SR 260/SR 89A Intersection Analysis

Final Design Report

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List of Abbreviations

AADT.....Annual average daily traffic
AASHTO..... American Association of State Highway and Transportation Officials
ADOT.....Arizona Department of Transportation
Ave..... Avenue
CY..... Cubic yard
D.....D (directional) factor
DDHV.....Directional design hourly volume
DHV.....Design hourly volume
Dr..... Drive
EB.....Eastbound
ft..... Feet (lineal)
GEH.....Geoffrey E. Havers statistic
GIS.....Geographic information system
HGV..... Heavy goods vehicle
K.....K-factor
km/h..... Kilometers per hour
LF..... Lineal foot
LOS..... Level of service
mph..... Miles per hour
NB.....Northbound
Pkwy..... Parkway
Rd..... Road
R/W..... Right-of-way
SB..... Southbound
SF..... Square foot
SQ YD..... Square yard
SR.....State Route
St..... Street
V/C ratio..... Volume-to-Capacity Ratio
VISSIM.....German abbreviation for "Traffic in Cities Simulation Model"
vpd..... Vehicles per day
vph..... Vehicles per hour
WB..... Westbound

0 Acknowledgements

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The team gives thanks to Dr. Edward Smaglik for serving as the technical advisor for this project and providing valuable input on the technical aspects of the project. The team would also like to thank the Capstone faculty: Professor Mark Lamer, Dr. Jeffrey Heiderscheidt, and Dr. Bridget Bero, for their guidance with key non-technical aspects of this project, including scheduling, staffing, budgeting, and project management.

1 Introduction

An increase in congestion and degradation of level of service (LOS) at the intersection of State Routes (SR) 260 and 89A in Cottonwood, Arizona, has prompted a re-evaluation of many aspects of the intersection's design, including number of lanes, lane grouping, and phasing. A 2018 traffic study by Kimley-Horn identified the SR 260/SR 89A intersection as a bottleneck and safety hotspot in the greater SR 260/SR 89A/SR 179 corridor connecting Cottonwood to the cities of Jerome, Sedona, and Camp Verde (and, by extension, Phoenix) [1].

Past solutions to similar problems were reviewed as well as regulatory considerations at the local, county, state, and federal level. Existing soil reports, roadway geometry, contributing intersections, lane configurations, site restrictions, proposed developments, signal phasing, and crash history at the site were all investigated using the as-built plan set, pre-existing traffic data, satellite imagery, GIS, and public records. The results of the site investigation were used to build and calibrate a base model in PTV VISSIM.

The intersection currently operates at LOS D, with the northbound (SR 260 West) and eastbound (SR 89A North) approaches operating at LOS E. All approaches except the westbound (SR 89A South) approach are expected to degrade by one letter in 20 years if capacity is not expanded.

Cottonwood is located roughly two-thirds of the way from Phoenix to Flagstaff. The SR 260/SR 89A intersection is located to the south-southeast of downtown Cottonwood, to which it is connected by Main St which carries SR 89A. Figure 1-1 below shows the location of the intersection in relation with the I-17 corridor and within the city of Cottonwood, as well as an aerial view of the intersection.

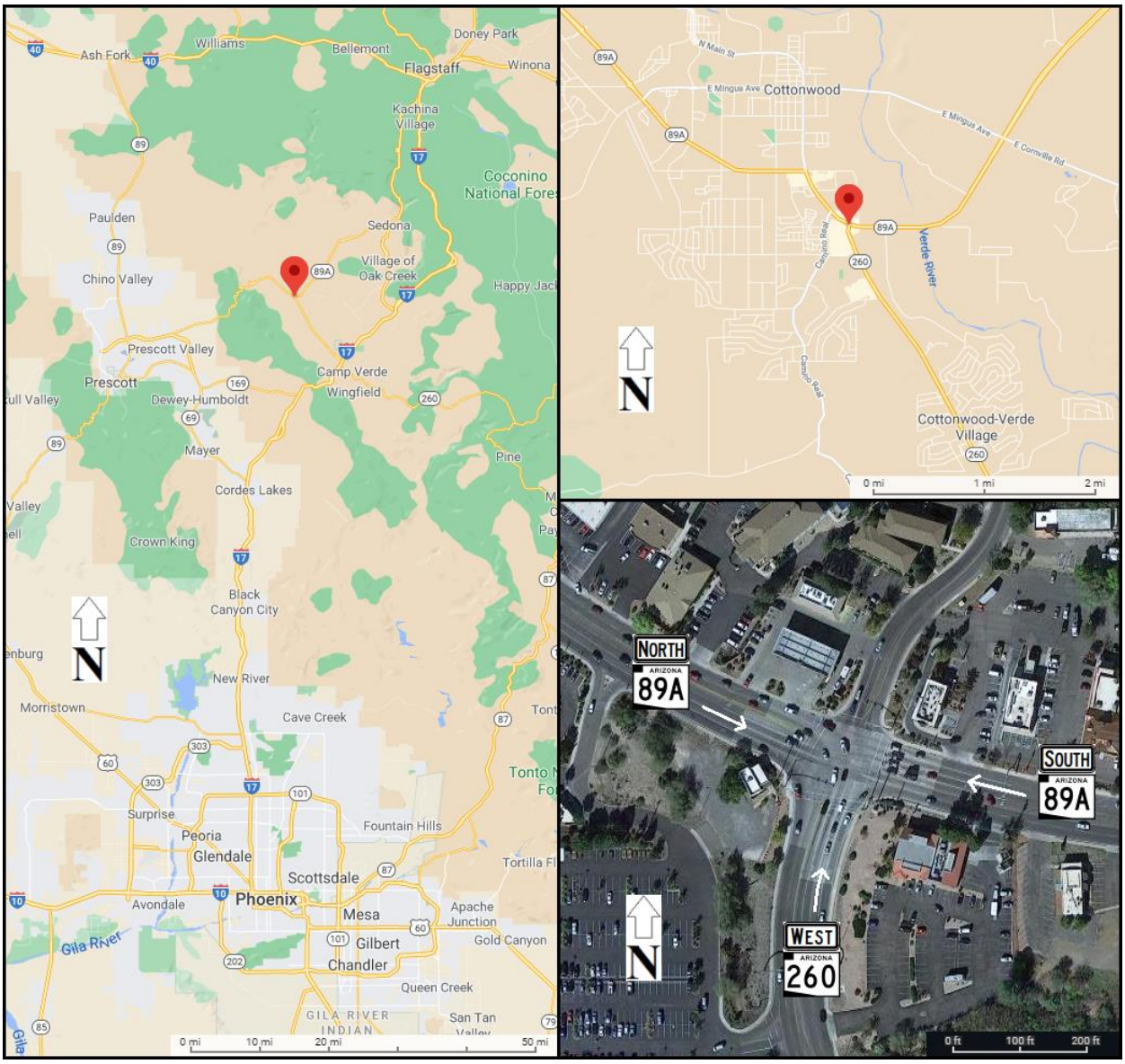

Figure 1-1: Location of the SR 260/SR 89A intersection. Clockwise from the left: Location of Cottonwood relative to Phoenix and Flagstaff, location of site within Cottonwood, and an aerial view of site annotated with signed highway directions. Map data © 2021 Google

Due to the local street alignment, the signed directions of the state highways are rotated 90 degrees counterclockwise compared to the actual direction of travel [2]. For instance, the northbound approach is SR 260 westbound, the southbound departure is SR 260 eastbound (SB approach is Cove Pkwy, a local street), the westbound approach is SR 89A southbound, and the eastbound approach is SR 89A northbound.

The SR 260 (NB) approach and both approaches of SR 89A (EB and WB) have four lanes in the approach direction and two in the exiting direction. The SB approach (Cove Pkwy) has two lanes in the approach direction and one in the exit direction. The EB and WB

approaches (SR 89A) have two through lanes, while the NB (SR 260) and SB (Cove Pkwy) approaches have one through lane. The EB and NB approaches both have one right-turn only lane. The rightmost lanes on the SB and WB approaches, as well as the inner right lane on the EB approach, are combination through/right-turn lanes. Each approach has at least one left-turn only lane, with the NB and WB approaches both having two left-turn only lanes [2].

Pedestrian crosswalks are 11 feet in width except for the one crossing Cove Pkwy which is 10 ft wide. All approaches have sidewalks which are 5.5 to 6 ft in width. Bicycle lanes are not present at the intersection at any approach, but the right lanes are 3.9 ft wider than the other lanes on all approaches except Cove Pkwy. However, bicycle lanes are present on Cove Pkwy approximately 200 ft north of the site.

An excerpt from the as-built plan set illustrating the lane configurations of each approach of the intersection is shown in Figure 3-3 below [3]. SR 89A runs left-to-right in the figure, the SR 260 approach is at the bottom, and Cove Pkwy is at the top.

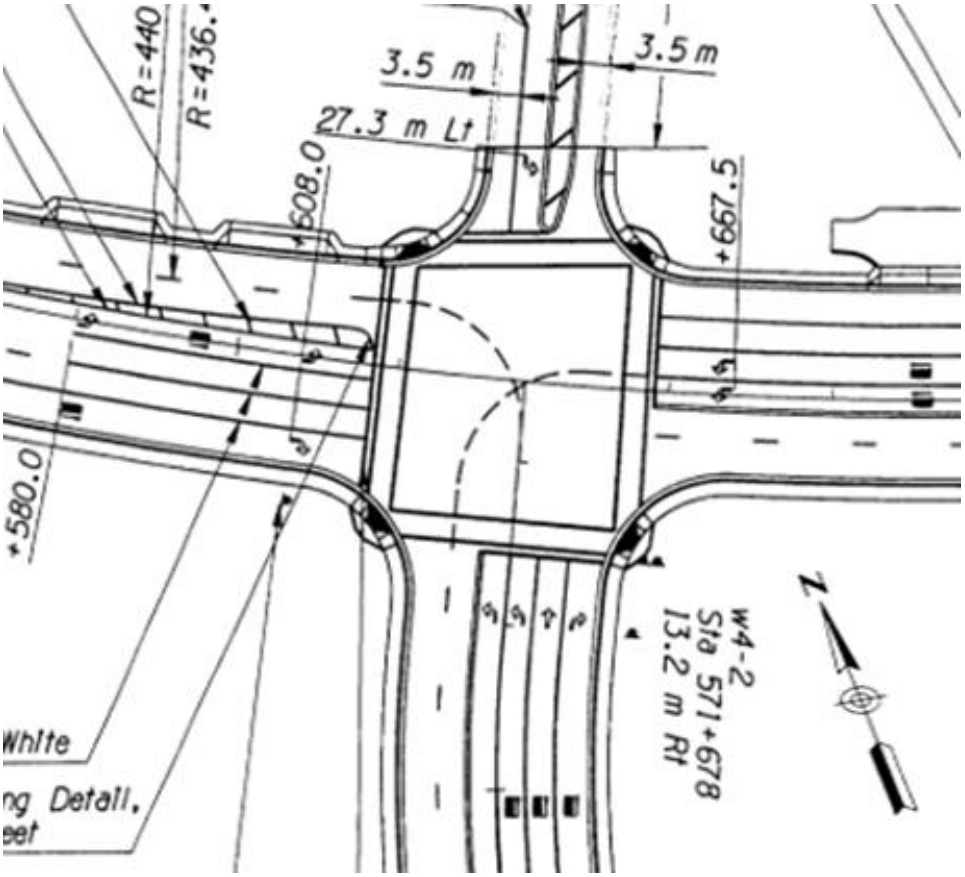

Figure 1-2: Lane configurations of the SR 260/SR 89A intersection

In addition, all left-turn movements at the intersection are protected-only and signal timing is actuated at every approach [2].

This project will be constrained by local, state, and federal regulations, right-of-way limitations, and budgetary concerns at ADOT. This project includes a field investigation report, which will fuel a working VISSIM model of the intersection, an analysis of design alternatives through VISSIM, and design of the final alternative with a plan set and an estimate of cost of construction.

2 Review of Literature

2.1 Regulatory Considerations

Many regulatory considerations should be considered in any improvement projects concerning this intersection. The project and its site are subject to numerous local, state, and federal regulations.

In summary, the regulations governing roadway design in Cottonwood include ADOT's Roadway Design Guidelines [4] and the AASHTO Green Book [5]. Lanes and signal timing are governed by the Highway Capacity Manual [6]. Signals, signs, and pavement markings are regulated by the Manual on Uniform Traffic Control Devices (MUTCD) [7] and its ADOT supplement [8].

The design of ramps connecting curbs and crosswalks must comply with the Civil Rights Act of 1964 and the Americans with Disabilities Act (ADA) of 1990 [9], as well as any of the aforementioned state and federal design standards in effect.

Moreover, Cottonwood Municipal Code requires a minimum setback of 10 feet in the form of landscaped area between a public right-of-way and a commercial building [10]. This poses a significant challenge with respect to expanding some approaches of the SR 260/SR 89A intersection.

Environmental regulators include the Arizona Department of Water Resources (ADWR), Arizona Department of Environmental Quality (ADEQ), Yavapai County Environmental Services Department (YCESD), and the U.S. Environmental Protection Agency (EPA) [11].

2.2 Past Solutions

To alleviate congestion, in 2014, the inner right lane on SR 89A NB was repurposed from a through-only lane to a combination through/right-turn lane [12].

Data gathered from the Arizona Department of Transportation (ADOT) shows that the Average Annual Daily traffic (AADT) in 2011 was at 27,744 vehicles on the State Route 89A portion of Main Street and State Route 260. In 2015, after that change, the AADT went down to 23,021 which shows a reduction in traffic [12]. This reduction can be

attributed to many factors, one of which being the alternate routes; a car driving to Sedona may not need to pass through the city and instead take Interstate 17 to SR 179.

In the fall of 2020, the City of Flagstaff added a right turn lane at the intersection of Historic Route 66 and Humphreys Street [13]. As this is a very recent project and work is still being done in the area, traffic counts have not yet been gathered. This project is noteworthy as it pertains to alleviating the traffic congestion in a similar method.

3 Field Work

Due to travel restrictions and concerns associated with the COVID-19 pandemic, no in-person site visit or investigation occurred. All field data were obtained remotely using the as-built plan set, pre-existing traffic data, satellite imagery, GIS, and public records.

3.1 Procurement of Field Data

3.1.1 Surveying and Soil Data

Since drainage analysis is not part of the scope of this project [2], and the area is known to be essentially flat, a topographic survey (Task 2.1) of the area was deemed unnecessary and removed from the scope of work.

Soil data was obtained via the Web Soil Survey provided by the United States Geological Survey [14]. This data was determined to meet the standards needed for this project.

A soil report on the SR 260/89A intersection in Cottonwood, Arizona was written on June 3, 2020, to determine the soil properties of the local roads and streets. The local roads and streets must carry vehicles and light truck traffic all year.

The subgrade is a cut or fill soil material which consists of a base of gravel, crushed rock, and soil material [14]. The subgrade was determined to be a surface of flexible material, rigid material, or gravel with a binder. The soil at the project site has a rating of 1.00, an indicator of the degree to which the features limit the soils as sources of road fill. The lower the number, the greater the limitation. For all intents and purposes of this project, a rating of 1.00 is acceptable [14].

According to Web soil survey the intersection in Cottonwood, Arizona reports the soil is 34% Mingus, 33% Tapco, and 33% urban land. Mingus soil is fine, gravelly loam soil, which is well drained, allows slow to medium runoff, and very slow permeability [1]. Tapco soil is gravelly clayey loam, which is well drained, allows slow to medium runoff, and very slow permeability [2]. The urban land soil by the

USDA classification is considered degraded and may be contaminated with heavy metals or chemicals. Urban land is soil with typically low infiltration and may have high to no runoff [3]. The soil report may be seen in Appendix A-1.

3.1.2 Roadway Geometry

The existing roadway geometry was specified in the as-built plan set which was signed and sealed on April 12, 1999 [3].

All approaches feature significant curvature meaning that the roads are not straight on one level; there are high and low curves, which may obstruct the view of oncoming traffic to left-turn movements. It is believed that all left-turns are protected-only for this reason. According to the as-built plan sets on both SR 260 and SR 89A, the outside lanes are 15.7 ft (4.8 m) wide, and the inside lanes are 11.8 ft (3.6 m) wide [3]. On Cove Parkway, all lanes are 11.5 ft (3.5 m) wide except for the center turn lane which is 11.8 ft (3.6 m) wide. An annotated, scaled figure illustrating the roadway geometry is presented in Figure 3-1 below:

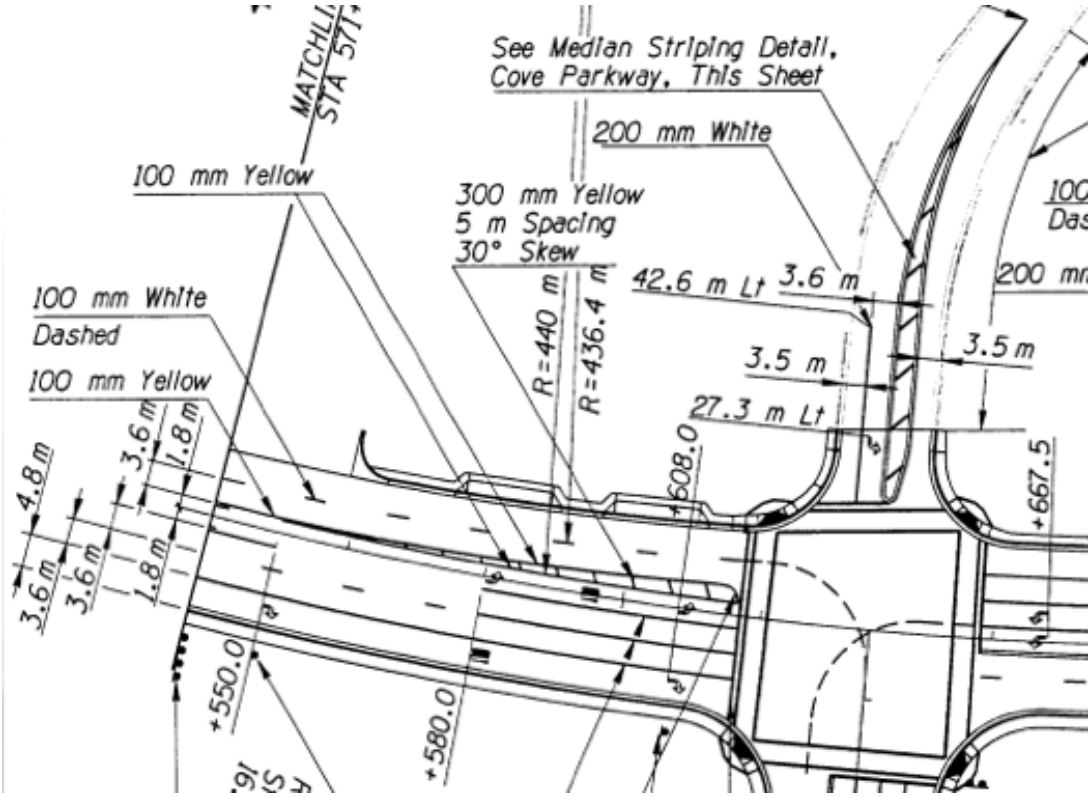

Figure 3-1: As-built plan set with geometry

Relevant excerpts from the as-built plan set may be seen in Appendix A-2.

3.1.3 Contributing Intersections

Several signalized intersections exist in the vicinity of the site. SR 260 intersects with Fir St and Rodeo Dr, which both support strip malls. The SR 260/Fir St intersection also supports a high school and nearby housing developments. SR 260 also carries traffic from Camp Verde and Phoenix. The intersection of Cottonwood St and Main St carries SR 89A on its EB and NB approaches, bringing in traffic from Jerome to the west and Old Town Cottonwood to the north. To the east of the study intersection, SR 89A intersects with Mingus Ave, which becomes Cornville Rd east of SR 89A. Cornville Rd carries traffic from the Verde Santa Fe development, which may use the study intersection to travel to shopping destinations along SR 260. A map of the signalized intersections is presented in Figure 3-2 below:

Figure 3-2: Signalized intersections contributing to the study intersection

In addition, numerous driveways exist within the immediate vicinity of the intersection, leading to various shopping complexes, hotels, gas stations, and restaurants. There are seven such driveways within 600 feet to the east (SR 89A

NB), six within 600 feet to the west (SR 89A SB), five within 600 feet to the north (Cove Pkwy), and three within 600 feet to the south (SR 260 EB).

3.1.4 Right-of-Way

The right-of-way (R/W) on SR 89A (parcel number 800-10-027U) was determined to be 100 feet wide, which is almost completely occupied by the existing roadway (95 feet). Purchasing right-of-way will be necessary to facilitate the expansion of SR 89A at this intersection. The right-of-way (R/W) along SR 260 (parcel number 800-10-011K) was determined to be 165 feet wide, significantly wider than the R/W on SR 89A. Given that SR 260 is 121 ft at its widest point, up to 3 lanes could be added at this approach (assuming a 12 ft lane width) without purchasing additional right-of-way. The R/W on Cove Pkwy (parcel number 800-14-006U) is 70 feet wide, which given a roadway width of 56 feet, is enough to add one lane without purchasing additional right-of-way.

A map of the intersection with right-of-way limits highlighted in red is presented in Figure 3-4 below [16]. Parcel numbers are presented for each individual lot.

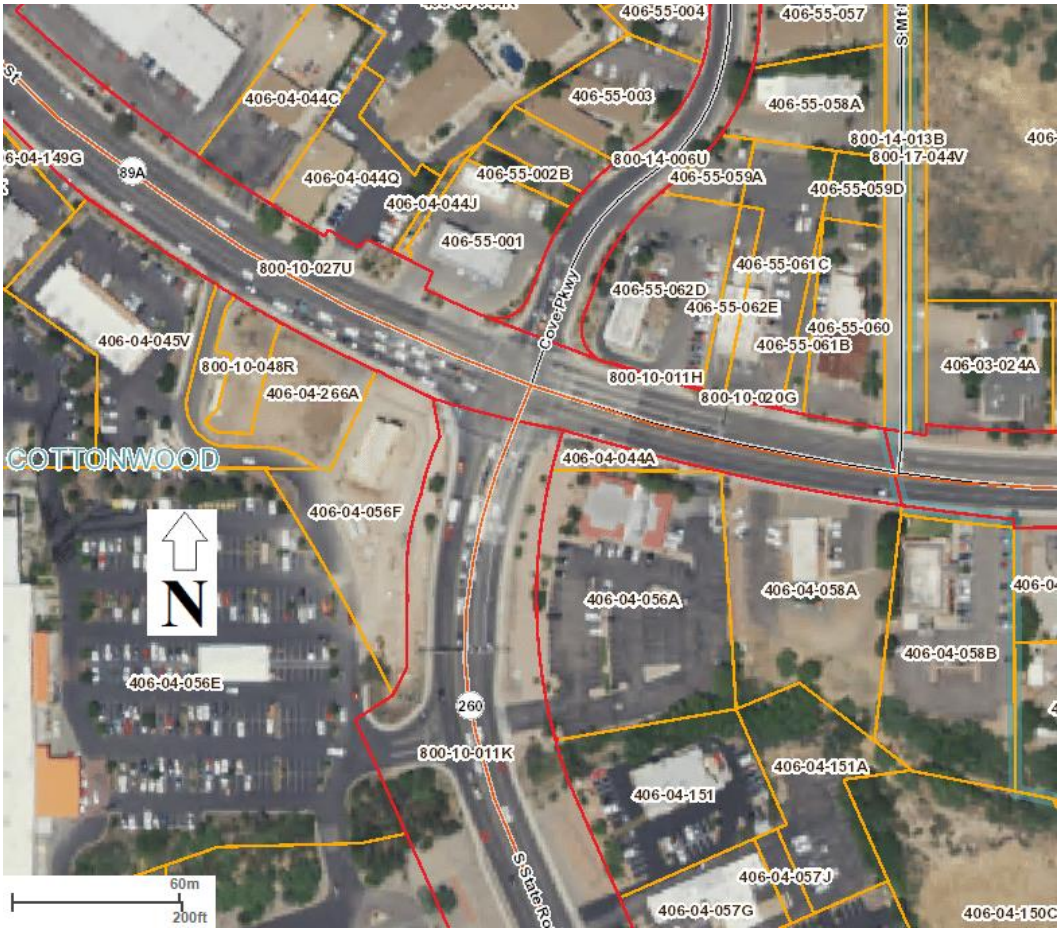

Figure 3-3: Right-of-way map of the SR 260/SR 89A intersection

The properties adjacent to the ADOT right-of-way are restaurants and cafes, with notable exceptions being a gas station (406-55-001), a hotel (406-55-003), and a shipping and mailing store (406-04-044C) on the northwest corner.

3.1.5 Proposed Developments

Several proposed and under-construction developments exist in the Cottonwood area, which are likely to increase traffic volumes at the project intersection. These range from residential developments to commercial office space to strip malls [17]. These developments will conservatively trigger a 1.2% growth factor. Many of these developments are expected to come from the arts, entertainment, recreational, and tourist industries. This will add onto the traffic already being generated by areas like Sedona and Jerome [17].

As of 2020, Cottonwood, together with Verde Village, have a population of 25,941. This population is projected to grow to by 1.2% per year to reach 32,930 by 2040 [17]. Yavapai County as a whole is projected to grow by 1.6% per year, increasing from 247,911 to 340,541 from 2020 to 2040 [17].

In addition, the civilian labor force in Cottonwood grew by 3.4% per year between 2000 and 2010 and is expected to continue growing in the decades to come [17].

3.1.6 Signal Phasing

The current phasing plan is specified in the as-built plan set, and is presented in Figure 3-5 below [3]:

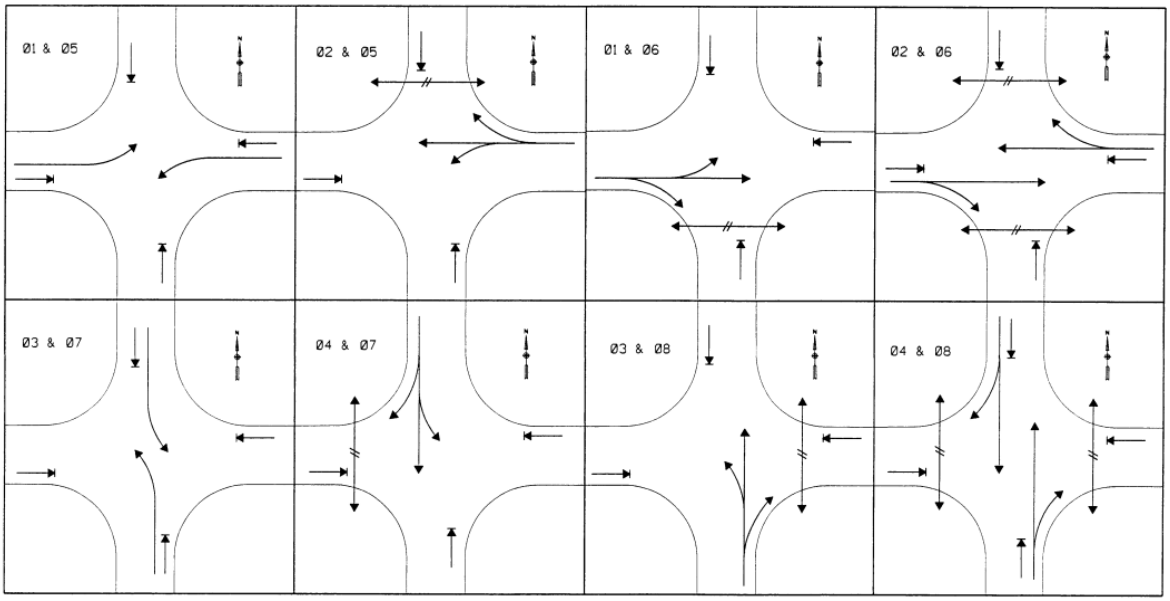

Figure 3-4: Phase diagram for the SR260/SR89A intersection

Phases in this diagram start from the top-left corner and progress left-to-right. In each box in the diagram, or ring, SR 89A runs left-to-right, SR 260 is on the bottom, and Cove Parkway is on the top. Phasing starts with protected leading lefts on both approaches of SR 89A, followed by through and turn movements on the WB approach and/or the EB approach. The next phase is the through and right-turn movements on SR 89A. This process then largely repeats itself on SR 260/Cove Pkwy, with protected leading lefts followed by all movements from Cove Pkwy, then all movements from SR 260. The phases shown in the diagram may vary based on the presence of vehicles in the left-turn lanes, as all approaches are actuated. All left-turn movements are protected-only.

3.1.7 Five-Year Crash Data

Crash data from January 2015 to December 2019 were obtained electronically from ADOT. Of the 125 crashes occurring at or around the intersection during this time, 62 (49.6%) were intersection-related and 27 (21.6 %) were driveway-related. The remaining crashes were not intersection-related, meaning they were caused by driver behavior rather than the design of the intersection. This analysis will therefore only look at crashes related to intersections or driveways.

During the five-year study period, the most common type of intersection-related crash was the rear-end crash, accounting for 51.6% of intersection-related crashes. Left-turn collisions were the most common type of crash involving driveways near the intersection, making up 48.1% of driveway-related crashes.

18 people were injured in intersection-related crashes while 11 people were injured in driveway-related crashes. No fatalities occurred during this period. Left turn and angle crashes at the intersection accounted for 22.6% of the crashes, but 50% of the injuries. Left-turn crashes involving driveways accounted for 48.1% of driveway-related crashes, but 81.8% of injuries. Crash data are summarized in the table below:

Table 3-1: Summary of five-year crash data for the SR 260/SR 89A intersection

	Crash type	Frequency	%	Injuries	%
Intersection-related	Rear-end	32	51.6%	8	44.4%
	Sideswipe	14	22.6%	0	0.0%
	Left turn	7	11.3%	4	22.2%
	Angle (T-bone)	7	11.3%	5	27.8%
	Rear-to-side	1	1.6%	1	5.6%
	Single vehicle	1	1.6%	0	0.0%
	Total	62	100.0%	18	100.0%
Driveway-related	**Crash type**	**Frequency**	**%**	**Injuries**	**%**
	Left turn	13	48.1%	9	81.8%
	Rear-end	7	25.9%	2	18.2%
	Angle (T-bone)	3	11.1%	0	0.0%
	Sideswipe	3	11.1%	0	0.0%
	Head-on	1	3.7%	0	0.0%
	Total	27	100.0%	11	100.0%

The relatively high frequency of rear-end collisions at the intersection suggest possible issues with sight distance related to the curvature of SR 260 and SR 89A coupled with increasing standing queue lengths which reduce the time given for traffic to stop. The high frequency of left turn crashes and resulting injuries related to driveways could also be attributed to the roadway curvature, as well as the high number of driveways near the intersection.

Complete five-year crash data at this intersection may be seen in Appendix A-3.

3.2 Traffic Counts

Due to COVID-19 related restrictions, traffic counts were obtained remotely, either through the Verde Connect project design report [18] or ADOT's Transportation Data Management System (TDMS) [19]. Traffic counts were obtained for April 17, 2019 and July 24, 2018. 2020 traffic volumes were not considered due to the general reduction in travel induced by the COVID-19 pandemic.

3.2.1 SR 260 and SR 89A

Traffic counts at the SR 260/SR 89A intersection were obtained for Wednesday, April 17, 2019 from 7:00 to 9:00am, 12:00 to 2:00pm, and from 3:00 to 5:00pm. Volumes were highest from 3 to 4pm, so those volumes were used in the analysis. A diagram of showing the movements during this peak hour is presented in Figure 3-6 below [18]:

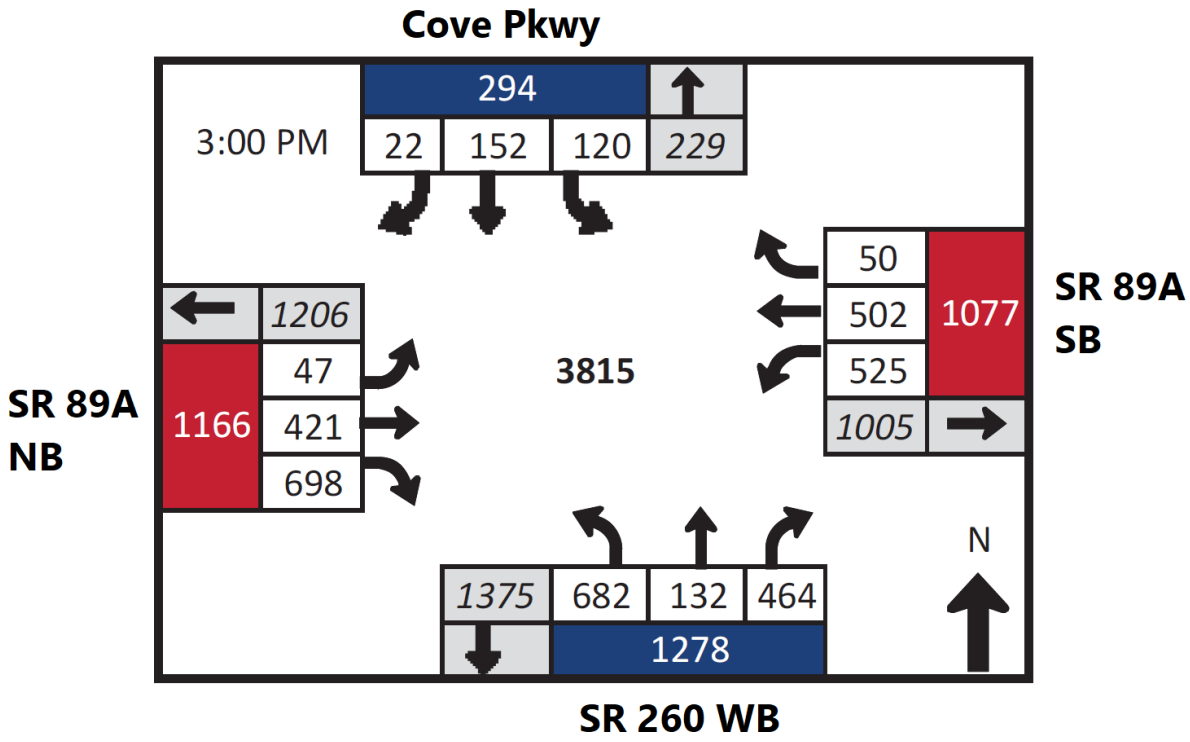

Figure 3-5: Peak traffic volumes, in vph, for the intersection of SR 260 and SR 89A

Traffic volumes for other hours may be seen in Appendix A-4.

3.2.2 Other Intersections

Traffic volumes for selected intersections in the vicinity of the design intersection were obtained via ADOT's TDMS system [19]. ADOT maintains several automated traffic counters on SR 260 and SR 89A and uploads data from all of them onto the TDMS website [19], some of which were used to determine daily and peak traffic volumes around the SR 260/SR 89A intersection. A map of the locations of each traffic counter, with their respective counter ID's shown in black, used relative to the SR 260/SR 89A intersection is presented in Figure 3-7 below:

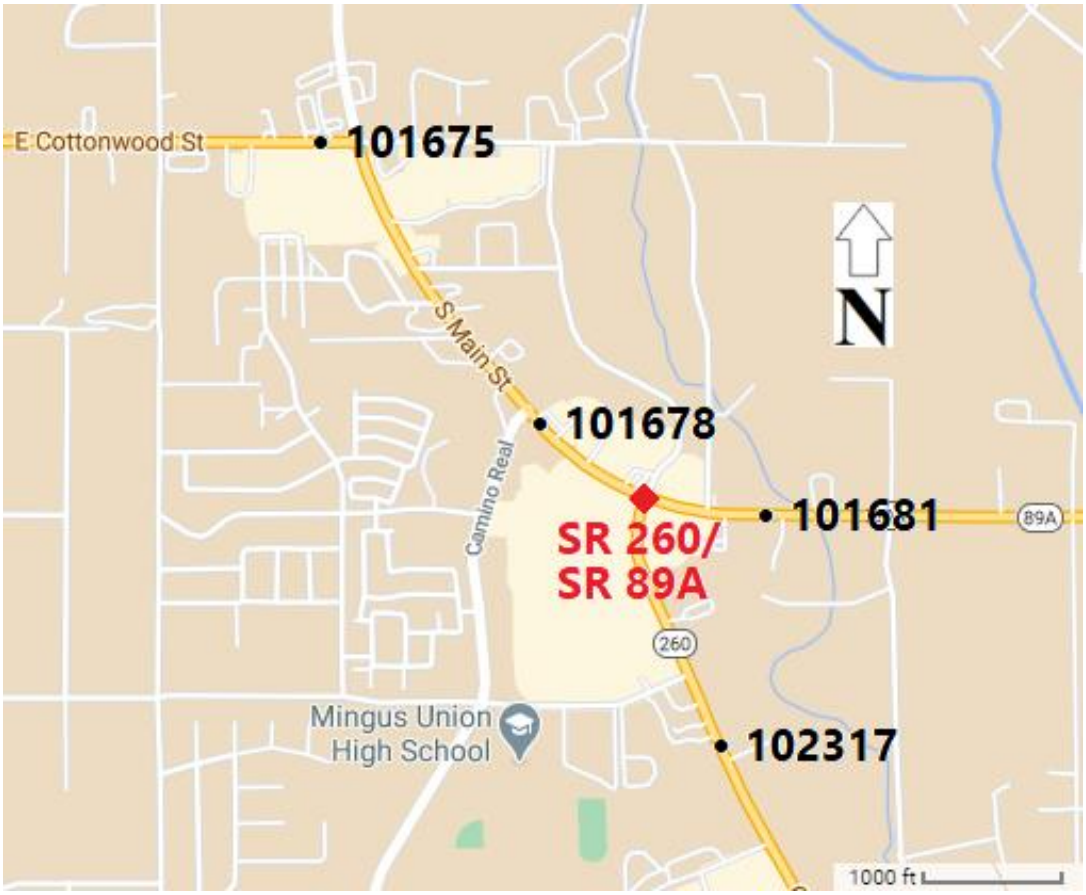

Figure 3-6: Map of traffic counters near the SR 260/SR 89A intersection

The busiest road in the vicinity of the intersection is SR 260, with an annual average daily traffic (AADT) of 33,369 vehicles per day (vpd). The AADT on SR 89A near the study intersection is roughly 21,156 vpd. SR 89A is slightly busier west of its intersection with Cottonwood St and Main St, with an AADT of 27,074 vpd. The K-factor, or the percentage of traffic volume occurring in the peak hour, is a consistent 8 to 9 percent throughout the study area. The D-factor, or the amount of AADT occurring in the peak direction, ranges from a low of 51% (50% is equal flow in either direction) to a high of 64%. The percentage of trucks is a consistent 10–11% along SR 89A, but increases to 14% along SR 260 [19].

The table below presents the AADT (total and directional), K-factor, D-factor, design hourly volume (DHV), and percentage of trucks for the counting stations in the vicinity of SR 260 and SR 89A [19]:

Table 3-2: Traffic counts at stations around the study intersection

ID	Location	Date	AADT			K, %	DHV (DDHV)	D, %	% trucks
			Total	Directional					
101675	89A W of Ctwd/Main	7/24/2018	27,074	NB	9,724	9	875	64	No data (assume 10%)
				SB	17,350	9	(1,562)		
101678	89A W of 260	7/24/2018	21,156	NB	9,143	8	731	60	10
				SB	12,013	8	(961)		10
101681	89A E of 260	7/24/2018	21,160	NB	9,240	8	739	51	10
				SB	11,920	8	(954)		11
102317	260 btwn Fir and Rodeo	7/24/2018	33,369	EB	16,882	9	(1,519)	58	14
				WB	16,487	9	1,484		14

The design hourly volumes (DHV) were calculated by multiplying the directional AADT by the K-factor, as illustrated in the equation below [20]:

Equation 3-1: Calculation of design hourly volume

$$DHV = AADT \times \frac{K\ (\%)}{100}$$

The directional design hourly volume (DDHV) was calculated by multiplying the total AADT by the D-factor and the K-factor, as illustrated in the equation below [20]:

Equation 3-2: Calculation of directional design hourly volume

$$DDHV = AADT \times \frac{D\ (\%)}{100} \times \frac{K\ (\%)}{100}$$

3.3 AASHTO Design Vehicle

According to the AASHTO Green Book, the design vehicle should be the largest vehicle expected to use a facility "with considerable frequency" [5]. Although only 10–14% of traffic is trucks, two state highways meet at the site, and 10–14% is a considerable frequency for truck traffic on state highways [5]. Thus, the design vehicle for any redesign of the intersection was selected as an interstate semitrailer, commonly known as an 18-wheeler (coded as WB-67 in the Green Book) [5].

4 Traffic Analysis

This chapter corresponds to "Task 5.0: Traffic Analysis" as described in the project proposal [2].

