period	PM Peak Hour		PHF	0.92									
Urban Street			Analysis Year	Existing + Project		Analysis Period	1> 7:00									
Intersection	US-50 & Casey		File Name	UsCa21pw.xus												
Project Description																
Demand Information					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					85	704	167	136	689	38	178	44	78	37	33	86
Signal Information																
Cycle, s	95.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On													
					Green	8.0	3.0	30.0	6.0	3.0	25.0					
					Yellow	4.0	0.0	4.0	4.0	0.0	4.0					
					Red	1.0	0.0	1.0	1.0	0.0	1.0					
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					5	2	1	6	3	8	7	4				
Case Number					2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0				
Phase Duration, s					13.0	35.0	16.0	38.0	14.0	33.0	11.0	30.0				
Change Period, (Y+R c), s					5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s					3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.3				
Queue Clearance Time (g s), s					6.8	20.5	9.7	19.2	11.7	5.7	4.0	5.9				
Green Extension Time (g e), s					0.0	3.5	0.0	3.7	0.1	0.5	0.0	0.5				
Phase Call Probability					1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability					1.00	0.28	1.00	0.21	1.00	0.00	1.00	0.00				
Movement Group Results					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h					92	765	171	148	749	36	193	48	79	40	36	83
Adjusted Saturation Flow Rate (s), veh/h/ln					1767	1724	1544	1767	1724	1547	1810	1856	1532	1810	1856	1566
Queue Service Time (g s), s					4.8	18.5	8.1	7.7	17.2	1.5	9.7	1.8	3.7	2.0	1.4	3.9
Cycle Queue Clearance Time (g c), s					4.8	18.5	8.1	7.7	17.2	1.5	9.7	1.8	3.7	2.0	1.4	3.9
Green Ratio (g/C)					0.08	0.32	0.32	0.12	0.35	0.35	0.15	0.29	0.29	0.06	0.26	0.26
Capacity (c), veh/h					149	1089	487	205	1198	537	267	547	452	114	488	412
Volume-to-Capacity Ratio (X)					0.621	0.703	0.350	0.722	0.625	0.067	0.726	0.087	0.176	0.352	0.073	0.200
Back of Queue (Q), ft/ln (95 th percentile)					105.5	317.9	129.8	177.3	293.3	23.4	210.2	35.3	60.1	40.9	27.6	64.5
Back of Queue (Q), veh/ln (95 th percentile)					4.1	12.1	5.2	6.9	11.2	0.9	8.4	1.4	2.3	1.6	1.1	2.6
Queue Storage Ratio (RQ) (95 th percentile)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh					42.0	28.6	25.0	40.5	25.8	20.7	38.7	24.3	24.9	42.6	26.3	27.2
Incremental Delay (d 2), s/veh					5.8	1.7	0.2	10.3	0.8	0.0	8.3	0.0	0.1	0.7	0.0	0.1
Initial Queue Delay (d 3), s/veh					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh					47.8	30.3	25.2	50.9	26.6	20.7	46.9	24.3	25.0	43.3	26.3	27.3
Level of Service (LOS)					D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS					31.0	C		30.2	C		38.1	D		31.1	C	
Intersection Delay, s/veh / LOS					31.7						C					
Multimodal Results					EB			WB			NB			SB		
Pedestrian LOS Score / LOS					2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS					1.34	A		1.26	A		1.02	A		0.75	A	

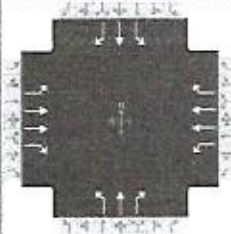
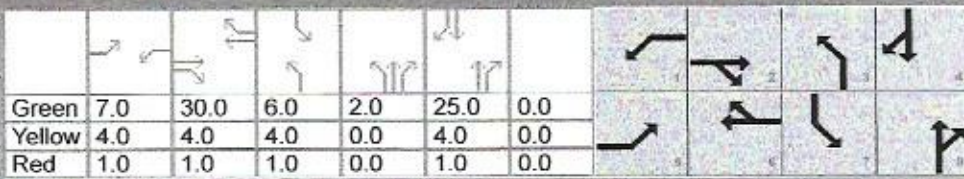
HCS7 Signalized Intersection Results Summary

General Information					Intersection Information											
Agency	Solaegui Engineers				Duration, h	0.250										
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other									
Jurisdiction	NDOT		Time Period	AM Peak Hour		PHF	0.92									
Urban Street			Analysis Year	2041 Base		Analysis Period	1> 7:00									
Intersection	US-50 & Casey		File Name	UsCa41ax.xus												
Project Description																
Demand Information					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					47	655	56	70	701	27	100	24	88	59	35	42
Signal Information																
Cycle, s	90.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On													
					Green	7.0	30.0	6.0	2.0	25.0	0.0					
					Yellow	4.0	4.0	4.0	0.0	4.0	0.0					
					Red	1.0	1.0	1.0	0.0	1.0	0.0					
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					5	2	1	6	3	8	7	4				
Case Number					2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0				
Phase Duration, s					12.0	35.0	12.0	35.0	13.0	32.0	11.0	30.0				
Change Period, (Y+R _c), s					5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s					3.1	3.0	3.1	3.0	3.1	3.3	3.1	3.3				
Queue Clearance Time (g _s), s					4.5	17.6	5.7	19.0	6.9	5.7	5.1	3.7				
Green Extension Time (g _e), s					0.0	3.5	0.0	3.3	0.1	0.3	0.0	0.3				
Phase Call Probability					1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability					1.00	0.11	1.00	0.15	0.02	0.00	1.00	0.00				
Movement Group Results					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h					51	712	50	76	762	24	109	26	85	64	38	40
Adjusted Saturation Flow Rate (s), veh/h/ln					1767	1724	1545	1767	1724	1545	1810	1856	1532	1810	1856	1567
Queue Service Time (g _s), s					2.5	15.6	2.0	3.7	17.0	0.9	4.9	0.9	3.7	3.1	1.4	1.7
Cycle Queue Clearance Time (g _c), s					2.5	15.6	2.0	3.7	17.0	0.9	4.9	0.9	3.7	3.1	1.4	1.7
Green Ratio (g/C)					0.08	0.33	0.33	0.08	0.33	0.33	0.14	0.30	0.30	0.07	0.28	0.28
Capacity (c), veh/h					137	1149	515	137	1149	515	261	557	460	121	515	435
Volume-to-Capacity Ratio (X)					0.372	0.619	0.097	0.554	0.663	0.046	0.416	0.047	0.184	0.532	0.074	0.092
Back of Queue (Q), ft/ln (95 th percentile)					49.4	269.2	31.7	78.1	290.6	14.9	96.4	17.7	59.9	63.9	26.9	27.9
Back of Queue (Q), veh/ln (95 th percentile)					1.9	10.3	1.3	3.0	11.1	0.6	3.9	0.7	2.3	2.6	1.1	1.1
Queue Storage Ratio (RQ) (95 th percentile)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh					39.4	25.2	20.7	40.0	25.7	20.3	35.0	22.4	23.3	40.6	24.0	24.1
Incremental Delay (d ₂), s/veh					0.6	0.8	0.0	2.9	1.2	0.0	0.4	0.0	0.1	2.3	0.0	0.0
Initial Queue Delay (d ₃), s/veh					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh					40.0	26.0	20.7	42.9	26.8	20.3	35.4	22.4	23.4	43.0	24.0	24.1
Level of Service (LOS)					D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS					26.5	C		28.1	C		29.2	C		32.6	C	
Intersection Delay, s/veh / LOS					27.9						C					
Multimodal Results					EB			WB			NB			SB		
Pedestrian LOS Score / LOS					2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS					1.16	A		1.20	A		0.85	A		0.72	A	

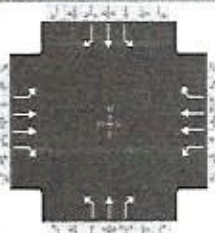
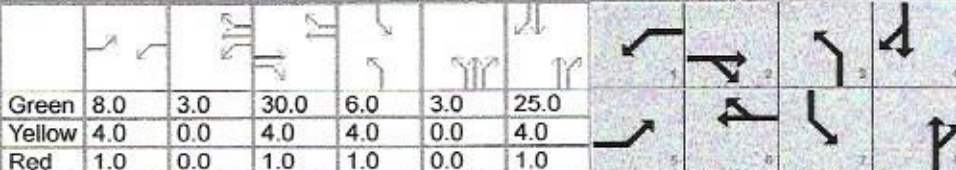
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information									
Agency		Solaegui Engineers				Duration, h		0.250							
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other					
Jurisdiction		NDOT		Time Period		PM Peak Hour		PHF		0.92					
Urban Street				Analysis Year		2041 Base		Analysis Period		1> 7:00					
Intersection		US-50 & Casey		File Name		UsCa41px.xus									
Project Description															
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				96	788	98	118	773	43	148	42	66	41	26	97
Signal Information															
Cycle, s	95.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
Green	8.0	3.0	30.0	6.0	3.0	25.0									
Yellow	4.0	0.0	4.0	4.0	0.0	4.0									
Red	1.0	0.0	1.0	1.0	0.0	1.0									
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6	3	8	7	4				
Case Number				2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0				
Phase Duration, s				13.0	35.0	16.0	38.0	14.0	33.0	11.0	30.0				
Change Period, (Y+R _c), s				5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s				3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.3				
Queue Clearance Time (g _s), s				7.5	23.5	8.6	22.0	9.9	5.0	4.2	6.5				
Green Extension Time (g _e), s				0.0	3.0	0.0	3.4	0.1	0.4	0.0	0.4				
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability				1.00	0.53	1.00	0.40	0.34	0.00	1.00	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h				104	857	96	128	840	41	161	46	66	45	28	95
Adjusted Saturation Flow Rate (s), veh/h/ln				1767	1724	1544	1767	1724	1547	1810	1856	1532	1810	1856	1566
Queue Service Time (g _s), s				5.5	21.5	4.3	6.6	20.0	1.7	7.9	1.7	3.0	2.2	1.1	4.5
Cycle Queue Clearance Time (g _c), s				5.5	21.5	4.3	6.6	20.0	1.7	7.9	1.7	3.0	2.2	1.1	4.5
Green Ratio (g/C)				0.08	0.32	0.32	0.12	0.35	0.35	0.15	0.29	0.29	0.06	0.26	0.26
Capacity (c), veh/h				149	1089	487	205	1198	537	267	547	452	114	488	412
Volume-to-Capacity Ratio (X)				0.701	0.787	0.196	0.627	0.701	0.077	0.603	0.083	0.147	0.390	0.058	0.229
Back of Queue (Q), ft/ln (95 th percentile)				129.9	366.2	69	140.5	334.6	27	163.1	33.7	49.8	45.5	21.7	74.4
Back of Queue (Q), veh/ln (95 th percentile)				5.1	14.0	2.8	5.5	12.8	1.1	6.5	1.3	1.9	1.8	0.8	3.0
Queue Storage Ratio (RQ) (95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d ₁), s/veh				42.3	29.6	23.7	40.0	26.7	20.8	37.9	24.2	24.7	42.7	26.2	27.4
Incremental Delay (d ₂), s/veh				11.8	3.6	0.1	4.5	1.6	0.0	2.7	0.0	0.1	0.8	0.0	0.1
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh				54.1	33.2	23.8	44.6	28.3	20.8	40.6	24.2	24.8	43.5	26.2	27.6
Level of Service (LOS)				D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS				34.4	C		30.1	C		34.0	C		31.6	C	
Intersection Delay, s/veh / LOS				32.4						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS				1.36	A		1.32	A		0.94	A		0.76	A	

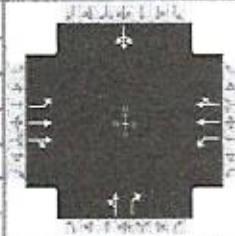
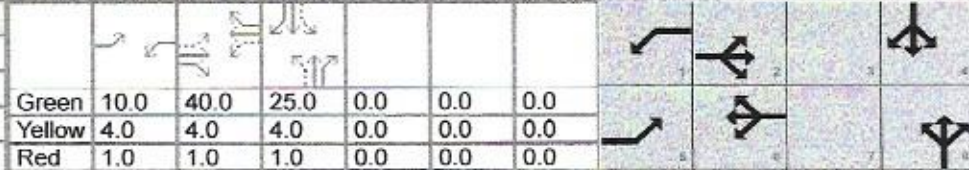
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information											
Agency		Solaegui Engineers				Duration, h		0.250									
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other							
Jurisdiction		NDOT		Time Period		AM Peak Hour		PHF		0.92							
Urban Street				Analysis Year		2041 Base + Project		Analysis Period		1> 7:00							
Intersection		US-50 & Casey		File Name		UsCa41aw.xus											
Project Description																	
Demand Information						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h						47	657	80	80	706	28	174	34	115	59	38	42
Signal Information																	
Cycle, s	90.0	Reference Phase	2														
Offset, s	0	Reference Point	End														
Uncoordinated	Yes	Simult. Gap E/W	On	Green	7.0	30.0	6.0	2.0	25.0	0.0							
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	4.0	0.0							
				Red	1.0	1.0	1.0	0.0	1.0	0.0							
Timer Results						EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase						5	2	1	6	3	8	7	4				
Case Number						2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0				
Phase Duration, s						12.0	35.0	12.0	35.0	13.0	32.0	11.0	30.0				
Change Period, (Y+R c), s						5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s						3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.3				
Queue Clearance Time (g s), s						4.5	17.7	6.3	19.2	11.0	7.1	5.1	3.7				
Green Extension Time (g e), s						0.0	3.6	0.0	3.4	0.1	0.4	0.0	0.4				
Phase Call Probability						1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability						1.00	0.12	1.00	0.17	1.00	0.00	1.00	0.00				
Movement Group Results						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h						51	714	76	87	767	25	189	37	114	64	41	40
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1724	1545	1767	1724	1545	1810	1856	1532	1810	1856	1567
Queue Service Time (g s), s						2.5	15.7	3.1	4.3	17.2	1.0	9.0	1.3	5.1	3.1	1.5	1.7
Cycle Queue Clearance Time (g c), s						2.5	15.7	3.1	4.3	17.2	1.0	9.0	1.3	5.1	3.1	1.5	1.7
Green Ratio (g/C)						0.08	0.33	0.33	0.08	0.33	0.33	0.14	0.30	0.30	0.07	0.28	0.28
Capacity (c), veh/h						137	1149	515	137	1149	515	261	557	460	121	515	435
Volume-to-Capacity Ratio (X)						0.372	0.621	0.148	0.633	0.668	0.049	0.724	0.066	0.248	0.532	0.080	0.092
Back of Queue (Q), ft/ln (95 th percentile)						49.4	270.3	49.1	96.4	292.8	15.6	198.1	25.2	82.3	63.9	29.2	27.9
Back of Queue (Q), veh/ln (95 th percentile)						1.9	10.3	2.0	3.8	11.2	0.6	7.9	1.0	3.2	2.6	1.1	1.1
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh						39.4	25.2	21.0	40.3	25.7	20.3	36.8	22.5	23.8	40.6	24.0	24.1
Incremental Delay (d 2), s/veh						0.6	0.8	0.0	7.0	1.2	0.0	8.3	0.0	0.1	2.3	0.0	0.0
Initial Queue Delay (d 3), s/veh						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh						40.0	26.0	21.1	47.3	26.9	20.3	45.1	22.5	23.9	43.0	24.0	24.1
Level of Service (LOS)						D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS						26.4	C		28.8	C		35.5	D		32.4	C	
Intersection Delay, s/veh / LOS						29.1						C					
Multimodal Results						EB			WB			NB			SB		
Pedestrian LOS Score / LOS						2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS						1.18	A		1.21	A		1.05	A		0.73	A	

