Payson Area Traffic Operations Study

January 2021

Prepared for:

Arizona Department of Transportation
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1.0 INTRODUCTION

The purpose of this study is to improve traffic operations on State Routes 87 and 260 through the Town of Payson, Arizona, particularly during summer holiday periods. The Payson area is commonly subject to extremely high traffic volume on summer weekends, related in part to recreational traffic from the Phoenix metropolitan area. High traffic volume leads to long travel times and extended queues, which severely impact the ease and reliability of local trips.

The study's purpose also includes developing and evaluating improved traffic signal timing and evaluating traffic signal interconnectivity and coordination in the Payson area.

The study included the following tasks:

- Construction of models of the study area using Synchro software, which allows effective modeling of changes to the network's signal timing.
- Construction of models of the study area using VISSIM micro-simulation software, which allows effective evaluation of many types of traffic alternatives, including changes to lane geometry, signal operations, and other features.
- Identification of signal timing improvements that could be implemented.
- Identification of projects that could be implemented to improve traffic capacity in the network.
- Detailed analysis of a roundabout at the intersection of SR 87 and SR 260, including preparation of a footprint-level concept plan that incorporates a preferred lane configuration.

1.1 Study Area

The study area covers approximately milepost 250.9 to 253.3 on SR 87 and milepost 251.8 to 253.6 on SR 260. All the traffic signals on the state highways within these limits are included in the study area, as shown in Figure 1. The following traffic signals are included in the study:

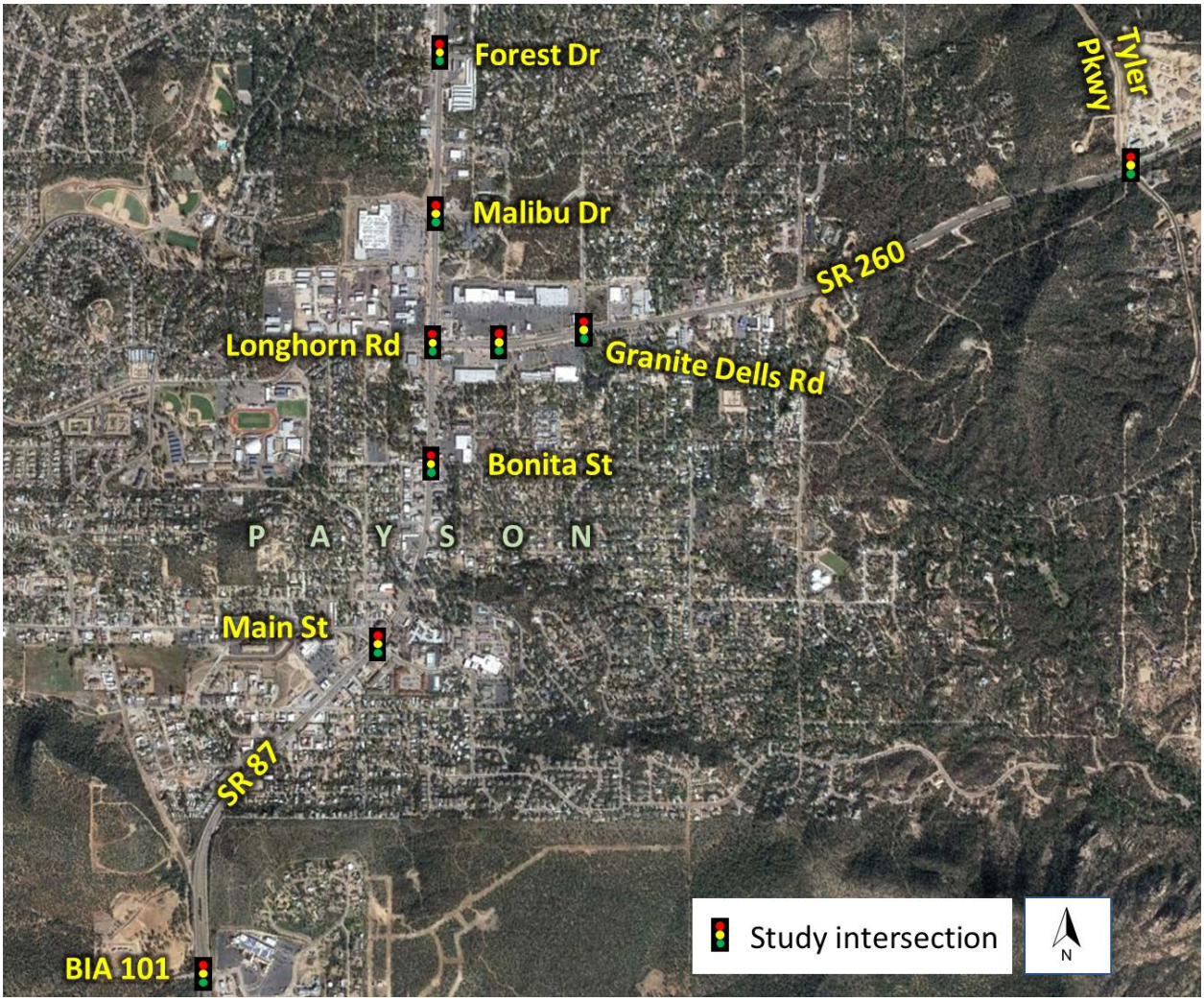
- SR 87 and SR 260/Longhorn Road
- SR 87 and Forest Drive
- SR 87 and Malibu Drive/Rumsey Drive
- SR 87 and Bonita Street
- SR 87 and Main Street
- SR 87 and BIA 101 (Casino)
- SR 260 and Payson Village Shopping Center
- SR 260 and Manzanita Drive/Granite Dells Road
- SR 260 and Tyler Parkway

1.2 Coordination

A technical advisory committee (TAC) was established to review and oversee the study. The TAC consisted of members of ADOT, the Town of Payson, and Lee Engineering staff. Following is a summary of TAC meetings held; minutes from each meeting are provided in Appendix A.

- February 19, 2019: Kickoff meeting, Payson
- July 9, 2019: Progress meeting, Payson
- August 13, 2019, Progress Meeting, Payson
- February 13, 2020: Progress Meeting, Payson

Figure 1: Study Area



2.0 DATA

Several sources of data were used for the study, including the following:

- ***Traffic Counts.*** Independent of the current study, ADOT collected turning movement count data at the study intersections over Labor Day weekend in 2017: August 31 through September 4.

- ***ARID Travel Time.*** Lee Engineering collected travel time data in the study area using Anonymous Re-identification (ARID) devices over Memorial Day weekend in 2019. Travel time data was collected on a holiday weekend in order to calibrate the VISSIM traffic simulation models. ARID devices detect the unique signatures of mobile electronic equipment, such as cellular telephones, when they pass by. Lee Engineering deployed six ARID devices throughout the network. When the same mobile equipment is detected at multiple sites, a travel time can be determined for that equipment. The ARID devices were able to collect many thousands of travel time pairs during the weekend, leading to a very good diurnal depiction of travel patterns.

However, it was determined that traffic patterns over Memorial Day 2019 were very different than conditions over Labor Day 2017, when traffic volumes were collected. In particular, anecdotal observations indicate that traffic volume was much lighter during the 2019 data collection period than in the 2017 data collection. It is hypothesized that unusually cool temperatures in the Phoenix area that weekend discouraged a considerable amount of traffic from traveling through Payson.

- ***INRIX Travel Time.*** In order to provide an additional travel time data source, ADOT provided travel time data from INRIX. INRIX uses Global-positioning System (GPS) data from travelers to generate travel time profiles for specific corridors. Historical travel time data is also available. As such, ADOT provided travel time data from INRIX that corresponded to the same weekend in 2017 when turning movement counts were collected.

- ***Calibration Data.*** Over Memorial Day 2019, Lee Engineering, via a subcontractor, also collected several data sources intended to assist with calibration of the microsimulation models:
    1. *Turning speed.* Lee Engineering deployed tube count devices to measure the speeds of vehicles making the right turn from northbound SR 87 to eastbound SR 260. This turn is channelized, but drivers frequently stop or yield at the departure of the turn because of a desire to make a left turn at a downstream intersection.
    2. *Queues.* Lee Engineering deployed video cameras near the intersection of SR 87 and SR 260 to measure queue lengths by time of day. The video data was manually reviewed according to a consistent protocol to determine queue lengths for movements approaching the intersection from the south and east.
    3. *Weaving behavior.* Video cameras were also used to capture driver weaving behavior on eastbound SR 260 between SR 87 and Manzanita Drive. The high-density retail land use in this area, combined with the high driveway density, encourages considerable movements to and from SR 260, and cameras were used to ensure that this behavior is reasonably captured by the VISSIM models.

- ***Supplemental Turning Movement Counts.*** ADOT's 2017 traffic count data were focused on holiday weekend periods, and the study team did not have access to traffic data collected during more conventional traffic periods. As such, the Memorial Day 2019 traffic data collection period included turning movement data on Thursday, May 30, three days after the Monday holiday and believed to represent more typical conditions. On May 30, data was collected and processed from 6:00 to 8:00 a.m., 11:00 a.m. to 1:00 p.m., and 4:00 to 6:00 p.m.

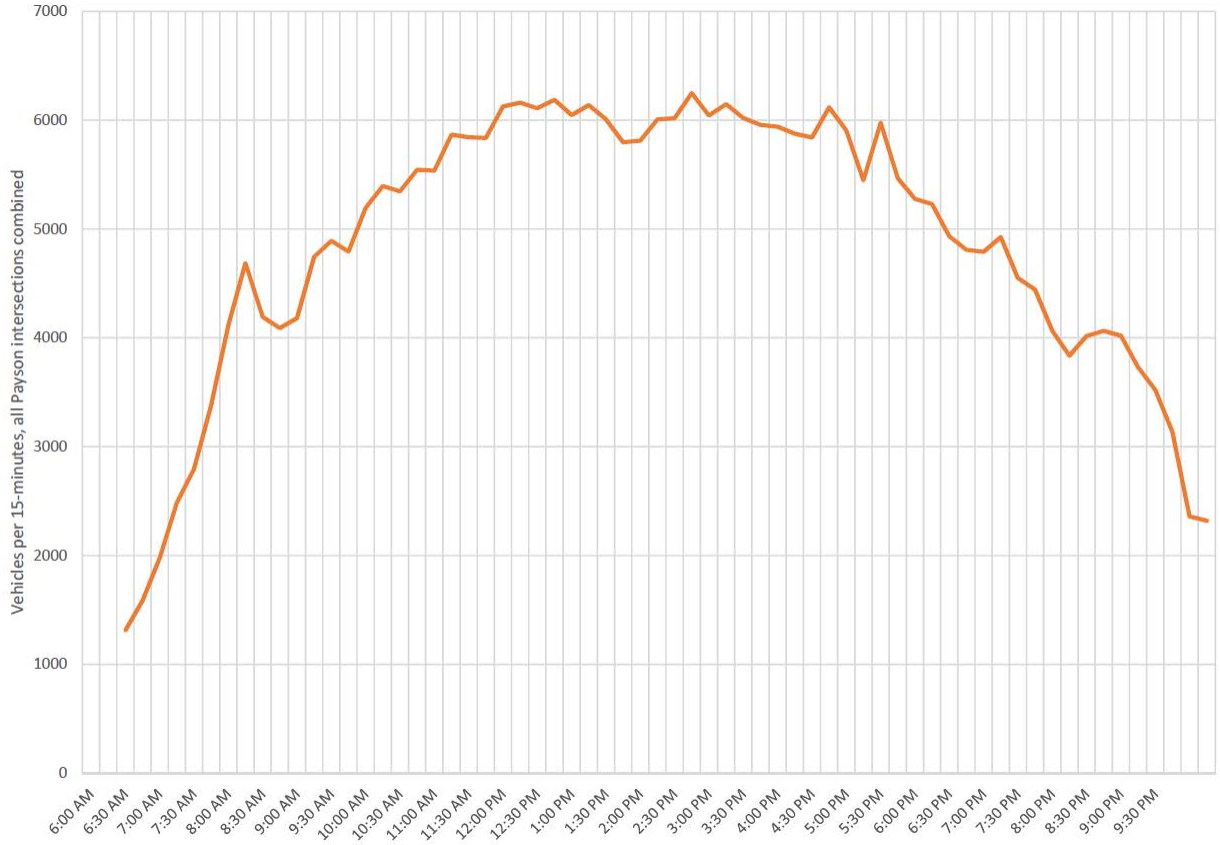
3.0 TRAFFIC MODEL CONSTRUCTION

3.1 Peak Hours

The peak hours during a holiday weekend in Payson are very different than a typical traffic study, which may have weekday morning and afternoon peak periods that correspond to traditional commuter traffic. Rather, in Payson, traffic volume reaches a relatively high plateau during the late morning and remains at a similar level for several hours before beginning to taper off in the afternoon. To illustrate this condition, Figure 2 and Figure 3 show the amount of traffic at all study intersections combined on the Friday and Sunday before Labor Day in 2017. On both days, only a

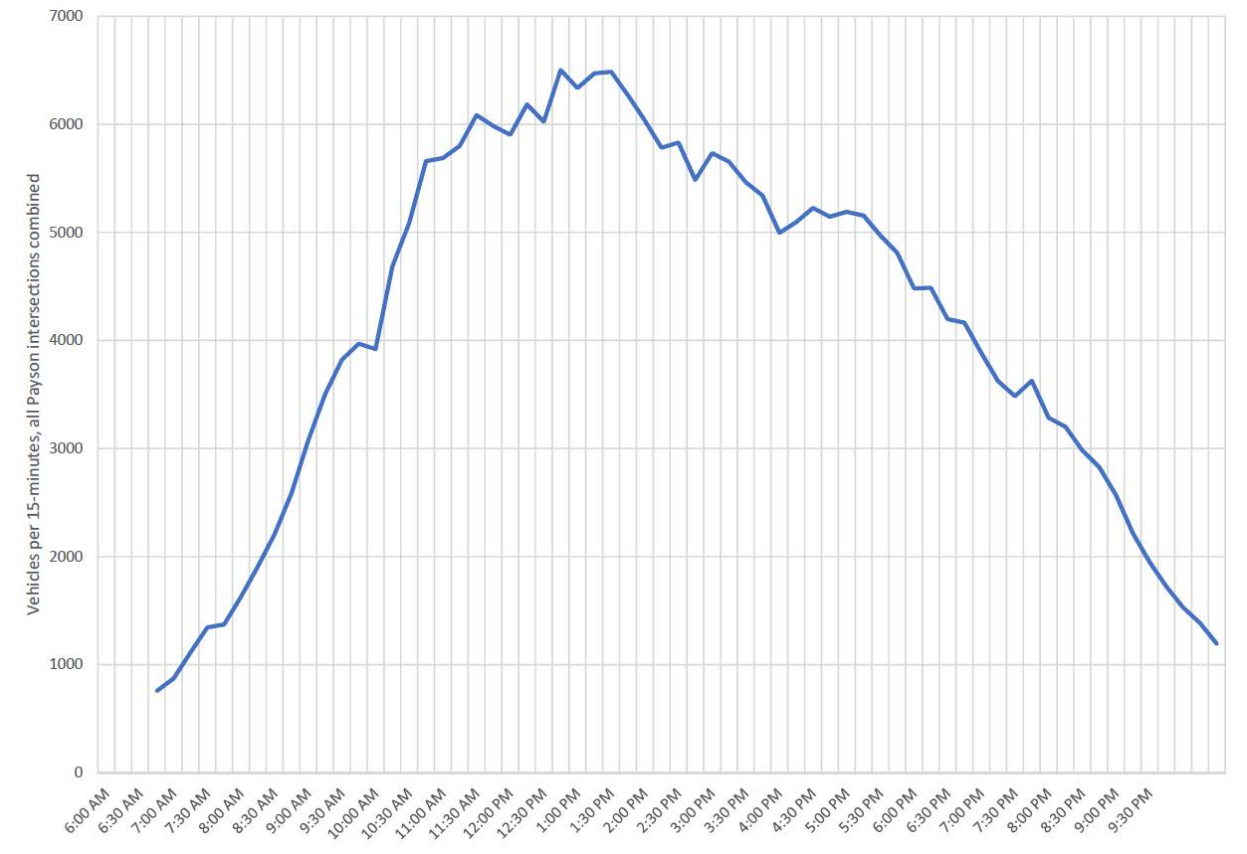
single midday peak is observed. On Friday, near-peak volumes are evident from about 11:00 a.m. to 5:00 p.m., and on Sunday, a peak lasts from about 11:00 a.m. to 2:00 p.m., with overall slightly higher volume demands than Friday.

Figure 2: Diurnal Traffic Pattern on Friday, September 1, 2017



The peak hour was determined for the intersection of SR 87 and SR 260, since it is in many ways the bottleneck of the network and is the key focus of analysis. This intersection experienced its highest 60-minute traffic demand on Friday between 11:30 a.m. and 12:30 p.m. and on Sunday between 12:00 and 1:00 p.m. However, the peak-hour volumes are very similar to time periods near the peak, as discussed. In addition, observations show that queues tend to be slightly longer just following the peak volume period.

Figure 3: Diurnal Traffic Pattern on Sunday, September 3, 2017



During the TAC meeting on July 9, 2019, the group reached consensus to model these highest-volume hours as part of the study. The group agreed that the highest-volume periods are appropriate to consider since they represent worst-case volume conditions for the microsimulation model. The group also acknowledged that queueing and travel time data from later in the afternoon can be considered as appropriate, recognizing that these measures may not peak at the same time as traffic volume.

Using data collected on Thursday, May 30, 2019, considered a typical weekday, it was determined that traffic volume in Payson on a weekday is also higher during the midday than either the morning or afternoon. On May 30, the morning peak hour was determined to be 7:00 to 8:00 a.m., when the study area intersections processed a total of about 11,800 vehicles. The afternoon peak hour, 4:15 to 5:15 p.m., experienced considerably more vehicles, about 18,000. However, neither of these peaks experienced as much traffic as the midday peak between 11:45 a.m. and 12:45 p.m., when the network processed nearly 21,500 vehicles. As such, the TAC determined that the study should evaluate typical weekday conditions from 11:45 a.m. to 12:45 p.m. in addition to the holiday peaks.

In summary, following are the three one-hour time periods evaluated in this study:

- Friday before a Monday holiday, 11:30 a.m. to 12:30 p.m.
- Sunday before a Monday holiday, 12:00 to 1:00 p.m.
- Typical weekday, 11:45 a.m. to 12:45 p.m.

3.2 Synchro Model Construction

Synchro models of the study area network were constructed for each of these three time periods, using existing signal timing plans provided by ADOT, actual roadway geometry collected in the field and using aerial photography, and traffic volumes provided by ADOT and collected as part of this study.

3.3 VISSIM Model Construction and Calibration

The three peak periods were modeled in VISSIM based on traffic counts collected during each time periods. The model construction relied on the following additional elements:

- Roadway geometry was entered in the models in the exact same configuration as in the field, using recent aerial photography supplemented by corridor video recordings made as a part of this study.
- The appropriate peak-hour volume was used as vehicle input into the three models.
- Vehicle routing decisions were created based on turning movement counts at each intersection. For minor movements such as entrances to driveways where traffic count data is not available, the routing decision is based on engineering judgment and trip attraction in a way to make it as similar as possible to the real world.
- For each intersection, signals and detectors were defined based on the actual signal layout and timing.
- Conflict areas were defined in the models to show the appropriate right of way wherever there are two conflicting movements.
- Reduced speed areas were applied in left- and right-turning movements to mimic typical driver turning behavior.

After creating the models using default VISSIM parameters, the simulations were run ten times each and the averages of the runs were used as a starting point to calibrate the VISSIM models. Calibration of a microsimulation model is an essential step to ensure that the model is sufficiently representative of real-world conditions. While VISSIM models are particularly detailed, they cannot include all the factors that influence the operational performance of a real-world network, including driver lane-change behavior, pass-by trips attracted to nearby businesses, and the influence of multiple driveways. The models were calibrated based on two factors: volume (vehicle throughput) and travel time.

The volumes output by the models were compared against the actual field volumes with the goal of a difference less than 10 percent. Likewise, travel time output by the models was compared to INRIX travel time data provided by ADOT for the exact dates of data collection over Labor Day 2017. The INRIX data allowed four travel-time segments to be created and used for comparison and calibration purposes. Two of the segments measure travel time eastbound and westbound on SR 260; an additional two segments measure travel time northbound and southbound on SR 87. Start and end points of the segments were coded in the VISSIM models to precisely match the limits of the INRIX segments, to provide an accurate comparison of travel time data from both sources.

The congested nature of the study-area network caused difficulties in accurately calibrating VISSIM travel times. The following steps were taken to adjust the VISSIM and INRIX data to improve the ability to calibrate travel time between models and INRIX data:

- INRIX data was found to include several "outliers" that are not representative of typical travel time conditions. These outliers were eliminated and new travel time averages were computed based on more typical traffic conditions.

- In a highly congested network, it is difficult to achieve travel times in which the *average* travel time in the model is within a certain range of the *average* INRIX travel time. During a meeting on February 13, 2020, the TAC agreed that rather than using the average INRIX travel time as a basis for comparison, it is acceptable to use a range of travel times, for instance, a range from the 25th percentile to the 75th percentile. When the average VISSIM travel time is within this range of INRIX travel times, the model can be considered calibrated.

The initial runs of the uncalibrated models were not sufficiently representative of field conditions, so several steps were taken to improve the operations, as follows:

- At congested intersections, priority rules were defined to prevent vehicles from getting stuck in an intersection. Congestion sometimes causes a queue to develop immediately downstream of an intersection, such that vehicles entering the intersection cannot move through it fully. Where this occurs, priority rules were used to cause entering vehicles wait before entering the intersection until there is enough space for them downstream.

- Vehicle routing decisions for the Sunday model along SR 260 westbound were modified slightly when compared with the Thursday and Friday models because of heavy congestion for the left turn from westbound SR 260 to southbound SR 87. To accommodate the long queue of vehicles making a left turn, a "super left turn" routing decision was defined from the beginning of the westbound corridor, which helped form the queue in the model the same as in the real scenario.

- The VISSIM models were modified to include right-turn movements into and out of certain driveways along the corridor, to better mimic the slowing that occurs when vehicles leave the mainline.

- VISSIM driver parameters were adjusted as needed to improve the match between field and models.

Following the calibration adjustments, the models were determined to be sufficiently calibrated to proceed with analysis of the alternatives. The calibrated models of existing conditions were delivered to ADOT on February 25, 2020, and ADOT accepted the calibrated models on March 2, 2020, after a review by TAC members.

Table 1 shows the results of the traffic volume comparisons between the field and calibrated VISSIM models; Table 2 shows results of the travel time comparisons.

Table 1: Peak Hour Calibration Volume Comparisons

A: Weekday (Thursday) Peak Hour (5/30/2019)

Node #	Intersection Name	Movement	Vissim Volume 2	Actual Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	662	7	1%
		SBT	576	571	-5	-1%
2	SR 87 & Main St	NBT	937	939	2	0%
		SBT	821	843	22	3%
3	SR 87 & Bonita St	NBT	1214	1242	28	2%
		SBT	1080	1100	20	2%
4	SR 87 & SR 260	NBT	687	703	16	2%
		NBR	649	678	29	4%
		NBL	60	62	2	3%
		SBT	597	628	31	5%
		SBR	117	122	5	4%
		SBL	219	221	2	1%
		EBT	194	191	-3	-2%
		EBR	74	76	2	3%
		EBL	156	161	5	3%
		WBT	182	179	-3	-2%
		WBR	262	253	-9	-4%
		WBL	605	589	-16	-3%
5	SR 87 & Malibu Dr	NBT	811	819	8	1%
		SBT	801	814	13	2%
6	SR 87 & Forest Dr	NBT	703	726	23	3%
		SBT	767	764	-3	0%
7	SR 260 & Payson Village Access	EBT	846	867	21	2%
		WBT	745	744	-1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	750	775	25	3%
		WBT	680	677	-3	0%
9	SR 260 & Tyler Pkwy	EBT	742	744	2	0%
		WBT	619	625	6	1%
Total			16549	16775		1%

B: Friday Peak Hour (9/1/2017)

Node #	Intersection Name	Movement	Vissim Volume	Actual Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1086	1093	7	1%
		SBT	514	487	-27	-6%
2	SR 87 & Main St	NBT	1236	1253	17	1%
		SBT	755	723	-32	-4%
3	SR 87 & Bonita St	NBT	1371	1392	21	2%
		SBT	1061	1010	-51	-5%
4	SR 87 & SR 260	NBT	728	701	-27	-4%
		NBR	774	768	-6	-1%
		NBL	53	52	-1	-2%
		SBT	494	502	8	2%
		SBR	157	169	12	7%
		SBL	268	273	5	2%
		EBT	312	315	3	1%
		EBR	87	83	-4	-5%
		EBL	269	275	6	2%
		WBT	214	223	9	4%
		WBR	296	311	15	5%
		WBL	623	608	-15	-2%
5	SR 87 & Malibu Dr	NBT	863	864	1	0%
		SBT	747	749	2	0%
6	SR 87 & Forest Dr	NBT	760	825	65	8%
		SBT	693	688	-5	-1%
7	SR 260 & Payson Village Access	EBT	1131	1140	9	1%
		WBT	761	763	2	0%
8	SR 260 & Manzanita/Granite Dells	EBT	995	1002	7	1%
		WBT	639	639	0	0%
9	SR 260 & Tyler Pkwy	EBT	1169	1166	-3	0%
		WBT	643	653	10	2%
	Total		18699	18727		**0%**

C: Sunday Peak Hour (9/3/2017)

Node #	Intersection Name	Movement	Vissim Volume	Actual Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	762	11	1%
		SBT	1173	1152	-21	-2%
2	SR 87 & Main St	NBT	968	988	20	2%
		SBT	1479	1460	-19	-1%
3	SR 87 & Bonita St	NBT	1142	1168	26	2%
		SBT	1638	1615	-23	-1%
4	SR 87 & SR 260	NBT	713	695	-18	-3%
		NBR	506	509	3	1%
		NBL	36	40	4	10%
		SBT	756	728	-28	-4%
		SBR	142	138	-4	-3%
		SBL	346	324	-22	-7%
		EBT	140	137	-3	-2%
		EBR	61	63	2	3%
		EBL	163	165	2	1%
		WBT	138	149	11	7%
		WBR	270	276	6	2%
		WBL	934	923	-11	-1%
5	SR 87 & Malibu Dr	NBT	922	913	-9	-1%
		SBT	1029	1035	6	1%
6	SR 87 & Forest Dr	NBT	811	876	65	7%
		SBT	1063	1075	12	1%
7	SR 260 & Payson Village Access	EBT	853	829	-24	-3%
		WBT	1103	1128	25	2%
8	SR 260 & Manzanita/Granite Dells	EBT	755	725	-30	-4%
		WBT	1050	1068	18	2%
9	SR 260 & Tyler Pkwy	EBT	827	807	-20	-2%
		WBT	1119	1128	9	1%
	Total		20888	20876		**0%**

Table 2: Peak-Hour Calibration Travel Time Comparisons

Travel Time Comparison - Thursday (05/30/2019)

		Travel Time (sec)					
Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	INRIX	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	280.6	302.2	267.0	209.9	70.7	34%
Southbound SR 87 from SR 260	1.2	202.0	210.1	195.5	144.9	57.1	39%
Westbound SR 260 approach to SR 87	1.2	190.9	197.8	185.4	123.6	67.3	54%
Eastbound SR 260 from SR 87	1.2	165.83	168.30	162.06	138.2	27.7	20%

Travel Time Comparison - Friday (09/01/2017)

		Travel Time (sec)					
Route	Segment Length	VISSIM(ave)	VISSIM (Max)	VISSIM (Min)	INRIX	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	280.6	302.2	267.0	370.5	-89.9	-24%
Southbound SR 87 from SR 260	1.2	202.0	210.1	195.5	171.0	31.0	18%
Westbound SR 260 approach to SR 87	1.2	190.9	197.8	185.4	252.2	-61.3	-24%
Eastbound SR 260 from SR 87	1.2	165.8	168.3	162.1	182.4	-16.6	-9%

Travel Time Comparison - Sunday (09/03/2017)

		Travel Time (sec)					
Route	Segment Length	VISSIM(ave)	VISSIM (Max)	VISSIM (Min)	INRIX	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	235.8	248.6	225.3	198.2	37.6	19%
Southbound SR 87 from SR 260	1.2	157.8	164.2	152.0	193.4	-35.6	-18%
Westbound SR 260 approach to SR 87	1.2	290.3	448.6	249.3	200.0	90.4	45%
Eastbound SR 260 from SR 87	1.2	205.9	216.0	196.9	140.9	65.0	46%

4.0 ALTERNATIVES

In conjunction with the TAC, Lee Engineering proposed several alternatives for potential evaluation. Some of these alternatives selected for evaluation by the TAC, and others were rejected.

Alternatives considered for Phase 1 are those that can be implemented in a short time with minimal need for construction. Alternatives considered for Phase 2 are considered "medium-term" projects that require larger cost and construction effort. No truly "long-term" alternatives, such as a bypass roadway around Payson, were considered.

4.1 Alternatives Evaluated

The following alternatives were evaluated:

- Phase 1

    1. Signal retiming/coordination/interconnectivity

- Phase 2 (All of these options also include signal timing/coordination changes):

    2. Modify the median on northbound SR 87 approaching SR 260 to lengthen the northbound left-turn lane. (All subsequent alternatives also include this change.)

    3. Lengthen the existing northbound right-turn lane from approx. 430 feet to approx. 750 feet.

    4. Modify the northbound lane configuration to allow right turns from the right-most through lane. (Right turns would be made from both sides of the porkchop.)

    5. Widen the northbound approach to provide a second right-turn lane. No additional eastbound receiving lanes. Configured with one right-turn lane on each side of the (modified) porkchop.

    6. Convert the existing westbound right turn to free operation by adding a northbound receiving lane north of the intersection. Drop the lane as a right-turn lane at the driveway about 750 feet north of SR 260 (behind the shopping center on the northeast corner).

    7. Install a roundabout at SR 87 and SR 260. (See Section 5.0 for more information on this alternative.)

    8. At the Payson Village Shopping Center signal (first signal east of SR 87 on SR 260), convert outbound movements to right-turn only both northbound and southbound. (This would eliminate one signal phase for improved efficiency.)

    9. This alternative includes the following elements:
        - On eastbound Rumsey Drive approaching SR 87, restripe the approach for three lanes instead of the existing two. The third lane would be formed by

eliminating one of the westbound lanes for a short segment. The three lanes would be allocated one each for lefts, throughs, and rights.
    - On eastbound Main Street approaching SR 87, restripe the approach for three lanes instead of the existing two, in the same manner as the bullet above.

Results of the analysis of these alternatives are presented in Section 6.0 of this document.

4.2 Alternatives Considered and Eliminated

The following alternative was considered and eliminated:

- At SR 87 and SR 260, eliminate eastbound and westbound through movements. This alternative would serve pedestrians on the south leg with southbound or eastbound left turns and would serve pedestrians on the north leg with westbound left turns. The eastbound and westbound through lanes would be converted to right-turn lanes.

This alternative was rejected after consultation with the TAC because it was considered too disruptive to local trips. While it was agreed that the alternative is likely to significantly benefit holiday weekend delays and queuing, its disadvantages to local travelers would be experienced all day, every day, not just during holidays.

Several roundabout configurations were also considered and rejected before selecting a recommended roundabout alternative, discussed further in the next section.

4.3 Alternatives for Further Consideration

4.3.1 Alternative 10: Northbound Right-Turn Lane

Independent of this study, ADOT conducted Synchro analysis of an alternative that would provide a second northbound right-turn lane from SR 87 to SR 260 and a receiving lane for this turn lane that would extend along eastbound SR 260 as a fourth travel lane, dropping as a right-turn lane at the Manzanita Drive traffic signal. A third lane would extend further east, to the Giant Gas Station, about 3,590 feet east of the SR 87 intersection. In this study, this alternative is labeled "Alternative 10."

While Alternative 10 was not selected by the TAC for VISSIM evaluation in this study, a Synchro analysis was conducted; the results of this analysis are presented in Section 6.1.5.

4.3.2 Payson Village

The TAC recognized that Alternative 8 in the list above is potentially disruptive to local traffic because it reduces mobility to, from, and between the shopping centers on the north and south sides of SR 260 east of SR 87. An additional alternative was proposed to improve operations of the SR 260/Payson Village intersection without the elimination of traffic movements, as proposed in Alternative 8. This alternative would include the following components:

- On the north leg of the intersection, restripe for three southbound lanes instead of two.
- On the south leg, reconstruct a portion of the parking lot to eliminate several parking spaces in order to provide a three-lane northbound approach.

This alternative was not selected for formal evaluation in the study, but it appears to have merit from a traffic operational perspective. Further study of this alternative may be indicated if Alternative 8 is not selected for implementation.

5.0 ROUNDABOUT ALTERNATIVE

As discussed earlier, ADOT requested that the study include evaluation of a roundabout to replace the existing traffic signal at the intersection of SR 87 and SR 260. For a roundabout to be feasible, it must accomplish two objectives: it must provide acceptable traffic operational performance, and it must fit in the intersection without unacceptable impacts on adjacent parcels. Initial assessment of both of these objectives was conducted as part of this study.

5.1 Operational Analysis

Traffic operational analysis of a roundabout with many combinations of lane configurations was conducted using SIDRA software. The operational results were compared with the existing signalized intersection to provide an understanding of the change in delay a roundabout would cause.

To provide an indication of intersection performance, signalized and unsignalized intersections are typically reported in terms of levels of service (LOS). Signalized intersection analysis is based on average control delay per vehicle, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay for all movements. Unsignalized intersection analysis is based on the minor street approach or critical movement, whichever is applicable. The HCM level of service criteria for signalized and unsignalized intersection analysis are presented in Table 4. A roundabout is evaluated under the category of unsignalized intersections.

Table 3: Level of Service Criteria for Signalized/Unsignalized Intersections

Level of Service (LOS)	Average Control Delay (sec/veh)	
	Signalized	**Unsignalized**
A	≤ 10.0	≤ 10.0
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	> 80.0	> 50.0

Source: *Highway Capacity Manual 2017*, Transportation Research Board

The operational analysis results of the various roundabout alternatives are presented in Table 4.

As shown in the table, the existing signalized intersection operates with LOS F conditions during all three peak hours studied when considering the combination of all approaches. Some approaches improve to LOS D conditions during some periods, but the intersection has poor overall operational performance.

No roundabout configuration evaluated can prevent LOS F conditions on at least one approach during at least one of the three peak hours. However, some of the larger roundabouts provide overall operational improvements over the existing signalized intersection.

It should be noted that larger (3-lane) roundabout configurations are relatively uncommon, particularly in a small community such as Payson where many drivers are non-local travelers. It may not be realistic to expect drivers to adapt to larger roundabouts in such a way that the intersection would be able to achieve the performance indicated in the table.

Pedestrian accommodations at larger roundabouts are more complicated than at more common, single-lane roundabouts. There is no federal requirement that roundabout crosswalks be controlled. However, the proposed Public Rights of Way Accessibility Guidelines (PROWAG) would require controlled crossings or similar treatments on multilane crossings at roundabouts. PROWAG has not been adopted and there is no indication when or if it will be, but ADOT is attempting to comply with PROWAG where feasible. Even in the absence of PROWAG, providing controlled pedestrian crossings is likely to be essential for safe and comfortable pedestrian accommodations.

If the crossings are to be controlled, the control would typically be either Rectangular Rapid-Flashing Beacons (RRFBs) or Pedestrian Hybrid Beacons (PHBs). Both of these treatments have advantages and disadvantages that would need to be considered further during later stages of project development if a roundabout alternative is selected for further evaluation. However, it is also possible that pedestrian control treatment could impact the operational performance of the roundabout. Certainly, on approaches with high pedestrian volume, the triggering of a controlled pedestrian crossing could increase vehicular delay. However, it is also possible that other approaches may see reductions in delay, depending on the actual volume and pattern of crossings.

Even the largest roundabouts evaluated in the study have some approaches with high delays and long queues. This is often the case because one high-volume approach limits the availability of gaps for a downstream approach. It may be possible to mitigate the lack of gaps using a pre-signal, which stops traffic on an approach for a period long enough to reduce queues on one or more other approaches. Pre-signals can be installed at an existing intersection a block upstream of a roundabout or at another location. Further investigation of pre-signal needs may be required if a roundabout is evaluated further in the study area.

During a meeting on February 13, 2020, the study's TAC met to discuss the roundabout alternatives shown in the table. After considerable discussion, the group agreed to proceed with a footprint analysis of Layout J as an ultimate solution, with Layout E to be evaluated as an interim, expandable treatment.