4.1 VISSIM Model Creation

To perform a traffic analysis, a base model was created in PTV VISSIM. Multiple satellite images were taken from Google Maps and compiled into one large image to form the base layer for the model. The scale bar was included in the composite image which was used to scale the base layer. Links were added for each approach according to their location on the composite image. Connectors were created for each turn movement at the intersection. Driveways in the vicinity of the intersection were then added to the model. For each turn movement, a reduced speed area was implemented according to Table 4-1 below:

Table 4-1: Reduced speed areas by roadway type

Turn type	Cars	Heavy trucks (HGVs)
Between major roads	15.5 mph	12.4 mph
Major road to driveway	9.32 mph	9.32 mph
Driveway to major road	12.4 mph	9.32 mph

Traffic volumes were input using the vehicle input function in VISSIM as shown in Figure 4-1 below:

Count: 13	No	Name	Link	Volume(0)	VehComp(0)
1	1	EB app	14: 89A NB...	1002.0	1: Default
2	2	SB app	16: Cove SB	294.0	1: Default
3	3	WB app	9: 89A SB	1077.0	1: Default
4	4	NB app	4: 260 WB	1083.0	1: Default

Figure 4-1: Traffic volumes input into the VISSIM model

Driveway volumes were input based on assumed volumes based on the size of the parking lot, as shown in Table 4-2 below:

Table 4-2: Origin volumes for driveways near the site

Driveway	Volume (vph)
NE strip mall	70
Mt. Mingus Rd	35
Black Bear Diner (SE corner)	100
Denny's (SE)	35
Home Depot (SW corner)	150
Speedway (NW corner)	50

Directional movements were input using the Static Routing function in VISSIM under each individual volume for all four approaches. Each movement was assigned a "relative

flow" based on the data collected during the site investigation. An example of a static route input in VISSIM is presented in Figure 4-2 below:

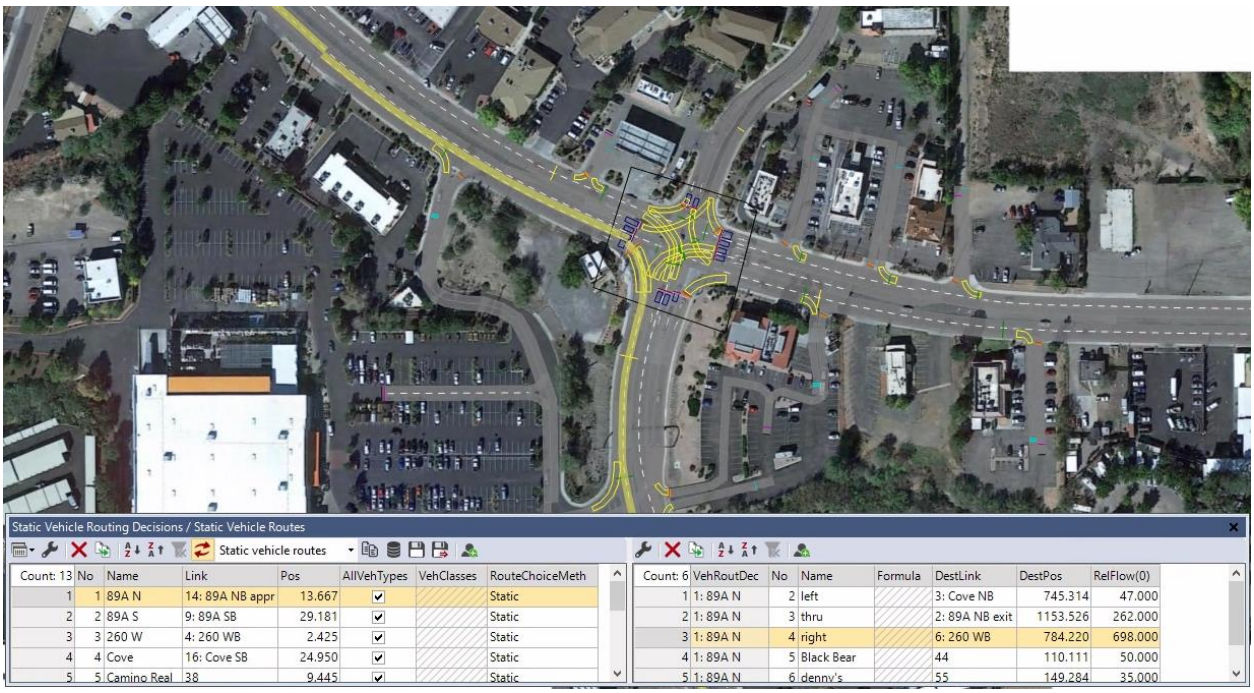

Figure 4-2: Static routing input example

It should be noted that the relative flows do not exactly match the field data in Figure 3-5; this was due to the inclusion of driveway flows in the model. On the "89A N" input for example, two driveways were modeled past the intersection (with respect to the 89A NB through movement) that passed the intersection as a through movement but turned into one of the driveways rather than continuing through to the end of the model.

Signal data were input based on a ring-barrier controller. Signal groups, or SG's, were numbered according to NEMA phasing, where the main through movement is numbered 2, the opposing movement is numbered 6, minor through movement are numbered 4 and 8, and left-turn movements are numbered 1, 3, 5, and 8 [21]. An example of a ring-barrier diagram is illustrated in Figure 4-3 below [21]:

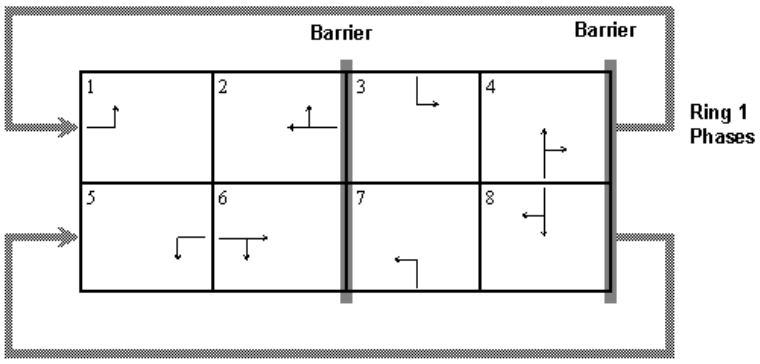

Figure 4-3: Ring-barrier diagram example

The signal groups used for each turn movement are presented in Table 4-3 below:

Table 4-3: Signal groups for each turn movement

Approach (direction)	Movement	Phase/SG
SR 260 WB (north appr.)	Left	3
	Thru/Right	8
Cove Pkwy (south appr.)	Left	7
	Thru/Right	4
SR 89A NB (east appr.)	Left	1
	Thru/Right	6
SR 89A SB (west appr.)	Left	5
	Thru/Right	2

In this case, the through movement for SR 89A SB is numbered 2 and numbering for other movements follows the diagram above. The timing for each signal group, or phase, as entered in VISSIM, is presented in Figure 4-4 below:

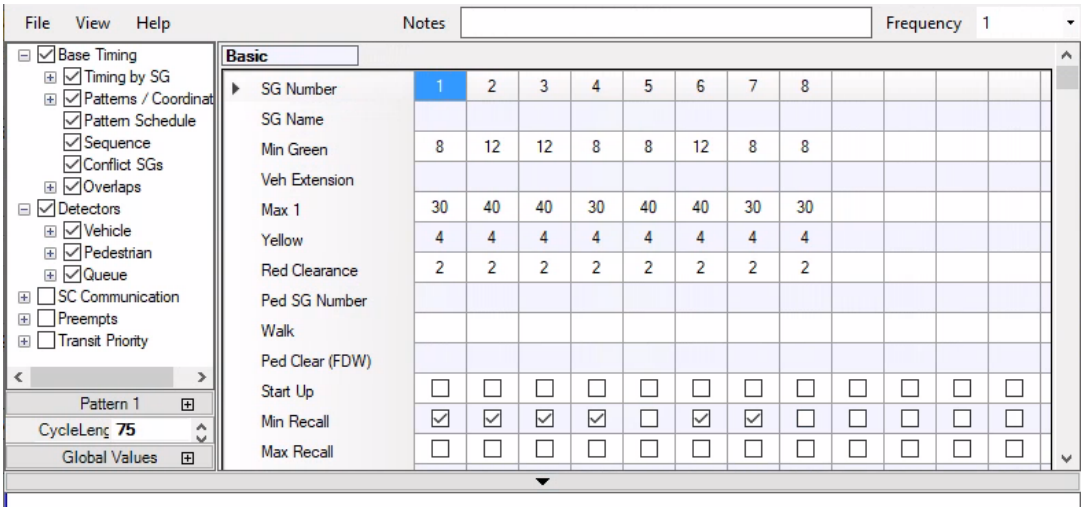

Figure 4-4: Signal timing input for each phase

The NEMA phases were input into the model as shown in Figure 4-5 below:

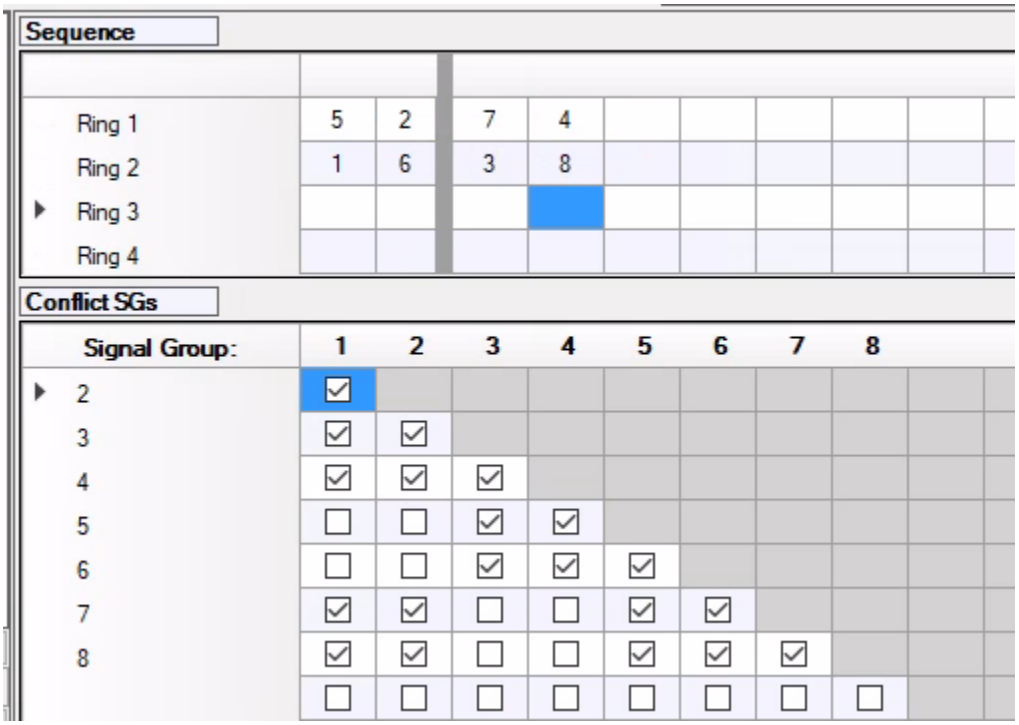

Figure 4-5: Ring-barrier diagram input

Then, signal heads and detectors were input into the model. Each one was set to the corresponding signal group. An example of a signal head being placed for the through movement on SR 89A NB is shown in Figure 4-6 below (specific signal head is bolded):

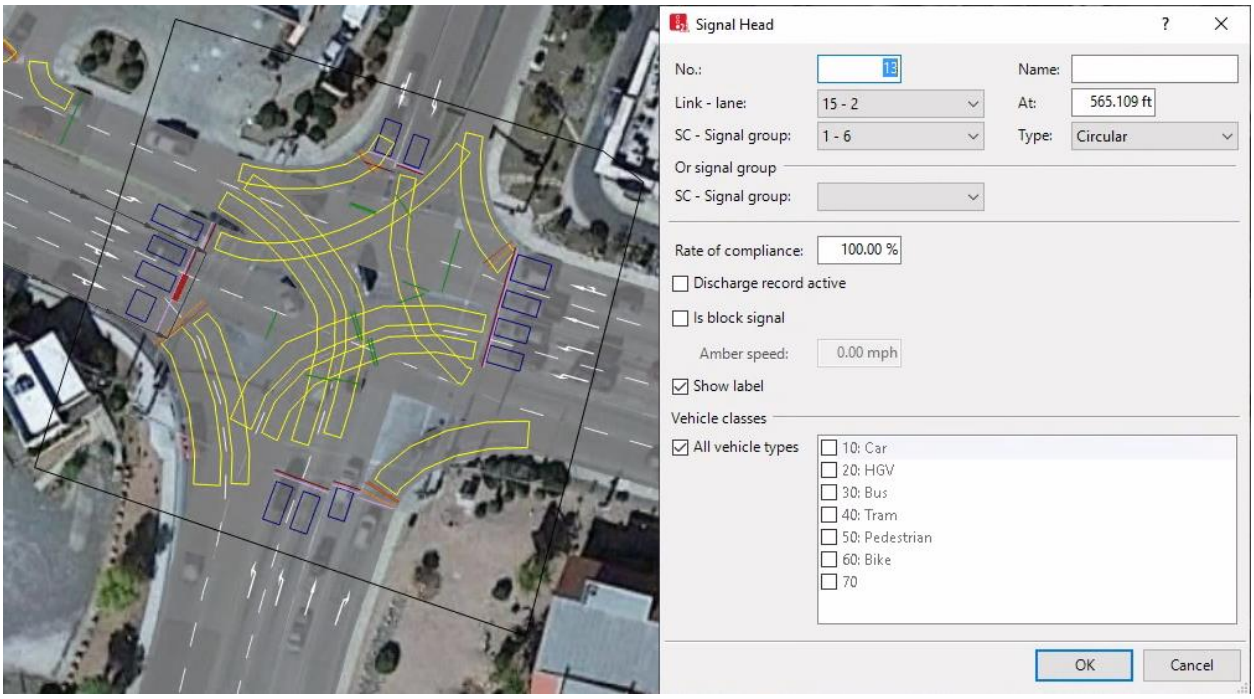

Figure 4-6: Signal head input example

To ensure the signal would run as an actuated facility (as it is in real life), detectors were placed behind each signal head. They were each given a "port number' which, like the signal heads, corresponded to the phase number of the associated movement. An example of the placement of a detector the through movement on SR 89A NB (the same as the signal head above) is shown in Figure 4-7 below:

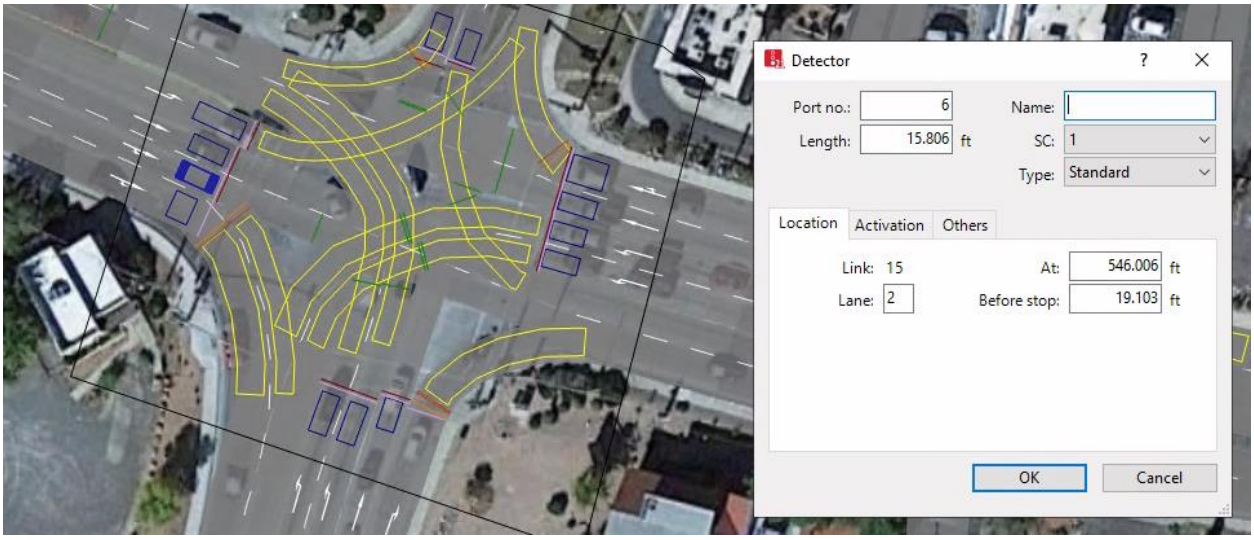

Figure 4-7: Detector input example

To allow right-turn-on-red (RTOR) movements and to ensure they would stop on red before turning, stop signs were added to every right turn lane. In dedicated right-turn lanes, signal heads were not used at all, and the stop signs were placed in connectors rather than the roadway links themselves.

To ensure the RTOR movements would yield to cross-traffic, priority rules were placed in addition to the stop signs. This was done by first specifying which lane was to yield the right-of-way, then placing priority with every lane associated with the through movement to the left of the right-turn and with the opposing left-turn movement.

Then, to run the simulation as a peak hour analysis, a period of 3,600 seconds was specified.

4.2 VISSIM Model Calibration

The model was calibrated to ensure the model reflected real-world conditions. This was done by evaluating the traffic volumes and level of service (LOS) for each approach and movement. Traffic volumes were calibrated using the Geoffrey E. Havers (GEH) statistic, which was calculated for each turn movement using the equation below [22]:

Equation 4-1: Formula for GEH statistic

$$GEH = \sqrt{\frac{2(m-c)^2}{m+c}}$$

where:

GEH = GEH statistic

m = output traffic volume produced by the model (vph)

c = input volume (vph)

The calculated GEH values were deemed acceptable if they were below 5.0 for every movement [21]. Each movement was coded by the approach it originated at and the direction it left the facility at. For example, the movement from SR 89A NB (the EB approach) to SR 260 EB (the SB exit) was coded ES. A table detailing each routing code is provided below:

Table 4-4: Vehicle routing codes used in the analysis

Code	From	To	Turn direction
EE	SR 89A NB	SR 89A NB	Thru
EN	SR 89A NB	Cove Pkwy	Left
ES	SR 89A NB	SR 260 EB	Right
NE	SR 260 WB	SR 89A NB	Right
NN	SR 260 WB	Cove Pkwy	Thru
NW	SR 260 WB	SR 89A SB	Left
SE	Cove Pkwy	SR 89A NB	Left
SS	Cove Pkwy	SR 260 EB	Thru
SW	Cove Pkwy	SR 89A SB	Right
WN	SR 89A SB	Cove Pkwy	Right
WS	SR 89A SB	SR 260 EB	Left
WW	SR 89A SB	SR 89A SB	Thru

The GEH values for each movement are presented in Table 4-5 below:

Table 4-5: GEH values for each movement at the site intersection

Movement	Volume		GEH statistic
	Input	Output	
EE	421	411	0.490
EN	47	34	2.043
ES	698	744	1.713
NE	464	394	3.380
NN	132	148	1.352
NW	682	707	0.949
SE	120	103	1.610
SS	152	166	1.110
SW	22	19	0.663
WN	50	49	0.142
WS	525	499	1.149
WW	502	572	3.021
Overall	**3,815**	**3,846**	**0.501**

Because all GEH values were less than 5, the model was considered acceptable. The level of service (LOS) was then calibrated to ensure that it matched real-world conditions, which were identified as an overall level of service of LOS D [1]. The data used to calibrate the model may be seen in Appendix B.

4.3 20-Year Projection

To project traffic volumes 20 years into the future (ca. 2040–41), a growth factor was established based on the Cottonwood General Plan [12], which was discussed in Section 3.1.5 of this report. This plan suggests a growth factor of 1.25%, which over 20 years, results in an increase in volume of 28.2%. The formula used to calculate future traffic volumes is presented below:

Equation 4-2: Future traffic volume given a growth factor and growth period

$$V_{future} = V_{present} \times (1 + GF)^t$$

where:

V_{future} = future traffic volume, in vph
$V_{present}$ = present traffic volume, in vph
GF = annual growth factor, expressed as a decimal
t = growth period, in years

For strip malls and parking lots, the traffic capacity is limited by the capacity of the parking lots and the businesses they serve, so a smaller growth factor of 1.0% was used.

The increased vehicle input volumes are presented in Table 4-6 below:

Table 4-6: Present and future volumes input into the VISSIM model

Origin segment	Volume (vph)		Growth factor
	Current	Future	
SR 89A NB	1002	1285	1.25%
Cove Pkwy	294	377	
SR 89A SB	1077	1381	
SR 260 WB	1083	1388	
Camino Real	164	210	
NE strip mall	70	85	1%
Mt. Mingus Rd	35	43	
Black Bear Diner (SE corner)	100	122	
Denny's (SE)	35	43	
Home Depot (SW corner)	150	183	
Speedway (NW corner)	50	61	

4.4 Results of Base Model Analysis

4.4.1 Present-Day Conditions

Based on results from the base model, the SR 260/SR 89A intersection is currently operating at a level of service (LOS) of D, with some movements operating at LOS E. The criteria for LOS at signalized intersections come from the Highway Capacity Manual and is determined solely by delay caused by the intersection [6]. The criteria for each LOS are illustrated in Table 4-7 below [6]:

Table 4-7: Description of LOS criteria for signalized intersections

Level of service	Average control delay (sec/veh)	Description
A	0–10	Free flow
B	10–20	Stable flow, slight delays
C	20–35	Stable flow, acceptable delays
D	35–55	Approaching unstable flow, tolerable delays
E	55–80	Unstable flow, unacceptable delays
F	> 80	Forced flow, congested

Table 4-8 below presents the maximum queue, volume, level of service, delay, stop delay, delay ratio (delay divided by stop delay), and number of stops at the

intersection as determined by the VISSIM model for present-day conditions. Each turn movement is color coded by level of service, with LOS B and C (acceptable) shaded in green, LOS D in yellow, and LOS E in orange.

Table 4-8: VISSIM results for present-day conditions

Road	Movement	Max queue	Volume (vph)	Level of service	Delay (s/veh)	Stop delay	Delay ratio	Stops (all)
SR 89A NB (EB appr.)	Left	7.51	34	LOS D	45.6	40.7	1.12	0.76
	Thru	114.40	411	LOS E	60.4	50.5	1.20	1.21
	Right	121.43	744	LOS C	30.4	15.4	1.98	1.82
SR 89A SB (WB appr.)	Left	106.05	499	LOS E	58.9	51.6	1.14	0.84
	Thru	126.10	572	LOS E	61.1	52.3	1.17	1.04
	Right	126.10	49	LOS E	66.1	58.5	1.13	1.00
SR 260 WB (NB appr.)	Left	183.47	707	LOS E	71.6	63.5	1.13	0.89
	Thru	48.81	148	LOS E	61.8	53.2	1.16	1.28
	Right	40.17	394	LOS B	16.9	2.9	5.86	1.94
Cove Pkwy (SB appr.)	Left	29.82	103	LOS D	50.5	45.1	1.12	0.82
	Thru	59.05	166	LOS E	59.3	52.5	1.13	0.81
	Right	57.99	19	LOS C	25.1	20.0	1.26	0.79
Overall		**81.34**	**3846**	**LOS D**	**51.6**	**41.5**	**1.24**	**1.24**

From these results, it is evident that the current conditions are already starting to indicate a problem to come. Most approaches at this intersection currently operate at LOS E, with the facility operating at LOS D overall. The lowest acceptable LOS at any approach is LOS D [22]. Most movements are already operating below acceptable levels and will continue to decline if no action is taken. The base model VISSIM results may be seen in Appendix C-1.

4.4.2 20-Year Conditions

When the 20-year volumes were input into the base model, level of service at the SR 260/SR 89A intersection degrades by at least one letter for every movement except those originating on SR 89A SB and the through movements on SR 260 and Cove Pkwy. Overall, the facility operates at LOS E, with some movements operating at LOS F, the worst level of service.

Table 4-9 below presents the maximum queue, volume, level of service, delay, stop delay, delay ratio (delay divided by stop delay), and number of stops at the intersection as determined by the VISSIM model for 20-year conditions. Each turn

movement is color coded by level of service, with LOS B and LOS C (acceptable) shaded in green, LOS D in yellow, LOS E in orange, and LOS F in red.

Table 4-9: VISSIM results for 20-year conditions

Road	Movement	Max queue	Volume (vph)	Level of service	Delay (s/veh)	Stop delay	Delay ratio	Stops (all)
SR 89A NB (EB appr.)	Left	18.15	45	LOS F	88.6	78.3	1.13	1.47
	Thru	543.39	465	LOS F	126.5	107.4	1.18	2.38
	Right	552.06	917	LOS E	73.3	43.0	1.71	3.92
SR 89A SB (WB appr.)	Left	365.50	609	LOS E	74.9	67.2	1.12	0.85
	Thru	310.43	712	LOS E	79.4	69.7	1.14	1.22
	Right	310.43	58	LOS E	77.0	68.5	1.12	1.05
SR 260 WB (NB appr.)	Left	400.78	857	LOS F	84.7	76.9	1.10	0.80
	Thru	64.68	182	LOS E	65.6	57.5	1.14	1.24
	Right	76.84	489	LOS C	24.7	4.8	5.10	2.54
Cove Pkwy (SB appr.)	Left	44.44	135	LOS E	61.5	54.9	1.12	0.89
	Thru	109.74	215	LOS E	76.0	68.1	1.12	0.94
	Right	109.84	22	LOS D	53.3	47.1	1.13	1.00
Overall		**235.99**	**4706**	**LOS E**	**76.3**	**61.5**	**1.24**	**1.85**

The most congested areas at the site are on SR 89A NB and SR 260 WB, particularly the left and through movements from SR 89A NB and the left turn movement from SR 260 WB.

Table 4-10 below presents the degradation of level of service, increase in queue, delay, stop delay, and number of stops for each movement. Note that positive numbers on this table represent a decrease in facility performance and negative numbers represent an improvement in performance.

Table 4-10: Changes in facility performance indicators from present-day to 20-year conditions

Road	Movement	Δ Queue	Δ LOS (letter)	Δ Delay	Δ Stop delay	Δ Stops (all)
SR 89A NB (EB appr.)	Left	10.64	+2	43.0	37.6	0.70
	Thru	428.99	+1	66.1	57.0	1.17
	Right	430.63	+2	42.9	27.6	2.10
SR 89A SB (WB appr.)	Left	259.46	0	16.1	15.6	0.01
	Thru	184.33	0	18.3	17.4	0.18
	Right	184.33	0	10.8	10.0	0.05
SR 260 WB (NB appr.)	Left	217.31	+1	13.1	13.4	-0.08
	Thru	15.87	0	3.7	4.3	-0.05
	Right	36.67	+1	7.9	2.0	0.60
Cove Pkwy (SB appr.)	Left	14.62	+1	10.9	9.8	0.07
	Thru	50.69	0	16.7	15.6	0.14
	Right	51.85	+1	28.2	27.1	0.21
Overall		**154.64**	**+1**	**24.7**	**19.9**	**0.62**

The movements experiencing the highest degradation to level of service are the left and right turn movements on SR 89A NB. The through movement at this approach will see an increase in delay of a staggering 57 seconds, resulting in LOS F conditions at this approach. The left turn from SR 260 to SR 89A SB will degrade by one LOS letter and see an increase in delays of 13 seconds. On Cove Pkwy, LOS will degrade by one letter and see delay increases from 11 to 28 seconds depending on the turn movement. The 20-year VISSIM model results may be seen in Appendix C-2.

5 Design Alternatives

After analyzing base conditions in VISSIM, five main design alternatives were generated. Alternative A would not add any lanes but would make improvements to signal timing. Alternatives B and C would include an additional right-turn lane to the eastbound approach, SR 89A NB, with Alternative C further adding a through/right-turn lane on Cove Pkwy. Alternatives D and E would include the additional through lane on Cove but replace the existing eastbound (SR 89A NB) right-turn lane with a slip lane instead of a double turn. Alternative E would also add a third left-turn lane on the northbound approach, SR 260 WB. These alternatives are discussed in further detail below.

5.1 No-Build Alternative

This is the control alternative to which all other alternatives were compared and consists of the current intersection with the 20-year projected traffic data.

5.2 Alternative A

This alternative would not add any lanes but would involve making improvements to signal timing. Signal timing would be optimized to reduce delays for SR 260 WB, the busiest approach, and right-turn arrows would be implemented in all dedicated right-turn lanes. This alternative is essentially the base configuration of the intersection with adjustments to phasing. An AutoCAD rendering of the site's base configuration is presented in Figure 5-1 below:

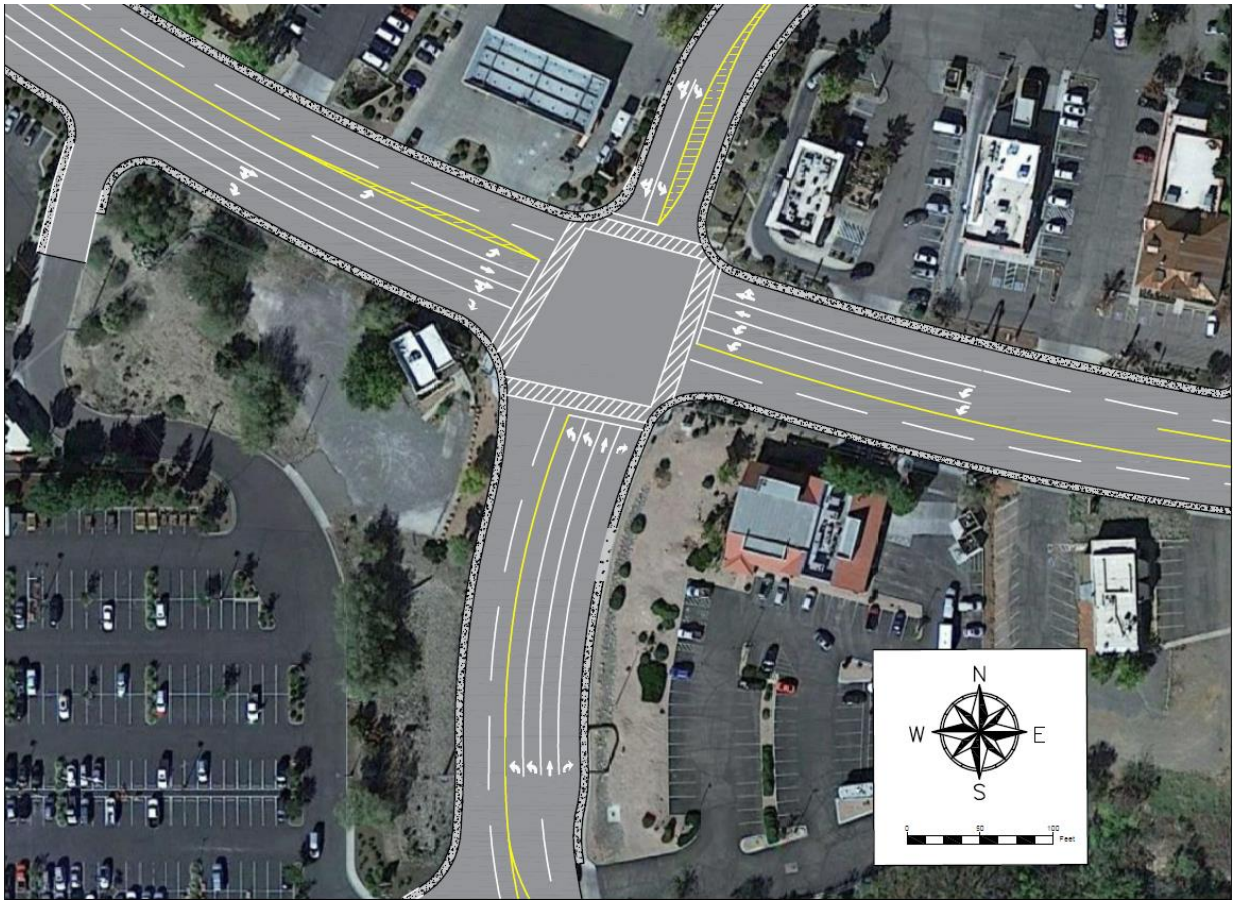

Figure 5-1: AutoCAD rendering of base configuration

5.3 Alternative B

This alternative would include the updated timing of Alternative A and add a right turn lane to the eastbound (SR 89A NB) approach. This will relieve traffic on SR 89A NB. This alternative would require the acquisition of right-of-way currently occupied by Starbucks[1] and Dunkin' Donuts[2], which may require the demolition of said businesses to meet setback requirements prescribed in the Cottonwood City Code [10].

[1] "Starbucks" is a trademark of Starbucks Corporation

[2] "Dunkin' Donuts" is a trademark of DD IP Holder, LLC

An AutoCAD rendering of Alternative B is presented in Figure 5-2 below. The additional lane is highlighted in red.

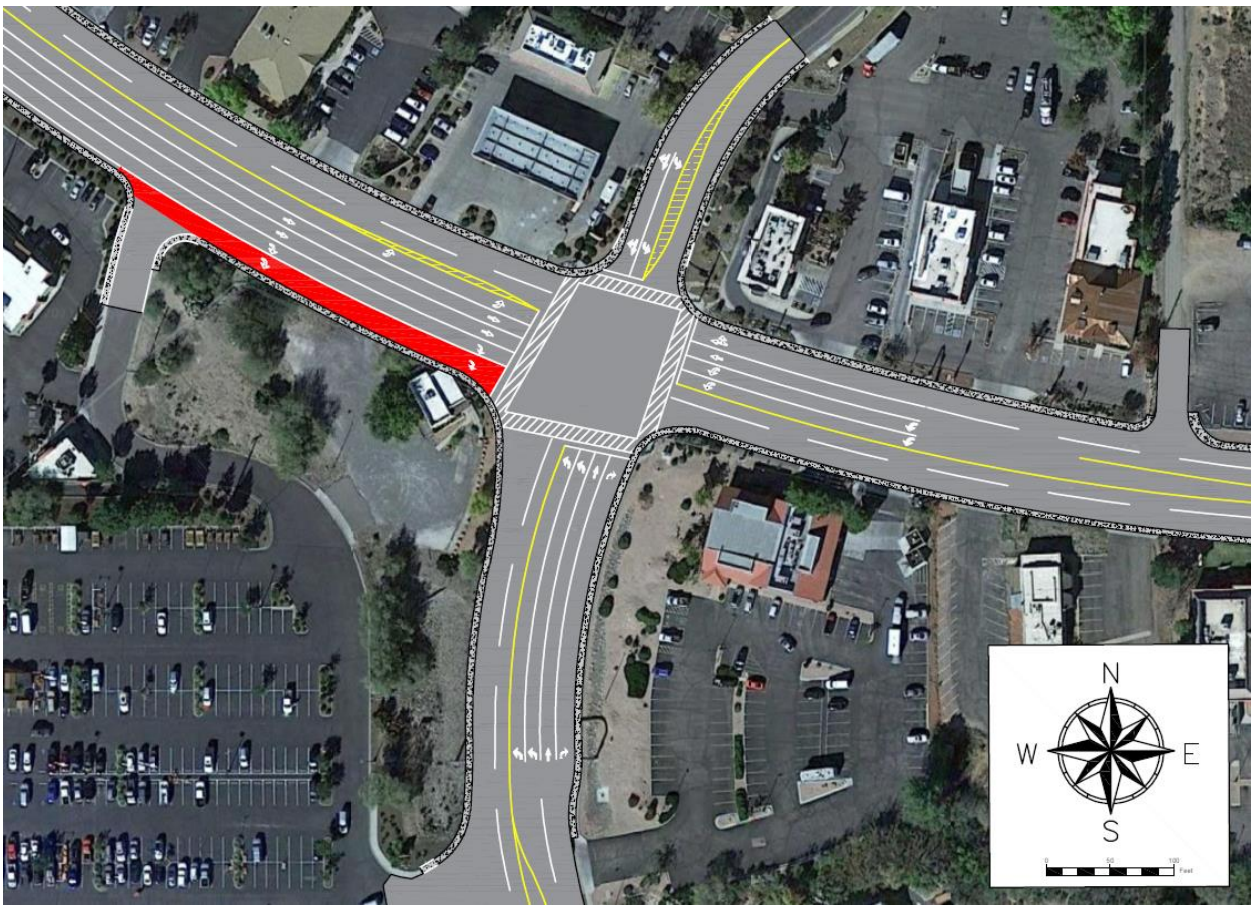

Figure 5-2: AutoCAD rendering of Alternative B

5.4 Alternative C

This alternative would include the updated timing of Alternative A and add right turn lanes to both the southbound (Cove Pkwy) and eastbound (SR 89A NB) approaches. This would relieve traffic on both Cove Pkwy and SR 89A NB. Like Alternative B, this may require the removal of businesses on the southwest corner of the intersection but would not impact businesses along the eastern edge of Cove Pkwy, where the road would be expanded by less than 12 feet.

An AutoCAD rendering of Alternative C is presented in Figure 5-3 below, with the additional lanes highlighted in red:

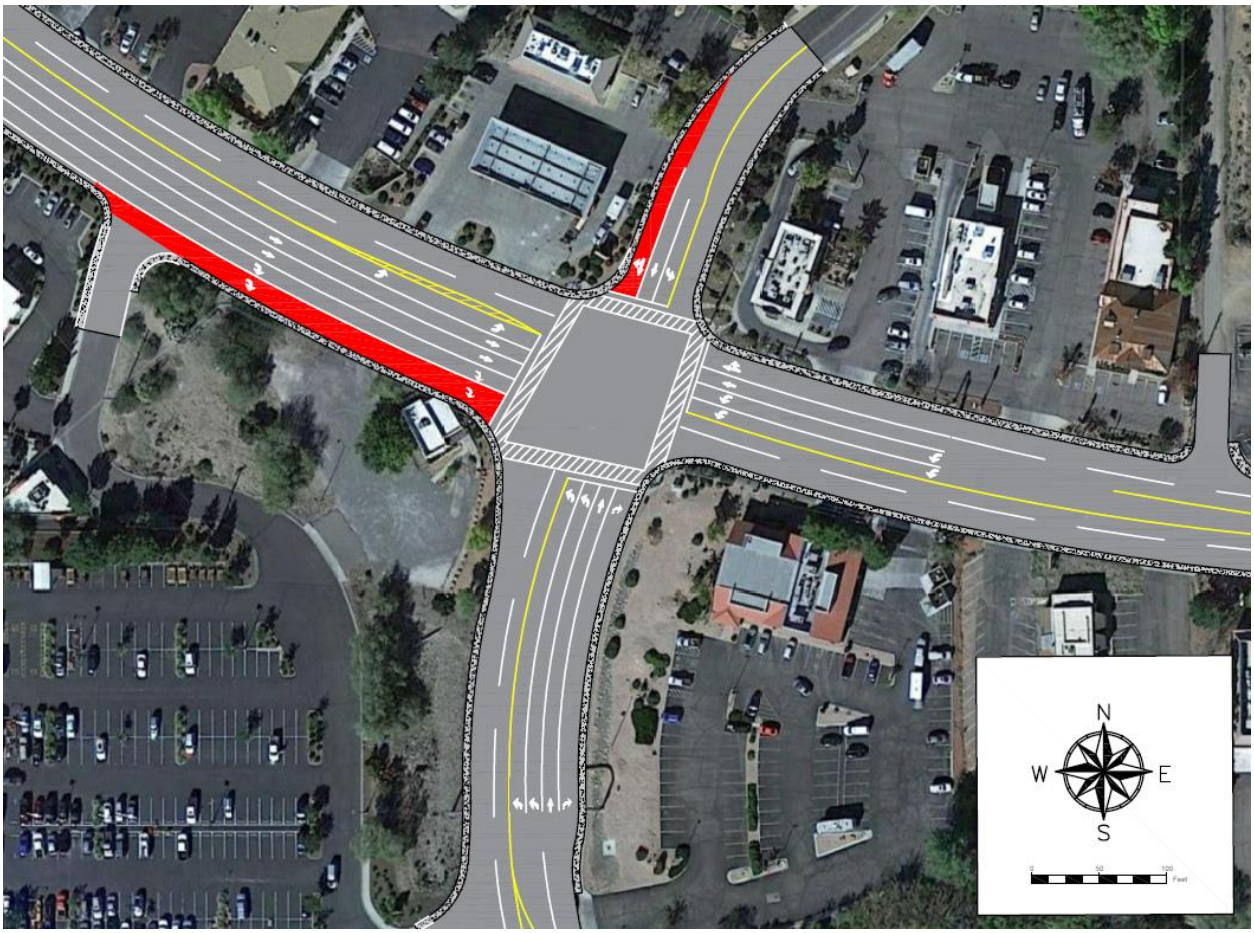

Figure 5-3: AutoCAD rendering of Alternative C

5.5 Alternative D

This alternative would not involve an additional turn lane on SR 89A NB (EB approach) but would add a slip lane to SR 260 EB, which would merge into the existing lanes on SR 260 EB at or before the next driveway. The advantage of the slip lane is that it would not impact businesses on the intersection's southwest corner like the double turn lane would. The updated timing in Alternative A and the added through/right-turn lane on Cove Parkway are included in Alternative D.

Four sub-alternatives have been identified that differ only in where the slip lane will end. These sub-alternatives are:

- Alternative D-1: Short merge distance (lane ends before driveway)
- Alternative D-2: Slip lane becomes a right-turn only lane at the driveway
- Alternative D-3: Slip lane continues past the driveway and merges before the next signal at Fir Street, and
- Alternative D-4: Slip lane continues until and becomes right-turn only at Fir St

Alternatives D-1 and D-2 could be constructed with minimal impact to businesses or right-of-way. However, Alternatives D-3 and D-4 would require extending the culvert (by others) carrying the Oak Wash under SR 260 to accommodate the additional lane. Beyond this, the additional lane would not cause significant impacts to businesses or right-of-way along the western edge of SR 260.