HCS7 Signalized Intersection Results Summary

General Information					Intersection Information											
Agency	Solaegui Engineers				Duration, h	0.250										
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other									
Jurisdiction	NDOT		Time Period	PM Peak Hour		PHF	0.92									
Urban Street			Analysis Year	2041 Base + Project		Analysis Period	1> 7:00									
Intersection	US-50 & Casey		File Name	UsCa41pw.xus												
Project Description																
Demand Information					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					96	793	178	149	776	43	195	49	85	42	36	97
Signal Information																
Cycle, s	95.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On													
Green	8.0	3.0	30.0	6.0	3.0	25.0										
Yellow	4.0	0.0	4.0	4.0	0.0	4.0										
Red	1.0	0.0	1.0	1.0	0.0	1.0										
Timer Results					EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					5	2	1	6	3	8	7	4				
Case Number					2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0				
Phase Duration, s					13.0	35.0	16.0	38.0	14.0	33.0	11.0	30.0				
Change Period, (Y+R c), s					5.0	5.0	5.0	5.0	0.0	5.0	5.0	5.0				
Max Allow Headway (MAH), s					3.1	3.1	3.1	3.1	3.1	3.3	3.1	3.3				
Queue Clearance Time (g s), s					7.5	23.7	10.5	22.1	12.7	6.0	4.3	6.5				
Green Extension Time (g e), s					0.0	3.1	0.0	3.6	0.1	0.5	0.0	0.5				
Phase Call Probability					1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability					1.00	0.58	1.00	0.44	1.00	0.00	1.00	0.00				
Movement Group Results					EB			WB			NB			SB		
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h					104	862	183	162	843	41	212	53	87	46	39	95
Adjusted Saturation Flow Rate (s), veh/h/ln					1767	1724	1544	1767	1724	1547	1810	1856	1532	1810	1856	1566
Queue Service Time (g s), s					5.5	21.7	8.7	8.5	20.1	1.7	10.7	2.0	4.0	2.3	1.5	4.5
Cycle Queue Clearance Time (g c), s					5.5	21.7	8.7	8.5	20.1	1.7	10.7	2.0	4.0	2.3	1.5	4.5
Green Ratio (g/C)					0.08	0.32	0.32	0.12	0.35	0.35	0.15	0.29	0.29	0.06	0.26	0.26
Capacity (c), veh/h					149	1089	487	205	1198	537	267	547	452	114	488	412
Volume-to-Capacity Ratio (X)					0.701	0.792	0.375	0.791	0.704	0.077	0.795	0.097	0.193	0.399	0.080	0.229
Back of Queue (Q), ft/ln (95 th percentile)					129.9	369.6	140.3	207.5	336.3	27	240.3	39.4	66.2	46.7	30.2	74.4
Back of Queue (Q), veh/ln (95 th percentile)					5.1	14.1	5.6	8.1	12.8	1.1	9.6	1.5	2.6	1.9	1.2	3.0
Queue Storage Ratio (RQ) (95 th percentile)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh					42.3	29.6	25.2	40.9	26.8	20.8	39.1	24.3	25.0	42.8	26.3	27.4
Incremental Delay (d 2), s/veh					11.8	3.7	0.2	17.4	1.6	0.0	14.1	0.0	0.1	0.8	0.0	0.1
Initial Queue Delay (d 3), s/veh					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh					54.1	33.4	25.4	58.3	28.4	20.8	53.2	24.4	25.1	43.6	26.4	27.6
Level of Service (LOS)					D	C	C	E	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS					34.0	C		32.7	C		41.9	D		31.4	C	
Intersection Delay, s/veh / LOS					34.4						C					
Multimodal Results					EB			WB			NB			SB		
Pedestrian LOS Score / LOS					2.12	B		2.12	B		2.44	B		2.45	B	
Bicycle LOS Score / LOS					1.44	A		1.35	A		1.07	A		0.78	A	

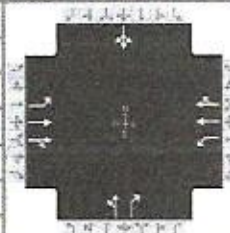
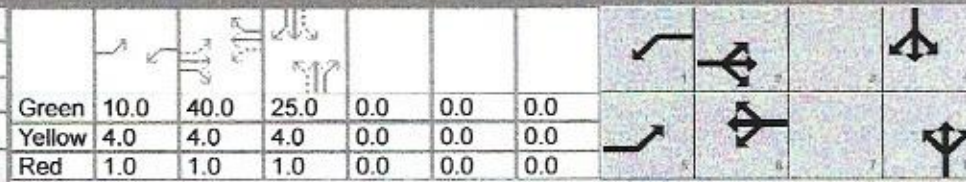
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information											
Agency		Solaegui Engineers				Duration, h		0.250									
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other							
Jurisdiction		NDOT		Time Period		AM Peak Hour		PHF		0.92							
Urban Street				Analysis Year		Existing		Analysis Period		1> 7:00							
Intersection		US-50 & Allen		File Name		UsAI21ax.xus											
Project Description																	
Demand Information						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h						65	825	170	70	665	10	150	45	60	25	25	65
Signal Information																	
Cycle, s	90.0	Reference Phase	2														
Offset, s	0	Reference Point	End														
Uncoordinated	Yes	Simult. Gap E/W	On														
Force Mode	Fixed	Simult. Gap N/S	On														
Timer Results						EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase						5	2	1	6		8		4				
Case Number						1.1	4.0	1.1	4.0		7.0		8.0				
Phase Duration, s						15.0	45.0	15.0	45.0		30.0		30.0				
Change Period, (Y+R c), s						5.0	5.0	5.0	5.0		5.0		5.0				
Max Allow Headway (MAH), s						3.1	3.1	3.1	3.1		3.3		3.3				
Queue Clearance Time (g s), s						3.7	23.3	3.8	14.8		13.7		6.8				
Green Extension Time (g e), s						0.0	3.6	0.0	3.9		0.6		0.7				
Phase Call Probability						1.00	1.00	1.00	1.00		1.00		1.00				
Max Out Probability						0.01	0.10	0.01	0.02		0.00		0.00				
Movement Group Results						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h						71	541	508	76	368	366		212	54		114	
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1811	1698	1767	1811	1799		1389	1531		1607	
Queue Service Time (g s), s						1.7	21.3	21.3	1.8	12.7	12.8		6.9	2.4		0.0	
Cycle Queue Clearance Time (g c), s						1.7	21.3	21.3	1.8	12.7	12.8		11.7	2.4		4.8	
Green Ratio (g/C)						0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28	
Capacity (c), veh/h						478	805	754	375	805	800		457	425		496	
Volume-to-Capacity Ratio (X)						0.148	0.673	0.673	0.203	0.457	0.457		0.464	0.128		0.230	
Back of Queue (Q), ft/ln (95 th percentile)						27.2	355.3	322.4	29.5	227.1	215.7		173.3	39		84.8	
Back of Queue (Q), veh/ln (95 th percentile)						1.1	13.6	12.9	1.2	8.7	8.6		6.8	1.5		3.3	
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d 1), s/veh						10.6	19.8	19.8	12.8	17.4	17.4		27.7	24.3		25.2	
Incremental Delay (d 2), s/veh						0.1	1.8	1.9	0.1	0.2	0.2		0.3	0.0		0.1	
Initial Queue Delay (d 3), s/veh						0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh						10.7	21.6	21.7	12.9	17.6	17.6		27.9	24.4		25.3	
Level of Service (LOS)						B	C	C	B	B	B		C	C		C	
Approach Delay, s/veh / LOS						21.0		C	17.1		B	27.2		C	25.3		C
Intersection Delay, s/veh / LOS						20.6						C					
Multimodal Results						EB			WB			NB			SB		
Pedestrian LOS Score / LOS						1.92		B	1.69		B	2.28		B	2.33		B
Bicycle LOS Score / LOS						1.41		A	1.16		A	0.93		A	0.68		A

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information									
Agency	Solaegui Engineers					Duration, h	0.250								
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other								
Jurisdiction	NDOT		Time Period	PM Peak Hour		PHF	0.92								
Urban Street			Analysis Year	Existing		Analysis Period	1> 7:00								
Intersection	US-50 & Allen		File Name	UsAl21px.xus											
Project Description															
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				60	810	125	90	785	35	210	60	85	35	45	80
Signal Information															
Cycle, s	90.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
Green	10.0	40.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Red	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6		8		4				
Case Number				1.1	4.0	1.1	4.0		7.0		8.0				
Phase Duration, s				15.0	45.0	15.0	45.0		30.0		30.0				
Change Period, (Y+R _c), s				5.0	5.0	5.0	5.0		5.0		5.0				
Max Allow Headway (MAH), s				3.1	3.1	3.1	3.1		3.3		3.3				
Queue Clearance Time (g _s), s				3.5	21.4	4.3	18.2		20.9		8.7				
Green Extension Time (g _e), s				0.0	3.9	0.1	4.0		0.5		1.1				
Phase Call Probability				1.00	1.00	1.00	1.00		1.00		1.00				
Max Out Probability				0.01	0.08	0.03	0.05		0.64		0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h				65	507	482	98	443	437		293	76		158	
Adjusted Saturation Flow Rate (s), veh/h/ln				1767	1811	1724	1767	1811	1786		1314	1531		1656	
Queue Service Time (g _s), s				1.5	19.4	19.4	2.3	16.2	16.2		12.2	3.4		0.0	
Cycle Queue Clearance Time (g _c), s				1.5	19.4	19.4	2.3	16.2	16.2		18.9	3.4		6.7	
Green Ratio (g/C)				0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28	
Capacity (c), veh/h				428	805	766	393	805	794		436	425		510	
Volume-to-Capacity Ratio (X)				0.152	0.629	0.629	0.249	0.551	0.551		0.673	0.179		0.309	
Back of Queue (Q), ft/ln (95 th percentile)				25	325.7	299.1	38.4	277.1	261.6		258.1	55.5		120.5	
Back of Queue (Q), veh/ln (95 th percentile)				1.0	12.4	12.0	1.5	10.6	10.5		10.1	2.2		4.7	
Queue Storage Ratio (RQ) (95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh				11.3	19.3	19.3	12.5	18.4	18.4		30.5	24.7		25.9	
Incremental Delay (d ₂), s/veh				0.1	1.2	1.3	0.1	0.5	0.5		3.3	0.1		0.1	
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh				11.3	20.5	20.5	12.6	18.9	18.9		33.8	24.8		26.0	
Level of Service (LOS)				B	C	C	B	B	B		C	C		C	
Approach Delay, s/veh / LOS				19.9	B		18.2	B		31.9	C		26.0	C	
Intersection Delay, s/veh / LOS				21.4						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				1.92	B		1.70	B		2.30	B		2.32	B	
Bicycle LOS Score / LOS				1.36	A		1.29	A		1.10	A		0.75	A	

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information									
Agency	Solaegui Engineers					Duration, h	0.250								
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other								
Jurisdiction	NDOT		Time Period	AM Peak Hour		PHF	0.92								
Urban Street			Analysis Year	Existing + Project		Analysis Period	1> 7:00								
Intersection	US-50 & Allen		File Name	UsAI21aw.xus											
Project Description															
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				65	852	172	90	674	10	156	47	125	25	26	66
Signal Information															
Cycle, s	90.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On		Green	10.0	40.0	25.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On		Yellow	4.0	4.0	4.0	0.0	0.0	0.0				
				Red	1.0	1.0	1.0	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6		8		4				
Case Number				1.1	4.0	1.1	4.0		7.0		8.0				
Phase Duration, s				15.0	45.0	15.0	45.0		30.0		30.0				
Change Period, (Y+R _c), s				5.0	5.0	5.0	5.0		5.0		5.0				
Max Allow Headway (MAH), s				3.1	3.1	3.1	3.1		3.3		3.3				
Queue Clearance Time (g _s), s				3.7	24.2	4.3	15.0		14.3		6.9				
Green Extension Time (g _e), s				0.0	3.7	0.1	4.0		0.8		0.9				
Phase Call Probability				1.00	1.00	1.00	1.00		1.00		1.00				
Max Out Probability				0.01	0.12	0.03	0.03		0.01		0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h				71	557	523	98	373	371		221	125		116	
Adjusted Saturation Flow Rate (s), veh/h/ln				1767	1811	1699	1767	1811	1799		1384	1531		1612	
Queue Service Time (g _s), s				1.7	22.2	22.2	2.3	13.0	13.0		7.5	5.8		0.0	
Cycle Queue Clearance Time (g _c), s				1.7	22.2	22.2	2.3	13.0	13.0		12.3	5.8		4.9	
Green Ratio (g/C)				0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28	
Capacity (c), veh/h				474	805	755	367	805	800		455	425		497	
Volume-to-Capacity Ratio (X)				0.149	0.692	0.693	0.267	0.463	0.463		0.485	0.294		0.234	
Back of Queue (Q), ft/ln (95 th percentile)				27.2	369.6	335.9	38.5	230.3	218.7		181.9	94.4		86.6	
Back of Queue (Q), veh/ln (95 th percentile)				1.1	14.1	13.4	1.5	8.8	8.7		7.1	3.7		3.4	
Queue Storage Ratio (RQ) (95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh				10.6	20.1	20.1	13.4	17.5	17.5		27.9	25.6		25.2	
Incremental Delay (d ₂), s/veh				0.1	2.1	2.3	0.1	0.2	0.2		0.3	0.1		0.1	
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh				10.7	22.2	22.4	13.6	17.6	17.6		28.2	25.7		25.3	
Level of Service (LOS)				B	C	C	B	B	B		C	C		C	
Approach Delay, s/veh / LOS				21.6		C	17.2		B	27.3		C	25.3		C
Intersection Delay, s/veh / LOS				21.1					C						
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				1.92		B	1.69		B	2.28		B	2.33		B
Bicycle LOS Score / LOS				1.44		A	1.18		A	1.06		A	0.68		A

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information									
Agency	Solaegui Engineers					Duration, h	0.250								
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other								
Jurisdiction	NDOT		Time Period	PM Peak Hour		PHF	0.92								
Urban Street			Analysis Year	Existing + Project		Analysis Period	1> 7:00								
Intersection	US-50 & Allen		File Name	UsAI21pw.xus											
Project Description															
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				61	828	131	158	816	35	213	61	125	35	48	80
Signal Information															
Cycle, s	90.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On												
Force Mode	Fixed	Simult. Gap N/S	On												
				Green	10.0	40.0	25.0	0.0	0.0	0.0	0.0				
				Yellow	4.0	4.0	4.0	0.0	0.0	0.0	0.0				
				Red	1.0	1.0	1.0	0.0	0.0	0.0	0.0				
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6		8		4				
Case Number				1.1	4.0	1.1	4.0		7.0		8.0				
Phase Duration, s				15.0	45.0	15.0	45.0		30.0		30.0				
Change Period, (Y+R _c), s				5.0	5.0	5.0	5.0		5.0		5.0				
Max Allow Headway (MAH), s				3.1	3.1	3.1	3.1		3.3		3.3				
Queue Clearance Time (g _s), s				3.6	22.2	6.3	19.0		21.4		8.8				
Green Extension Time (g _e), s				0.0	4.1	0.1	4.2		0.6		1.2				
Phase Call Probability				1.00	1.00	1.00	1.00		1.00		1.00				
Max Out Probability				0.01	0.10	0.54	0.06		0.87		0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h				66	520	495	172	460	454		298	120		161	
Adjusted Saturation Flow Rate (s), veh/h/ln				1767	1811	1722	1767	1811	1787		1306	1531		1662	
Queue Service Time (g _s), s				1.6	20.2	20.2	4.3	17.0	17.0		12.6	5.5		0.0	
Cycle Queue Clearance Time (g _c), s				1.6	20.2	20.2	4.3	17.0	17.0		19.4	5.5		6.8	
Green Ratio (g/C)				0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28	
Capacity (c), veh/h				418	805	765	386	805	794		434	425		511	
Volume-to-Capacity Ratio (X)				0.159	0.647	0.647	0.445	0.572	0.572		0.686	0.281		0.315	
Back of Queue (Q), ft/ln (95 th percentile)				25.6	337.3	309.3	70.9	289.7	273.6		264.1	89.9		123.2	
Back of Queue (Q), veh/ln (95 th percentile)				1.0	12.9	12.4	2.8	11.1	10.9		10.3	3.5		4.8	
Queue Storage Ratio (RQ) (95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh				11.5	19.5	19.5	13.8	18.6	18.6		30.7	25.5		25.9	
Incremental Delay (d ₂), s/veh				0.1	1.4	1.5	0.3	0.6	0.6		3.7	0.1		0.1	
Initial Queue Delay (d ₃), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh				11.6	20.9	21.0	14.1	19.2	19.3		34.5	25.6		26.1	
Level of Service (LOS)				B	C	C	B	B	B		C	C		C	
Approach Delay, s/veh / LOS				20.4	C		18.4	B		31.9	C		26.1	C	
Intersection Delay, s/veh / LOS				21.7						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				1.92	B		1.70	B		2.30	B		2.32	B	
Bicycle LOS Score / LOS				1.38	A		1.38	A		1.18	A		0.75	A	