Table 4: Roundabout Operational Analysis Results

Table A. Intersection Capacity Analysis Results – SR 87 at SR 260 – Existing Signal

Existing Signal Control with Existing Lanes					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	116.7 (F)[1]	122.0 (F)	64.0 (E)	195.5 (F)	50.1 (D)
Sunday	91.8 (F)	57.2 (E)	153.1 (F)	63.0 (E)	62.8 (E)
Weekday	80.8 (F)	66.7 (E)	56.2 (E)	126.8 (F)	44.7 (D)

[1] Delay in seconds/vehicle (Level of Service) from *Synchro 10* HCM 6 methodology

Table B. Intersection Capacity Analysis Results – SR 87 at SR 260 – No Auxiliary Lanes

Layout A – 2x2x2x1 Roundabout					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	128.9 (F)[1]	442.7 (F)	80.1 (F)	83.0 (F)	38.7 (E)
Sunday	110.3 (F)	219.5 (F)	156.8 (F)	25.5 (D)	112.8 (F)
Weekday	64.1 (F)	195.8 (F)	63.1 (F)	41.1 (E)	41.3 (E)
Layout B – 2x2x2x2 Roundabout					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	119.3 (F)	99.1 (F)	70.4 (F)	212.7 (F)	42.7 (E)
Sunday	102.4 (F)	48.7 (E)	181.6 (F)	97.7 (F)	37.0 (E)
Weekday	55.9 (F)	37.8 (E)	68.4 (F)	63.2 (F)	39.8 (E)
Layout C 1 – 2x2x2x3 Roundabout with 3 Lanes Southbound					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	112.3 (F)	97.1 (F)	68.5 (F)	210.4 (F)	18.7 (C)
Sunday	85.8 (F)	65.1 (F)	181.6 (F)	42.9 (E)	28.5 (D)
Weekday	50.8 (F)	37.8 (E)	68.4 (F)	63.2 (F)	19.5 (C)
Layout C 2 – 2x2x2x3 Roundabout with 3 Lanes Westbound					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	107.4 (F)	103.4 (F)	29.4 (D)	206.5 (F)	45.6 (E)
Sunday	95.6 (F)	50.0 (E)	45.7 (E)	28.1 (D)	236.5 (F)
Weekday	44.8 (E)	38.4 (E)	25.1 (D)	63.2 (F)	41.0 (E)

[1] Delay in seconds/vehicle (Level of Service) from *SIDRA* HCM 6 methodology

Table C. Intersection Capacity Analysis Results – SR 87 at SR 260 – 2 Lane Roundabout Comparison

Layout B – 2x2x2x2 Roundabout					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	119.3 (F)	99.1 (F)	70.4 (F)	212.7 (F)	42.7 (E)
Sunday	102.4 (F)	48.7 (E)	181.6 (F)	97.7 (F)	37.0 (E)
Weekday	55.9 (F)	37.8 (E)	68.4 (F)	63.2 (F)	39.8 (E)
Layout D – 2x2x2x2 Roundabout with Westbound Right Turn Lane					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	105.3 (F)	103.4 (F)	21.9 (C)	206.5 (F)	45.6 (E)
Sunday	93.1 (F)	49.1 (E)	67.3 (F)	29.6 (D)	202.2 (F)
Weekday	44.6 (E)	38.4 (E)	24.3 (C)	63.2 (F)	41.0 (E)
Layout E – 2x2x2x2 Roundabout with Westbound and Northbound Right Turn Lanes					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	44.1 (E)	110.1 (F)	46.3 (E)	10.6 (B)	48.4 (E)
Sunday	86.3 (F)	49.1 (E)	67.3 (F)	6.9 (A)	202.2 (F)
Weekday	24.4 (C)	41.9 (E)	25.8 (D)	6.9 (A)	41.3 (E)
Layout F – 2x2x2x2 Roundabout with Northbound Right Turn Lane					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	65.6 (F)	68.4 (F)	168.9 (F)	11.7 (B)	24.6 (C)
Sunday	93.6 (F)	48.6 (E)	181.6 (F)	7.6 (A)	97.7 (F)
Weekday	36.2 (E)	39.9 (E)	74.9 (F)	6.9 (A)	37.7 (E)

[1] Delay in seconds/vehicle (Level of Service) from *SIDRA* HCM 6 methodology

Table D. Intersection Capacity Analysis Results – SR 87 at SR 260 – 3 Lane Roundabout Comparison

Layout C 1 – 2x2x2x3 Roundabout with 3 Lanes Southbound					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	112.3 (F)	97.1 (F)	68.5 (F)	210.4 (F)	18.7 (C)
Sunday	85.8 (F)	65.1 (F)	181.6 (F)	42.9 (E)	28.5 (D)
Weekday	50.8 (F)	37.8 (E)	68.4 (F)	63.2 (F)	19.5 (C)
Layout C 2 – 2x2x2x3 Roundabout with 3 Lanes Westbound					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	107.4 (F)	103.4 (F)	29.4 (D)	206.5 (F)	45.6 (E)
Sunday	95.6 (F)	50.0 (E)	45.7 (E)	28.1 (D)	236.5 (F)
Weekday	44.8 (E)	38.4 (E)	25.1 (D)	63.2 (F)	41.0 (E)
Layout G – 2x2x2x3 Roundabout with 3 Lanes Southbound and Westbound Right Turn Lane					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	99.7 (F)	103.4 (F)	21.9 (C)	206.5 (F)	19.8 (C)
Sunday	61.8 (F)	109.8 (F)	67.2 (F)	42.8 (E)	60.8 (F)
Weekday	39.9 (E)	38.4 (E)	24.3 (C)	63.2 (F)	19.9 (C)
Layout H – 2x2x2x3 Roundabout with 3 Lanes SB Plus Westbound & Northbound Right Turn Lanes					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	36.2 (E)	103.4 (F)	43.3 (E)	10.9 (A)	20.4 (C)
Sunday	51.4 (F)	109.8 (F)	67.2 (F)	8.1 (A)	60.8 (F)
Weekday	18.6 (C)	38.4 (E)	25.8 (D)	6.9 (A)	20.0 (C)
Layout I 1 – 2x2x2x3 Roundabout with 3 Lanes Southbound and Northbound Right Turn Lane					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	62.5 (F)	62.9 (F)	168.9 (F)	12.0 (B)	13.9 (B)
Sunday	75.4 (F)	65.1 (F)	181.6 (F)	8.1 (A)	28.5 (D)
Weekday	31.2 (D)	36.7 (E)	74.9 (F)	6.9 (A)	18.9 (C)
Layout I 2 – 2x2x2x3 Roundabout with 3 Lanes Westbound and Northbound Right Turn Lane					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	46.9 (E)	103.4 (F)	64.2 (F)	10.9 (B)	43.7 (E)
Sunday	89.1 (F)	50.0 (E)	45.7 (E)	6.8 (A)	236.5 (F)
Weekday	24.2 (C)	38.4 (E)	26.6 (D)	6.9 (A)	41.3 (E)
Layout J – 2x2x3x3 Roundabout with 3 Lanes SB & WB Plus WB & NB Right Turn Lanes					
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87
Friday	30.4 (D)	103.4 (F)	21.8 (C)	10.9 (B)	20.4 (C)
Sunday	45.8 (E)	114.5 (F)	35.5 (E)	8.1 (A)	75.8 (F)
Weekday	16.0 (C)	37.4 (E)	16.6 (C)	6.8 (A)	19.9 (C)

[1] Delay in seconds/vehicle (Level of Service) from *SIDRA* HCM 6 methodology

5.2 Footprint Analysis

ADOT provided a GIS layer with the approximate right-of-way line at the SR 87/SR 260 intersection, and this line was overlaid on an aerial photograph to provide an estimate of the available right-of-way at the intersection. (The right-of-way limits should be considered approximate because no survey has been conducted.)

A potential roundabout footprint is shown in Figure 4. This footprint is based on Layout E, which includes two approach lanes in each direction, plus right-turn bypass lanes on both the northbound and westbound approaches.

In the northbound direction, the right-turn bypass lane enters SR 260 with a dedicated receiving lane, similar to existing conditions. This condition is important to retain because of the high-volume northbound right-turn movement, particularly during the Friday peak period. In the westbound direction, the right-turn bypass lane has a merge condition rather than a dedicated receiving lane. This design was selected to minimize the impact on the parcel in the northeast corner of the intersection, and also in recognition of the much smaller westbound right-turn volume.

The footprint shown in Figure 2 has a minimal encroachment outside existing right-of-way in the northwest corner of the intersection. This corner clip measures about 10 feet along the north-south axis and about 30 feet along the east-west axis. It appears that this clip would not impact any developed land and should not impact the use of the parcel. No other right-of-way encroachments are shown in Figure 2; however, it should be noted that the right-of-way line provided by ADOT does not encompass the entirety of Longhorn Road on the southwest corner of the intersection. Part of the existing roadway appears to be outside the right-of-way line as shown. In general, the proposed footprint in Figure 2 would stay within the limits of the existing roadway in this area. ADOT may wish to investigate whether the right-of-way line needs adjustment.

The Town of Payson provided copies of right-of-way deeds that indicate additional right-of-way is available on the south side of Longhorn Drive, when compared to the right-of-way line provided by ADOT. Copies of the right-of-way deeds are provided in Appendix D.

The literature defines three general cases on dealing with trucks in roundabouts:

- ***Case 1*** roundabouts are designed such that trucks encroach into adjacent lanes while entering, circulating, and exiting a roundabout.

- ***Case 2*** roundabouts are designed such that trucks enter the roundabout without encroaching, but may encroach into adjacent lanes when circulating and exiting the roundabout. In many cases, case 2 roundabouts have a painted “gore” area between lanes on the approaches, but this characteristic is not always present.

- ***Case 3*** roundabouts are designed such that trucks can stay within their lanes as they enter, circulate, and exit the roundabout (i.e., no encroachment). In many cases, Case 3 roundabouts have a painted gore area between lanes on the approaches, but not always. Typically, case 3 roundabouts require a truck in the inside circulating lane to use a truck

apron on the central island to stay in the lane, but not always. Often the outside circulating lane is wider than the inside lane, to allow trucks to stay in lane.[1]

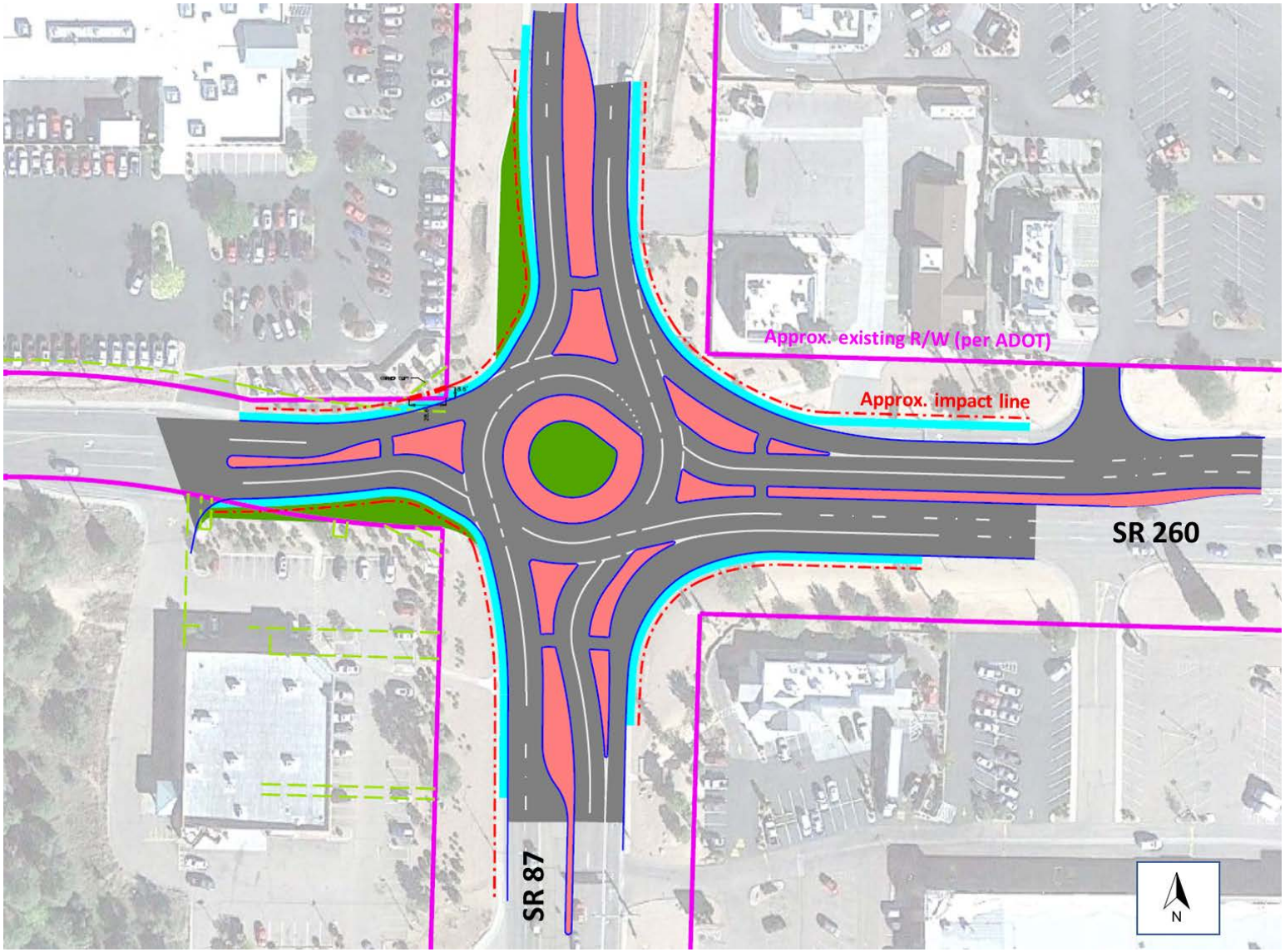
The footprint shown in Figure 2 is designed as a Case 1 roundabout, in which large vehicles may encroach on adjacent lanes. Considering the preponderance of heavy vehicles in the Payson area and the central nature of the intersection, it may be desirable to use a different case for roundabout design purposes. However, Case 1 involves the minimum impact to adjacent parcels; considerably more impact would be involved with a Case 2 or Case 3 roundabout.

ADOT suggested Layout E, as shown in Figure 2, as an interim treatment, with the ultimate goal to expand the roundabout to Layout J. This expansion would involve adding a lane on the southbound and westbound approaches to provide three approach lanes to the circulating roadway. While these additional lanes are not shown in Figure 2, they too would increase the roundabout's impact on adjacent parcels.

As with most roundabouts, it is possible to adjust the center of the intersection slightly during design to change the parcels impacted by the overall footprint. While the footprint shown in Figure 2 impacts the northwest corner, if right-of-way acquisition on this corner proves to be infeasible, it would likely be possible to shift the impacts to other quadrants.

[1] Roundabout case information is cited from: Short Elliott Hendrickson Incorporated. *DLZ, National, and Roundabouts and Traffic Engineering Joint Roundabout Truck Study: Draft Report for Phase 1; Synthesis of Current Design Practice.* Draft Report Prepared for Wisconsin and Minnesota DOT, 2011.

Figure 4: Possible Roundabout Footprint



6.0 RESULTS

6.1 Synchro Analysis

Synchro was used to evaluate Alternative 1 (the only Phase 1 alternative in the study). A summary of Synchro results is provided below for each of the modeled time periods, and more complete results of the Synchro analysis are provided in Appendix B.

6.1.1 Weekdays

Existing Conditions

The morning and afternoon periods are not coordinated and offer adequate green time to accommodate pedestrian actuations and service without disruption to the overall signal timing[2] only at SR 260. The midday period is coordinated and uses four different cycle lengths. The four cycle lengths vary by segment as follows:

- SR 87 & Casino to SR 87 & Bonita Street (120 sec cycle length)
- SR 87 & Bonita Street to SR 87 & SR 260 (120 sec / 180 sec cycle lengths)
- SR 87 & SR 260 to SR 87 & Malibu Drive/Rumsey Drive (180 sec / 120 sec cycle lengths)
- SR 87 & Malibu Drive/Rumsey Drive to SR 87 & Forest Drive (Periodic cycle lengths – 120 sec / 60 sec)
- SR 87 & SR 260 to SR 260 & Payson Village (Periodic cycle lengths – 120 sec / 90 sec)
- SR 260 & Payson Village to SR 260 & Tyler Parkway (90 sec cycle)

The midday coordination includes the end signals at SR 87 & Casino and SR 260 & Tyler Parkway. The midday coordination fits crossing pedestrians at SR 87 & Main St, SR 87 & Bonita St, and SR 87 & SR 260.

In existing conditions, the same signal timing plan is used for both morning and afternoon peak periods. While this operation is reasonable when considering necessary green times, the Synchro analysis determined that overall operations can be improved by using significantly different offsets during morning and afternoon peaks. As such, separate morning and afternoon peak plans were developed and are discussed as follows.

Proposed Plan – AM

The proposed plan for the weekday AM period is the optimization of the main intersection of the study of SR 87 & SR 260, first with a cycle length of 90 seconds and building coordination away from this intersection. Also, not retaining cross street pedestrian fits with less than 10 pedestrians/hour and coordinating the remaining signals with the same cycle length of 90 seconds without including SR 260 & Tyler Parkway (1.3 miles) and SR 87 & Casino (0.35 miles) due to distance.

As a result of removing the pedestrian fit for SR 87 & SR 260 in the eastbound and westbound directions (3 pedestrians/hour), improves the cycle length to 90 seconds as compared to 120 seconds,

[2] The concept of offering adequate green time to accommodate pedestrians without disruption to the overall signal cycle is referred to in this report as pedestrian crossings that "fit" within the cycle. Where pedestrian crossings do not fit, a pedestrian actuation typically impedes mainline progression. (See also Section 6.1.3.)

and the intersection delay will drop from 31 sec/veh to 24 sec/veh. It is also proposed to remove pedestrian fits for SR 87 & Bonita Street (2 pedestrians/hour) and SR 87 & Main Street (2 pedestrians/hour).

The link green bands on SR 87 in the northbound direction will range from 32 to 50 seconds and will range from 29 to 53 seconds in the southbound direction. The link green bands on SR 260 in the eastbound direction will range from 13 to 62 seconds and will range from 15 to 38 seconds in the westbound direction.

As a result, the westbound left-turn traffic volume from SR 260 (316 vehicles per hour) should be able to get through SR 87 & Bonita Street and SR 87 & Main Street after turning, and the northbound right-turn traffic volume from SR 87 (346 vph) turning on red should be able to get through SR 260 & Payson Village and SR 260 & Manzanita after turning. Also, all southbound released traffic at the SR 87 & SR 260 signal (410 vph) should be able to get through SR 87 & Bonita Street and SR 87 & Main Street.

Proposed Plan – PM

Like the AM period, the proposed weekday PM plan starts at SR 87 & SR 260 with a cycle length of 90 seconds and builds coordination away from this intersection, making the same assumption about pedestrian fit considering the similar pedestrian volumes (2 pedestrians/hour).

In the PM, removing pedestrian fit improves the cycle length to 90 seconds as compared to 125 seconds, and the intersection delay will drop from 33 sec/veh to 26 sec/veh. As with the AM period, it is proposed to remove pedestrian fits for SR 87 & Bonita Street (9 pedestrians/hour) and SR 87 & Main Street (2 pedestrians/hour). Cross street pedestrian fit is allowed at SR 87 & Forest Drive in the east and west direction (12 pedestrians/hour).

Westbound left-turn volume from SR 260 (477 vph) should be able to get through SR 87 & Bonita Street and SR 87 & Main Street after turning, and the northbound right-turn volume from SR 87 (568 vph) turning on red should be able to get through SR 260 & Payson Village and SR 260 & Manzanita after turning. Also, all the northbound released traffic at the SR 87 & SR 260 signal (571 vph) should be able to get through SR 87 & Malibu Drive/Rumsey Drive and SR 87 & Forest Drive.

6.1.2 Holidays

Proposed Plan – Friday

The proposed plan for holiday Friday starts by optimizing SR 87 & SR 260 first with a cycle length of 130 seconds and building coordination away from this intersection. The remaining signals are coordinated with the same 130-second cycle length, but the signals farthest afield, SR 260 & Tyler Parkway (1.3 miles) and SR 87 & Casino (0.35 miles), are excluded due to distance. Pedestrian data is not available, but it is possible to do some cross-street pedestrian fits.

At SR 87 & Forest Drive, a half cycle was used to avoid over-capacity conditions, resulting in the lack of fit for eastbound/westbound pedestrians. Cross-street pedestrians fit at SR 87 intersections with Malibu Drive/Rumsey Drive, Bonita Street, and Main Street, and at SR 260 intersections with Payson Village and Manzanita Drive. A few intersections (SR 87 at Bonita and SR 260 at Payson Village and Manzanita) experience LOS F conditions due to the long cycle length, but this allows

mainline traffic to flow well. Westbound left turn traffic volume from SR 260 should be able to get through SR 87 & Bonita Street and SR 87 & Main Street and out of town after turning. Southbound left-turning traffic from SR 87 to SR 260 should be able to get through SR 260 at Payson Village and SR 260 at Manzanita and out of town.

Proposed Plan – Sunday

The proposed holiday Sunday plan also starts by optimizing SR 87 & SR 260 with a 130-second cycle length and building coordination away from this intersection. As on Friday, the most distant signals at SR 260 and Tyler Parkway and SR 87 & Casino Drive are not coordinated due to distance. Pedestrian data is not available, but it is possible to do some cross-street pedestrian fits.

Most notable conditions in the holiday Friday plan also exist in the Sunday plan, including the half-cycle at SR 87 & Forest Drive and LOS F conditions at SR 87 at Bonita Street and SR 260 & Payson Village. Most westbound left-turn traffic from SR 260 should be able to get through SR 87 & Bonita Street, but may get stopped at SR 87 & Main Street. Southbound left-turning traffic from SR 87 to SR 260 should be able to get through SR 260 at Payson Village and SR 260 at Manzanita and out of town.

6.1.3 Pedestrian Accommodations

At intersections where pedestrian movements are not accommodated within the signal cycle length, a pedestrian actuation will take the intersection out of coordination, which is likely to have some impact on traffic operational performance. In general, the deterministic nature of the Synchro analysis is not able to quantify these performance impacts, but the measured low volumes of pedestrians and the need to maintain maximum vehicular throughput on weekdays suggests that the advantages of the shorter cycle length outweigh the disadvantage of occasional loss of coordination.

6.1.4 Interconnectivity

Synchro is not able to directly model the differences between an interconnected network and a disconnected network. However, in general, if each intersection is dependent on its own controller's internal time clock to maintain coordination, it is possible for the clocks at nearby intersections to slowly drift out of synch. As this drift occurs, the quality of the signal timing plan gradually worsens, because the signals are no longer serving offsets that were expressly designed in the signal timing plan.

Several methods are available to avoid "time clock creep." Interconnectivity is one such method, but other methods, such as obtaining a wireless time clock synchronization, are also available.

However, aside from day-to-day traffic operational performance, interconnectivity offers several other benefits. In most cases, interconnectivity allows staff remote access to review and modify signal timing parameters. More advanced treatments permit automated traffic signal performance measures, which can alert an operator when a signal experiences anomalous behavior, such as a phase that is served to its maximum green every cycle, which could indicate a malfunctioning detector. Agencies have found these advanced features to be very helpful in quickly diagnosing and resolving non-recurring issues that can have a major impact on network performance.

As such, while interconnectivity is not directly modeled by Synchro, it is regarded by most agencies as a helpful and often necessary component of traffic signals, particularly those in a closely-spaced,

congested, coordinated network. It is understood that ADOT is already taking some steps to interconnect the signals in the Payson area, which should provide overall network benefits.

6.1.5 Alternative 10

The results of the Synchro analysis of Alternative 10 are presented in Table 5.

Table 5: Results of Synchro Analysis of Alternative 10

Existing Signal Control with Existing Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	116.7 (F)[1]	122.0 (F)	64.0 (E)	195.5 (F)	50.1 (D)	17 veh (NB)
Sunday	91.8 (F)	57.2 (E)	153.1 (F)	63.0 (E)	62.8 (E)	30 veh (WB)
Weekday	80.8 (F)	66.7 (E)	56.2 (E)	126.8 (F)	44.7 (D)	17 veh (NB)
Existing Signal Control with Two Northbound Right Turn Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	59.7 (E)[1]	122.0 (F)	64.0 (E)	34.8 (C)	50.1 (D)	17 veh (NB)
Sunday	83.0 (F)	57.2 (E)	153.1 (F)	33.8 (C)	62.8 (E)	30 veh (WB)
Weekday	46.1 (D)	66.7 (E)	56.2 (E)	33.8 (C)	44.7 (D)	17 veh (NB)

[1] Delay in seconds/vehicle (Level of Service) from *Synchro 10* HCM 6 methodology

The top half of Table 5 shows that the existing signalized intersection of SR 87 and SR 260 experiences overall failing levels of service during all three peak hours evaluated. Conditions are notably worse during the Friday and Sunday peak hours, but overall delay just exceeds the 80-second LOS F threshold during the weekday peak hour also. Delays on the various approaches to the existing intersection vary. Only the southbound approach lacks LOS F conditions during any of the three peak hours.

The bottom half of Table 5 shows that Alternative 10 has significant potential to alleviate the existing excessive delay. Its main benefits accrue on the northbound approach, where delays are expected to drop from 196 seconds per vehicle during the Friday peak hour to about 35 seconds per vehicle, LOS C conditions. Improvements to a lesser extent are also observed during the other two peak hours.

Overall intersection delay is also expected to decrease in all three peak hours. Friday holiday delay would drop from about 117 seconds to about 60 seconds, a delay reduction of nearly 50 percent. Sunday holiday delay would decrease slightly, from 92 to 83 seconds (about 10 percent), an acknowledgement that Alternative 10 does not address the high-volume westbound conditions observed on holiday Sundays. However, typical weekday peak hours would also benefit from a delay reduction, with delay dropping from 81 to 46 seconds (about 43 percent), reducing overall intersection LOS from F to D.

The Synchro analysis of Alternative 10 maintained the same signal timing as in existing conditions, and consequently, the delays for the eastbound, westbound, and southbound approaches are the same in both halves of Table 5. Additional signal timing adjustments may be possible to better balance delays among all four approaches and further reduce overall intersection delay.

It should be noted that while Alternative 10 provides significant benefits in the form of delay reduction, it also may introduce potential merging and weaving concerns, particularly related to traffic from eastbound Longhorn Drive and southbound SR 87 turning right into the Payson Village shopping center. In Alternative 10, this traffic would need to change two lanes in about 350 feet after passing through the signalized intersection to reach the first driveway, or in about 700 feet to reach the Payson Village traffic signal. This weaving could introduce new merging conflicts.

Nevertheless, this alternative provides considerable operational value for Friday holiday and weekday peak traffic periods. Furthermore, if Alternative 10 is selected for implementation, one measure that could be considered to partially mitigate the merging and weaving issues is closure of the first driveway to the Payson Village Shopping Center east of SR 87. Alternatively, the driveway could be closed to entering traffic but remain open for only exiting movements.

6.2 VISSIM Analysis

VISSIM was used to evaluate the Phase 2 alternatives, itemized in Section 4.0. (However, VISSIM was not used to evaluate Alternative 7, the roundabout, which is presented in detail in Section 5.0.)

Table 6 presents a summary of the changes in delay experienced at each intersection during VISSIM analysis of each alternative by time period. Complete results of the VISSIM analysis are shown in Appendix C.

Unlike Synchro, which uses deterministic formulas to calculate traffic operational results, VISSIM is stochastic software, which obtains results by simulating the actual environment. Since every simulation run is slightly different, the VISSIM model of each alternative was run 10 times and the results of the runs were averaged to obtain results. However, the stochastic nature of VISSIM means that results are sometimes affected by random variation in addition to results due to changes in the geometry of the alternatives. As such, small changes in delay or travel time should not be interpreted to mean an alternative is causing such changes, particularly when they occur some distance from the changes that are part of an alternative. Rather, larger changes in delay and travel time can be considered more representative of an alternative's actual impact. As such, in Table 6, changes in delay of 10 seconds or more are highlighted.

Table 6: VISSIM Delay Results Summary

Change in delay by intersection for each alternative compared with the calibrated model of existing conditions (seconds per vehicle)								
		Alternative No.						
		2	***3***	***4***	***5***	***6***	***8***	***9***
Weekday	SR 87 & Green Valley Pkwy	0	0	0	0	0	0	-1
	SR 87 & Main St	0	-1	2	-1	0	-1	-1
	SR 87 & Bonita St	-1	0	3	0	-1	0	-1
	SR 87 & SR 260	0	0	6	1	-1	4	-2
	SR 87 & Malibu Dr	0	0	8	0	-1	0	-1
	SR 87 & Forest Dr	0	0	1	0	2	0	0
	SR 260 & Payson Village Access	0	0	4	1	0	-5	0
	SR 260 & Manzanita/Granite Dells	0	0	2	9	0	0	-1
	SR 260 & Tyler Pkwy	0	0	0	0	0	0	0
Friday	SR 87 & Green Valley Pkwy	0	0	0	0	-1	-1	0
	SR 87 & Main St	0	0	0	0	0	0	1
	SR 87 & Bonita St	0	0	0	4	0	0	-2
	SR 87 & SR 260	0	3	5	2	-2	3	-4
	SR 87 & Malibu Dr	0	0	0	0	2	0	5
	SR 87 & Forest Dr	0	0	0	0	1	0	5
	SR 260 & Payson Village Access	0	-1	-1	0	-1	-6	-1
	SR 260 & Manzanita/Granite Dells	0	0	0	0	0	-2	-1
	SR 260 & Tyler Pkwy	0	0	0	0	0	0	0
Sunday	SR 87 & Green Valley Pkwy	1	0	1	0	0	1	0
	SR 87 & Main St	0	0	2	-1	0	0	-1
	SR 87 & Bonita St	0	1	3	0	1	1	0
	SR 87 & SR 260	0	0	10	2	-1	-2	-4
	SR 87 & Malibu Dr	2	2	16	0	0	4	-1
	SR 87 & Forest Dr	4	0	8	-1	-1	0	-1
	SR 260 & Payson Village Access	-4	1	5	0	-5	-43	0
	SR 260 & Manzanita/Granite Dells	-2	3	14	3	1	-7	-4
	SR 260 & Tyler Pkwy	0	0	0	0	0	0	0

Note: Alternative 7 (the roundabout) is discussed in Section 5.0.

In general, the VISSIM analysis showed relatively small changes in delay for most alternatives. One reason for this appears to be the very high volumes in the study area, which limit the ability of the network to avoid considerable congestion and queueing.

Alternative 2, modification of the median on northbound SR 87, and Alternative 3, lengthening of the northbound right-turn lane, both showed very little change in delay at any intersections in the network. Both are viable mitigation measures with no significant disadvantages, and it is possible that a more focused study area network may demonstrate more positive delay results for each of these alternatives. However, the study's VISSIM network does not indicate significant improvements in delay.

Alternative 4, allowing right-turns from the right-most through lane, showed increases in delay at the main SR 87/SR 260 intersection during all three time periods. In this case, the shared nature of the lane appears to be a disbenefit to traffic at the intersection. When the signal is green for northbound traffic, a right-turning vehicle in the shared lane must slow significantly to turn, which delays trailing through traffic. The problem is exacerbated when a conflicting pedestrian is present. Likewise, when the signal is red for northbound traffic, most right-turning vehicles are likely to avoid the shared lane so they can take advantage of the free-flowing adjacent right-turn lane, where they will not be delayed by stopped through traffic ahead. Similar lane configurations elsewhere sometimes result in considerable last-minute lane changing as vehicles jockey for position depending on the color of the signal indication, which is a potential disadvantage of this alternative.

Alternative 5, a second northbound right-turn lane, and Alternative 6, a free westbound right-turn lane, did not yield significant benefits in the VISSIM analysis. The advantages of the second northbound right-turn lane are offset by the need for vehicles to merge back into the same number of eastbound travel lanes on SR 260 as before. However, from a traffic engineering perspective, Alternative 5 is a better configuration than Alternative 4 if ADOT does choose to provide a second right-turn lane. Alternative 5 provides a shorter pedestrian crossing distance and avoids the shared-use lane that can create confusion and increase lane-changing behavior.

Alternative 6 did show an improvement in delay in all time periods, but its peak delay improvement was only 5 seconds on Sunday. The 5-second improvement on Sunday does correspond to the time period when westbound traffic is heaviest. The alternative is also promising to improve intersection operations, but the westbound right-turn movement is relatively low in volume compared to other movements, and improving this movement does not allow a reallocation of green time that might help the intersection overall, because right-turning traffic seldom has much impact on green splits.

Alternative 8, eliminating northbound and southbound through movements at the Payson Village intersection, is the one alternative that showed the most improvement at a single intersection, with a 43-second reduction in average delay at the Payson Village intersection on Sunday. Sunday is the highest-volume westbound period, when westbound vehicles are likely to be queued through the Payson Village intersection. As such, providing additional westbound green time can maximize the amount of traffic getting through this minor intersection to the nearby signal at SR 87. This alternative did improve operations in both Friday and weekday periods, but the results were less pronounced than on Sunday, with improvements of 6 and 5 seconds, respectively. Alternative 8 did not cause significant changes at the SR 87 and SR 260 intersection, which is expected because it

does not include any geometric changes there. However, the alternative can increase throughput and is expected to generate significant advantages to mainline traffic.

The primary disadvantage of Alternative 8 is the reduction in mobility between the shopping centers on the north and south sides of SR 260. While these movements are relatively small, particularly compared with holiday traffic on SR 260, any reduction in mobility is potentially concerning to nearby residents and businesses. Even though alternative routes are available, some drivers may not consider them as direct.

Alternative 9 involves changes to Malibu Drive/Rumsey Drive and Main Street. The VISSIM results showed no significant improvements in overall delay at either of these intersections with Alternative 9, but from a traffic operational perspective, the changes are expected to be an overall improvement with few disadvantages.

7.0 CONCLUSIONS AND RECOMMENDATIONS

It is without question that traffic volume in the study area network is extreme during holiday weekends, and the high volume of traffic complicates attempts to improve traffic operational performance using short-term and medium-term improvements.

In Phase 1, the study determined that retiming and coordinating the traffic signals provides considerable benefits to traffic operations, both during typical weekday operations and during holiday weekends. However, LOS F conditions remain at several intersections, suggesting that Phase 1 improvements are not sufficient to address all congestion in the study area during the highest traffic demand periods.

Several alternatives proposed in Phase 2 were also determined to have traffic operational benefits, most notably the elimination of northbound and southbound through traffic at the SR 260/Payson Village traffic signal in Alternative 8, which helped reduce intersection delay by 43 seconds on Sunday. No other Phase 2 alternative provided operational benefits on the same magnitude in the VISSIM analysis, though several offer fundamental traffic engineering benefits.

The following steps are recommended for action:

7.1 Phase 1

- ADOT should consider retiming and coordinating the traffic signals in the study area using signal timing plans similar to those developed in the Synchro Analysis of Alternative 1.

- If coordination is implemented, ADOT should consider using different signal timing plans for morning and afternoon peak periods to ensure that offsets are optimized separately for each period.

- ADOT should consider interconnecting the signals in the Payson network, particularly those for which coordination is recommended (including all the study area signals except SR 260 at Tyler Parkway and SR 87 at the Casino). It is understood that this effort is already underway.

7.2 Phase 2

- Alternative 10 offers significant benefits to intersection performance, mainly during Friday and weekday peak periods. ADOT should consider implementing Alternative 10 but may wish to further consider the merging and weaving concerns this alternative may exacerbate.

- Several medium-term concepts, evaluated as part of the VISSIM analysis, were not shown to have significant operational benefits, but do make sense from a traffic engineering perspective and are likely to improve local traffic operational performance without notable disadvantages. ADOT should consider implementing the following medium-term improvements as budget becomes available. These improvements are listed in priority order:
    - Modify the median on northbound SR 87 approaching SR 260 to lengthen the northbound left-turn lane.
    - On eastbound Rumsey Drive approaching SR 87, restripe the approach for three lanes instead of the existing two. The third lane would be formed by eliminating one of the westbound lanes for a short segment. The three lanes would be allocated one each for lefts, throughs, and rights.
    - On eastbound Main Street approaching SR 87, restripe the approach for three lanes instead of the existing two, in the same manner as the bullet above.
    - Lengthen the existing northbound right-turn lane from approx. 430 feet to approx. 750 feet.
    - Convert the existing westbound right turn to free operation by adding a northbound receiving lane north of the intersection. Drop the lane as a right-turn lane at the driveway about 750 feet north of SR 260 (behind the shopping center on the northeast corner).

- One alternative evaluated in the VISSIM analysis demonstrated significant operational benefits: eliminating north-south through movements at the Payson Village Shopping Center signal on SR 260. This improvement should be considered for implementation, but because of its potentially negative effects on circulation and mobility, a public process should be followed to determine and evaluate public support for the option before proceeding further with project development.

- If ADOT and the Town of Payson are interested in pursuing this change at the Payson Village Shopping Center signal, it may be possible to implement the change as a "trial" during a particular holiday period so travelers can understand its impacts. The lane configuration could be changed using temporary traffic control devices, and the signal controller could be adjusted to avoid serving northbound-southbound through traffic (except when a pedestrian is present). If the trial period is successful, it may provide more confidence to move forward with a permanent installation. (Alternatively, the agencies may elect to reinstall the temporary configuration only during holiday weekends when high volumes are expected, thus avoiding the mobility disbenefits during other times.)