An AutoCAD rendering of Alternative D-2 is presented in Figure 5-4 below, with the additional lanes highlighted in red:

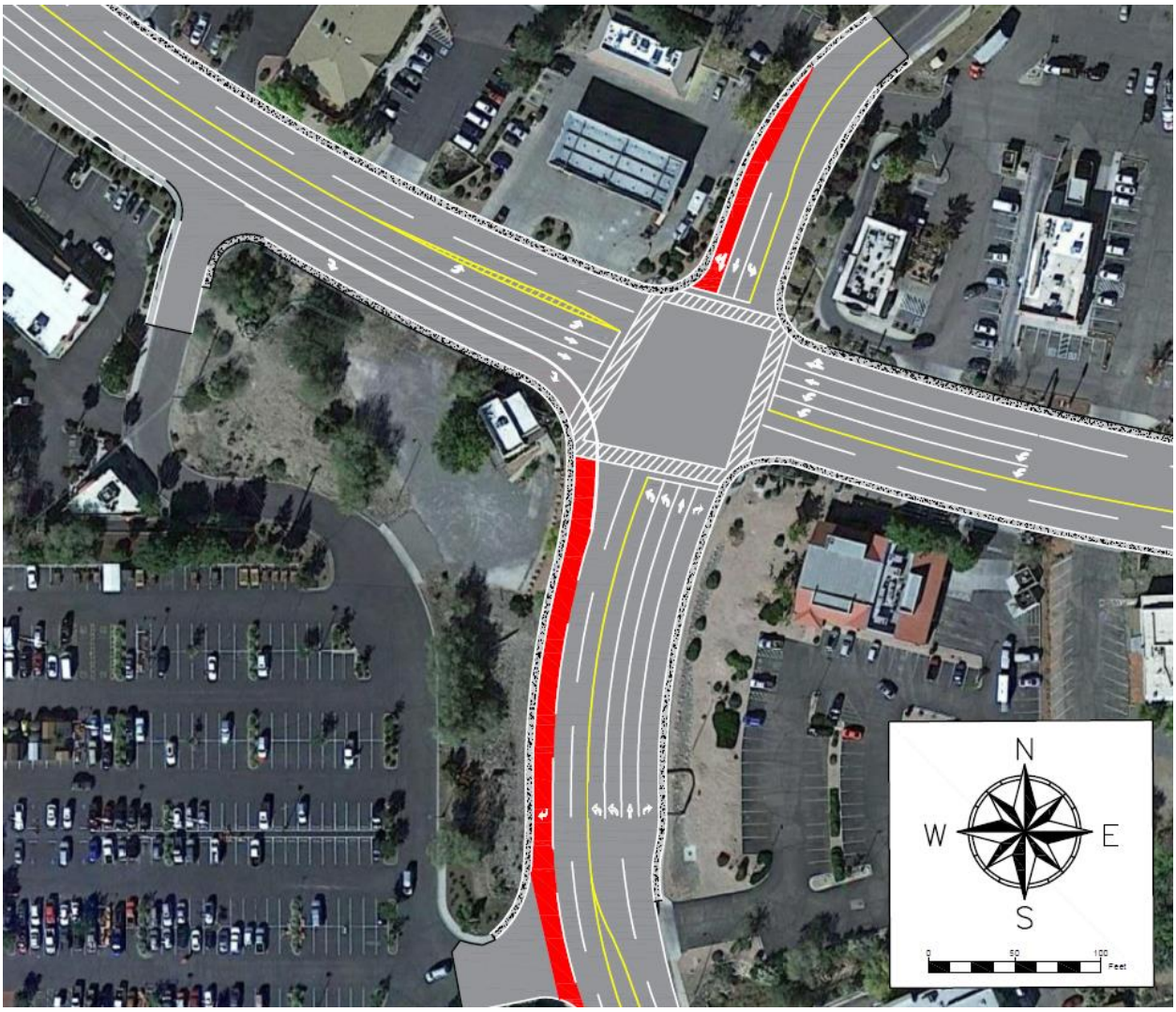

Figure 5-4: AutoCAD rendering of Alternative D

5.6 Alternative E

This alternative includes the slip lane and additional through/right-turn lane on Cove Pkwy described in Alternative D, plus adds a third turn lane from SR 260 WB to SR 89A SB. This would require widening SR 89A west of the SR 260 intersection which would require partial or full removal of the gas station on the intersection's northwest corner

and the partial removal of parking lots along the northern edge of the road. To minimize impacts to existing businesses, the third lane on SR 89A SB would merge before the next signal at Cottonwood St/Main St. The sub-alternatives for Alternative E would mirror those of Alternative D. An AutoCAD rendering of Alternative E is presented in Figure 5-5 below, with the additional lanes highlighted in red:

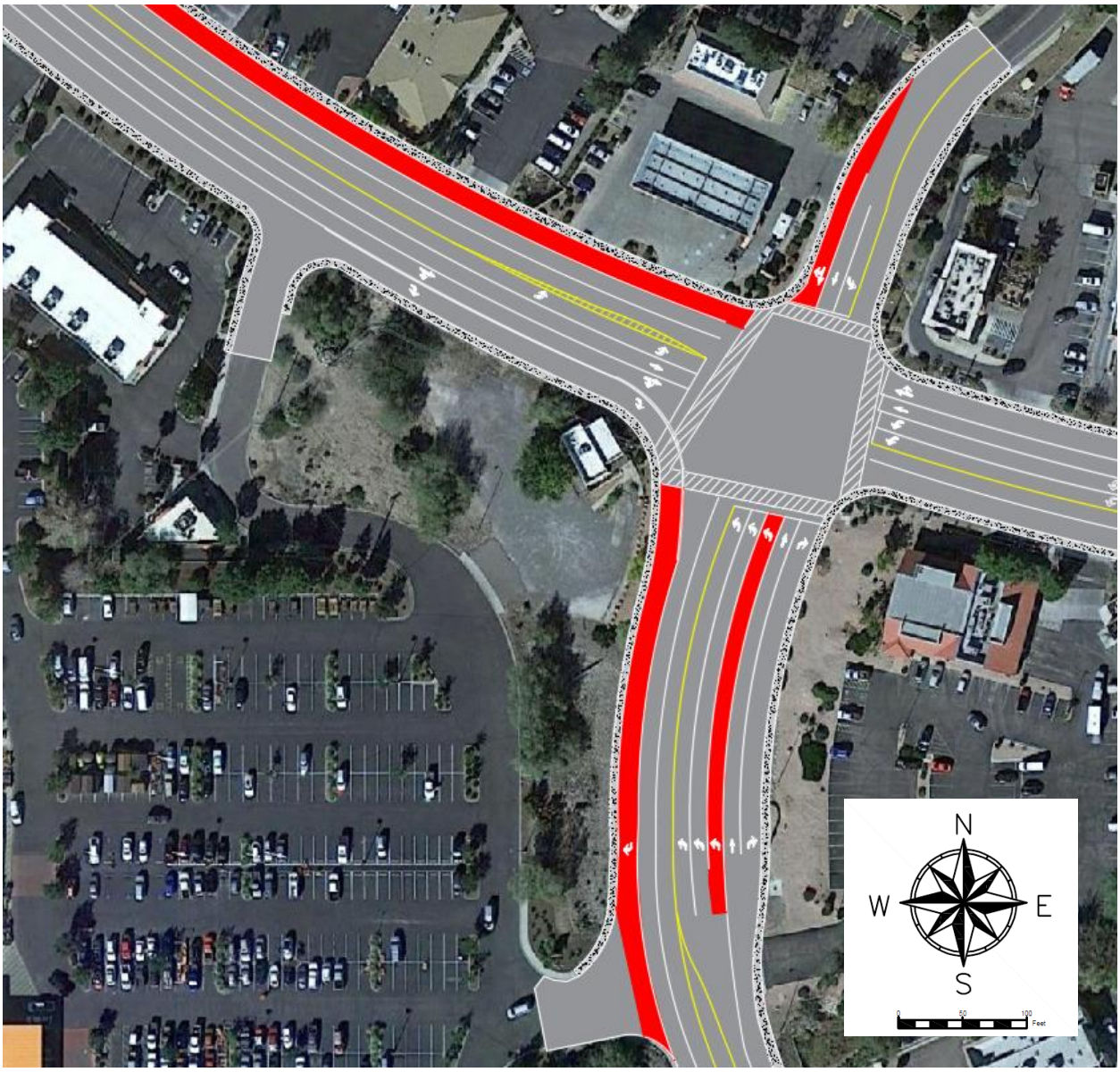

Figure 5-5: AutoCAD rendering of Alternative E

6 Final Design Recommendation

6.1 Scoring Matrix

A scoring matrix was developed to rate and score each design alternative and select the best one. Each alternative was scored on a 1–3 scale, with 1 being the worst and 3 being the best. A score of 1.5 was assigned to alternatives that met the criteria for 1 on some approaches and 2 on others, and 2.5 scores were assigned to those that met the criteria for 2 on some approaches and 3 on others. Several criteria were established and given a weight according to their importance to the project. The categories and the weights assigned to each are presented in Table 6-1 below:

Table 6-1: Scoring matrix categories and weights

Traffic improvements	0.32
Impacts to right-of-way	0.28
Construction cost	0.18
Maintenance cost	0.12
Impacts to pedestrians and cyclists	0.10

6.1.1 Traffic Improvements

This category is based on improvements to traffic flow. Results from the VISSIM analysis were used as well as a qualitative assessment of traffic conditions. The criteria used to assign scores in this category are listed below:

1. Little to no improvement to traffic flow
2. Improves traffic flow, but causes some issues, such as weaving
3. Improves traffic flow with no weaving issues

6.1.2 Impacts to Right-of-Way

This category is based on the amount of new right-of-way that ADOT does not already own that would need to be acquired to build each alternative. The criteria used to assign scores in this category are listed below:

1. The alternative would require a significant amount of right-of-way to be constructed and would result in the demolition of multiple existing businesses
2. The alternative would require little additional right-of-way or require the demolition of one or two existing businesses.
3. The alternative could be constructed without purchasing any additional right-of-way or by purchasing a very small amount of right-of-way

6.1.3 Construction Costs

This is a separate category from "Impacts to right-of-way," as it is only concerned with the actual cost of construction. This category assumes all necessary right-of-way has already been purchased. The criteria used to assign scores in this category are listed below:

1. The alternative has design components which are extraordinarily expensive to construct
2. The alternative has no expensive design components, but would incur a relatively high construction cost
3. The alternative could be constructed with minimal expense incurred by the client

6.1.4 Maintenance Costs

This category considers what the cost of maintaining each alternative would be relative to the existing facility. The criteria used to assign scores in this category are listed below:

1. The alternative would require extensive maintenance which is projected to be very costly in the long term
2. The alternative would require maintenance on par with or slightly higher than previous treatments or the existing facility
3. The alternative would incur very little or no maintenance costs

6.1.5 Impacts to Pedestrians and Bicyclists

This category considers the impacts each alternative would have on the mobility and safety of pedestrians and cyclists. The criteria used to assign scores in this category are listed below:

1. The alternative would not improve safety for pedestrians or bicyclists
2. The alternative would result in marginal improvements to pedestrian and bicyclist safety
3. The alternative would result in significant improvements to pedestrian and bicyclist safety

6.2 Scoring of Design Alternatives

A comparison of alternatives to the no-build in terms of level of service is presented in Table 6-2 below:

Table 6-2: Level of service comparison of each alternative

Legend		LOS A		LOS B		LOS C		LOS D		LOS E		LOS F	
Road	**Movement**	**No-build**	**A**	**B**	**C**	**D-1**	**D-2**	**D-3**	**D-4**	**E-1**	**E-2**	**E-3**	**E-4**
SR 89A NB	Left												
	Thru												
	Right												
SR 89A SB	Left												
	Thru												
	Right												
SR 260 WB	Left												
	Thru												
	Right												
Cove Pkwy	Left												
	Thru												
	Right												
Overall													

Alternative A did not produce an acceptable level of service on several key movements, including all movements associated with SR 89A as well as left turn and through movements originating at SR 260 and Cove Pkwy or SR 89A NB. Likewise, Alternative B did not produce an acceptable level of service on Cove Pkwy. Alternatives C through E did not vary by much in terms of level of service and only minor variations in delay and queue were observed. However, on the SR 89A NB to SR 260 EB (east-to-south) right-turn movement, the slip lane alternatives (D and E) yielded significantly better delay results than the double-turn alternatives (B and C) with the exception of Alternatives D-1 and E-1. The results regarding delay times are shown in Table 6-3 below:

Table 6-3: Comparison of delay for each proposed treatment of the east-to-south turn movement

Treatment	**Alternative #** Delay (sec/veh)	
Slip lane, continuing along SR 260 EB	**D-2, D-3, D-4, E-2, E-3, and E-4**	
	1.4–1.6	
Double turn	**B**	**C**
	6.8	5.4
Slip lane, short merge	**D-1**	**E-1**
	11.5	7.7

The VISSIM results for each design alternative may be seen in Appendix D.

Alternatives B, C, and E (all) received a 1.0 on "Impacts to Right-of-Way" due to the intrusion on the existing businesses they would cause. Alternatives B and C would require the demolition of existing businesses on the southwest corner of the intersection, and Alternative E would require demolition of businesses on the northwest corner. Alternatives A and D (all) are the only alternatives that would not require the demolition of any businesses.

Alternatives D-3, D-4, E-3, and E-4 were given a 1.0 in "Construction Costs" due to the widening of SR 260 over Oak Wash, which would require extending the culvert or replacing it with a bridge. The alternatives widening Cove Parkway, C, D (all), and E (all), were given a 1.5 or less due to the requirement of shifting SR 260 one lane to the east to ensure the through lanes on Cove could flow to SR 260 EB without having to shift while transiting through the intersection. Alternative B received a 2.0 in this category because it would not widen Cove Pkwy, which would not require shifting the road to the east. Alternative A received a 3.0 in this category because it would not add any lanes, virtually eliminating all construction costs except those to redo phasing.

Alternatives B, C, D-1, and D-2 received a 2.0 in "Maintenance Costs" due to the added road surface, resulting in maintenance costs on par with the existing treatments. Alternatives D-3 and D-4 received a 1.5 in this category due to the required lengthening of the culvert. Alternatives E-1, E-2, E-3, and E-4 received a 0.5-point deduction in this category compared to their Alternative D counterparts due to the further additional road surface which would increase maintenance costs and possibly cause drainage complications in the long-term. Alternative A received a 3 in this category as the only component associated with it, the signal cabinet, has a minimal maintenance cost.

Alternatives A, B, C, D-2, and E-2 received a 2.0 in the "Impacts to Pedestrians and Cyclists" category due to their negligible impact on pedestrian and cyclist safety. Alternatives D-1 and E-1 received a 1.5 due to the short merging distance associated with the slip lane of those alternatives, which would adversely impact cyclists. Alternatives D-3, D-4, E-3, and E-4 all received a 2.5 due to the increased capacity along SR 260 which would improve the flow of vehicular and bicycle traffic.

Alternative D-4 was selected as the preferred alternative, as it received the highest score in the decision matrix and resulted in the best balance of traffic improvements and need for new right-of-way. Table 6-4 below presents the overall score given to each alternative, with the winning alternative, D-4, highlighted in green:

Table 6-4: Decision matrix with scores of each alternative

Alternative	Traffic improvements	Impacts to right-of-way	Construction cost	Maintenance cost	Impacts to pedestrians and cyclists	Score
Weight	0.32	0.28	0.18	0.12	0.1	--
Alt A	0.5	3.0	3.0	3.0	2.0	2.10
Alt B	1.0	1.0	2.0	2.0	2.0	1.40
Alt C	1.5	1.0	1.5	2.0	2.0	1.47
Alt D-1	1.5	3.0	1.5	2.0	1.5	1.98
Alt D-2	2.0	3.0	1.5	2.0	2.0	2.19
Alt D-3	2.5	2.5	1.0	1.5	2.5	2.11
Alt D-4	3.0	2.5	1.0	1.5	2.5	2.27
Alt E-1	2.0	1.0	1.5	1.5	1.5	1.52
Alt E-2	2.5	1.0	1.5	1.5	2.0	1.73
Alt E-3	3.0	1.0	1.0	1.0	2.5	1.79
Alt E-4	3.0	1.0	1.0	1.0	2.5	1.79

6.3 Final Recommendation

The recommended design alternative is Alternative D-4. This alternative would add a through lane on Cove Pkwy and replace the existing right-turn-only lane on SR 89A NB with a slip lane which would become a third lane on SR 260 EB to Fir Street, at which it would become a right-turn only lane, and through traffic would be directed to merge left.

To accommodate the added lanes on both SR 260 EB and Cove Pkwy, the slip lane would take the place of the existing right lane on SR 260, and the rest of the approach would be shifted to the east. Then, the existing alignment would return to existing conditions south of Oak Wash, with the roadway being widened to the west rather than the east. The plan set for the recommended alternative may be seen in Appendix E.

7 Impacts Analysis

Transportation projects serve a variety of objectives that include safety, mobility, environmental protection, and livability. Every transportation project has economic, environmental, and social impacts (the triple bottom line). The alternative chosen will be sustainable and will benefit the community and natural environment. This sustainability will enhance the quality of life and serve present and future needs. The overall impacts of this project are regarded as positive and are discussed below.

7.1 Economic

The main economic impact of this alternative is a reduction in delays that is projected to increase the economic development of businesses in the surrounding area. An increase in capacity to this facility will reduce commute times for local workers, increasing economic productivity. This increase in productivity is projected to stimulate economic activity. An increase in capacity will also increase the number of people shopping, leading to an increase in tax revenue for the City of Cottonwood. Although the taxpayers bear the initial burden of constructing this project, the economic benefits will outweigh the costs in the long term. Economic impacts for this project are generally viewed as positive.

7.2 Environmental

The impacts caused to the environment include increase in runoff from the developed lands, reduced culvert capacity due to the extension of the Oak Wash culvert (drainage evaluation was not included in the scope of this project), and an increase in carbon emissions due to the increase in traffic. However, an increase in mobility may reduce carbon emissions due to reduced delays and idling. In addition, the increase in impervious surface area will likely lead to an increase in runoff and by extension, stormwater pollution. However, these impacts are viewed as marginal in the long term, as this is a relatively minor project.

7.3 Social

Alleviating congestion will inevitably reduce traffic-related stress and road rage incidents. In addition, the increase in tax revenue for the City may, one day, result in improved public transportation, increasing mobility for the low-income population who cannot afford a car. Furthermore, the increased economic productivity arising from the relief of congestion will possibly lead to increased upward mobility for the residents of Cottonwood, leading to an overall increase in happiness for the local population.

8 Cost of Implementation

Construction of the recommended alternative consists of acquiring a small piece of new right-of-way (406-04-044A), earthwork, and removing/replacing existing asphalt, concrete sidewalk, curb and gutter, and lane striping. Two of the signal masts, the controller cabinet on the southeast corner, and a utility cabinet on the northeast corner will need to be relocated. The scope of construction also includes extending a culvert under Oak Wash, installing a pedestrian island, and temporary traffic control (TTC).

The recommended alternative is projected to cost $1,335,830 to construct. An estimate of construction expenses associated with this project is presented in Table 8-1 below:

Table 8-1: Construction cost estimate

Item	Quantity	Unit	Unit cost	Total cost
Acquire right-of-way	1	Each	$750,000.00	$750,000
Remove Lane striping	3125	LF	$0.40	$1,250
Lane striping	5857.5	LF	$0.40	$2,343
Pavement markers	5857.5	LF	$0.83	$4,881
Remove crosswalks	373.5	LF	$1.00	$374
Add crosswalks	457.1	LF	$1.20	$549
Paint	1239.1	SF	$11.00	$13,630
Remove asphalt	1880.37	SF	$4.00	$7,521
New asphaltic concrete	1136.275	Ton	$110.00	$124,990
Remove Concrete sidewalk	8398.775	SF	$4.50	$37,794
Install Concrete sidewalk	8398.775	SF	$5.00	$41,994
Sidewalk ramps	3	Each	$2,500.00	$7,500
Install Curb & gutter	1679.755	LF	$30.00	$50,393
Earthwork	730	CY	$30.00	$21,900
Extend Oak Wash culvert	18	LF	$2,500.00	$45,000
Signal mast arm	2	Each	$700.00	$1,400
Signal mast foundation	2	Each	$1,200.00	$2,400
Move signal cabinet	1	Each	$500.00	$500
Move utility box	1	Each	$500.00	$500
Replace overhead sign (SR 260)	1	Each	$10,000.00	$10,000
Pedestrian island concrete	208.93	SQ YD	$95.00	$19,848
Catch basin	4	Each	$4,000.00	$16,000
Traffic sign	13	Each	$25.00	$325
TTC Cones	20	Each	$15.00	$300
TTC Signs	25	Each	$0.75	$19
TTC Sign trucks	6	Each-day	$30.00	$180
Subtotal				**$1,161,591**
Overhead (15%)				**$174,239**
Total				**$1,335,830**

9 Summary of Engineering Work

As travel restrictions associated with the COVID-19 pandemic prevented any physical site investigation, all field data were collected remotely through online sources. Because this project was scoped under the assumption that all work would be performed remotely, these restrictions had no material effect on the quality of the field data or the execution and delivery of the project. In light of these restrictions, Tasks 1.0, 2.0, and 3.0 were left intact and completed on time. However, Tasks 4.1: Field Safety Plan and Task 4.3: Upload Data, which were contingent on the possibly of the lifting of travel

restrictions, were removed from the scope of work as travel restrictions were still in effect at the time these tasks were scheduled for.

Task 5.0: Traffic Analysis took longer than expected due to issues related to the creation and calibration of the VISSIM model. The task associated with the calibration (Task 5.1) took slightly longer than expected, resulting in moderate delays for the project. However, these delays did not materially affect the schedule or the delivery of the project.

Task 6.0: Alternatives and Final Design, was modified during the course of the project. Under Task 6.1: Scoring System, Task 6.1.2: Construction Considerations was merged into Task 6.1.1: Design Criteria. Task 6.1.3: Evaluation of Impacts was moved to its own task called Task 6.5: Final Design Impacts Analysis. All modifications to Task 6.0 are visualized in Table 9-1 below:

Table 9-1: Modifications to Task 6.0 made during the project

<table>
<tr><th colspan="2">Proposal</th><th colspan="2">Actual</th></tr>
<tr><td>Task 6.0: Alternatives and Evaluation of Impacts</td><td>24 days</td><td>Task 6.0: Alternatives and Final Design</td><td>25 days</td></tr>
<tr><td>Task 6.1: Scoring System</td><td>7 days</td><td rowspan="2">Task 6.1: Scoring System Development</td><td rowspan="2">7 days</td></tr>
<tr><td>Task 6.1.1: Design Criteria</td><td>5 days</td></tr>
<tr><td>Task 6.1.2: Construction Considerations</td><td>7 days</td><td rowspan="2">Task 6.2: Analyze Alternatives in VISSIM</td><td rowspan="2">9 days</td></tr>
<tr><td>Task 6.1.3: Evaluation of Impacts</td><td>4 days</td></tr>
<tr><td>Task 6.2: Generate and Analyze Alternatives</td><td>9 days</td><td rowspan="2">Task 6.3: Score Alternatives, Select Final Design</td><td rowspan="2">2 days</td></tr>
<tr><td rowspan="2">Task 6.3: Scoring, Selection of Final Alternative</td><td rowspan="2">2 days</td></tr>
<tr><td>Task 6.4: Final Design Plan Set</td><td>11 days</td></tr>
<tr><td>Task 6.4: Preliminary and Final Design Plan Sets</td><td>11 days</td><td>Task 6.5: Final Design Impacts Analysis</td><td>5 days</td></tr>
</table>

These changes did not materially affect the delivery of the project. The original and modified Gantt charts associated with this project may be seen in Appendix F.

Table 9-2 below presents a side-by-side comparison of the staffing matrix from the Proposal [2] and the actual hours log. Additions made to the schedule during the project are highlighted in red. Tasks removed from the schedule and words removed from the names of tasks during the project are shown in strikethrough.

Table 9-2: Comparison of Proposal staffing matrix and actual hours log

	Proposal					Actual					
Task	**SE**	**E**	**PM**	**DR**	**Total**	**SE**	**E**	**PM**	**DR**	**Total**	**Difference**
Task 1.0: Research and Regulatory Considerations	**10**	**14**	**16**	**12**	**52**	**9**	**21**	**15**	**12**	**57**	**5**
Task 1.1: Review Past Solutions	5	6	8	4	23	3	4	2	5	14	-9
Task 1.2: Regulatory Considerations	5	8	8	8	29	3	6	6	5	20	-9
Task 1.2.1: Federal Highway Administration (FHWA)						1	7	3	0	11	11
Task 1.2.2 ADOT Roadway Design Guidelines						2	4	4	2	12	12
Task 2.0: Site Investigation	**7**	**13**	**22**	**31**	**73**	**11.5**	**18**	**14**	**12**	**55.5**	**-17.5**
Task 2.1: Surveying and Soil Data	1	2	2	4	9	2	3	2	1	8	-1
Task 2.2: Existing Geometry	2	4	4	8	18	1	6	2.5	4	13.5	-4.5
Task 2.3: Identify Contributing Intersections	1	3	2	3	9	4	3	3	2	12	3
Task 2.4: Lane Configurations	0	0	2	4	6	0.5	2	2	2.5	7	1
Task 2.5: Site Restrictions	2	2	6	6	16	1	2.5	3	2	8.5	-7.5
Task 2.6: Investigate Proposed Developments	1	2	6	6	15	3	1.5	1.5	0.5	6.5	-8.5
Task 3.0: Collection of Traffic Data from ADOT	**8**	**19**	**25**	**18**	**70**	**5**	**12.5**	**8.5**	**6.5**	**32.5**	**-37.5**
Task 3.1: Existing Plan Set	3	6	12	12	33	3	4	2	4	13	-20
Task 3.2: Classification of Vehicles	2	4	4	2	12	0.5	2.5	1.5	1	5.5	-6.5
Task 3.3: Five-Year Crash Data	1	4	4	0	9	0.5	2	4	1.5	8	-1
Task 3.4: Signal Timing and Phasing	2	5	5	4	16	1	4	1	0	6	-10
Task 4.0: Traffic Counts	**0.5**	**13**	**13**	**10**	**36.5**	**4**	**7**	**1**	**2**	**14**	**-22.5**
~~Task 4.1: Field Safety Plan~~	0	4	4	4	12	--	--	--	--	--	--
Task 4.2: Peak Hour Volumes	0	6	6	6	18	4	7	1	2	14	-4
~~Task 4.3: Upload Data~~	0.5	3	3	0	6.5	--	--	--	--	--	--
Task 5.0: Traffic Analysis	**23.5**	**47.5**	**47.5**	**47.5**	**166**	**12**	**22.5**	**25.5**	**38.5**	**98.5**	**-67.5**
Task 5.1: Base Model Creation and Calibration	14	28	28	28	98	8	15	18	25	66	-32
Task 5.2: VISSIM Analysis of Base Conditions	5	10.5	10.5	10.5	36.5	3	5	5	10	23	-13.5
Task 5.3: 20-Year Projection	4.5	9	9	9	31.5	1	2.5	2.5	3.5	9.5	-22
Task 6.0: Alternatives and Evaluation of Impacts	**41**	**66**	**55**	**71**	**233**	**23**	**34.5**	**39**	**47.5**	**144**	**-89**
Task 6.1: Scoring System Development	8	16	12	12	48	6	5.5	3	5	19.5	-28.5
~~Task 6.1.1: Design Criteria~~						--	--	--	--	--	--
~~Task 6.1.2: Construction Considerations~~						--	--	--	--	--	--
~~Task 6.1.3: Evaluation of Impacts~~						--	--	--	--	--	--
Task 6.2: ~~Generate and~~ Analyze Alternatives in VISSIM	15	20	15	15	65	6.5	11	12	13.5	43	-22
Task 6.3: Scoring, Selection of Final Alternative	2	6	4	4	16	4	6	9	6	25	9
Task 6.4: ~~Preliminary and~~ Final Design Plan Sets~~~~	16	24	24	40	104	4	8	10	19	41	-63
Task 6.5: Final Design Impacts Analysis	--	--	--	--	--	2.5	4	5	4	15.5	15.5
Task 7.0: Project Deliverables	**19**	**34**	**34**	**34**	**121**	**27**	**33.5**	**37**	**46.5**	**144**	**23**
Task 7.1: 30% Report and Presentation	3	6	6	6	21	7.5	3	7	9	26.5	5.5
Task 7.2: 60% Report and Presentation	3	6	6	6	21	5	11	5.5	9	30.5	9.5
Task 7.3: 90% Report	3	6	6	6	21	4	7	8	11	30	9
Task 7.4: Final Report and Presentation	--	--	--	--	--	--	--	--	--	0	--
Task 7.4.1: Final Report	3	6	6	6	21	2	4	7	6	19	-2
Task 7.4.2: UGRADS Presentation	4	4	4	4	16	3	4	4	5	16	0
Task 7.5: Website	--	--	--	--	--	--	--	--	--	0	--
Task 7.5.1: 90% Website	2	4	4	4	14	3.5	2.5	3.5	4.5	14	0
Task 7.5.2: Final Website	1	2	2	2	7	2	2	2	2	8	1
Task 8.0: Project Management	**34**	**34**	**44**	**24**	**136**	**23.5**	**23**	**25**	**24**	**95.5**	**-40.5**
Task 8.1: Resource Management	5	5	10	0	20	5	5	5	5	20	0
Task 8.2: Client and TA Meetings	8	8	8	8	32	4	4	4	4	16	-16
Task 8.3: GI Meetings	8	8	8	8	32	3.5	3	4	4	14.5	-17.5
Task 8.4: Team Meetings	8	8	8	8	32	7	7	8	7	29	-3
Task 8.5: Schedule Management	5	5	10	0	20	4	4	4	4	16	-4
Total of All Tasks	**143**	**241**	**257**	**248**	**887.5**	**115**	**172**	**165**	**189**	**641**	**-246.5**

10 Summary of Engineering Costs

Due to COVID-related travel restrictions, Tasks 4.1 and 4.3 were removed from the scope and the client was not billed for any hours during those tasks.

A total of 641.0 personnel-hours were required to complete this project, 246.5 personnel-hours fewer than the 887.5 budgeted for in the Proposal [2]. Given the billing rates outlined in the Proposal [2], the total cost of engineering personnel was determined to be $61,208. An outline of these costs by position is presented in Table 10-1 below:

Table 10-1: Comparison of personnel-hours and costs by position

Position	Hours	Billing rate/hr	Cost
SE	115.0	$153	$17,548
E	172.0	$106	$18,229
PM	165.0	$90	$14,787
DR	189.0	$56	$10,644
Total	**641.0**	**$405**	**$61,208**

As COVID-related travel restrictions eliminated the possibility of travel, travel expenses associated with this project were reduced from $347 to $0. These restrictions also reduced the number of trips to the traffic lab from 20 to 10, as NAU's Remote Desktop made it possible for most VISSIM work to be performed remotely. In total, the actual cost of engineering services was $62,708, which was $23,874 less than the projection of $86,582 given by the Proposal [2].

A comparison of personnel, travel, and supply costs between the estimates from the Proposal [2] and actual expenses incurred during the project is presented in Table 6-2 below:

Table 10-2: Comparison of personnel-hours and engineering costs between the proposal and actual project

		Rate per Hour	Proposal		Actual	
	Classification		**Hours**	**Cost**	**Hours**	**Cost**
	Senior Engineer (SE)	$152.59	143.0	$21,820	115.0	$17,548
	Engineer (E)	$105.98	240.5	$25,488	172.0	$18,229
	Project Manager (PM)	$89.62	256.5	$22,988	165.0	$14,787
1.0	Drafter (DR)	$56.32	247.5	$13,939	189.0	$10,644
Personnel	**Total personnel**			**$84,235**		**$61,208**
	Classification	**Rate per Mile**	**Miles**	**Cost**	**Miles**	**Cost**
	Travel to site					
	3 vehicles, 2 round trips, 130 miles roundtrip, @ $0.445/mile	$0.45	780	$347	0	$0
2.0 Travel	**Total travel**			**$347**		**$0**
	Classification	**Rate per Day**	**Days**	**Cost**	**Days**	**Cost**
	Traffic Lab access					
3.0	20 days @ $100/day	$100.00	20	$2,000	15	$1,500
Supplies	**Total supplies**			**$2,000**		**$1,500**
4.0 Total Cost of Engineering Services				**$86,582**		**$62,708**

11 Conclusion

In conclusion, a microsimulation analysis was performed using field data obtained using COVID-compliant methods for the SR 260/SR 89A intersection in Cottonwood, Arizona. Control delay, level of service, and queue length were compared between a base model and several design alternatives. The final recommendation is to add a slip lane to the right-turn movement from SR 89A NB (toward Sedona) to SR 260 EB (toward Camp Verde) and widen SR 260 one lane to the right to eliminate the conflict with other movements utilizing SR 260 EB. Additionally, one through lane should be added to Cove Pkwy to increase efficiency for the through movement and to free up signal timing for other phases.

The recommended build alternative has an estimated cost of $1,398,538, including $1,335,830 for construction and $62,708 for engineering services. Minor delays and changes to the schedule occurred during the execution of the project, but these did not materially affect the delivery of the project.

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Appendix A: Field Data

Appendix A-1: Soil report for the SR 260/SR 89A intersection

This appendix contains the soil report for the ground underneath the SR 260/SR 89A intersection. This report begins on the next page.

Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties

420—Mingus soils, Tapco soils and Urban land, 3 to 12 percent slopes

Map Unit Setting

National map unit symbol: 1ylq
Elevation: 2,900 to 3,800 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 60 to 65 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Mingus and similar soils: 34 percent
Tapco and similar soils: 33 percent
Urban land: 33 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mingus

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

A - 0 to 3 inches: extremely gravelly clay loam
Bt - 3 to 12 inches: gravelly clay
Btk - 12 to 24 inches: gravelly clay
2Bkqm1 - 24 to 30 inches: cemented material
2Bkqm2 - 30 to 60 inches: cemented material

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R038XA103AZ - Clay Loam Upland 12-16" p.z.
Hydric soil rating: No

Description of Tapco

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

A - 0 to 3 inches: very gravelly clay loam
Bt - 3 to 7 inches: clay
Btk - 7 to 18 inches: clay
2Bkqm - 18 to 26 inches: cemented material
2Bkkm - 26 to 60 inches: cemented material

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 4 to 20 inches to duripan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R038XA103AZ - Clay Loam Upland 12-16" p.z.
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

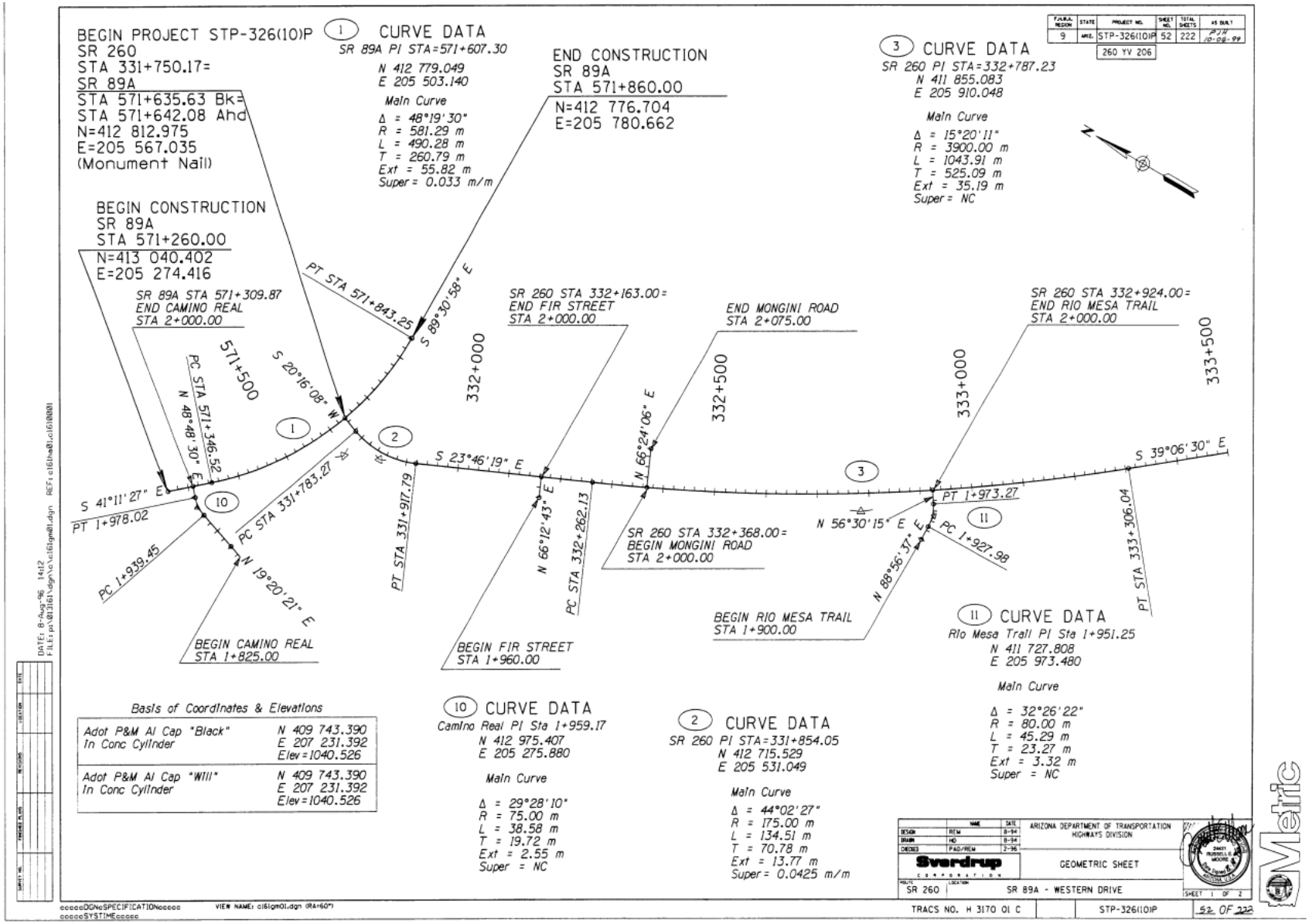
Hydric soil rating: No

Data Source Information

Soil Survey Area: Black Hills-Sedona Area, Arizona, Parts of Coconino and Yavapai Counties
Survey Area Data: Version 9, Jun 3, 2020