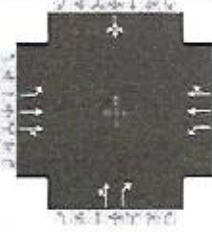
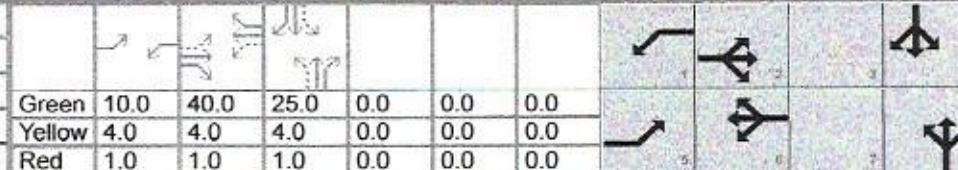
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Solaegui Engineers				Duration, h		0.250											
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other									
Jurisdiction		NDOT		Time Period		AM Peak Hour		PHF		0.92									
Urban Street				Analysis Year		2041 Base		Analysis Period		1> 7:00									
Intersection		US-50 & Allen		File Name		UsAl41ax.xus													
Project Description																			
Demand Information						EB			WB			NB			SB				
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R		
Demand (v), veh/h						73	930	192	79	750	11	169	51	68	28	28	73		
Signal Information																			
Cycle, s	90.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	Yes	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
Green						10.0	40.0	25.0	0.0	0.0	0.0								
Yellow						4.0	4.0	4.0	0.0	0.0	0.0								
Red						1.0	1.0	1.0	0.0	0.0	0.0								
Timer Results						EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT						
Assigned Phase						5	2	1	6		8		4						
Case Number						1.1	4.0	1.1	4.0		7.0		8.0						
Phase Duration, s						15.0	45.0	15.0	45.0		30.0		30.0						
Change Period, (Y+R c), s						5.0	5.0	5.0	5.0		5.0		5.0						
Max Allow Headway (MAH), s						3.1	3.1	3.1	3.1		3.3		3.3						
Queue Clearance Time (g s), s						3.9	27.6	4.0	16.9		15.7		7.5						
Green Extension Time (g e), s						0.0	3.9	0.1	4.6		0.7		0.8						
Phase Call Probability						1.00	1.00	1.00	1.00		1.00		1.00						
Max Out Probability						0.01	0.27	0.02	0.06		0.02		0.00						
Movement Group Results						EB			WB			NB			SB				
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R		
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14		
Adjusted Flow Rate (v), veh/h						79	612	575	86	415	412		239	63		129			
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1811	1695	1767	1811	1799		1373	1531		1617			
Queue Service Time (g s), s						1.9	25.5	25.6	2.0	14.9	14.9		8.3	2.8		0.0			
Cycle Queue Clearance Time (g c), s						1.9	25.5	25.6	2.0	14.9	14.9		13.7	2.8		5.5			
Green Ratio (g/C)						0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28			
Capacity (c), veh/h						445	805	753	341	805	800		452	425		499			
Volume-to-Capacity Ratio (X)						0.178	0.761	0.763	0.252	0.515	0.516		0.529	0.148		0.259			
Back of Queue (Q), ft/ln (95 th percentile)						30.8	424.9	387.4	33.6	257.4	244.4		200.4	45.6		97.2			
Back of Queue (Q), veh/ln (95 th percentile)						1.2	16.2	15.5	1.3	9.8	9.8		7.8	1.8		3.8			
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00			
Uniform Delay (d 1), s/veh						11.1	21.0	21.0	14.5	18.0	18.0		28.4	24.5		25.4			
Incremental Delay (d 2), s/veh						0.1	3.8	4.2	0.1	0.3	0.3		0.6	0.1		0.1			
Initial Queue Delay (d 3), s/veh						0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0			
Control Delay (d), s/veh						11.2	24.8	25.2	14.7	18.3	18.3		29.0	24.5		25.5			
Level of Service (LOS)						B	C	C	B	B	B		C	C		C			
Approach Delay, s/veh / LOS						24.1		C	17.9		B	28.1		C	25.5		C		
Intersection Delay, s/veh / LOS						22.5						C							
Multimodal Results						EB			WB			NB			SB				
Pedestrian LOS Score / LOS						1.92		B	1.69		B	2.28		B	2.33		B		
Bicycle LOS Score / LOS						1.53		B	1.24		A	0.99		A	0.70		A		

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information											
Agency	Solaegui Engineers					Duration, h	0.250										
Analyst	MSH		Analysis Date	Apr 20, 2021		Area Type	Other										
Jurisdiction	NDOT		Time Period	PM Peak Hour		PHF	0.92										
Urban Street			Analysis Year	2041 Base		Analysis Period	1> 7:00										
Intersection	US-50 & Allen		File Name	UsA141px.xus													
Project Description																	
Demand Information						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h						68	913	141	101	885	40	237	68	96	40	51	90
Signal Information																	
Cycle, s	90.0	Reference Phase	2														
Offset, s	0	Reference Point	End														
Uncoordinated	Yes	Simult. Gap E/W	On														
Force Mode	Fixed	Simult. Gap N/S	On														
Timer Results						EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase						5	2	1	6		8		4				
Case Number						1.1	4.0	1.1	4.0		7.0		8.0				
Phase Duration, s						15.0	45.0	15.0	45.0		30.0		30.0				
Change Period, (Y+R _c), s						5.0	5.0	5.0	5.0		5.0		5.0				
Max Allow Headway (MAH), s						3.1	3.1	3.1	3.1		3.3		3.3				
Queue Clearance Time (g _s), s						3.7	25.2	4.6	21.1		25.3		9.8				
Green Extension Time (g _e), s						0.0	4.4	0.1	4.7		0.0		1.2				
Phase Call Probability						1.00	1.00	1.00	1.00		1.00		1.00				
Max Out Probability						0.01	0.21	0.06	0.13		1.00		0.00				
Movement Group Results						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h						74	573	545	110	501	494		332	88		180	
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1811	1722	1767	1811	1785		1262	1531		1676	
Queue Service Time (g _s), s						1.7	23.1	23.2	2.6	19.1	19.1		15.5	4.0		0.0	
Cycle Queue Clearance Time (g _c), s						1.7	23.1	23.2	2.6	19.1	19.1		23.3	4.0		7.8	
Green Ratio (g/C)						0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28	
Capacity (c), veh/h						394	805	765	359	805	793		422	425		515	
Volume-to-Capacity Ratio (X)						0.187	0.712	0.713	0.306	0.622	0.622		0.786	0.207		0.350	
Back of Queue (Q), ft/ln (95 th percentile)						28.6	384.4	353.2	43.5	321.2	303		315.2	64.7		140	
Back of Queue (Q), veh/ln (95 th percentile)						1.1	14.7	14.1	1.7	12.3	12.1		12.3	2.5		5.5	
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh						12.1	20.3	20.3	14.0	19.2	19.2		32.3	24.9		26.3	
Incremental Delay (d ₂), s/veh						0.1	2.5	2.7	0.2	1.1	1.1		8.7	0.1		0.2	
Initial Queue Delay (d ₃), s/veh						0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh						12.2	22.9	23.0	14.2	20.3	20.3		41.1	25.0		26.4	
Level of Service (LOS)						B	C	C	B	C	C		D	C		C	
Approach Delay, s/veh / LOS						22.3		C	19.7		B	37.7		D	26.4		C
Intersection Delay, s/veh / LOS						23.8						C					
Multimodal Results						EB			WB			NB			SB		
Pedestrian LOS Score / LOS						1.92		B	1.70		B	2.30		B	2.32		B
Bicycle LOS Score / LOS						1.47		A	1.40		A	1.18		A	0.79		A

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information															
Agency		Solaegui Engineers				Duration, h		0.250													
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other											
Jurisdiction		NDOT		Time Period		AM Peak Hour		PHF		0.92											
Urban Street				Analysis Year		2041 Base + Project		Analysis Period		1> 7:00											
Intersection		US-50 & Allen		File Name		UsA141aw.xus															
Project Description																					
Demand Information						EB			WB			NB			SB						
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h						73	957	194	99	759	11	175	53	133	28	29	74				
Signal Information																					
Cycle, s		90.0	Reference Phase		2																
Offset, s		0	Reference Point		End																
Uncoordinated		Yes	Simult. Gap E/W		On																
Force Mode		Fixed	Simult. Gap N/S		On																
						Green	10.0	40.0	25.0	0.0	0.0	0.0	0.0								
						Yellow	4.0	4.0	4.0	0.0	0.0	0.0	0.0								
						Red	1.0	1.0	1.0	0.0	0.0	0.0	0.0								
Timer Results						EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						5		2		1		6				8				4	
Case Number						1.1		4.0		1.1		4.0				7.0				8.0	
Phase Duration, s						15.0		45.0		15.0		45.0				30.0				30.0	
Change Period, (Y+R _c), s						5.0		5.0		5.0		5.0				5.0				5.0	
Max Allow Headway (MAH), s						3.1		3.1		3.1		3.1				3.3				3.3	
Queue Clearance Time (g _s), s						3.9		28.7		4.6		17.1				16.4				7.6	
Green Extension Time (g _e), s						0.0		3.9		0.1		4.7				0.8				1.0	
Phase Call Probability						1.00		1.00		1.00		1.00				1.00				1.00	
Max Out Probability						0.01		0.33		0.05		0.07				0.05				0.00	
Movement Group Results						EB			WB			NB			SB						
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14				
Adjusted Flow Rate (v), veh/h						79	628	591	108	420	417		248	134		132					
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1811	1697	1767	1811	1800		1371	1531		1622					
Queue Service Time (g _s), s						1.9	26.5	26.7	2.6	15.1	15.1		8.8	6.2		0.0					
Cycle Queue Clearance Time (g _c), s						1.9	26.5	26.7	2.6	15.1	15.1		14.4	6.2		5.6					
Green Ratio (g/C)						0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28					
Capacity (c), veh/h						442	805	754	333	805	800		451	425		500					
Volume-to-Capacity Ratio (X)						0.179	0.780	0.783	0.323	0.522	0.522		0.549	0.314		0.263					
Back of Queue (Q), ft/ln (95 th percentile)						30.8	442.2	404.6	42.8	260.8	247.7		208.2	101.6		99					
Back of Queue (Q), veh/ln (95 th percentile)						1.2	16.9	16.2	1.7	10.0	9.9		8.1	4.0		3.9					
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00					
Uniform Delay (d ₁), s/veh						11.2	21.3	21.3	15.5	18.1	18.1		28.7	25.7		25.5					
Incremental Delay (d ₂), s/veh						0.1	4.5	4.9	0.2	0.3	0.3		0.8	0.2		0.1					
Initial Queue Delay (d ₃), s/veh						0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0					
Control Delay (d), s/veh						11.2	25.8	26.2	15.7	18.4	18.4		29.5	25.9		25.6					
Level of Service (LOS)						B	C	C	B	B	B		C	C		C					
Approach Delay, s/veh / LOS						25.1		C	18.1		B	28.2		C	25.6		C				
Intersection Delay, s/veh / LOS						23.1						C									
Multimodal Results						EB			WB			NB			SB						
Pedestrian LOS Score / LOS						1.92		B	1.69		B	2.28		B	2.33		B				
Bicycle LOS Score / LOS						1.56		B	1.27		A	1.12		A	0.70		A				

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information											
Agency		Solaegui Engineers				Duration, h		0.250									
Analyst		MSH		Analysis Date		Apr 20, 2021		Area Type		Other							
Jurisdiction		NDOT		Time Period		PM Peak Hour		PHF		0.92							
Urban Street				Analysis Year		2041 Base + Proejct		Analysis Period		1> 7:00							
Intersection		US-50 & Allen		File Name		UsA141pw.xus											
Project Description																	
Demand Information						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h						69	931	147	169	916	40	240	69	136	40	54	90
Signal Information																	
Cycle, s	90.0	Reference Phase	2														
Offset, s	0	Reference Point	End														
Uncoordinated	Yes	Simult. Gap E/W	On														
Force Mode	Fixed	Simult. Gap N/S	On														
						Green	10.0	40.0	25.0	0.0	0.0	0.0	0.0				
						Yellow	4.0	4.0	4.0	0.0	0.0	0.0	0.0				
						Red	1.0	1.0	1.0	0.0	0.0	0.0	0.0				
Timer Results						EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase						5	2	1	6		8		4				
Case Number						1.1	4.0	1.1	4.0		7.0		8.0				
Phase Duration, s						15.0	45.0	15.0	45.0		30.0		30.0				
Change Period, (Y+R _c), s						5.0	5.0	5.0	5.0		5.0		5.0				
Max Allow Headway (MAH), s						3.1	3.1	3.1	3.1		3.3		3.3				
Queue Clearance Time (g _s), s						3.8	26.0	6.6	22.0		25.9		9.9				
Green Extension Time (g _e), s						0.0	4.5	0.1	4.8		0.0		1.3				
Phase Call Probability						1.00	1.00	1.00	1.00		1.00		1.00				
Max Out Probability						0.01	0.26	0.78	0.16		1.00		0.00				
Movement Group Results						EB			WB			NB			SB		
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement						5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h						75	587	558	184	518	511		336	132		184	
Adjusted Saturation Flow Rate (s), veh/h/ln						1767	1811	1720	1767	1811	1786		1253	1531		1682	
Queue Service Time (g _s), s						1.8	24.0	24.0	4.6	20.0	20.0		16.0	6.1		0.0	
Cycle Queue Clearance Time (g _c), s						1.8	24.0	24.0	4.6	20.0	20.0		23.9	6.1		7.9	
Green Ratio (g/C)						0.56	0.44	0.44	0.56	0.44	0.44		0.28	0.28		0.28	
Capacity (c), veh/h						385	805	764	352	805	794		419	425		517	
Volume-to-Capacity Ratio (X)						0.195	0.729	0.730	0.522	0.643	0.643		0.801	0.309		0.355	
Back of Queue (Q), ft/ln (95 th percentile)						29.1	397.7	365.7	78	335.1	316.2		324.1	99.8		142.8	
Back of Queue (Q), veh/ln (95 th percentile)						1.1	15.2	14.6	3.0	12.8	12.6		12.7	3.9		5.6	
Queue Storage Ratio (RQ) (95 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	
Uniform Delay (d ₁), s/veh						12.4	20.5	20.6	15.9	19.4	19.4		32.6	25.7		26.3	
Incremental Delay (d ₂), s/veh						0.1	2.9	3.1	0.7	1.4	1.4		9.9	0.2		0.2	
Initial Queue Delay (d ₃), s/veh						0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Control Delay (d), s/veh						12.5	23.5	23.7	16.6	20.8	20.8		42.5	25.8		26.5	
Level of Service (LOS)						B	C	C	B	C	C		D	C		C	
Approach Delay, s/veh / LOS						22.9	C		20.2	C		37.8	D		26.5	C	
Intersection Delay, s/veh / LOS						24.3						C					
Multimodal Results						EB			WB			NB			SB		
Pedestrian LOS Score / LOS						1.92	B		1.70	B		2.30	B		2.32	B	
Bicycle LOS Score / LOS						1.49	A		1.49	A		1.26	A		0.79	A	

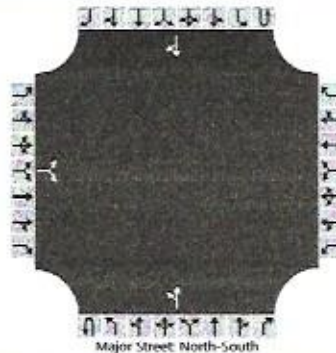
HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH	Intersection	Allen/Birch
Agency/Co.	Solaegui Engineers	Jurisdiction	Churchill County
Date Performed	4/20/2021	East/West Street	Birch Lane
Analysis Year	2021	North/South Street	Allen Road
Time Analyzed	AM Existing	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Site Information

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		18		23						4	301				217	2
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			45							4						
Capacity, c (veh/h)			617							1323						
v/c Ratio			0.07							0.00						
95% Queue Length, Q ₉₅ (veh)			0.2							0.0						
Control Delay (s/veh)			11.3							7.7						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		11.3								0.1						
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

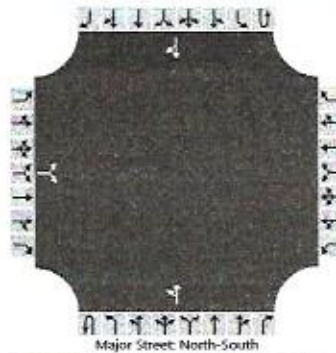
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/20/2021
Analysis Year	2021
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Allen/Birch
Jurisdiction	Churchill County
East/West Street	Birch Lane
North/South Street	Allen Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR								LT					TR
Volume (veh/h)		24		7						15	256				230	17
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			34							16						
Capacity, c (veh/h)			520							1289						
v/c Ratio			0.06							0.01						
95% Queue Length, Q ₉₅ (veh)			0.2							0.0						
Control Delay (s/veh)			12.4							7.8						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		12.4								0.5						
Approach LOS		B														

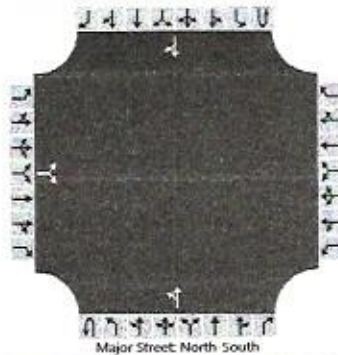
HCS7 Two-Way Stop-Control Report

General Information

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Agency/Co.	Solaegui Engineers	Jurisdiction	Churchill County
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Time Analyzed	AM Existing + Project	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Site Information

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		91		76						21	301				217	25
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			182							23						
Capacity, c (veh/h)			550							1295						
v/c Ratio			0.33							0.02						
95% Queue Length, Q ₉₅ (veh)			1.4							0.1						
Control Delay (s/veh)			14.7							7.8						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	14.7								0.7							
Approach LOS	B															

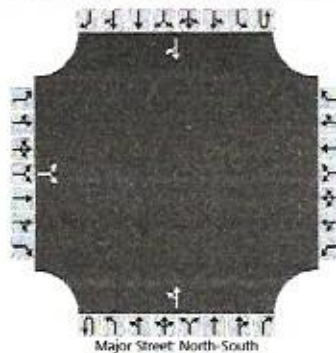
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General Information

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Agency/Co.	Solaegui Engineers	Jurisdiction	Churchill County
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Time Analyzed	PM Existing + Project	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Site Information