- The roundabout at SR 87 and SR 260 appears to have promise from an operational and geometric perspective. However, questions remain about its ability to accommodate all movements with reasonable delay and whether pre-signals would be needed to reduce large queues during certain time periods. ADOT may wish to consider further evaluation of a roundabout.

8.0 COST ESTIMATES

In a parallel effort to this study, ADOT prepared cost estimates to implement Phases 1 and 2 recommendations. Detailed cost estimates prepared by ADOT are included in Appendix E.

8.1 Phase 1

The Phase 1 cost includes interconnecting the signals in the study area and implementing the recommended signal phasing changes to provide an "adaptive" signal system that can optimize the performance of the existing signals as a system as traffic demands change. The estimated construction cost of Phase 1 is $957,000.

8.2 Phase 2

The Phase 2 cost consists of construction of Alternative 10, including placement of an additional right turn lane that begins roughly 650 feet south of the SR 87/SR 260 intersection on the right side of SR 87 and leads to four lanes (this adds a fourth lane to an existing three-lane section) on SR 260 eastbound that goes through the Payson Village intersection and ends as a right-turn only lane at the Manzanita Drive/Granite Dells Intersection.

This four lane section then becomes a three lane section eastbound (this adds a third lane to an existing two lane section) from the Manzanita Drive/Granite Dells Intersection and ends as a right-turn only lane into the Giant Gas Station. This right-turn only location is approximately 3,590 feet east of the SR 87/SR 260 intersection.

A taper about 1,000 feet long leads back to the existing two lanes eastbound on mainline SR 260 from the turnout to the Giant Station. This taper length was used because of the recreational vehicles and trailers (hauling boats, etc.,) that comprise part of the tourist traffic in that area.

The estimated construction cost of Phase 2 (Second Right Turn Lane option) is $1,989,000. That estimate includes costs for the following:

- Moving the existing portions of the traffic signals at the Payson Village Shopping Center and Manzanita Drive/Granite Dells intersections as necessary to accommodate the additional right-turn lane
- A retaining wall needed to contain existing side slopes in the vicinity of the Payson Village Shopping Center by placing an additional right-turn lane
- Drainage modifications needed to maintain drainage that is now being conveyed by an open channel ditch on the south side of SR 260 west of the Giant Station. To maintain drainage when adding an additional lane on SR 260, by not relocating the open channel ditch outside of the right of way available to ADOT, it is proposed to convey that drainage by concrete pipes to where the open channel drainage outfalls now.

APPENDIX A

TAC Meeting Minutes

ADOT SR 87 to SR 260 Intersection Study:

Micro-Simulation Modeling, MPD0013

KICK – OFF MEETING NOTES

Tuesday, February 19, 2019
1:30 PM - 3:00 PM
303 N. Beeline Highway, Payson – Police Department Training Room

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Moderator: Ray Leon
Attendees: See Sign-In Sheet

Introductions were made by all in attendance.

Ray Leon gave a brief background on the history of the project. After a brief discussion, the group agreed that the project's proposed scope of work is adequate to address the traffic operational concerns in the area.

Nate said the District's goal is to review the corridor of SR 87/SR 260 to identify suitable projects to address ongoing congestion, and have a strategy for funding. Possible funding sources include District Minor (Max $4 M, adjustable annually, funds rotated among districts) and Statewide Planning Process Funds.

Past history included Simon Ramos (TSMO) trying to improve operations only by making signal adjustments, including with interconnection. This project is to still consider interconnect with or without additional lanes or other changes, as interconnection remains a goal of TSMO in rural signal networks such as Payson's. Lee will need to coordinate with Steve Orosz for any adjustments in signal operations (phasing, timing, coordination, interconnect).

A key project goal is the need for well-supported improvements that must be backed by a traffic model and documentation.

Randy Dittberner laid out approach and scope, which includes models of SYNCHRO and VISSIM for optimization and simulation. Randy expressed the importance of making sure the models reflect the reality of traffic operations as much as practicable, and that there will be considerable data collected as

part of the project. Data collection will include measuring travel times, origin-destination data, and queue lengths to supplement turning movement count data already collected by ADOT over Labor Day 2017.

One alternative the project will evaluate will attempt to address the traffic issue with "signals only", then add in physical improvements on top of or in combination with the signal operational improvements.

LaRon Garrett noted that traffic congestion is extreme on holiday weekends, with northbound queues routinely extending as far south as Rye and at times as far as SR-188. Thursday evenings and all day Friday have become peak periods. Curtis Ward suggested development of "weekday" plans for times when there is lower traffic in the system. Curtis also pointed out that during congested periods, there is often more demand on side streets than usual because local traffic avoids the heavily congested state highways in favor of less direct routes on local streets.

Ray Leon noted that a prior TSMO SYNCHRO model showed traffic moving when reality was stopped traffic.

A traffic tech noted traffic returning on Sundays is just as bad as outgoing traffic early in the weekend. The network currently runs a time-of-day plan that has separate weekday and weekend plans. ADOT has made limited adjustments to the plans. The main intersection of SR-87 and SR-260 operates with a 180-second cycle length and the other intersections in the network operate at 120 seconds. This time of year, when traffic is not as high as summer, ADOT has coordinated the network between 11:00 a.m. and 4:00 or 5:00 p.m. using clock-based coordination.

Curtis Ward noted that the NB left-turn movement from SR-87 to SR-260 chokes the northbound through lane, in part because of a median that limits the length of the northbound left-turn lane. The growth rate of Phoenix/Mesa might be appropriate to consider when determining a growth rate for the project. Nate indicated that the project will be assuming 20% more traffic than existing conditions to account for future growth. Curtis noted that as economy improves, recreational traffic increases. The 3 lanes on eastbound SR-260 east of SR-87 seem adequate, but it may also be desirable to provide three southbound lanes on SR-87 from SR-260 to the Giant gas station. Curtis also suggested an additional NB right turn lane.

Pedestrians aggravate delays, particularly at the southeast corner of the SR-87/SR-260 intersection, where one pedestrian actuation can severely limit vehicular capacity. Nate suggested that the project investigate the pedestrian and vehicular volumes to determine if a different balance might be appropriate. The Town of Payson indicated that there have been some pedestrian crashes, and many pedestrians are schoolchildren at one of two schools about ¼ mile west of the intersection.

Steve suggested ensuring that the study highlights the pedestrian and bicycle volumes and their impacts on traffic operations, as well as ensuring safe crossing times for all users. While it may be possible to consider eliminating a pedestrian crossing if it makes substantial improvement in corridor traffic operations, such a change would need to be weighed against potential negative impacts, including the

possibility of jaywalking pedestrians and the associated safety impacts. It is important that the model output sufficiently represents real-world field conditions.

Curtis noted that Bonita street has only one lane east/west. He suggested modeling an alternative to assess whether an additional lane could help. He also suggested considering right-turn deceleration lanes approaching business driveways. Randy pointed out that driveways will not be included in the models, but that the project could consider the impact of right-turn lanes independently outside the models. Nate indicated that in his observations, traffic turning from the right lane caused recreational vehicles pulling trailers to slow, and their limited acceleration caused the impacts of a single right-turning vehicle to cause a considerable impact to traffic flow. Curtis suggested developing a model to maximize the corridor's capacity. Nate indicated that such a model would be possible, but doing so would have undesirable impacts on local businesses and side-street traffic.

LaRon advocated that the right-most NB through lane on SR-87 approaching SR-260 be converted to a right/through lane by shaving off the northwest corner of the channelizing "porkchop" island as a permanent improvement.

Nate suggested compiling the Calibrated Existing Conditions VISSIM models for review before moving to the next steps of testing improvements.

The group decided to target Memorial Day 2019 for data collection. In the days leading up to this weekend, the consultant team will deploy of several pieces of data collection equipment in the field, including Anonymous Re-Identification (ARID) devices that will be installed in ADOT signal cabinets (for the purposes of obtaining a power source). The consultant team will work with ADOT well in advance to gain access to the signal cabinets.

It is expected that a smaller Technical Advisory Committee (TAC) will be invited to review the calibrated VISSIM model and options in Synchro prior to moving to VISSIM evaluation. The TAC is expected to include Curtis Ward (Town of Payson), Steve Orosz (ADOT District), Nate Reisner (ADOT District), Trevor Eltringham (ADOT TSMO), and Jory Woolwine (ADOT TSMO).

It would be ideal to complete the project by the end of July 2019 to align with ADOT's funding request calendar. This will require additional input from the group during June/July timeframe to review progress and comment on alternatives.

Attachment: Sign-in sheet

Micro-Simulation Modeling (MPD0013), SR 87 to SR 260 KOM Meeting

Tuesday, February 19, 2019 • 1:30 P.M.- 3:00 P.M., Police Department Training Room, 303 N. Beeline Hwy., Payson, Arizona

Completion of this sign-in sheet is completely voluntary and helps the project team keep an accurate record of meeting attendees. Under state law, any identifying information provided below will become part of the public record and, as such, must be released to any individual upon request. Please print clearly.

NAME	TITLE	SECTION	ADDRESS	PHONE	EMAIL
Scott Orrahood	Manager	Traffic Design		(602) 712-7800	sorrahood@azdot.gov
Dave Bruggeman		Lee Engineering	3636 N. 44th St. Phx	(602) 618 0406	dbruggeman@lee-eng.com
LaRon Garth	Manager	Town of Payson	303 N Beeline Payson	928-472-5041	lgarth@paysonaz.gov
Nate Reisner	Dev Engineer	Northcentral District	1801 S. Milton Rd Flagstaff AZ 86001	928-779-7545	nreisner@azdot.gov
Wisam Qasim	Predesign	predesign		602-712-6678	wqasim@azdot.gov
Yudi Lei	~~MPD~~ ADOT EIT	MPD		602-501-7904	ylei@azdot.gov
KATHRYN HAMMOND	PREDESIGN		2055 17th Ave Phx	602-712-7343	khammond@azdot.gov
JORY WOOLWINE	TRAFFIC SIGNAL SUPERVISOR PAYSON	TSMO	200 N. Colcord Payson AZ 85541	928-978-4531	JWOOLWINE@AZDOT.GOV
JIM RUST	TRAFFIC SIGNAL TECH	ADOT TSMO	200 N Colcord Payson, AZ 85541	928 978 3557	JRUST@AZDOT.GOV
Cole Estes	Traffic signal tech	TSMO	200 N Colcord	928-707-4063	CESTES@AZdot.gov
Steve Crose	District Traffic Engr (ADOT)	TSMO	6989 N Seward St PV	928-277-2906	SCROSE@AZDOT.GOV

ADOT

Sheila DeSchaaf	Public Works Director	Town of Payson	303 N. Bieline Hwy Payson AZ 85541	928-472-5031	sdieschaaf@paysonaz.gov
Randy Dittberner	Project Mgr.	Lee Engineering	3610 N. 44th St. Phx AZ 85018	602-443-8479	rdittberner@lee-eng.com
CURTIS WARD	TOWN ENGINEER	TOWN OF PAYSON	303 N Beeline Hwy Payson, AZ 85541	928-472-5044	cward@paysonaz.gov
Ray Leon	Roadway Design	ADOT	205 S 17th Ave Phoenix, 85007	602-712-772	Rleon@azdot.gov

ADOT SR 87 to SR 260 Intersection Study:

Micro-Simulation Modeling, MPD0013

PROGRESS MEETING NOTES

Tuesday, July 9, 2019
10:00 AM - Noon
303 N. Beeline Highway, Payson – Police Department Training Room

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Moderator: Ray Leon
Attendees: See Sign-In Sheet

- **WELCOME AND INTRODUCTIONS**

Room introductions were made.

- **PROJECT STATUS**

Counts were taken over Memorial Day weekend, including speeds, queues, and travel time as well as driver-behavior characteristics. It was noted that cooler than normal weather in Phoenix may have contributed to lower volumes and queues in Payson over Memorial Day weekend than for a typical holiday weekend. (The project will use traffic volume data from Labor Day 2017.) The SYNCHRO model is built and in use. The VISSIM model is built and is in the tuning phase.

ADOT reported that it has a new CCTV camera at the intersection of SR-87 and SR-260 that went live just prior to Memorial Day. ADOT is still working to gain internal access to the camera feed; ADOT will notify Lee Engineering if the feed can be made public.

- **REVIEW OF SYNCHRO MODEL**

Dave gave an overview of past SYNCHRO and progression efforts, by others, and current network evaluation during AM, Midday, and PM peak periods. Dave proposed initially excluding the most distant signals (87 and Casino, 260 and Tyler) from the coordination plan, although they could be added later if appropriate. The group was not in favor of sequence changes by time of day due to type of driver and traffic mix. The group supported removing the half-cycle operation at 87-Forest and using a consistent cycle length at all intersections. Lee Engineering will propose a recommended phase sequence at each intersection, even if different than the existing sequence, but it will not vary by time of day.

- **REVIEW OF VISSIM MODEL**

Randy presented the differences between the SYNCHRO optimization model and the VISSIM simulation model, and showed a sample clip on screen, explaining what VISSIM does and shows. The VISSIM model is largely constructed and is awaiting calibration. Nate asked if VISSIM can model vehicles pulling trailers accurately, and Lee Engineering indicated that the traffic mix can be accurately represented in VISSIM using appropriate speed, acceleration and deceleration characteristics to reflect the effect of trailers and RVs. The VISSIM model will also include pedestrians.

- **DISCUSSION OF SIMULATION MODELING HOURS**

Randy introduced the topic with a handout of weekday and holiday volumes. On Fridays prior to a holiday weekend, the highest-volume hour is from 11:30 a.m. to 12:30 p.m., but network-wide volumes are very similar for an extended period from late morning through early afternoon. If ADOT would prefer to model a later hour, such as 2:15 p.m., volumes would be nearly as high but queues would be longer. George suggested using maximum peak-hour volumes at 11:30 a.m. in order to replicate worst-case conditions, with the understanding that queuing and travel times can be considered from later in the afternoon as appropriate. On Sunday of a holiday weekend, the peak hour was determined to be 12:00 to 1:00 p.m., and the group supported use of Sunday peak volumes in the simulation model.

- **DISCUSSION OF ALTERNATIVES**

In response to a question about additional alternatives that should be evaluated, George asked whether the Town of Payson would support a roundabout at the 87-260 intersection. LaRon said Payson favors roundabouts, but wondered if it could work there, particularly if a 3-lane configuration would be needed. George said Scott Ritchie had taken a preliminary look and determined that a roundabout footprint would likely fit at the intersection without major adverse impacts to adjacent parcels. Ray indicated that discussion would be necessary with ADOT Planning to determine if a scope expansion would be needed to allow Lee Engineering to evaluate a roundabout as part of the current project. Ray asked Lee to develop a scope and fee proposal for a triage analysis of size and operations of a roundabout. (However, following the meeting, on July 10, Ray asked Lee Engineering to hold off on preparing a scope and fee proposal until ADOT can undertake additional discussion about process.)

- **OPEN DISCUSSION**

None.

- **SCHEDULE, NEXT STEPS**

Randy indicated that the VISSIM models are scheduled to be fully calibrated by the end of July, and as such it would be appropriate to target the next Progress Meeting for early August to review the calibrated VISSIM models and obtain ADOT's support before using the models to evaluate alternatives.

- **ADJOURN**

ADOT Payson meeting, 7/9/19

Randy Dittberner	Lee Engr.	rdittberner@lee-eng.com
Ray Leon	ADOT	rleon@azdot.gov
Kathryn Hammond	ADOT	khammond@azdot.gov
Scott Orrahood	ADOT	sorrahood@azdot.gov
Dylan Renner	ADOT	drenner@azdot.gov
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Cole Estes	ADOT	CESTES@AZDOT.GOV
Jory Woolwine	ADOT	JWOOLWINE@AZDOT.GOV
Dave Bruggeman	Lee Eng.	dbruggeman@lee-eng.com
Nate Reisner	ADOT	nreisner@azdot.gov
George Williams	ADOT	gwilliams2@azdot.gov
Trevor Settingham	ADOT	tsettingham@azdot.gov

Non-Holiday

	87 & Casino	87 & Main	87 & Bonita	87 & 260	87 & Malibu	87 & Forest	260 & Payson Village	260 & Manzanita	260 & Tyler	All Intersections	Peak Hour
Time	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		
06:00	139	169	170	255	123	112	122	114	98	1302	7157
06:15	160	185	215	275	145	131	152	158	152	1573	8131
06:30	171	238	260	332	190	173	184	193	162	1903	9309
06:45	216	318	327	421	252	233	214	217	181	2379	10499
07:00	185	275	287	409	231	218	227	232	212	2276	11787
07:15	251	347	370	486	259	256	279	282	221	2751	
07:30	252	367	413	559	320	304	305	310	263	3093	
07:45	274	465	510	660	397	370	348	373	270	3667	
11:00	376	583	641	882	526	441	520	550	400	4919	20495
11:15	382	592	675	924	535	450	570	541	385	5054	21054
11:30	419	631	694	927	522	450	553	517	423	5136	21371
11:45	425	622	752	975	579	485	572	576	400	5386	21454
12:00	417	673	688	1023	620	536	577	557	387	5478	21307
12:15	423	659	759	955	582	490	564	530	409	5371	
12:30	388	610	672	931	566	503	576	566	407	5219	
12:45	416	643	722	940	559	467	581	543	368	5239	
16:00	369	582	629	838	474	429	498	491	388	4698	17927
16:15	369	568	577	780	491	433	454	498	367	4537	18040
16:30	371	543	601	765	409	389	486	485	360	4409	17880
16:45	362	540	567	750	477	416	431	444	296	4283	17142
17:00	397	579	640	842	551	502	478	485	337	4811	16371
17:15	358	518	560	784	486	446	445	442	338	4377	
17:30	289	427	496	657	403	373	381	386	259	3671	
17:45	307	386	445	626	387	366	354	368	273	3512	
Total	7716	11520	12670	16996	10084	8973	9871	9858	7356		
AM Peak Hr:	7:00	7:00	7:00	7:00	7:00	7:00	7:00	7:00	7:00	7:00	
Pk Vol	962	1454	1580	2114	1207	1148	1159	1197	966		
PHF	0.878	0.782	0.775	0.801	0.760	0.776	0.833	0.802	0.894		
MID Peak Hr:	11:30	11:30	11:30	11:45	11:45	11:45	12:00	11:45	11:30	11:45	
Pk Vol	1684	2585	2893	3884	2347	2014	2298	2229	1619		
PHF	0.991	0.960	0.953	0.949	0.946	0.939	0.989	0.967	0.957		
PM Peak Hr:	16:15	16:15	16:15	16:30	16:15	16:30	16:00	16:00	16:00	16:15	
Pk Vol	1499	2230	2385	3141	1928	1753	1869	1918	1411		
PHF	0.944	0.963	0.932	0.933	0.875	0.873	0.938	0.963	0.909		

Holiday Weekend

Average Volume						
	Date	8/31/2017	9/1/2017	9/2/2017	9/3/2017	9/4/2017
	Day of the Week	Thursday	Friday	Saturday	Sunday	Monday
SR87	Casino/Green Valley Pkwy	20601	32812	30024	29284	31254
SR87	Main St	31728	40123	34889	34446	33494
SR87	Bonita St	33658	41696	36273	35992	33713
SR87	SR260	46554	56335	48720	45341	39215
SR87	Malibu Dr	27010	32079	30004	27080	23317
SR87	Forest Dr	23731	27770	26076	24759	22132
SR260	Payson Village Shopping	27687	35777	29900	28196	23178
SR260	Granite Dells/Manzanita Dr	26647	36340	30917	28622	25504
SR260	Tyler Pkwy	19472	28430	24553	22921	22830
	Total	**257088**	**331362**	**291356**	**276641**	**254637**

Intersection Peak Hour						
	Date	8/31/2017	9/1/2017	9/2/2017	9/3/2017	9/4/2017
	Day of the Week	Thursday	Friday	Saturday	Sunday	Monday
SR87	Casino/Green Valley Pkwy	16:30	16:15	12:30	12:30	11:00
SR87	Main St	11:45	11:30	9:45	12:30	10:30
SR87	Bonita St	11:45	11:45	10:45	12:00	9:15
SR87	SR260	11:45	11:45	11:30	12:00	10:30
SR87	Malibu Dr	11:15	11:15	11:00	12:00	10:15
SR87	Forest Dr	11:45	14:00	11:30	12:00	10:30
SR260	Payson Village Shopping	11:30	11:30	11:30	11:15	9:00
SR260	Granite Dells/Manzanita Dr	11:45	11:30	11:15	12:00	9:30
SR260	Tyler Pkwy	14:45	15:45	11:30	12:00	10:30
	Most Common	**11:45**	**11:30**	**11:30**	**12:00**	**10:30**

Intersection Peak Hour Volumes						
	Date	8/31/2017	9/1/2017	9/2/2017	9/3/2017	9/4/2017
	Day of the Week	Thursday	Friday	Saturday	Sunday	Monday
SR87	Casino/Green Valley Pkwy	1610	2556	2610	2603	2765
SR87	Main St	2555	2960	2772	3123	2840
SR87	Bonita St	2698	3026	2798	3189	2877
SR87	SR260	2160	2797	2792	2747	2225
SR87	Malibu Dr	2295	2507	2598	2799	2195
SR87	Forest Dr	1960	2169	2307	2512	2226
SR260	Payson Village Shopping	2381	2797	2536	2631	2044
SR260	Granite Dells/Manzanita Dr	3803	4295	4041	4157	3284
SR260	Tyler Pkwy	1581	2166	2225	2151	2086
	Total	**21043**	**25273**	**24679**	**25912**	**22542**

SR87 and SR260			
Outbound Analysis 8/31/2017		**Int Vol**	**NB Vol**
Intersection Peak Hour	11:45	3803	1302
NB Peak Hour	14:45	3527	1351

SR87 and SR260			
Outbound Analysis 9/1/2017		**Int Vol**	**NB Vol**
Intersection Peak Hour	11:30	4295	1526
NB Peak Hour	13:30	4095	1625

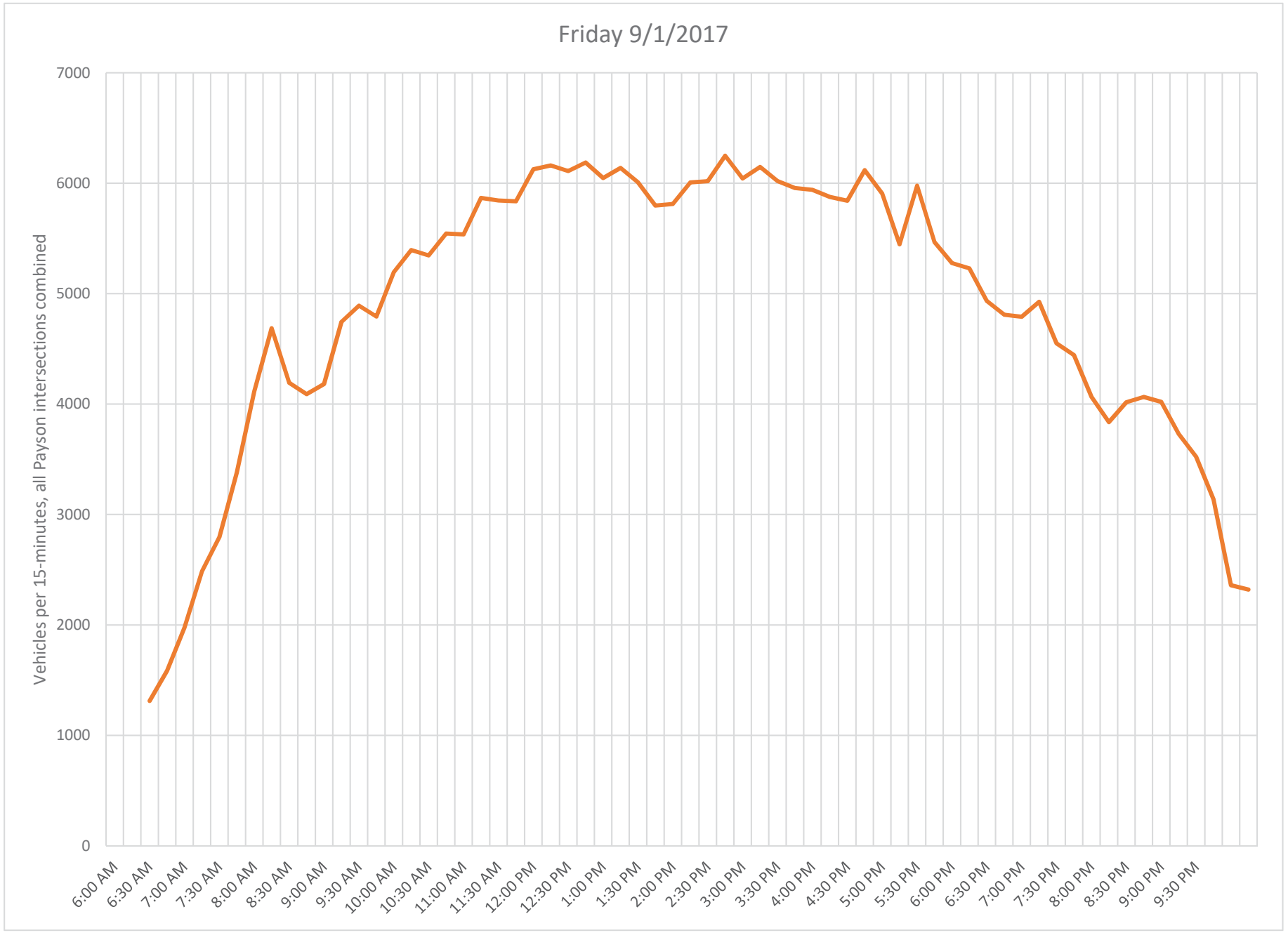
SR87 and SR260			
Inbound Analysis 9/2/2017		**Int Vol**	**WB and SB Vol**
Intersection Peak Hour	11:15	4041	1904
WB + SB Peak Hour	11:15	4041	1904

SR87 and SR260			
Inbound Analysis 9/3/2017		**Int Vol**	**WB and SB Vol**
Intersection Peak Hour	12:00	4157	2539
WB + SB Peak Hour	12:15	4137	2549

SR87 and SR260			
Inbound Analysis 9/4/2017		**Int Vol**	**WB and SB Vol**
Intersection Peak Hour	9:30	3284	2153
WB + SB Peak Hour	9:00	3270	2208

Friday 9/1/2017

	87 & Forest	87 & Malibu	87 & Bonita	87 & Main	87 & Casino	260 & Payson Village	260 & Manzanita	260 & Tyler	87 & 260	All Intersections	Peak Hour
Time	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		
6:00	118	131	176	167	128	133	119	105	235	1312	7357
6:15	149	143	213	201	130	178	162	126	282	1584	8841
6:30	167	181	255	245	187	206	219	167	348	1975	10638
6:45	215	237	333	329	230	243	245	215	439	2486	12777
7:00	248	293	371	361	241	282	284	230	486	2796	14978
7:15	334	331	450	467	278	326	338	271	586	3381	16375
7:30	450	501	492	530	319	389	388	297	748	4114	17084
7:45	520	548	577	530	302	480	525	334	871	4687	17151
8:00	387	420	560	529	294	458	438	322	785	4193	17208
8:15	372	434	558	478	322	417	413	330	766	4090	17906
8:30	397	426	521	505	332	454	457	348	741	4181	18609
8:45	392	468	603	600	403	542	522	366	848	4744	19623
9:00	408	512	633	587	416	564	526	369	876	4891	20274
9:15	412	473	641	605	414	517	499	387	845	4793	20729
9:30	448	542	666	589	390	627	576	418	939	5195	21481
9:45	426	539	703	629	453	640	613	433	959	5395	21822
10:00	448	555	714	616	443	611	579	452	928	5346	22294
10:15	521	631	715	696	393	617	571	445	956	5545	22792
10:30	468	569	759	616	497	620	586	428	993	5536	23083
10:45	541	613	699	714	517	614	661	452	1056	5867	23673
11:00	524	587	725	702	508	680	645	480	993	5844	23967
11:15	550	630	725	685	542	533	648	422	1101	5836	24233
11:30	527	620	748	727	514	708	618	537	1127	6126	24584
11:45	549	628	740	744	537	713	687	484	1079	6161	24505
12:00	536	629	777	723	526	675	682	469	1093	6110	24483
12:15	518	607	740	766	518	701	693	535	1109	6187	24381
12:30	487	602	769	682	504	701	735	519	1048	6047	23992
12:45	569	639	739	729	542	689	668	506	1058	6139	23757
13:00	490	568	744	732	570	675	680	523	1026	6008	23625
13:15	482	574	732	711	520	620	674	473	1012	5798	23636
13:30	481	563	729	715	565	651	627	486	995	5812	24087
13:45	511	585	779	752	579	641	650	505	1005	6007	24318
14:00	525	579	705	692	633	658	682	513	1032	6019	24459
14:15	556	642	765	734	612	676	681	553	1030	6249	24460
14:30	560	627	719	689	643	635	671	504	995	6043	24167
14:45	528	634	745	731	597	651	689	545	1028	6148	24064
15:00	504	549	739	723	657	670	670	542	966	6020	23792
15:15	498	590	737	699	593	638	666	521	1014	5956	23614
15:30	539	600	693	678	592	616	667	545	1010	5940	23776
15:45	541	592	713	680	576	594	660	533	987	5876	23744
16:00	516	569	690	673	618	630	641	520	985	5842	23315
16:15	492	576	766	747	671	666	684	562	954	6118	23451
16:30	501	535	728	697	645	643	675	551	933	5908	22799
16:45	452	533	673	675	570	539	610	499	896	5447	22168
17:00	472	560	746	735	670	661	656	500	978	5978	21950
17:15	453	528	696	673	645	567	588	448	868	5466	20906
17:30	446	500	623	627	604	543	592	475	867	5277	20249
17:45	406	460	658	633	621	555	605	488	803	5229	19763
18:00	379	452	601	609	590	513	557	434	799	4934	19460
18:15	393	434	588	600	564	502	544	433	751	4809	19076
18:30	381	422	604	550	573	516	527	429	789	4791	18711
18:45	377	443	610	563	555	551	575	449	803	4926	17986
19:00	363	410	561	582	545	486	492	367	744	4550	16897
19:15	320	390	536	543	534	495	499	414	713	4444	16364
19:30	281	341	542	497	513	397	455	401	639	4066	15984
19:45	268	323	511	520	481	406	385	332	611	3837	15938
20:00	245	314	560	533	522	404	444	359	636	4017	15831
20:15	259	326	519	496	528	437	454	406	639	4064	15337
20:30	240	304	523	480	503	458	474	407	631	4020	14410
20:45	233	279	488	489	509	391	419	386	536	3730	12750
21:00	219	269	445	461	419	382	401	351	576	3523	11340
21:15	199	257	411	348	258	382	399	347	536	3137	
21:30	172	222	280	276	258	254	271	241	386	2360	
21:45	172	225	274	256	207	270	270	218	428	2320	
Total	27770	32079	41696	40123	32812	35777	36340	28430	56335		
AM Peak	9:45	9:45	9:45	9:45	9:45	9:30	9:45	9:45	9:45		
Pk Vol	1863	2294	2891	2557	1786	2495	2349	1758	3836		
PHF	0.894	0.909	0.952	0.918	0.898	0.975	0.958	0.972	0.966		
MID Peak	14:00	11:15	11:45	11:30	14:15	11:30	11:45	14:45	11:30		
Pk Vol	2169	2507	3026	2960	2509	2797	2797	2153	4408		
PHF	0.968	0.995	0.974	0.966	0.955	0.981	0.951	0.988	0.978		
PM Peak	15:15	15:15	16:15	16:15	16:15	15:45	15:00	15:45	15:15		
Pk Vol	2094	2351	2913	2854	2556	2533	2663	2166	3996		
PHF	0.968	0.980	0.951	0.955	0.952	0.951	0.994	0.964	0.985		


Friday 9/1/2017
Vehicles per 15-minutes, all Payson intersections combined
7000
6000
5000
4000
3000
2000
1000
0
6:00 AM
6:30 AM
7:00 AM
7:30 AM
8:00 AM
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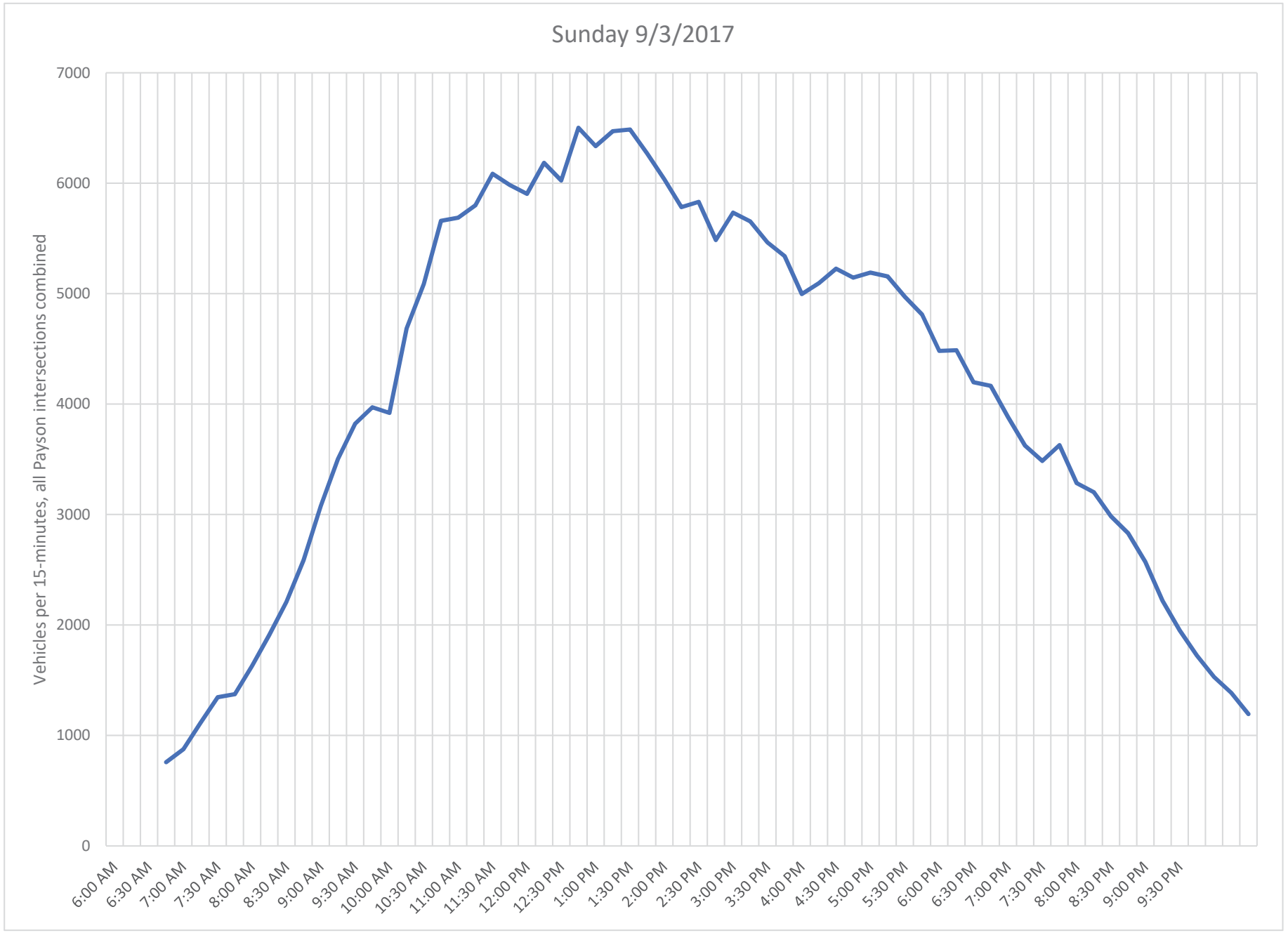
9:30 PM

Sunday 9/3/2017

Time	87 & Forest	87 & Malibu	87 & Bonita	87 & Main	87 & Casino	260 & Payson Village	260 & Manzanita	260 & Tyler	87 & 260	All Intersections	Peak Hour
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		
6:00	66	73	104	106	77	72	72	57	130	757	4089
6:15	76	76	126	117	94	85	80	66	153	873	4705
6:30	116	125	151	116	107	108	104	84	203	1114	5459
6:45	108	137	184	177	128	138	134	108	231	1345	6253
7:00	108	141	189	162	135	134	141	121	242	1373	7116
7:15	156	180	206	192	149	167	172	136	269	1627	8329
7:30	198	203	253	229	196	177	184	140	328	1908	9779
7:45	222	235	278	278	173	250	197	192	383	2208	11374
8:00	241	269	351	323	270	242	260	211	419	2586	12988
8:15	320	354	390	329	274	317	298	265	530	3077	14373
8:30	391	395	454	423	354	330	356	273	527	3503	15216
8:45	361	370	539	464	334	378	415	323	638	3822	16398
9:00	349	376	526	491	416	412	425	345	631	3971	17664
9:15	366	407	491	481	406	391	397	343	638	3920	19352
9:30	395	437	601	571	482	507	506	401	785	4685	21120
9:45	471	551	632	581	479	540	590	394	850	5088	22235
10:00	530	568	754	672	546	591	618	460	920	5659	23233
10:15	565	670	706	655	539	592	597	458	906	5688	23558
10:30	500	551	759	708	658	590	612	489	933	5800	23774
10:45	633	643	759	735	629	617	611	478	981	6086	24158
11:00	537	635	769	723	597	630	609	504	980	5984	24097
11:15	534	574	709	676	628	709	641	506	927	5904	24615
11:30	574	663	794	772	587	619	632	533	1010	6184	25047
11:45	544	574	744	721	575	655	678	518	1016	6025	25334
12:00	618	698	801	796	611	648	715	566	1049	6502	25795
12:15	637	714	774	746	591	657	695	522	1000	6336	25562
12:30	649	687	795	788	660	636	649	525	1082	6471	25261
12:45	608	700	819	787	643	655	688	538	1048	6486	24574
13:00	558	620	782	783	648	669	654	537	1018	6269	23919
13:15	528	614	765	765	652	595	632	512	972	6035	23136
13:30	514	578	745	697	602	618	631	456	943	5784	22835
13:45	553	587	744	739	595	595	593	458	967	5831	22705
14:00	523	570	690	657	546	535	560	516	889	5486	22338
14:15	540	588	721	697	603	584	606	476	919	5734	22192
14:30	492	526	733	701	559	594	608	510	931	5654	21454
14:45	444	505	746	714	625	542	595	465	828	5464	20895
15:00	498	528	663	654	559	554	544	462	878	5340	20657
15:15	403	436	627	635	551	534	559	432	819	4996	20462
15:30	434	487	671	633	543	516	527	437	847	5095	20657
15:45	438	476	698	672	583	541	543	448	827	5226	20718
16:00	430	498	676	608	519	554	550	443	867	5145	20464
16:15	493	505	627	659	576	539	531	427	834	5191	20130
16:30	437	474	680	650	612	517	526	452	808	5156	19421
16:45	386	431	641	648	597	500	535	423	811	4972	18753
17:00	420	439	583	593	534	512	522	438	770	4811	17979
17:15	388	406	590	589	514	451	444	360	740	4482	17333
17:30	381	402	574	540	493	464	493	392	749	4488	16735
17:45	351	374	553	527	481	416	435	347	714	4198	15870
18:00	348	370	552	545	493	435	419	339	664	4165	15157
18:15	331	360	513	501	466	396	372	296	649	3884	14620
18:30	307	342	509	479	392	357	348	293	596	3623	14020
18:45	321	321	456	435	377	369	364	271	571	3485	13599
19:00	292	334	494	478	372	404	366	287	601	3628	13098
19:15	285	311	469	431	329	319	323	263	554	3284	12301
19:30	288	306	436	415	338	314	310	243	552	3202	11588
19:45	212	246	432	393	355	303	303	257	483	2984	10605
20:00	241	250	379	367	321	278	285	233	477	2831	9572
20:15	218	244	327	316	291	277	282	202	414	2571	8464
20:30	156	155	317	305	260	252	229	182	363	2219	7422
20:45	162	166	285	260	239	176	178	152	333	1951	6588
21:00	107	121	254	235	231	177	176	124	298	1723	5830
21:15	116	131	225	194	163	155	149	125	271	1529	
21:30	96	95	194	203	185	144	137	95	236	1385	
21:45	102	93	163	154	152	112	126	95	196	1193	
Total	24759	27080	35992	34446	29284	28196	28622	22921	45341		
AM Peak	9:45	9:45	9:45	9:45	9:45	9:45	9:45	9:45	9:45		
Pk Vol	2066	2340	2851	2616	2222	2313	2417	1801	3609		
PHF	0.914	0.873	0.939	0.924	0.844	0.977	0.978	0.921	0.967		
MID Peak	12:00	12:00	12:00	12:30	12:30	11:15	12:00	12:00	12:00		
Pk Vol	2512	2799	3189	3123	2603	2631	2747	2151	4179		
PHF	0.968	0.980	0.973	0.991	0.986	0.928	0.960	0.950	0.966		
PM Peak	15:45	15:30	15:45	15:00	16:15	15:45	15:15	15:00	15:30		
Pk Vol	1798	1966	2681	2594	2319	2151	2179	1779	3375		
PHF	0.912	0.973	0.960	0.965	0.947	0.971	0.975	0.963	0.973		


Sunday 9/3/2017
Vehicles per 15-minutes, all Payson intersections combined
7000
6000
5000
4000
3000
2000
1000
0
6:00 AM
6:30 AM
7:00 AM
7:30 AM
8:00 AM
8:30 AM
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ADOT SR 87 to SR 260 Intersection Study:

Micro-Simulation Modeling, MPD0013

PROGRESS MEETING NOTES

Tuesday, August 13, 2019
10:00 AM - Noon
303 N. Beeline Highway, Payson – Police Department Training Room

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Moderator: Ray Leon
Attendees: See Sign-In Sheet

- **WELCOME AND INTRODUCTIONS**

Room introductions were made.