Appendix A-2: Excerpts from existing as-built plan set

This appendix contains parts of the as-built plan set used to gather field data and to govern the calibration of the VISSIM model. Due to the size of the sheets involved, they begin on the next page.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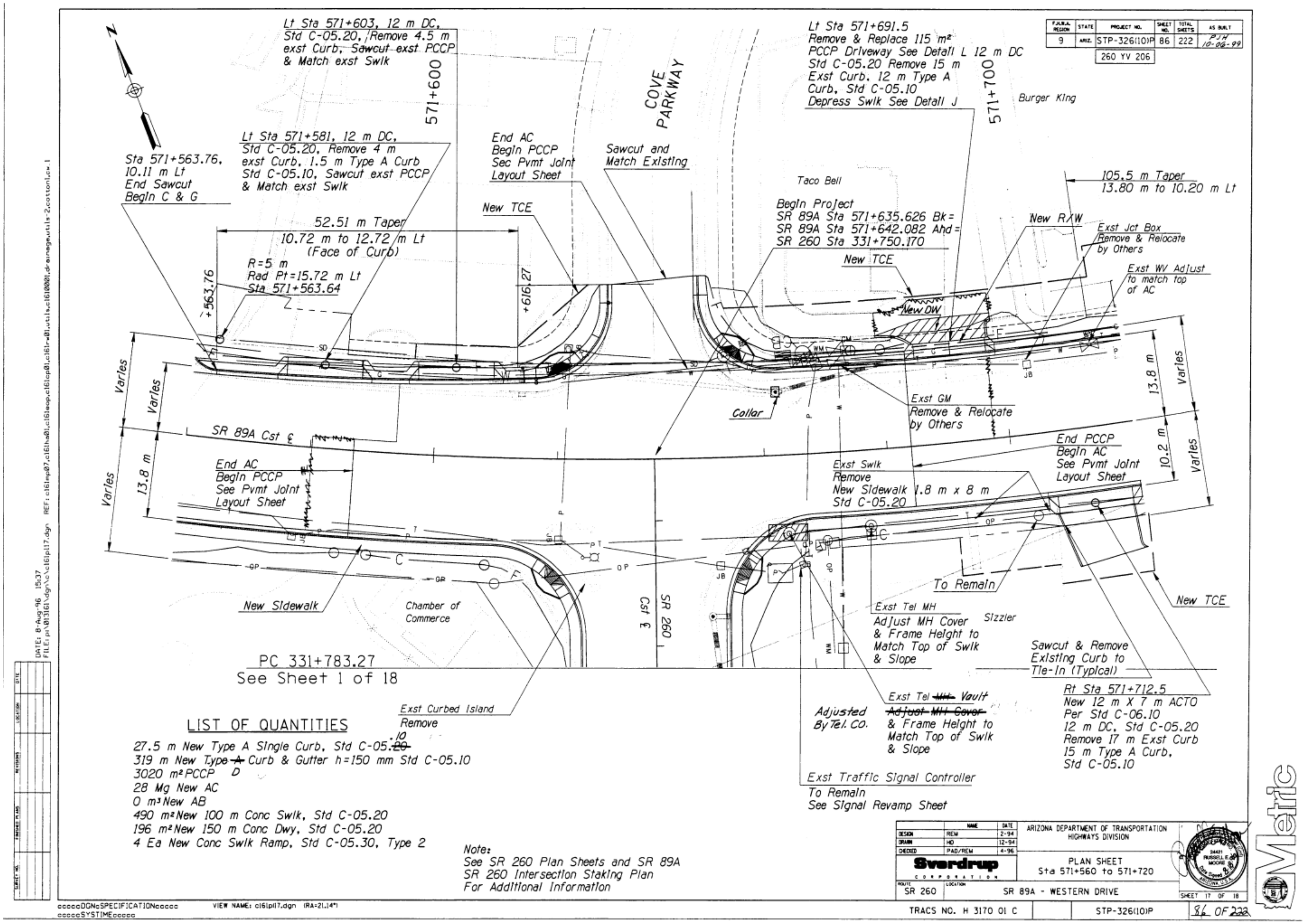
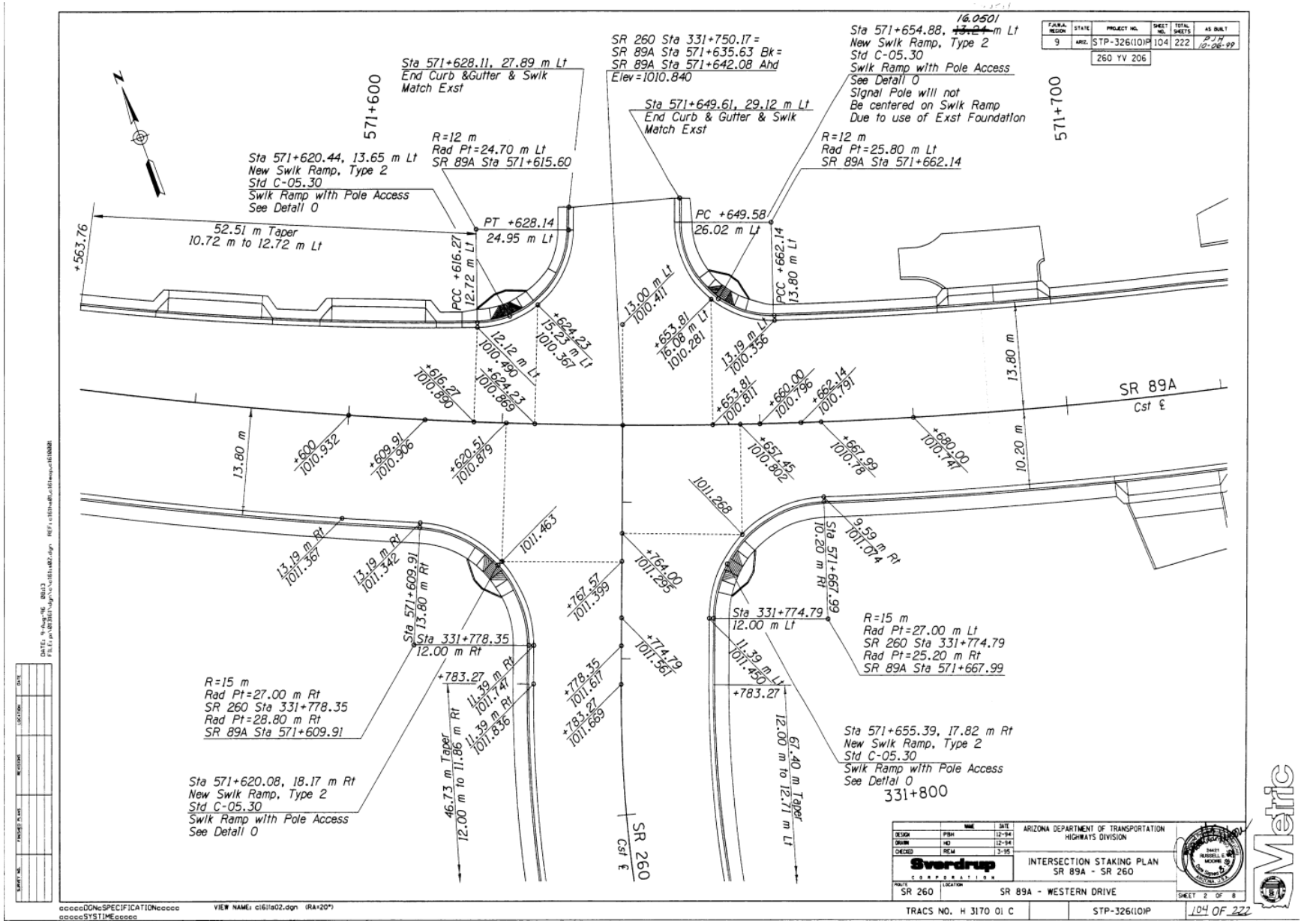
SR 89A
STA 571+635.63 Bk=
STA 571+642.08 Ahd
N=412 812.975
E=205 567.035
(Monument Nail)
BEGIN CONSTRUCTION
SR 89A
STA 571+260.00
N=413 040.402
E=205 274.416
1 CURVE DATA
SR 89A PI STA=571+607.30
N 412 779.049
E 205 503.140
Main Curve
Δ = 48°19'30"
R = 581.29 m
L = 490.28 m
T = 260.79 m
Ext = 55.82 m
Super = 0.033 m/m
END CONSTRUCTION
SR 89A
STA 571+860.00
N=412 776.704
E=205 780.662
3 CURVE DATA
SR 260 PI STA=332+787.23
N 411 855.083
E 205 910.048
Main Curve
Δ = 15°20'11"
R = 3900.00 m
L = 1043.91 m
T = 525.09 m
Ext = 35.19 m
Super = NC
SR 89A STA 571+309.87
END CAMINO REAL
STA 2+000.00
PT STA 571+843.25
S 89°30'58" E
SR 260 STA 332+163.00=
END FIR STREET
STA 2+000.00
END MONGINI ROAD
STA 2+075.00
SR 260 STA 332+924.00=
END RIO MESA TRAIL
STA 2+000.00
571+500
332+000
332+500
333+000
333+500
PC STA 571+346.52
N 48°48'30" E
S 20°16'08" W
S 41°11'27" E
PT 1+978.02
PC 1+939.45
N 19°20'21" E
BEGIN CAMINO REAL
STA 1+825.00
PC STA 331+783.27
PT STA 331+917.79
S 23°46'19" E
N 66°12'43" E
PC STA 332+262.13
BEGIN FIR STREET
STA 1+960.00
N 66°24'06" E
SR 260 STA 332+368.00=
BEGIN MONGINI ROAD
STA 2+000.00
N 56°30'15" E
PT 1+973.27
PC 1+927.98
N 88°56'37" E
BEGIN RIO MESA TRAIL
STA 1+900.00
S 39°06'30" E
PT STA 333+306.04
11 CURVE DATA
Rio Mesa Trail PI Sta 1+951.25
N 411 727.808
E 205 973.480
Main Curve
Δ = 32°26'22"
R = 80.00 m
L = 45.29 m
T = 23.27 m
Ext = 3.32 m
Super = NC
10 CURVE DATA
Camino Real PI Sta 1+959.17
N 412 975.407
E 205 275.880
Main Curve
Δ = 29°28'10"
R = 75.00 m
L = 38.58 m
T = 19.72 m
Ext = 2.55 m
Super = NC
2 CURVE DATA
SR 260 PI STA=331+854.05
N 412 715.529
E 205 531.049
Main Curve
Δ = 44°02'27"
R = 175.00 m
L = 134.51 m
T = 70.78 m
Ext = 13.77 m
Super = 0.0425 m/m
Basis of Coordinates & Elevations
Adot P&M Al Cap "Black" In Conc Cylinder
N 409 743.390
E 207 231.392
Elev = 1040.526
Adot P&M Al Cap "Will" In Conc Cylinder
N 409 743.390
E 207 231.392
Elev = 1040.526
ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
GEOMETRIC SHEET
Sverdrup
SR 260
SR 89A - WESTERN DRIVE
TRACS NO. H 3170 01 C
STP-326(10)P
52 OF 222


Lt Sta 571+603, 12 m DC, Std C-05.20, Remove 4.5 m exst Curb, Sawcut exst PCCP & Match exst Swlk
Lt Sta 571+691.5 Remove & Replace 115 m² PCCP Driveway See Detail L 12 m DC Std C-05.20 Remove 15 m Exst Curb, 12 m Type A Curb, Std C-05.10 Depress Swlk See Detail J
F.H.W.A. REGION 9 | STATE ARIZ. | PROJECT NO. STP-326(10)P | SHEET NO. 86 | TOTAL SHEETS 222 | AS BUILT
260 YV 206
571+600
571+700
COVE PARKWAY
Burger King
Sta 571+563.76, 10.11 m Lt End Sawcut Begin C & G
Lt Sta 571+581, 12 m DC, Std C-05.20, Remove 4 m exst Curb, 1.5 m Type A Curb Std C-05.10, Sawcut exst PCCP & Match exst Swlk
End AC Begin PCCP Sec Pvmt Joint Layout Sheet
Sawcut and Match Existing
Taco Bell
105.5 m Taper 13.80 m to 10.20 m Lt
New TCE
52.51 m Taper 10.72 m to 12.72 m Lt (Face of Curb)
R=5 m Rad Pt=15.72 m Lt Sta 571+563.64
Begin Project SR 89A Sta 571+635.626 Bk= SR 89A Sta 571+642.082 Ahd= SR 260 Sta 331+750.170
New R/W
Exst Jct Box Remove & Relocate by Others
Exst WV Adjust to match top of AC
New TCE
New DW
+563.76
+616.27
Varies
Collar
Exst GM Remove & Relocate by Others
13.8 m
SR 89A Cst ℄
End PCCP Begin AC See Pvmt Joint Layout Sheet
10.2 m
End AC Begin PCCP See Pvmt Joint Layout Sheet
Exst Swlk Remove New Sidewalk 1.8 m x 8 m Std C-05.20
To Remain
New TCE
New Sidewalk
Chamber of Commerce
Cst ℄
SR 260
Exst Tel MH Adjust MH Cover & Frame Height to Match Top of Swlk & Slope
Sizzler
Sawcut & Remove Existing Curb to Tie-In (Typical)
PC 331+783.27
See Sheet 1 of 18
Exst Curbed Island Remove
Exst Tel Vault & Frame Height to Match Top of Swlk & Slope
Adjusted By Tel. Co.
Rt Sta 571+712.5 New 12 m X 7 m ACTO Per Std C-06.10 12 m DC, Std C-05.20 Remove 17 m Exst Curb 15 m Type A Curb, Std C-05.10
LIST OF QUANTITIES
27.5 m New Type A Single Curb, Std C-05.10
319 m New Type D Curb & Gutter h=150 mm Std C-05.10
3020 m² PCCP
28 Mg New AC
0 m³ New AB
490 m² New 100 m Conc Swlk, Std C-05.20
196 m² New 150 m Conc Dwy, Std C-05.20
4 Ea New Conc Swlk Ramp, Std C-05.30, Type 2
Exst Traffic Signal Controller To Remain See Signal Revamp Sheet
Note: See SR 260 Plan Sheets and SR 89A SR 260 Intersection Staking Plan For Additional Information
DESIGN REM 2-94
DRAWN HO 12-94
CHECKED PAD/REM 4-96
Sverdrup CORPORATION
ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
PLAN SHEET Sta 571+560 to 571+720
SR 260
SR 89A - WESTERN DRIVE
SHEET 17 OF 18
TRACS NO. H 3170 01 C
STP-326(10)P
86 OF 222
Metric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F.A.H.A. REGION 9
STATE ARIZ.
PROJECT NO. STP-326(10)P
SHEET NO. 104
TOTAL SHEETS 222
AS BUILT
260 YV 206
571+600
571+700
331+800
Sta 571+628.11, 27.89 m Lt
End Curb &Gutter & Swlk
Match Exst
SR 260 Sta 331+750.17 =
SR 89A Sta 571+635.63 Bk =
SR 89A Sta 571+642.08 Ahd
Elev = 1010.840
Sta 571+654.88, 13.24 m Lt
New Swlk Ramp, Type 2
Std C-05.30
Swlk Ramp with Pole Access
See Detail 0
Signal Pole will not
Be centered on Swlk Ramp
Due to use of Exst Foundation
Sta 571+649.61, 29.12 m Lt
End Curb & Gutter & Swlk
Match Exst
R=12 m
Rad Pt=24.70 m Lt
SR 89A Sta 571+615.60
R=12 m
Rad Pt=25.80 m Lt
SR 89A Sta 571+662.14
Sta 571+620.44, 13.65 m Lt
New Swlk Ramp, Type 2
Std C-05.30
Swlk Ramp with Pole Access
See Detail 0
+563.76
52.51 m Taper
10.72 m to 12.72 m Lt
PT +628.14
24.95 m Lt
PC +649.58
26.02 m Lt
PCC +616.27
12.72 m Lt
PCC +662.14
13.80 m Lt
+624.23
15.23 m Lt
1010.357
12.12 m Lt
1010.490
+624.23
1010.869
+616.27
1010.390
13.00 m Lt
1010.411
+653.81
16.08 m Lt
1010.281
13.19 m Lt
1010.356
+653.81
1010.811
+660.00
1010.796
+662.14
1010.791
13.80 m
SR 89A
Cst ℄
13.80 m
+600
1010.932
+609.91
1010.906
+620.51
1010.879
+657.45
1010.802
+667.99
1010.78
+680.00
1010.747
10.20 m
1011.268
13.19 m Rt
1011.367
13.19 m Rt
1011.342
1011.463
Sta 571+609.91
13.80 m Rt
+764.00
1011.295
+767.57
1011.399
Sta 571+667.99
10.20 m Rt
9.59 m Rt
1011.074
Sta 331+778.35
12.00 m Rt
+774.79
1011.561
Sta 331+774.79
12.00 m Lt
11.39 m Lt
1011.450
R=15 m
Rad Pt=27.00 m Rt
SR 260 Sta 331+778.35
Rad Pt=28.80 m Rt
SR 89A Sta 571+609.91
+783.27
11.39 m Rt
1011.747
11.39 m Rt
1011.836
+778.35
1011.617
+783.27
1011.669
+783.27
R=15 m
Rad Pt=27.00 m Lt
SR 260 Sta 331+774.79
Rad Pt=25.20 m Rt
SR 89A Sta 571+667.99
46.73 m Taper
12.00 m to 11.86 m Rt
12.00 m to 12.71 m Lt
67.40 m Taper
Sta 571+620.08, 18.17 m Rt
New Swlk Ramp, Type 2
Std C-05.30
Swlk Ramp with Pole Access
See Detail 0
Sta 571+655.39, 17.82 m Rt
New Swlk Ramp, Type 2
Std C-05.30
Swlk Ramp with Pole Access
See Detail 0
SR 260
Cst ℄
DESIGN PBH 12-94
DRAWN HD 12-94
CHECKED REM 3-95
Sverdrup CORPORATION
ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
INTERSECTION STAKING PLAN
SR 89A - SR 260
ROUTE SR 260
LOCATION SR 89A - WESTERN DRIVE
SHEET 2 OF 8
TRACS NO. H 3170 01 C
STP-326(10)P
104 OF 222
cccccDGNcSPECIFICATIONcccccc
ccccSYSTIMEcccccc
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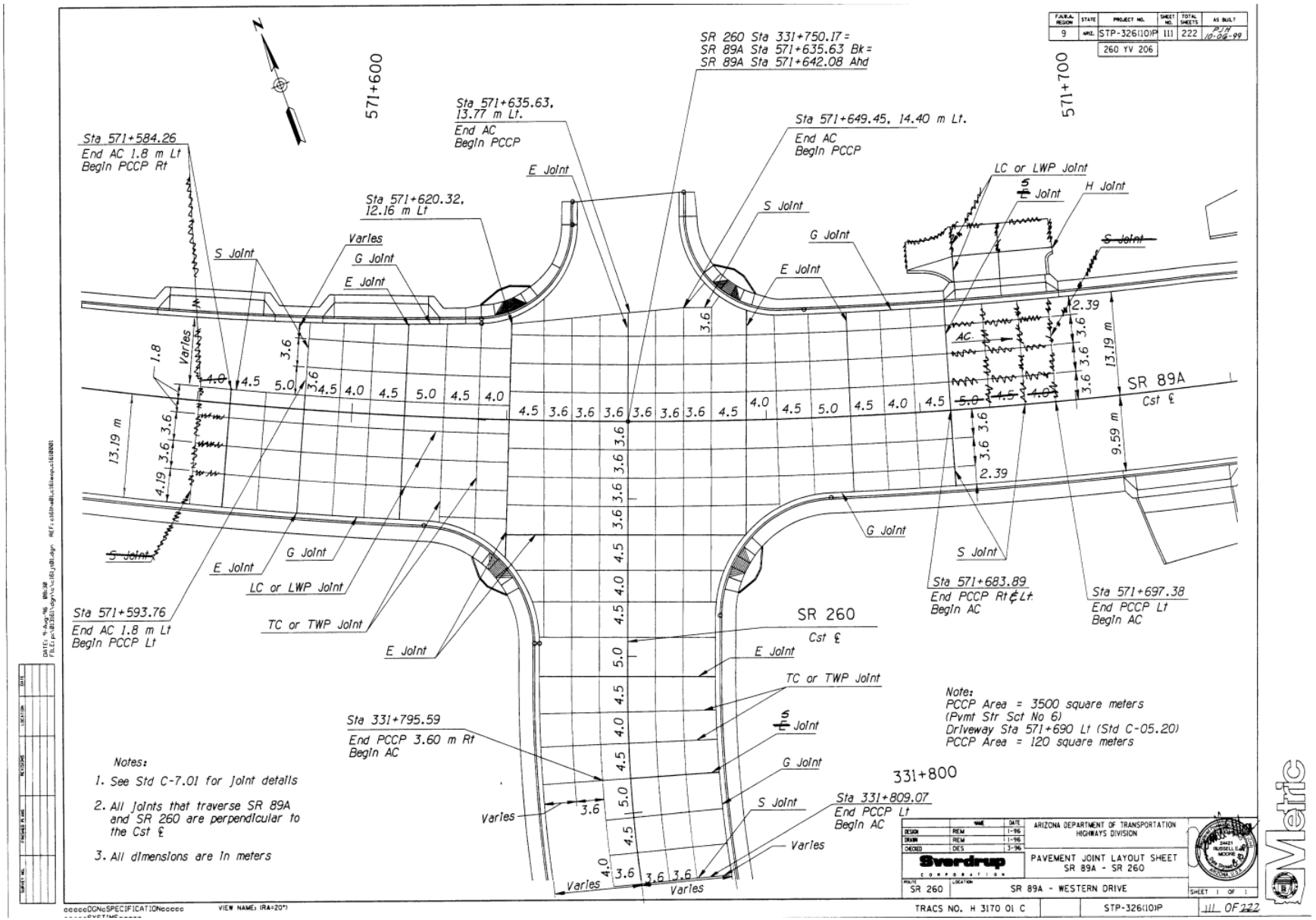
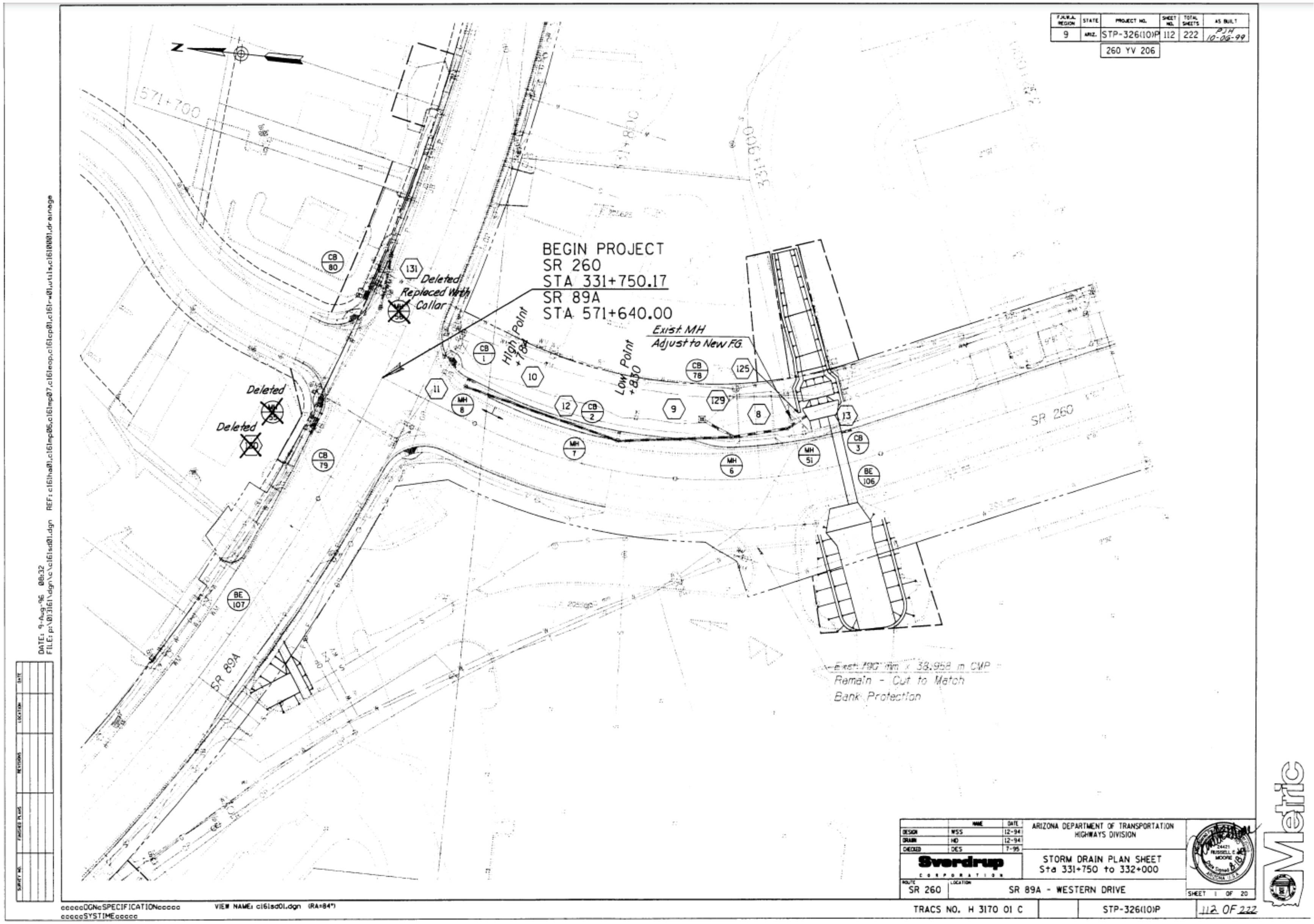
Metric


571+600
571+700
SR 260 Sta 331+750.17 =
SR 89A Sta 571+635.63 Bk =
SR 89A Sta 571+642.08 Ahd
Sta 571+584.26
End AC 1.8 m Lt
Begin PCCP Rt
Sta 571+635.63,
13.77 m Lt.
End AC
Begin PCCP
Sta 571+649.45, 14.40 m Lt.
End AC
Begin PCCP
Sta 571+620.32,
12.16 m Lt
S Joint
Varies
G Joint
E Joint
LC or LWP Joint
H Joint
SR 89A
Cst ℄
SR 260
Cst ℄
Sta 571+593.76
End AC 1.8 m Lt
Begin PCCP Lt
TC or TWP Joint
Sta 571+683.89
End PCCP Rt ℄ Lt
Begin AC
Sta 571+697.38
End PCCP Lt
Begin AC
Sta 331+795.59
End PCCP 3.60 m Rt
Begin AC
Sta 331+809.07
End PCCP Lt
Begin AC
331+800
Notes:
1. See Std C-7.01 for joint details
2. All joints that traverse SR 89A and SR 260 are perpendicular to the Cst ℄
3. All dimensions are in meters
Note:
PCCP Area = 3500 square meters
(Pvmt Str Sct No 6)
Driveway Sta 571+690 Lt (Std C-05.20)
PCCP Area = 120 square meters
ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PAVEMENT JOINT LAYOUT SHEET
SR 89A - SR 260
SR 260
SR 89A - WESTERN DRIVE
TRACS NO. H 3170 01 C
STP-326(10)P
111 OF 222
Metric


F.H.W.A. REGION | STATE | PROJECT NO. | SHEET NO. | TOTAL SHEETS | AS BUILT
9 | ARIZ. | STP-326(10)P | 112 | 222 | PJH 10-06-99
260 YV 206
BEGIN PROJECT
SR 260
STA 331+750.17
SR 89A
STA 571+640.00
Deleted Replaced With Collar
Deleted
Deleted
High Point +784
Low Point +830
Exist MH Adjust to New FG.
SR 260
SR 89A
571+700
331+900
Exist 1190 mm × 38.958 m CMP - Remain - Cut to Match Bank Protection
ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
DESIGN WSS 12-94
DRAWN HD 12-94
CHECKED DES 7-95
Sverdrup CORPORATION
STORM DRAIN PLAN SHEET
Sta 331+750 to 332+000
ROUTE SR 260
LOCATION SR 89A - WESTERN DRIVE
SHEET 1 OF 20
TRACS NO. H 3170 01 C
STP-326(10)P
112 OF 222
Metric
DATE: 9-Aug-96 08:32
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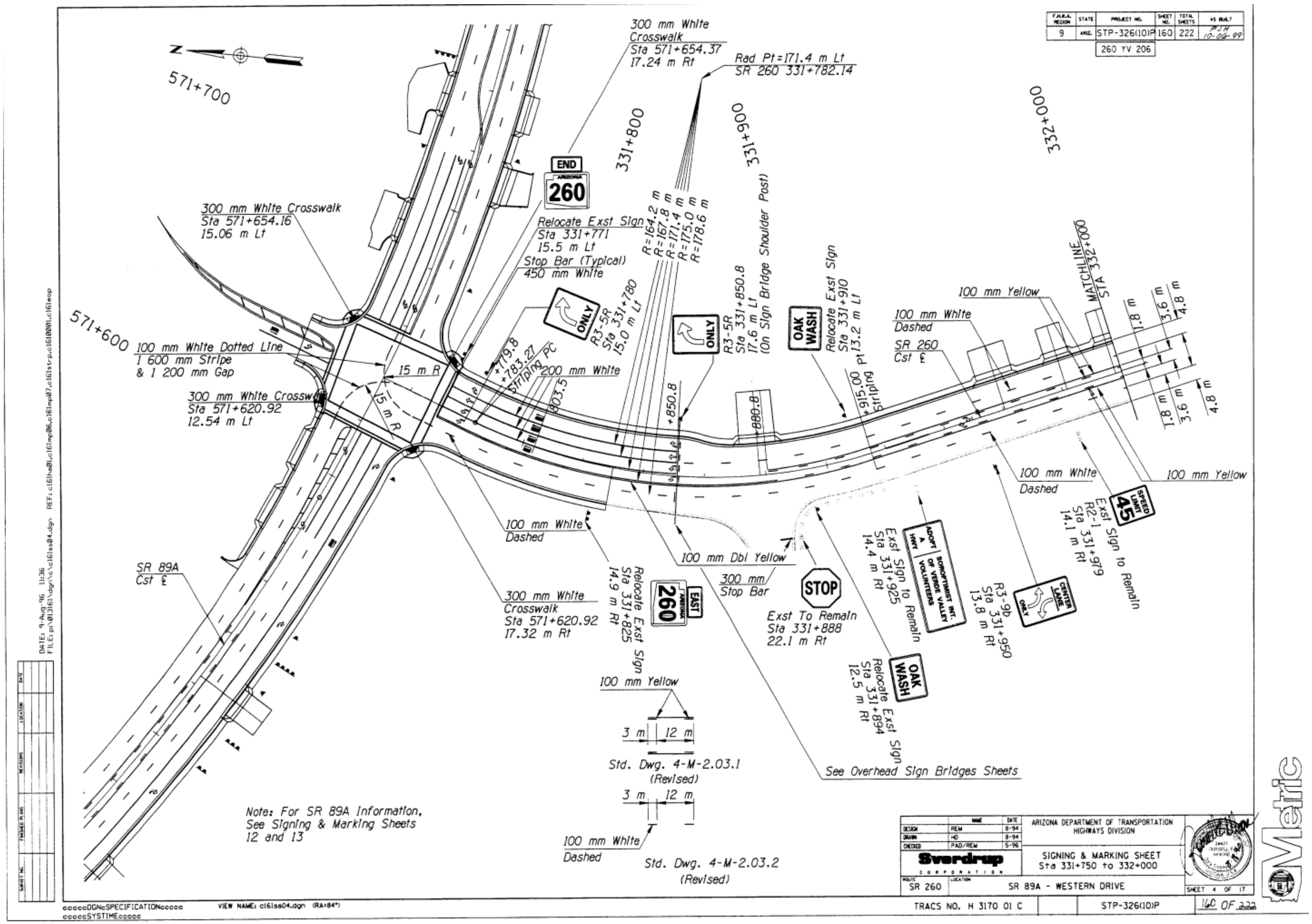
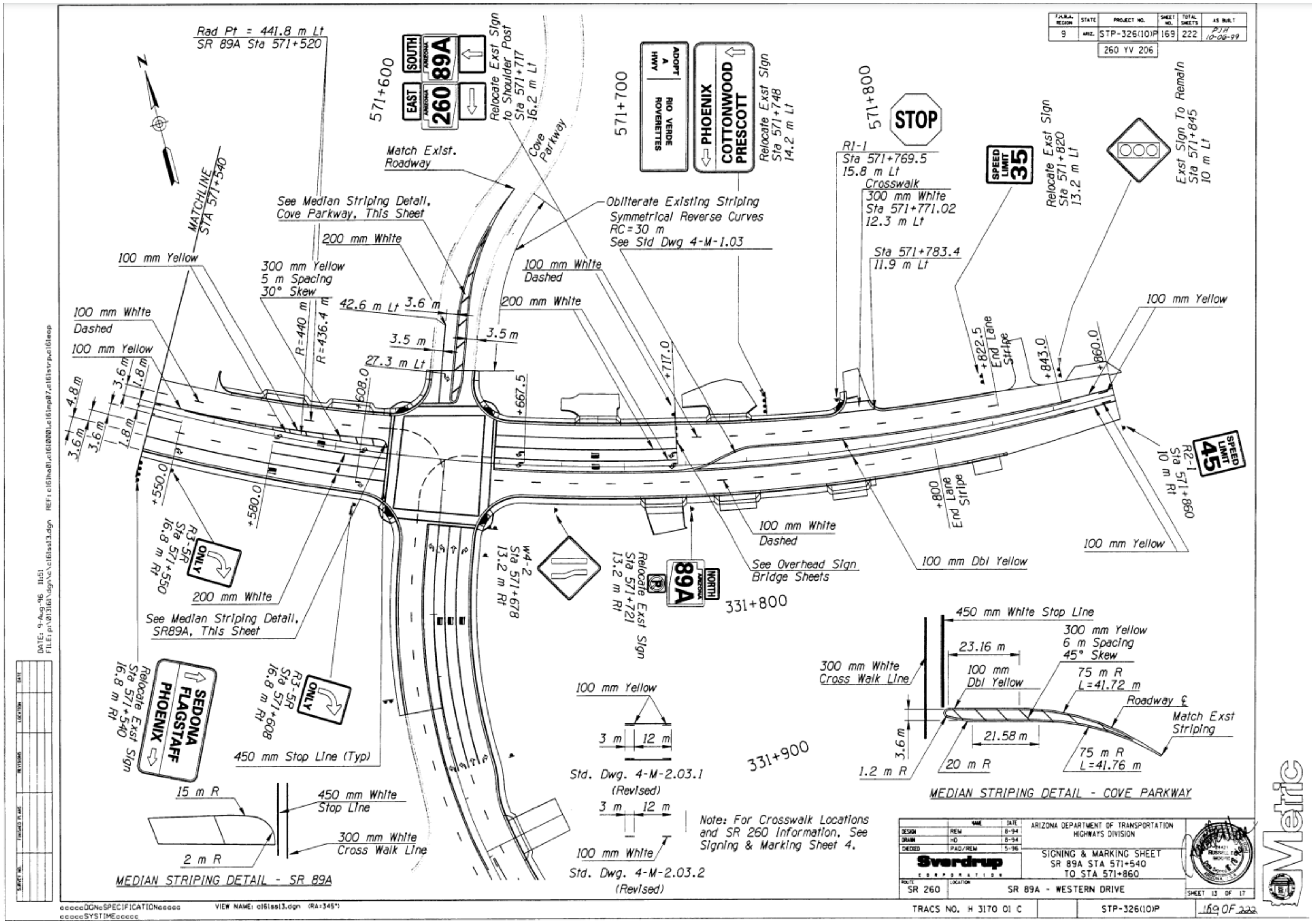


300 mm White Crosswalk
Sta 571+654.37
17.24 m Rt
Rad Pt=171.4 m Lt
SR 260 331+782.14
571+700
331+800
331+900
332+000
300 mm White Crosswalk
Sta 571+654.16
15.06 m Lt
Relocate Exst Sign
Sta 331+771
15.5 m Lt
Stop Bar (Typical)
450 mm White
R=164.2 m
R=167.8 m
R=171.4 m
R=175.0 m
R=178.6 m
R3-5R
Sta 331+780
15.0 m Lt
R3-5R
Sta 331+850.8
17.6 m Lt
(On Sign Bridge Shoulder Post)
Relocate Exst Sign
Sta 331+910
13.2 m Lt
MATCHLINE
STA 332+000
100 mm Yellow
100 mm White
Dashed
SR 260
Cst ℄
571+600
100 mm White Dotted Line
1 600 mm Stripe
& 1 200 mm Gap
15 m R
200 mm White
300 mm White Crosswalk
Sta 571+620.92
12.54 m Lt
100 mm White
Dashed
100 mm Yellow
100 mm White
Dashed
100 mm Dbl Yellow
300 mm
Stop Bar
SR 89A
Cst ℄
300 mm White
Crosswalk
Sta 571+620.92
17.32 m Rt
Relocate Exst Sign
Sta 331+825
14.9 m Rt
Exst To Remain
Sta 331+888
22.1 m Rt
Exst Sign to Remain
Sta 331+925
14.4 m Rt
R3-9b
Sta 331+950
13.8 m Rt
Exst Sign to Remain
R2-1
Sta 331+979
14.1 m Rt
Relocate Exst Sign
Sta 331+894
12.5 m Rt
100 mm Yellow
3 m
12 m
Std. Dwg. 4-M-2.03.1
(Revised)
3 m
12 m
100 mm White
Dashed
Std. Dwg. 4-M-2.03.2
(Revised)
See Overhead Sign Bridges Sheets
Note: For SR 89A Information,
See Signing & Marking Sheets
12 and 13
END
260
ONLY
OAK WASH
STOP
EAST
SPEED LIMIT 45
CENTER LANE ONLY
ADOPT A HWY
SOROPTIMIST INT. OF VERDE VALLEY VOLUNTEERS
F.H.W.A. REGION 9
STATE ARIZ.
PROJECT NO. STP-326(10)P
SHEET NO. 160
TOTAL SHEETS 222
260 YV 206
ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DESIGN REM 8-94
DRAWN HD 8-94
CHECKED PAD/REM 5-96
Sverdrup
CORPORATION
SIGNING & MARKING SHEET
Sta 331+750 to 332+000
ROUTE SR 260
SR 89A - WESTERN DRIVE
SHEET 4 OF 17
TRACS NO. H 3170 01 C
STP-326(10)P
160 OF 222
Metric


Rad Pt = 441.8 m Lt
SR 89A Sta 571+520
MATCHLINE STA 571+540
571+600
571+700
571+800
Relocate Exst Sign to Shoulder Post Sta 571+717 16.2 m Lt
ADOPT A HWY RIO VERDE ROVERETTES
PHOENIX COTTONWOOD PRESCOTT
Relocate Exst Sign Sta 571+748 14.2 m Lt
STOP
R1-1 Sta 571+769.5 15.8 m Lt
Crosswalk 300 mm White Sta 571+771.02 12.3 m Lt
Sta 571+783.4 11.9 m Lt
SPEED LIMIT 35
Relocate Exst Sign Sta 571+820 13.2 m Lt
Exst Sign To Remain Sta 571+845 10 m Lt
Match Exist. Roadway
Cove Parkway
See Median Striping Detail, Cove Parkway, This Sheet
Obliterate Existing Striping Symmetrical Reverse Curves RC = 30 m See Std Dwg 4-M-1.03
100 mm Yellow
200 mm White
300 mm Yellow 5 m Spacing 30° Skew
100 mm White Dashed
200 mm White
100 mm Yellow
100 mm White Dashed
100 mm Yellow
42.6 m Lt
3.6 m
3.5 m
3.5 m
27.3 m Lt
R=440 m
R=436.4 m
+608.0
+667.5
+717.0
+822.5
End Lane Stripe
+843.0
+860.0
4.8 m
3.6 m
1.8 m
3.6 m
3.6 m
1.8 m
+550.0
+580.0
R3-5R Sta 571+550 16.8 m Rt
ONLY
200 mm White
See Median Striping Detail, SR89A, This Sheet
W4-2 Sta 571+678 13.2 m Rt
NORTH 89A
Relocate Exst Sign Sta 571+721 13.2 m Rt
331+800
331+900
100 mm White Dashed
See Overhead Sign Bridge Sheets
100 mm Dbl Yellow
+800 End Lane Stripe
100 mm Yellow
R2-1 Sta 571+860 10 m Rt
SPEED LIMIT 45
SEDONA FLAGSTAFF PHOENIX
Relocate Exst Sign Sta 571+540 16.8 m Rt
R3-5R Sta 571+608 16.8 m Rt
ONLY
450 mm Stop Line (Typ)
15 m R
2 m R
450 mm White Stop Line
300 mm White Cross Walk Line
MEDIAN STRIPING DETAIL - SR 89A
100 mm Yellow
3 m
12 m
Std. Dwg. 4-M-2.03.1 (Revised)
3 m
12 m
100 mm White
Std. Dwg. 4-M-2.03.2 (Revised)
Note: For Crosswalk Locations and SR 260 Information, See Signing & Marking Sheet 4.
450 mm White Stop Line
300 mm Yellow 6 m Spacing 45° Skew
23.16 m
300 mm White Cross Walk Line
100 mm Dbl Yellow
75 m R L=41.72 m
Roadway ℄
Match Exst Striping
21.58 m
3.6 m
1.2 m R
20 m R
75 m R L=41.76 m
MEDIAN STRIPING DETAIL - COVE PARKWAY
F.H.W.A. REGION 9 | STATE ARIZ. | PROJECT NO. STP-326(10)P | SHEET NO. 169 | TOTAL SHEETS 222 | AS BUILT
260 YV 206
ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
Sverdrup CORPORATION
SIGNING & MARKING SHEET SR 89A STA 571+540 TO STA 571+860
SR 260
SR 89A - WESTERN DRIVE
SHEET 13 OF 17
TRACS NO. H 3170 01 C
STP-326(10)P
169 OF 222
Metric
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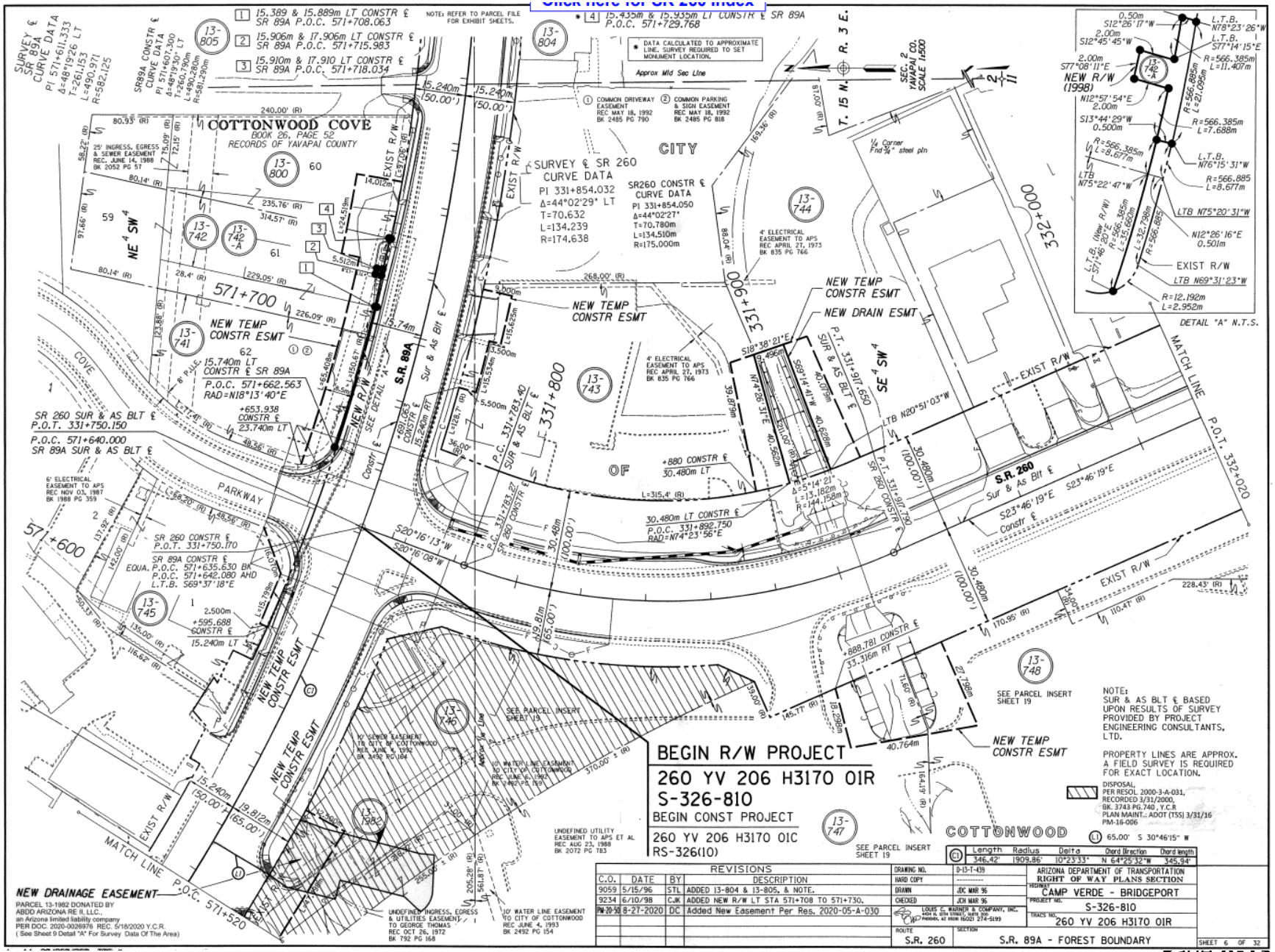
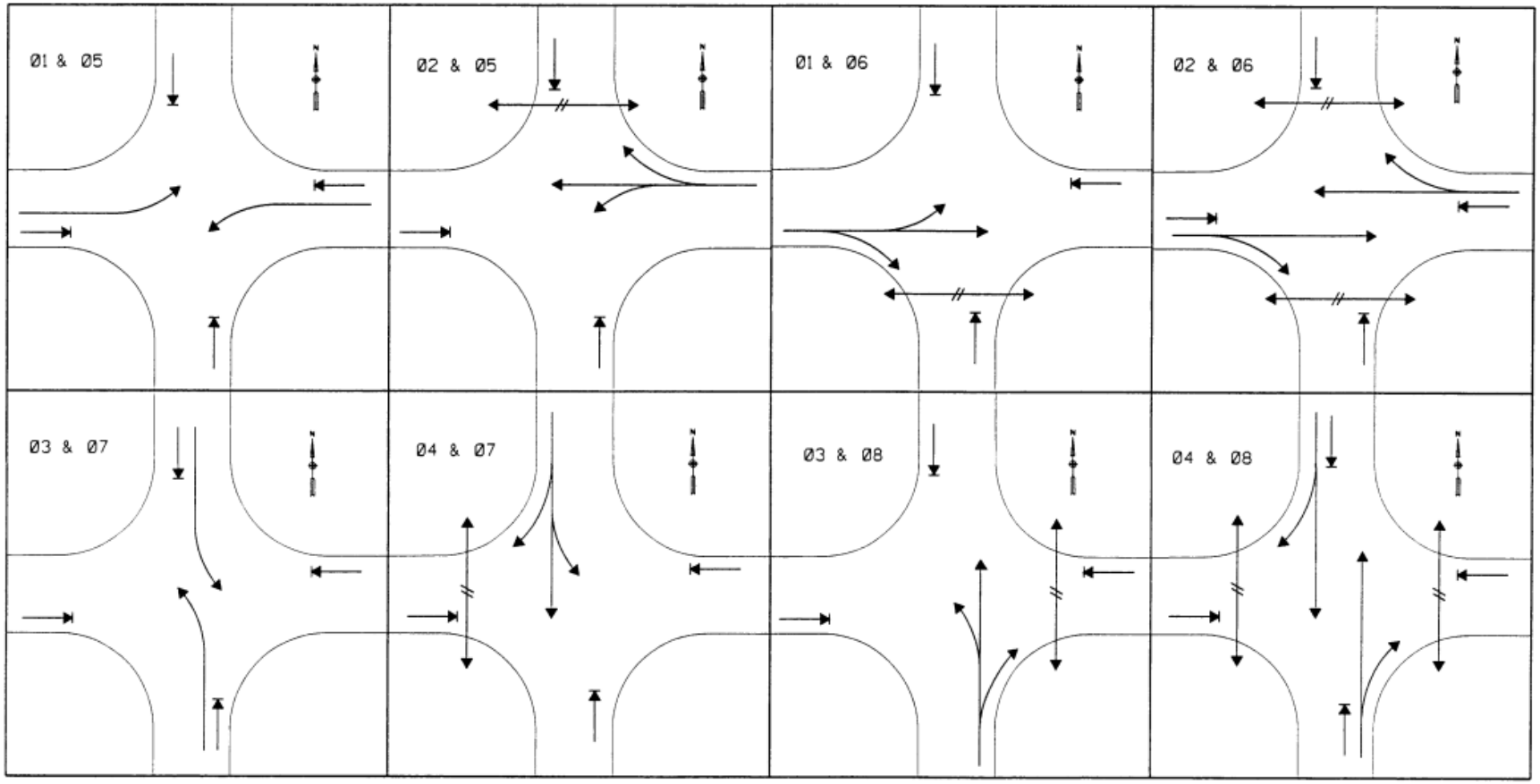