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		68		41						72	256				230	94
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			118							78						
Capacity, c (veh/h)			441							1201						
v/c Ratio			0.27							0.07						
95% Queue Length, Q ₉₅ (veh)			1.1							0.2						
Control Delay (s/veh)			16.1							8.2						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)		16.1								2.3						
Approach LOS		C														

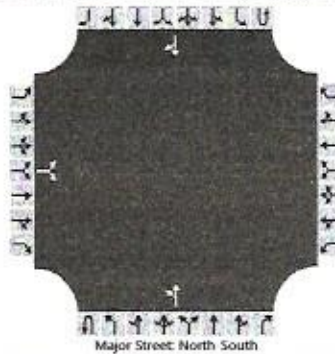
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Agency/Co.	Solaegui Engineers	Jurisdiction	Churchill County
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Analysis Year	2041	North/South Street	Allen Road
Time Analyzed	AM Base	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Site Information

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		20		26						5	339				245	2
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage					Undivided											

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			50							5						
Capacity, c (veh/h)			574							1289						
v/c Ratio			0.09							0.00						
95% Queue Length, Q ₉₅ (veh)			0.3							0.0						
Control Delay (s/veh)			11.9							7.8						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	11.9								0.2							
Approach LOS	B															

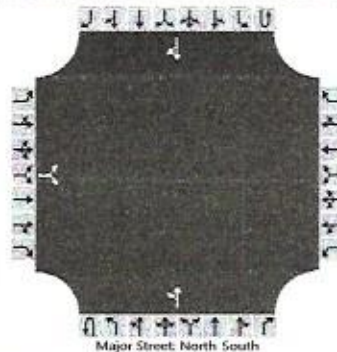
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General Information

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Agency/Co.	Solaegui Engineers	Jurisdiction	Churchill County
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Analysis Year	2041	North/South Street	Allen Road
Time Analyzed	PM Base	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Site Information

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		27		8						17	289				259	19
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
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Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			38							18						
Capacity, c (veh/h)			475							1253						
v/c Ratio			0.08							0.01						
95% Queue Length, Q ₉₅ (veh)			0.3							0.0						
Control Delay (s/veh)			13.2							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	13.2								0.6							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

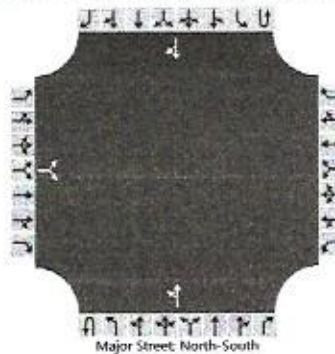
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/20/2021
Analysis Year	2041
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Allen/Birch
Jurisdiction	Churchill County
East/West Street	Birch Lane
North/South Street	Allen Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		93		79						22	339				245	25
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
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Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

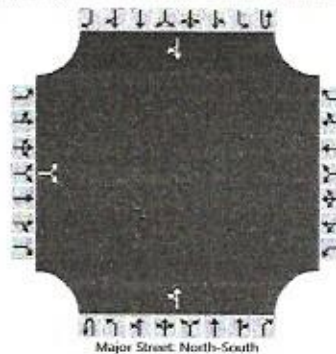
Flow Rate, v (veh/h)			187							24						
Capacity, c (veh/h)			507							1262						
v/c Ratio			0.37							0.02						
95% Queue Length, Q ₉₅ (veh)			1.7							0.1						
Control Delay (s/veh)			16.2							7.9						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	16.2								0.7							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

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Analysis Year	2041	North/South Street	Allen Road
Time Analyzed	PM Base + Project	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	10	1	2	3	40	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		71		42						74	289				259	96
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
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Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			123							80						
Capacity, c (veh/h)			401							1167						
v/c Ratio			0.31							0.07						
95% Queue Length, Q ₉₅ (veh)			1.3							0.2						
Control Delay (s/veh)			17.9							8.3						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	17.9								2.2							
Approach LOS	C															

SOLAEGUI ENGINEERS

April 29, 2022

Dean Patterson
Churchill County Planning Director
dpatterson@churchillcounty.gov

Re: Old Stone Ranch Traffic Study Addendum Letter

Dear Dean:

This letter contains the findings of our traffic engineering review of the updated Old Stone Ranch site plan. A copy of the updated site plan is attached. On April 27, 2021 a full traffic study was issued for the property. The title was Sandcreek and Birch Lane Traffic Study. The land uses for that project included 175 single family homes, 102 duplexes, 300 multifamily dwelling units, a minim storage facility containing 194 units and an RV storage facility containing 53 spaces. Based on ITE land use descriptions trip generation for the duplex units was calculated as single family units. The updated site plan now contains 113 single family dwelling units, 98 townhomes and 408 apartments. The storage facilities were eliminate.

Trip generation calculations for the new site plan are based on the Eleventh Edition of *ITE Trip Generation* (2021). ITE land uses #210 "Single Family Detached Housing" and #220 "Multifamily Housing (Low Rise) Not Close to Rail Transit" were utilized in the analysis. Table 1 shows the trip generation summary for the new plan with trip totals compared against the volumes shown in the original traffic study.

TABLE 1
TRIP GENERATION

<u>LAND USE</u>	<u>ADT</u>	<u>AM PEAK HOUR TOTAL</u>	<u>PM PEAK HOUR TOTAL</u>
Original Traffic Study	5,073	349	450
Updated Site Plan Single Family Housing 113 Dwelling Units	1,066	79	106
Multifamily Housing 506 Dwelling Units	3,319	202	258
Updated Plan Subtotal	4,385	281	364
Change	-688	-68	-86

As indicated in Table 1, trip generation totals from the original traffic study include 5,073 average daily trips with 349 AM peak hour trips and 450 PM peak hour trips. Trip generation totals for the new updated site plan include 4,385 average daily trips with 281 AM peak hour trips and 364 PM peak hour trips. The new updated site plan results in 688 fewer average daily trips, 68 less AM peak hour trips and 86 fewer PM peak hour trips. In all three time period the new updated site plan generates less traffic than the original traffic study land uses.

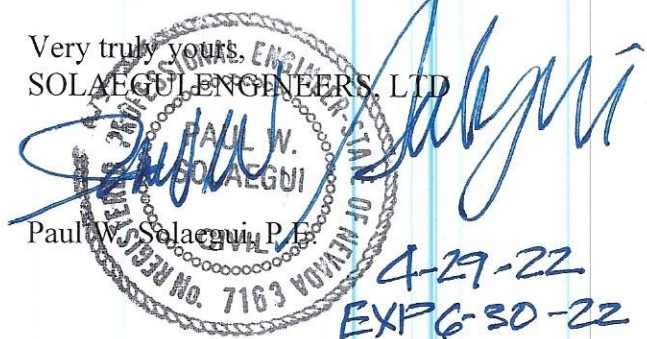
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The updated site plan results in less traffic generation. This equates to less traffic impacts. Because the original study showed acceptable traffic operation for each the existing, existing plus project, year 2041 base and year 2041 base plus project scenarios build out of the updated site plan will result in better traffic operation.

We trust that this information will be helpful to you. Please contact us if you have questions or comments.

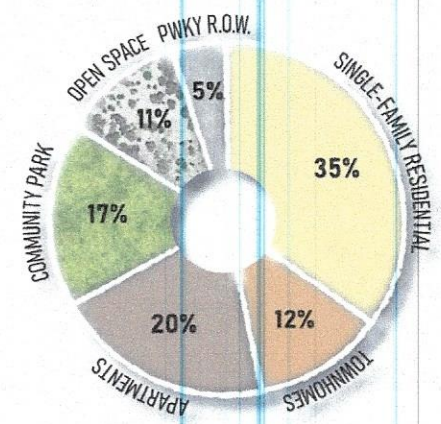
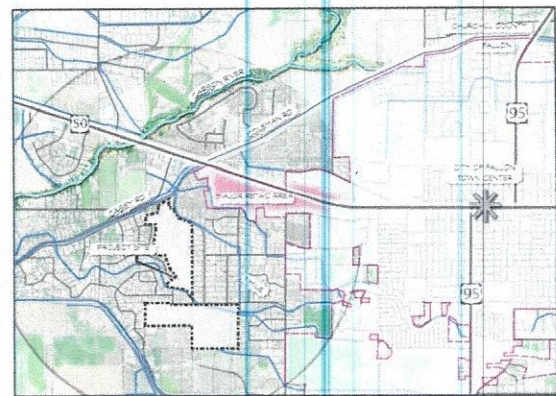
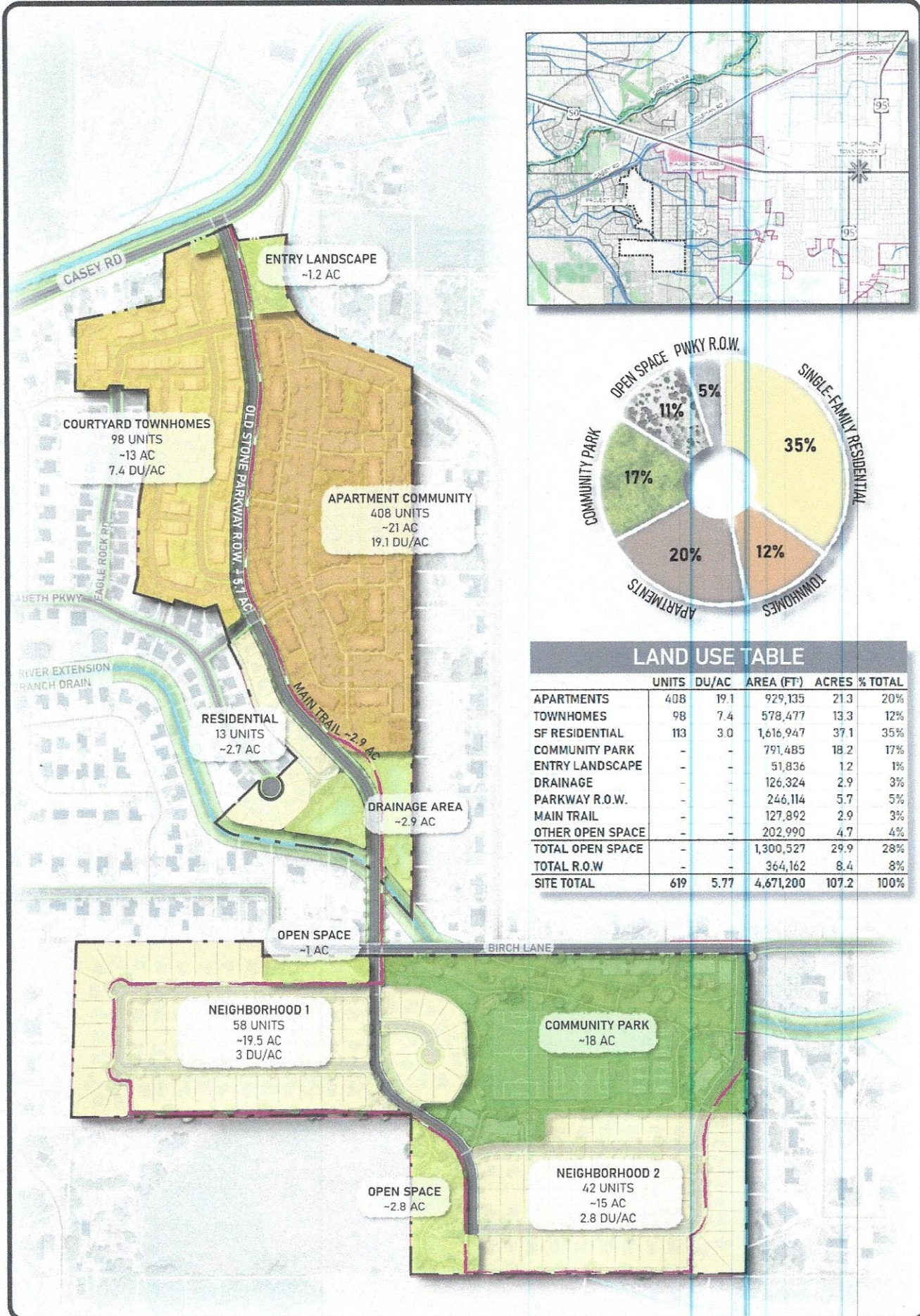
Very truly yours,
SOLAEGUI ENGINEERS, LTD

Paul W. Solaequi, P.E.



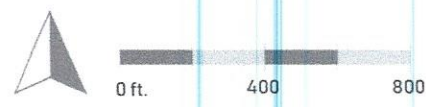
Enclosures

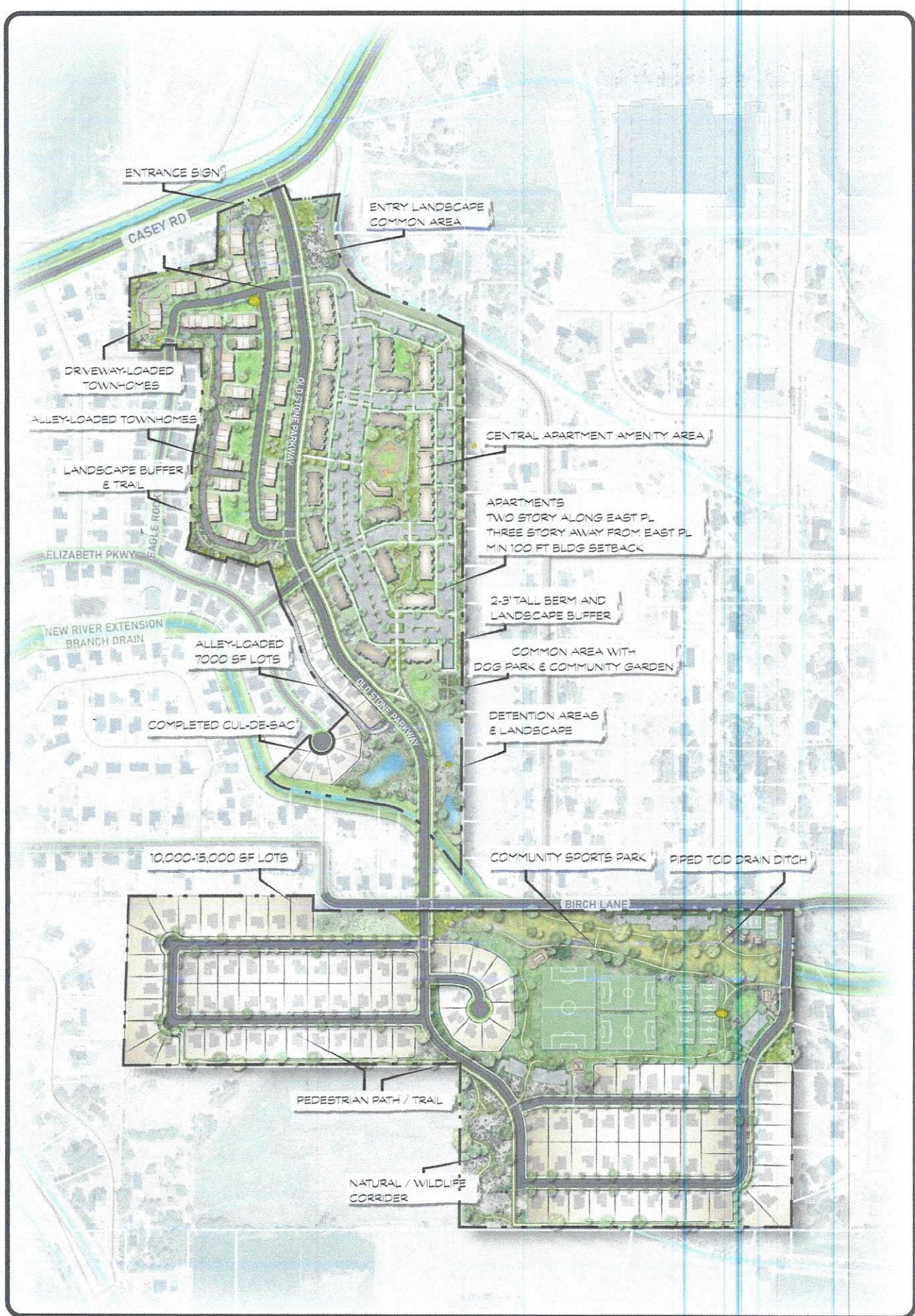
Letters/Old Stone Ranch Traffic Update Letter



LAND USE TABLE					
	UNITS	DU/AC	AREA (FT ²)	ACRES	% TOTAL
APARTMENTS	408	19.1	929,135	21.3	20%
TOWNHOMES	98	7.4	578,477	13.3	12%
SF RESIDENTIAL	113	3.0	1,616,947	37.1	35%
COMMUNITY PARK	-	-	791,485	18.2	17%
ENTRY LANDSCAPE	-	-	51,836	1.2	1%
DRAINAGE	-	-	126,324	2.9	3%
PARKWAY R.O.W.	-	-	246,114	5.7	5%
MAIN TRAIL	-	-	127,892	2.9	3%
OTHER OPEN SPACE	-	-	202,990	4.7	4%
TOTAL OPEN SPACE	-	-	1,300,527	29.9	28%
TOTAL R.O.W.	-	-	364,162	8.4	8%
SITE TOTAL	619	5.77	4,671,200	107.2	100%