Curtis noted that LaRon's contract was terminated by the Payson Town Council on Thursday 8/8/19, and as such he will no longer participate in the project.

- **PROJECT STATUS**

The group was concerned about pedestrian data at the intersection of SR 87 & SR 260, since pedestrian volumes were collected at a time of year when school was out of session. T he group discussed obtaining information from local schools on starting/ending/break times. However, a preferable option would be to use ADOT's new CCTV camera installed at the intersection to collect volume and pedestrian data. George agreed to coordinate this data collection upon request.

While the Synchro model was not a main point of discussion, the group mentioned a concern about calibration of the Synchro model. Following the meeting, Lee Engineering determined that calibration of Synchro models is not a task typical of similar projects. Lee Engineering can investigate this further if needed.

The group also discussed the possibility of collecting data over the upcoming holiday weekend next month but agreed to defer a decision about additional data collection until identifying what other sources are available, as discussed later.

- **REVIEW OF CALIBRATED VISSIM MODEL**

Randy presented and discussed the VISSIM calibration effort to date. He pointed out a concern that traffic volume was collected on Labor Day 2017 and calibration data was collected on Memorial Day 2019. Anecdotal evidence suggests that traffic was much smoother on Memorial Day 2019, which has complicated the VISSIM calibration effort.

After discussion, Dan agreed to reach out to Tracy at ADOT for INRIX data from (at least) Labor Day 2017, which could be used and compared to the data from the VISSIM models and will report back on the availability of this data.

The group agreed that it may be possible to conduct the review of the calibrated VISSIM models by email if the volume and travel time results are within 5 to 10% of field observations.

Curtis mentioned that the driver behavior may be different on weekdays than weekends.

- **DISCUSSION OF ROUNDABOUT ALTERNATIVE SCOPE**

Lee Engineering agreed to provide a detailed breakdown of their fee proposal to evaluate the operational characteristics of a roundabout at SR-87 and SR-260. The scope is proposed to include evaluation of several possible roundabout configurations and working with ADOT to select a preferred alternative.

ADOT requested Lee Engineering to also provide a fee proposal to prepare a conceptual-level geometric configuration of the preferred roundabout alternative, less than 15% design, and to provide a construction cost estimate for this configuration. The right of way alignment will be provided by ADOT; it is preferable that the roundabout be configured so it remains within existing right of way.

The group discussed the safety concerns of signalized intersections vs. roundabouts.

The group discussed modelling several alternatives in VISSIM and choosing the most effective one.

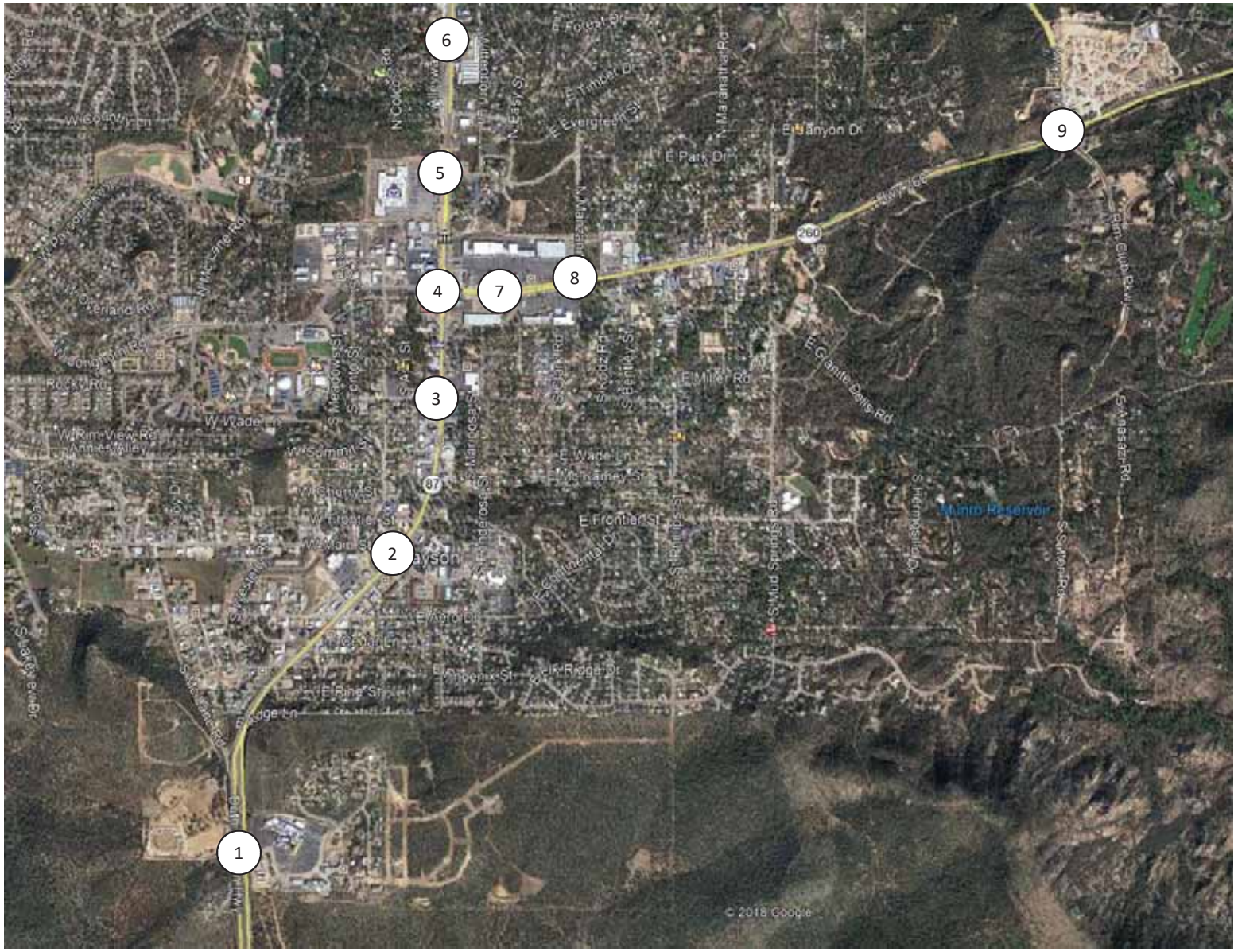
- **SCHEDULE, NEXT STEPS**

LEE Engineering will await the INRIX data to be provided by ADOT.

Lee Engineering will provide a revised fee proposal for the roundabout alternative that includes a preliminary geometric configuration and construction cost estimate.

Lee Engineering will review the project schedule once INRIX data is identified and propose an updated schedule to Ray.

ADOT Payson Micro-Simulation - Status Meeting		
August 13, 2019, 10:00 a.m., Police Department Training Room, 303 N. Beeline Hwy., Payson, Arizona		
Name	Representing	Email
THOMAS TOMLIN	ADOT TRAFFIC	ttomlin@azdot.gov
CURTIS WARD	TOWN OF PAYSON	cward@paysonaz.gov
STEVE OROSZ	ADOT NC District	SOROSZ@AZDOT.GOV
JOEY WOODWINE	ADOT N.W. REGION	JWOODWINE@AZDOT.GOV
Trevor S. Eltringham	ADOT NW Region Traffic	teltringham@azdot.gov
Ray Leon	ADOT	RLeon@
George Williams	ADOT	gwilliams2@azdot.gov
Dan Gabion	ADOT	dgabion@azdot.gov
Mohamed Jatit	LEE Engineering	mjatit@lee-eng.com
Randy Dittberner	Lee Engineering	rdittberner@leecas.com


6
5
4
7
8
9
3
2
1
E Park Dr
E Miller Rd
E Frontier St
W Wade Ln
E Wade Ln
Munro Reservoir
260
87
© 2018 Google

Volume Comparison - Friday (09/01/2017)

Node #	Intersection Name	Movement	Vissim Volume	Actual Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1086	1093	7	1%
		SBT	444	487	43	9%
2	SR 87 & Main St	NBT	1239	1253	14	1%
		SBT	664	723	59	8%
3	SR 87 & Bonita St	NBT	1378	1392	14	1%
		SBT	925	1010	85	8%
4	SR 87 & SR 260	NBT	705	701	-4	-1%
		NBR	759	768	9	1%
		NBL	51	52	1	2%
		SBT	480	502	22	4%
		SBR	164	169	5	3%
		SBL	264	273	9	3%
		EBT	307	315	8	3%
		EBR	83	83	0	0%
		EBL	269	275	6	2%
		WBT	206	233	27	12%
		WBR	273	311	38	12%
		WBL	532	608	76	13%
5	SR 87 & Malibu Dr	NBT	820	864	44	5%
		SBT	740	749	9	1%
6	SR 87 & Forest Dr	NBT	732	825	93	11%
		SBT	692	688	-4	-1%
7	SR 260 & Payson Village Access	EBT	1103	1140	37	3%
		WBT	748	763	15	2%
8	SR 260 & Manzanita/Granite Dells	EBT	975	1002	27	3%
		WBT	644	639	-5	-1%
9	SR 260 & Tyler Pkwy	EBT	1124	1166	42	4%
		WBT	647	653	6	1%
	Total		18054	18737	683	**4%**

Volume Comparison - Sunday (09/03/2017)

Node #	Intersection Name	Movement	Vissim Volume	Actual Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	792	762	-30	-4%
		SBT	964	1152	188	16%
2	SR 87 & Main St	NBT	979	988	9	1%
		SBT	1210	1460	250	17%
3	SR 87 & Bonita St	NBT	1157	1168	11	1%
		SBT	1342	1615	273	17%
4	SR 87 & SR 260	NBT	744	695	-49	-7%
		NBR	514	509	-5	-1%
		NBL	29	40	11	28%
		SBT	739	728	-11	-2%
		SBR	145	138	-7	-5%
		SBL	339	324	-15	-5%
		EBT	154	137	-17	-12%
		EBR	69	63	-6	-10%
		EBL	168	165	-3	-2%
		WBT	232	149	-83	-56%
		WBR	269	276	7	3%
		WBL	611	923	312	34%
5	SR 87 & Malibu Dr	NBT	937	913	-24	-3%
		SBT	996	1035	39	4%
6	SR 87 & Forest Dr	NBT	825	876	51	6%
		SBT	1038	1075	37	3%
7	SR 260 & Payson Village Access	EBT	599	829	230	28%
		WBT	989	1128	139	12%
8	SR 260 & Manzanita/Granite Dells	EBT	543	725	182	25%
		WBT	1060	1068	8	1%
9	SR 260 & Tyler Pkwy	EBT	625	807	182	23%
		WBT	1120	1128	8	1%
	Total		19189	20876		**8%**

ADOT SR 87 to SR 260 Intersection Study:

Micro-Simulation Modeling, MPD0013

PROGRESS MEETING NOTES

DRAFT

Thursday, February 13, 2020

10:00 AM - Noon

303 N. Beeline Highway, Payson – Community Development Conference Room

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Moderator: Ray Leon
Attendees: See Sign-In Sheet

- **Welcome and Introductions**
  Room introductions were made.

- **Roundabout Analysis at SR-87/SR-260**
  - **Review of Preliminary Capacity Analysis Results**
    Randy presented tables (attached) showing traffic operational analysis results of the existing signal and a modified signal with a second right-turn lane added, as well as a variety of roundabout alternatives. The analysis results were obtained using SIDRA software. All peaks in the existing condition operate at LOS F. Addition of a second northbound right turn lane offers considerable operational improvements for the northbound approach, and some improvements for the overall intersection level of service. Table 2 considers four roundabout alternatives with no auxiliary lanes, which the group agreed would not improve current conditions. Table 3 shows various configurations of roundabouts with no more than two lanes entering the circulating roadway. Table 4 deals with larger roundabouts, including at least one approach with more than two lanes, which offer a higher challenge for drivers.

    It was agreed that Layout J had the best performance based on the tabulated results, but has two approaches with 3 lanes, which could be out of context for Payson.

    The analysis did not address future volume projections, but capacity improvements need to be viewed in context of other intersections in the network.

    George stated that there could be a need to introduce pedestrian refuge islands and bypass lanes. Also, having 3 through lanes at more than two exits in a row may be confusing. He mentioned that alternatives E, H, and J have potential for further review.

The group discussed the configurations in Table 4, which include at least one approach with three lanes entering the roundabout. These configurations would require pedestrians to cross three lanes at a time, and would likely require a raised island separator or some kind of controlled crossing treatment, such as a Pedestrian Hybrid Beacon (HAWK).

Randy suggested that layout E has among the best operational performance among roundabouts with no more than two lanes entering the circulating roadway. This layout could be a preferred alternative.

Steve was concerned that layout E shows a queue length longer existing conditions, which may increase rear-end crashes. Randy pointed out that the southbound approach is the main issue in layout E, as in most other roundabout alternatives. Particularly during the Sunday peak hour, the very heavy westbound traffic does not allow many gaps for the southbound traffic. A metering signal or other metering approach may address this issue.

Steve asked if it would be possible to add dual right turn lanes on additional approaches. Steve advised that queues be considered, along with the pros and cons of pedestrian accommodations.

- **Discussion of Pedestrian Accommodations**

  Randy presented a slide focusing on pedestrian accommodations. There is no federal requirement that roundabout crosswalks be controlled. However, the proposed Public Rights of Way Accessibility Guidelines (PROWAG) would require controlled crossings or similar treatments on multilane crossings at roundabouts, but PROWAG has not been adopted and there is no indication when or if it will be.

  Sam mentioned that the ADOT policy is to comply with the Americans with Disability Act Accessibility Guidelines (ADAAG), which is currently in force, and "do the best we can" to address PROWAG requirements if possible on a project-by-project basis.

  George stated that a HAWK or RRRF should be used on multilane approaches. An example is Hayden Road/Northsight Blvd in Scottsdale. A similar example was shown on a slide. The example has PHBs on both approaching and departing legs of a roundabout with a pedestrian path through the splitter island in a Z-shape.

  Steve asked if a grade separated pedestrian crossing should be considered, which would need to be ADA compliant and would be a long-term solution. The group agreed that this is a costly solution but that it would eliminate pedestrian conflicts. George mentioned a grade-separated pedestrian crossing in Buckeye.

- **Decision About Proceeding with Footprint Evaluation**

  The group discussed that a decision to move to Phase 2 of the roundabout review does not signify that the roundabout is the preferred alternative, only that the roundabout is an alternative. Phase 2 will provide further information about the cost and size of the roundabout to help compare it with other alternatives.

Ray asked if the roundabout should be included as one of the alternatives. George mentioned that it is possible with dual right turn lanes and upgraded signal timing, Layouts E, H, and J could be considered. Nate agreed, and mentioned that it is best to consider layouts E and J, as H will probably fall out.

Ray discussed right of way. George noted that a fatal flaw of a roundabout would be taking a critical portion of a parking lot or building. Lee Engineering will consider right-of-way needs and attempt to choose a layout that minimizes or avoids major takes.

The group agreed to proceed with a phase 2 analysis of Layout J as an ultimate solution, with Layout E to be constructed as an interim, expandable treatment.

- **Other Alternatives**
  Dave mentioned that he has the original interconnect estimate from Trevor.

  Steve requested that a westbound right-turn lane be considered as a project alternative, and Randy agreed to incorporate the suggestion.

- **Calibrated VISSIM Model**
  Randy gave a VISSIM update showing model hours and travel time sources, and he discussed the history of traffic and travel time data collection on the project. At an earlier meeting, the group had decided to use INRIX data for VISSIM calibration purposes.

  Shafique asked if speed data was available. Randy mentioned that speed data was not available and that only travel time by segment from INRIX was available.

  Randy mentioned that more calibration of VISSIM is needed due to INRIX travel time data not sufficiently matching field conditions. A key concern is a large variability in the INRIX data during the peak hour. Randy said Lee Engineering will work to identify methods to handle this variability.

  The models currently show a travel time variance between field and model of 10% to 30%, and that another week is needed to refine the models. Ray proposed a two-week window.

  Randy mentioned that VISSIM model is shown using version 11 and showed a demo of the Friday peak-hour scenario.

  George advocated considering options away from the main intersection but short of a full Payson Bypass route to help improve conditions in the network.

- **Schedule, Next Steps**
  Lee Engineering will provide a meeting summary and handouts for review and comment.

  VISSIM models will be provided for review upon completion of calibration using Version 9 of the software.

MPD0013 – SR 87 TO SR 260 INTERSECTION STUDY (MICRO-SIMULATION MODELING)

THURSDAY, FEBRUARY 13, 2020 • 10:00 AM – 12:00 PM (NOON)

COMMUNITY DEVELOPMENT CONFERENCE ROOM • 303 N BEELINE HWY • PAYSON, AZ 85541

Completion of this sign-in sheet is completely voluntary and helps the project team keep an accurate record of meeting attendees. Under state law, any identifying information provided below will become part of the public record and, as such, must be released to any individual upon request. Please print clearly.

NAME	COMPANY	ADDRESS	PHONE	EMAIL
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Steve Crosz	ADOT	6989 2nd ST PV	(928) 277-5935	SCROSZ@AZDOT.GOV
Jory Woolwine	ADOT	200 N Colcord Rd Payson Az 85547	928-978-4531	JWoolwine@AZDOT.GOV
Trevor S. Eltringham	ADOT	6989 E 2ND ST. Prescott Valley	928-277-2915	teltringham@azdot.gov
Beena Chakkarabani	ADOT	1615 N Jackson St, PHX, AZ 85004	602-712-6248	bchakkarabani@azdot.gov
Shafiqul Islam	ADOT	1215 Jamison Dr	8603	ms islam@azdot.gov
Larry Halberstadt	Town of Payson	303 N. Beeline Hwy	(928) 472-5044	lhalberstadt@paysonaz.gov
Kathryn Hammond	ADOT	205 S. 17th Ave.	(602) 712-7343	khammond@azdot.gov
Wisam Qasim	ADOT	205 S. 17th Ave	602-712-7639	wqasim2@azdot.gov
Mohamed Jatit	LEE Engineering	3610 N. 44th St	602-443-8478	mjatit@lee-eng.com
Randy Dittberner	Lee Engineering	3610 N. 44th St	602-443-8479	rdittberner@lee-eng.com
Dave Bruggeman	"	"	602-955-7206	dbruggeman@lee-eng.com

Completion of this sign-in sheet is completely voluntary and helps the project team keep an accurate record of meeting attendees. Under state law, any identifying information provided below will become part of the public record and, as such, must be released to any individual upon request. Please print clearly.

NAME	COMPANY	ADDRESS	PHONE	EMAIL
PHONE ATTENDEES				
George Williams	ADOT			
Nati Reisner	ADOT			
Sheila DeSchaaf	Town of Payson			

Table 1. Intersection Capacity Analysis Results – SR 87 at SR 260 – Existing Signal

Existing Signal Control with Existing Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	116.7 (F)[1]	122.0 (F)	64.0 (E)	195.5 (F)	50.1 (D)	17 veh (NB)
Sunday	91.8 (F)	57.2 (E)	153.1 (F)	63.0 (E)	62.8 (E)	30 veh (WB)
Weekday	80.8 (F)	66.7 (E)	56.2 (E)	126.8 (F)	44.7 (D)	17 veh (NB)
Existing Signal Control with Two Northbound Right Turn Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	59.7 (E)[1]	122.0 (F)	64.0 (E)	34.8 (C)	50.1 (D)	17 veh (NB)
Sunday	83.0 (F)	57.2 (E)	153.1 (F)	33.8 (C)	62.8 (E)	30 veh (WB)
Weekday	46.1 (D)	66.7 (E)	56.2 (E)	33.8 (C)	44.7 (D)	17 veh (NB)

[1] Delay in seconds/vehicle (Level of Service) from *Synchro 10* HCM 6 methodology

Table 2. Intersection Capacity Analysis Results – SR 87 at SR 260 – No Auxiliary Lanes

Layout A – 1x2x2x2 Roundabout with 1 Lane Eastbound						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	128.9 (F), *1.91*[1]	442.7 (F), *1.91*	80.1 (F), *1.07*	83.0 (F), *1.09*	38.7 (E)	119 veh (EB)
Sunday	110.3 (F), *1.37*	219.5 (F), *1.37*	156.8 (F), *1.27*	25.5 (D)	112.8 (F), *1.15*	66 veh (WB)
Weekday	64.1 (F), *1.33*	195.8 (F), *1.33*	63.1 (F), *0.99*	41.1 (E)	41.3 (E)	44 veh (EB)
Layout B – 2x2x2x2 Roundabout						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	119.3 (F), *1.41*	99.1 (F), *1.06*	70.4 (F), *1.03*	212.7 (F), *1.41*	42.7 (E)	93 veh (NB)
Sunday	102.4 (F), *1.33*	48.7 (E)	181.6 (F), *1.33*	37.0 (E)	97.7 (F), *1.11*	73 veh (WB)
Weekday	55.9 (F), *1.03*	37.8 (E)	68.4 (F), *1.01*	63.2 (F), *1.03*	39.8 (E)	36 veh (NB)
Layout C 1 – 2x2x2x3 Roundabout with 3 Lanes Southbound						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	112.3 (F), *1.40*	97.1 (F), *1.05*	68.5 (F), *1.03*	210.4 (F), *1.40*	18.7 (C)	92 veh (NB)
Sunday	85.8 (F), *1.33*	65.1 (F), *0.83*	181.6 (F), *1.33*	42.9 (E)	28.5 (D)	73 veh (WB)
Weekday	50.8 (F), *1.03*	37.8 (E)	68.4 (F), *1.01*	63.2 (F), *1.03*	19.5 (C)	36 veh (NB)
Layout C 2 – 2x3x2x2 Roundabout with 3 Lanes Westbound						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	107.4 (F), *1.39*	103.4 (F), *1.07*	29.4 (D)	206.5 (F), *1.39*	45.6 (E)	91 veh (NB)
Sunday	95.6 (F), *1.45*	50.0 (E)	45.7 (E)	28.1 (D)	236.5 (F), *1.45*	77 veh (SB)
Weekday	44.8 (E), *1.03*	38.4 (E)	25.1 (D)	63.2 (F), *1.03*	41.0 (E)	36 veh (NB)

[1] Delay in seconds/vehicle (Level of Service) from *SIDRA* HCM 6 methodology, v/c ratio for approach with LOS F or intersection with LOS E or F

Table 3. Intersection Capacity Analysis Results – SR 87 at SR 260 – 2 Lane Roundabout Comparison

Layout B – 2x2x2x2 Roundabout						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	119.3 (F), *1.41*	99.1 (F), *1.06*	70.4 (F), *1.03*	212.7 (F), *1.41*	42.7 (E)	93 veh (NB)
Sunday	102.4 (F), *1.33*	48.7 (E)	181.6 (F), *1.33*	37.0 (E)	97.7 (F), *1.11*	73 veh (WB)
Weekday	55.9 (F), *1.03*	37.8 (E)	68.4 (F), *1.01*	63.2 (F), *1.03*	39.8 (E)	36 veh (NB)
Layout D – 2x2x2x2 Roundabout with Westbound Right Turn Lane						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	105.3 (F), *1.39*	103.4 (F), *1.07*	21.9 (C)	206.5 (F), *1.39*	45.6 (E)	91 veh (NB)
Sunday	93.1 (F), *1.37*	49.1 (E)	67.3 (F), *1.06*	29.6 (D)	202.2 (F), *1.37*	69 veh (SB)
Weekday	44.6 (E), *1.03*	38.4 (E)	24.3 (C)	63.2 (F), *1.03*	41.0 (E)	36 veh (NB)
Layout E – 2x2x2x2 Roundabout with Westbound and Northbound Right Turn Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	44.1 (E), *1.17*	110.1 (F), *1.17*	46.3 (E)	10.6 (B)	48.4 (E)	29 veh (EB)
Sunday	86.3 (F), *1.37*	49.1 (E)	67.3 (F), *1.06*	6.9 (A)	202.2 (F), *1.37*	69 veh (SB)
Weekday	24.4 (C)	41.9 (E)	25.8 (D)	6.9 (A)	41.3 (E)	13 veh (SB)
Layout F – 2x2x2x2 Roundabout with Northbound Right Turn Lane						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	65.6 (F), *1.29*	68.4 (F), *1.03*	168.9 (F), *1.29*	11.7 (B)	24.6 (C)	58 veh (WB)
Sunday	93.6 (F), *1.33*	48.6 (E)	181.6 (F), *1.33*	7.6 (A)	97.7 (F), *1.11*	73 veh (WB)
Weekday	36.2 (E), *1.03*	39.9 (E)	74.9 (F), *1.03*	6.9 (A)	37.7 (E)	24 veh (WB)

[1] Delay in seconds/vehicle (Level of Service) from *SIDRA* HCM 6 methodology, v/c ratio for approach with LOS F or intersection with LOS E or F

Table 4. Intersection Capacity Analysis Results – SR 87 at SR 260 – 3 Lane Roundabout Comparison

Layout C 1 – 2x2x2x3 Roundabout with 3 Lanes Southbound						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	112.3 (F), *1.40*	97.1 (F), *1.05*	68.5 (F), *1.03*	210.4 (F), *1.40*	18.7 (C)	92 veh (NB)
Sunday	85.8 (F), *1.33*	65.1 (F), *0.83*	181.6 (F), *1.33*	42.9 (E)	28.5 (D)	73 veh (WB)
Weekday	50.8 (F), *1.03*	37.8 (E)	68.4 (F), *1.01*	63.2 (F), *1.03*	19.5 (C)	36 veh (NB)
Layout C 2 – 2x3x2x2 Roundabout with 3 Lanes Westbound						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	107.4 (F), *1.39*	103.4 (F), *1.07*	29.4 (D)	206.5 (F), *1.39*	45.6 (E)	91 veh (NB)
Sunday	95.6 (F), *1.45*	50.0 (E)	45.7 (E)	28.1 (D)	236.5 (F), *1.45*	77 veh (SB)
Weekday	44.8 (E), *1.03*	38.4 (E)	25.1 (D)	63.2 (F), *1.03*	41.0 (E)	36 veh (NB)
Layout G – 2x2x2x3 Roundabout with 3 Lanes Southbound and Westbound Right Turn Lane						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	99.7 (F), *1.39*	103.4 (F), *1.07*	21.9 (C)	206.5 (F), *1.39*	19.8 (C)	91 veh (NB)
Sunday	61.8 (F), *1.06*	109.8 (F), *0.99*	67.2 (F), *1.06*	42.8 (E)	60.8 (F), *0.99*	28 veh (WB)
Weekday	39.9 (E), *1.03*	38.4 (E)	24.3 (C)	63.2 (F), *1.03*	19.9 (C)	36 veh (NB)
Layout H – 2x2x2x3 Roundabout with 3 Lanes SB Plus Westbound & Northbound Right Turn Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	36.2 (E), *1.07*	103.4 (F), *1.07*	43.3 (E)	10.9 (A)	20.4 (C)	19 veh (EB)
Sunday	51.4 (F), *1.06*	109.8 (F), *0.99*	67.2 (F), *1.06*	8.1 (A)	60.8 (F), *0.99*	28 veh (WB)
Weekday	18.6 (C)	38.4 (E)	25.8 (D)	6.9 (A)	20.0 (C)	7 veh (WB)
Layout I 1 – 2x2x2x3 Roundabout with 3 Lanes Southbound and Northbound Right Turn Lane						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	62.5 (F), *1.29*	62.9 (F), *0.93*	168.9 (F), *1.29*	12.0 (B)	13.9 (B)	58 veh (WB)
Sunday	75.4 (F), *1.33*	65.1 (F), *0.83*	181.6 (F), *1.33*	8.1 (A)	28.5 (D)	73 veh (WB)
Weekday	31.2 (D)	36.7 (E)	74.9 (F), *1.03*	6.9 (A)	18.9 (C)	24 veh (WB)
Layout I 2 – 2x3x2x2 Roundabout with 3 Lanes Westbound and Northbound Right Turn Lane						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	46.9 (E), *1.12*	103.4 (F), *1.07*	64.2 (F), *1.12*	10.9 (B)	43.7 (E)	34 veh (WB)
Sunday	89.1 (F), *1.45*	50.0 (E)	45.7 (E)	6.8 (A)	236.5 (F), *1.45*	77 veh (SB)
Weekday	24.2 (C)	38.4 (E)	26.6 (D)	6.9 (A)	41.3 (E)	13 veh (SB)
Layout J – 2x3x2x3 Roundabout with 3 Lanes SB & WB Plus WB & NB Right Turn Lanes						
Peak Hour	Intersection	EB Longhorn Rd	WB SR 260	NB SR 87	SB SR 87	Max 95th Percentile Queue
Friday	30.4 (D)	103.4 (F), *1.07*	21.8 (C)	10.9 (B)	20.4 (C)	19 veh (EB)
Sunday	45.8 (E), *1.05*	114.5 (F), *1.01*	35.5 (E)	8.1 (A)	75.8 (F), *1.05*	22 veh (SB)
Weekday	16.0 (C)	37.4 (E)	16.6 (C)	6.8 (A)	19.9 (C)	6 veh (SB)

[1] Delay in seconds/vehicle (Level of Service) from *SIDRA* HCM 6 methodology, v/c ratio for approach with LOS F or intersection with LOS E or F

PAYSON TRAFFIC STUDY UPDATE

FEB. 13, 2020

1

AGENDA

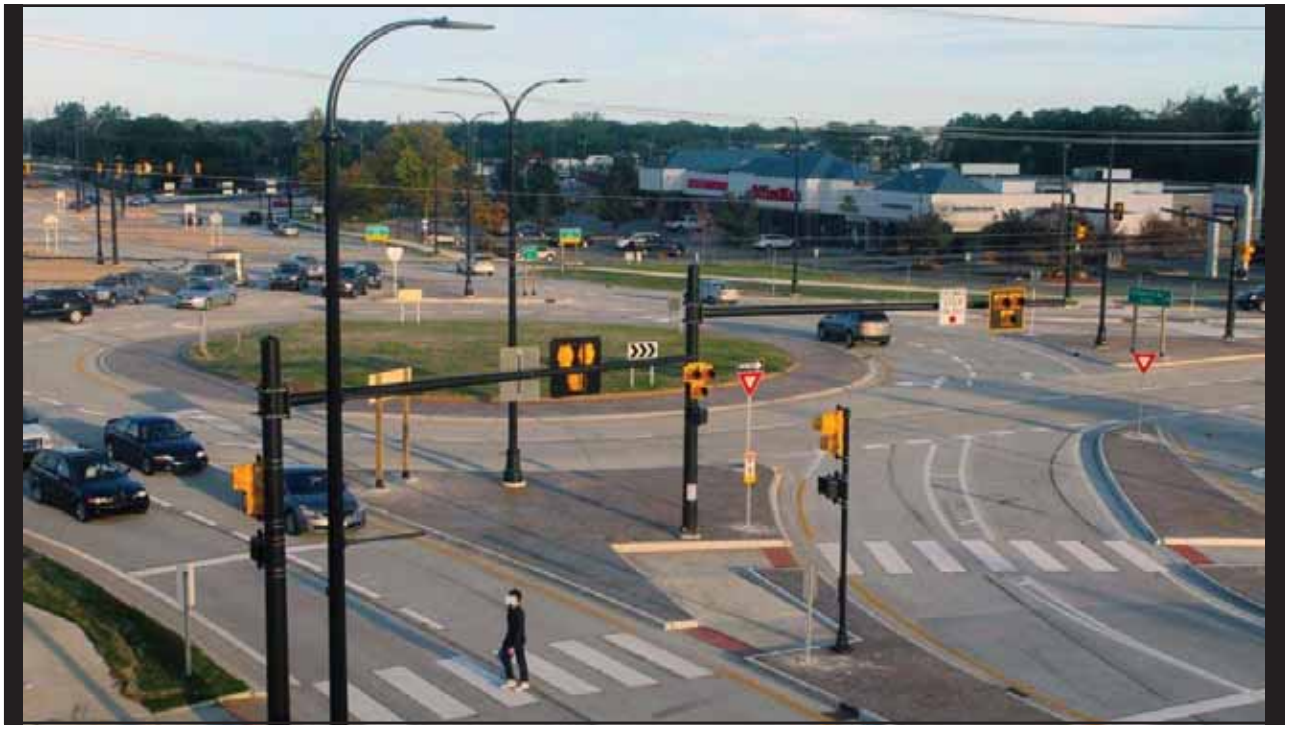
- Roundabout Update
- VISSIM Calibration Update