COTTONWOOD COVE
BOOK 26, PAGE 52
RECORDS OF YAVAPAI COUNTY
SURVEY & SR 89A CURVE DATA
PI 571+611.333
Δ=48°19'26" LT
T=261.153
L=490.971
R=582.125
SR89A CONSTR & CURVE DATA
PI 571+607.300
Δ=48°19'30" LT
T=260.780m
L=490.280m
R=581.290m
SURVEY & SR 260 CURVE DATA
PI 331+854.032
Δ=44°02'29" LT
T=70.632
L=134.239
R=174.638
SR260 CONSTR & CURVE DATA
PI 331+854.050
Δ=44°02'27"
T=70.780m
L=134.510m
R=175.000m
CITY OF COTTONWOOD
BEGIN R/W PROJECT
260 YV 206 H3170 01R
S-326-810
BEGIN CONST PROJECT
260 YV 206 H3170 01C
RS-326(10)
NEW DRAINAGE EASEMENT
PARCEL 13-1982 DONATED BY
ABDD ARIZONA RE II, LLC.,
an Arizona limited liability company
PER DOC. 2020-0028976 REC. 5/18/2020 Y.C.R.
(See Sheet 9 Detail "A" For Survey Data Of The Area)
NEW TEMP CONSTR ESMT
NEW DRAIN ESMT
EXIST R/W
S.R. 89A
S.R. 260
PARKWAY
MATCH LINE
P.O.T. 332+020
NOTE: SUR & AS BLT ℄ BASED UPON RESULTS OF SURVEY PROVIDED BY PROJECT ENGINEERING CONSULTANTS, LTD.
PROPERTY LINES ARE APPROX. A FIELD SURVEY IS REQUIRED FOR EXACT LOCATION.
DISPOSAL, PER RESOL 2000-3-A-031, RECORDED 3/31/2000, BK. 3743 PG.740, Y.C.R
PLAN MAINT.: ADOT (TSS) 3/31/16
PM-16-006
REVISIONS
C.O. DATE BY DESCRIPTION
9059 5/15/96 STL ADDED 13-804 & 13-805, & NOTE.
9234 6/10/98 CJK ADDED NEW R/W LT STA 571+708 TO 571+730.
PW-20-52 8-27-2020 DC Added New Easement Per Res. 2020-05-A-030
DRAWING NO. D-13-1-09
HARD COPY
DRAWN JDC MAR 96
CHECKED JCH MAR 96
LOUIS C. WARNER & COMPANY, INC.
ROUTE S.R. 260
SECTION S.R. 89A - FOREST BOUNDARY
ARIZONA DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY PLANS SECTION
HIGHWAY CAMP VERDE - BRIDGEPORT
PROJECT NO. S-326-810
TRACT NO. 260 YV 206 H3170 01R
SHEET 6 OF 32

PHASE MOVEMENTS



Appendix A-3: Five-year crash data at the SR 260/SR 89A intersection

Appendix A-3a: Crash data for 2015

IncidentID	IncidentDateTime	Incident Hour	Collision Manner	Light Condition	FirstHarmfulEvent	Total Units	Total Motorists	Total Non Motorists	Total Injuries	Total Fatalities	Total Motorists 1	Total Non Motorists 1	Total Motorists Fatalities	Total Non Motorists Fatalities	InjurySeverity	Fatal Accident Flag	Tow Away Flag	School Bus Related Flag	Work Zone Related Flag	Workers Present Flag	Alcohol Involvement Flag	Drug Involvement Flag	Hit And Run Flag	RouteName	Crossing Feature Name
2940537	1/21/2015 12:57	12	Rear-end	Daylight	MV in transport	2	5	0	3	0	5	0	0	0	Possible injury	0	0	0	0	0	0	0	0	S 260	Main St
2931878	2/5/2015 12:16	12	Angle (non-left-turn)	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
2947114	3/2/2015 12:28	12	Angle (non-left-turn)	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
2935482	3/5/2015 15:28	15	Single vehicle	Daylight	Other fixed object	1	1	0	1	0	1	0	0	0	Minor injury	0	0	0	0	0	0	0	0	S 260	Main St
2946639	3/16/2015 14:11	14	Rear to side	Daylight	MV in transport	2	4	0	1	0	4	0	0	0	Possible injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
2938716	3/16/2015 16:06	16	Left-turn	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Possible injury	0	0	0	0	0	0	0	0	S 260	Main St
2940515	3/17/2015 16:27	16	Left-turn	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	Main St
2946616	3/19/2015 8:00	8	Rear-end	Daylight	MV in transport	3	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
2940525	3/24/2015 12:58	12	Left-turn	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
2954577	4/7/2015 7:59	7	Rear-end	Daylight	MV in transport	3	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
2956765	5/5/2015 16:36	16	Rear-end	Daylight	MV in transport	3	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
2962559	5/22/2015 9:26	9	Head-on	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
2963847	5/28/2015 15:05	15	Other	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	Main St
2958075	5/29/2015 7:10	7	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	M355
2964093	6/6/2015 12:03	12	Rear-end	Daylight	MV in transport	2	2	0	1	0	2	0	0	0	Possible injury	0	1	0	0	0	0	0	0	13 COVE PARKWAY	SR-89A
2981885	7/21/2015 7:50	7	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	Main St
2986940	8/8/2015 21:02	21	Sideswipe, same direction	Dark (lighted)	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
2986941	8/11/2015 11:49	11	Sideswipe, same direction	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
2994854	8/25/2015 14:02	14	Rear-end	Daylight	MV in transport	3	3	0	1	0	3	0	0	0	Possible injury	0	1	0	0	0	0	0	0	S 260	Main St
2990036	8/28/2015 15:59	15	Rear-end	Daylight	MV in transport	3	5	0	0	0	5	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	Cove Parkway
2998706	9/9/2015 16:49	16	Rear-end	Daylight	MV in transport	2	4	0	1	0	4	0	0	0	Possible injury	0	1	0	0	0	0	0	0	13 COVE PARKWAY	Main St
3006930	10/16/2015 15:44	15	Left-turn	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	Main St
3021179	10/23/2015 17:10	17	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	1	S 260	Main St
3021177	10/28/2015 8:36	8	Rear-end	Daylight	MV in transport	3	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
3018559	11/4/2015 14:51	14	Left-turn	Dusk	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	Cove Parkway
3018482	11/5/2015 15:37	15	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
3032720	11/14/2015 12:16	12	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	Cove Parkway
3028974	12/3/2015 15:15	15	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
3032725	12/9/2015 13:11	13	Left-turn	Daylight	MV in transport	3	4	0	1	0	4	0	0	0	Minor injury	0	0	0	0	0	0	0	0	SA089	SR-260
3040768	12/14/2015 11:53	11	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260

RouteName	Crossing Feature Name	Offset	Offset Measured Flag	Offset Unit	MP Num	MP Offset	CityId	Latitude	Longitude	Intersection Flag	Traffic Way Type	Intersection Type	JunctionRelation	Weather	Offset Direction	Secondary Crash Flag	GeocodeOnRoad	Geocode Crossing Feature Name	Geocode Offset In Miles	X	Y	Geocode On Road Route Id	CrossingFeature
S 260	Main St	0	0	0	206	0.419	60	34.7216474	-112.0024253	1	99	1	Intersection	Clear	N/A	0	SR-260	Main St	0	674234.3731	1354003.201	S 260	13 MAIN ST
13 MAIN ST	SR-260	-250	0	0	0	0	60	34.72334318	-112.0052277	0	3	255	Driveway/Alley	Clear	West	0	S Camino Real	SR-260	-0.047348485	673392.8333	1354621.068	13S CAMINO REAL	S 260
SA089	SR-260	200	0	0	355	0.237	60	34.72147856	-112.0017941	0	3	255	Driveway/Alley	Rain	N/A	0	SR-89A	SR-260	0.037878788	674423.9666	1353941.596	SA089	S 260
S 260	Main St	125	0	0	206	0.443	60	34.72131841	-112.0025477	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	Main St	0.023674242	674197.4934	1353883.503	S 260	13 MAIN ST
13 MAIN ST	SR-260	0	0	0	0	0	60	34.72163766	-112.0009361	1	99	1	Intersection	Clear	N/A	0	S Mt Mingus Rd	SR-260	0	674681.8432	1353999.28	13S MT MINGUS RD	S 260
S 260	Main St	5	0	0	206	0.42	60	34.72163346	-112.0024301	1	2	2	Intersection-related	Clear	N/A	0	SR-260	Main St	0.00094697	674232.9084	1353998.13	S 260	13 MAIN ST
S 260	Main St	800	0	0	206	0.571	60	34.71954831	-112.0021611	0	2	0	Not Intersection-related	Clear	N/A	0	SR-260	Main St	0.151515152	674313.0997	1353239.223	S 260	13 MAIN ST
S 260	Main St	640	0	0	206	0.54	60	34.71995061	-112.0023751	0	4	255	Unknown	Cloudy	N/A	0	SR-260	Main St	0.121212121	674248.9079	1353385.684	S 260	13 MAIN ST
S 260	Main St	400	0	0	206	0.495	60	34.72057263	-112.002631	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	Main St	0.075757576	674172.2238	1353612.117	S 260	13 MAIN ST
S 260	Main St	800	0	0	206	0.571	60	34.71954831	-112.0021611	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	Main St	0.151515152	674313.0997	1353239.223	S 260	13 MAIN ST
S 260	Main St	50	0	0	206	0.428	60	34.72151508	-112.0024714	1	2	1	Intersection-related	Cloudy	N/A	0	SR-260	Main St	0.009469697	674220.4663	1353955.058	S 260	13 MAIN ST
S 260	Main St	75	0	0	206	0.433	60	34.72144861	-112.0024947	0	3	255	Driveway/Alley	Clear	N/A	0	SR-260	Main St	0.014204545	674213.4449	1353930.873	S 260	13 MAIN ST
S 260	Main St	200	0	0	206	0.457	60	34.72111919	-112.0026111	0	99	99	Not Intersection-related	Clear	N/A	0	SR-260	Main St	0.037878788	674178.3589	1353811.02	S 260	13 MAIN ST
SA089	M355	0.2	0	1	355	0.198	60	34.7216538	-112.0024438	1	2	1	Intersection	Clear	N/A	0	SR-89A	M355	0.198	674228.8002	1354005.533	SA089	M355
13 COVE PARKWAY	SR-89A	30	0	0	0	0	60	34.72172126	-112.0023845	1	2	1	Intersection-related	Clear	North	0	Cove Pkwy	SR-89A	0.005681818	674246.6547	1354030.071	13 COVE PKWY	SA089
SA089	Main St	50	0	0	355	0.209	60	34.72160343	-112.0022694	0	3	255	Driveway/Alley	Clear	N/A	0	SR-89A	Main St	0.009469697	674281.2049	1353987.158	SA089	13 MAIN ST
SA089	SR-260	20	0	0	355	0.203	60	34.72163004	-112.0023637	1	3	1	Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.003787879	674252.8659	1353996.866	SA089	S 260
S 260	Main St	200	0	0	206	0.457	60	34.72111919	-112.0026111	0	3	2	Driveway/Alley	Cloudy	N/A	0	SR-260	Main St	0.037878788	674178.3589	1353811.02	S 260	13 MAIN ST
S 260	Main St	343	0	0	206	0.484	60	34.72072845	-112.0026487	0	3	255	Driveway/Alley	Clear	N/A	0	SR-260	Main St	0.064962121	674166.9553	1353668.831	S 260	13 MAIN ST
SA089	Cove Parkway	150	0	0	355	0.227	60	34.72151473	-112.0019549	1	2	1	Intersection-related	Clear	N/A	0	SR-89A	Cove Parkway	0.028409091	674375.6681	1353954.8	SA089	13 COVE PARKWAY
13 COVE PARKWAY	Main St	150	0	0	0	0	60	34.7220205	-112.0022192	0	2	255	Driveway/Alley	Cloudy	North	0	Cove Pkwy	Main St	0.028409091	674296.4093	1354138.928	13 COVE PKWY	13 MAIN ST
SA089	Main St	200	0	0	355	0.237	60	34.72147856	-112.0017941	0	3	0	Not Intersection-related	Cloudy	N/A	0	SR-89A	Main St	0.037878788	674423.9666	1353941.596	SA089	13 MAIN ST
S 260	Main St	20	0	0	206	0.423	60	34.721594	-112.0024439	1	2	1	Intersection-related	Cloudy	N/A	0	SR-260	Main St	0.003787879	674228.761	1353983.772	S 260	13 MAIN ST
S 260	Main St	269	0	0	206	0.47	60	34.72093165	-112.0026437	0	3	255	Driveway/Alley	Clear	N/A	0	SR-260	Main St	0.05094697	674168.5263	1353742.779	S 260	13 MAIN ST
SA089	Cove Parkway	285	0	0	355	0.253	60	34.72143342	-112.0015171	0	3	2	Driveway/Alley	Rain	N/A	0	SR-89A	Cove Parkway	0.053977273	674507.2086	1353925.095	SA089	13 COVE PARKWAY
S 260	Main St	210	0	0	206	0.459	60	34.72109228	-112.0026176	1	3	1	Intersection-related	Clear	N/A	-1	SR-260	Main St	0.039772727	674176.4067	1353801.23	S 260	13 MAIN ST
13 MAIN ST	Cove Parkway	0	0	0	0	0	60	34.72163766	-112.0009361	1	2	1	Intersection-related	Clear	N/A	0	S Mt Mingus Rd	Cove Parkway	0	674681.8432	1353999.28	13S MT MINGUS RD	13 COVE PARKWAY
S 260	Main St	269	0	0	206	0.47	60	34.72093165	-112.0026437	0	3	255	Driveway/Alley	Clear	N/A	-1	SR-260	Main St	0.05094697	674168.5263	1353742.779	S 260	13 MAIN ST
SA089	SR-260	200	0	0	355	0.237	60	34.72147856	-112.0017941	0	3	255	Driveway/Alley	Cloudy	N/A	0	SR-89A	SR-260	0.037878788	674423.9666	1353941.596	SA089	S 260
13 MAIN ST	SR-260	50	0	0	0	0	60	34.72334318	-112.0052277	1	3	1	Intersection-related	Cloudy	North	0	S Camino Real	SR-260	0.009469697	673392.8333	1354621.068	13S CAMINO REAL	S 260

Appendix A-3b: Crash data for 2016

IncidentID	IncidentDateTime	Incident Hour	Collision Manner	Light Condition	FirstHarmfulEvent	Total Units	Total Motorists	Total Non Motorists	Total Injuries	Total Fatalities	Total Motorists 1	Total Non Motorists 1	Total Motorists Fatalities	Total Non Motorists Fatalities	InjurySeverity	Fatal Accident Flag	Tow Away Flag	School Bus Related Flag	Work Zone Related Flag	Workers Present Flag	Alcohol Involvement Flag	Drug Involvement Flag	Hit And Run Flag	RouteName	Crossing Feature Name
3191589	11/18/2016 18:01	18	Rear-end	Dark (not light	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	1	SA089	S Mt Mingus Rd
3046052	1/22/2016 11:46	11	Left-turn	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Possible injury	0	1	0	0	0	0	0	0	S 260	Main St
3046053	1/22/2016 4:08	4	Sideswipe, same direction	Dark (lighted)	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	Main St
3054239	1/31/2016 14:36	14	Sideswipe, same direction	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	Main St
3061329	3/2/2016 8:16	8	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
3062684	3/4/2016 13:47	13	Rear-end	Daylight	MV in transport	2	2	0	1	0	2	0	0	0	Minor injury	0	0	0	0	0	0	0	0	S 260	Main St
3062856	3/4/2016 17:48	17	Rear-end	Daylight	MV in transport	3	6	0	2	0	6	0	0	0	Minor injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3066789	3/6/2016 18:37	18	Single vehicle	Dark (lighted)	Fell/jumped from v	1	1	0	1	0	1	0	0	0	Minor injury	0	0	0	0	0	0	0	0	13 COVE PARKWAY	Main St
3069737	3/21/2016 14:17	14	Sideswipe, same direction	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3074818	3/21/2016 18:00	18	Sideswipe, same direction	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	Cove Parkway
3078991	3/29/2016 15:41	15	Angle (non-left-turn)	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	Main St
3079022	3/24/2016 16:55	16	Rear-end	Daylight	MV in transport	3	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	Cove Parkway
3085535	4/11/2016 15:02	15	Rear-end	Daylight	MV in transport	2	2	0	1	0	2	0	0	0	Possible injury	0	1	0	0	0	0	0	0	13 MAIN ST	SR-260
3090592	4/28/2016 7:53	7	Sideswipe, same direction	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3092992	5/5/2016 8:58	8	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3097083	6/3/2016 15:23	15	Left-turn	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 COVE PARKWAY	Main St
3101165	6/10/2016 15:49	15	Left-turn	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	Main St
3107531	6/23/2016 15:01	15	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3107535	6/27/2016 10:45	10	Angle (non-left-turn)	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3115292	7/10/2016 9:22	9	Single vehicle	Daylight	Animal (pet)	1	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 MAIN ST	SR-260
3123072	7/29/2016 14:02	14	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Main St
3128566	8/19/2016 22:46	22	Sideswipe, same direction	Dark (lighted)	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3136908	9/12/2016 12:52	12	Left-turn	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3142450	9/30/2016 16:33	16	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	1	13 COVE PKWY	SR-89A
3142456	9/22/2016 17:03	17	Angle (non-left-turn)	Daylight	MV in transport	2	3	0	2	0	3	0	0	0	Minor injury	0	1	0	0	0	0	0	0	SA089	SR-260
3151101	10/22/2016 16:28	16	Left-turn	Daylight	MV in transport	2	2	0	2	0	2	0	0	0	Minor injury	0	1	0	0	0	0	0	1	SA089	Cove Pkwy
3174702	12/22/2016 18:26	18	Rear-end	Dark (lighted)	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	1	0	0	SA089	SR-260
3201889	12/21/2016 16:27	16	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A

RouteName	Crossing Feature Name	Offset	Offset Measured Flag	Offset Unit	MP Num	MP Offset	CityId	Latitude	Longitude	Intersection Flag	Traffic Way Type	Intersection Type	JunctionRelation	Weather	Offset Direction	Secondary Crash Flag	GeocodeOnRoad	Geocode Crossing Feature Name	Geocode Offset In Miles	X	Y	Geocode On Road Route Id	CrossingFeature
SA089	S Mt Mingus Rd	427	0	0	355	0.368	999	34.72127581	-111.9995035	0	3	255	Driveway/Alley	Clear	N/A	0	SR-89A	S Mt Mingus Rd	0.080871212	675112.2162	1353867.233	SA089	13S MT MINGUS
S 260	Main St	0.1	0	1	206	0.519	60	34.7202341	-112.002519	1	3	2	Intersection-related	Clear	N/A	0	SR-260	Main St	0.1	674205.7762	1353488.888	S 260	13 MAIN ST
SA089	Main St	0	0	0	355	0.199	60	34.72164768	-112.0024261	1	3	1	Intersection	Clear	N/A	0	SR-89A	Main St	0	674234.1271	1354003.304	SA089	13 MAIN ST
S 260	Main St	0.1	0	1	206	0.519	60	34.7202341	-112.002519	0	4	0	Not Intersection-related	Clear	N/A	0	SR-260	Main St	0.1	674205.7762	1353488.888	S 260	13 MAIN ST
S 260	Main St	30	0	0	206	0.425	60	34.72156769	-112.0024531	1	3	1	Intersection-related	Clear	N/A	0	SR-260	Main St	0.005681818	674225.9962	1353974.201	S 260	13 MAIN ST
S 260	Main St	151	0	0	206	0.448	60	34.72125007	-112.0025729	1	3	2	Intersection-related	Clear	N/A	0	SR-260	Main St	0.028598485	674189.8751	1353858.641	S 260	13 MAIN ST
13 MAIN ST	SR-260	-150	0	0	0	0	60	34.72334318	-112.0052277	1	3	1	Intersection-related	Clear	West	0	S Camino Real	SR-260	-0.028409091	673392.8333	1354621.068	13S CAMINO REAL	S 260
13 COVE PARKWAY	Main St	200	0	0	0	0	60	34.72213837	-112.0021386	0	3	0	Not Intersection-related	Cloudy	East	0	Cove Pkwy	Main St	0.037878788	674320.6624	1354181.805	13 COVE PKWY	13 MAIN ST
13 MAIN ST	SR-260	20	0	0	0	0	60	34.72165849	-112.0009359	1	99	1	Intersection-related	Clear	N/A	0	S Mt Mingus Rd	SR-260	0.003787879	674681.9061	1354006.857	13S MT MINGUS RD	S 260
13 MAIN ST	Cove Parkway	-50	0	0	0	0	60	34.72334318	-112.0052277	1	99	1	Intersection-related	Clear	West	0	S Camino Real	Cove Parkway	-0.009469697	673392.8333	1354621.068	13S CAMINO REAL	13 COVE PARKWAY
S 260	Main St	200	0	0	206	0.457	60	34.72111919	-112.0026111	0	2	255	Driveway/Alley	Cloudy	N/A	0	SR-260	Main St	0.037878788	674178.3589	1353811.02	S 260	13 MAIN ST
SA089	Cove Parkway	50	0	0	355	0.209	60	34.72160343	-112.0022694	1	3	1	Intersection-related	Clear	N/A	1	SR-89A	Cove Parkway	0.009469697	674281.2049	1353987.158	SA089	13 COVE PARKWAY
13 MAIN ST	SR-260	-150	0	0	0	0	60	34.72334318	-112.0052277	0	3	0	Not Intersection-related	Cloudy	West	0	S Camino Real	SR-260	-0.028409091	673392.8333	1354621.068	13S CAMINO REAL	S 260
13 MAIN ST	SR-260	0	0	0	0	0	60	34.72163766	-112.0009361	1	3	1	Intersection-related	Clear	N/A	0	S Mt Mingus Rd	SR-260	0	674681.8432	1353999.28	13S MT MINGUS RD	S 260
13 MAIN ST	SR-260	0	0	0	0	0	60	34.72163766	-112.0009361	1	3	1	Intersection	Clear	N/A	0	S Mt Mingus Rd	SR-260	0	674681.8432	1353999.28	13S MT MINGUS RD	S 260
13 COVE PARKWAY	Main St	100	0	0	0	0	60	34.72189558	-112.0022882	0	2	255	Driveway/Alley	Clear	North	0	Cove Pkwy	Main St	0.018939394	674275.6393	1354093.486	13 COVE PKWY	13 MAIN ST
SA089	Main St	300	0	0	355	0.256	60	34.72142545	-112.0014682	0	3	255	Driveway/Alley	Clear	N/A	0	SR-89A	Main St	0.056818182	674521.8986	1353922.183	SA089	13 MAIN ST
13 MAIN ST	SR-260	100	0	0	0	0	60	34.72334318	-112.0052277	1	3	1	Intersection-related	Clear	North	0	S Camino Real	SR-260	0.018939394	673392.8333	1354621.068	13S CAMINO REAL	S 260
13 MAIN ST	SR-260	-12	0	0	0	0	60	34.72165016	-112.000936	1	3	1	Intersection-related	Clear	West	0	S Mt Mingus Rd	SR-260	-0.002272727	674681.881	1354003.826	13S MT MINGUS RD	S 260
13 MAIN ST	SR-260	-10	0	0	0	0	60	34.72164808	-112.000936	1	2	1	Intersection	Clear	West	0	S Mt Mingus Rd	SR-260	-0.001893939	674681.8747	1354003.068	13S MT MINGUS RD	S 260
S 260	Main St	100	0	0	206	0.438	60	34.72138369	-112.0025216	1	3	1	Intersection-related	Cloudy	N/A	0	SR-260	Main St	0.018939394	674205.3331	1353907.255	S 260	13 MAIN ST
S 260	SR-89A	269	0	0	206	0.47	60	34.72093259	-112.0026436	0	2	0	Not Intersection-related	Cloudy	N/A	1	SR-260	SR-89A	0.05094697	674168.5455	1353743.12	S 260	SA089
S 260	SR-89A	0.2	0	1	206	0.619	60	34.71890625	-112.0018158	0	3	255	Driveway/Alley	Clear	N/A	-1	SR-260	SR-89A	0.2	674416.664	1353005.47	S 260	SA089
13 COVE PKWY	SR-89A	0.3	0	1	0	0	60	34.72471798	-112.0040418	0	2	0	Not Intersection-related	Clear	N/A	0	Cove Pkwy	SR-89A	0.3	673749.5882	1355121.08	13 COVE PKWY	SA089
SA089	SR-260	20	0	0	355	0.203	60	34.7216297	-112.0023625	0	3	0	Not Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.003787879	674253.2191	1353996.745	SA089	S 260
SA089	Cove Pkwy	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	1	Intersection	Clear	N/A	0	SR-89A	Cove Pkwy	0	674234.3571	1354003.207	SA089	13 COVE PKV
SA089	SR-260	300	0	0	355	0.256	60	34.72142525	-112.0014669	1	2	1	Intersection-related	Rain	N/A	0	SR-260	SR-89A	0.056818182	674522.2644	1353922.111	SA089	S 260
S 260	SR-89A	100	0	0	206	0.438	60	34.72138459	-112.0025213	0	2	0	Not Intersection-related	Rain	N/A	0	SR-260	SR-89A	0.018939394	674205.441	1353907.581	S 260	SA089

Appendix A-3c: Crash data for 2017

IncidentID	IncidentDateTime	Incident Hour	Collision Manner	Light Condition	FirstHarmfulEvent	Total Units	Total Motorists	Total Non Motorists	Total Injuries	Total Fatalities	Total Motorists 1	Total Non Motorists 1	Total Motorists Fatalities	Total Non Motorists Fatalities	InjurySeverity	Fatal Accident Flag	Tow Away Flag	School Bus Related Flag	Work Zone Related Flag	Workers Present Flag	Alcohol Involvement Flag	Drug Involvement Flag	Hit And Run Flag	RouteName	Crossing Feature Name
3213510	2/28/2017 14:57	14	Left-turn	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	SR-260
3285460	9/17/2017 9:10	9	Other	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3193215	1/14/2017 14:20	14	Left-turn	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3197611	2/9/2017 11:28	11	Rear-end	Daylight	MV in transport	3	4	0	1	0	4	0	0	0	Minor injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3224003	4/4/2017 7:46	7	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3227577	4/20/2017 11:01	11	Left-turn	Daylight	MV in transport	2	4	0	1	0	4	0	0	0	Possible injury	0	1	0	0	0	0	0	0	13 COVE PKV	SR-89A
3252737	7/22/2017 13:22	13	Left-turn	Daylight	MV in transport	2	5	0	4	0	5	0	0	0	Possible injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3263334	7/25/2017 17:00	17	Rear-end	Daylight	MV in transport	3	5	0	0	0	5	0	0	0	No injury	0	1	0	0	0	0	0	1	SA089	SR-260
3323440	12/28/2017 15:45	15	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	SR-260
3244684	6/16/2017 12:36	12	Rear-end	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3258734	6/21/2017 11:21	11	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	SR-260
3304522	11/20/2017 17:24	17	Rear-end	Dusk	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	13 COVE PKV	SR-89A
3197610	2/14/2017 11:24	11	Angle (non-left-turn)	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Minor injury	0	1	0	0	0	0	0	0	SA089	SR-260
3323439	12/29/2017 16:02	16	Angle (non-left-turn)	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	1	SA089	SR-260
3306840	11/4/2017 12:51	12	Left-turn	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	Cove Pkwy
3323442	12/14/2017 15:31	15	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3474670	4/10/2017 9:44	9	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3245473	6/15/2017 11:28	11	Sideswipe, same direction	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3293349	9/20/2017 7:52	7	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3213504	3/16/2017 14:09	14	Sideswipe, same direction	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3219262	3/24/2017 16:56	16	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3234841	5/18/2017 12:13	12	Left-turn	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A Non-Card
3193211	1/11/2017 15:46	15	Left-turn	Daylight	MV in transport	2	5	0	1	0	5	0	0	0	Minor injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3297878	10/24/2017 18:30	18	Sideswipe, same direction	Dark (lighted)	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	M355

RouteName	Crossing Feature Name	Offset	Offset Measured Flag	Offset Unit	MP Num	MP Offset	CityId	Latitude	Longitude	Intersection Flag	Traffic Way Type	Intersection Type	JunctionRelation	Weather	Offset Direction	Secondary Crash Flag	GeocodeOnRoad	Geocode Crossing Feature Name	Geocode Offset In Miles	X	Y	Geocode On Road Route Id	CrossingFeature
SA089	SR-260	300	0	0	355	0.256	60	34.72142525	-112.0014669	0	3	255	Driveway/Alley	Cloudy	N/A	0	SR-89A	SR-260	0.056818182	674522.2644	1353922.111	SA089	S 260
SA089	SR-260	250	0	0	355	0.246	60	34.72145181	-112.0016299	0	3	0	Not Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.047348485	674473.2986	1353931.817	SA089	S 260
S 260	SR-89A	0.2	0	1	206	0.619	60	34.71890625	-112.0018158	0	2	2	Driveway/Alley	Cloudy	N/A	0	SR-260	SR-89A	0.2	674416.664	1353005.47	S 260	SA089
S 260	SR-89A	0.2	0	1	206	0.619	60	34.71890625	-112.0018158	0	4	0	Not Intersection-related	Clear	N/A	1	SR-260	SR-89A	0.2	674416.664	1353005.47	S 260	SA089
S 260	SR-89A	0.2	0	1	206	0.619	60	34.71890625	-112.0018158	1	3	1	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.2	674416.664	1353005.47	S 260	SA089
13 COVE PKV	SR-89A	250	0	0	0	0	60	34.72224392	-112.0020254	0	2	99	Driveway/Alley	Clear	North	0	Cove Pkwy	SR-89A	0.047348485	674354.7001	1354220.188	13 COVE PKWY	SA089
S 260	SR-89A	850	0	0	206	0.58	60	34.719424	-112.0020944	0	2	2	Driveway/Alley	Clear	N/A	0	SR-260	SR-89A	0.160984848	674333.0955	1353193.966	S 260	SA089
SA089	SR-260	75	0	0	355	0.213	60	34.72158092	-112.0021896	1	3	1	Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.014204545	674305.1739	1353978.948	SA089	S 260
SA089	SR-260	50	0	0	355	0.209	60	34.7216031	-112.0022682	1	2	1	Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.009469697	674281.5581	1353987.037	SA089	S 260
SA089	SR-260	40	0	0	355	0.207	60	34.72161197	-112.0022996	0	3	0	Not Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.007575758	674272.1115	1353990.273	SA089	S 260
SA089	SR-260	40	0	0	355	0.207	60	34.72161197	-112.0022996	1	2	1	Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.007575758	674272.1115	1353990.273	SA089	S 260
13 COVE PKV	SR-89A	75	0	0	0	0	60	34.72183431	-112.002322	1	2	1	Intersection-related	Clear	North	0	Cove Pkwy	SR-89A	0.014204545	674265.4519	1354071.197	13 COVE PKWY	SA089
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	2	1	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	1	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
S 260	Cove Pkwy	600	0	0	206	0.533	60	34.72005185	-112.0024287	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	Cove Pkwy	0.113636364	674232.8461	1353422.539	S 260	13 COVE PKV
S 260	SR-89A	10	0	0	206	0.421	60	34.72162122	-112.0024344	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.001893939	674231.6213	1353993.674	S 260	SA089
S 260	SR-89A	25	0	0	206	0.424	60	34.72158175	-112.0024482	1	3	1	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.004734848	674227.4736	1353979.316	S 260	SA089
S 260	SR-89A	100	0	0	206	0.438	60	34.72138459	-112.0025213	0	2	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.018939394	674205.441	1353907.581	S 260	SA089
S 260	SR-89A	100	0	0	206	0.438	60	34.72138459	-112.0025213	1	3	1	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.018939394	674205.441	1353907.581	S 260	SA089
S 260	SR-89A	200	0	0	206	0.457	60	34.72112012	-112.0026109	1	3	1	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.037878788	674178.426	1353811.356	S 260	SA089
S 260	SR-89A	200	0	0	206	0.457	60	34.72112012	-112.0026109	0	2	0	Not Intersection-related	Clear	N/A	-1	SR-260	SR-89A	0.037878788	674178.426	1353811.356	S 260	SA089
S 260	SR-89A Non-Card	400	0	0	206	0.495	60	34.72057356	-112.0026312	1	3	2	Intersection-related	Clear	N/A	0	SR-260	SR-89A Non-Card	0.075757576	674172.1695	1353612.455	S 260	SA089 0
S 260	SR-89A	300	0	0	206	0.476	60	34.72084759	-112.0026482	0	2	255	Driveway/Alley	Clear	N/A	0	SR-260	SR-89A	0.056818182	674167.1228	1353712.187	S 260	SA089
SA089	M355	0.18	0	1	355	0.177	60	34.72177223	-112.0027873	1	3	1	Intersection-related	Clear	N/A	0	SR-89A	M355	0.177	674125.6158	1354048.721	SA089	M355

Appendix A-3d: Crash data for 2018

IncidentID	IncidentDateTime	Incident Hour	Collision Manner	Light Condition	FirstHarmfulEvent	Total Units	Total Motorists	Total Non Motorists	Total Injuries	Total Fatalities	Total Motorists 1	Total Non Motorists 1	Total Motorists Fatalities	Total Non Motorists Fatalities	InjurySeverity	Fatal Accident Flag	Tow Away Flag	School Bus Related Flag	Work Zone Related Flag	Workers Present Flag	Alcohol Involvement Flag	Drug Involvement Flag	Hit And Run Flag	RouteName	Crossing Feature Name
3440319	10/25/2018 12:07	12	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	S Camino Real
3400855	7/11/2018 16:28	16	Sideswipe, same direction	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3337699	2/20/2018 16:50	16	Left-turn	Daylight	MV in transport	2	7	0	0	0	7	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3341933	2/16/2018 7:50	7	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3399708	5/14/2018 17:09	17	Single vehicle	Daylight	Animal (pet)	1	1	0	1	0	1	0	0	0	Minor injury	0	1	0	0	0	0	0	0	13 COVE PKV	SR-89A
3363459	4/7/2018 14:34	14	Sideswipe, same direction	Daylight	MV in transport	2	4	0	1	0	4	0	0	0	Possible injury	0	0	0	0	0	0	0	0	SA089	SR-260
3405072	8/9/2018 15:39	15	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	13 COVE PKV	SR-89A
3337700	2/8/2018 15:39	15	Rear-end	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Minor injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3370898	4/19/2018 6:41	6	Left-turn	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3457346	10/19/2018 11:53	11	Left-turn	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 COVE PKV	SR-89A
3395428	5/1/2018 17:10	17	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	13 COVE PKV	SR-89A
3405793	7/21/2018 10:58	10	Rear-end	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	13 COVE PKV	SR-89A
3479288	12/10/2018 17:23	17	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	13 COVE PKV	SR-89A
3424105	9/17/2018 15:37	15	Left-turn	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Possible injury	0	0	0	0	0	0	0	0	13 COVE PKV	SR-260
3370897	3/23/2018 15:23	15	Sideswipe, same direction	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3376064	5/10/2018 9:59	9	Angle (non-left-turn)	Daylight	MV in transport	3	5	0	3	0	5	0	0	0	Serious injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3395179	7/9/2018 8:01	8	Angle (non-left-turn)	Daylight	MV in transport	2	2	0	1	0	2	0	0	0	Possible injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3341940	1/18/2018 16:38	16	Sideswipe, same direction	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3363489	2/6/2018 13:06	13	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	SR-260
3384852	4/18/2018 15:06	15	Sideswipe, same direction	Daylight	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3457352	10/7/2018 11:20	11	Angle (non-left-turn)	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3457368	11/19/2018 5:48	5	Left-turn	Dark (lighted)	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	SA089	SR-260
3363488	4/9/2018 14:37	14	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	1	S 260	SR-89A
3356785	1/31/2018 15:13	15	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3421827	9/30/2018 15:29	15	Left-turn	Daylight	MV in transport	2	4	0	1	0	4	0	0	0	Possible injury	0	0	0	0	0	0	0	0	S 260	Cove Pkwy
3492028	7/19/2018 13:15	13	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3329385	1/5/2018 18:23	18	Angle (non-left-turn)	Dark (lighted)	MV in transport	3	3	0	0	0	3	0	0	0	No injury	0	1	0	0	0	1	0	0	S 260	SR-89A