OLD STONE RANCH LAND USE BREAKDOWN





OLD STONE RANCH

Overall Site Plan



0 ft. 400 800

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 174

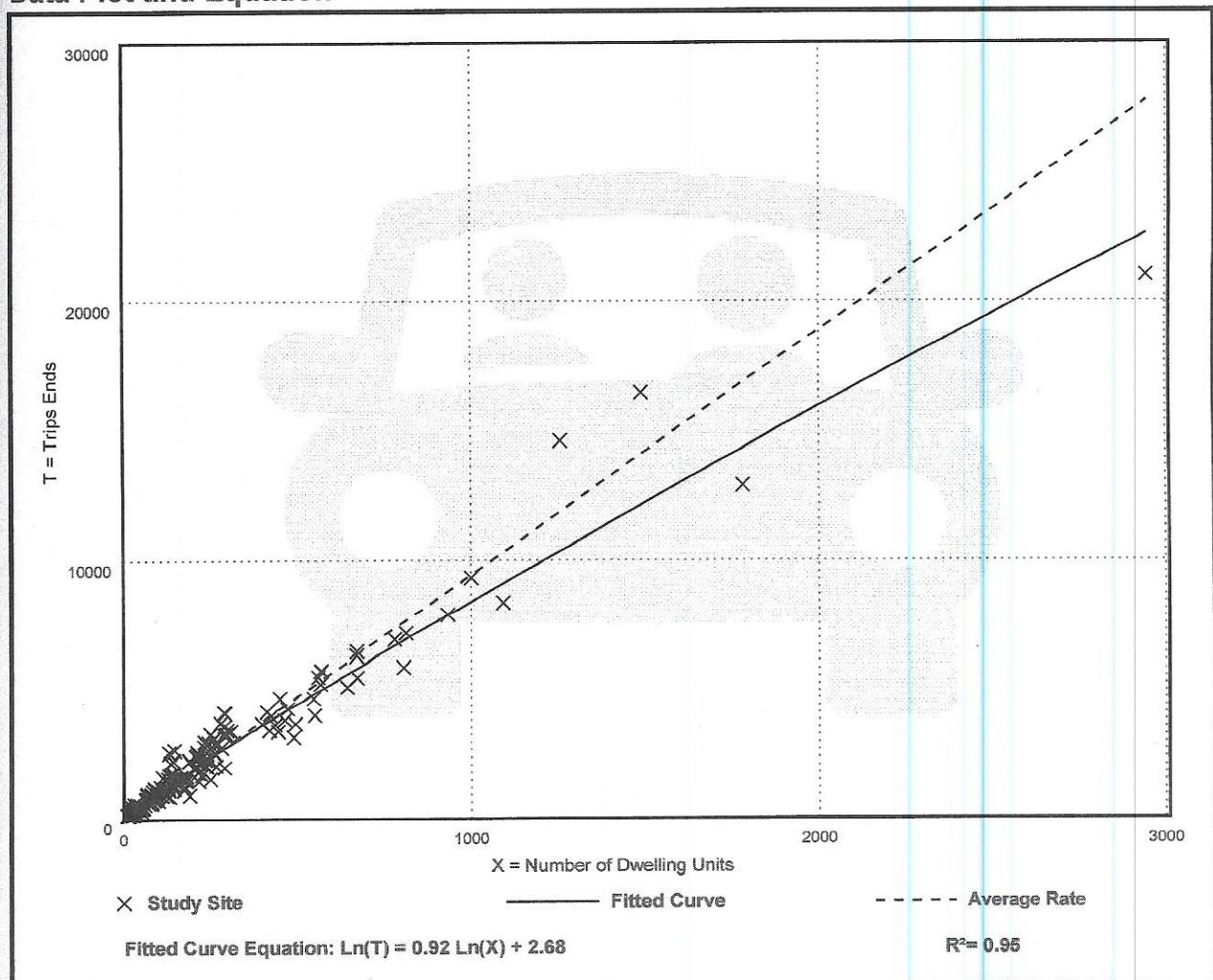
Avg. Num. of Dwelling Units: 246

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



$$T = 113(9.43) = 1,066$$

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

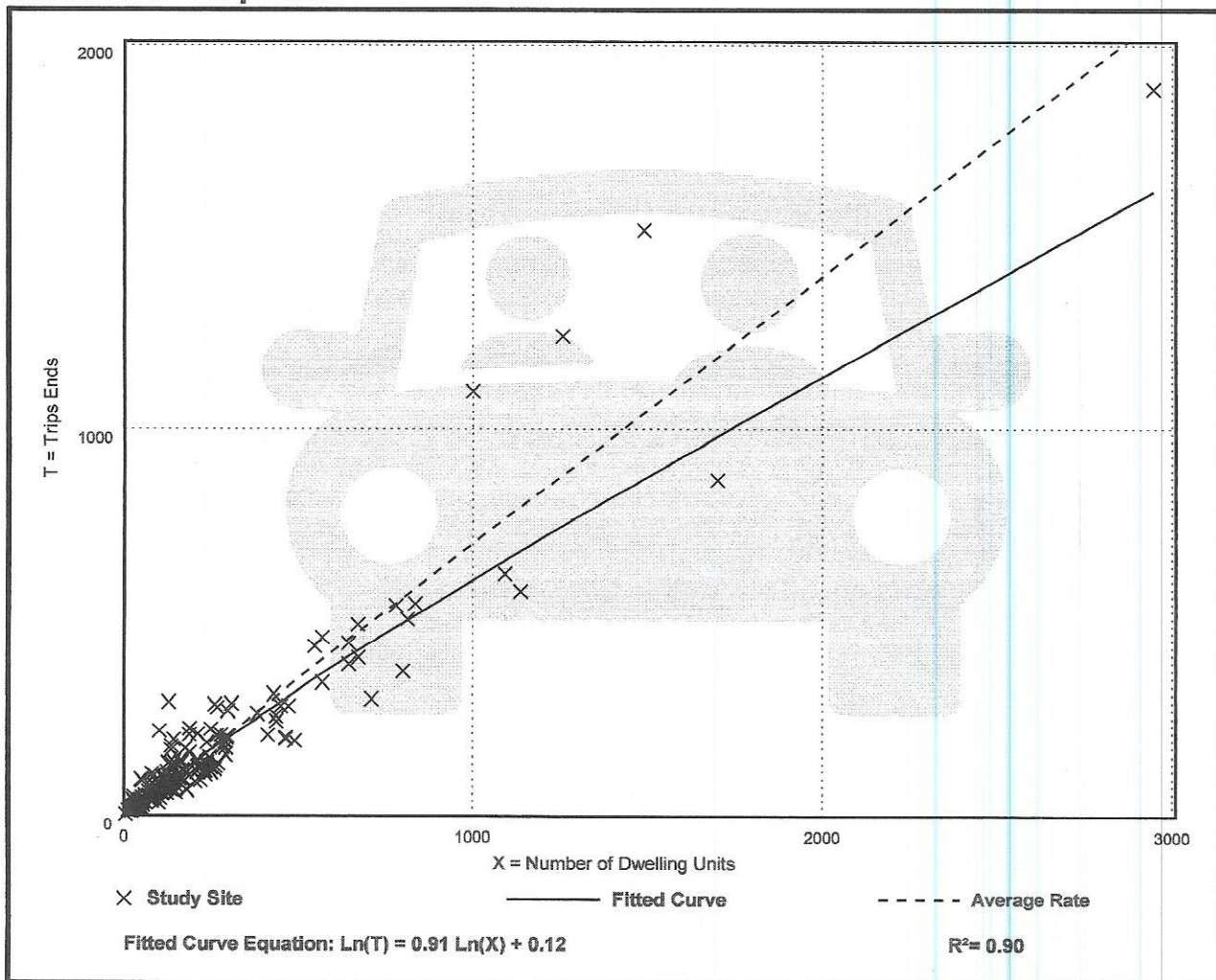
Avg. Num. of Dwelling Units: 226

Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



$$T = 113 (0.70) = 79$$

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

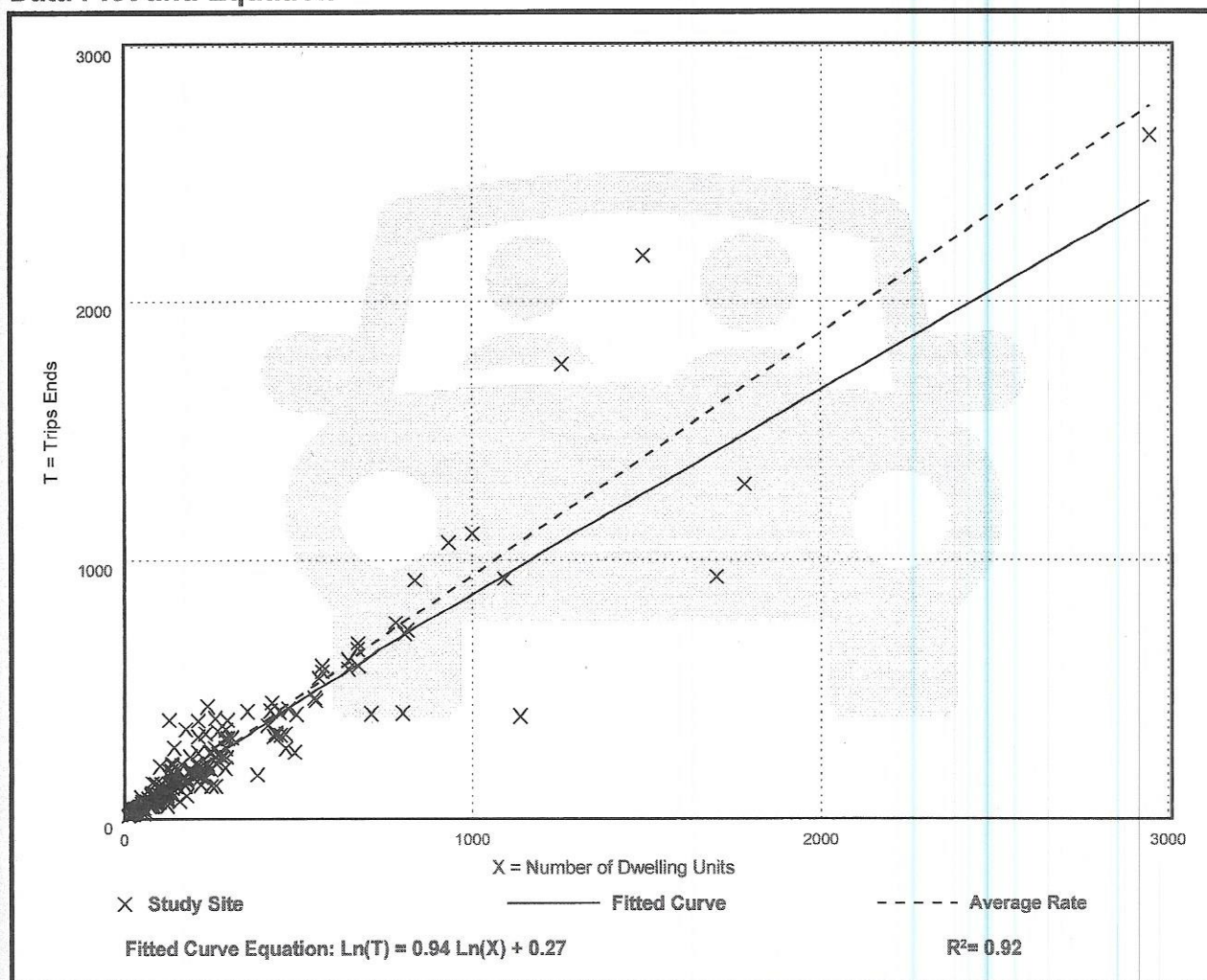
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