2

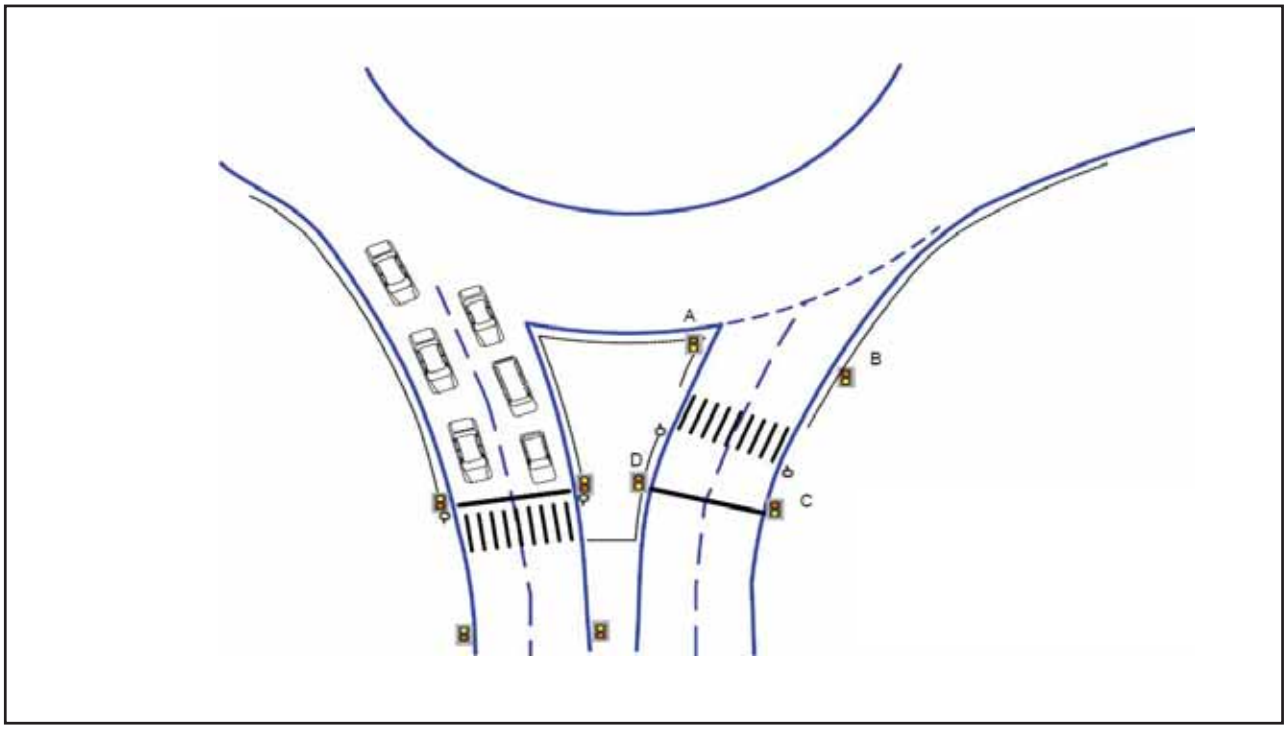
PEDESTRIANS AT ROUNDABOUTS

- No current requirement for crosswalks to be controlled
- PROWAG: If adopted, would require a pedestrian treatment across multi-lane crossings at new roundabouts:
  - Pedestrian-activated traffic signal
  - Pedestrian Hybrid Beacon (PHBs)
  - "Other treatment that results in substantially equivalent accessibility"

3



4

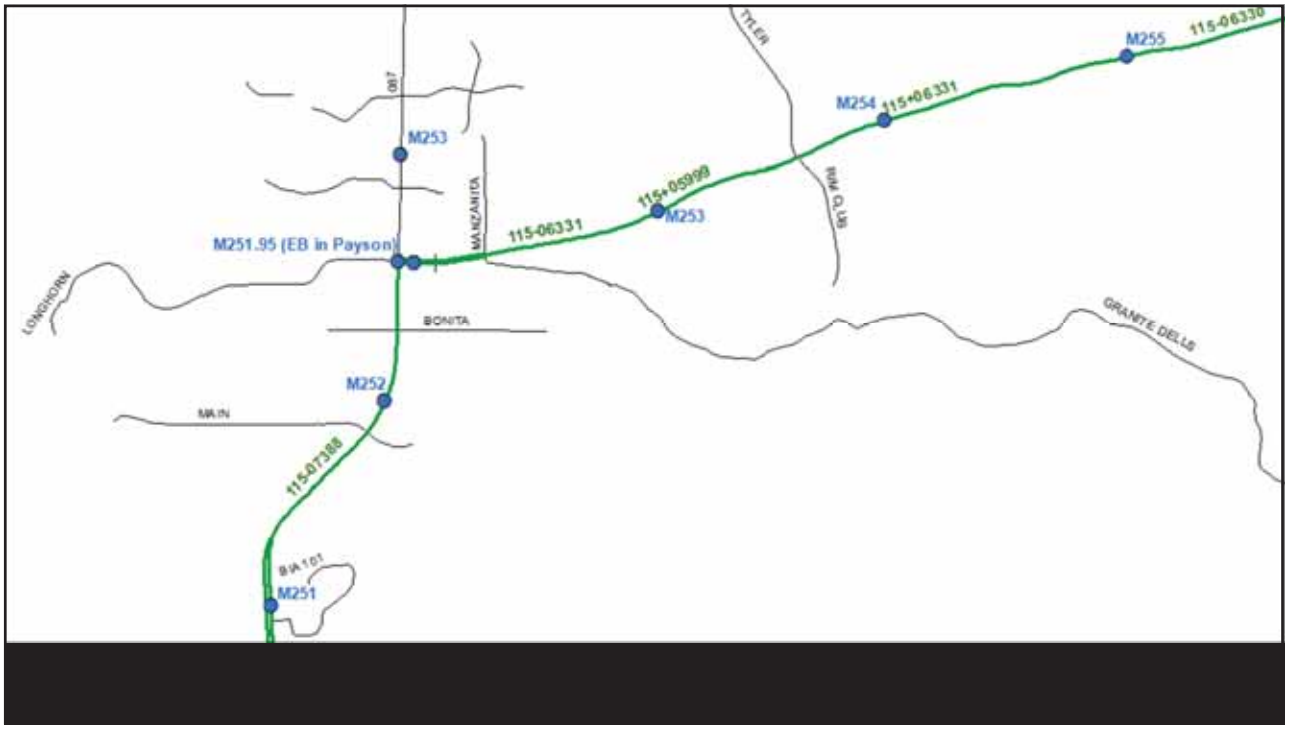


5

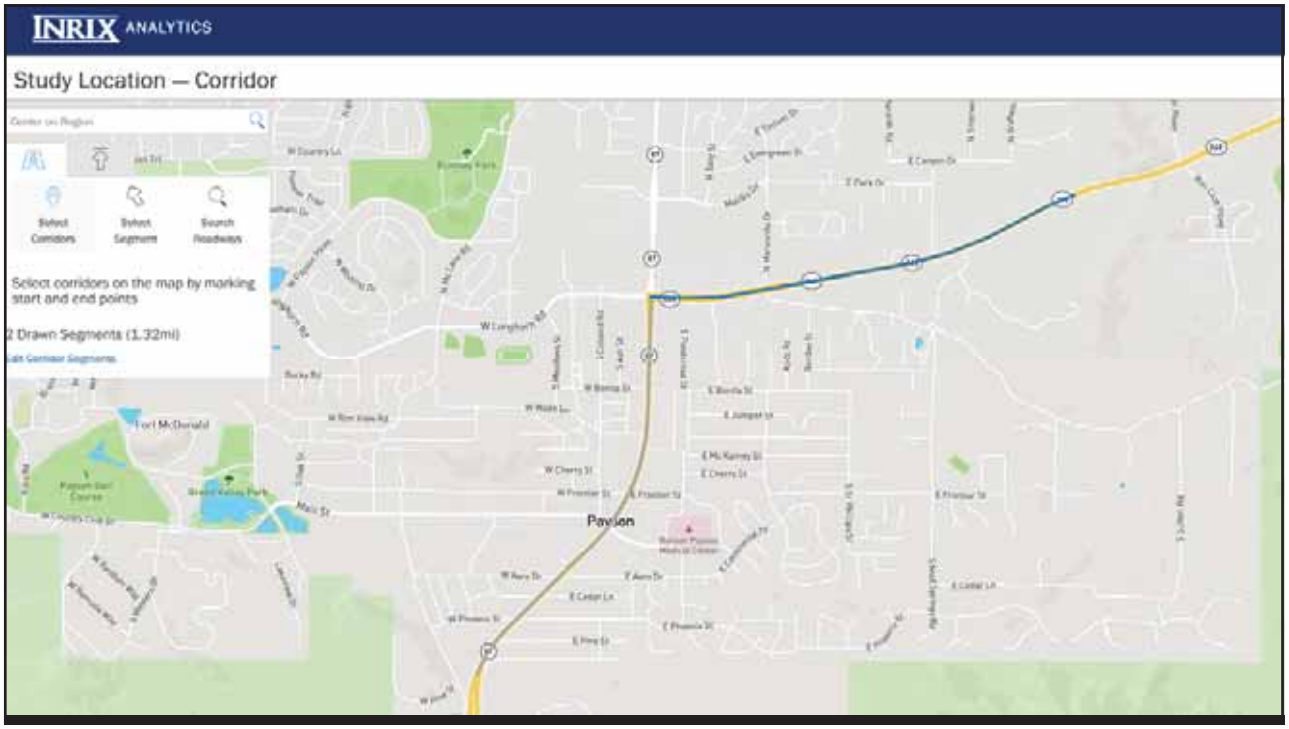
VISSIM UPDATE

- Modeling hours:
  - Friday Holiday, 11:30 a.m. to 12:30 p.m.
  - Sunday Holiday, 12:00 to 1:00 p.m.
  - Weekday, 11:45 a.m. to 12:45 p.m.
- Travel Time Source
  - ARID vs. INRIX

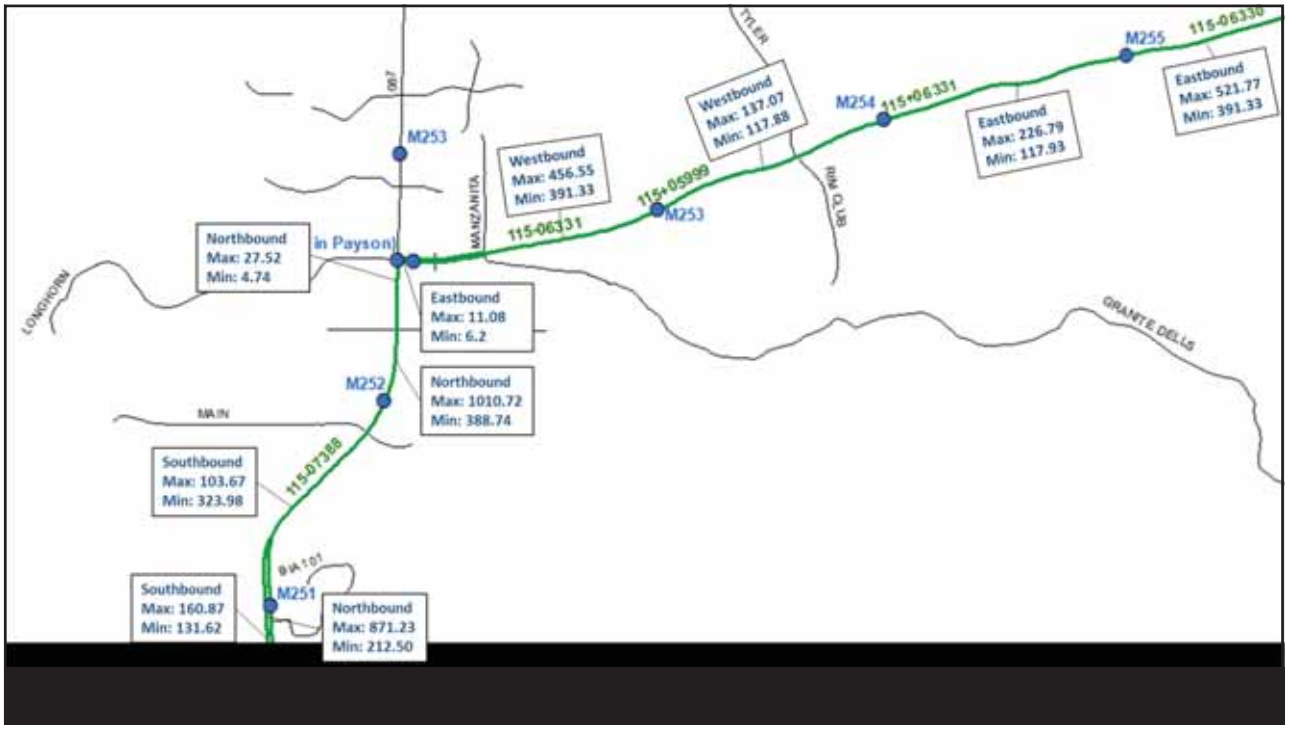
6


M255
115-06330
M254
115+06331
M253
115+05999
M253
115-06331
M251.95 (EB in Payson)
MANZANITA
TYLER
BONITA
LONGHORN
GRANITE DELLS
M252
MAIN
115-07388
M251

7


INRIX ANALYTICS
Study Location — Corridor
Select corridors on the map by marking start and end points
2 Drawn Segments (1.32mi)
Payson

8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Westbound
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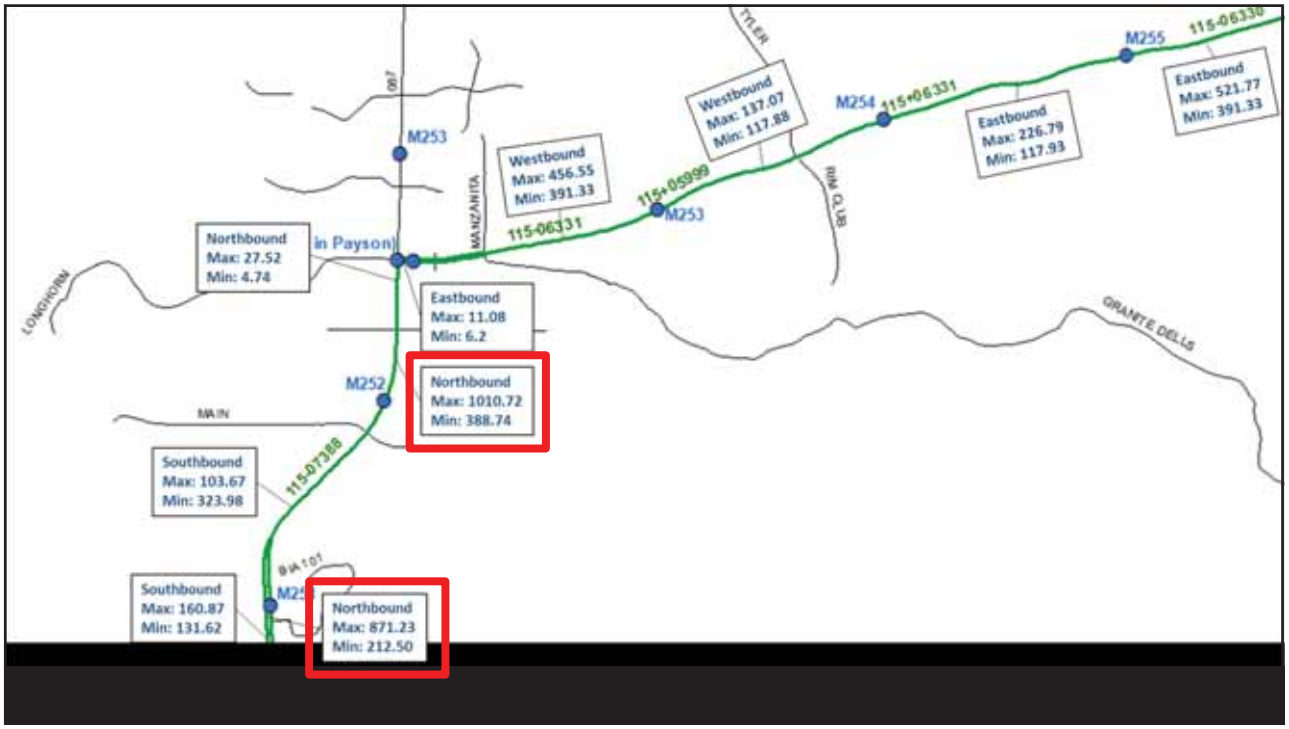
Min: 391.33
115-06331
115+05999
M253
Westbound
Max: 137.07
Min: 117.88
M254
115+06331
Eastbound
Max: 226.79
Min: 117.93
M255
115-06330
Eastbound
Max: 521.77
Min: 391.33
Northbound
Max: 27.52
Min: 4.74
in Payson)
Eastbound
Max: 11.08
Min: 6.2
M252
Northbound
Max: 1010.72
Min: 388.74
MAIN
Southbound
Max: 103.67
Min: 323.98
115-07388
M251
Southbound
Max: 160.87
Min: 131.62
Northbound
Max: 871.23
Min: 212.50
MANZANITA
RIM CLUB
TYLER
LONGHORN
GRANITE DELLS

9


M253
Westbound
Max: 456.55
Min: 391.33
115-06331
115+05999
M253
Westbound
Max: 137.07
Min: 117.88
M254
115+06331
Eastbound
Max: 226.79
Min: 117.93
M255
115-06330
Eastbound
Max: 521.77
Min: 391.33
Northbound
Max: 27.52
Min: 4.74
in Payson)
Eastbound
Max: 11.08
Min: 6.2
M252
Northbound
Max: 1010.72
Min: 388.74
MAIN
Southbound
Max: 103.67
Min: 323.98
115-07388
Southbound
Max: 160.87
Min: 131.62
Northbound
Max: 871.23
Min: 212.50
MANZANITA
RIM CLUB
TYLER
LONGHORN
GRANITE DELLS

10

APPENDIX B

Synchro Results and Timing Plans

Proposed Holiday Plan - Friday

Optimize SR 268/SR 87 first (Cycle = 130 Sec)
Build coordination away from SR 260/SR 87
No ped data available, but some can do cross street ped fit.
Do not include Tyler (1.3 mi) or Casino (.35 mi) due to distance

End to End Greenbands

		SR 87		SR 260	
	PI	NB	SB	EB	WB
	203.8	0	0	27	0

Segment Greenbands

SR 87		SR 260	
NB	SB	EB	WB
23 - 68	28 - 54	27 - 77	6 - 41

Notes:

<< Half Cycle at Forest to avoid v/c>1. E/W Peds do not fit.
<< Cross street peds fit @ Malibu, Bonita, WB Main, Payson Village, Manzanita
<< Bonita EB LOS=F due to long cycle, but allows N/S traffic to flow well
<< Payson Village NB Lt LOS=F due to long cycle, but allows E/W traffic to flow well
<< Manzanita SB Lt LOS=F due to long cycle length, but allows E/W traffic to flow well
<< WB Lt traffic from SR260 should be able to get through Bonita and Main and out of town
<< SB Lt traffic from SR87 should be able to get through Payson Village and Manzanita and out of town

Proposed Holiday Plan - Sunday

Optimize SR 268/SR 87 first (Cycle = 130 Sec)
Build coordination away from SR 260/SR 87
No ped data available, but some can do cross street ped fit.
Do not include Tyler (1.3 mi) or Casino (.35 mi) due to distance

End to End Greenbands

		SR 87		SR 260	
	PI	NB	SB	EB	WB
	186.3	5	28	13	26

Segment Greenbands

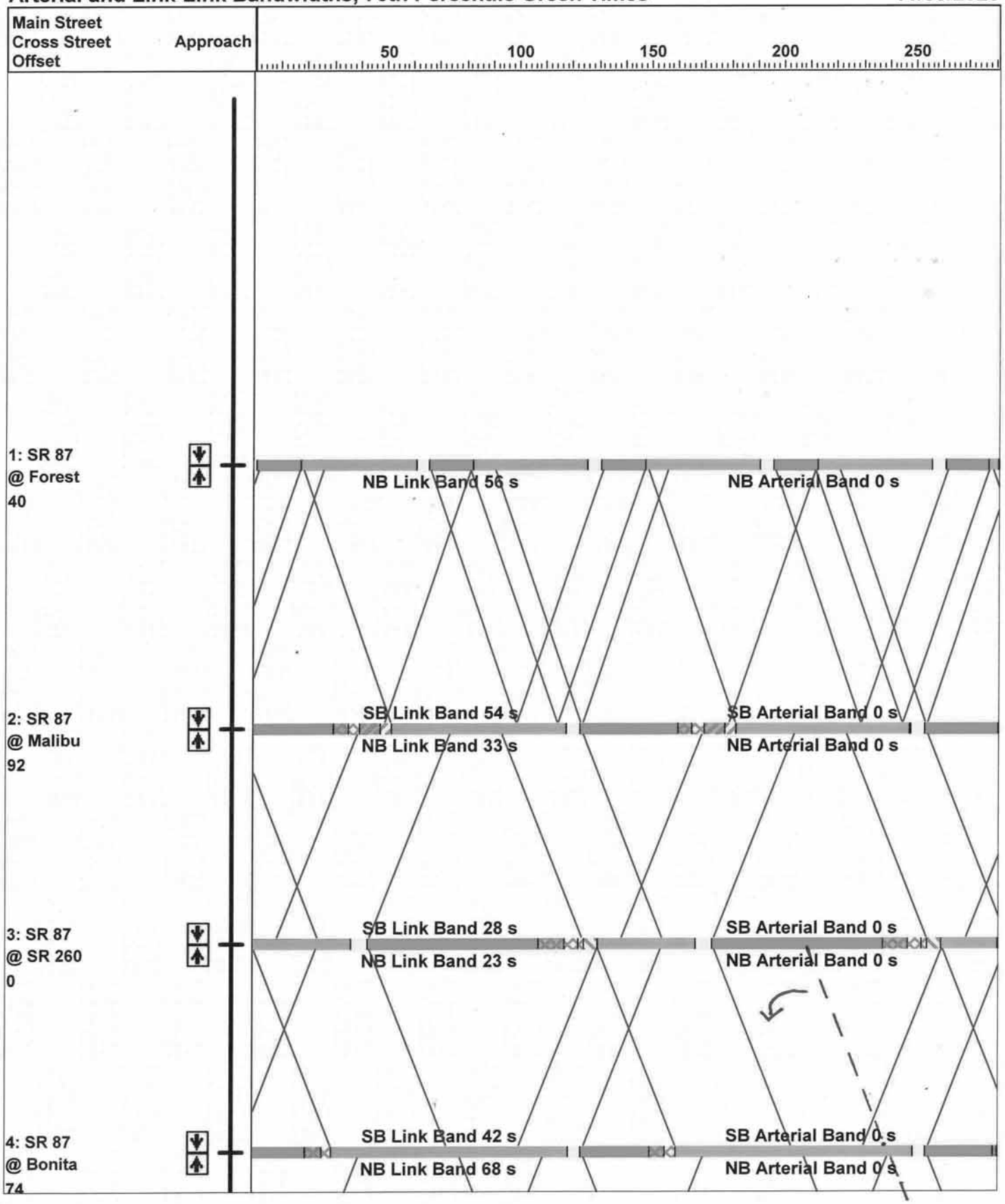
SR 87		SR 260	
NB	SB	EB	WB
Dec-67	28 - 58	13 - 77	26 - 58

Notes:

<< Half Cycle at Forest to avoid LOS=F for WB. E/W Peds do not fit.
<< Cross street peds fit @ Malibu, Bonita, WB Main, Payson Village, Manzanita
<< Bonita EB LOS=F due to long cycle, but allows N/S traffic to flow well
<< Payson Village NB Lt LOS=F due to long cycle, but allows E/W traffic to flow well
<< Most WB Lt traffic from SR260 should be able to get through Bonita, but may get stopped at Main
<< SB Lt traffic from SR87 should be able to get through Payson Village and Manzanita and out of town

C = 130

Time-Space Diagram - SR 87
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 11/03/2020

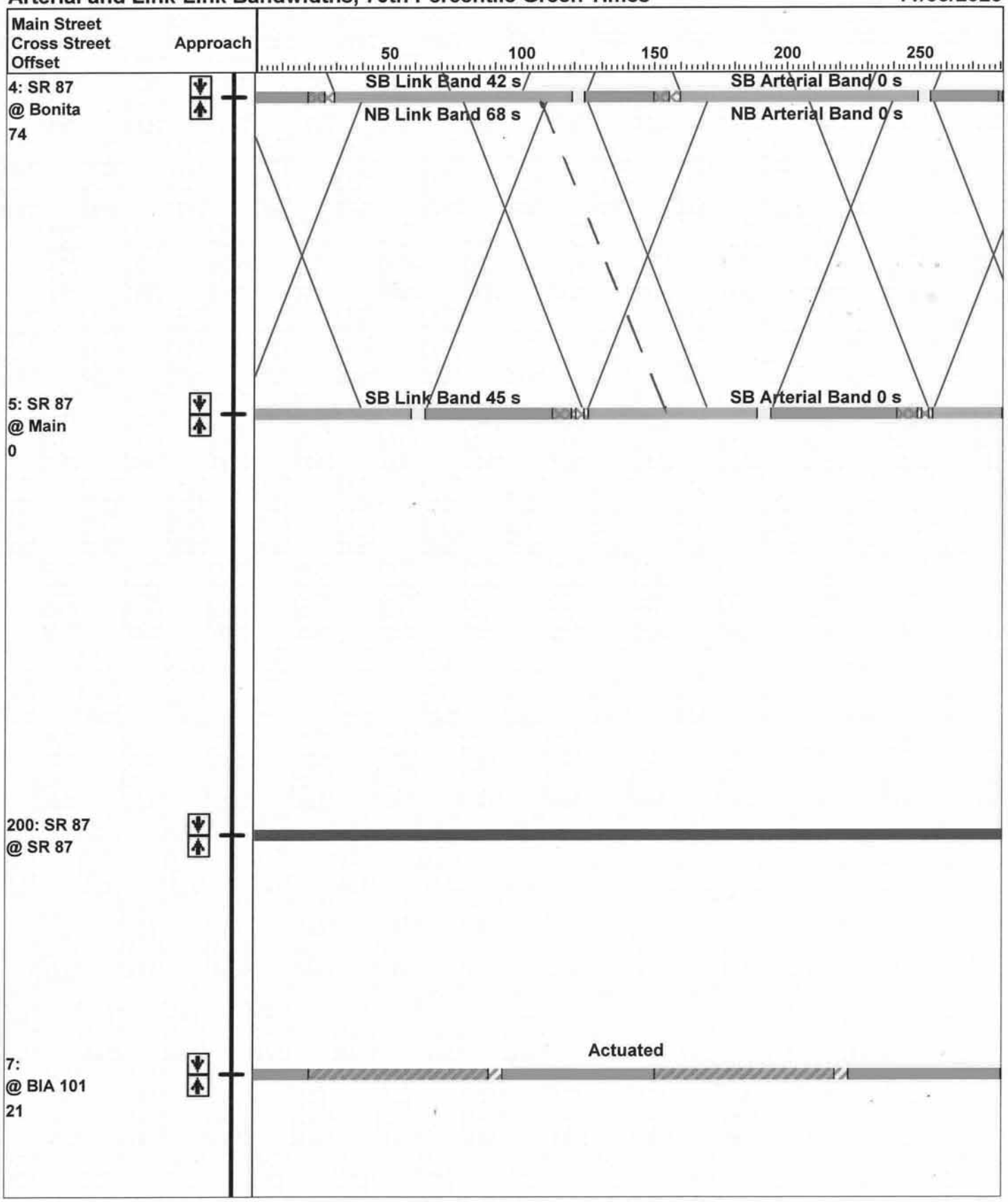


HOLIDAY FRIDAY PROPOSED

C = 130

Time-Space Diagram - SR 87

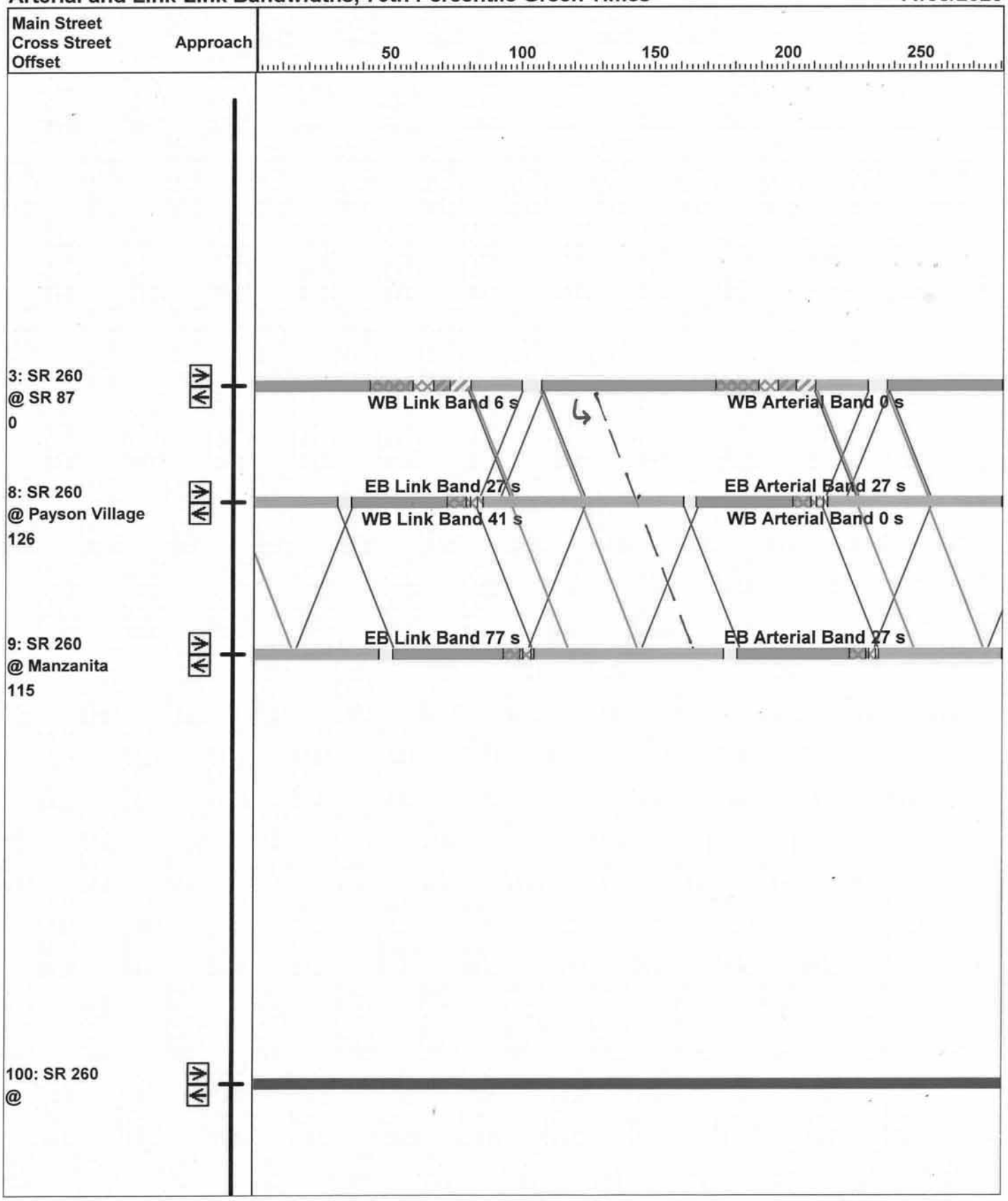
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 11/03/2020



HOLIDAY FRIDAY PROPOSED

C = 130

Time-Space Diagram - SR 260
Arterial and Link-Link Bandwidths, 70th Percentile Green Times **11/03/2020**

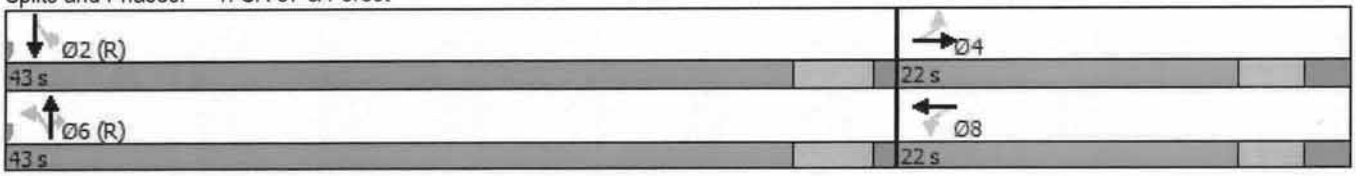


HOLIDAY FRIDAY PROPOSED

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	45	38	81	31	84	921	55	31	674
Future Volume (vph)	45	38	81	31	84	921	55	31	674
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		6			2
Permitted Phases	4		8		6		6	2	
Detector Phase	4	4	8	8	6	6	6	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	12.5	12.5	12.5	12.5	25.0	25.0	25.0	25.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	43.0	43.0	43.0	43.0	43.0
Total Split (%)	33.8%	33.8%	33.8%	33.8%	66.2%	66.2%	66.2%	66.2%	66.2%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	2.3	2.3	2.3	2.3	1.1	1.1	1.1	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	9.6	9.6	9.6	9.6	48.4	48.4	48.4	48.4	48.4
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.26	0.46	0.49	0.38	0.18	0.38	0.05	0.09	0.29
Control Delay	27.0	13.1	34.1	12.9	4.8	6.3	1.4	4.9	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	13.1	34.1	12.9	4.8	6.3	1.4	4.9	4.3
LOS	C	B	C	B	A	A	A	A	A
Approach Delay		16.5		21.8		5.9			4.3
Approach LOS		B		C		A			A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 40 (62%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: SR 87 & Forest



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	163	25	61	30	54	221	896	54	742	130
Future Volume (vph)	163	25	61	30	54	221	896	54	742	130
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	custom
Protected Phases	7	4	3	8		1	6	5	2	
Permitted Phases	4		8		8	6		2		6
Detector Phase	7	4	3	8	8	1	6	5	2	6
Switch Phase										
Minimum Initial (s)	5.0	6.0	5.0	6.0	6.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.8	37.9	10.8	40.9	40.9	9.3	33.2	9.4	33.3	33.2
Total Split (s)	14.0	42.0	14.0	42.0	42.0	25.0	64.0	10.0	49.0	64.0
Total Split (%)	10.8%	32.3%	10.8%	32.3%	32.3%	19.2%	49.2%	7.7%	37.7%	49.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.0	3.9	3.9
All-Red Time (s)	2.8	2.9	2.8	2.9	2.9	1.3	1.3	1.4	1.4	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.9	5.8	5.9	5.9	4.3	5.2	4.4	5.3	5.2
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	25.5	14.4	12.9	6.7	6.7	94.4	85.6	80.6	74.3	85.6
Actuated g/C Ratio	0.20	0.11	0.10	0.05	0.05	0.73	0.66	0.62	0.57	0.66
v/c Ratio	0.68	0.45	0.42	0.35	0.28	0.47	0.44	0.17	0.40	0.13
Control Delay	58.3	21.7	49.5	69.4	3.2	4.2	6.5	11.0	22.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	21.7	49.5	69.4	3.2	4.2	6.5	11.0	22.0	4.8
LOS	E	C	D	E	A	A	A	B	C	A
Approach Delay		43.6		36.4			6.1		18.9	
Approach LOS		D		D			A		B	

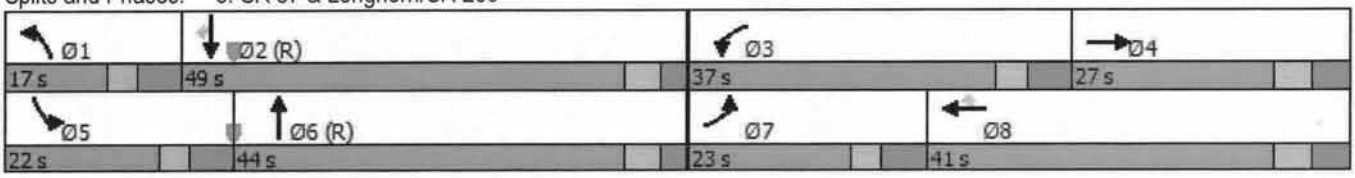
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 92 (71%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 16.7	Intersection LOS: B
Intersection Capacity Utilization 64.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR 87 & Rumsey/Malibu