RouteName	Crossing Feature Name	Offset	Offset Measured Flag	Offset Unit	MP Num	MP Offset	CityId	Latitude	Longitude	Intersection Flag	Traffic Way Type	Intersection Type	JunctionRelation	Weather	Offset Direction	Secondary Crash Flag	GeocodeOnRoad	Geocode Crossing Feature Name	Geocode Offset In Miles	X	Y	Geocode On Road Route Id	CrossingFeature
SA089	S Camino Real	0.25	0	1	355	0.248	60	34.72144637	-112.0015965	0	3	0	Not Intersection-related	Clear	N/A	0	SR-89A	S Camino Real	0.25	674483.3282	1353929.829	SA089	13S CAMINO REAL
SA089	SR-260	250	0	0	355	0.246	60	34.72145181	-112.0016299	0	3	0	Not Intersection-related	Rain	N/A	0	SR-89A	SR-260	0.047348485	674473.2986	1353931.817	SA089	S 260
S 260	SR-89A	0.2	0	1	206	0.619	60	34.71890625	-112.0018158	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.2	674416.664	1353005.47	S 260	SA089
S 260	SR-89A	0.2	0	1	206	0.619	60	34.71890625	-112.0018158	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.2	674416.664	1353005.47	S 260	SA089
13 COVE PKV	SR-89A	800	0	0	0	0	60	34.72355906	-112.0018812	0	2	0	Not Intersection-related	Clear	North	0	Cove Pkwy	SR-89A	0.151515152	674398.443	1354698.765	13 COVE PKWY	SA089
SA089	SR-260	125	0	0	355	0.223	60	34.72153657	-112.0020323	0	4	99	Not Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.023674242	674352.4056	1353962.768	SA089	S 260
13 COVE PKV	SR-89A	200	0	0	0	0	60	34.72214148	-112.0021358	0	2	255	Driveway/Alley	Cloudy	North	0	Cove Pkwy	SR-89A	0.037878788	674321.4917	1354182.936	13 COVE PKWY	SA089
S 260	SR-89A	0.15	0	1	206	0.569	60	34.7195692	-112.0021723	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.15	674309.74	1353246.827	S 260	SA089
S 260	SR-89A	0.15	0	1	206	0.569	60	34.7195692	-112.0021723	1	3	2	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.15	674309.74	1353246.827	S 260	SA089
13 COVE PKV	SR-89A	100	0	0	0	0	60	34.72189658	-112.0022876	1	2	255	Intersection-related	Clear	North	0	Cove Pkwy	SR-89A	0.018939394	674275.8052	1354093.849	13 COVE PKWY	SA089
13 COVE PKV	SR-89A	100	0	0	0	0	60	34.72189658	-112.0022876	0	2	255	Driveway/Alley	Rain	North	0	Cove Pkwy	SR-89A	0.018939394	674275.8052	1354093.849	13 COVE PKWY	SA089
13 COVE PKV	SR-89A	100	0	0	0	0	60	34.72189658	-112.0022876	1	2	255	Intersection-related	Clear	North	0	Cove Pkwy	SR-89A	0.018939394	674275.8052	1354093.849	13 COVE PKWY	SA089
13 COVE PKV	SR-89A	50	0	0	0	0	60	34.72177205	-112.0023564	1	2	255	Intersection-related	Clear	North	-1	Cove Pkwy	SR-89A	0.009469697	674255.0986	1354048.545	13 COVE PKWY	SA089
13 COVE PKV	SR-260	40	0	0	0	0	60	34.72174714	-112.0023702	0	2	255	Driveway/Alley	Clear	North	0	Cove Pkwy	SR-260	0.007575758	674250.9573	1354039.485	13 COVE PKWY	S 260
SA089	SR-260	12	0	0	355	0.201	60	34.7216368	-112.0023877	1	3	1	Intersection-related	Clear	N/A	0	SR-89A	SR-260	0.002272727	674245.662	1353999.334	SA089	S 260
S 260	SR-89A	0	0	0	206	0.419	60	34.7216474	-112.0024253	1	2	1	Intersection	Clear	N/A	0	SR-260	SR-89A	0	674234.3731	1354003.201	S 260	SA089
S 260	SR-89A	0	0	0	206	0.419	60	34.7216474	-112.0024253	1	3	255	Intersection	Clear	N/A	0	SR-260	SR-89A	0	674234.3731	1354003.201	S 260	SA089
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	2	1	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	2	1	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	255	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	255	Intersection	Cloudy	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	255	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
S 260	SR-89A	50	0	0	206	0.428	60	34.72151598	-112.0024711	1	2	1	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.009469697	674220.5608	1353955.385	S 260	SA089
S 260	SR-89A	100	0	0	206	0.438	60	34.72138459	-112.0025213	1	2	1	Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.018939394	674205.441	1353907.581	S 260	SA089
S 260	Cove Pkwy	500	0	0	206	0.514	60	34.72030713	-112.0025516	0	2	255	Driveway/Alley	Clear	N/A	0	SR-260	Cove Pkwy	0.09469697	674195.9977	1353515.475	S 260	13 COVE PKV
S 260	SR-89A	200	0	0	206	0.457	60	34.72112011	-112.0026109	0	2	0	Not Intersection-related	Cloudy	N/A	0	SR-260	SR-89A	0.037878788	674178.426	1353811.356	S 260	SA089
S 260	SR-89A	350	0	0	206	0.485	60	34.72071022	-112.0026479	0	3	0	Not Intersection-related	Clear	N/A	1	SR-260	SR-89A	0.066287879	674167.1975	1353662.195	S 260	SA089

Appendix A-3e: Crash data for 2019

IncidentID	IncidentDateTime	Incident Hour	Collision Manner	Light Condition	FirstHarmfulEvent	Total Units	Total Motorists	Total Non Motorists	Total Injuries	Total Fatalities	Total Motorists 1	Total Non Motorists 1	Total Motorists Fatalities	Total Non Motorists Fatalities	InjurySeverity	Fatal Accident Flag	Tow Away Flag	School Bus Related Flag	Work Zone Related Flag	Workers Present Flag	Alcohol Involvement Flag	Drug Involvement Flag	Hit And Run Flag	RouteName	Crossing Feature Name
3564608	9/5/2019 12:20	12	Left-turn	Daylight	MV in transport	2	4	0	4	0	4	0	0	0	Possible injury	0	1	0	0	0	0	0	0	SA089	S Mt Mingus Rd
3603385	12/30/2019 16:33	16	Left-turn	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Minor injury	0	0	0	0	0	0	0	0	SA089	M355
3625746	4/2/2019 17:01	17	Rear-end	Daylight	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	S Mt Mingus Rd
3604986	12/10/2019 13:35	13	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3588332	9/26/2019 12:21	12	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	1	SA089	SR-260
3588333	9/26/2019 10:21	10	Left-turn	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3599654	11/28/2019 13:24	13	Rear-end	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3530920	5/22/2019 18:59	18	Rear-end	Dark (lighted)	MV in transport	2	2	0	1	0	2	0	0	0	Possible injury	0	0	0	0	0	0	0	0	SA089	Cove Pkwy
3545446	3/21/2019 18:20	18	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	1	S 260	SR-89A
3588382	3/15/2019 20:42	20	Rear-end	Dark (lighted)	MV in transport	2	4	0	0	0	4	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3508496	3/1/2019 12:26	12	Angle (non-left-turn)	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3543563	6/18/2019 13:42	13	Sideswipe, same direction	Daylight	MV in transport	2	2	0	0	0	2	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3551600	6/4/2019 16:04	16	Rear-end	Daylight	MV in transport	2	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	SA089	SR-260
3489193	2/8/2019 11:47	11	Rear-end	Daylight	MV in transport	2	3	0	1	0	3	0	0	0	Minor injury	0	1	0	0	0	0	0	0	S 260	SR-89A
3508500	3/5/2019 11:18	11	Rear-end	Daylight	MV in transport	3	3	0	0	0	3	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A
3543562	5/25/2019 21:14	21	Sideswipe, same direction	Dark (lighted)	MV in transport	2	5	0	0	0	5	0	0	0	No injury	0	0	0	0	0	0	0	0	S 260	SR-89A

RouteName	Crossing Feature Name	Offset	Offset Measured Flag	Offset Unit	MP Num	MP Offset	CityId	Latitude	Longitude	Intersection Flag	Traffic Way Type	Intersection Type	JunctionRelation	Weather	Offset Direction	Secondary Crash Flag	GeocodeOnRoad	Geocode Crossing Feature Name	Geocode Offset In Miles	X	Y	Geocode On Road Route Id	CrossingFeature
SA089	S Mt Mingus Rd	50	0	0	355	0.297	999	34.72132424	-112.0007563	0	3	0	Not Intersection-related	Clear	N/A	-1	SR-89A	S Mt Mingus Rd	0.009469697	674735.755	1353885.17	SA089	13S MT MINGUS
SA089	M355	0.3	0	1	355	0.297	999	34.72132443	-112.0007601	0	2	0	Not Intersection-related	Cloudy	N/A	0	SR-89A	M355	0.297	674734.6152	1353885.242	SA089	M355
SA089	S Mt Mingus Rd	35	0	0	355	0.294	999	34.72132718	-112.0008061	0	3	255	Driveway/Alley	Clear	N/A	-1	SR-89A	S Mt Mingus Rd	0.006628788	674720.8208	1353886.253	SA089	13S MT MINGUS
SA089	SR-260	300	0	0	355	0.256	60	34.72142525	-112.0014669	0	3	0	Not Intersection-related	Clear	N/A	-1	SR-89A	SR-260	0.056818182	674522.2646	1353922.111	SA089	S 260
SA089	SR-260	80	0	0	355	0.214	60	34.72157649	-112.0021738	1	3	255	Intersection-related	Cloudy	N/A	0	SR-89A	SR-260	0.015151515	674309.897	1353977.33	SA089	S 260
SA089	SR-260	80	0	0	355	0.214	60	34.72157649	-112.0021738	0	2	255	Driveway/Alley	Rain	N/A	0	SR-89A	SR-260	0.015151515	674309.897	1353977.33	SA089	S 260
SA089	SR-260	25	0	0	355	0.204	60	34.72162527	-112.0023468	1	3	255	Intersection-related	Clear	N/A	-1	SR-89A	SR-260	0.004734848	674257.9422	1353995.127	SA089	S 260
SA089	Cove Pkwy	20	0	0	355	0.203	60	34.7216297	-112.0023625	1	3	255	Intersection-related	Cloudy	N/A	0	SR-89A	Cove Pkwy	0.003787879	674253.2191	1353996.745	SA089	13 COVE PKV
S 260	SR-89A	0	0	0	206	0.419	60	34.7216474	-112.0024253	1	3	255	Intersection-related	Clear	N/A	-1	SR-260	SR-89A	0	674234.3731	1354003.201	S 260	SA089
S 260	SR-89A	0	0	0	206	0.419	60	34.7216474	-112.0024253	1	4	255	Intersection	Clear	N/A	0	SR-260	SR-89A	0	674234.3731	1354003.201	S 260	SA089
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	255	Intersection	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	255	Intersection-related	Clear	N/A	-1	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
SA089	SR-260	0	0	0	355	0.199	60	34.72164742	-112.0024253	1	3	255	Intersection-related	Clear	N/A	0	SR-89A	SR-260	0	674234.3571	1354003.207	SA089	S 260
S 260	SR-89A	0.1	0	1	206	0.519	60	34.72023498	-112.0025194	0	4	0	Not Intersection-related	Cloudy	N/A	0	SR-260	SR-89A	0.1	674205.6535	1353489.208	S 260	SA089
S 260	SR-89A	500	0	0	206	0.514	60	34.72030713	-112.0025516	0	3	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.09469697	674195.9977	1353515.475	S 260	SA089
S 260	SR-89A	200	0	0	206	0.457	60	34.72112011	-112.0026109	0	4	0	Not Intersection-related	Clear	N/A	0	SR-260	SR-89A	0.037878788	674178.426	1353811.356	S 260	SA089

Appendix A-4: Traffic volumes at the SR 260/SR 89A intersection

United Civil Group

Project No: TC19030

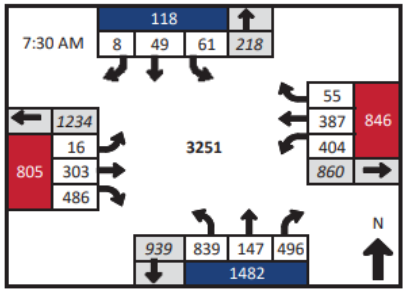
Location: SR 260 and SR 89A

Intersection Configuration: Signalized

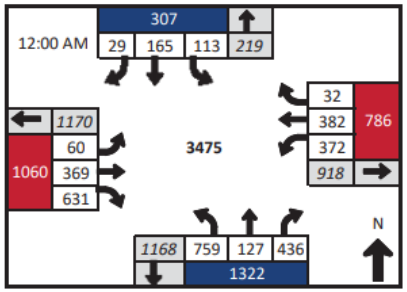
April 17, 2019 (Wednesday)

Turning Movement Count

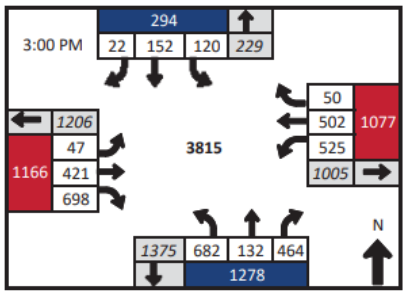
	Speed Limit	Lt	Lt\T	Thru	T/Rt	Rt	Lt/T/Rt	Lt/Rt
Northbound	45	2		1		1		
Southbound	25	1			1			
Eastbound	35	1		1	1	1		
Westbound	45	2		1	1			



	SR 260					SR 260					SR 89A					SR 89A						
	Northbound			South Crosswalk		Southbound			North Crosswalk		Eastbound			West Crosswalk		Westbound			East Crosswalk		Total	Peak Hour
Start Time	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes		
7:00 AM	87	16	88	0	0	5	9	1	0	0	1	56	73	0	1	33	71	8	0	0	448	
7:15 AM	160	13	119	0	0	13	9	0	1	0	1	71	82	0	0	57	57	4	0	0	586	
7:30 AM	211	31	128	0	0	14	11	2	0	0	6	49	126	0	0	88	80	15	0	0	761	
7:45 AM	237	45	112	1	1	14	15	0	0	0	4	76	107	0	0	118	125	18	0	0	871	2666
8:00 AM	249	47	150	0	0	15	12	2	0	0	4	93	140	0	0	105	80	12	0	0	909	3127
8:15 AM	142	24	106	0	0	18	11	4	0	0	2	85	113	2	3	93	102	10	0	1	710	3251
8:30 AM	140	20	94	0	0	18	25	3	0	0	3	80	141	1	0	88	70	7	0	0	689	3179
8:45 AM	169	43	89	0	0	13	24	3	0	0	7	83	123	0	0	86	81	16	0	0	737	3045
Peak Hour Total	**839**	**147**	**496**	**1**	**1**	**61**	**49**	**8**	**0**	**0**	**16**	**303**	**486**	**2**	**3**	**404**	**387**	**55**	**0**	**1**	**3251**	



	SR 260					SR 260					SR 89A					SR 89A						
	Northbound			South Crosswalk		Southbound			North Crosswalk		Eastbound			West Crosswalk		Westbound			East Crosswalk		Total	Peak Hour
Start Time	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes		
12:00 AM	209	32	119	0	0	30	39	13	0	0	19	101	163	0	0	89	91	6	0	0	911	
12:15 AM	180	30	117	0	0	25	42	6	0	0	10	72	156	0	1	86	90	8	0	0	822	
12:30 AM	199	32	107	0	0	36	34	6	0	0	14	118	170	0	0	96	91	9	0	0	912	
12:45 AM	171	33	93	0	1	22	50	4	0	0	17	78	142	0	1	101	110	9	0	0	830	3475
1:00 PM	155	38	116	0	0	27	36	10	0	0	13	102	174	0	0	120	99	11	0	1	901	3465
1:15 PM	199	39	110	0	0	0	2	1	0	0	0	1	1	0	0	102	91	14	0	0	560	3203
1:30 PM	170	39	96	1	0	23	25	11	0	0	8	91	135	0	1	92	86	10	0	0	786	3077
1:45 PM	192	37	117	0	0	27	32	7	0	0	12	94	162	0	0	93	111	11	0	1	895	3142
Peak Hour Total	**759**	**127**	**436**	**0**	**1**	**113**	**165**	**29**	**0**	**0**	**60**	**369**	**631**	**0**	**2**	**372**	**382**	**32**	**0**	**0**	**3475**	



	SR 260					SR 260					SR 89A					SR 89A						
	Northbound			East Crosswalk		Southbound			West Crosswalk		Eastbound			South Crosswalk		Westbound			North Crosswalk		Total	Peak Hour
Start Time	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes		
3:00 PM	174	36	110	0	1	23	39	8	0	0	12	94	166	0	0	132	124	8	0	0	926	
3:15 PM	156	26	130	0	3	37	39	7	0	2	10	98	171	0	1	135	127	11	0	0	947	
3:30 PM	187	30	129	0	0	31	41	3	0	0	12	107	185	0	4	121	119	14	0	0	979	
3:45 PM	165	40	95	0	0	29	33	4	0	1	13	122	176	1	2	137	132	17	0	0	963	3815
4:00 PM	145	18	97	0	0	35	44	8	0	0	17	102	170	0	0	129	102	19	0	0	886	3775
4:15 PM	114	22	94	0	0	38	36	7	0	1	19	89	199	0	0	120	116	5	0	0	859	3687
4:30 PM	166	26	101	0	1	39	34	7	0	1	5	102	156	4	1	123	94	12	0	0	865	3573
4:45 PM	157	34	76	0	0	30	39	2	0	0	18	124	169	0	0	131	113	14	0	0	907	3517
Peak Hour Total	**682**	**132**	**464**	**0**	**4**	**120**	**152**	**22**	**0**	**3**	**47**	**421**	**698**	**1**	**7**	**525**	**502**	**50**	**0**	**0**	**3815**	

Appendix B: VISSIM Calibration Results

Appendix B-1: Volume

This appendix contains the data used to calibrate the GEH statistic for each turn movement at the intersection.

Run 1							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
NE	464	342	6.077253	-122	-26.3%	N/A	N/A
EN	47	70	3.007114	23	48.9%	N/A	N/A
EE	421	475	2.55126	54	12.8%	N/A	N/A
ES	698	762	2.368746	64	9.2%	N/A	N/A
WW	502	555	2.305438	53	10.6%	N/A	N/A
NW	682	743	2.285269	61	8.9%	N/A	N/A
NN	132	155	1.920003	23	17.4%	N/A	N/A
SE	120	103	1.609947	-17	-14.2%	N/A	N/A
SS	152	168	1.264911	16	10.5%	N/A	N/A
WS	525	504	0.92582	-21	-4.0%	N/A	N/A
SW	22	19	0.662589	-3	-13.6%	N/A	N/A
WN	50	49	0.142134	-1	-2.0%	N/A	N/A
Run 2							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	475	2.55126	54	12.8%	133	-3.52599
EN	47	70	3.007114	23	48.9%	0	0
ES	698	762	2.368746	64	9.2%	287	-0.18251
NE	464	337	6.346035	-127	-27.4%	-425	3.977289
NN	132	156	2	24	18.2%	-399	-0.30544
NW	682	747	2.431713	65	9.5%	4	0.146443
SE	120	103	1.609947	-17	-14.2%	-52	-0.31006
SS	152	168	1.264911	16	10.5%	65	-0.34504
SW	22	19	0.662589	-3	-13.6%	-149	-0.60232
WN	50	49	0.142134	-1	-2.0%	-455	-0.78369
WS	525	504	0.92582	-21	-4.0%	485	0.263231
WW	502	555	2.305438	53	10.6%	506	2.163304

Run 3							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	474	2.505413	53	12.6%	-1	-0.04585
EN	47	70	3.007114	23	48.9%	0	0
ES	698	762	2.368746	64	9.2%	0	0
NE	464	372	4.499867	-92	-19.8%	35	-1.84617
NN	132	152	1.678363	20	15.2%	-4	-0.32164
NW	682	718	1.360672	36	5.3%	-29	-1.07104
SE	120	103	1.609947	-17	-14.2%	0	0
SS	152	168	1.264911	16	10.5%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	504	0.92582	-21	-4.0%	0	0
WW	502	555	2.305438	53	10.6%	0	0
Run 4							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	429	0.388057	8	1.9%	-45	-2.11736
EN	47	55	1.120224	8	17.0%	-15	-1.88689
ES	698	739	1.529574	41	5.9%	-23	-0.83917
NE	464	376	4.29396	-88	-19.0%	4	-0.20591
NN	132	149	1.434203	17	12.9%	-3	-0.24416
NW	682	728	1.73246	46	6.7%	10	0.371788
SE	120	106	1.317009	-14	-11.7%	3	-0.29294
SS	152	169	1.341873	17	11.2%	1	0.076962
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	492	1.463418	-33	-6.3%	-12	0.537598
WW	502	558	2.432485	56	11.2%	3	0.127047
Run 5							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	429	0.388057	8	1.9%	0	0
EN	47	55	1.120224	8	17.0%	0	0
ES	698	739	1.529574	41	5.9%	0	0
NE	464	378	4.191384	-86	-18.5%	2	-0.10258
NN	132	148	1.352247	16	12.1%	-1	-0.08196
NW	682	727	1.695399	45	6.6%	-1	-0.03706
SE	120	106	1.317009	-14	-11.7%	0	0
SS	152	169	1.341873	17	11.2%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	492	1.463418	-33	-6.3%	0	0
WW	502	558	2.432485	56	11.2%	0	0

Run 6							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	463	1.997736	42	10.0%	34	1.609679
EN	47	65	2.405351	18	38.3%	10	1.285127
ES	698	786	3.230582	88	12.6%	47	1.701008
NE	464	378	4.191384	-86	-18.5%	0	0
NN	132	147	1.270001	15	11.4%	-1	-0.08225
NW	682	716	1.285998	34	5.0%	-11	-0.4094
SE	120	103	1.609947	-17	-14.2%	-3	0.292937
SS	152	168	1.264911	16	10.5%	-1	-0.07696
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	504	0.92582	-21	-4.0%	12	-0.5376
WW	502	557	2.390175	55	11.0%	-1	-0.04231
Run 7							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	467	2.183063	46	10.9%	4	0.185327
EN	47	65	2.405351	18	38.3%	0	0
ES	698	789	3.337343	91	13.0%	3	0.106762
NE	464	378	4.191384	-86	-18.5%	0	0
NN	132	148	1.352247	16	12.1%	1	0.082246
NW	682	717	1.323348	35	5.1%	1	0.03735
SE	120	103	1.609947	-17	-14.2%	0	0
SS	152	168	1.264911	16	10.5%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	504	0.92582	-21	-4.0%	0	0
WW	502	555	2.305438	53	10.6%	-2	-0.08474
Run 8							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	402	0.936631	-19	-4.5%	-65	-1.24643
EN	47	32	2.386672	-15	-31.9%	-33	-0.01868
ES	698	694	0.15162	-4	-0.6%	-95	-3.18572
NE	464	396	3.279251	-68	-14.7%	18	-0.91213
NN	132	151	1.597259	19	14.4%	3	0.245012
NW	682	734	1.95428	52	7.6%	17	0.630931
SE	120	106	1.317009	-14	-11.7%	3	-0.29294
SS	152	169	1.341873	17	11.2%	1	0.076962
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	487	1.689306	-38	-7.2%	-17	0.763486
WW	502	560	2.516986	58	11.6%	5	0.211548

Run 9							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	464	2.044146	43	10.2%	62	1.107514
EN	47	66	2.527722	19	40.4%	34	0.141051
ES	698	770	2.657568	72	10.3%	76	2.505949
NE	464	394	3.379632	-70	-15.1%	-2	0.100381
NN	132	148	1.352247	16	12.1%	-3	-0.24501
NW	682	718	1.360672	36	5.3%	-16	-0.59361
SE	120	103	1.609947	-17	-14.2%	-3	0.292937
SS	152	168	1.264911	16	10.5%	-1	-0.07696
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	504	0.92582	-21	-4.0%	17	-0.76349
WW	502	554	2.26301	52	10.4%	-6	-0.25398
Run 10							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	374	2.357378	-47	-11.2%	-90	0.313233
EN	47	117	7.730207	70	148.9%	51	5.202484
ES	698	688	0.379869	-10	-1.4%	-82	-2.2777
NE	464	396	3.279251	-68	-14.7%	2	-0.10038
NN	132	151	1.597259	19	14.4%	3	0.245012
NW	682	734	1.95428	52	7.6%	16	0.593608
SE	120	106	1.317009	-14	-11.7%	3	-0.29294
SS	152	169	1.341873	17	11.2%	1	0.076962
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	48	0.285714	-2	-4.0%	-1	0.14358
WS	525	486	1.734619	-39	-7.4%	-18	0.808799
WW	502	559	2.474755	57	11.4%	5	0.211745
Run 11							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	426	0.242965	5	1.2%	52	-2.11441
EN	47	18	5.086937	-29	-61.7%	-99	-2.64327
ES	698	746	1.786375	48	6.9%	58	1.406506
NE	464	394	3.379632	-70	-15.1%	-2	0.100381
NN	132	148	1.352247	16	12.1%	-3	-0.24501
NW	682	719	1.397969	37	5.4%	-15	-0.55631
SE	120	103	1.609947	-17	-14.2%	-3	0.292937
SS	152	166	1.110272	14	9.2%	-3	-0.2316
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	1	-0.14358
WS	525	502	1.01498	-23	-4.4%	16	-0.71964
WW	502	569	2.89531	67	13.3%	10	0.420555

Run 12							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	416	0.244412	-5	-1.2%	-10	0.001447
EN	47	34	2.042753	-13	-27.7%	16	-3.04418
ES	698	742	1.639783	44	6.3%	-4	-0.14659
NE	464	393	3.429912	-71	-15.3%	-1	0.05028
NN	132	148	1.352247	16	12.1%	0	0
NW	682	719	1.397969	37	5.4%	0	0
SE	120	103	1.609947	-17	-14.2%	0	0
SS	152	166	1.110272	14	9.2%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	502	1.01498	-23	-4.4%	0	0
WW	502	569	2.89531	67	13.3%	0	0
Run 13							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	414	0.342586	-7	-1.7%	-2	0.098174
EN	47	34	2.042753	-13	-27.7%	0	0
ES	698	744	1.71313	46	6.6%	2	0.073346
NE	464	394	3.379632	-70	-15.1%	1	-0.05028
NN	132	148	1.352247	16	12.1%	0	0
NW	682	717	1.323348	35	5.1%	-2	-0.07462
SE	120	103	1.609947	-17	-14.2%	0	0
SS	152	166	1.110272	14	9.2%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	499	1.149049	-26	-5.0%	-3	0.134068
WW	502	571	2.978957	69	13.7%	2	0.083647
Run 14							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	414	0.342586	-7	-1.7%	0	0
EN	47	34	2.042753	-13	-27.7%	0	0
ES	698	744	1.71313	46	6.6%	0	0
NE	464	394	3.379632	-70	-15.1%	0	0
NN	132	148	1.352247	16	12.1%	0	0
NW	682	717	1.323348	35	5.1%	0	0
SE	120	103	1.609947	-17	-14.2%	0	0
SS	152	166	1.110272	14	9.2%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	499	1.149049	-26	-5.0%	0	0
WW	502	571	2.978957	69	13.7%	0	0

Run 15							
Mvmt	Input	Output	GEH	Difference	%	δ volume	δ GEH
EE	421	411	0.49029	-10	-2.4%	-3	0.147704
EN	47	34	2.042753	-13	-27.7%	0	0
ES	698	744	1.71313	46	6.6%	0	0
NE	464	394	3.379632	-70	-15.1%	0	0
NN	132	148	1.352247	16	12.1%	0	0
NW	682	707	0.948645	25	3.7%	-10	-0.3747
SE	120	103	1.609947	-17	-14.2%	0	0
SS	152	166	1.110272	14	9.2%	0	0
SW	22	19	0.662589	-3	-13.6%	0	0
WN	50	49	0.142134	-1	-2.0%	0	0
WS	525	499	1.149049	-26	-5.0%	0	0
WW	502	572	3.020723	70	13.9%	1	0.041766

Appendix B-2: Delay, Level of Service

This appendix contains the data used to calibrate delay and level of service for each turn movement at the intersection.

Run 1	Queue	Q max	Vol	LOS	Delay	Stop delay	Stops (all)
EE	121.31	403.3511	416	LOS_E	60.438526	49.702288	1.175481
EN	7.3295	83.89181	34	LOS_D	44.292671	39.566957	0.735294
ES	128.52	412.1109	742	LOS_C	32.93647	17.81658	1.854447
NE	42.157	336.1034	393	LOS_B	17.608785	3.482279	1.931298
NN	53.737	270.5608	148	LOS_E	72.90644	63.727737	1.47973
NW	218.93	1003.481	719	LOS_E	76.128239	68.2125	0.878999
SE	33.267	167.1094	103	LOS_E	59.073808	52.959201	0.883495
SS	77.485	419.26	166	LOS_E	70.869432	63.316172	0.89759
SW	76.717	420.6404	19	LOS_E	61.988077	54.94057	0.947368
WN	134.01	401.423	49	LOS_E	67.000549	59.179939	0.938776
WS	106.08	513.7501	502	LOS_E	57.77624	50.278353	0.856574
WW	134.01	401.423	569	LOS_E	64.380735	55.325175	1.137083
Total	**90.868**	**1003.481**	**3860**	**LOS_D**	**54.787536**	**44.485774**	**1.264508**

Run 2	Queue	Q max	Vol	LOS	Delay	Stop delay	Stops (all)
EE	137.45	478.9917	414	LOS_E	61.979292	61.979292	50.742263
EN	7.2602	81.49337	34	LOS_D	43.806082	43.806082	39.056914
ES	144.94	487.7515	744	LOS_D	38.018574	38.018574	21.064938
NE	41.744	324.5803	394	LOS_B	17.445074	17.445074	3.365638
NN	50.219	208.182	148	LOS_E	65.779704	65.779704	56.944287
NW	203.87	949.0608	717	LOS_E	74.191823	74.191823	65.952489
SE	33.301	167.1094	103	LOS_E	58.834444	58.834444	52.652018
SS	75.635	419.26	166	LOS_E	69.156937	69.156937	61.641625
SW	74.922	420.6404	19	LOS_E	59.580613	59.580613	52.438481
WN	137.28	437.3434	49	LOS_E	62.779635	62.779635	55.013983
WS	105.91	571.8151	499	LOS_E	57.464702	57.464702	50.078884
WW	137.28	437.3434	571	LOS_E	63.840165	63.840165	54.712867
Total	**92.05**	**949.0608**	**3858**	**LOS_D**	**54.980508**	**54.980508**	**44.226902**

Run 3	Queue	Q max	Vol	LOS	Delay	Stop delay	Stops (all)
EE	137.45	478.9917	414	LOS_E	61.979292	44.226902	1.306376
EN	7.2602	81.49337	34	LOS_D	43.806082	65.952489	0.868898
ES	144.94	487.7515	744	LOS_D	38.018574	54.712867	1.113835
NE	41.744	324.5803	394	LOS_B	17.445074	55.013983	1
NN	50.219	208.182	148	LOS_E	65.779704	21.064938	2.051075
NW	203.87	949.0608	717	LOS_E	74.191823	50.742263	1.289855
SE	33.301	167.1094	103	LOS_E	58.834444	61.641625	0.885542
SS	75.635	419.26	166	LOS_E	69.156937	52.438481	1.105263
SW	74.922	420.6404	19	LOS_E	59.580613	39.056914	0.735294
WN	137.28	437.3434	49	LOS_E	62.779635	56.944287	1.358108
WS	105.91	571.8151	499	LOS_E	57.464702	52.652018	0.902913
WW	137.28	437.3434	571	LOS_E	63.840165	3.365638	1.936548
Total	**92.05**	**949.0608**	**3858**	**LOS_D**	**54.980508**	50.078884	0.845691

Run 4	Queue	Q max	Vol	LOS	Delay	Stop delay	Stops (all)
EE	117.8	376.1952	411	LOS_E	60.937461	50.686809	1.189781
EN	7.5086	81.49337	34	LOS_D	45.653878	40.685537	0.764706
ES	124.84	384.955	744	LOS_C	30.196821	15.290997	1.880376
NE	39.626	316.8706	394	LOS_B	16.535725	2.591063	1.959391
NN	49.079	228.2429	148	LOS_E	64.107098	55.320743	1.371622
NW	182.16	874.1217	707	LOS_E	71.896092	63.669848	0.88826
SE	29.82	148.4012	103	LOS_D	50.534366	45.139429	0.815534
SS	59.047	269.6256	166	LOS_E	59.323126	52.474559	0.807229
SW	57.992	271.0061	19	LOS_C	25.111691	19.973206	0.789474
WN	131.48	439.234	49	LOS_E	66.481678	58.6366	1
WS	108.51	571.7713	499	LOS_E	58.998004	51.571016	0.847695
WW	131.48	439.234	572	LOS_E	62.756306	53.573633	1.103147
Total	**82.533**	**874.1217**	**3846**	**LOS_D**	**52.007655**	**41.811206**	**1.26183**

Run 5	Queue	Q max	Vol	LOS	Delay	Stop delay	Stops (all)
EE	114.4	360.6433	411	LOS_E	60.423578	50.481388	1.206813
EN	7.5101	81.49337	34	LOS_D	45.629808	40.663102	0.764706
ES	121.43	369.4031	744	LOS_C	30.362782	15.3715	1.821237
NE	40.166	305.5196	394	LOS_B	16.861937	2.87666	1.941624
NN	48.813	221.2006	148	LOS_E	61.826463	53.243499	1.283784
NW	183.47	838.6675	707	LOS_E	71.62815	63.483658	0.885431
SE	29.82	148.4012	103	LOS_D	50.533731	45.139429	0.815534
SS	59.047	269.6256	166	LOS_E	59.323126	52.474559	0.807229
SW	57.992	271.0061	19	LOS_C	25.111691	19.973206	0.789474
WN	126.1	407.034	49	LOS_E	66.147504	58.539137	1
WS	106.05	557.8903	499	LOS_E	58.859149	51.571316	0.841683
WW	126.1	407.034	572	LOS_E	61.100501	52.262402	1.041958
Total	**81.344**	**838.6675**	**3846**	**LOS_D**	**51.612481**	**41.523507**	**1.236609**

Appendix C: Base VISSIM Model Results

Appendix C-1: Present-day

This appendix contains the final, calibrated VISSIM model results for present-day conditions.

SimRun	TimeInt	Movement	QLen	QLenMax	Turn	Vehs(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
123	0-3600	1: 260/89A - 15: 89A NB appr@529.5 - 2: 89A NB exit@7.9	114.402	360.6433	EE	411	LOS_E	5	60.423578	60.423578	50.481388	1.206813	698.830525	135.967026	161.960722	9.997575
123	0-3600	1: 260/89A - 19: turn EN@117.6 - 3: Cove NB@4.3	7.51009	81.49337	EN	34	LOS_D	4	45.629808	45.629808	40.663102	0.764706	43.324743	8.429421	10.040928	0.61981
123	0-3600	1: 260/89A - 15: 89A NB appr@529.5 - 10005: turn ES@104.0	121.428	369.4031	ES	744	LOS_C	3	30.362782	30.362782	15.3715	1.821237	1128.3315	219.532309	261.501721	16.142082
123	0-3600	1: 260/89A - 22: 260 RT lane@210.5 - 2: 89A NB exit@7.9	40.1657	305.5196	NE	394	LOS_B	2	16.861937	16.861937	2.87666	1.941624	546.785525	106.384594	126.722826	7.822397
123	0-3600	1: 260/89A - 20: 260 thru lane@214.9 - 3: Cove NB@4.3	48.8133	221.2006	NN	148	LOS_E	5	61.826463	61.826463	53.243499	1.283784	260.342975	50.653283	60.336998	3.724506
123	0-3600	1: 260/89A - 10016: NW turn@375.9 - 11: 89A SB exit@37.2	183.469	838.6675	NW	707	LOS_E	5	71.62815	71.62815	63.483658	0.885431	1213.500987	236.103196	281.240572	17.360529
123	0-3600	1: 260/89A - 21: Cove LT lane@113.6 - 2: 89A NB exit@7.9	29.8203	148.4012	SE	103	LOS_D	4	50.533731	50.533731	45.139429	0.815534	140.532495	27.342517	32.569763	2.010479
123	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 10013: SS@162.6	59.0474	269.6256	SS	166	LOS_E	5	59.323126	59.323126	52.474559	0.807229	248.033599	48.258325	57.484182	3.548406
123	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 11: 89A SB exit@37.2	57.9918	271.0061	SW	19	LOS_C	3	25.111691	25.111691	19.973206	0.789474	18.305643	3.561613	4.24251	0.261883
123	0-3600	1: 260/89A - 13: 89A SB@141.4 - 3: Cove NB@4.3	126.095	407.034	WN	49	LOS_E	5	66.147504	66.147504	58.539137	1	80.624028	15.686506	18.685397	1.15342
123	0-3600	1: 260/89A - 5: WS turn@170.8 - 10003@160.9	106.046	557.8903	WS	499	LOS_E	5	58.859149	58.859149	51.571316	0.841683	751.605317	146.235083	174.19179	10.75258
123	0-3600	1: 260/89A - 13: 89A SB@141.4 - 11: 89A SB exit@37.2	126.095	407.034	WW	572	LOS_E	5	61.100501	61.100501	52.262402	1.041958	936.524679	182.213671	217.048638	13.398064
123	0-3600	1: 260/89A	**81.3444**	**838.6675**	**Total**	**3846**	**LOS_D**	**4**	**51.612481**	**51.612481**	**41.523507**	**1.236609**	**6066.726605**	**1180.364547**	**1406.022475**	**86.791511**

Appendix C-2: 20-year

This appendix contains the final, calibrated VISSIM model results for 20-year conditions.