$$T = 113(0.94) = 106$$

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 22

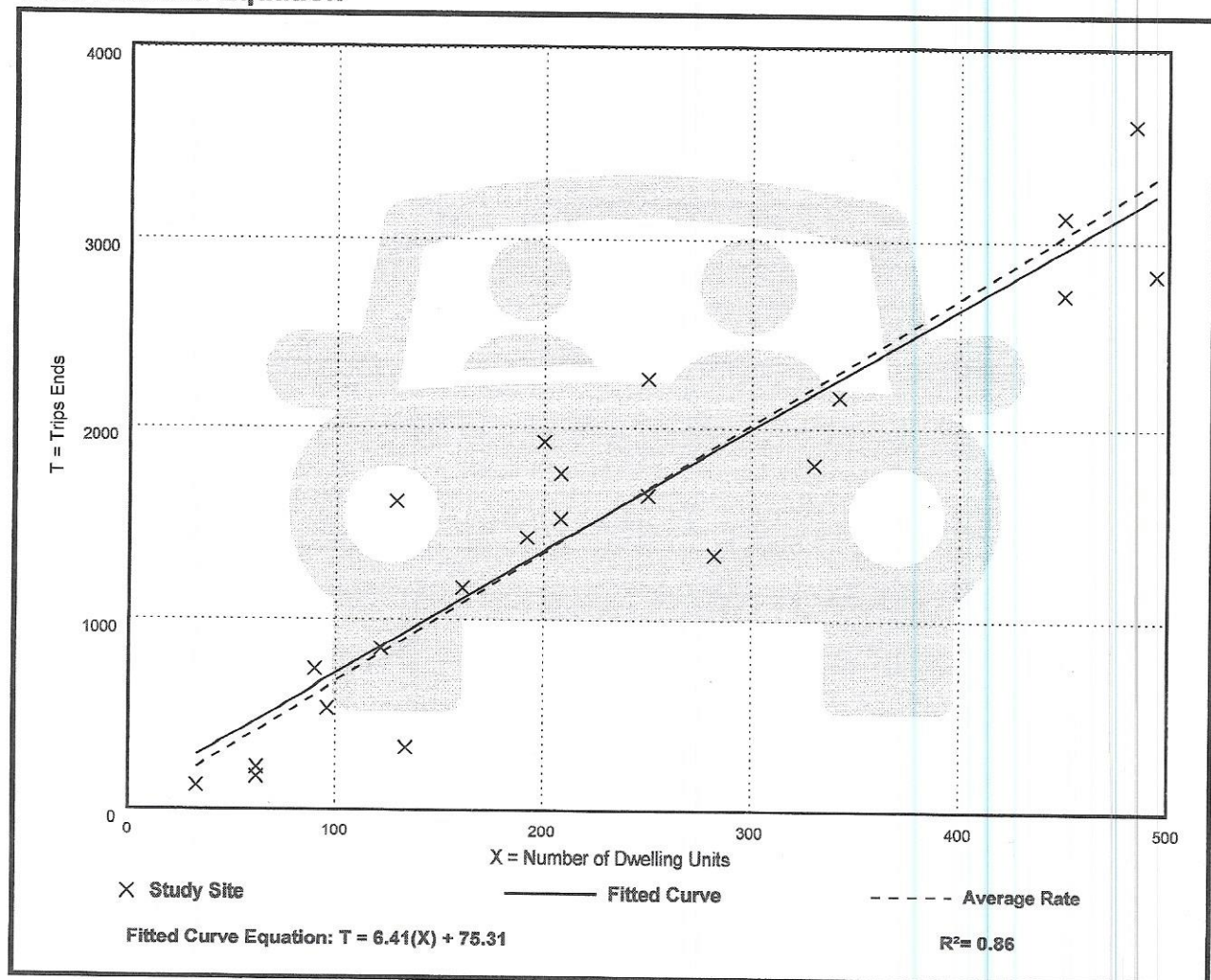
Avg. Num. of Dwelling Units: 229

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



$$T = 6.41(506) + 75.31 = 3,319$$

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 49

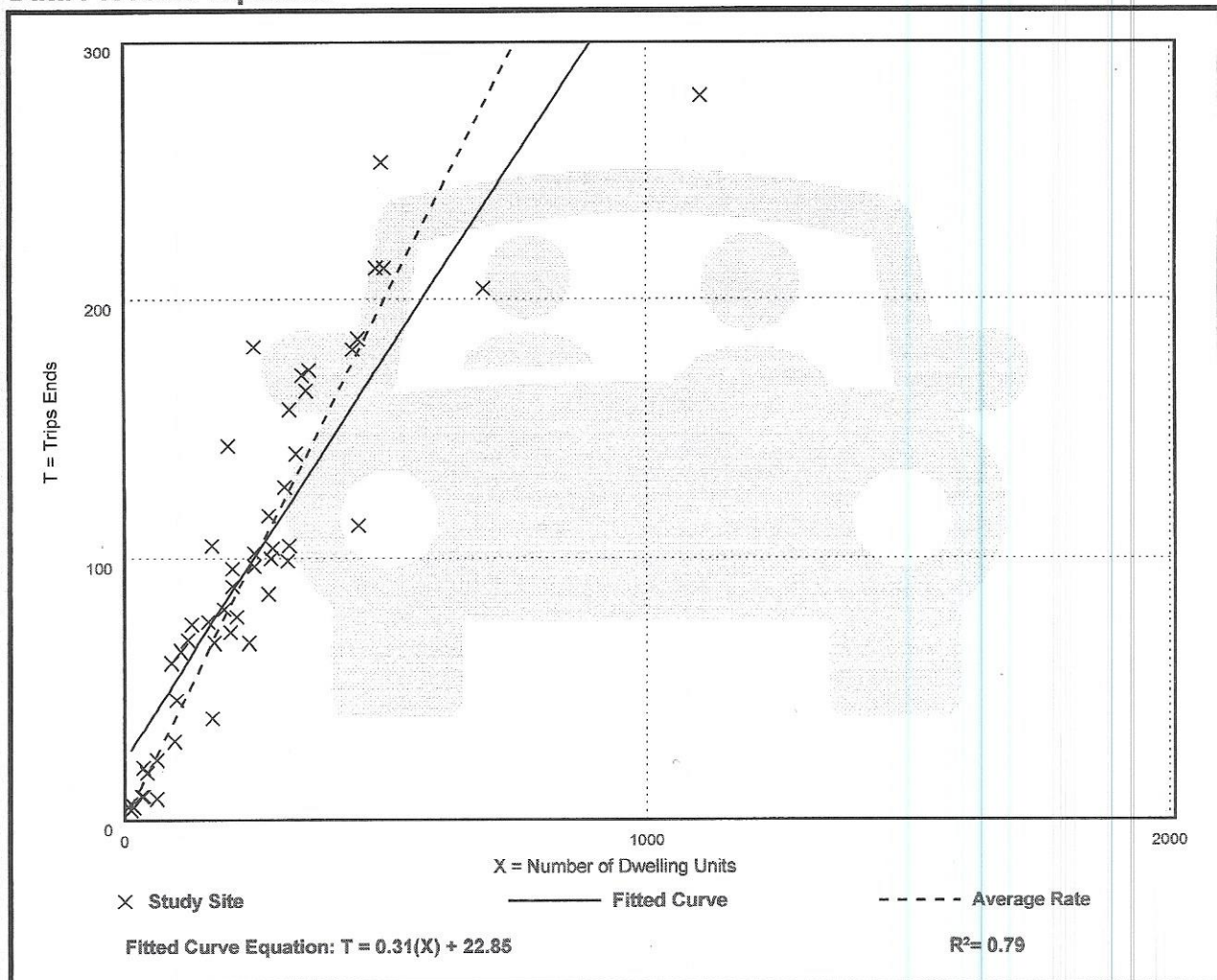
Avg. Num. of Dwelling Units: 249

Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



$$T = 506(0.40) = 202$$

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 59

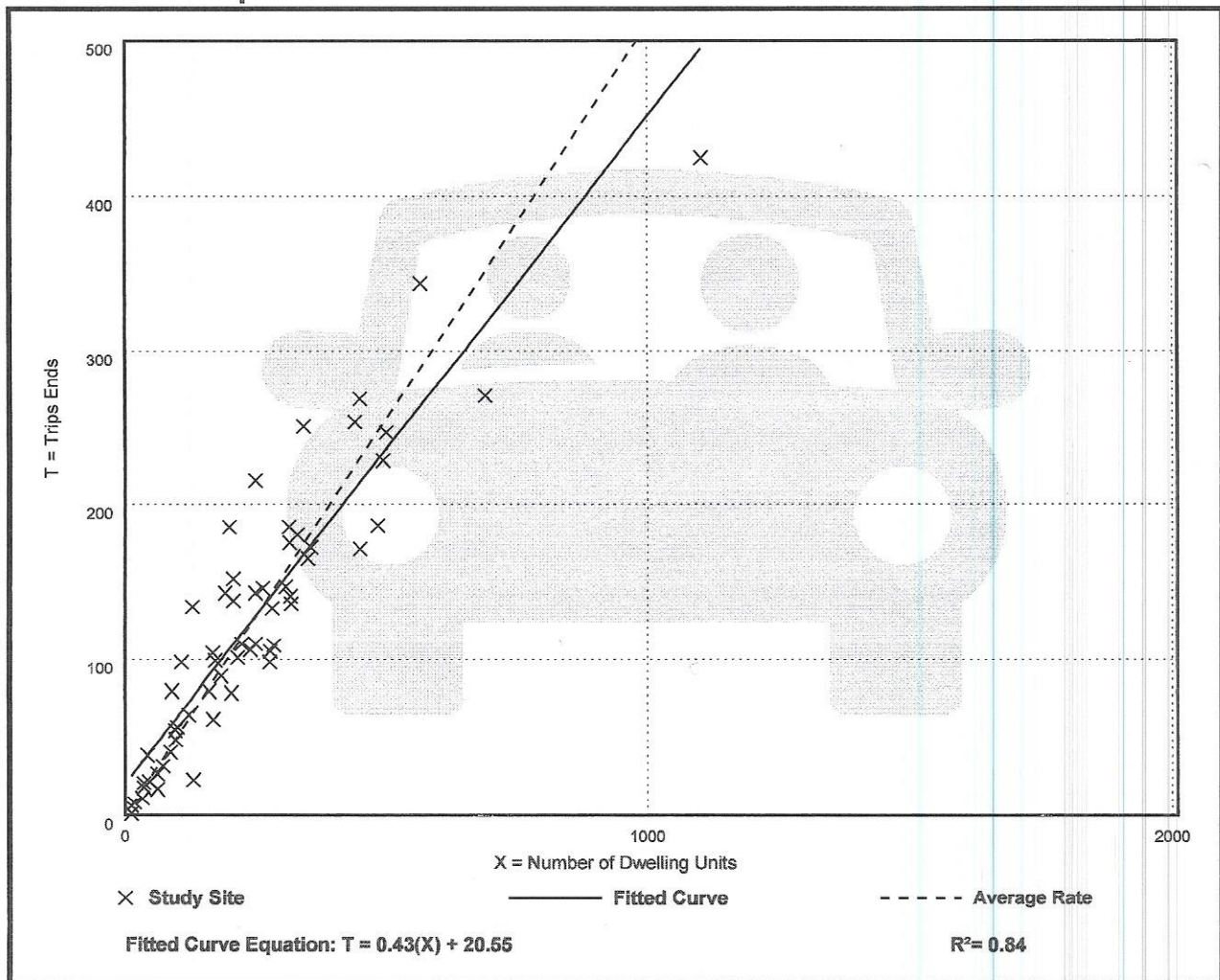
Avg. Num. of Dwelling Units: 241

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



$$T = 506(0.51) = 258$$

SOLAEGUI
ENGINEERS

August 11, 2022

Dean Patterson
Churchill County Planning Director
dpatterson@churchillcounty.gov

RE: Old Stone Ranch Traffic Study Addendum Letter

Dear Dean:

This letter addendum is in response to traffic engineering comments received from planning commissioners at the recent Churchill County Planning Commission meeting regarding Old Stone Ranch. At that meeting planning commissioners asked for expanded traffic engineering analysis to include the Casey Road / Old Stone Parkway intersection. This letter addendum to the original April 27, 2021 traffic study provides the requested additional analysis at that location. This letter addendum addresses traffic capacity analysis of the Casey Road / Old Stone Parkway intersection with AM and PM peak hour review for the existing plus project and 2041 base plus project scenarios. The intersection does not currently exist so there are no existing or 2041 base scenario calculations. Figures 2, 3, 4B, 5, 6 and 7 from the April 27, 2021 report are the basis of this addendum analysis. Copies of those figures are included in the attachments to this letter. Results from the capacity analysis of the new intersection are presented. The need for additional left lanes at the new intersection is addressed.

The original traffic study was the source of information regarding the amount of project traffic anticipated to use the Casey Road / Old Stone Parkway intersection. The project trip assignment figure from that report is attached. It shows the AM and PM peak hour trips calculated at that intersection. The opposing traffic on Casey Road is taken from Figures 4B, 5, 6 and 7 for the existing, existing plus project, 2041 base and 2041 base plus project traffic volumes and is summarized in Table 1. The Casey Road through volumes are taken from south approach of the Casey Road / US-50 intersection volumes presented in the original report. There is a commercial driveway just south of US-50 but north of the Old Stone Parkway intersection location so the actual Old Stone Parkway / Casey Road intersection through volumes will likely be less south of the adjacent commercial driveway than at the signalized intersection approach. These higher volumes will result in conservative results slightly over predicting the actual delay.

On April 29, 2022 a traffic study addendum letter was issued that addressed site plan changes between April 27, 2021 and April 29, 2022. The outcome was that the 2022 site plan resulted in 688 fewer average daily trips with 68 less AM and 86 fewer PM peak hour trips than the 2021 site plan. The 2021 traffic analysis was based on slightly higher traffic volumes than those anticipated from the 2022 plan. The 2021 analysis slightly over predicts traffic delay at the key intersections.

TABLE 1 PEAK HOUR TRAFFIC VOLUMES										
MOVEMENT	PROJECT TRIP ASSIGNMENT		EXISTING		EXISTING + PROJECT		2041 BASE		2041 BASE + PROJECT	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Northbound Left	27	16	0	0	27	16	0	0	27	16
Northbound Right	111	73	0	0	111	73	0	0	111	73
Westbound Left	37	121	0	0	37	121	0	0	37	121
Westbound Thru	0	0	143	215	143	215	161	242	161	242
Eastbound Right	8	28	0	0	8	28	0	0	8	28
Eastbound Thru	0	0	188	227	188	227	212	256	212	256

Using these volumes the Casey Road / Old Stone Parkway intersection was subsequently analyzed for capacity for the various study scenarios and study years. Table 2 shows the intersection level of service and delay results with detailed calculations for the existing plus project and 2041 base plus project scenarios. The capacity worksheets are attached.

TABLE 2 LEVEL OF SERVICE AND DELAY RESULTS CASEY ROAD / OLD STONE PARKWAY INTERSECTION								
MOVEMENT	EXISTING		EXISTING + PROJECT		2042 BASE		2042 BASE + PROJECT	
	AM	PM	AM	PM	AM	PM	AM	PM
Westbound Northbound *No conflicting traffic	A0* A0*	A0* A0*	A1.8 B10.9	A3.5 B11.8	A0* A0*	A0* A0*	A1.7 B11.2	A3.4 B12.3

The Casey Road / Old Stone Parkway intersection was analyzed as an unsignalized tee intersection with stop sign control on the Old Stone Parkway approach. The intersection major movements operate at LOS B or better for the existing plus project scenarios. For the 2041 base plus project traffic volumes the level of service remains B or better for the AM and PM peak hours. The intersection was analyzed with a single lane on each approach for all scenarios. Based on the fact that the northbound to westbound left turn movement operates at level of service B or better for all with project scenarios an exclusive left turn lane is not recommended for that turning movement at this time.

The need for a Casey Road westbound to southbound left turn lane at the Old Stone Parkway intersection was evaluated. Based Nevada Department of Transportation access management criteria a westbound Casey Road left turn lane is warranted. A minimum of 240 feet of combined storage / deceleration length is recommended for that left turn lane.

We trust that this information will satisfy the planning commission's requirements. Please contact us if you have any questions or comments.

Very truly yours,

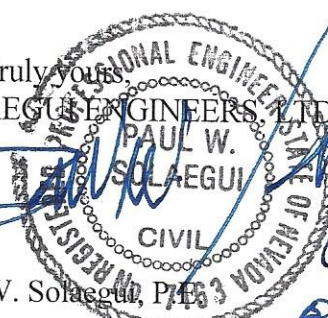
SOLAEGUI ENGINEERS, LTD.

PAUL W.

SOLAEGUI

CIVIL

Paul W. SolaeGUI, P.E.



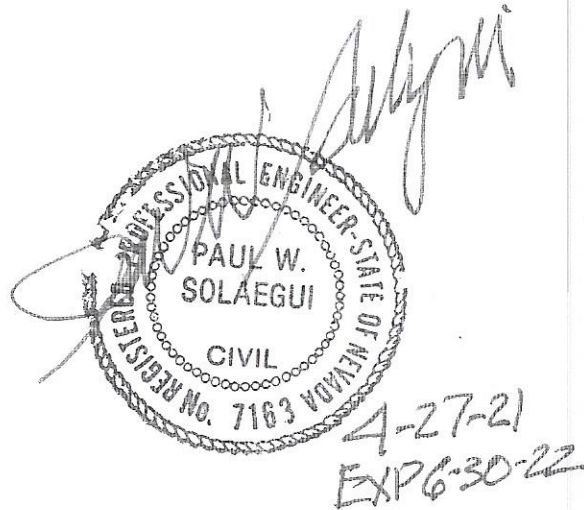
8-11-22
EXP 6-30-24

Enclosures

Letters/Old Stone Ranch Casey Road Update

SANDCREEK
AND
BIRCH LANE
TRAFFIC STUDY

APRIL 2021



Prepared by:
Solaegui Engineers, Ltd.
715 H Street
Sparks, Nevada 89431
(775) 358-1004

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed Sandcreek and Birch Lane developments on the adjacent street network, trip generation rates and peak hours had to be determined. Trip generation rates or equations were obtained from the Tenth Edition of *ITE Trip Generation* (2018) for Land Uses 151: Mini-Warehouse, 210: Single Family Detached Housing, and 220: Multifamily Housing (Low-Rise). *ITE Trip Generation* does not contain information for duplexes so trips generated by this land use were calculated using the single family detached housing land use. The mini-warehouse land use was used to calculate trips generated by both the mini-storage and RV storage facilities.

The proposed Sandcreek development will consist of the construction of 175 single family homes and the proposed Birch Lane development will consist of the construction of 102 duplex units, 300 multi-family dwelling units, a mini-storage facility containing 194 units, an RV storage facility containing 53 spaces, and open space.

Trip generation was calculated for an average weekday and the weekday peak hours occurring between 7:00 AM and 9:00 AM and 4:00 PM and 6:00 PM. These timeframes correspond to the peak hours of adjacent street traffic. Table 1 shows a summary of the average daily traffic (ADT) and peak hour volumes generated by the proposed Sandcreek and Birch Lane developments. The trip generation worksheets are included in the Appendix.

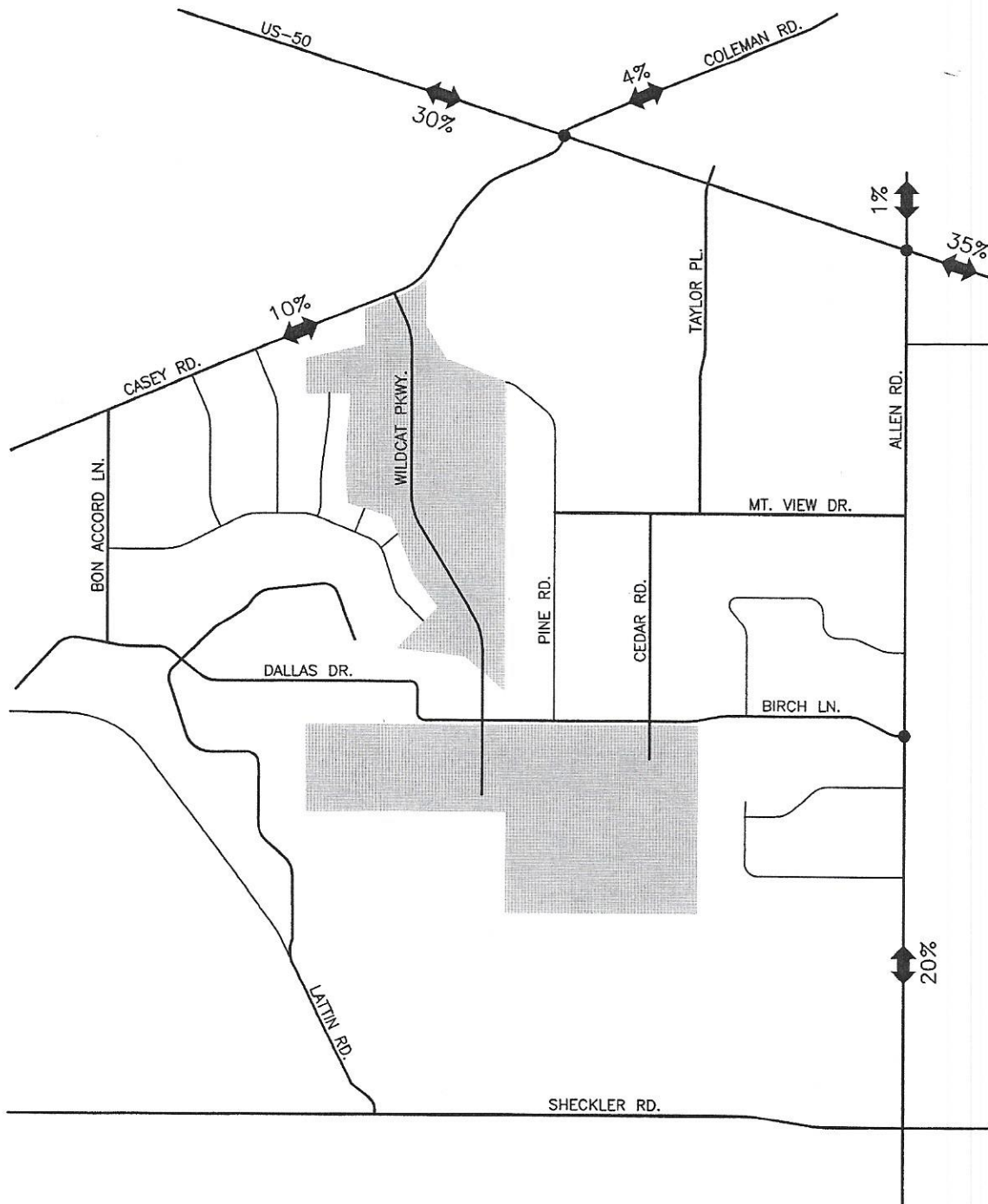
TABLE 1 TRIP GENERATION							
LAND USE	ADT	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
SANDCREEK Single Family (175 Dwelling Units)	1,740	32	98	130	110	64	174
BIRCH LANE Single Family (102 Dwelling Units)	1,059	19	58	77	65	39	104
Low-Rise Multifamily Housing (300 DU)	2,227	32	106	138	106	62	168
Mini-Warehouse (247 Units/Spaces)	47	2	2	4	2	2	4
Total Trips	3,333	53	166	219	173	103	276
Total Trips	5,073	85	264	349	383	167	450

As shown in Table 1, the Sandcreek development is anticipated to generate 1,740 average daily trips with 130 trips occurring during the AM peak hour and 174 trips occurring during the PM peak hour and the Birch Lane development is anticipated to generate 3,333 average daily trips with 219 trips occurring during the AM peak hour and 276 trips occurring during the PM peak hour. The combined projects are anticipated to generate a total of 5,073 average daily trips with 349 total trips occurring during the AM peak hour and 450 total trips occurring during the PM peak hour.