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	275	315	608	233	311	52	701	768	273	502	169
Future Volume (vph)	275	315	608	233	311	52	701	768	273	502	169
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4	3	8		1	6		5	2	
Permitted Phases					8			Free			2
Detector Phase	7	4	3	8	8	1	6		5	2	2
Switch Phase											
Minimum Initial (s)	10.0	6.0	6.0	6.0	6.0	6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	17.4	13.5	13.4	13.5	13.5	13.2	41.3		13.2	41.3	41.3
Total Split (s)	23.0	27.0	37.0	41.0	41.0	17.0	44.0		22.0	49.0	49.0
Total Split (%)	17.7%	20.8%	28.5%	31.5%	31.5%	13.1%	33.8%		16.9%	37.7%	37.7%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.6	3.0	3.6		3.0	3.6	3.6
All-Red Time (s)	4.4	3.9	4.4	3.9	3.9	4.2	2.7		4.2	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.4	7.5	7.4	7.5	7.5	7.2	6.3		7.2	6.3	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	14.5	18.5	28.6	32.6	32.6	8.0	40.6	130.0	13.9	49.1	49.1
Actuated g/C Ratio	0.11	0.14	0.22	0.25	0.25	0.06	0.31	1.00	0.11	0.38	0.38
v/c Ratio	0.78	0.86	0.88	0.54	0.63	0.52	0.69	0.53	0.81	0.41	0.25
Control Delay	70.8	68.4	61.5	53.4	31.1	65.4	47.1	2.1	59.8	29.3	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	68.4	61.5	53.4	31.1	65.4	47.1	2.1	59.8	29.3	11.5
LOS	E	E	E	D	C	E	D	A	E	C	B
Approach Delay		69.4		51.6			25.0			34.9	
Approach LOS		E		D			C			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 41.3	Intersection LOS: D
Intersection Capacity Utilization 89.3%	ICU Level of Service E
Analysis Period (min) 15	

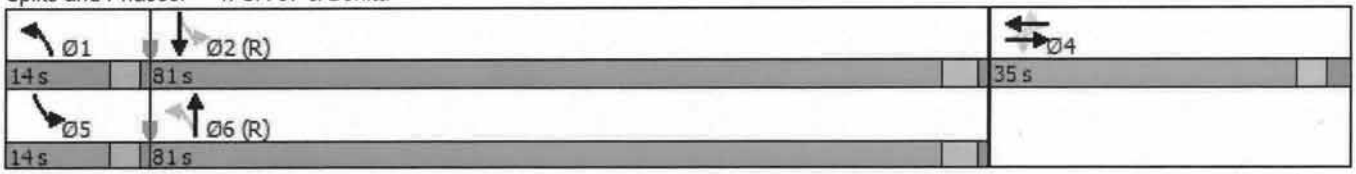
Splits and Phases: 3: SR 87 & Longhorn/SR 260



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	90	74	72	52	23	1379	81	1038
Future Volume (vph)	90	74	72	52	23	1379	81	1038
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4		4	1	6	5	2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	25.0	6.0	25.0
Minimum Split (s)	32.5	32.5	32.5	32.5	10.5	29.7	10.5	29.7
Total Split (s)	35.0	35.0	35.0	35.0	14.0	81.0	14.0	81.0
Total Split (%)	26.9%	26.9%	26.9%	26.9%	10.8%	62.3%	10.8%	62.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	1.0	1.1	1.0	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	4.0	4.7	4.0	4.7
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	16.9	16.9	16.9	16.9	99.3	92.6	101.5	96.9
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.76	0.71	0.78	0.75
v/c Ratio	1.02	0.45	0.53	0.62	0.07	0.61	0.36	0.45
Control Delay	150.6	50.1	63.9	39.2	1.5	4.5	7.4	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	150.6	50.1	63.9	39.2	1.5	4.5	7.4	4.6
LOS	F	D	E	D	A	A	A	A
Approach Delay		97.5		46.9		4.5		4.8
Approach LOS		F		D		A		A

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 75.7%	ICU Level of Service D
Analysis Period (min) 15	

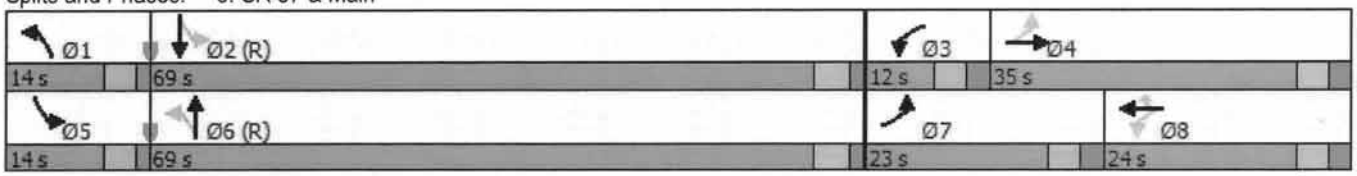
Splits and Phases: 4: SR 87 & Bonita



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	220	102	68	111	71	82	1253	101	723
Future Volume (vph)	220	102	68	111	71	82	1253	101	723
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8		1	6	5	2
Permitted Phases	4		8		8	6		2	
Detector Phase	7	4	3	8	8	1	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	15.0	5.0	15.0
Minimum Split (s)	10.9	10.4	10.9	23.4	23.4	9.5	25.1	10.0	34.1
Total Split (s)	23.0	35.0	12.0	24.0	24.0	14.0	69.0	14.0	69.0
Total Split (%)	17.7%	26.9%	9.2%	18.5%	18.5%	10.8%	53.1%	10.8%	53.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	4.5	5.1	4.5	5.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	36.4	26.1	19.3	12.3	12.3	78.2	71.0	80.1	71.9
Actuated g/C Ratio	0.28	0.20	0.15	0.09	0.09	0.60	0.55	0.62	0.55
v/c Ratio	0.68	0.52	0.36	0.69	0.27	0.26	0.72	0.55	0.48
Control Delay	48.8	45.5	40.1	75.9	2.4	11.9	26.2	23.1	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	45.5	40.1	75.9	2.4	11.9	26.2	23.1	20.6
LOS	D	D	D	E	A	B	C	C	C
Approach Delay		47.3		45.3			25.3		20.9
Approach LOS		D		D			C		C

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 76.1%	ICU Level of Service D
Analysis Period (min) 15	

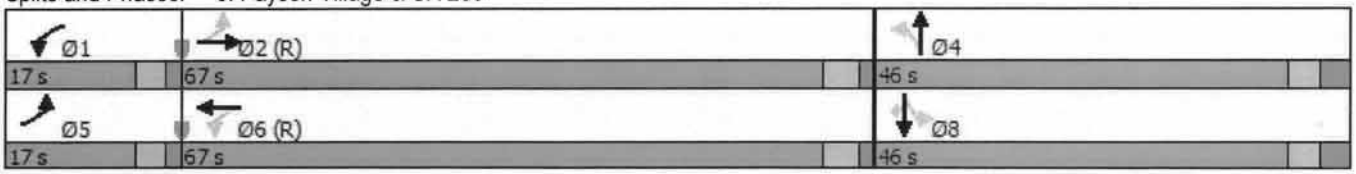
Splits and Phases: 5: SR 87 & Main



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	146	1140	75	763	185	31	96	27	128
Future Volume (vph)	146	1140	75	763	185	31	96	27	128
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4		8	
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	1	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	30.0	5.0	30.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.5	35.1	9.5	35.1	42.1	42.1	43.1	43.1	43.1
Total Split (s)	17.0	67.0	17.0	67.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	13.1%	51.5%	13.1%	51.5%	35.4%	35.4%	35.4%	35.4%	35.4%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.5	1.5	1.5	1.5	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	5.1	4.5	5.1	6.1	6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
Act Effct Green (s)	90.9	82.4	87.7	80.8	25.6	25.6		25.6	25.6
Actuated g/C Ratio	0.70	0.63	0.67	0.62	0.20	0.20		0.20	0.20
v/c Ratio	0.36	0.43	0.30	0.28	0.89	0.21		0.50	0.33
Control Delay	4.1	4.3	10.0	9.1	87.6	20.6		51.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	4.1	4.3	10.0	9.1	87.6	20.6		51.6	8.1
LOS	A	A	A	A	F	C		D	A
Approach Delay		4.3		9.2		68.7		29.4	
Approach LOS		A		A		E		C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 126 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

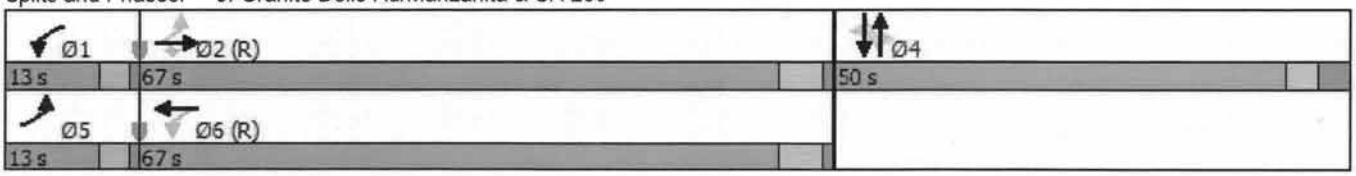
Splits and Phases: 8: Payson Village & SR 260



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	73	1034	128	97	664	158	147	107	136
Future Volume (vph)	73	1034	128	97	664	158	147	107	136
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		4		4
Permitted Phases	2		2	6		4		4	
Detector Phase	5	2	2	1	6	4	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	17.0	17.0	6.0	17.0	6.0	6.0	6.0	6.0
Minimum Split (s)	10.0	26.3	26.3	10.0	27.3	45.3	45.3	45.3	45.3
Total Split (s)	13.0	67.0	67.0	13.0	67.0	50.0	50.0	50.0	50.0
Total Split (%)	10.0%	51.5%	51.5%	10.0%	51.5%	38.5%	38.5%	38.5%	38.5%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	3.3	3.3	3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	84.7	76.9	76.9	86.2	79.3	30.6	30.6	30.6	30.6
Actuated g/C Ratio	0.65	0.59	0.59	0.66	0.61	0.24	0.24	0.24	0.24
v/c Ratio	0.17	0.54	0.14	0.35	0.25	0.74	0.73	0.93	0.43
Control Delay	5.2	8.3	0.5	11.9	13.5	63.4	48.6	109.5	41.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	8.3	0.5	11.9	13.5	63.4	48.6	109.5	41.0
LOS	A	A	A	B	B	E	D	F	D
Approach Delay		7.3			13.3		53.8		67.2
Approach LOS		A			B		D		E

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 115 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 74.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: Granite Dells Rd/Manzanita & SR 260



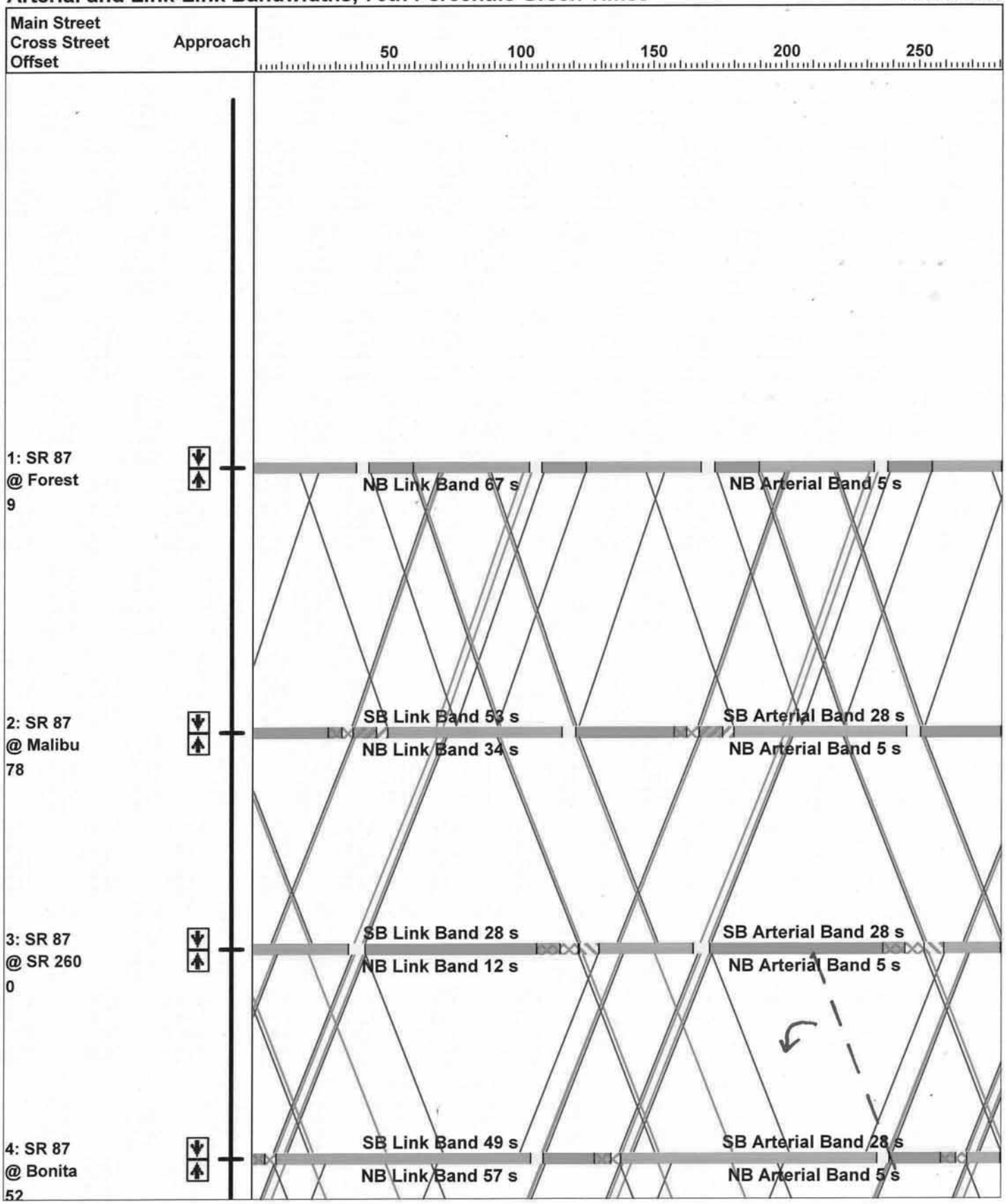
C = 130

Network Totals

Number of Intersections	12
Total Delay (hr)	166
Stops (#)	13480
Average Speed (mph)	23
Total Travel Time (hr)	430
Distance Traveled (mi)	9988
Fuel Consumed (gal)	598
Fuel Economy (mpg)	16.7
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	527
Performance Index	203.8

C = 130

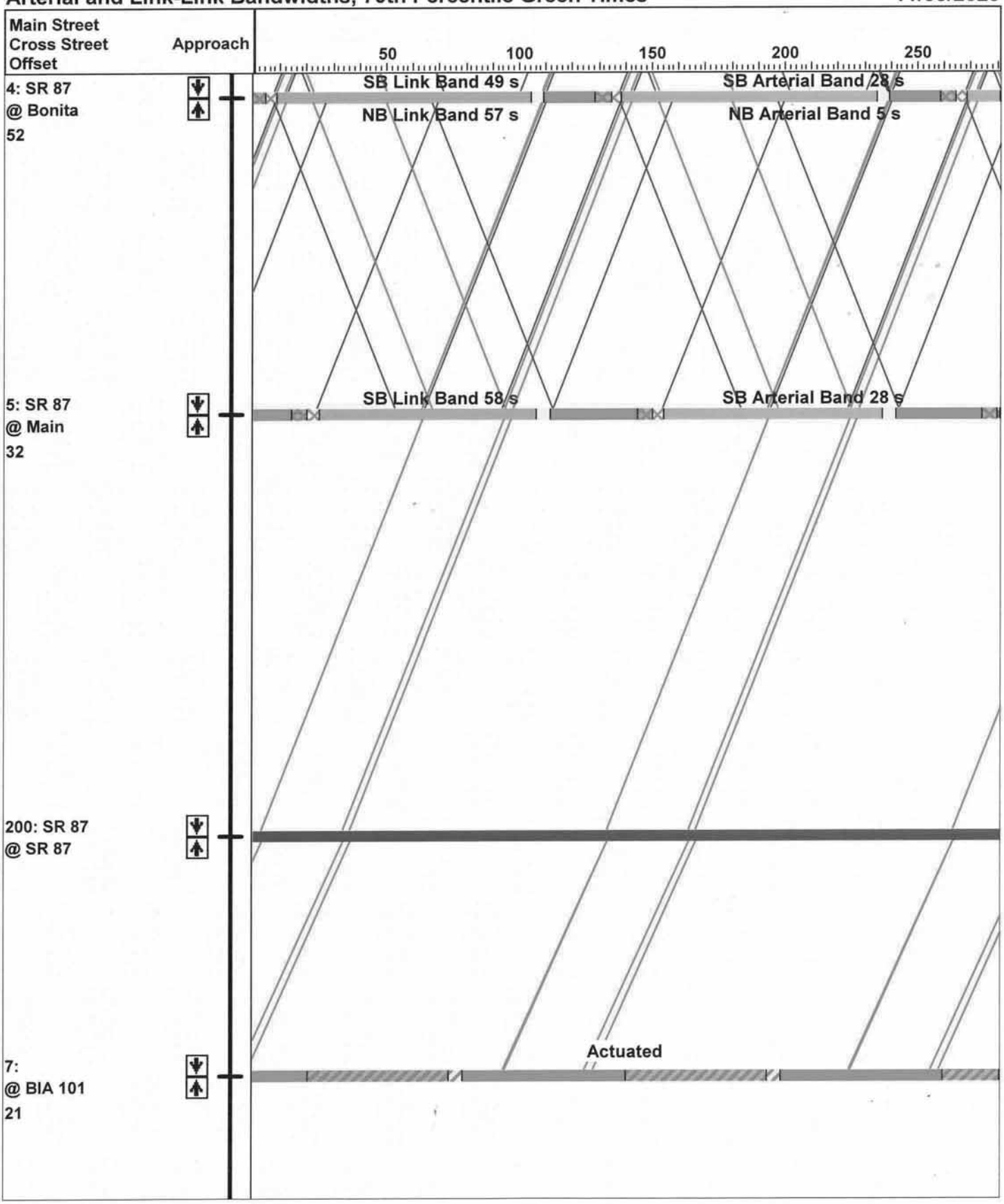
Time-Space Diagram - SR 87
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 11/05/2020



HOLIDAY SUNDAY PROPOSED

C=130

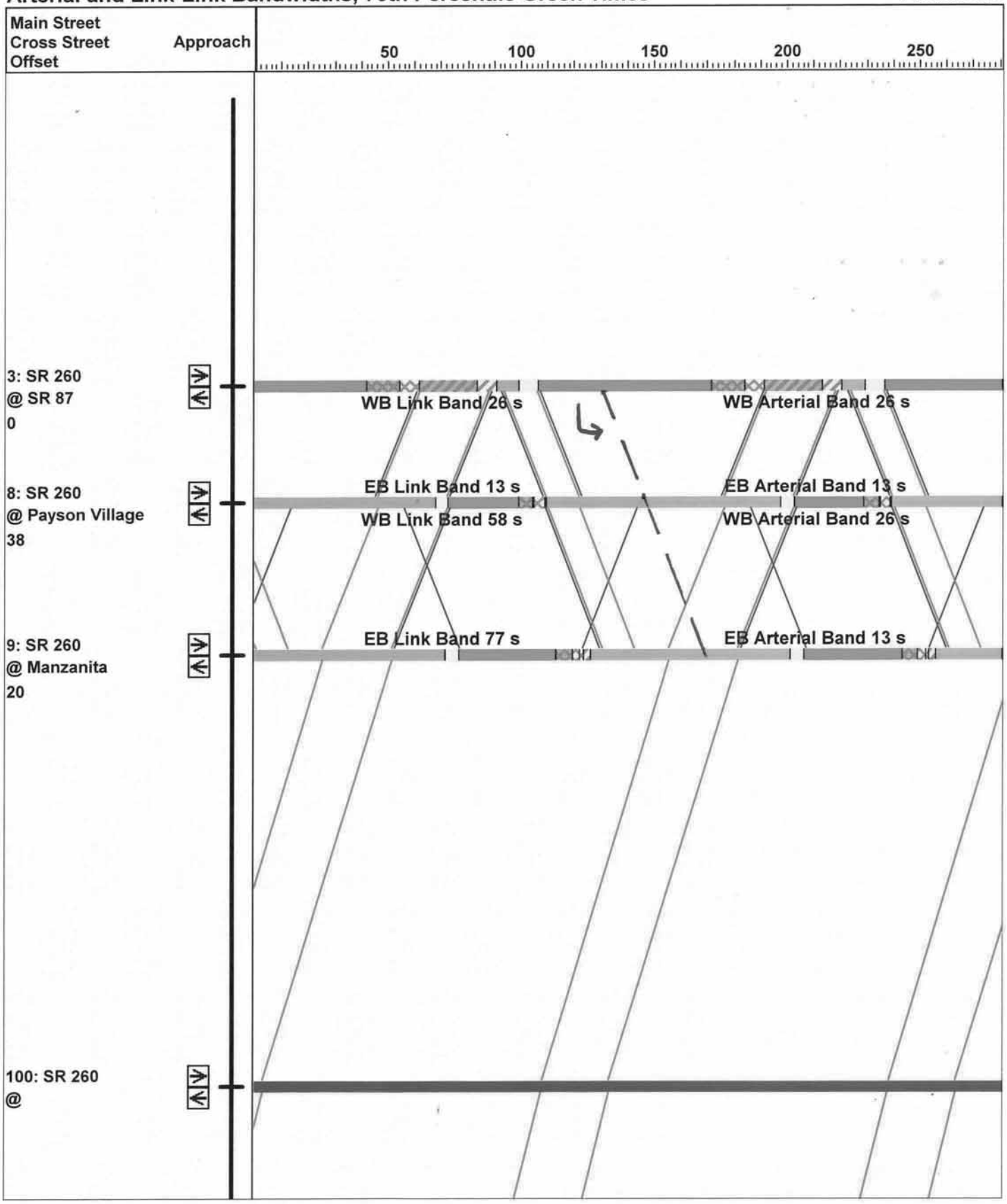
Time-Space Diagram - SR 87
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 11/05/2020



HOLIDAY SUNDAY PROPOSED

C = 130

Time-Space Diagram - SR 260
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 11/05/2020

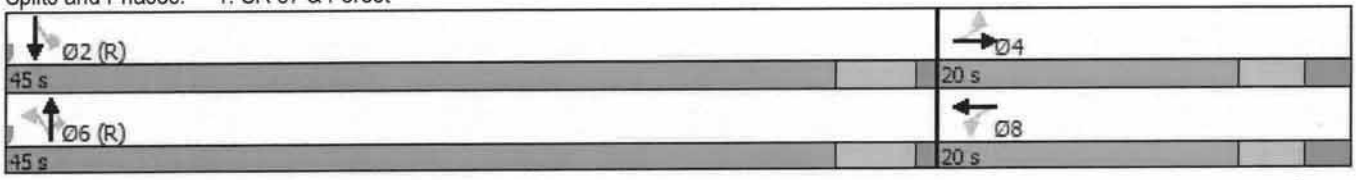


HOLIDAY SUNDAY PROPOSED

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	17	27	87	42	101	876	61	54	1075
Future Volume (vph)	17	27	87	42	101	876	61	54	1075
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		6			2
Permitted Phases	4		8		6		6	2	
Detector Phase	4	4	8	8	6	6	6	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	12.5	12.5	12.5	12.5	25.0	25.0	25.0	25.0	25.0
Total Split (s)	20.0	20.0	20.0	20.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	69.2%	69.2%	69.2%	69.2%	69.2%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	2.3	2.3	2.3	2.3	1.1	1.1	1.1	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	9.7	9.7	9.7	9.7	48.3	48.3	48.3	48.3	48.3
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.74	0.74	0.74	0.74	0.74
v/c Ratio	0.10	0.36	0.50	0.37	0.38	0.36	0.06	0.15	0.46
Control Delay	23.2	12.4	34.0	14.9	7.3	2.5	0.6	5.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	12.4	34.0	14.9	7.3	2.5	0.6	5.5	5.4
LOS	C	B	C	B	A	A	A	A	A
Approach Delay		13.9		23.7		2.8			5.4
Approach LOS		B		C		A			A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 9 (14%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

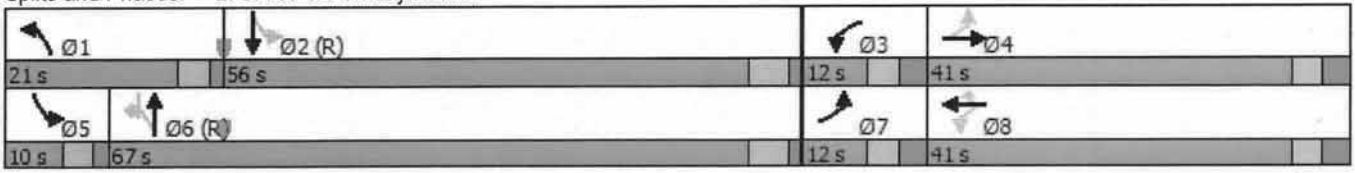
Splits and Phases: 1: SR 87 & Forest



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	164	20	42	29	41	195	913	38	1035	177
Future Volume (vph)	164	20	42	29	41	195	913	38	1035	177
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	custom
Protected Phases	7	4	3	8		1	6	5	2	
Permitted Phases	4		8		8	6		2		6
Detector Phase	7	4	3	8	8	1	6	5	2	6
Switch Phase										
Minimum Initial (s)	5.0	6.0	5.0	6.0	6.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.8	37.9	10.8	40.9	40.9	9.3	33.2	9.4	33.3	33.2
Total Split (s)	12.0	41.0	12.0	41.0	41.0	21.0	67.0	10.0	56.0	67.0
Total Split (%)	9.2%	31.5%	9.2%	31.5%	31.5%	16.2%	51.5%	7.7%	43.1%	51.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.0	3.9	3.9
All-Red Time (s)	2.8	2.9	2.8	2.9	2.9	1.3	1.3	1.4	1.4	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.9	5.8	5.9	5.9	4.3	5.2	4.4	5.3	5.2
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.9	14.1	12.6	7.5	7.5	95.8	87.3	81.0	75.0	87.3
Actuated g/C Ratio	0.18	0.11	0.10	0.06	0.06	0.74	0.67	0.62	0.58	0.67
v/c Ratio	0.77	0.51	0.32	0.30	0.20	0.53	0.43	0.11	0.55	0.18
Control Delay	69.6	19.9	48.1	65.0	2.0	10.7	4.3	7.6	17.8	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	19.9	48.1	65.0	2.0	10.7	4.3	7.6	17.8	1.6
LOS	E	B	D	E	A	B	A	A	B	A
Approach Delay		47.3		35.7			5.4		15.2	
Approach LOS		D		D			A		B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 78 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 72.8%	ICU Level of Service C
Analysis Period (min) 15	

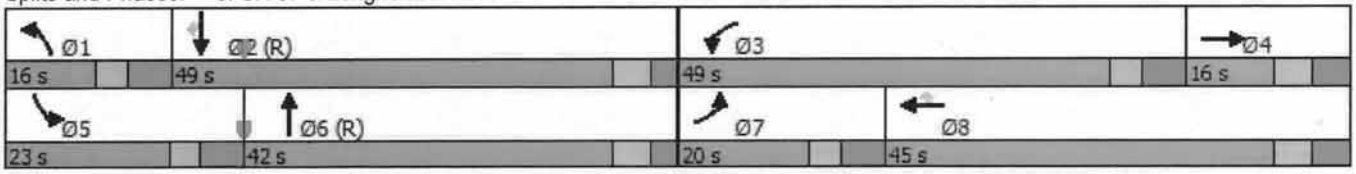
Splits and Phases: 2: SR 87 & Rumsey/Malibu



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	165	137	923	149	276	40	695	509	324	728	138
Future Volume (vph)	165	137	923	149	276	40	695	509	324	728	138
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4	3	8		1	6		5	2	
Permitted Phases					8			Free			2
Detector Phase	7	4	3	8	8	1	6		5	2	2
Switch Phase											
Minimum Initial (s)	10.0	6.0	6.0	6.0	6.0	6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	17.4	13.5	13.4	13.5	13.5	13.2	41.3		13.2	41.3	41.3
Total Split (s)	20.0	16.0	49.0	45.0	45.0	16.0	42.0		23.0	49.0	49.0
Total Split (%)	15.4%	12.3%	37.7%	34.6%	34.6%	12.3%	32.3%		17.7%	37.7%	37.7%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.6	3.0	3.6		3.0	3.6	3.6
All-Red Time (s)	4.4	3.9	4.4	3.9	3.9	4.2	2.7		4.2	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.4	7.5	7.4	7.5	7.5	7.2	6.3		7.2	6.3	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	11.2	8.7	41.3	38.8	38.8	7.3	36.3	130.0	15.2	47.0	47.0
Actuated g/C Ratio	0.09	0.07	0.32	0.30	0.30	0.06	0.28	1.00	0.12	0.36	0.36
v/c Ratio	0.60	0.81	0.92	0.29	0.49	0.44	0.76	0.35	0.88	0.62	0.21
Control Delay	66.0	70.6	50.9	34.4	18.9	71.6	47.2	0.6	64.9	34.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	70.6	50.9	34.4	18.9	71.6	47.2	0.6	64.9	34.5	7.3
LOS	E	E	D	C	B	E	D	A	E	C	A
Approach Delay		68.5		42.5			28.9			39.6	
Approach LOS		E		D			C			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 39.9	Intersection LOS: D
Intersection Capacity Utilization 94.2%	ICU Level of Service F
Analysis Period (min) 15	

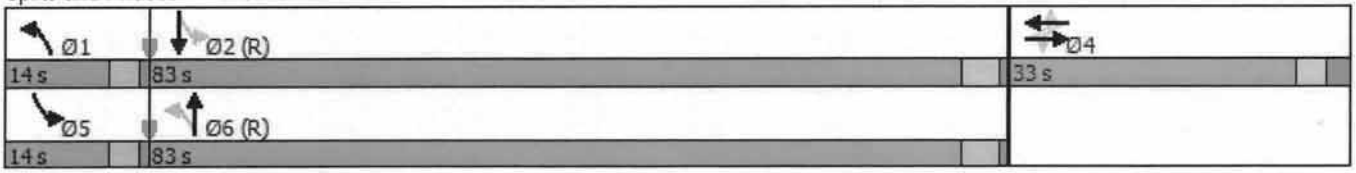
Splits and Phases: 3: SR 87 & Longhorn/SR 260



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	69	36	67	27	18	1168	60	1615
Future Volume (vph)	69	36	67	27	18	1168	60	1615
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4		4	1	6	5	2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	25.0	6.0	25.0
Minimum Split (s)	11.5	11.5	11.5	11.5	10.5	29.7	10.5	29.7
Total Split (s)	33.0	33.0	33.0	33.0	14.0	83.0	14.0	83.0
Total Split (%)	25.4%	25.4%	25.4%	25.4%	10.8%	63.8%	10.8%	63.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	1.0	1.1	1.0	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	4.0	4.7	4.0	4.7
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	11.5	11.5	11.5	11.5	105.8	100.3	106.6	102.3
Actuated g/C Ratio	0.09	0.09	0.09	0.09	0.81	0.77	0.82	0.79
v/c Ratio	0.68	0.37	0.62	0.43	0.09	0.48	0.19	0.64
Control Delay	85.8	42.3	78.6	28.8	2.9	5.5	2.7	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.8	42.3	78.6	28.8	2.9	5.5	2.7	5.9
LOS	F	D	E	C	A	A	A	A
Approach Delay		65.8		51.7		5.4		5.8
Approach LOS		E		D		A		A

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 52 (40%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 68.9%	ICU Level of Service C
Analysis Period (min) 15	

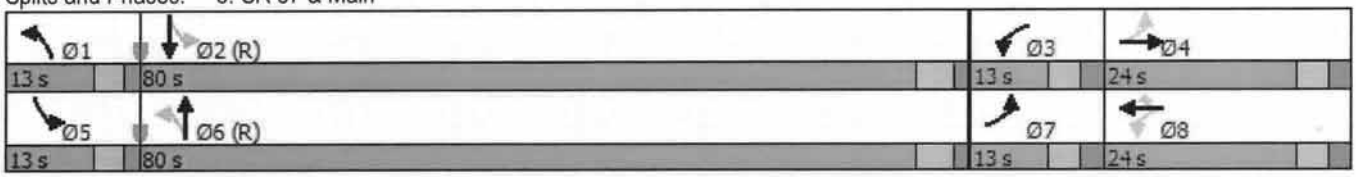
Splits and Phases: 4: SR 87 & Bonita



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	128	58	34	29	36	52	979	57	1576
Future Volume (vph)	128	58	34	29	36	52	979	57	1576
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8		1	6	5	2
Permitted Phases	4		8		8	6		2	
Detector Phase	7	4	3	8	8	1	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	15.0	5.0	15.0
Minimum Split (s)	10.9	10.4	10.9	23.4	23.4	9.5	25.1	10.0	34.1
Total Split (s)	13.0	24.0	13.0	24.0	24.0	13.0	80.0	13.0	80.0
Total Split (%)	10.0%	18.5%	10.0%	18.5%	18.5%	10.0%	61.5%	10.0%	61.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	4.5	5.1	4.5	5.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	21.1	13.7	14.9	9.8	9.8	93.5	88.2	93.2	88.1
Actuated g/C Ratio	0.16	0.11	0.11	0.08	0.08	0.72	0.68	0.72	0.68
v/c Ratio	0.66	0.68	0.22	0.23	0.18	0.37	0.45	0.18	0.76
Control Delay	62.6	54.6	44.6	57.5	1.9	12.6	12.0	5.9	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	54.6	44.6	57.5	1.9	12.6	12.0	5.9	14.3
LOS	E	D	D	E	A	B	B	A	B
Approach Delay		58.5		33.0			12.1		14.0
Approach LOS		E		C			B		B

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 32 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

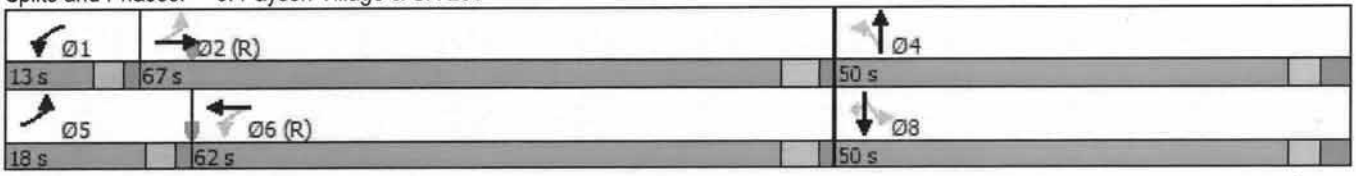
Splits and Phases: 5: SR 87 & Main



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	75	928	53	1094	116	25	83	13	93
Future Volume (vph)	75	928	53	1094	116	25	83	13	93
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4		8	
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	1	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	30.0	5.0	30.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.5	35.1	9.5	35.1	42.1	42.1	43.1	43.1	43.1
Total Split (s)	18.0	67.0	13.0	62.0	50.0	50.0	50.0	50.0	50.0
Total Split (%)	13.8%	51.5%	10.0%	47.7%	38.5%	38.5%	38.5%	38.5%	38.5%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.5	1.5	1.5	1.5	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	5.1	4.5	5.1	6.1	6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
Act Effct Green (s)	99.2	94.0	97.7	91.8	16.9	16.9		16.9	16.9
Actuated g/C Ratio	0.76	0.72	0.75	0.71	0.13	0.13		0.13	0.13
v/c Ratio	0.25	0.29	0.15	0.35	0.80	0.21		0.60	0.34
Control Delay	4.8	4.9	3.9	5.9	86.7	31.1		66.5	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	4.8	4.9	3.9	5.9	86.7	31.1		66.5	11.8
LOS	A	A	A	A	F	C		E	B
Approach Delay		4.8		5.8		70.9		39.6	
Approach LOS		A		A		E		D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 38 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 55.9%	ICU Level of Service B
Analysis Period (min) 15	

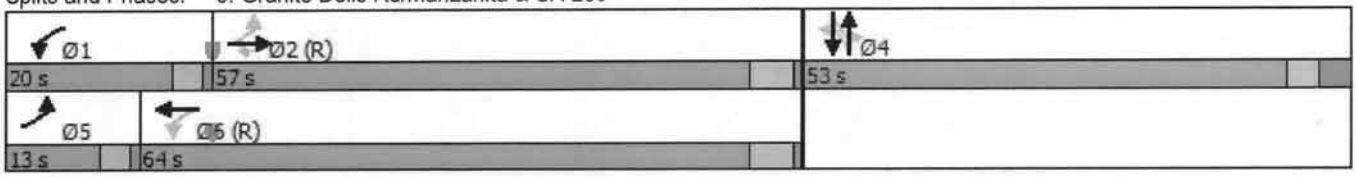
Splits and Phases: 8: Payson Village & SR 260