SimRun	TimeInt	Movement	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
123	0-3600	1: 260/89A - 10016: NW turn@375.9 - 11: 89A SB exit@37.2	400.783313	1272.928868	857	857	LOS_F	6	84.678922	84.678922	76.89688	0.803967	1596.947385	310.707932	370.107978	22.846171
123	0-3600	1: 260/89A - 13: 89A SB@141.4 - 11: 89A SB exit@37.2	310.425659	938.949697	712	712	LOS_E	5	79.448998	79.448998	69.691657	1.224719	1412.02922	274.729576	327.251407	20.200704
123	0-3600	1: 260/89A - 13: 89A SB@141.4 - 3: Cove NB@4.3	310.425659	938.949697	58	58	LOS_E	5	76.986	76.986	68.531125	1.051724	105.746642	20.574454	24.507806	1.512828
123	0-3600	1: 260/89A - 15: 89A NB appr@529.5 - 10005: turn ES@104.0	552.058009	1165.042405	917	917	LOS_E	5	73.300178	73.300178	42.979779	3.918212	2839.672695	552.497119	658.121569	40.624788
123	0-3600	1: 260/89A - 15: 89A NB appr@529.5 - 2: 89A NB exit@7.9	543.394885	1156.28261	465	465	LOS_F	6	126.47638	126.47638	107.440808	2.378495	1480.938114	288.136743	343.221709	21.186525
123	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 10013: SS@162.6	109.737219	535.308858	215	215	LOS_E	5	75.987415	75.987415	68.112706	0.944186	386.056885	75.112641	89.472411	5.522988
123	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 11: 89A SB exit@37.2	109.843651	536.689272	22	22	LOS_D	4	53.298164	53.298164	47.114072	1	32.20538	6.265997	7.463908	0.460735
123	0-3600	1: 260/89A - 19: turn EN@117.6 - 3: Cove NB@4.3	18.151007	103.865185	45	45	LOS_F	6	88.614792	88.614792	78.258217	1.466667	99.554684	19.369724	23.072759	1.424244
123	0-3600	1: 260/89A - 20: 260 thru lane@214.9 - 3: Cove NB@4.3	64.682309	239.646672	182	182	LOS_E	5	65.573302	65.573302	57.503223	1.236264	324.822501	63.198655	75.280751	4.64696
123	0-3600	1: 260/89A - 21: Cove LT lane@113.6 - 2: 89A NB exit@7.9	44.440565	201.453521	135	135	LOS_E	5	61.456864	61.456864	54.893153	0.888889	209.691539	40.798354	48.598039	2.999879
123	0-3600	1: 260/89A - 22: 260 RT lane@210.5 - 2: 89A NB exit@7.9	76.837882	465.685454	489	489	LOS_C	3	24.719255	24.719255	4.844142	2.543967	871.30968	169.525202	201.934432	12.465088
123	0-3600	1: 260/89A - 5: WS turn@170.8 - 10003@160.9	365.502202	1073.911011	609	609	LOS_E	5	74.933666	74.933666	67.204504	0.850575	1059.197109	206.081269	245.479158	15.153034
123	**0-3600**	**1: 260/89A**	**235.986973**	**1272.928868**	**4706**	**4706**	**LOS_E**	**5**	**76.302879**	**76.302879**	**61.462638**	**1.852741**	**10422.69878**	**2027.878447**	**2415.561091**	**149.108709**

Appendix D: Design Alternative VISSIM Results

Appendix D-1: Alternative A

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
112	0-3600	1: 260/89A - 19: turn EN@117.6 - 3: Cove NB@4.3	EN	10.37	84.801	49	49	LOS_D	4	52.394	52.3937	43.8517	1.3265	79.70455	15.507609	18.472298	1.140265
112	0-3600	1: 260/89A - 62: 89A NB appr@180.7 - 2: 89A NB exit@7.9	EE	218.8	444.287	504	504	LOS_F	6	96.979	96.9785	78.8886	2.2956	1374.028	267.33598	318.44433	19.657057
112	0-3600	1: 260/89A - 62: 89A NB appr@180.7 - 10005: turn ES@104.0	ES	226.9	453.047	931	931	LOS_C	3	20.503	20.5033	12.6032	0.7444	816.3092	158.82412	189.18755	11.678244
112	0-3600	1: 260/89A - 5: WS turn@163.6 - 10003@160.9	WS	80.96	346.982	629	629	LOS_D	4	39.476	39.4763	30.8259	0.9285	799.5901	155.57119	185.31274	11.439058
112	0-3600	1: 260/89A - 13: 89A SB@141.4 - 11: 89A SB exit@37.2	WW	80.13	279.915	735	735	LOS_C	3	31.3	31.2996	22.7071	1.0041	878.3285	170.89081	203.56111	12.5655
112	0-3600	1: 260/89A - 13: 89A SB@141.4 - 3: Cove NB@4.3	WN	80.13	279.915	58	58	LOS_C	3	28.763	28.7627	22.0293	0.8276	59.78297	11.631594	13.855281	0.855264
112	0-3600	1: 260/89A - 10016: NW turn@375.9 - 11: 89A SB exit@37.2	NW	100.7	370.895	891	891	LOS_C	3	34.839	34.8391	27.1242	0.8608	1051.72	204.62642	243.74617	15.04606
112	0-3600	1: 260/89A - 20: 260 thru lane@214.9 - 3: Cove NB@4.3	NN	24.43	182.738	185	185	LOS_C	3	29.407	29.4068	21.2567	1.2595	237.1408	46.13898	54.959667	3.392572
112	0-3600	1: 260/89A - 22: 260 RT lane@210.5 - 2: 89A NB exit@7.9	NE	10.28	208.223	507	507	LOS_A	1	4.8101	4.8101	1.41887	0.3629	240.7842	46.847855	55.804062	3.444695
112	0-3600	1: 260/89A - 21: Cove LT lane@113.6 - 2: 89A NB exit@7.9	SE	35.4	184.619	136	136	LOS_D	4	50.479	50.479	42.8662	1.1176	204.5891	39.805596	47.41549	2.926882
112	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 10013: SS@162.6	SS	94.58	598.883	204	204	LOS_E	5	65.388	65.3883	54.8038	1.2598	365.6158	71.135546	84.734989	5.230555
112	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 11: 89A SB exit@37.2	SW	94.26	600.264	22	22	LOS_E	5	55.398	55.398	46.0208	1.3636	36.58077	7.117289	8.477947	0.52333
112	**0-3600**	**1: 260/89A**		**88.81**	**600.264**	**4851**	**4851**	**LOS_D**	**4**	**37.184**	**37.1842**	**28.4149**	**1.0118**	**6146.003**	**1195.7888**	**1424.3955**	**87.925646**

Appendix D-2: Alternative B

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
169	0-3600	1: 260/89A - 19: turn EN@117.6 - 3: Cove NB@4.3	EN	10.24	82.6767	49	49	LOS_D	4	41.545	41.5449	36.1855	0.9184	62.8329	12.225	14.562132	0.898897
169	0-3600	1: 260/89A - 15: 89A NB appr@526.5 - 2: 89A NB exit@7.9	EE	65.92	211.586	496	496	LOS_D	4	44.852	44.852	34.955	1.2722	749.1152	145.7506	173.61468	10.716956
169	0-3600	1: 260/89A - 62@226.6 - 10005: turn ES@89.7	ES	18.83	189.063	942	942	LOS_A	1	6.8061	6.80613	2.80756	0.4193	497.5558	96.806283	115.31337	7.118109
169	0-3600	1: 260/89A - 5: WS turn@170.8 - 10003@160.9	WS	76.49	283.555	628	628	LOS_D	4	38.581	38.5806	31.0184	0.8583	769.7062	149.75686	178.38685	11.011534
169	0-3600	1: 260/89A - 13: 89A SB@141.4 - 11: 89A SB exit@37.2	WW	85.57	272.287	730	730	LOS_C	3	33.082	33.0816	24.7514	0.9603	875.9623	170.43043	203.01272	12.531649
169	0-3600	1: 260/89A - 13: 89A SB@141.4 - 3: Cove NB@4.3	WN	85.57	272.287	58	58	LOS_C	3	33.147	33.1469	25.8649	0.9138	65.78449	12.799271	15.246191	0.941123
169	0-3600	1: 260/89A - 10016: NW turn@375.9 - 11: 89A SB exit@37.2	NW	98.74	339.036	952	952	LOS_C	3	31.761	31.7613	24.3564	0.8183	1063.392	206.89746	246.45139	15.213049
169	0-3600	1: 260/89A - 20: 260 thru lane@214.9 - 3: Cove NB@4.3	NN	24.94	243.409	185	185	LOS_C	3	28.818	28.818	20.9497	1.2108	231.3261	45.007656	53.612061	3.309386
169	0-3600	1: 260/89A - 22: 260 RT lane@210.5 - 2: 89A NB exit@7.9	NE	8.2	147.232	507	507	LOS_A	1	4.1646	4.16458	1.38187	0.2682	213.5971	41.558239	49.503197	3.055753
169	0-3600	1: 260/89A - 21: Cove LT lane@113.6 - 2: 89A NB exit@7.9	SE	28.09	205.872	136	136	LOS_D	4	46.777	46.777	38.4851	1.1691	200.696	39.048142	46.513228	2.871187
169	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 10013: SS@162.6	SS	151.8	598.883	211	211	LOS_F	6	97.536	97.5365	83.4841	1.6114	509.3095	99.093112	118.03738	7.286258
169	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 11: 89A SB exit@37.2	SW	152.2	600.263	22	22	LOS_F	6	92.965	92.9654	79.1198	2	54.84853	10.671531	12.711676	0.784671
169	**0-3600**	**1: 260/89A**		**65.55**	**600.263**	**4916**	**4916**	**LOS_C**	**3**	**30.037**	**30.0368**	**23.0181**	**0.823**	**5294.446**	**1030.1068**	**1227.0389**	**75.743145**

Appendix D-3: Alternative C

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
178	0-3600	1: 260/89A - 19: turn EN@117.6 - 3: Cove NB@4.3	EN	10.24	82.6767	49	49	LOS_D	4	41.577	41.5771	36.1821	0.9184	64.40806	12.531467	14.927189	0.921431
178	0-3600	1: 260/89A - 15: 89A NB appr@526.5 - 2: 89A NB exit@7.9	EE	66.67	211.586	496	496	LOS_D	4	45.102	45.1019	35.1255	1.2742	761.9183	148.24162	176.58192	10.900119
178	0-3600	1: 260/89A - 62@226.6 - 10005: turn ES@89.7	ES	13.41	147.158	942	942	LOS_A	1	5.438	5.43801	1.94192	0.3036	458.7304	89.252259	106.31519	6.562666
178	0-3600	1: 260/89A - 5: WS turn@170.8 - 10003@160.9	WS	79.47	404.144	615	615	LOS_D	4	40.184	40.1842	31.8042	0.8732	786.0539	152.93753	182.17559	11.245406
178	0-3600	1: 260/89A - 13: 89A SB@141.4 - 11: 89A SB exit@37.2	WW	84.61	272.287	745	745	LOS_C	3	32.994	32.9943	24.3793	1.0322	933.5679	181.63839	216.36338	13.355764
178	0-3600	1: 260/89A - 13: 89A SB@141.4 - 3: Cove NB@4.3	WN	84.61	272.287	57	57	LOS_C	3	32.695	32.6952	25.2301	0.9123	65.59377	12.762165	15.201991	0.938394
178	0-3600	1: 260/89A - 10016: NW turn@375.9 - 11: 89A SB exit@37.2	NW	98.16	339.031	952	952	LOS_C	3	31.747	31.7466	24.1698	0.812	1086.935	211.478	251.90761	15.549853
178	0-3600	1: 260/89A - 20: 260 thru lane@214.9 - 3: Cove NB@4.3	NN	25.04	243.483	185	185	LOS_C	3	29.173	29.1728	21.0911	1.2162	238.1935	46.343797	55.20364	3.407632
178	0-3600	1: 260/89A - 22: 260 RT lane@210.5 - 2: 89A NB exit@7.9	NE	8.272	161.468	507	507	LOS_A	1	4.2912	4.29118	1.30405	0.2623	223.1732	43.4214	51.72255	3.19275
178	0-3600	1: 260/89A - 21: Cove LT lane@113.6 - 2: 89A NB exit@7.9	SE	28.13	164.143	136	136	LOS_D	4	38.356	38.3561	32.3523	0.8603	166.9338	32.479251	38.688519	2.38818
178	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 10013: SS@162.6	SS	32.76	135.553	22	22	LOS_B	2	18.999	18.9995	10.1137	1.4091	26.29274	5.115612	6.093597	0.376148
178	0-3600	1: 260/89A - 18: Cove RT/thru lane@109.4 - 11: 89A SB exit@37.2	SW	29.95	126.113	215	215	LOS_D	4	39.39	39.3901	31.7225	0.8465	271.2016	52.76598	62.853594	3.879851
178	**0-3600**	**1: 260/89A**		**43.34**	**404.144**	**4921**	**4921**	**LOS_C**	**3**	**26.943**	**26.943**	**20.1585**	**0.7685**	**5083.043**	**988.97549**	**1178.0443**	**72.718786**

Appendix D-4: Alternative D

Appendix D-4a: Alternative D-1

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
191	0-3600	1: 260/89A - 19: turn EN@94.4 - 3: Cove NB@34.1	EN	9.658	82.9642	49	49	LOS_D	4	39.349	39.3487	34.0782	0.898	62.28912	12.1192	14.436105	0.891118
191	0-3600	1: 260/89A - 15: 89A NB appr@504.9 - 2: 89A NB exit@20.3	EE	66.59	230.455	496	496	LOS_D	4	44.858	44.8585	34.9415	1.2661	756.5284	147.19293	175.33275	10.823009
191	0-3600	1: 260/89A - 17@236.3 - 10004@36.4	ES	92.53	809.138	942	942	LOS_B	2	11.526	11.5256	3.82696	0.7293	748.6821	145.66633	173.51431	10.71076
191	0-3600	1: 260/89A - 5: WS turn@156.6 - 7: 260 EB@89.1	WS	74.5	265.458	615	615	LOS_D	4	38.592	38.5921	30.6652	0.852	872.0744	169.67399	202.11166	12.476028
191	0-3600	1: 260/89A - 13: 89A SB@125.5 - 11: 89A SB exit@62.1	WW	84.45	272.287	745	745	LOS_C	3	32.884	32.8842	24.2947	1.0295	931.3611	181.20902	215.85192	13.324193
191	0-3600	1: 260/89A - 13: 89A SB@125.5 - 3: Cove NB@34.1	WN	84.45	272.287	57	57	LOS_C	3	32.665	32.6653	25.1947	0.9123	65.56953	12.757448	15.196371	0.938048
191	0-3600	1: 260/89A - 10016: NW turn@291.1 - 11: 89A SB exit@62.1	NW	99.44	339.405	953	953	LOS_C	3	32.259	32.2592	24.561	0.8216	1127.142	219.30089	261.22607	16.125066
191	0-3600	1: 260/89A - 20: 260 thru lane@140.1 - 3: Cove NB@34.1	NN	24.94	243.262	185	185	LOS_C	3	29.367	29.3666	20.9995	1.2649	247.504	48.15529	57.361448	3.54083
191	0-3600	1: 260/89A - 22: 260 RT lane@143.2 - 2: 89A NB exit@20.3	NE	7.226	147.427	507	507	LOS_A	1	4.1051	4.10508	1.21761	0.2544	230.7975	44.904808	53.489551	3.301824
191	0-3600	1: 260/89A - 21: Cove LT lane@83.7 - 2: 89A NB exit@20.3	SE	28.13	164.143	136	136	LOS_D	4	38.354	38.3543	32.3564	0.8603	166.9303	32.478568	38.687706	2.38813
191	0-3600	1: 260/89A - 18: Cove RT/thru lane@72.5 - 7: 260 EB@89.1	SS	29.65	126.113	214	214	LOS_D	4	39.311	39.3107	31.7702	0.8411	305.6335	59.465179	70.833522	4.37244
191	0-3600	1: 260/89A - 18: Cove RT/thru lane@72.5 - 11: 89A SB exit@62.1	SW	32.46	135.553	22	22	LOS_B	2	18.975	18.975	10.1123	1.4545	26.74682	5.203958	6.198833	0.382644
191	**0-3600**	**1: 260/89A**		**49.96**	**809.138**	**4921**	**4921**	**LOS_C**	**3**	**27.928**	**27.9279**	**20.3884**	**0.8488**	**5531.58**	**1076.2444**	**1281.997**	**79.135619**

Appendix D-4b: Alternative D-2

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
195	0-3600	1: 260/89A - 19: turn EN@88.0 - 3: Cove NB@92.3	EN	10.24	82.6767	49	49	LOS_D	4	41.607	41.6068	36.1789	0.9184	65.97449	12.836237	15.290224	0.943841
195	0-3600	1: 260/89A - 15: 89A NB appr@493.7 - 2: 89A NB exit@43.4	EE	67.39	244.272	496	496	LOS_D	4	44.747	44.7475	34.7985	1.2661	764.6238	148.768	177.20894	10.938824
195	0-3600	1: 260/89A - 17@218.9 - 7: 260 EB@91.5	ES	0	0	946	946	LOS_A	1	1.6121	1.61214	0.00039	0.0011	290.3859	56.498537	67.299728	4.154304
195	0-3600	1: 260/89A - 5: WS turn@141.0 - 7: 260 EB@91.5	WS	77.6	264.274	614	614	LOS_D	4	40.493	40.4932	31.3835	0.8713	799.0665	155.4693	185.19138	11.431566
195	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@62.9	WW	84.44	304.633	742	742	LOS_C	3	33.432	33.4323	24.7264	1.0431	941.526	183.18675	218.20775	13.469614
195	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@92.3	WN	84.44	304.633	57	57	LOS_C	3	32.626	32.6262	25.0727	0.9474	68.45684	13.319213	15.865533	0.979354
195	0-3600	1: 260/89A - 10016: NW turn@317.0 - 11: 89A SB exit@62.9	NW	100.1	339.405	952	952	LOS_C	3	32.352	32.3515	24.6545	0.8235	1115.597	217.05469	258.55044	15.959904
195	0-3600	1: 260/89A - 20: 260 thru lane@157.9 - 3: Cove NB@92.3	NN	24.94	243.589	185	185	LOS_C	3	29.271	29.2708	20.9862	1.227	247.8683	48.226172	57.445882	3.546042
195	0-3600	1: 260/89A - 22: 260 RT lane@154.7 - 2: 89A NB exit@43.4	NE	8.768	161.218	507	507	LOS_A	1	4.6149	4.61486	1.43094	0.2801	243.6554	47.406488	56.469494	3.485771
195	0-3600	1: 260/89A - 21: Cove LT lane@21.1 - 2: 89A NB exit@43.4	SE	28.13	164.143	136	136	LOS_D	4	38.384	38.3844	32.3564	0.8603	173.0504	33.669321	40.106103	2.475685
195	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 7: 260 EB@91.5	SS	29.62	126.113	215	215	LOS_D	4	39.191	39.191	31.715	0.8419	281.4004	54.750296	65.217265	4.025757
195	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 11: 89A SB exit@62.9	SW	32.42	135.553	22	22	LOS_B	2	19.179	19.1794	10.1495	1.5	28.07908	5.463168	6.507598	0.401704
195	**0-3600**	**1: 260/89A**		**42.15**	**339.405**	**4921**	**4921**	**LOS_C**	**3**	**26.399**	**26.399**	**19.8334**	**0.7155**	**5018.793**	**976.4748**	**1163.1538**	**71.799618**

Appendix D-4c: Alternative D-3

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
214	0-3600	1: 260/89A - 19: turn EN@98.4 - 3: Cove NB@76.7	EN	9.213	81.7366	49	49	LOS_D	4	37.798	37.7976	32.7631	0.8367	60.79526	11.828549	14.089889	0.869746
214	0-3600	1: 260/89A - 65: 89A NB appr@161.0 - 2: 89A NB exit@43.4	EE	73.18	243.654	496	496	LOS_D	4	44.498	44.4979	34.6139	1.2581	758.3872	147.55459	175.76356	10.849602
214	0-3600	1: 260/89A - 17@228.7 - 7: 260 EB@91.5	ES	0	0	946	946	LOS_A	1	1.539	1.53895	0	0	284.1076	55.27701	65.844673	4.064486
214	0-3600	1: 260/89A - 5: WS turn@141.0 - 7: 260 EB@91.5	WS	76.83	275.404	614	614	LOS_D	4	38.736	38.7358	30.7865	0.8436	775.8318	150.94868	179.80652	11.099168
214	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@52.2	WW	85.7	304.633	742	742	LOS_C	3	32.663	32.6626	24.0907	1.0323	925.5365	180.07577	214.50202	13.240865
214	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@76.7	WN	85.7	304.633	57	57	LOS_C	3	32.816	32.8158	25.1362	0.9825	69.0988	13.444116	16.014314	0.988538
214	0-3600	1: 260/89A - 10016: NW turn@317.0 - 11: 89A SB exit@52.2	NW	99.27	339.405	953	953	LOS_C	3	32.1	32.0999	24.4755	0.8195	1106.229	215.23191	256.37918	15.825875
214	0-3600	1: 260/89A - 20: 260 thru lane@157.9 - 3: Cove NB@76.7	NN	24.79	224.29	185	185	LOS_C	3	29.285	29.2847	21.0271	1.227	246.4095	47.942336	57.107782	3.525172
214	0-3600	1: 260/89A - 22: 260 RT lane@154.7 - 2: 89A NB exit@43.4	NE	9.991	159.815	507	507	LOS_A	1	4.9361	4.9361	1.57692	0.3037	251.6215	48.956391	58.315701	3.599735
214	0-3600	1: 260/89A - 21: Cove LT lane@39.8 - 2: 89A NB exit@43.4	SE	28.12	164.143	136	136	LOS_D	4	38.374	38.3736	32.3499	0.8603	171.7042	33.407407	39.794117	2.456427
214	0-3600	1: 260/89A - 18: Cove RT/thru lane@26.6 - 7: 260 EB@91.5	SS	29.62	126.113	215	215	LOS_D	4	39.152	39.1524	31.7136	0.8419	278.6465	54.214477	64.579009	3.986359
214	0-3600	1: 260/89A - 18: Cove RT/thru lane@26.6 - 11: 89A SB exit@52.2	SW	32.43	135.553	22	22	LOS_B	2	18.787	18.7873	9.892	1.4091	26.63397	5.182002	6.172679	0.38103
214	**0-3600**	**1: 260/89A**		**42.65**	**339.405**	**4922**	**4922**	**LOS_C**	**3**	**25.971**	**25.9712**	**19.5927**	**0.7103**	**4953.983**	**963.86512**	**1148.1334**	**70.872435**

Appendix D-4d: Alternative D-4

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
6	0-3600	1: 260/89A - 19: turn EN@88.0 - 3: Cove NB@92.3	EN	10.24	82.6767	49	49	LOS_D	4	41.607	41.6068	36.1789	0.9184	65.97449	12.836238	15.290225	0.943841
6	0-3600	1: 260/89A - 15: 89A NB appr@493.7 - 2: 89A NB exit@43.4	EE	67.39	244.272	496	496	LOS_D	4	44.746	44.7456	34.7981	1.2661	764.6105	148.76542	177.20587	10.938634
6	0-3600	1: 260/89A - 17@218.9 - 7: 260 EB@91.5	ES	0	0	946	946	LOS_A	1	1.5782	1.57821	0	0	289.4661	56.319578	67.086556	4.141145
6	0-3600	1: 260/89A - 5: WS turn@141.0 - 7: 260 EB@91.5	WS	74.28	264.274	614	614	LOS_D	4	37.576	37.576	29.8291	0.8339	762.9247	148.43743	176.81517	10.914517
6	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@62.9	WW	84.46	304.633	742	742	LOS_C	3	33.431	33.4306	24.7183	1.0458	942.4728	183.37096	218.42718	13.483159
6	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@92.3	WN	84.46	304.633	57	57	LOS_C	3	32.641	32.6413	25.0823	0.9649	68.94273	13.413751	15.978144	0.986305
6	0-3600	1: 260/89A - 10016: NW turn@317.0 - 11: 89A SB exit@62.9	NW	99.6	340.504	952	952	LOS_C	3	32.361	32.3607	24.655	0.8225	1115.203	216.978	258.45909	15.954265
6	0-3600	1: 260/89A - 20: 260 thru lane@157.9 - 3: Cove NB@92.3	NN	25	243.424	185	185	LOS_C	3	29.293	29.2932	21.0604	1.227	247.8148	48.215758	57.433476	3.545276
6	0-3600	1: 260/89A - 22: 260 RT lane@154.7 - 2: 89A NB exit@43.4	NE	8.955	161.264	507	507	LOS_A	1	4.6378	4.6378	1.42645	0.2821	244.301	47.532088	56.619105	3.495006
6	0-3600	1: 260/89A - 21: Cove LT lane@21.1 - 2: 89A NB exit@43.4	SE	28.13	164.143	136	136	LOS_D	4	38.387	38.3866	32.3564	0.8603	173.0548	33.670183	40.107129	2.475749
6	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 7: 260 EB@91.5	SS	29.62	126.113	215	215	LOS_D	4	39.11	39.1103	31.7155	0.8419	281.1534	54.702236	65.160017	4.022223
6	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 11: 89A SB exit@62.9	SW	32.42	135.553	22	22	LOS_B	2	19.146	19.1456	10.2064	1.5	28.06852	5.461114	6.505151	0.401553
6	**0-3600**	**1: 260/89A**		**41.83**	**340.504**	**4921**	**4921**	**LOS_C**	**3**	**26.03**	**26.0296**	**19.6409**	**0.7112**	**4983.08**	**969.52626**	**1154.8769**	**71.288696**

Appendix D-5: Alternative E

Appendix D-5a: Alternative E-1

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
4	0-3600	1: 260/89A - 19: turn EN@88.0 - 3: Cove NB@92.3	EN	10.6	82.9642	49	49	LOS_D	4	43.376	43.3759	37.8441	0.9388	67.67344	13.166793	15.683974	0.968147
4	0-3600	1: 260/89A - 15: 89A NB appr@493.7 - 2: 89A NB exit@43.4	EE	67.16	213.971	496	496	LOS_D	4	44.876	44.876	34.8714	1.2742	767.3859	149.30541	177.8491	10.978339
4	0-3600	1: 260/89A - 17@218.9 - 10004@39.3	ES	47.42	604.719	942	942	LOS_A	1	7.7201	7.72011	2.05794	0.4703	594.3526	115.63941	137.74695	8.502898
4	0-3600	1: 260/89A - 5: WS turn@141.0 - 66: 260 EB@73.4	WS	74.29	264.274	614	614	LOS_D	4	37.362	37.3619	29.8308	0.8339	854.7324	166.29986	198.09248	12.227931
4	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@65.3	WW	84.43	304.633	742	742	LOS_C	3	33.422	33.4215	24.7127	1.0458	943.4533	183.56172	218.6544	13.497185
4	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@92.3	WN	84.43	304.633	57	57	LOS_C	3	32.638	32.6378	25.0803	0.9649	68.93986	13.413191	15.977478	0.986264
4	0-3600	1: 260/89A - 10016: NW turn@108.2 - 11: 89A SB exit@65.3	NW	56.16	205.02	870	870	LOS_C	3	25.592	25.5921	19.5343	0.6655	884.0645	172.00682	204.89048	12.647561
4	0-3600	1: 260/89A - 20: 260 thru lane@125.2 - 3: Cove NB@92.3	NN	40.04	347.286	268	268	LOS_C	3	30.118	30.118	22.0416	1.0821	348.4125	67.788413	80.747962	4.984442
4	0-3600	1: 260/89A - 22: 260 RT lane@125.7 - 2: 89A NB exit@43.4	NE	9.311	165.797	507	507	LOS_A	1	4.7372	4.73723	1.43508	0.2998	253.0594	49.23617	58.648968	3.620307
4	0-3600	1: 260/89A - 21: Cove LT lane@21.1 - 2: 89A NB exit@43.4	SE	28.13	164.143	136	136	LOS_D	4	38.474	38.4735	32.3562	0.8603	173.2229	33.702891	40.14609	2.478154
4	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 66: 260 EB@73.4	SS	29.62	126.113	214	214	LOS_D	4	39.167	39.1665	31.7786	0.8458	313.0762	60.91326	72.558442	4.478916
4	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 11: 89A SB exit@65.3	SW	32.42	135.553	22	22	LOS_B	2	18.019	18.0193	9.31661	1.4545	27.26436	5.304654	6.318779	0.390048
4	**0-3600**	**1: 260/89A**		**43.6**	**604.719**	**4917**	**4917**	**LOS_C**	**3**	**26.033**	**26.0331**	**19.1595**	**0.7759**	**5276.016**	**1026.521**	**1222.7676**	**75.479482**

Appendix D-5b: Alternative E-2

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
3	0-3600	1: 260/89A - 19: turn EN@88.0 - 3: Cove NB@92.3	EN	10.24	82.6767	49	49	LOS_D	4	41.609	41.6085	36.1789	0.9184	65.9757	12.836473	15.290504	0.943858
3	0-3600	1: 260/89A - 15: 89A NB appr@493.7 - 2: 89A NB exit@43.4	EE	67.57	244.272	496	496	LOS_D	4	44.954	44.9537	34.9707	1.2823	769.7894	149.77304	178.40612	11.012723
3	0-3600	1: 260/89A - 17@218.9 - 7: 260 EB@91.5	ES	0	0	946	946	LOS_A	1	1.6139	1.61388	0.00195	0.0042	291.7981	56.7733	67.627019	4.174507
3	0-3600	1: 260/89A - 5: WS turn@141.0 - 7: 260 EB@91.5	WS	75.34	264.274	614	614	LOS_D	4	39.414	39.4141	30.4739	0.8616	786.8644	153.09522	182.36343	11.257002
3	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@65.3	WW	84.5	304.633	742	742	LOS_C	3	33.423	33.4229	24.7344	1.0404	941.5652	183.19437	218.21682	13.470174
3	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@92.3	WN	84.5	304.633	57	57	LOS_C	3	32.584	32.5841	25.0398	0.9649	68.89634	13.404724	15.967391	0.985641
3	0-3600	1: 260/89A - 10016: NW turn@141.5 - 11: 89A SB exit@65.3	NW	56.22	205.02	870	870	LOS_C	3	25.558	25.5581	19.5429	0.6655	868.5657	168.99132	201.29849	12.425832
3	0-3600	1: 260/89A - 20: 260 thru lane@153.7 - 3: Cove NB@92.3	NN	40.02	347.286	268	268	LOS_C	3	30.065	30.0646	22.0362	1.0858	344.7175	67.069507	79.891619	4.931581
3	0-3600	1: 260/89A - 22: 260 RT lane@151.2 - 2: 89A NB exit@43.4	NE	9.272	157.756	507	507	LOS_A	1	4.5945	4.59453	1.41685	0.286	242.0351	47.091237	56.093974	3.462591
3	0-3600	1: 260/89A - 21: Cove LT lane@21.1 - 2: 89A NB exit@43.4	SE	28.13	164.143	136	136	LOS_D	4	38.495	38.4949	32.3563	0.8603	173.2644	33.710962	40.155705	2.478747
3	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 7: 260 EB@91.5	SS	29.62	126.113	215	215	LOS_D	4	39.169	39.1695	31.7206	0.8465	281.8002	54.828084	65.309924	4.031477
3	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 11: 89A SB exit@65.3	SW	32.42	135.553	22	22	LOS_B	2	18.003	18.0034	9.29841	1.4545	27.25937	5.303683	6.317622	0.389977
3	**0-3600**	**1: 260/89A**		**39.39**	**347.286**	**4922**	**4922**	**LOS_C**	**3**	**25.07**	**25.0701**	**18.8262**	**0.6881**	**4861.383**	**945.84841**	**1126.6724**	**69.547677**

Appendix D-5c: Alternative E-3

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
4	0-3600	1: 260/89A - 19: turn EN@88.0 - 3: Cove NB@92.3	EN	10.24	82.6767	49	49	LOS_D	4	41.609	41.6085	36.1789	0.9184	65.9757	12.836473	15.290504	0.943858
4	0-3600	1: 260/89A - 15: 89A NB appr@493.7 - 2: 89A NB exit@43.4	EE	67.39	244.272	496	496	LOS_D	4	44.749	44.7488	34.7989	1.2641	764.1696	148.67963	177.10368	10.932326
4	0-3600	1: 260/89A - 17@218.9 - 7: 260 EB@91.5	ES	0	0	946	946	LOS_A	1	1.5794	1.57937	0	0	289.4818	56.322641	67.090205	4.141371
4	0-3600	1: 260/89A - 5: WS turn@141.0 - 7: 260 EB@91.5	WS	75.54	264.274	614	614	LOS_D	4	38.364	38.3637	30.4878	0.842	772.1183	150.22616	178.94586	11.046041
4	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@65.3	WW	84.45	304.633	742	742	LOS_C	3	33.419	33.4194	24.7175	1.0445	942.9626	183.46625	218.54068	13.490165
4	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@92.3	WN	84.45	304.633	57	57	LOS_C	3	32.621	32.6215	25.0648	0.9649	68.92667	13.410625	15.97442	0.986075
4	0-3600	1: 260/89A - 10016: NW turn@141.5 - 11: 89A SB exit@65.3	NW	56.16	205.02	870	870	LOS_C	3	25.56	25.5605	19.5426	0.6655	868.5952	168.99706	201.30532	12.426254
4	0-3600	1: 260/89A - 20: 260 thru lane@153.7 - 3: Cove NB@92.3	NN	40.02	347.286	268	268	LOS_C	3	30.066	30.0658	22.0373	1.0858	344.722	67.070367	79.892643	4.931645
4	0-3600	1: 260/89A - 22: 260 RT lane@151.2 - 2: 89A NB exit@43.4	NE	9.486	155.433	507	507	LOS_A	1	4.7013	4.70127	1.44864	0.2919	244.2177	47.515894	56.599815	3.493816
4	0-3600	1: 260/89A - 21: Cove LT lane@21.1 - 2: 89A NB exit@43.4	SE	28.13	164.143	136	136	LOS_D	4	38.474	38.4742	32.3563	0.8603	173.2242	33.703144	40.146392	2.478172
4	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 7: 260 EB@91.5	SS	29.62	126.113	215	215	LOS_D	4	39.112	39.112	31.7206	0.8465	281.6244	54.793876	65.269176	4.028961
4	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 11: 89A SB exit@65.3	SW	32.42	135.553	22	22	LOS_B	2	18.008	18.0076	9.30056	1.4545	27.2607	5.303942	6.317931	0.389996
4	**0-3600**	**1: 260/89A**		**39.4**	**347.286**	**4922**	**4922**	**LOS_C**	**3**	**24.92**	**24.9201**	**18.8113**	**0.6843**	**4842.031**	**942.08321**	**1122.1874**	**69.270824**

Appendix D-5d: Alternative E-4

SimRun	TimeInt	Movement	Turn	QLen	QLenMax	Vehs(All)	Pers(All)	LOS(All)	LOSVal (All)	VehDelay (All)	PersDelay (All)	StopDelay (All)	Stops (All)	EmissionsCO	EmissionsNOx	EmissionsVOC	FuelConsumption
10	0-3600	1: 260/89A - 19: turn EN@88.0 - 3: Cove NB@92.3	EN	10.24	82.6767	49	49	LOS_D	4	41.609	41.6085	36.1789	0.9184	65.9757	12.836473	15.290504	0.943858
10	0-3600	1: 260/89A - 15: 89A NB appr@493.7 - 2: 89A NB exit@43.4	EE	67.39	244.272	496	496	LOS_D	4	44.749	44.7491	34.7981	1.2661	764.6349	148.77017	177.21152	10.938983
10	0-3600	1: 260/89A - 17@218.9 - 7: 260 EB@91.5	ES	0	0	946	946	LOS_A	1	1.579	1.57903	0	0	289.4772	56.321748	67.089141	4.141305
10	0-3600	1: 260/89A - 5: WS turn@141.0 - 7: 260 EB@91.5	WS	74.28	264.274	614	614	LOS_D	4	37.577	37.577	29.8293	0.8339	762.9337	148.43918	176.81726	10.914645
10	0-3600	1: 260/89A - 13: 89A SB@116.8 - 11: 89A SB exit@65.3	WW	84.46	304.633	742	742	LOS_C	3	33.421	33.421	24.7183	1.0458	943.4478	183.56066	218.65314	13.497108
10	0-3600	1: 260/89A - 13: 89A SB@116.8 - 3: Cove NB@92.3	WN	84.46	304.633	57	57	LOS_C	3	32.64	32.6401	25.0824	0.9649	68.94176	13.413561	15.977919	0.986291
10	0-3600	1: 260/89A - 10016: NW turn@141.5 - 11: 89A SB exit@65.3	NW	56.22	205.02	870	870	LOS_C	3	25.57	25.5703	19.5427	0.6655	868.717	169.02076	201.33355	12.427997
10	0-3600	1: 260/89A - 20: 260 thru lane@153.7 - 3: Cove NB@92.3	NN	40.02	347.286	268	268	LOS_C	3	30.064	30.0644	22.0383	1.0858	344.7166	67.069328	79.891405	4.931568
10	0-3600	1: 260/89A - 22: 260 RT lane@151.2 - 2: 89A NB exit@43.4	NE	9.486	155.433	507	507	LOS_A	1	4.6881	4.68814	1.45201	0.288	243.1813	47.314254	56.359626	3.478989
10	0-3600	1: 260/89A - 21: Cove LT lane@21.1 - 2: 89A NB exit@43.4	SE	28.13	164.143	136	136	LOS_D	4	38.473	38.4728	32.3563	0.8603	173.2217	33.702641	40.145793	2.478135
10	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 7: 260 EB@91.5	SS	29.62	126.113	215	215	LOS_D	4	39.11	39.1104	31.7206	0.8465	281.6194	54.792907	65.268022	4.02889
10	0-3600	1: 260/89A - 18: Cove RT/thru lane@3.0 - 11: 89A SB exit@65.3	SW	32.42	135.553	22	22	LOS_B	2	18.013	18.0134	9.31324	1.4545	27.26252	5.304295	6.318352	0.390022
10	**0-3600**	**1: 260/89A**		**39.3**	**347.286**	**4922**	**4922**	**LOS_C**	**3**	**24.823**	**24.8226**	**18.7299**	**0.6833**	**4832.874**	**940.30162**	**1120.0652**	**69.139825**

Appendix D-6: Comparison of Alternatives

Appendix D-6a: Comparison of Level of Service

This appendix contains a comparison of level of service between each design alternative and the no-build alternative for every turn movement. Each projected level of service is color-coded, and the drop in level of service compared to the no-build is provided in each cell, with negative values representing improvements and positive values representing degradations compared to the no-build.

Road	Turn	No-build	A	B	C	D-1	D-2	D-3	D-4	E-1	E-2	E-3	E-4
SR 89A NB	Left	F	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
	Thru	F	0	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
	Right	E	-2	-4	-4	-3	-4	-4	-4	-4	-4	-4	-4
SR 89A SB	Left	E	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Thru	E	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
	Right	E	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
SR 260 WB	Left	F	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
	Thru	E	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
	Right	C	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Cove Pkwy	Left	E	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Thru	E	0	+1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	Right	D	+1	+1	-2	-2	-2	-2	-2	-2	-2	-2	-2
Overall		**E**	**-1**	**-2**	**-2**	**-2**	**-2**	**-2**	**-2**	**-2**	**-2**	**-2**	**-2**

Legend	LOS A	LOS B	LOS C	LOS D	LOS E	LOS F

Appendix D-6b: Comparison of Delay

Overall delay for each alternative and turn movement:

Road	Turn	No-build	A	B	C	D-1	D-2	D-3	D-4	E-1	E-2	E-3	E-4
SR 89A NB	Left	88.6	52.4	41.5	41.6	39.3	41.6	37.8	41.6	43.4	41.6	41.6	41.6
	Thru	126.5	97.0	44.9	45.1	44.9	44.7	44.5	44.7	44.9	45.0	44.7	44.7
	Right	73.3	20.5	6.8	5.4	11.5	1.6	1.5	1.6	7.7	1.6	1.6	1.6
SR 89A SB	Left	74.9	39.5	38.6	40.2	38.6	40.5	38.7	37.6	37.4	39.4	38.4	37.6
	Thru	79.4	31.3	33.1	33.0	32.9	33.4	32.7	33.4	33.4	33.4	33.4	33.4
	Right	77.0	28.8	33.1	32.7	32.7	32.6	32.8	32.6	32.6	32.6	32.6	32.6
SR 260 WB	Left	84.7	34.8	31.8	31.7	32.3	32.4	32.1	32.4	25.6	25.6	25.6	25.6
	Thru	65.6	29.4	28.8	29.2	29.4	29.3	29.3	29.3	30.1	30.1	30.1	30.1
	Right	24.7	4.8	4.2	4.3	4.1	4.6	4.9	4.6	4.7	4.6	4.7	4.7
Cove Pkwy	Left	61.5	50.5	46.8	38.4	38.4	38.4	38.4	38.4	38.5	38.5	38.5	38.5
	Thru	76.0	65.4	97.5	39.4	39.3	39.2	39.2	39.1	39.2	39.2	39.1	39.1
	Right	53.3	55.4	93.0	19.0	19.0	19.2	18.8	19.1	18.0	18.0	18.0	18.0
Overall		**76.3**	**37.2**	**30.0**	**26.9**	**27.9**	**26.4**	**26.0**	**26.0**	**26.0**	**25.1**	**24.9**	**24.8**

Reduction in delay for each alternative and turn movement:

Road	Turn	A	B	C	D-1	D-2	D-3	D-4	E-1	E-2	E-3	E-4
SR 89A NB	Left	-36.2	-47.1	-47.0	-49.3	-47.0	-50.8	-47.0	-45.2	-47.0	-47.0	-47.0
	Thru	-29.5	-81.6	-81.4	-81.6	-81.7	-82.0	-81.7	-81.6	-81.5	-81.7	-81.7
	Right	-52.8	-66.5	-67.9	-61.8	-71.7	-71.8	-71.7	-65.6	-71.7	-71.7	-71.7
SR 89A SB	Left	-35.5	-36.4	-34.7	-36.3	-34.4	-36.2	-37.4	-37.6	-35.5	-36.6	-37.4
	Thru	-48.1	-46.4	-46.5	-46.6	-46.0	-46.8	-46.0	-46.0	-46.0	-46.0	-46.0
	Right	-48.2	-43.8	-44.3	-44.3	-44.4	-44.2	-44.3	-44.3	-44.4	-44.4	-44.3
SR 260 WB	Left	-49.8	-52.9	-52.9	-52.4	-52.3	-52.6	-52.3	-59.1	-59.1	-59.1	-59.1
	Thru	-36.2	-36.8	-36.4	-36.2	-36.3	-36.3	-36.3	-35.5	-35.5	-35.5	-35.5
	Right	-19.9	-20.6	-20.4	-20.6	-20.1	-19.8	-20.1	-20.0	-20.1	-20.0	-20.0
Cove Pkwy	Left	-11.0	-14.7	-23.1	-23.1	-23.1	-23.1	-23.1	-23.0	-23.0	-23.0	-23.0
	Thru	-10.6	21.5	-36.6	-36.7	-36.8	-36.8	-36.9	-36.8	-36.8	-36.9	-36.9
	Right	2.1	39.7	-34.3	-34.3	-34.1	-34.5	-34.2	-35.3	-35.3	-35.3	-35.3
Overall		**-39.1**	**-46.3**	**-49.4**	**-48.4**	**-49.9**	**-50.3**	**-50.3**	**-50.3**	**-51.2**	**-51.4**	**-51.5**

Appendix D-6c: Comparison of Queue Length

Overall queue length for each alternative and turn movement

Road	Turn	No-build	A	B	C	D-1	D-2	D-3	D-4	E-1	E-2	E-3	E-4
SR 89A NB	Left	18.2	10.4	10.2	10.2	9.7	10.2	9.2	10.2	10.6	10.2	10.2	10.2
	Thru	543.4	218.8	65.9	66.7	66.6	67.4	73.2	67.4	67.2	67.6	67.4	67.4
	Right	552.1	226.9	18.8	13.4	92.5	0.0	0.0	0.0	47.4	0.0	0.0	0.0
SR 89A SB	Left	365.5	81.0	76.5	79.5	74.5	77.6	76.8	74.3	74.3	75.3	75.5	74.3
	Thru	310.4	80.1	85.6	84.6	84.5	84.4	85.7	84.5	84.4	84.5	84.5	84.5
	Right	310.4	80.1	85.6	84.6	84.5	84.4	85.7	84.5	84.4	84.5	84.5	84.5
SR 260 WB	Left	400.8	100.7	98.7	98.2	99.4	100.1	99.3	99.6	56.2	56.2	56.2	56.2
	Thru	64.7	24.4	24.9	25.0	24.9	24.9	24.8	25.0	40.0	40.0	40.0	40.0
	Right	76.8	10.3	8.2	8.3	7.2	8.8	10.0	9.0	9.3	9.3	9.5	9.5
Cove Pkwy	Left	44.4	35.4	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1
	Thru	109.7	94.6	151.8	30.0	29.7	29.6	29.6	29.6	29.6	29.6	29.6	29.6
	Right	109.8	94.3	152.2	32.8	32.5	32.4	32.4	32.4	32.4	32.4	32.4	32.4
Overall		**236.0**	**88.8**	**65.5**	**43.3**	**50.0**	**42.1**	**42.6**	**41.8**	**43.6**	**39.4**	**39.4**	**39.3**

Reduction in queue length for each alternative and turn movement

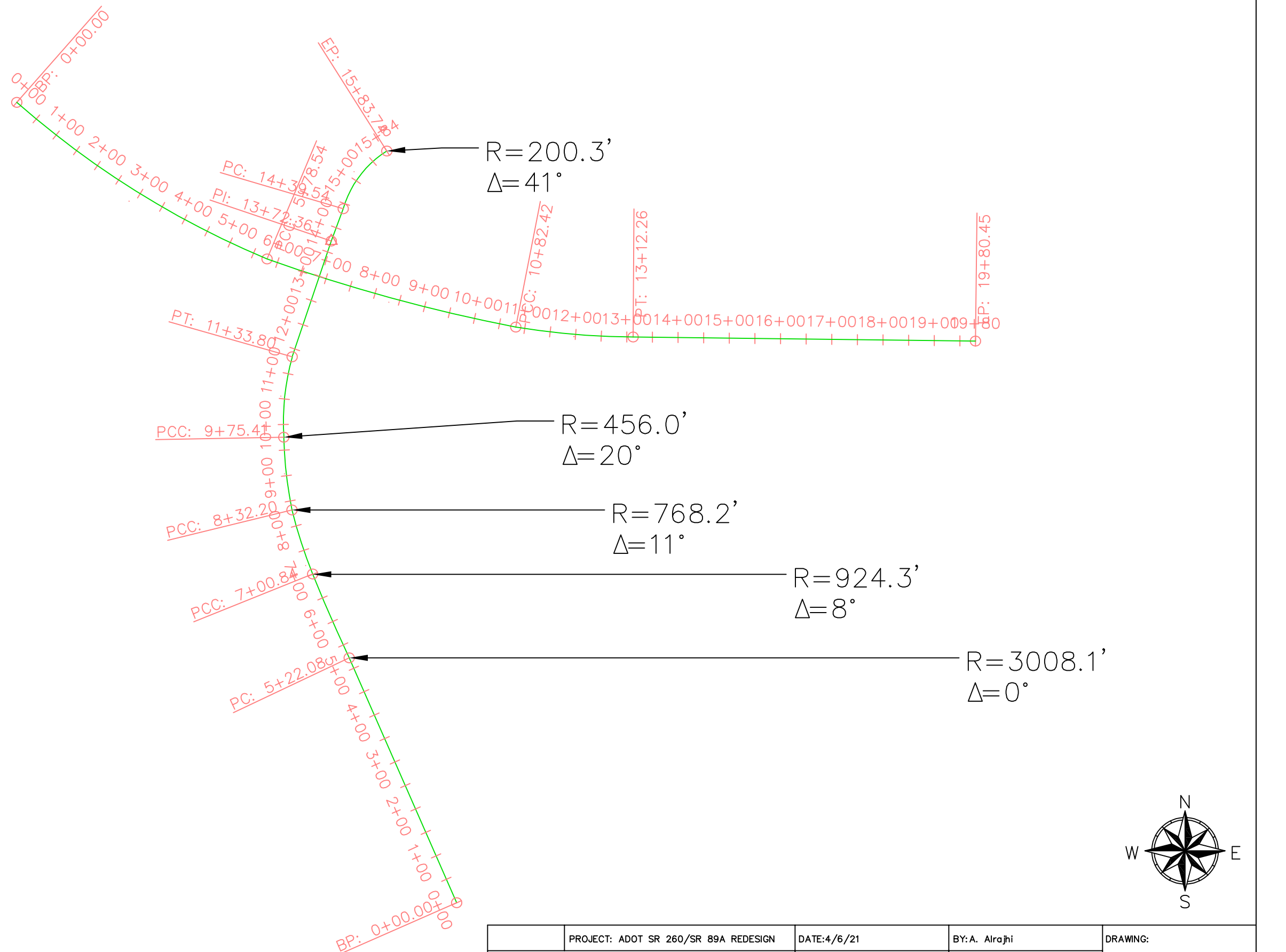
Road	Turn	A	B	C	D-1	D-2	D-3	D-4	E-1	E-2	E-3	E-4
SR 89A NB	Left	-7.8	-7.9	-7.9	-8.5	-7.9	-8.9	-7.9	-7.6	-7.9	-7.9	-7.9
	Thru	-324.5	-477.5	-476.7	-476.8	-476.0	-470.2	-476.0	-476.2	-475.8	-476.0	-476.0
	Right	-325.1	-533.2	-538.7	-459.5	-552.1	-552.1	-552.1	-504.6	-552.1	-552.1	-552.1
SR 89A SB	Left	-284.5	-289.0	-286.0	-291.0	-287.9	-288.7	-291.2	-291.2	-290.2	-290.0	-291.2
	Thru	-230.3	-224.9	-225.8	-226.0	-226.0	-224.7	-226.0	-226.0	-225.9	-226.0	-226.0
	Right	-230.3	-224.9	-225.8	-226.0	-226.0	-224.7	-226.0	-226.0	-225.9	-226.0	-226.0
SR 260 WB	Left	-300.0	-302.0	-302.6	-301.3	-300.7	-301.5	-301.2	-344.6	-344.6	-344.6	-344.6
	Thru	-40.3	-39.7	-39.6	-39.7	-39.7	-39.9	-39.7	-24.6	-24.7	-24.7	-24.7
	Right	-66.6	-68.6	-68.6	-69.6	-68.1	-66.8	-67.9	-67.5	-67.6	-67.4	-67.4
Cove Pkwy	Left	-9.0	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3
	Thru	-15.2	42.1	-79.8	-80.1	-80.1	-80.1	-80.1	-80.1	-80.1	-80.1	-80.1
	Right	-15.6	42.3	-77.1	-77.4	-77.4	-77.4	-77.4	-77.4	-77.4	-77.4	-77.4
Overall		**-147.2**	**-170.4**	**-192.7**	**-186.0**	**-193.8**	**-193.3**	**-194.2**	**-192.4**	**-196.6**	**-196.6**	**-196.7**

Appendix E: Final Design Plan Set

This appendix contains the plan sets for the final design. The plan sets included are:

- Alignment
- Plan view
- Pavement marking plan
- Cross-sections of each altered approach
- Pedestrian island detail

These plan sets begin on the next page.