LEGEND



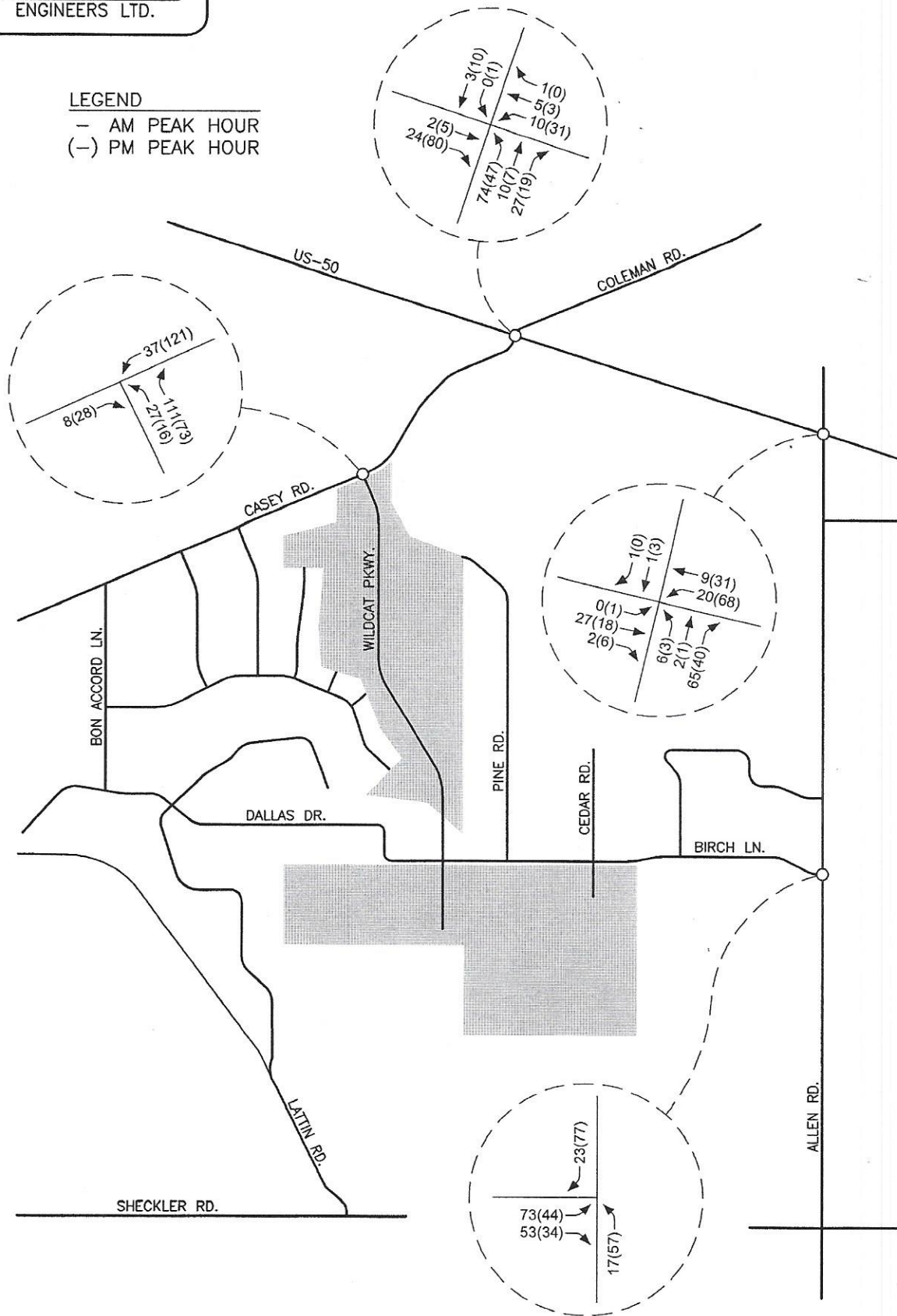
PROJECT SITES



SANDCREEK AND BIRCH LANE
TRIP DISTRIBUTION
FIGURE 2

LEGEND

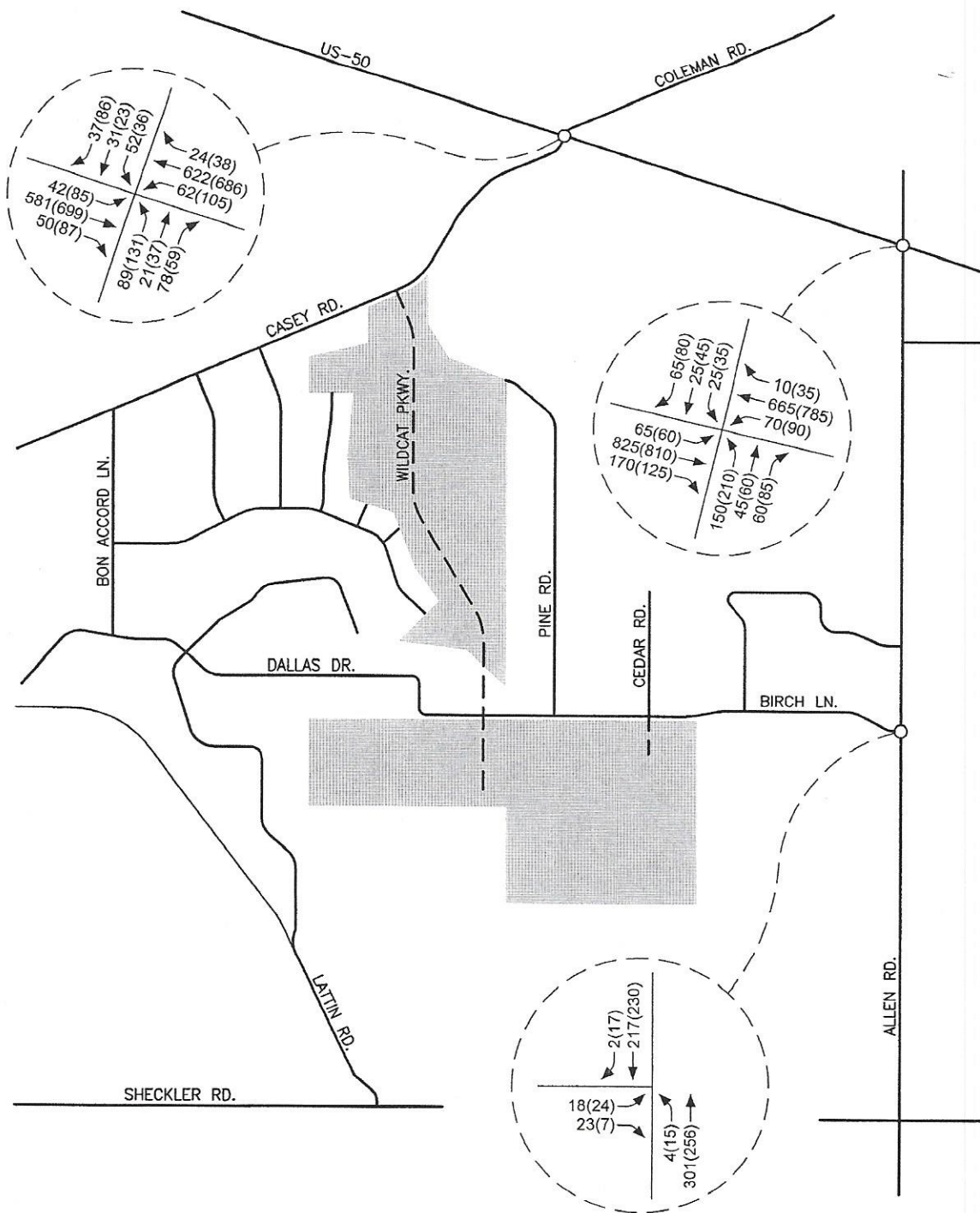
— AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
TRIP ASSIGNMENT
FIGURE 3

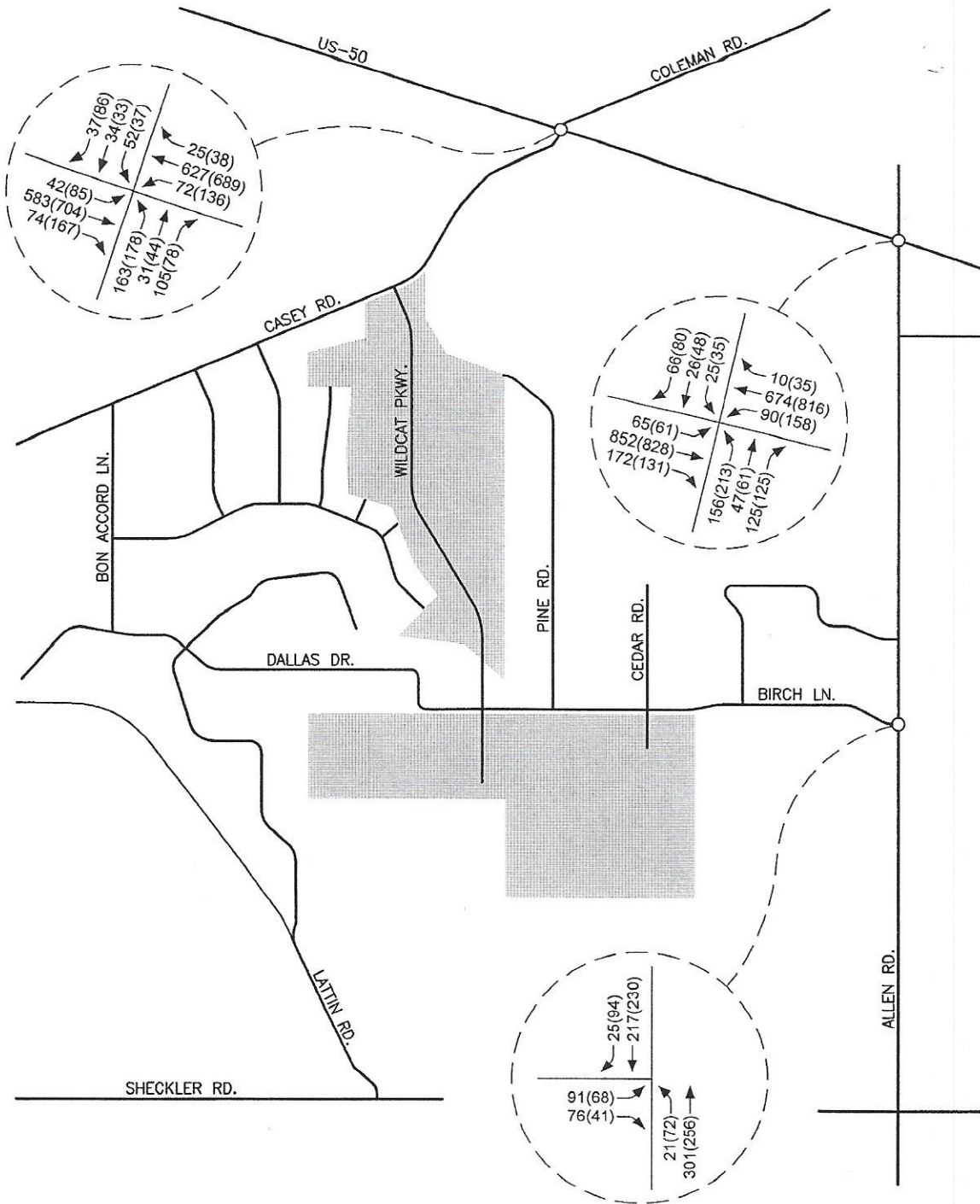
LEGEND

— AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
EXISTING TRAFFIC VOLUMES (ADJUSTED COUNTS)
FIGURE 4B

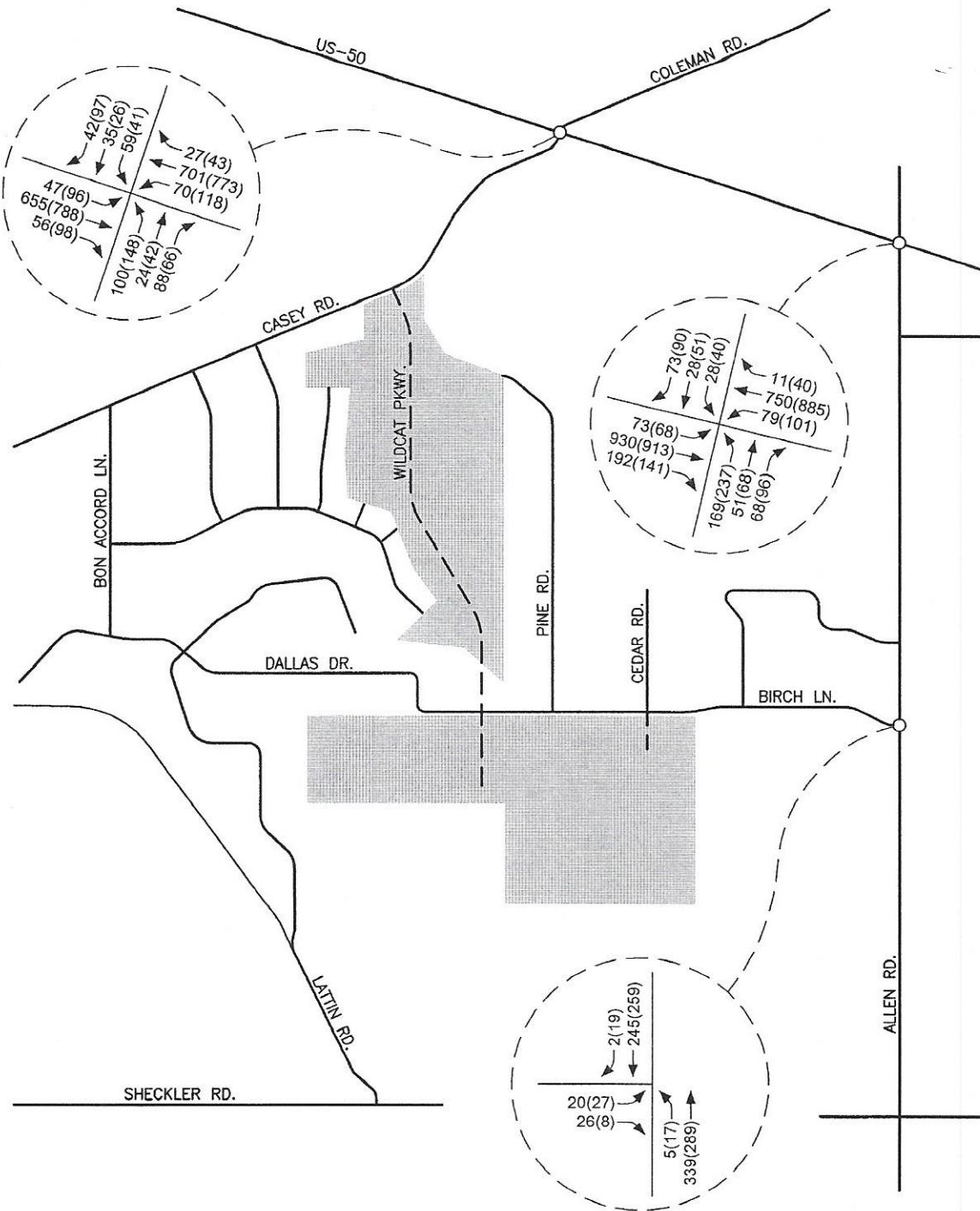
LEGEND
 — AM PEAK HOUR
 (—) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
EXISTING PLUS PROJECT TRAFFIC VOLUMES
FIGURE 5