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	72	725	85	156	1068	144	79	83	113
Future Volume (vph)	72	725	85	156	1068	144	79	83	113
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		4		4
Permitted Phases	2		2	6		4		4	
Detector Phase	5	2	2	1	6	4	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	17.0	17.0	6.0	17.0	6.0	6.0	6.0	6.0
Minimum Split (s)	10.0	26.3	26.3	10.0	27.3	45.3	45.3	45.3	45.3
Total Split (s)	13.0	57.0	57.0	20.0	64.0	53.0	53.0	53.0	53.0
Total Split (%)	10.0%	43.8%	43.8%	15.4%	49.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	3.3	3.3	3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	88.9	81.3	81.3	92.9	84.9	25.2	25.2	25.2	25.2
Actuated g/C Ratio	0.68	0.63	0.63	0.71	0.65	0.19	0.19	0.19	0.19
v/c Ratio	0.24	0.36	0.09	0.36	0.37	0.80	0.57	0.58	0.46
Control Delay	5.9	5.9	0.4	8.8	12.2	76.0	36.8	60.6	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	5.9	0.4	8.8	12.2	76.0	36.8	60.6	44.4
LOS	A	A	A	A	B	E	D	E	D
Approach Delay		5.4			11.8		53.3		50.2
Approach LOS		A			B		D		D

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 20 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 9: Granite Dells Rd/Manzanita & SR 260



Network Totals

Number of Intersections	12
Total Delay (hr)	152
Stops (#)	12268
Average Speed (mph)	25
Total Travel Time (hr)	427
Distance Traveled (mi)	10570
Fuel Consumed (gal)	599
Fuel Economy (mpg)	17.7
Unserved Vehicles (#)	41
Vehicles in dilemma zone (#)	700
Performance Index	186.3

Existing Conditions

	AM	*PM*
	PI	*PI*
AM/PM not coordinated - fit peds	51.6	99.3
AM/PM not coordinated - fit peds only at SR 260	50.4	95.6

Existing Conditions

Noon is coordinated, and uses 4 different Cycle Lengths
Noon coordination includes the end signals (Casino, Tyler)
Noon coordination fits Xing peds at Main, Bonita and SR 260

		Greenbands		
	SR 87		*SR 260*	
PI	*NB*	*SB*	*EB*	*WB*
154.6				
Casino to Bonita (120 Sec Cycle)	21	0		
Bonita to SR 260 (Different Cycle Lengths - 120/180)	0	0		
SR 260 to Malibu (Different Cycle Lengths - 180/120)	0	0		
Malibu to Forest (Periodic Cycle Lengths - 120/60 Sec Cycles)	62	57		
SR 260 to Payson Village (Periodic Cycle Lengths - 120/90)			14	36
Payson Village to Tyler (90 Sec Cycle)			6	36

Proposed Weekday Plan - AM

Optimize SR 268/SR 87 first (Cycle = 90 Sec)
Build coordination away from SR 260/SR 87
Do not retain cross street ped fits with <10 peds/hr
All in Coord with same cycle length
Do not include Tyler (1.3 mi) or Casino (.35 mi) due to distance
No movement LOS>D

	End to End Greenbands				
		SR 87		SR 260	
PI	NB	SB	EB	WB
36.8	20	16	13	15
(44.4)				

Notes:

<< Removing ped fit for SR 260 E/W (3 peds/hr) allows cycle to be 90 sec vs 120 sec, and drops intersection delay from 31 sec/veh to 24 sec/veh
<< Removed ped fit for Bonita (2 peds/hr) and Main (2 peds/hr)
<< Link greenbands on SR 87 NB range from 32 sec to 50 sec. SR 87 SB link bands range from 29 sec to 53 sec
<< Link greenbands on SR 260 EB range from 13 sec to 62 sec. SR 260 WB link bands range from 15 sec to 38 sec
<< All WB lefts from SR 260 (316 veh) should get through Bonita and Main after turn
<< Most NB rights from SR 87 (346 veh) on NB red should get through Payson Village and Manzanita after turn
<< All SB traffic released at SR 260 signal (410 veh) should get through Bonita and Main
<< Several good link bands

Proposed Weekday Plan - PM

Optimize SR 268/SR 87 first (Cycle = 90 Sec)
Build coordination away from SR 260/SR 87
Do not retain cross street ped fits with <10 peds/hr
All in Coord with same cycle length
Do not include Tyler (1.3 mi) or Casino (.35 mi) due to distance
No movement LOS>D

	End to End Greenbands				
		SR 87		SR 260	
PI	NB	SB	EB	WB
70.7	17	12	16	12
(83.0)				

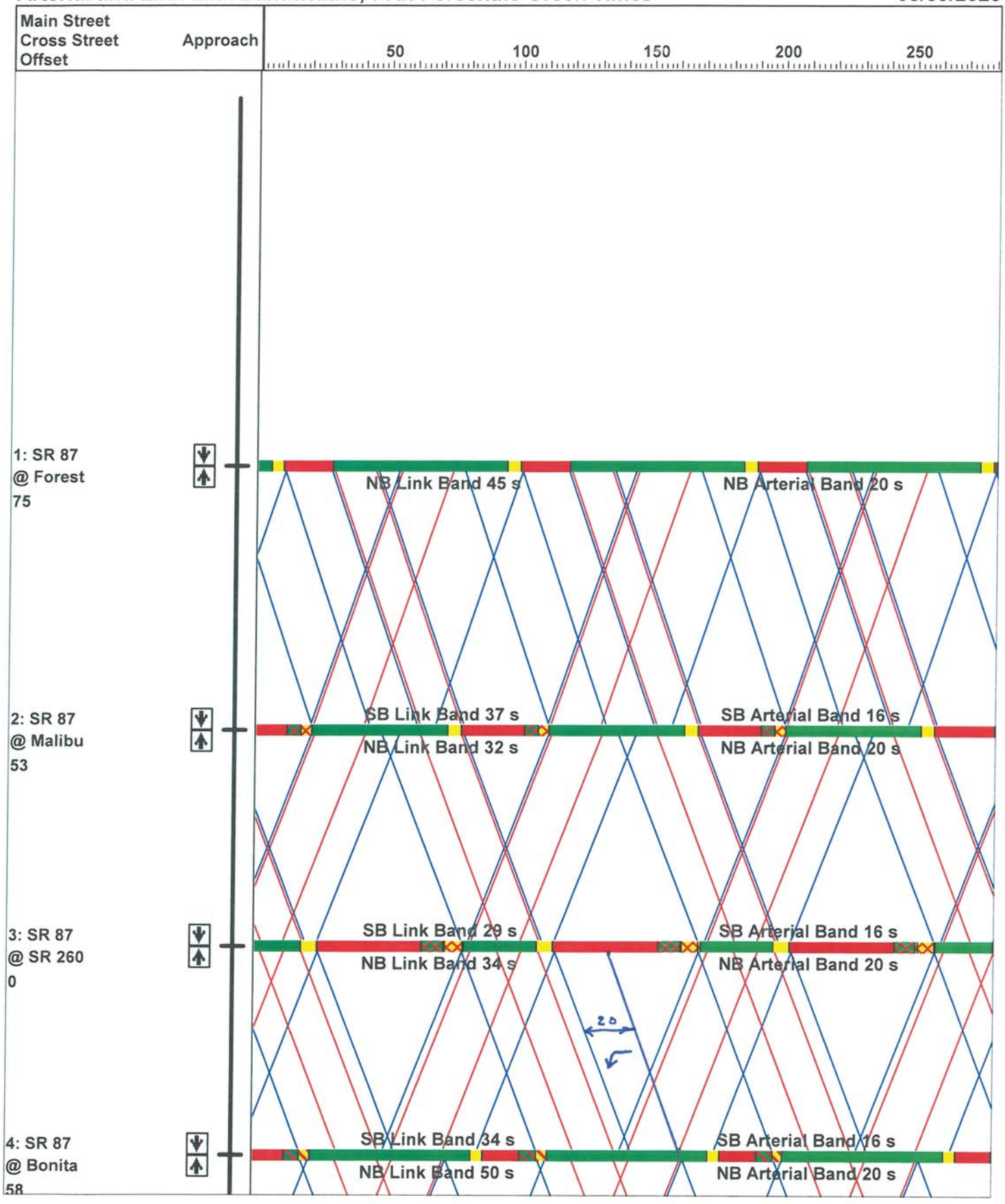
Notes:

<< Removing ped fit for SR 260 E/W (2 peds/hr) allows cycle to be 90 sec vs 125 sec, and drops intersection delay from 33 sec/veh to 26 sec/veh
<< Removed ped fit for Bonita (9 peds/hr) and Main (2 peds/hr)
<< Main: EB Lt Vol = 201 vph, needing 22 sec
<< Malibu/Rumsey: EB Lt Vol = 147 vph, needing 20 sec
<< Allowed ped fit at Forest E/W (12 peds/hr)
<< All WB lefts from SR 260 (477 veh) should get through Bonita and Main after turn
<< Most NB rights from SR 87 (568 veh) on NB red should get through Payson Village and Manzanita after turn
<< All NB traffic released at SR 260 signal (571 veh) should get through Malibu and Forest
<< Several good link bands

Time-Space Diagram - SR 87

Arterial and Link-Link Bandwidths, 70th Percentile Green Times

08/09/2020

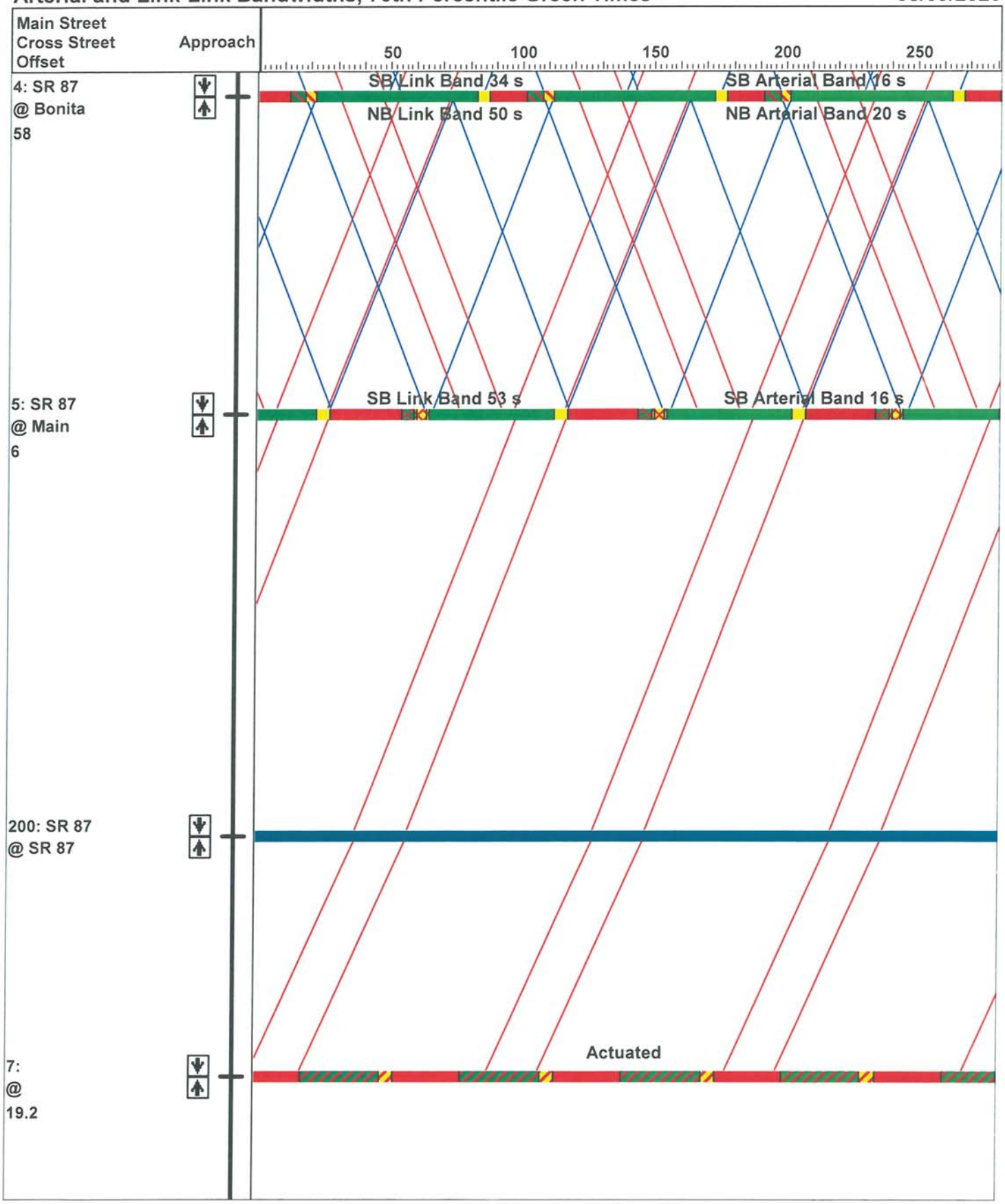


WEEKDAY AM PROPOSED

Time-Space Diagram - SR 87

Arterial and Link-Link Bandwidths, 70th Percentile Green Times

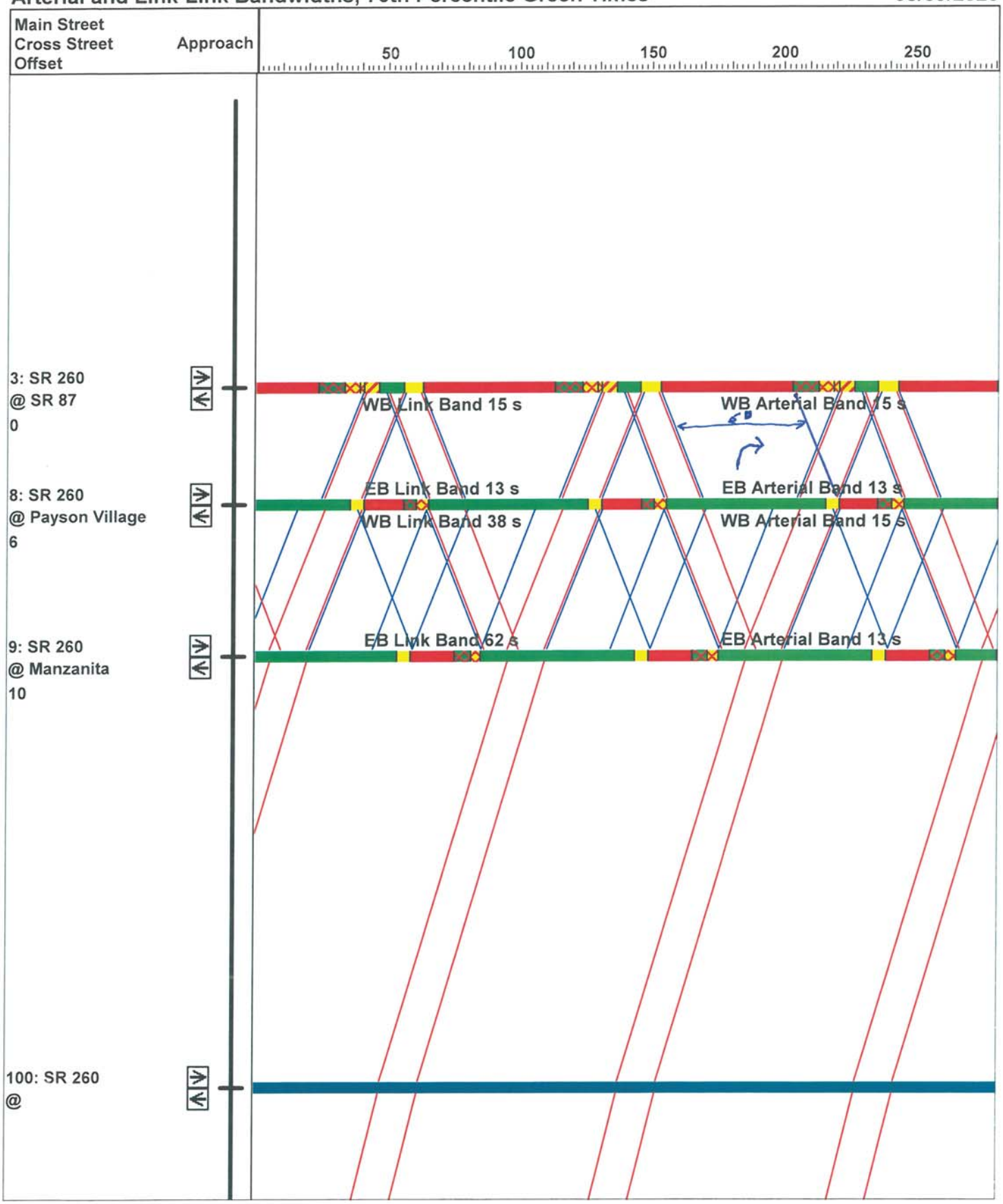
08/09/2020



WEEKDAY AM PROPOSED

Time-Space Diagram - SR 260
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

08/09/2020



WEEKDAY AM PROPOSED

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	77	119	316	80	105	56	331	346	136	410	72
Future Volume (vph)	77	119	316	80	105	56	331	346	136	410	72
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4	3	8		1	6		5	2	
Permitted Phases					8			Free			2
Detector Phase	7	4	3	8	8	1	6		5	2	2
Switch Phase											
Minimum Initial (s)	10.0	6.0	6.0	6.0	6.0	6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	17.4	13.5	13.4	13.5	13.5	13.2	41.3		13.2	41.3	41.3
Total Split (s)	18.0	14.0	20.0	16.0	16.0	14.0	42.0		14.0	42.0	42.0
Total Split (%)	20.0%	15.6%	22.2%	17.8%	17.8%	15.6%	46.7%		15.6%	46.7%	46.7%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.6	3.0	3.6		3.0	3.6	3.6
All-Red Time (s)	4.4	3.9	4.4	3.9	3.9	4.2	2.7		4.2	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.4	7.5	7.4	7.5	7.5	7.2	6.3		7.2	6.3	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	10.0	8.1	14.2	15.7	15.7	7.5	31.4	90.0	7.9	34.5	34.5
Actuated g/C Ratio	0.11	0.09	0.16	0.17	0.17	0.08	0.35	1.00	0.09	0.38	0.38
v/c Ratio	0.22	0.53	0.64	0.27	0.25	0.41	0.29	0.24	0.49	0.33	0.11
Control Delay	38.1	31.8	35.2	33.3	6.4	37.8	21.3	0.5	42.4	18.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	31.8	35.2	33.3	6.4	37.8	21.3	0.5	42.4	18.0	2.8
LOS	D	C	D	C	A	D	C	A	D	B	A
Approach Delay		33.7		28.9			12.7			21.6	
Approach LOS		C		C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: SR 87 & Longhorn/SR 260

Zone Coord Totals

Number of Intersections	7
Total Delay (hr)	28
Stops (#)	3208
Average Speed (mph)	27
Total Travel Time (hr)	116
Distance Traveled (mi)	3120
Fuel Consumed (gal)	160
Fuel Economy (mpg)	19.5
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	205
Performance Index	36.8

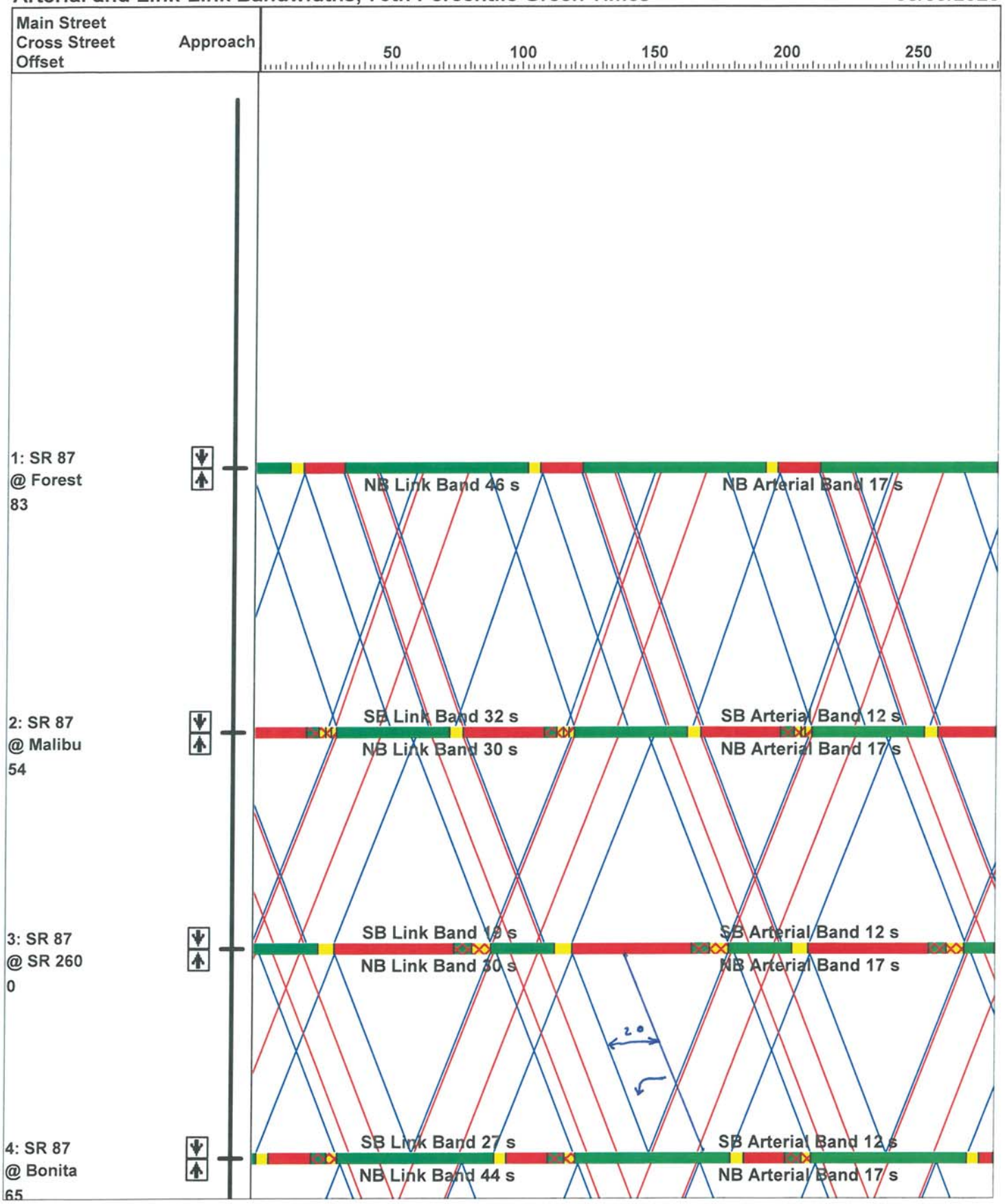
Network Totals

Number of Intersections	12
Total Delay (hr)	33
Stops (#)	4089
Average Speed (mph)	30
Total Travel Time (hr)	165
Distance Traveled (mi)	5018
Fuel Consumed (gal)	243
Fuel Economy (mpg)	20.7
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	310
Performance Index	44.4

Time-Space Diagram - SR 87

Arterial and Link-Link Bandwidths, 70th Percentile Green Times

08/09/2020

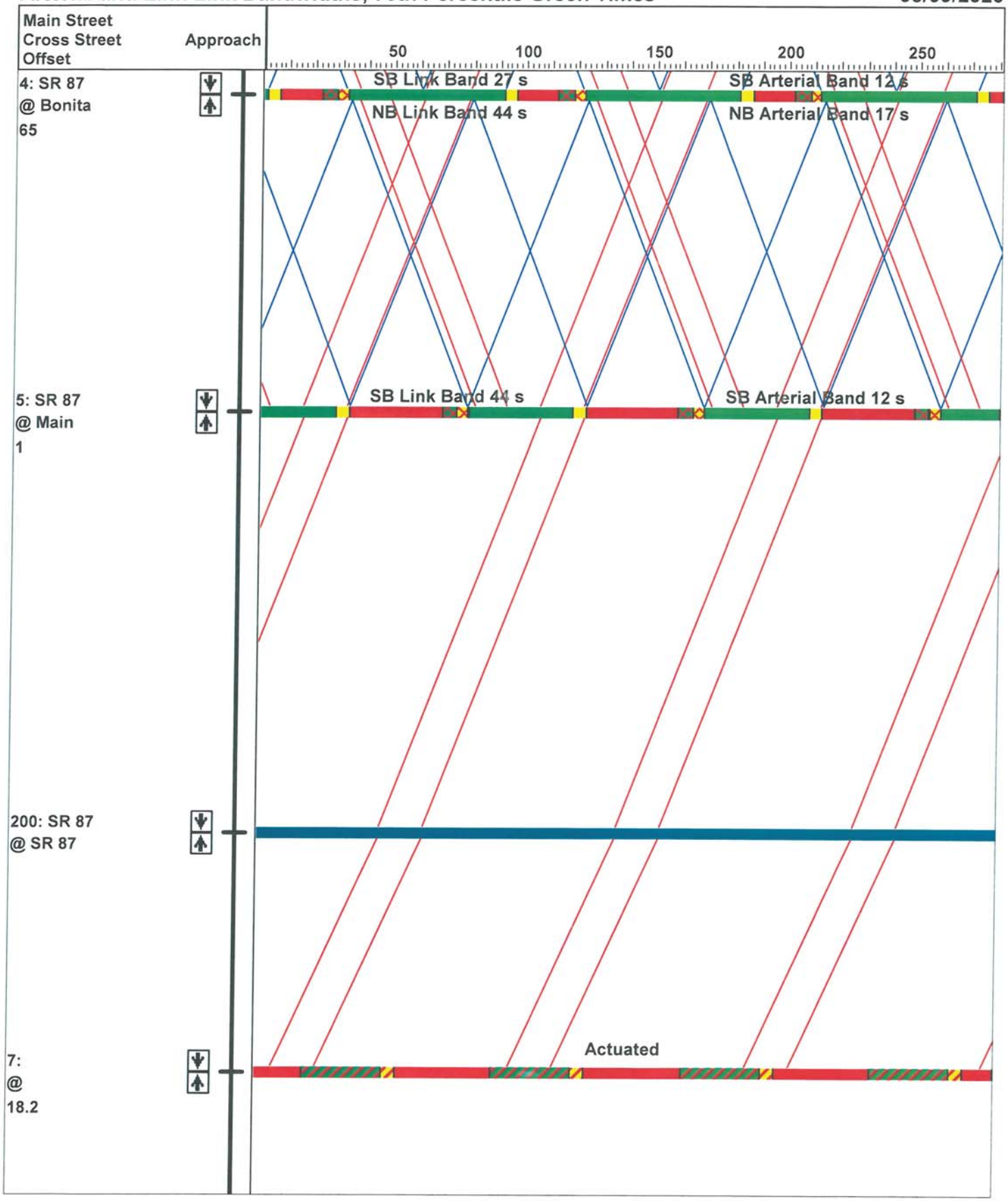


WEEKDAY PM PROPOSED

Time-Space Diagram - SR 87

Arterial and Link-Link Bandwidths, 70th Percentile Green Times

08/09/2020

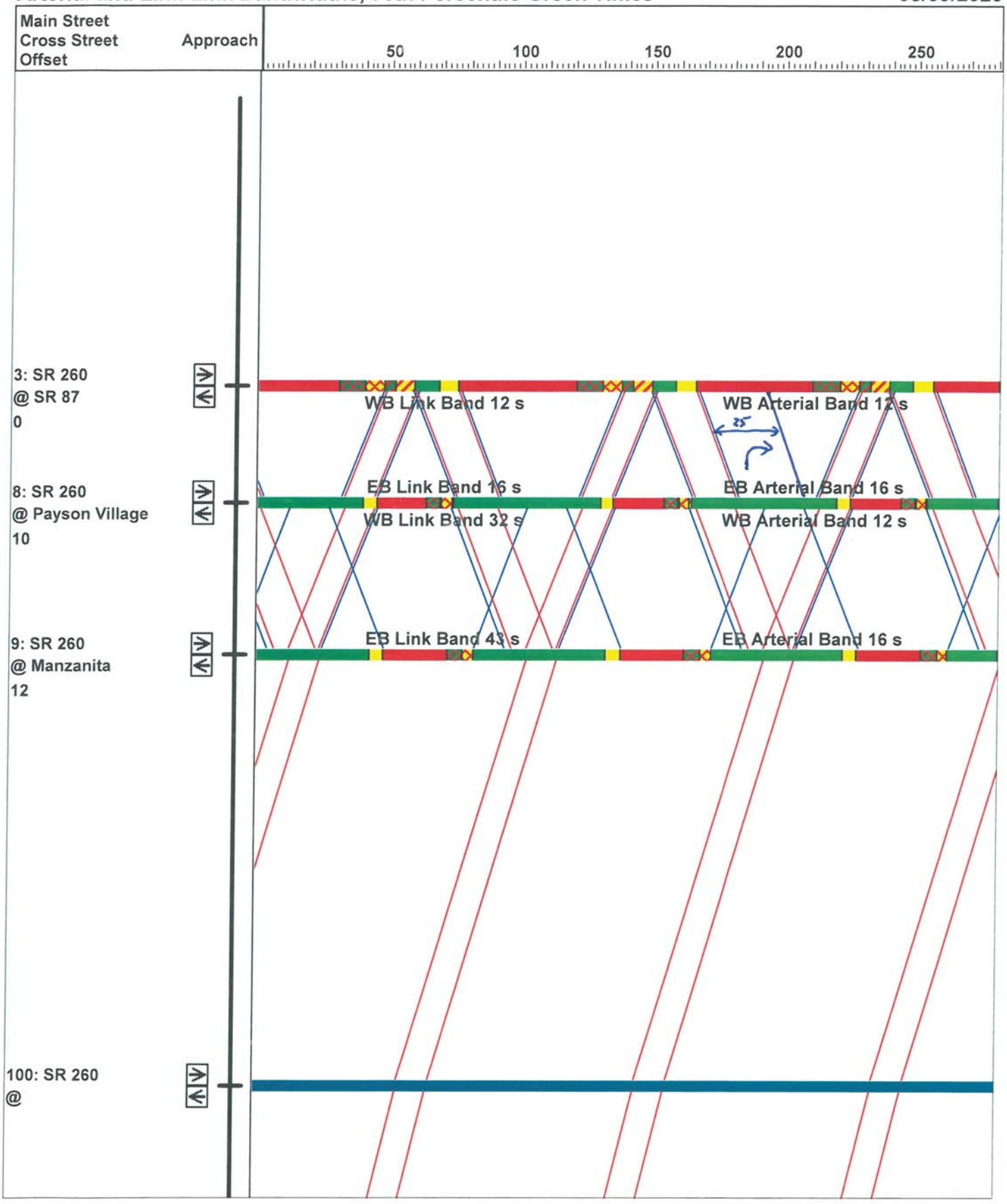


WEEKDAY PM PROPOSED

Time-Space Diagram - SR 260

Arterial and Link-Link Bandwidths, 70th Percentile Green Times

08/09/2020

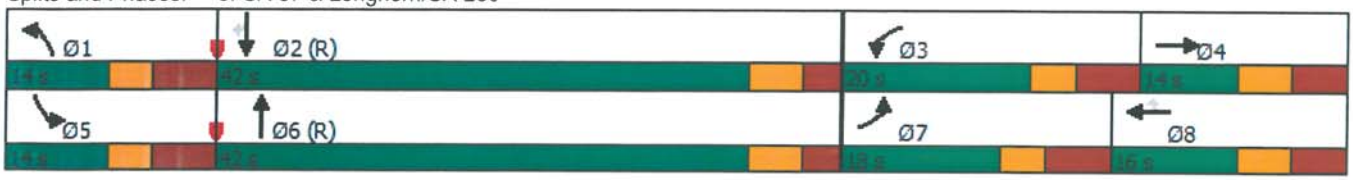


WEEKDAY PM PROPOSED

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	164	159	477	141	218	47	571	568	170	424	121
Future Volume (vph)	164	159	477	141	218	47	571	568	170	424	121
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4	3	8		1	6		5	2	
Permitted Phases					8			Free			2
Detector Phase	7	4	3	8	8	1	6		5	2	2
Switch Phase											
Minimum Initial (s)	10.0	6.0	6.0	6.0	6.0	6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	17.4	13.5	13.4	13.5	13.5	13.2	41.3		13.2	41.3	41.3
Total Split (s)	18.0	14.0	20.0	16.0	16.0	14.0	42.0		14.0	42.0	42.0
Total Split (%)	20.0%	15.6%	22.2%	17.8%	17.8%	15.6%	46.7%		15.6%	46.7%	46.7%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.6	3.0	3.6		3.0	3.6	3.6
All-Red Time (s)	4.4	3.9	4.4	3.9	3.9	4.2	2.7		4.2	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.4	7.5	7.4	7.5	7.5	7.2	6.3		7.2	6.3	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	10.4	8.3	21.4	19.3	19.3	6.4	24.8	90.0	7.1	30.7	30.7
Actuated g/C Ratio	0.12	0.09	0.24	0.21	0.21	0.07	0.28	1.00	0.08	0.34	0.34
v/c Ratio	0.45	0.68	0.63	0.38	0.46	0.40	0.64	0.39	0.69	0.38	0.19
Control Delay	40.9	42.6	30.2	32.0	13.1	45.1	27.1	1.3	48.1	17.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	42.6	30.2	32.0	13.1	45.1	27.1	1.3	48.1	17.7	5.3
LOS	D	D	C	C	B	D	C	A	D	B	A
Approach Delay		41.9		26.0			15.5			22.8	
Approach LOS		D		C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 77.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: SR 87 & Longhorn/SR 260



Zone Coord Totals

Number of Intersections	7
Total Delay (hr)	53
Stops (#)	6229
Average Speed (mph)	25
Total Travel Time (hr)	187
Distance Traveled (mi)	4670
Fuel Consumed (gal)	259
Fuel Economy (mpg)	18.0
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	382
Performance Index	70.7

Network Totals

Number of Intersections	12
Total Delay (hr)	62
Stops (#)	7555
Average Speed (mph)	29
Total Travel Time (hr)	263
Distance Traveled (mi)	7571
Fuel Consumed (gal)	385
Fuel Economy (mpg)	19.6
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	538
Performance Index	83.0

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	13	88	17	42	322	20	32	475
Future Volume (vph)	8	13	88	17	42	322	20	32	475
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		6			2
Permitted Phases	4		8		6		6	2	
Detector Phase	4	4	8	8	6	6	6	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	12.5	12.5	12.5	12.5	25.0	25.0	25.0	25.0	25.0
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	2.3	2.3	2.3	2.3	1.1	1.1	1.1	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	11.4	11.4	11.4	11.4	71.6	71.6	71.6	71.6	71.6
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.80	0.80	0.80	0.80	0.80
v/c Ratio	0.05	0.34	0.59	0.24	0.07	0.12	0.02	0.04	0.19
Control Delay	32.6	14.0	50.7	17.8	1.6	1.2	0.3	3.7	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	14.0	50.7	17.8	1.6	1.2	0.3	3.7	3.4
LOS	C	B	D	B	A	A	A	A	A
Approach Delay		15.7		38.3		1.2			3.4
Approach LOS		B		D		A			A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 75 (83%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 55.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: SR 87 & Forest

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	34	8	40	6	22	48	372	42	547	34
Future Volume (vph)	34	8	40	6	22	48	372	42	547	34
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	custom
Protected Phases	7	4	3	8		1	6	5	2	
Permitted Phases	4		8		8	6		2		6
Detector Phase	7	4	3	8	8	1	6	5	2	6
Switch Phase										
Minimum Initial (s)	5.0	6.0	5.0	6.0	6.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.8	11.9	10.8	11.9	11.9	9.3	33.2	9.4	33.3	33.2
Total Split (s)	15.0	15.0	15.0	15.0	15.0	12.0	48.0	12.0	48.0	48.0
Total Split (%)	16.7%	16.7%	16.7%	16.7%	16.7%	13.3%	53.3%	13.3%	53.3%	53.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.0	3.9	3.9
All-Red Time (s)	2.8	2.9	2.8	2.9	2.9	1.3	1.3	1.4	1.4	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.9	5.8	5.9	5.9	4.3	5.2	4.4	5.3	5.2
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	9.3	6.1	9.8	6.3	6.3	68.6	66.7	68.5	66.7	66.7
Actuated g/C Ratio	0.10	0.07	0.11	0.07	0.07	0.76	0.74	0.76	0.74	0.74
v/c Ratio	0.20	0.24	0.22	0.05	0.10	0.08	0.17	0.06	0.23	0.03
Control Delay	32.9	25.4	33.2	39.8	0.8	1.6	2.3	3.8	6.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	25.4	33.2	39.8	0.8	1.6	2.3	3.8	6.0	0.1
LOS	C	C	C	D	A	A	A	A	A	A
Approach Delay		29.5		23.3			2.2		5.5	
Approach LOS		C		C			A		A	

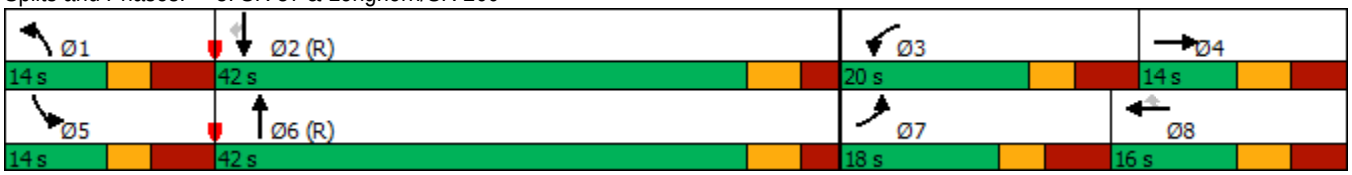
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 53 (59%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.24	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 49.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: SR 87 & Rumsey/Malibu