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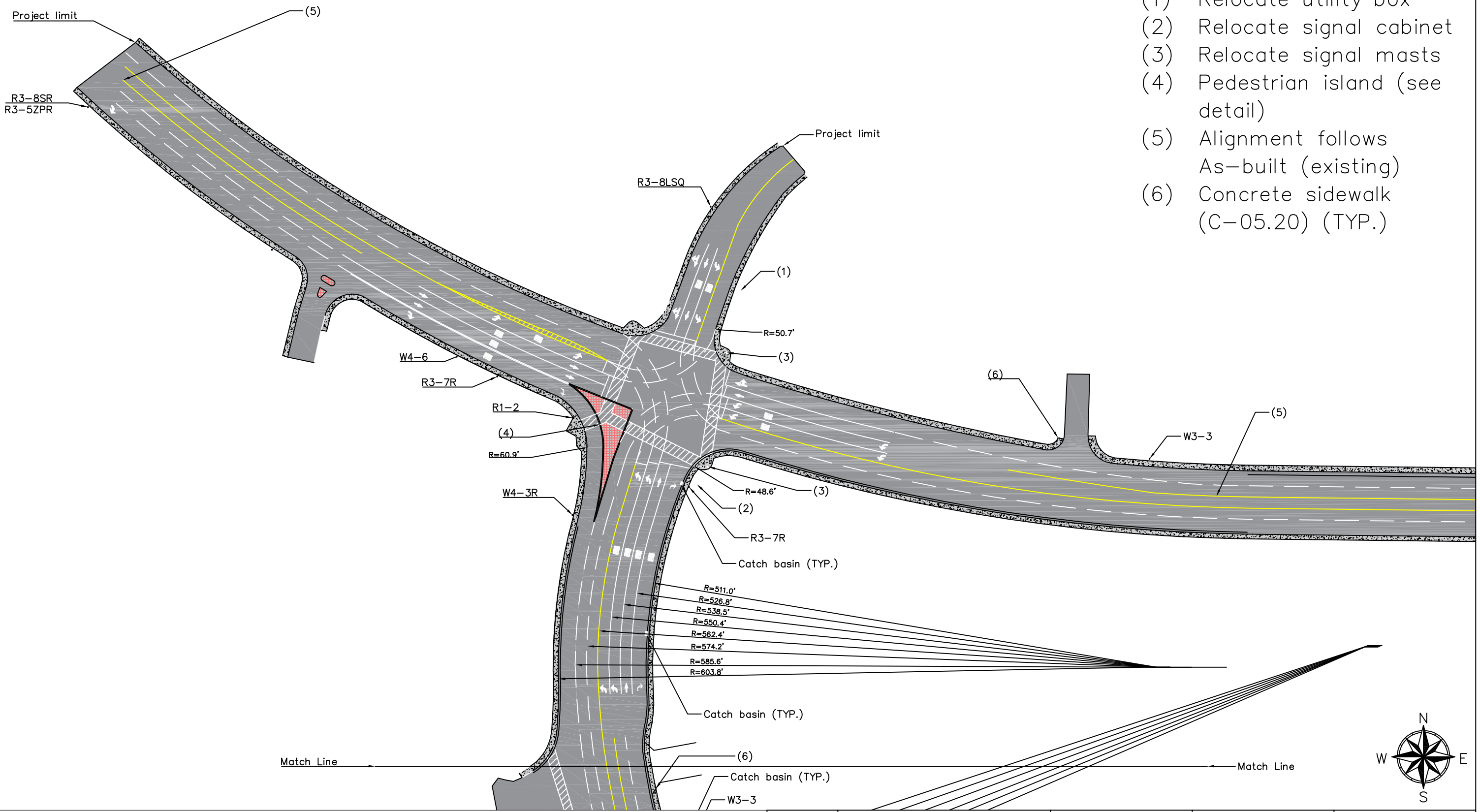
LAB:DEPICT EGR GRP		DUE:4/8/21	0 50’ 100’ 200’ SCALE: 1” = 200’	
		REVISION:2		PAGE:1 OF:1

CONSTRUCTION NOTES

(1) Relocate utility box
(2) Relocate signal cabinet
(3) Relocate signal masts
(4) Pedestrian island (see detail)
(5) Alignment follows As–built (existing)
(6) Concrete sidewalk (C–05.20) (TYP.)



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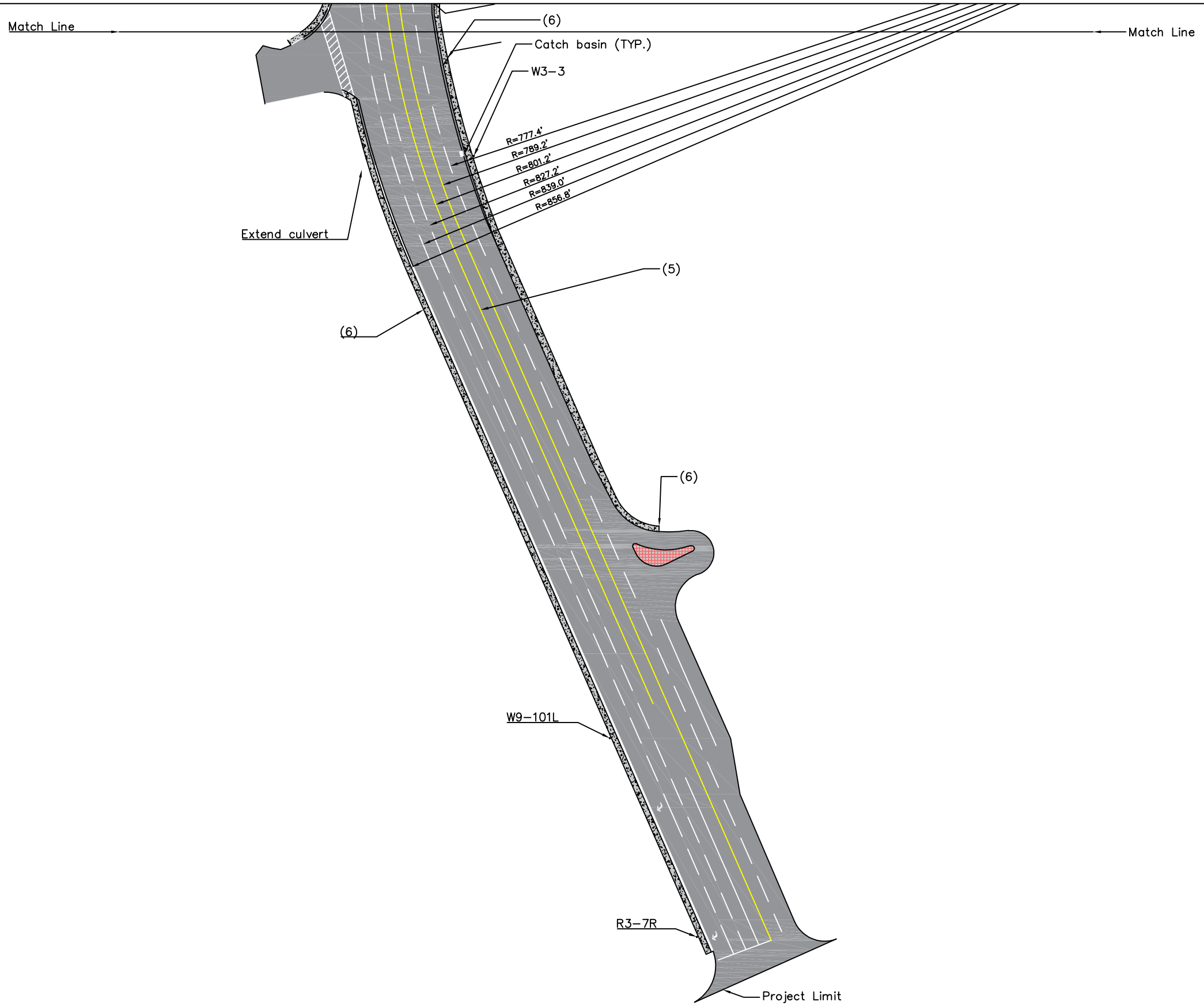
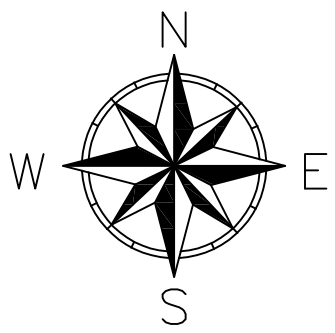
	REVISION:5		



CONSTRUCTION NOTES

(1) Relocate utility box
(2) Relocate signal cabinet
(3) Relocate signal masts
(4) Pedestrian island (see detail)
(5) Alignment follows As-built (existing)
(6) Concrete sidewalk (C-05.20) (TYP.)



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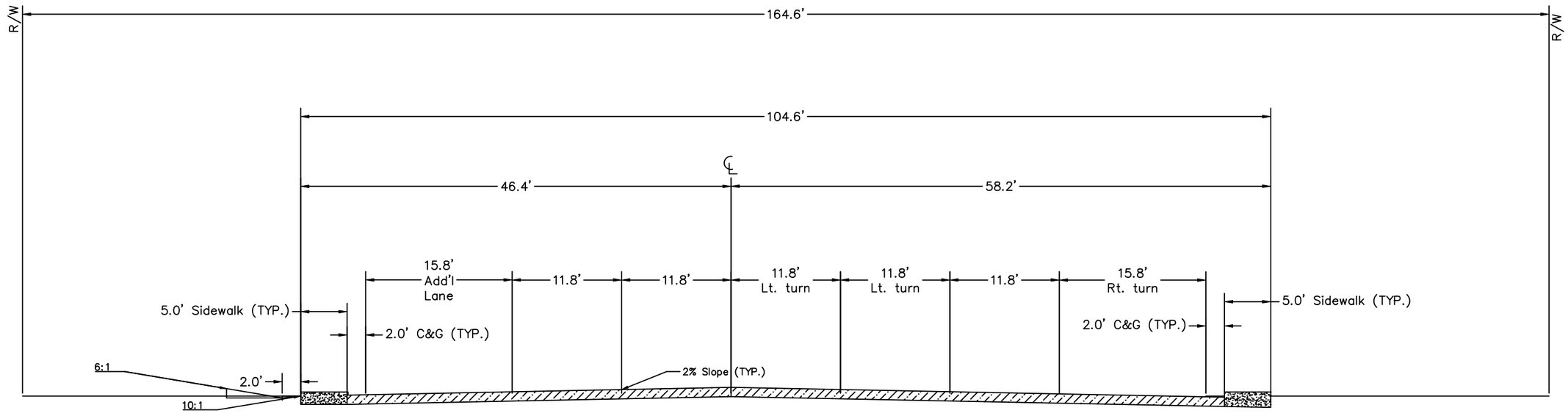
Cross-section

SR 260 at SR 89A



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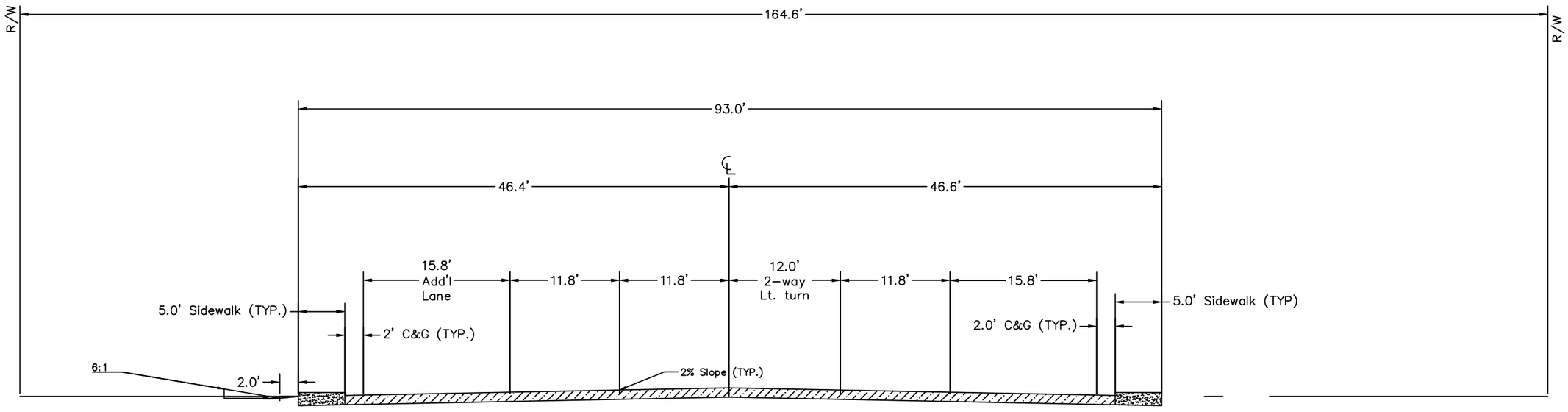
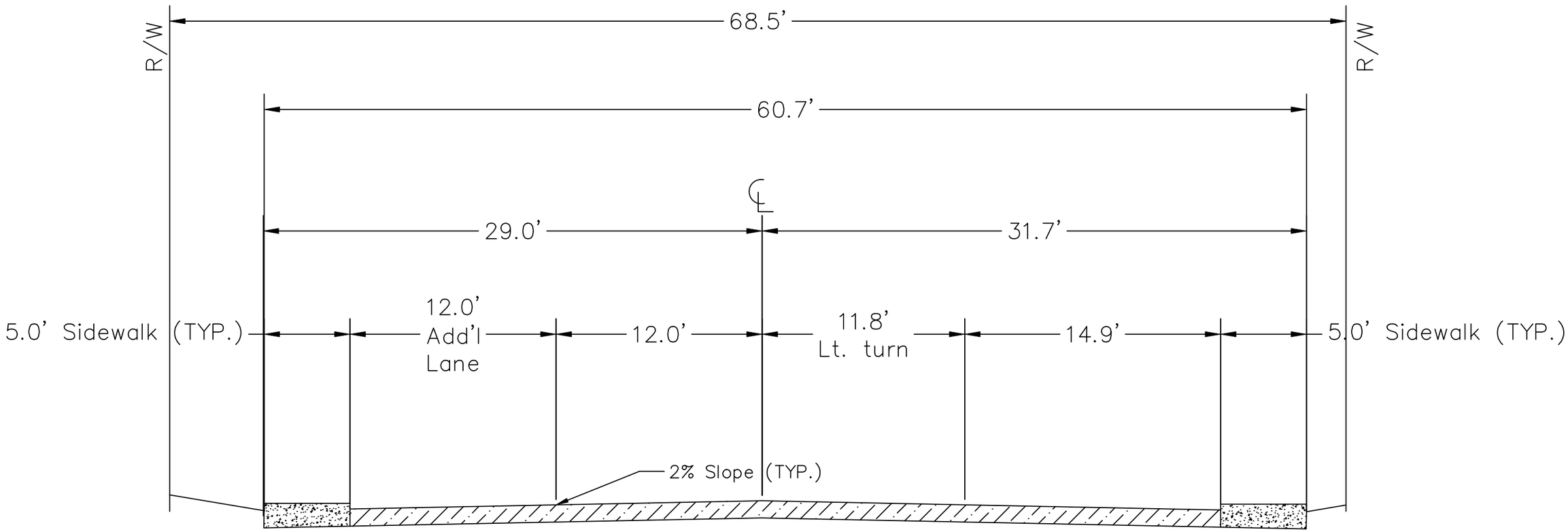
LAB:DEPICT EGR GRP		DUE:4/8/21	0 3' 6' 12' SCALE: 1" = 12'	
		REVISION:2		PAGE:1 OF:3

Cross-section
SR 260 at Oak Wash



PROJECT: ADOT SR 260/SR 89A REDESIGN	DATE: 4/5/21	BY: K. ROECKNER	DRAWING: CROSS SECTION
LAB: DEPICT EGR GRP	DUE: 4/8/21	0 3' 6' 12' SCALE: 1" = 12'	
	REVISION: 2		PAGE: 2 OF: 3

Cross-section
Cove Pkwy at SR 89A



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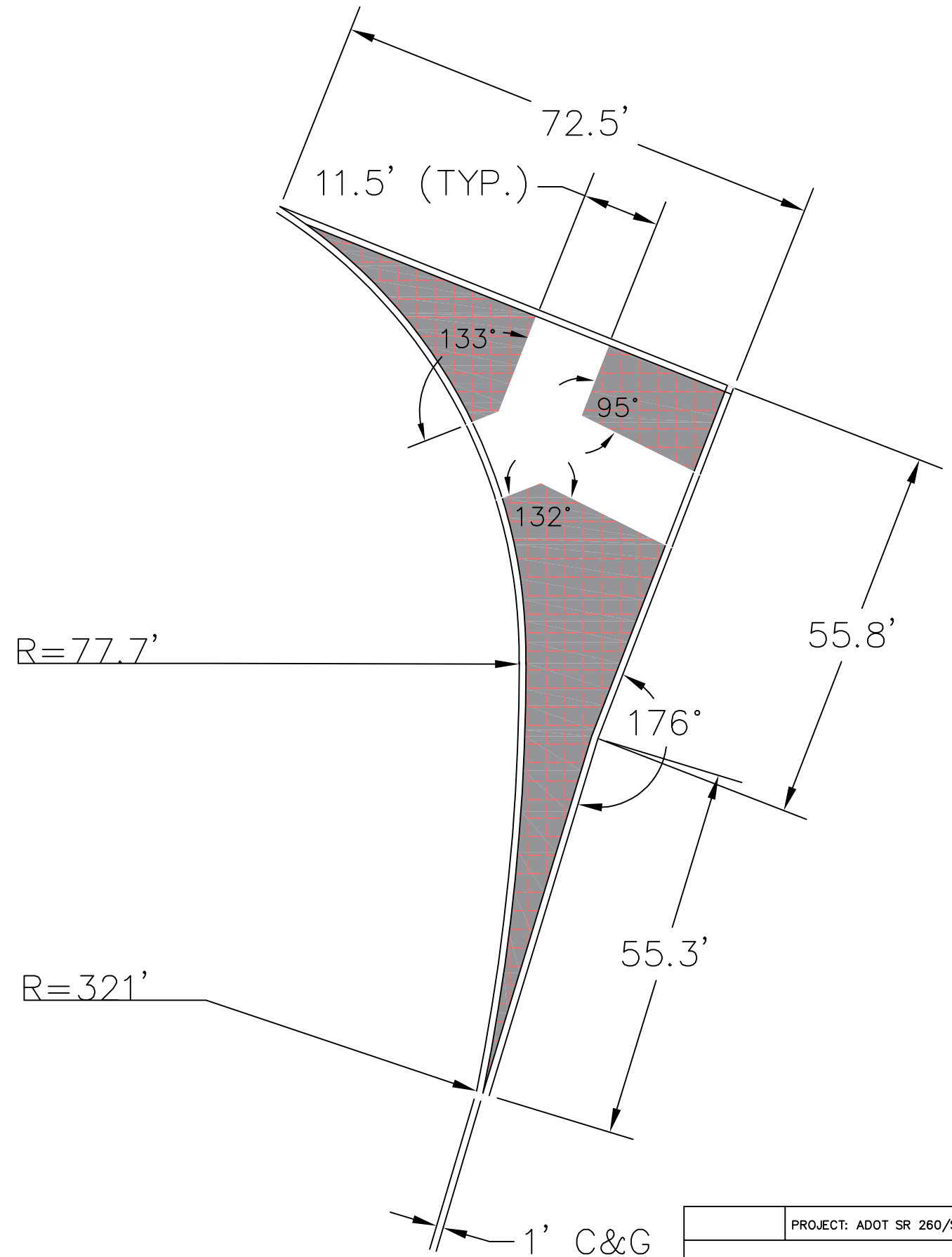
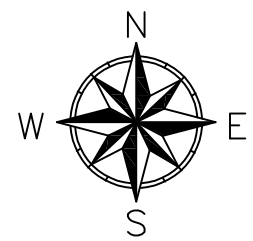
		REVISION:2		PAGE:3 OF:3





	PROJECT: ADOT SR 260/SR 89A REDESIGN	DATE:4/7/21	BY:K. ROECKNER	DRAWING:
LAB:DEPICT EGR GRP		DUE:4/8/21	0 5’ 10’ 20’ SCALE: 1” = 20’	PED ISLAND
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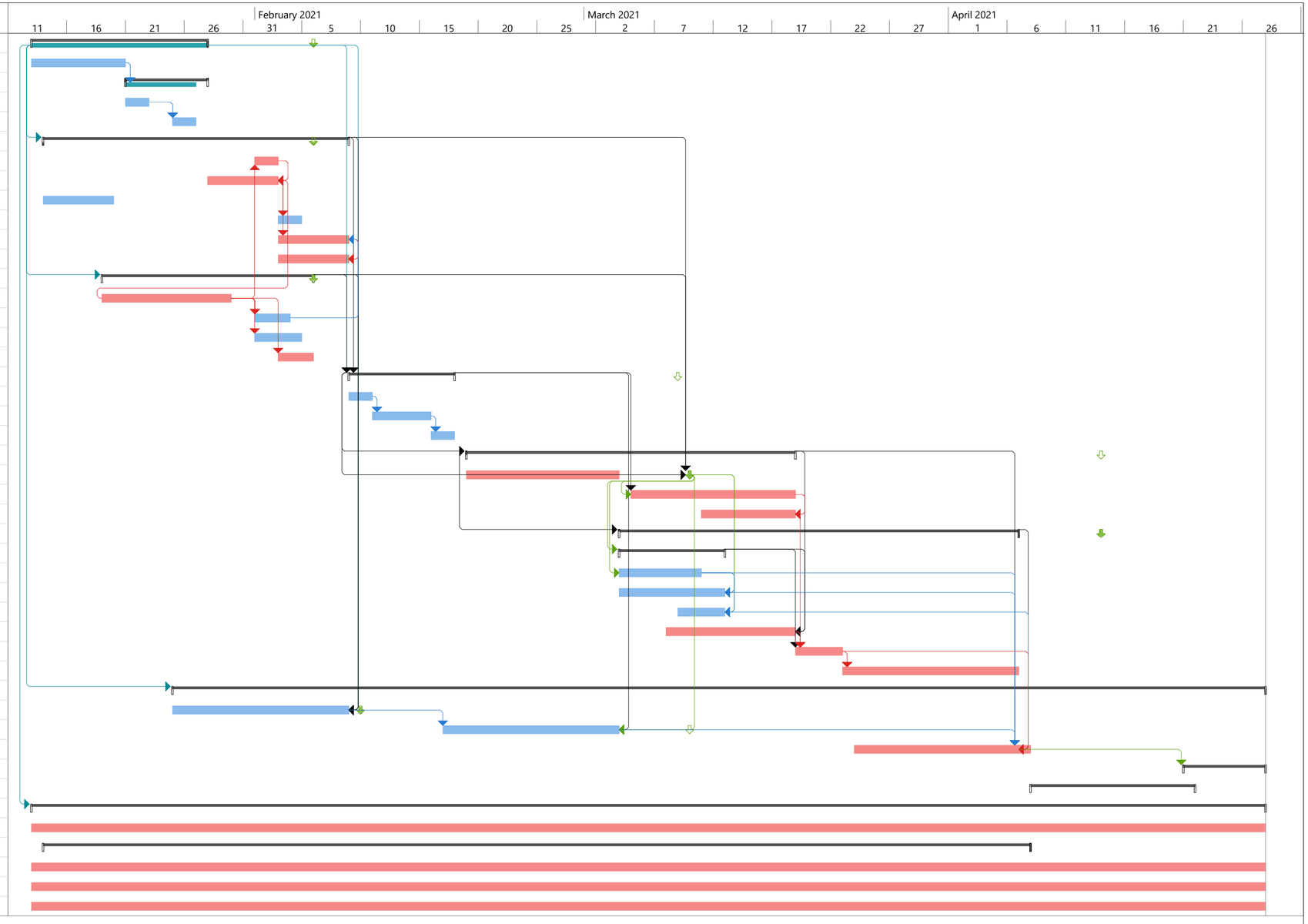
Appendix F: Proposal vs. Actual Schedule

This appendix contains the Gantt charts from the final proposal and final report. Due to the large size of the Gantt charts, they begin on the next page.

Appendix F-1: Proposal Schedule

ID	Task Name	Duration	Start	Finish
1	**Task 1.0: Research and Regulatory Considerations**	**10 days**	**Wed 1/13/21**	**Wed 1/27/21**
2	Task 1.1: Review Past Solutions	5 days	Wed 1/13/21	Wed 1/20/21
3	**Task 1.2: Regulatory Considerations**	**5 days**	**Thu 1/21/21**	**Wed 1/27/21**
4	Task 1.2.1: FHWA	2 days	Thu 1/21/21	Fri 1/22/21
5	Task 1.2.2: ADOT	2 days	Mon 1/25/21	Tue 1/26/21
6	**Task 2.0: Site Investigation**	**17 days**	**Thu 1/14/21**	**Mon 2/8/21**
7	Task 2.1: Surveying and Soil Data	2 days	Mon 2/1/21	Tue 2/2/21
8	Task 2.2: Existing Geometry	4 days	Thu 1/28/21	Tue 2/2/21
9	Task 2.3: Identify Contributing Intersections	3 days	Thu 1/14/21	Tue 1/19/21
10	Task 2.4: Lane Configurations	2 days	Wed 2/3/21	Thu 2/4/21
11	Task 2.5: Site Restrictions	4 days	Wed 2/3/21	Mon 2/8/21
12	Task 2.6: Investigate Proposed Developments	4 days	Wed 2/3/21	Mon 2/8/21
13	**Task 3.0: Collection of Traffic Data from ADOT**	**14 days**	**Tue 1/19/21**	**Fri 2/5/21**
14	Task 3.1: Existing Plan Set	9 days	Tue 1/19/21	Fri 1/29/21
15	Task 3.2: Classification of Vehicles	3 days	Mon 2/1/21	Wed 2/3/21
16	Task 3.3: Five-Year Crash Data	4 days	Mon 2/1/21	Thu 2/4/21
17	Task 3.4: Signal Timing and Phasing	3 days	Wed 2/3/21	Fri 2/5/21
18	**Task 4.0: Traffic Counts**	**7 days**	**Tue 2/9/21**	**Wed 2/17/21**
19	Task 4.1: Field Safety Plan	2 days	Tue 2/9/21	Wed 2/10/21
20	Task 4.2: Peak Hour Volumes	3 days	Thu 2/11/21	Mon 2/15/21
21	Task 4.3: Upload Data	2 days	Tue 2/16/21	Wed 2/17/21
22	**Task 5.0: Traffic Analysis**	**20 days**	**Fri 2/19/21**	**Thu 3/18/21**
23	Task 5.1: Base Model Creation and Calibration	9 days	Fri 2/19/21	Thu 3/4/21
24	Task 5.2: VISSIM Analysis of Base Conditions	10 days	Fri 3/5/21	Thu 3/18/21
25	Task 5.3: 20-Year Projection	6 days	Thu 3/11/21	Thu 3/18/21
26	**Task 6.0: Alternatives and Evaluation of Impacts**	**24 days**	**Thu 3/4/21**	**Tue 4/6/21**
27	**Task 6.1: Scoring System**	**7 days**	**Thu 3/4/21**	**Fri 3/12/21**
28	Task 6.1.1: Design Criteria	5 days	Thu 3/4/21	Wed 3/10/21
29	Task 6.1.2: Construction Considerations	7 days	Thu 3/4/21	Fri 3/12/21
30	Task 6.1.3: Evaluation of Impacts	4 days	Tue 3/9/21	Fri 3/12/21
31	Task 6.2: Generate and Analyze Alternatives	9 days	Mon 3/8/21	Thu 3/18/21
32	Task 6.3: Scoring, Selection of Final Alternative	2 days	Fri 3/19/21	Mon 3/22/21
33	Task 6.4: Preliminary and Final Design Plan Sets	11 days	Tue 3/23/21	Tue 4/6/21
34	**Task 7.0: Project Deliverables**	**67 days**	**Mon 1/25/21**	**Tue 4/27/21**
35	Task 7.1: 30% Report and Presentation	11 days	Mon 1/25/21	Mon 2/8/21
36	Task 7.2: 60% Report and Presentation	11 days	Wed 2/17/21	Thu 3/4/21
37	Task 7.3: 90% Report	11 days	Wed 3/24/21	Thu 4/8/21
38	**Task 7.4: Final Report and Presentation**	**5 days**	**Wed 4/21/21**	**Tue 4/27/21**
41	**Task 7.5: Website**	**10 days**	**Thu 4/8/21**	**Wed 4/21/21**
44	**Task 8.0: Project Management**	**74 days**	**Wed 1/13/21**	**Tue 4/27/21**
45	Task 8.1: Resource Management	74 days	Wed 1/13/21	Tue 4/27/21
46	**Task 8.2: Client and TA Meetings**	**59 days**	**Thu 1/14/21**	**Thu 4/8/21**
54	Task 8.3: GI Meetings	74 days	Wed 1/13/21	Tue 4/27/21
55	Task 8.4: Team Meetings	74 days	Wed 1/13/21	Tue 4/27/21
56	Task 8.5: Schedule Management	74 days	Wed 1/13/21	Tue 4/27/21

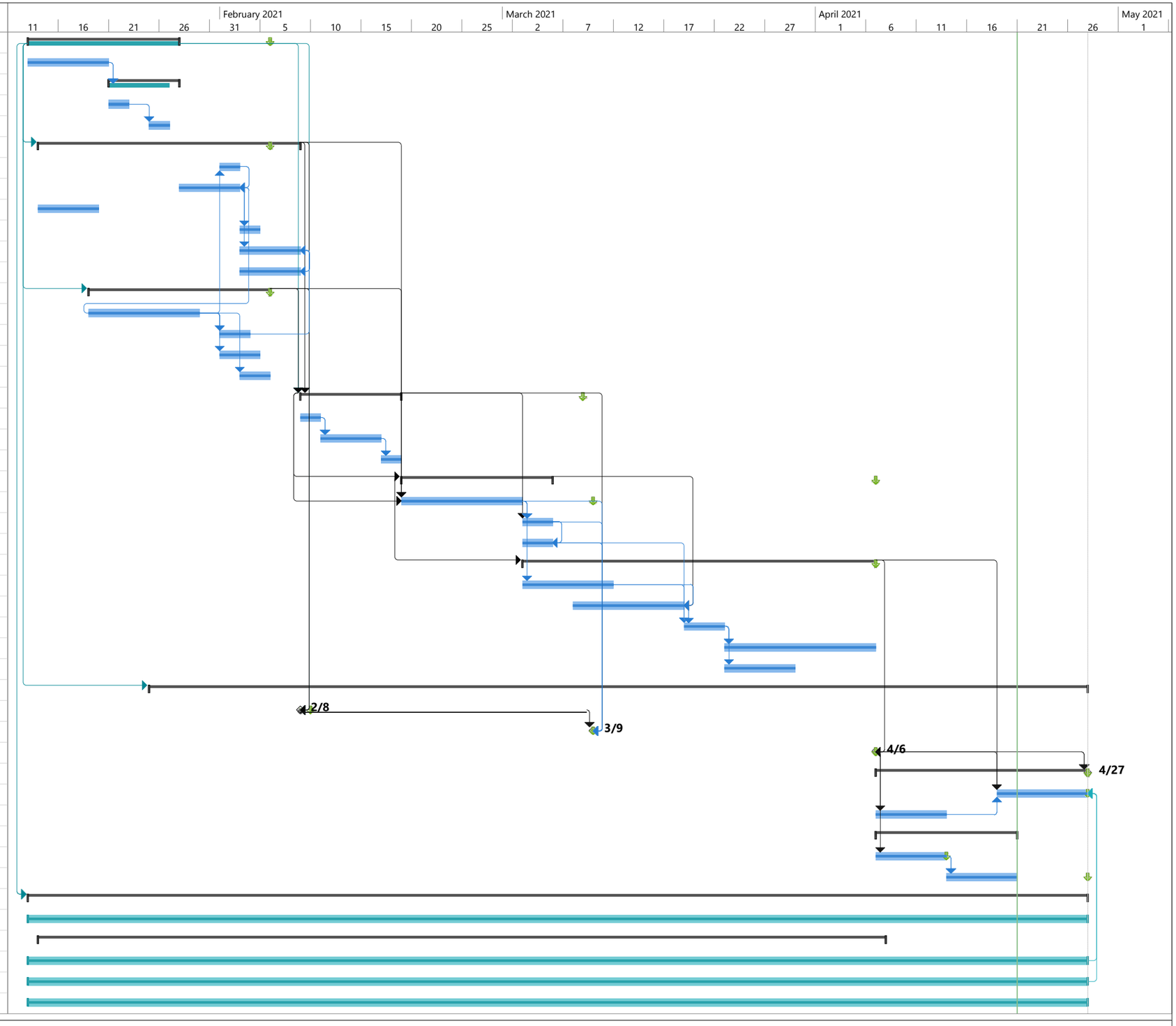


Project: CENE 476 Schedule
Date: Thu 11/12/20

Task	Summary	Inactive Milestone	Duration-only	Start-only	External Milestone	Critical Split
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline	Progress
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Critical	Manual Progress

Appendix F-2: Actual Schedule

ID	Task Name	Duration	Start	Finish
1	**Task 1.0: Research and Regulatory Considerations**	**10 days**	**Wed 1/13/21**	**Wed 1/27/21**
2	Task 1.1: Review Past Solutions	5 days	Wed 1/13/21	Wed 1/20/21
3	**Task 1.2: Regulatory Considerations**	**5 days**	**Thu 1/21/21**	**Wed 1/27/21**
4	Task 1.2.1: FHWA	2 days	Thu 1/21/21	Fri 1/22/21
5	Task 1.2.2: ADOT	2 days	Mon 1/25/21	Tue 1/26/21
6	**Task 2.0: Site Investigation**	**17 days**	**Thu 1/14/21**	**Mon 2/8/21**
7	Task 2.1: Surveying and Soil Data	2 days	Mon 2/1/21	Tue 2/2/21
8	Task 2.2: Existing Geometry	4 days	Thu 1/28/21	Tue 2/2/21
9	Task 2.3: Identify Contributing Intersections	3 days	Thu 1/14/21	Tue 1/19/21
10	Task 2.4: Lane Configurations	2 days	Wed 2/3/21	Thu 2/4/21
11	Task 2.5: Site Restrictions	4 days	Wed 2/3/21	Mon 2/8/21
12	Task 2.6: Investigate Proposed Developments	4 days	Wed 2/3/21	Mon 2/8/21
13	**Task 3.0: Collection of Traffic Data from ADOT**	**14 days**	**Tue 1/19/21**	**Fri 2/5/21**
14	Task 3.1: Existing Plan Set	9 days	Tue 1/19/21	Fri 1/29/21
15	Task 3.2: Classification of Vehicles	3 days	Mon 2/1/21	Wed 2/3/21
16	Task 3.3: Five-Year Crash Data	4 days	Mon 2/1/21	Thu 2/4/21
17	Task 3.4: Signal Timing and Phasing	3 days	Wed 2/3/21	Fri 2/5/21
18	**Task 4.0: Traffic Counts**	**8 days**	**Tue 2/9/21**	**Thu 2/18/21**
19	~~*Task removed*~~	2 days	Tue 2/9/21	Wed 2/10/21
20	Task 4.2: Peak Hour Volumes	4 days	Thu 2/11/21	Tue 2/16/21
21	~~*Task removed*~~	2 days	Wed 2/17/21	Thu 2/18/21
22	**Task 5.0: Traffic Analysis**	**11 days**	**Fri 2/19/21**	**Fri 3/5/21**
23	Task 5.1: Base Model Creation and Calibration	8 days	Fri 2/19/21	Tue 3/2/21
24	Task 5.2: VISSIM Analysis of Base Conditions	3 days	Wed 3/3/21	Fri 3/5/21
25	Task 5.3: 20-Year Projection	3 days	Wed 3/3/21	Fri 3/5/21
26	**Task 6.0: Alternatives and Final Design**	**25 days**	**Wed 3/3/21**	**Tue 4/6/21**
27	Task 6.1: Scoring System Development	7 days	Wed 3/3/21	Thu 3/11/21
28	Task 6.2: Analyze Alternatives in VISSIM	9 days	Mon 3/8/21	Thu 3/18/21
29	Task 6.3: Score Alternatives, Select Final Design	2 days	Fri 3/19/21	Mon 3/22/21
30	Task 6.4: Final Design Plan Set	11 days	Tue 3/23/21	Tue 4/6/21
31	Task 6.5: Final Design Impacts Analysis	5 days	Tue 3/23/21	Mon 3/29/21
32	**Task 7.0: Project Deliverables**	**67 days**	**Mon 1/25/21**	**Tue 4/27/21**
33	Task 7.1: 30% Report and Presentation	11 days	Mon 1/25/21	Mon 2/8/21
34	Task 7.2: 60% Report and Presentation	11 days	Wed 2/17/21	Tue 3/9/21
35	Task 7.3: 90% Report	11 days	Tue 3/23/21	Tue 4/6/21
36	**Task 7.4: Final Report and Presentation**	**15 days**	**Wed 4/7/21**	**Tue 4/27/21**
37	Task 7.4.1: Final Report	7 days	Mon 4/19/21	Tue 4/27/21
38	Task 7.4.2: UGRADS Presentation	5 days	Wed 4/7/21	Tue 4/13/21
39	**Task 7.5: Website**	**10 days**	**Wed 4/7/21**	**Tue 4/20/21**
40	Task 7.5.1: 90% Website	5 days	Wed 4/7/21	Tue 4/13/21
41	Task 7.5.2: Final Website	5 days	Wed 4/14/21	Tue 4/20/21
42	**Task 8.0: Project Management**	**74 days**	**Wed 1/13/21**	**Tue 4/27/21**
43	Task 8.1: Resource Management	74 days	Wed 1/13/21	Tue 4/27/21
44	**Task 8.2: Client and TA Meetings**	**59 days**	**Thu 1/14/21**	**Thu 4/8/21**
52	Task 8.3: GI Meetings	74 days	Wed 1/13/21	Tue 4/27/21
53	Task 8.4: Team Meetings	74 days	Wed 1/13/21	Tue 4/27/21
54	Task 8.5: Schedule Management	74 days	Wed 1/13/21	Tue 4/27/21



Project: CENE 486 Schedule
Date: Wed 4/26/21

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Critical, Critical Split, Progress, Manual Progress