LEGEND

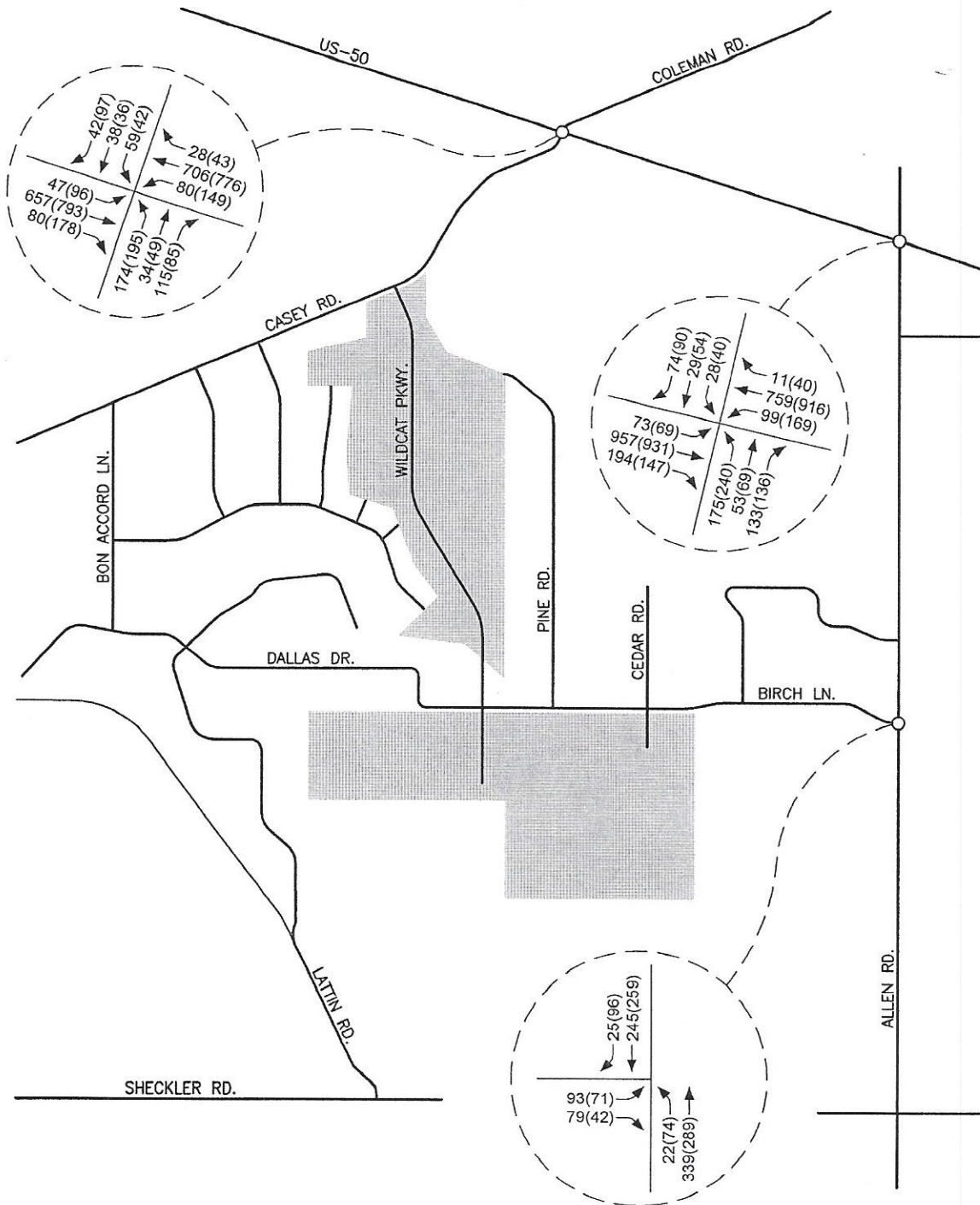
- AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
2041 BASE TRAFFIC VOLUMES
FIGURE 6

LEGEND

- AM PEAK HOUR
(-) PM PEAK HOUR



SANDCREEK AND BIRCH LANE
2041 BASE PLUS PROJECT TRAFFIC VOLUMES
FIGURE 7

SOLAEGUI
ENGINEERS

April 29, 2022

Dean Patterson
Churchill County Planning Director
dpatterson@churchillcounty.gov

Re: Old Stone Ranch Traffic Study Addendum Letter

Dear Dean:

This letter contains the findings of our traffic engineering review of the updated Old Stone Ranch site plan. A copy of the updated site plan is attached. On April 27, 2021 a full traffic study was issued for the property. The title was Sandcreek and Birch Lane Traffic Study. The land uses for that project included 175 single family homes, 102 duplexes, 300 multifamily dwelling units, a minim storage facility containing 194 units and an RV storage facility containing 53 spaces. Based on ITE land use descriptions trip generation for the duplex units was calculated as single family units. The updated site plan now contains 113 single family dwelling units, 98 townhomes and 408 apartments. The storage facilities were eliminate.

Trip generation calculations for the new site plan are based on the Eleventh Edition of *ITE Trip Generation* (2021). ITE land uses #210 "Single Family Detached Housing" and #220 "Multifamily Housing (Low Rise) Not Close to Rail Transit" were utilized in the analysis. Table 1 shows the trip generation summary for the new plan with trip totals compared against the volumes shown in the original traffic study.

TABLE 1
TRIP GENERATION

<u>LAND USE</u>	<u>ADT</u>	<u>AM PEAK HOUR TOTAL</u>	<u>PM PEAK HOUR TOTAL</u>
Original Traffic Study	5,073	349	450
Updated Site Plan			
Single Family Housing 113 Dwelling Units	1,066	79	106
Multifamily Housing 506 Dwelling Units	3,319	202	258
Updated Plan Subtotal	4,385	281	364
Change	-688	-68	-86

As indicated in Table 1, trip generation totals from the original traffic study include 5,073 average daily trips with 349 AM peak hour trips and 450 PM peak hour trips. Trip generation totals for the new updated site plan include 4,385 average daily trips with 281 AM peak hour trips and 364 PM peak hour trips. The new updated site plan results in 688 fewer average daily trips, 68 less AM peak hour trips and 86 fewer PM peak hour trips. In all three time period the new updated site plan generates less traffic than the original traffic study land uses.

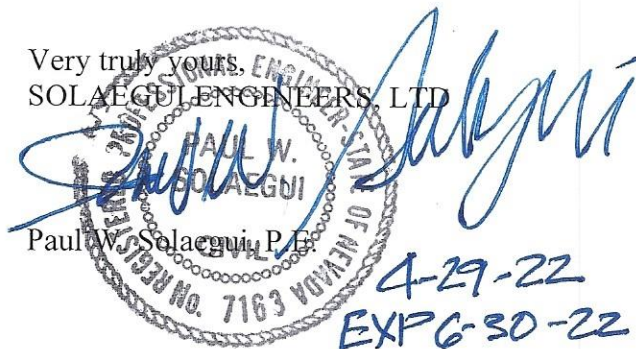
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The updated site plan results in less traffic generation. This equates to less traffic impacts. Because the original study showed acceptable traffic operation for each the existing, existing plus project, year 2041 base and year 2041 base plus project scenarios build out of the updated site plan will result in better traffic operation.

We trust that this information will be helpful to you. Please contact us if you have questions or comments.

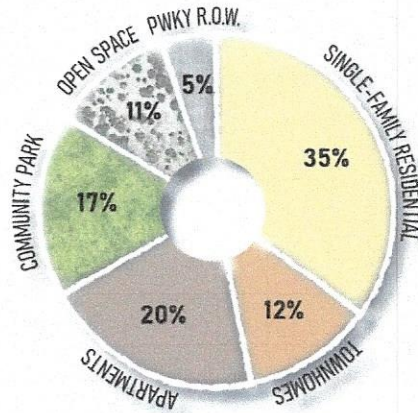
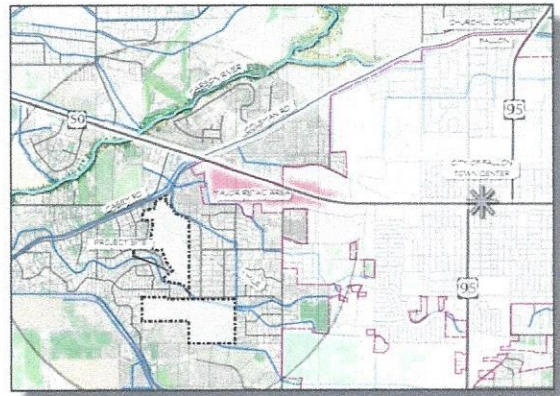
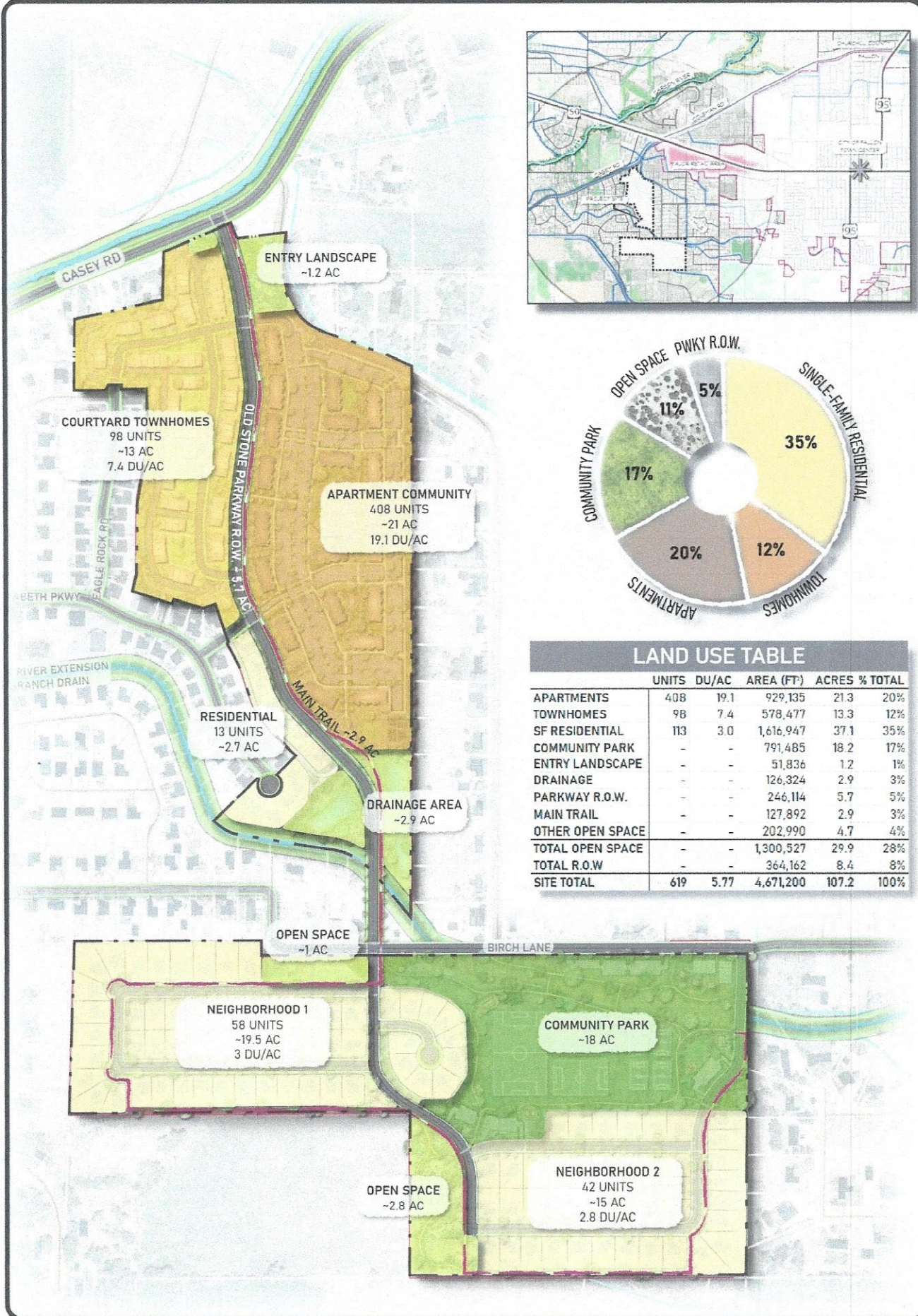
Very truly yours,
SOLAE GUL ENGINEERS, LTD

Paul W. Solae Guli, P.E.



Enclosures

Letters/Old Stone Ranch Traffic Update Letter



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OLD STONE RANCH LAND USE BREAKDOWN



0 ft. 400 800



OLD STONE RANCH

Overall Site Plan



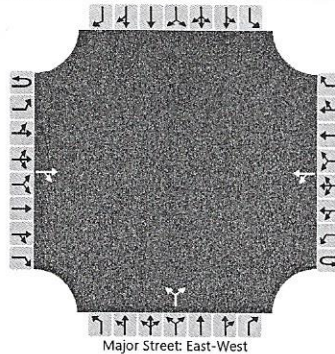
0 ft. 400 800

HCS7 Two-Way Stop-Control Report

General Information

Analyst	PWS	Intersection	Casey Old Stone
Agency/Co.	Solaegui Engineers	Jurisdiction	Churchil Co.
Date Performed	8/9/2022	East/West Street	Casey Road
Analysis Year	2022	North/South Street	Old Stone Parkway
Time Analyzed	Existing Plus AM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT	-				LR					
Volume (veh/h)			188	8		37	143			27		111				
Percent Heavy Vehicles (%)						2				2		2				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.12				6.42		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.22				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						40					150					
Capacity, c (veh/h)						1357					757					
v/c Ratio						0.03					0.20					
95% Queue Length, Q ₉₅ (veh)						0.1					0.7					
Control Delay (s/veh)						7.7					10.9					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					1.8				10.9							
Approach LOS									B							

HCS7 Two-Way Stop-Control Report

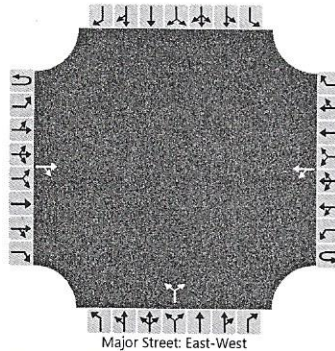
General Information

Analyst	PWS
Agency/Co.	Solaegui Engineers
Date Performed	8/9/2022
Analysis Year	2022
Time Analyzed	Existing Plus PM
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Casey Old Stone
Jurisdiction	Churchil Co.
East/West Street	Casey Road
North/South Street	Old Stone Parkway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			227	28		121	215			16		73				
Percent Heavy Vehicles (%)						2				2		2				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.12				6.42		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.22				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						132					97					
Capacity, c (veh/h)						1286					625					
v/c Ratio						0.10					0.15					
95% Queue Length, Q ₉₅ (veh)						0.3					0.5					
Control Delay (s/veh)						8.1					11.8					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					3.5				11.8							
Approach LOS									B							

HCS7 Two-Way Stop-Control Report

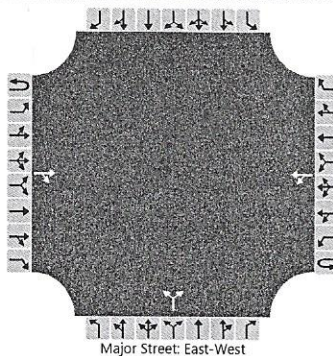
General Information

Analyst	PWS
Agency/Co.	Solaegui Engineers
Date Performed	8/9/2022
Analysis Year	2022
Time Analyzed	2041 Plus AM
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Casey Old Stone
Jurisdiction	Churchil Co.
East/West Street	Casey Road
North/South Street	Old Stone Parkway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			212	8		37	161			27		111				
Percent Heavy Vehicles (%)						2				2		2				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.12				6.42		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.22				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						40					150					
Capacity, c (veh/h)						1328					726					
v/c Ratio						0.03					0.21					
95% Queue Length, Q ₉₅ (veh)						0.1					0.8					
Control Delay (s/veh)						7.8					11.2					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					1.7				11.2							
Approach LOS									B							

HCS7 Two-Way Stop-Control Report

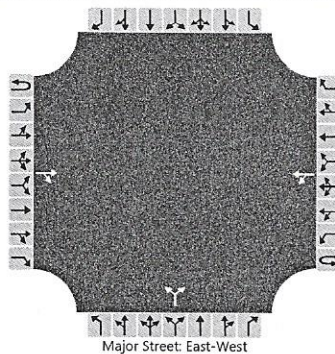
General Information

Analyst	PWS
Agency/Co.	Solaegui Engineers
Date Performed	8/9/2022
Analysis Year	2022
Time Analyzed	2041 Plus PM
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Casey Old Stone
Jurisdiction	Churchil Co.
East/West Street	Casey Road
North/South Street	Old Stone Parkway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			256	28		121	242			16		73				
Percent Heavy Vehicles (%)						2				2		2				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.12				6.42		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.22				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						132					97					
Capacity, c (veh/h)						1252					590					
v/c Ratio						0.11					0.16					
95% Queue Length, Q ₉₅ (veh)						0.4					0.6					
Control Delay (s/veh)						8.2					12.3					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					3.4				12.3							
Approach LOS									B							