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	77	119	316	80	105	56	331	346	136	410	72
Future Volume (vph)	77	119	316	80	105	56	331	346	136	410	72
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4	3	8		1	6		5	2	
Permitted Phases					8			Free			2
Detector Phase	7	4	3	8	8	1	6		5	2	2
Switch Phase											
Minimum Initial (s)	10.0	6.0	6.0	6.0	6.0	6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	17.4	13.5	13.4	13.5	13.5	13.2	41.3		13.2	41.3	41.3
Total Split (s)	18.0	14.0	20.0	16.0	16.0	14.0	42.0		14.0	42.0	42.0
Total Split (%)	20.0%	15.6%	22.2%	17.8%	17.8%	15.6%	46.7%		15.6%	46.7%	46.7%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.6	3.0	3.6		3.0	3.6	3.6
All-Red Time (s)	4.4	3.9	4.4	3.9	3.9	4.2	2.7		4.2	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.4	7.5	7.4	7.5	7.5	7.2	6.3		7.2	6.3	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	10.0	8.1	14.2	15.7	15.7	7.5	31.4	90.0	7.9	34.5	34.5
Actuated g/C Ratio	0.11	0.09	0.16	0.17	0.17	0.08	0.35	1.00	0.09	0.38	0.38
v/c Ratio	0.22	0.53	0.64	0.27	0.25	0.41	0.29	0.24	0.49	0.33	0.11
Control Delay	38.1	31.8	35.2	33.3	6.4	37.8	21.3	0.5	42.4	18.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	31.8	35.2	33.3	6.4	37.8	21.3	0.5	42.4	18.0	2.8
LOS	D	C	D	C	A	D	C	A	D	B	A
Approach Delay		33.7		28.9			12.7			21.6	
Approach LOS		C		C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: SR 87 & Longhorn/SR 260



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	16	44	11	7	639	28	681
Future Volume (vph)	43	16	44	11	7	639	28	681
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4		4	1	6	5	2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	25.0	6.0	25.0
Minimum Split (s)	11.5	11.5	11.5	11.5	10.5	29.7	10.5	29.7
Total Split (s)	23.0	23.0	23.0	23.0	14.0	53.0	14.0	53.0
Total Split (%)	25.6%	25.6%	25.6%	25.6%	15.6%	58.9%	15.6%	58.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	1.0	1.1	1.0	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	4.0	4.7	4.0	4.7
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	7.7	7.7	7.7	7.7	72.7	69.3	74.3	73.3
Actuated g/C Ratio	0.09	0.09	0.09	0.09	0.81	0.77	0.83	0.81
v/c Ratio	0.41	0.21	0.41	0.33	0.01	0.27	0.05	0.26
Control Delay	49.3	26.6	49.0	20.2	0.4	1.4	0.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	26.6	49.0	20.2	0.4	1.4	0.6	0.8
LOS	D	C	D	C	A	A	A	A
Approach Delay		39.8		33.1		1.4		0.8
Approach LOS		D		C		A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 58 (64%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: SR 87 & Bonita

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	81	32	25	25	40	24	564	73	449
Future Volume (vph)	81	32	25	25	40	24	564	73	449
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8		1	6	5	2
Permitted Phases	4		8		8	6		2	
Detector Phase	7	4	3	8	8	1	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	15.0	5.0	15.0
Minimum Split (s)	10.9	10.4	10.9	10.4	10.4	9.5	25.1	10.0	34.1
Total Split (s)	17.0	20.0	14.0	17.0	17.0	13.0	43.0	13.0	43.0
Total Split (%)	18.9%	22.2%	15.6%	18.9%	18.9%	14.4%	47.8%	14.4%	47.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	4.5	5.1	4.5	5.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	17.8	13.2	10.1	5.7	5.7	60.1	56.4	63.1	60.9
Actuated g/C Ratio	0.20	0.15	0.11	0.06	0.06	0.67	0.63	0.70	0.68
v/c Ratio	0.35	0.26	0.15	0.23	0.18	0.04	0.28	0.15	0.25
Control Delay	31.8	22.1	28.6	44.5	1.7	6.3	11.2	2.3	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	22.1	28.6	44.5	1.7	6.3	11.2	2.3	2.2
LOS	C	C	C	D	A	A	B	A	A
Approach Delay		27.4		21.1			11.0		2.2
Approach LOS		C		C			B		A

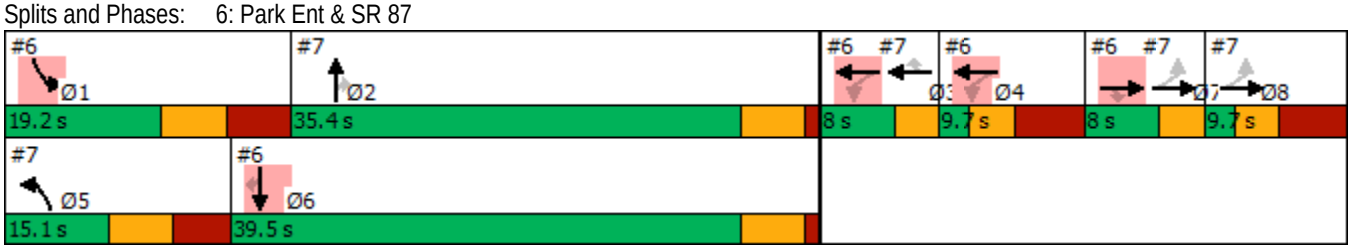
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 6 (7%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: SR 87 & Main

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations												
Traffic Volume (vph)	2	1	9	1	91	286	1					
Future Volume (vph)	2	1	9	1	91	286	1					
Turn Type	NA	Perm	Perm	NA	Prot	NA	Perm					
Protected Phases	7			3 4	1	6		2	3	4	5	8
Permitted Phases		7	3 4				6					
Detector Phase	7	7	3 4	3 4	1	6	6					
Switch Phase												
Minimum Initial (s)	5.0	5.0			7.0	30.0	30.0	30.0	5.0	2.0	7.0	2.0
Minimum Split (s)	8.0	8.0			15.7	35.3	35.3	35.3	8.0	9.7	15.1	9.7
Total Split (s)	8.0	8.0			19.2	39.5	39.5	35.4	8.0	9.7	15.1	9.7
Total Split (%)	8.9%	8.9%			21.3%	43.9%	43.9%	39%	9%	11%	17%	11%
Yellow Time (s)	3.0	3.0			4.3	4.3	4.3	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	0.0	0.0			4.4	1.0	1.0	1.0	0.0	4.7	3.8	4.7
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	3.0	3.0			8.7	5.3	5.3					
Lead/Lag	Lead	Lead			Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes			Yes	
Recall Mode	None	None			None	Min	Min	Min	None	None	None	None
Act Effct Green (s)	5.2	5.2		13.2	8.3	47.5	47.5					
Actuated g/C Ratio	0.08	0.08		0.21	0.13	0.74	0.74					
v/c Ratio	0.01	0.00		0.05	0.43	0.12	0.00					
Control Delay	34.0	0.0		3.6	35.5	7.1	0.0					
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0					
Total Delay	34.0	0.0		3.6	35.5	7.1	0.0					
LOS	C	A		A	D	A	A					
Approach Delay	22.7			3.6		13.9						
Approach LOS	C			A		B						

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

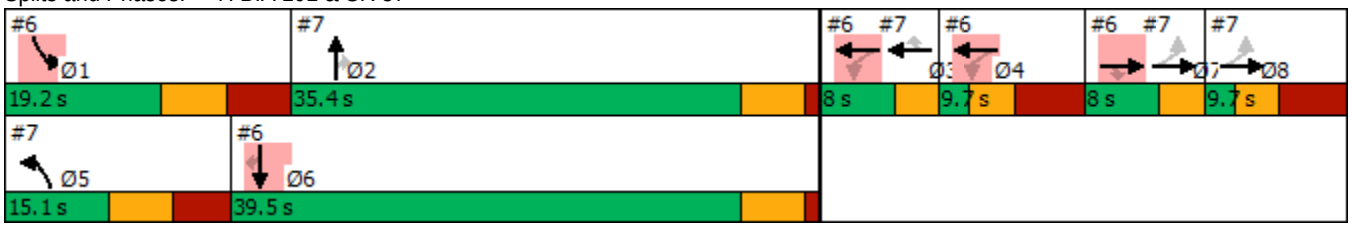
Splits and Phases: 6: Park Ent & SR 87



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø4	Ø6	Ø7	Ø8
Lane Configurations												
Traffic Volume (vph)	1	1	10	87	1	457	31					
Future Volume (vph)	1	1	10	87	1	457	31					
Turn Type	Perm	NA	NA	Perm	Prot	NA	Perm					
Protected Phases		7 8	3		5	2		1	4	6	7	8
Permitted Phases	7 8			3			2					
Detector Phase	7 8	7 8	3	3	5	2	2					
Switch Phase												
Minimum Initial (s)			5.0	5.0	7.0	30.0	30.0	7.0	2.0	30.0	5.0	2.0
Minimum Split (s)			8.0	8.0	15.1	35.3	35.3	15.7	9.7	35.3	8.0	9.7
Total Split (s)			8.0	8.0	15.1	35.4	35.4	19.2	9.7	39.5	8.0	9.7
Total Split (%)			8.9%	8.9%	16.8%	39.3%	39.3%	21%	11%	44%	9%	11%
Yellow Time (s)			3.0	3.0	4.3	4.3	4.3	4.3	3.0	4.3	3.0	3.0
All-Red Time (s)			0.0	0.0	3.8	1.0	1.0	4.4	4.7	1.0	0.0	4.7
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	0.0					
Total Lost Time (s)			3.0	3.0	8.1	5.3	5.3					
Lead/Lag			Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		Yes		
Recall Mode			None	None	None	Min	Min	None	None	Min	None	None
Act Effct Green (s)		8.1	5.2	5.2	7.3	36.3	36.3					
Actuated g/C Ratio		0.13	0.08	0.08	0.11	0.57	0.57					
v/c Ratio		0.01	0.07	0.21	0.00	0.25	0.03					
Control Delay		43.0	34.6	1.1	33.0	12.6	0.1					
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay		43.0	34.6	1.1	33.0	12.6	0.1					
LOS		D	C	A	C	B	A					
Approach Delay		43.0	4.6			11.8						
Approach LOS		D	A			B						

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 45.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: BIA 101 & SR 87



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	31	538	29	437	49	6	20	5	6
Future Volume (vph)	31	538	29	437	49	6	20	5	6
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4		8	
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	1	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	30.0	5.0	30.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.5	35.1	9.5	35.1	12.1	12.1	12.1	12.1	12.1
Total Split (s)	15.0	49.0	15.0	49.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	16.7%	54.4%	16.7%	54.4%	28.9%	28.9%	28.9%	28.9%	28.9%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.5	1.5	1.5	1.5	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	5.1	4.5	5.1	6.1	6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
Act Effct Green (s)	71.2	68.6	71.2	68.6	7.9	7.9		7.9	7.9
Actuated g/C Ratio	0.79	0.76	0.79	0.76	0.09	0.09		0.09	0.09
v/c Ratio	0.05	0.16	0.05	0.13	0.44	0.10		0.22	0.03
Control Delay	1.1	1.6	2.3	3.8	49.7	27.0		41.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	1.1	1.6	2.3	3.8	49.7	27.0		41.4	0.3
LOS	A	A	A	A	D	C		D	A
Approach Delay		1.5		3.7		44.7		32.9	
Approach LOS		A		A		D		C	

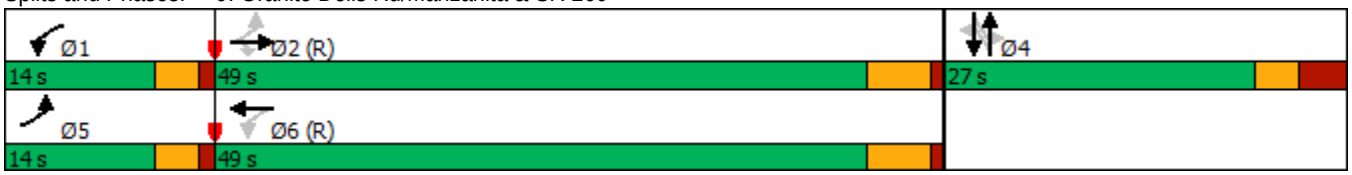
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 6 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Payson Village & SR 260

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	17	453	64	38	393	42	25	46	41
Future Volume (vph)	17	453	64	38	393	42	25	46	41
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		4		4
Permitted Phases	2		2	6		4		4	
Detector Phase	5	2	2	1	6	4	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	17.0	17.0	6.0	17.0	6.0	6.0	6.0	6.0
Minimum Split (s)	10.0	26.3	26.3	10.0	27.3	12.3	12.3	12.3	12.3
Total Split (s)	14.0	49.0	49.0	14.0	49.0	27.0	27.0	27.0	27.0
Total Split (%)	15.6%	54.4%	54.4%	15.6%	54.4%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	3.3	3.3	3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	70.6	66.8	66.8	71.4	68.8	9.1	9.1	9.1	9.1
Actuated g/C Ratio	0.78	0.74	0.74	0.79	0.76	0.10	0.10	0.10	0.10
v/c Ratio	0.02	0.19	0.06	0.06	0.11	0.35	0.32	0.37	0.35
Control Delay	0.9	1.4	0.1	2.9	4.4	43.6	22.6	44.6	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	1.4	0.1	2.9	4.4	43.6	22.6	44.6	30.1
LOS	A	A	A	A	A	D	C	D	C
Approach Delay		1.2			4.3		31.1		36.1
Approach LOS		A			A		C		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 10 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 41.4%	ICU Level of Service A
Analysis Period (min) 15	

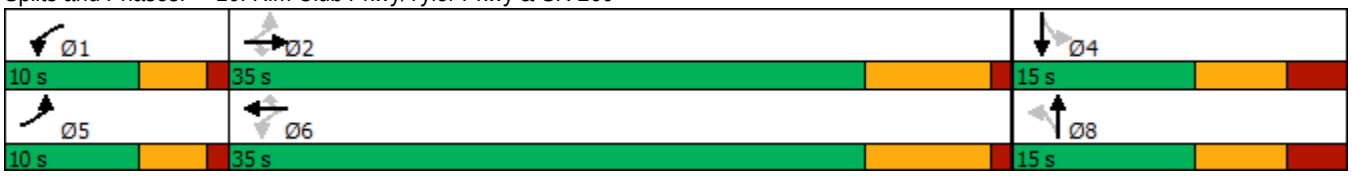
Splits and Phases: 9: Granite Dells Rd/Manzanita & SR 260



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	6	388	27	8	377	41	16	4	53	8
Future Volume (vph)	6	388	27	8	377	41	16	4	53	8
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	6.0	20.0	20.0	6.0	20.0	20.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	32.6	32.6	10.0	31.6	31.6	13.9	13.9	13.9	13.9
Total Split (s)	10.0	35.0	35.0	10.0	35.0	35.0	15.0	15.0	15.0	15.0
Total Split (%)	16.7%	58.3%	58.3%	16.7%	58.3%	58.3%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	3.0	5.6	5.6	3.0	5.6	5.6	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	4.0	6.6	6.6	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None
Act Effct Green (s)	30.3	29.4	29.4	30.3	29.4	29.4	7.3	7.3	7.3	7.3
Actuated g/C Ratio	0.70	0.68	0.68	0.70	0.68	0.68	0.17	0.17	0.17	0.17
v/c Ratio	0.01	0.18	0.03	0.01	0.17	0.04	0.06	0.03	0.20	0.15
Control Delay	3.8	6.4	0.0	3.9	6.4	0.1	17.4	14.4	18.8	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	6.4	0.0	3.9	6.4	0.1	17.4	14.4	18.8	10.2
LOS	A	A	A	A	A	A	B	B	B	B
Approach Delay		6.0			5.7			16.5		15.0
Approach LOS		A			A			B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 7.0	Intersection LOS: A
Intersection Capacity Utilization 42.1%	ICU Level of Service A
Analysis Period (min) 15	

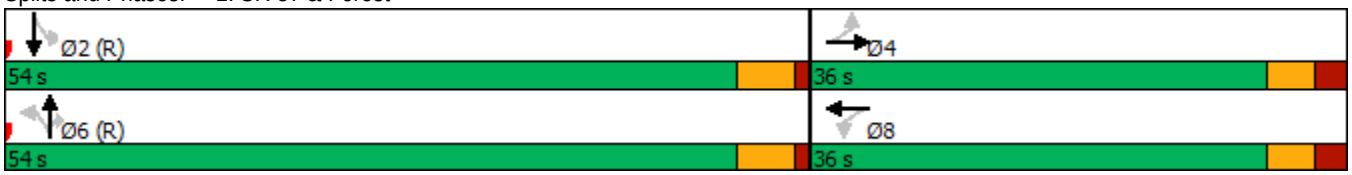
Splits and Phases: 10: Rim Club Pkwy/Tyler Pkwy & SR 260



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	29	28	54	39	108	690	62	46	542
Future Volume (vph)	29	28	54	39	108	690	62	46	542
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		6			2
Permitted Phases	4		8		6		6	2	
Detector Phase	4	4	8	8	6	6	6	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	31.5	31.5	31.5	31.5	25.0	25.0	25.0	25.0	25.0
Total Split (s)	36.0	36.0	36.0	36.0	54.0	54.0	54.0	54.0	54.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	2.3	2.3	2.3	2.3	1.1	1.1	1.1	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	9.2	9.2	9.2	9.2	73.8	73.8	73.8	73.8	73.8
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.82	0.82	0.82	0.82	0.82
v/c Ratio	0.24	0.43	0.45	0.43	0.18	0.26	0.05	0.09	0.21
Control Delay	40.7	20.8	48.4	25.3	2.2	1.6	0.5	3.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	20.8	48.4	25.3	2.2	1.6	0.5	3.2	2.7
LOS	D	C	D	C	A	A	A	A	A
Approach Delay		25.7		34.2		1.6			2.7
Approach LOS		C		C		A			A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 83 (92%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 61.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: SR 87 & Forest



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	20	39	21	50	130	717	45	568	87
Future Volume (vph)	147	20	39	21	50	130	717	45	568	87
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	custom
Protected Phases	7	4	3	8		1	6	5	2	
Permitted Phases	4		8		8	6		2		6
Detector Phase	7	4	3	8	8	1	6	5	2	6
Switch Phase										
Minimum Initial (s)	5.0	6.0	5.0	6.0	6.0	5.0	20.0	5.0	20.0	20.0
Minimum Split (s)	10.8	11.9	10.8	11.9	11.9	9.3	33.2	9.4	33.3	33.2
Total Split (s)	20.0	21.0	13.0	14.0	14.0	15.0	46.0	10.0	41.0	46.0
Total Split (%)	22.2%	23.3%	14.4%	15.6%	15.6%	16.7%	51.1%	11.1%	45.6%	51.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.9	3.0	3.9	3.9
All-Red Time (s)	2.8	2.9	2.8	2.9	2.9	1.3	1.3	1.4	1.4	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.9	5.8	5.9	5.9	4.3	5.2	4.4	5.3	5.2
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Act Effct Green (s)	20.4	13.2	10.6	6.1	6.1	58.2	52.7	53.5	47.4	52.7
Actuated g/C Ratio	0.23	0.15	0.12	0.07	0.07	0.65	0.59	0.59	0.53	0.59
v/c Ratio	0.56	0.31	0.23	0.18	0.15	0.28	0.39	0.12	0.33	0.10
Control Delay	35.2	15.5	28.2	43.1	0.9	4.3	5.6	7.2	12.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	15.5	28.2	43.1	0.9	4.3	5.6	7.2	12.6	0.2
LOS	D	B	C	D	A	A	A	A	B	A
Approach Delay		27.9		18.7			5.4		10.7	
Approach LOS		C		B			A		B	

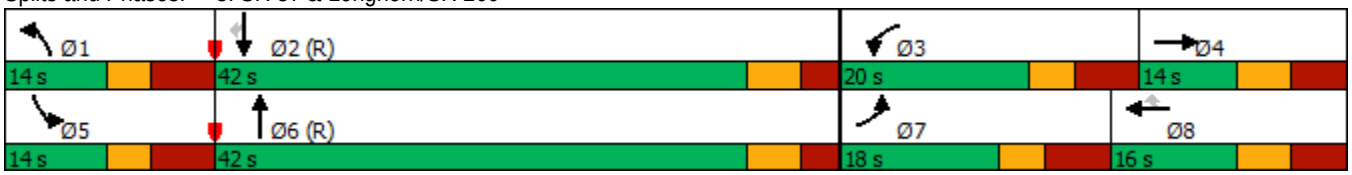
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 54 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 58.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: SR 87 & Rumsey/Malibu

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	164	159	477	141	218	47	571	568	170	424	121
Future Volume (vph)	164	159	477	141	218	47	571	568	170	424	121
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4	3	8		1	6		5	2	
Permitted Phases					8			Free			2
Detector Phase	7	4	3	8	8	1	6		5	2	2
Switch Phase											
Minimum Initial (s)	10.0	6.0	6.0	6.0	6.0	6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	17.4	13.5	13.4	13.5	13.5	13.2	41.3		13.2	41.3	41.3
Total Split (s)	18.0	14.0	20.0	16.0	16.0	14.0	42.0		14.0	42.0	42.0
Total Split (%)	20.0%	15.6%	22.2%	17.8%	17.8%	15.6%	46.7%		15.6%	46.7%	46.7%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.6	3.0	3.6		3.0	3.6	3.6
All-Red Time (s)	4.4	3.9	4.4	3.9	3.9	4.2	2.7		4.2	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.4	7.5	7.4	7.5	7.5	7.2	6.3		7.2	6.3	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min		None	C-Min	C-Min
Act Effct Green (s)	10.4	8.3	21.4	19.3	19.3	6.4	24.8	90.0	7.1	30.7	30.7
Actuated g/C Ratio	0.12	0.09	0.24	0.21	0.21	0.07	0.28	1.00	0.08	0.34	0.34
v/c Ratio	0.45	0.68	0.63	0.38	0.46	0.40	0.64	0.39	0.69	0.38	0.19
Control Delay	40.9	42.6	30.2	32.0	13.1	45.1	27.1	1.3	48.1	17.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	42.6	30.2	32.0	13.1	45.1	27.1	1.3	48.1	17.7	5.3
LOS	D	D	C	C	B	D	C	A	D	B	A
Approach Delay		41.9		26.0			15.5			22.8	
Approach LOS		D		C			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green, Master Intersection	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 77.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: SR 87 & Longhorn/SR 260



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	62	35	63	36	19	1063	53	899
Future Volume (vph)	62	35	63	36	19	1063	53	899
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4		4	1	6	5	2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	1	6	5	2
Switch Phase								
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	25.0	6.0	25.0
Minimum Split (s)	11.5	11.5	11.5	11.5	10.5	29.7	10.5	29.7
Total Split (s)	21.0	21.0	21.0	21.0	12.0	57.0	12.0	57.0
Total Split (%)	23.3%	23.3%	23.3%	23.3%	13.3%	63.3%	13.3%	63.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.5	2.5	2.5	2.5	1.0	1.1	1.0	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	4.0	4.7	4.0	4.7
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	9.0	9.0	9.0	9.0	70.6	66.0	72.2	70.0
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.78	0.73	0.80	0.78
v/c Ratio	0.52	0.31	0.52	0.47	0.04	0.46	0.15	0.37
Control Delay	52.4	29.4	51.7	23.1	1.2	4.0	1.5	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	29.4	51.7	23.1	1.2	4.0	1.5	2.7
LOS	D	C	D	C	A	A	A	A
Approach Delay		41.4		34.2		4.0		2.7
Approach LOS		D		C		A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 65 (72%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 57.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: SR 87 & Bonita

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	201	51	50	46	67	38	800	34	744
Future Volume (vph)	201	51	50	46	67	38	800	34	744
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8		1	6	5	2
Permitted Phases	4		8		8	6		2	
Detector Phase	7	4	3	8	8	1	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	15.0	5.0	15.0
Minimum Split (s)	10.9	10.4	10.9	10.9	10.9	9.5	25.1	10.0	34.1
Total Split (s)	22.0	23.0	12.0	13.0	13.0	10.0	45.0	10.0	45.0
Total Split (%)	24.4%	25.6%	13.3%	14.4%	14.4%	11.1%	50.0%	11.1%	50.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.6	3.0	3.6
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	4.5	5.1	4.5	5.1
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	24.6	15.1	11.5	6.3	6.3	52.9	49.1	52.8	49.1
Actuated g/C Ratio	0.27	0.17	0.13	0.07	0.07	0.59	0.55	0.59	0.55
v/c Ratio	0.59	0.35	0.27	0.38	0.24	0.13	0.46	0.11	0.50
Control Delay	32.3	21.0	25.9	48.3	1.8	10.2	16.1	3.9	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	21.0	25.9	48.3	1.8	10.2	16.1	3.9	6.6
LOS	C	C	C	D	A	B	B	A	A
Approach Delay		28.5		22.3			15.8		6.5
Approach LOS		C		C			B		A

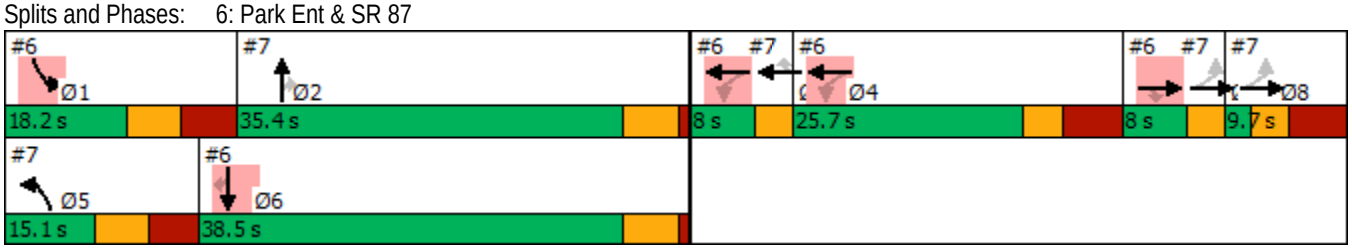
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 1 (1%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: SR 87 & Main

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	Ø2	Ø3	Ø4	Ø5	Ø8
Lane Configurations												
Traffic Volume (vph)	2	1	19	1	135	546	1					
Future Volume (vph)	2	1	19	1	135	546	1					
Turn Type	NA	Perm	Perm	NA	Prot	NA	Perm					
Protected Phases	7			3 4	1	6		2	3	4	5	8
Permitted Phases		7	3 4				6					
Detector Phase	7	7	3 4	3 4	1	6	6					
Switch Phase												
Minimum Initial (s)	5.0	5.0			7.0	30.0	30.0	30.0	5.0	2.0	7.0	2.0
Minimum Split (s)	8.0	8.0			15.7	35.3	35.3	35.3	8.0	25.7	15.1	9.7
Total Split (s)	8.0	8.0			18.2	38.5	38.5	35.4	8.0	25.7	15.1	9.7
Total Split (%)	7.6%	7.6%			17.3%	36.7%	36.7%	34%	8%	24%	14%	9%
Yellow Time (s)	3.0	3.0			4.3	4.3	4.3	4.3	3.0	3.0	4.3	3.0
All-Red Time (s)	0.0	0.0			4.4	1.0	1.0	1.0	0.0	4.7	3.8	4.7
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	3.0	3.0			8.7	5.3	5.3					
Lead/Lag	Lead	Lead			Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes			Yes	
Recall Mode	None	None			None	Min	Min	Min	None	None	None	None
Act Effct Green (s)	5.1	5.1		16.1	9.6	47.0	47.0					
Actuated g/C Ratio	0.07	0.07		0.23	0.14	0.68	0.68					
v/c Ratio	0.01	0.00		0.12	0.60	0.25	0.00					
Control Delay	37.0	0.0		5.3	43.6	8.7	0.0					
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0					
Total Delay	37.0	0.0		5.3	43.6	8.7	0.0					
LOS	D	A		A	D	A	A					
Approach Delay	24.7			5.3		15.6						
Approach LOS	C			A		B						

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 69.5	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

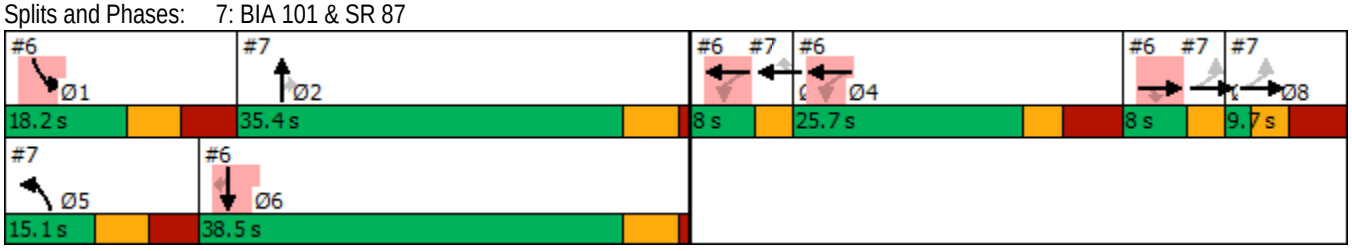
Splits and Phases: 6: Park Ent & SR 87



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	Ø1	Ø4	Ø6	Ø7	Ø8
Lane Configurations												
Traffic Volume (vph)	1	1	20	169	1	570	51					
Future Volume (vph)	1	1	20	169	1	570	51					
Turn Type	Perm	NA	NA	Perm	Prot	NA	Perm					
Protected Phases		7 8	3		5	2		1	4	6	7	8
Permitted Phases	7 8			3			2					
Detector Phase	7 8	7 8	3	3	5	2	2					
Switch Phase												
Minimum Initial (s)			5.0	5.0	7.0	30.0	30.0	7.0	2.0	30.0	5.0	2.0
Minimum Split (s)			8.0	8.0	15.1	35.3	35.3	15.7	25.7	35.3	8.0	9.7
Total Split (s)			8.0	8.0	15.1	35.4	35.4	18.2	25.7	38.5	8.0	9.7
Total Split (%)			7.6%	7.6%	14.4%	33.7%	33.7%	17%	24%	37%	8%	9%
Yellow Time (s)			3.0	3.0	4.3	4.3	4.3	4.3	3.0	4.3	3.0	3.0
All-Red Time (s)			0.0	0.0	3.8	1.0	1.0	4.4	4.7	1.0	0.0	4.7
Lost Time Adjust (s)			0.0	0.0	0.0	0.0	0.0					
Total Lost Time (s)			3.0	3.0	8.1	5.3	5.3					
Lead/Lag			Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes		Yes		
Recall Mode			None	None	None	Min	Min	None	None	Min	None	None
Act Effct Green (s)		8.1	5.1	5.1	7.2	30.8	30.8					
Actuated g/C Ratio		0.12	0.07	0.07	0.10	0.44	0.44					
v/c Ratio		0.01	0.16	0.47	0.01	0.40	0.06					
Control Delay		52.5	38.2	4.0	35.0	16.2	0.1					
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0					
Total Delay		52.5	38.2	4.0	35.0	16.2	0.1					
LOS		D	D	A	C	B	A					
Approach Delay		52.5	7.6			14.9						
Approach LOS		D	A			B						

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 69.5	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 50.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: BIA 101 & SR 87



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	77	743	33	658	92	24	65	11	63
Future Volume (vph)	77	743	33	658	92	24	65	11	63
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2	1	6		4		8	
Permitted Phases	2		6		4		8		8
Detector Phase	5	2	1	6	4	4	8	8	8
Switch Phase									
Minimum Initial (s)	5.0	30.0	5.0	30.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	9.5	35.1	9.5	35.1	12.1	12.1	12.1	12.1	12.1
Total Split (s)	15.0	48.0	12.0	45.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	16.7%	53.3%	13.3%	50.0%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	3.6	3.0	3.6	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.5	1.5	1.5	1.5	3.1	3.1	3.1	3.1	3.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	5.1	4.5	5.1	6.1	6.1		6.1	6.1
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	C-Min	None	C-Min	None	None	None	None	None
Act Effct Green (s)	68.5	65.5	66.9	63.2	11.0	11.0		11.0	11.0
Actuated g/C Ratio	0.76	0.73	0.74	0.70	0.12	0.12		0.12	0.12
v/c Ratio	0.15	0.24	0.07	0.21	0.63	0.18		0.50	0.26
Control Delay	1.9	2.0	3.2	5.4	54.1	25.6		46.4	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	1.9	2.0	3.2	5.4	54.1	25.6		46.4	9.0
LOS	A	A	A	A	D	C		D	A
Approach Delay		2.0		5.3		45.8		29.5	
Approach LOS		A		A		D		C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 10 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 54.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Payson Village & SR 260

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	51	637	96	68	550	109	67	80	85
Future Volume (vph)	51	637	96	68	550	109	67	80	85
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		4		4
Permitted Phases	2		2	6		4		4	
Detector Phase	5	2	2	1	6	4	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	17.0	17.0	6.0	17.0	6.0	6.0	6.0	6.0
Minimum Split (s)	10.0	26.3	26.3	10.0	27.3	12.3	12.3	12.3	12.3
Total Split (s)	12.0	46.0	46.0	12.0	46.0	32.0	32.0	32.0	32.0
Total Split (%)	13.3%	51.1%	51.1%	13.3%	51.1%	35.6%	35.6%	35.6%	35.6%
Yellow Time (s)	3.0	4.3	4.3	3.0	4.3	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	3.3	3.3	3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.3	5.3	4.0	5.3	6.3	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None
Act Effct Green (s)	61.3	55.2	55.2	61.5	55.3	15.1	15.1	15.1	15.1
Actuated g/C Ratio	0.68	0.61	0.61	0.68	0.61	0.17	0.17	0.17	0.17
v/c Ratio	0.10	0.32	0.11	0.14	0.21	0.56	0.48	0.47	0.40
Control Delay	2.4	4.3	0.4	5.8	9.0	43.2	22.7	40.0	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	4.3	0.4	5.8	9.0	43.2	22.7	40.0	29.7
LOS	A	A	A	A	A	D	C	D	C
Approach Delay		3.7			8.7		31.3		33.9
Approach LOS		A			A		C		C

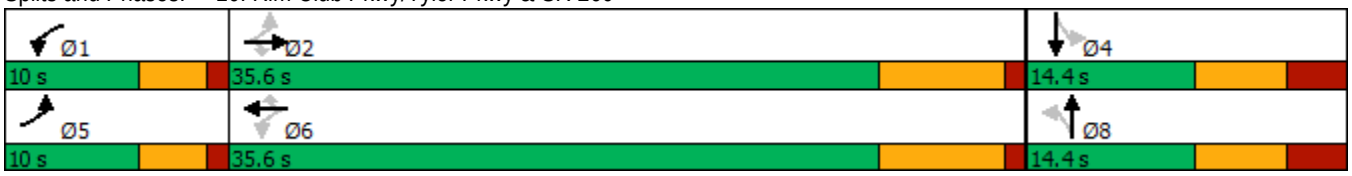
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 12 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 9: Granite Dells Rd/Manzanita & SR 260

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	22	706	13	3	507	55	21	2	51	2
Future Volume (vph)	22	706	13	3	507	55	21	2	51	2
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	6.0	20.0	20.0	6.0	20.0	20.0	7.0	7.0	7.0	7.0
Minimum Split (s)	10.0	32.6	32.6	10.0	31.6	31.6	13.9	13.9	13.9	13.9
Total Split (s)	10.0	35.6	35.6	10.0	35.6	35.6	14.4	14.4	14.4	14.4
Total Split (%)	16.7%	59.3%	59.3%	16.7%	59.3%	59.3%	24.0%	24.0%	24.0%	24.0%
Yellow Time (s)	3.0	5.6	5.6	3.0	5.6	5.6	4.1	4.1	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	4.0	6.6	6.6	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?										
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None
Act Effct Green (s)	33.2	32.6	32.6	33.2	32.6	32.6	7.2	7.2	7.2	7.2
Actuated g/C Ratio	0.72	0.71	0.71	0.72	0.71	0.71	0.16	0.16	0.16	0.16
v/c Ratio	0.03	0.31	0.01	0.00	0.22	0.05	0.08	0.03	0.19	0.10
Control Delay	3.5	6.2	0.0	3.3	5.8	0.1	20.5	15.7	21.3	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	6.2	0.0	3.3	5.8	0.1	20.5	15.7	21.3	11.6
LOS	A	A	A	A	A	A	C	B	C	B
Approach Delay		6.0			5.2			19.4		18.1
Approach LOS		A			A			B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 46	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 42.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Rim Club Pkwy/Tyler Pkwy & SR 260



APPENDIX C

VISSIM Results

Volume Comparison - Friday

Node #	Intersection Name	Movement	Vissim Volume (Alt 2)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1085	1086	-1	0%
		SBT	514	514	0	0%
2	SR 87 & Main St	NBT	1240	1236	4	0%
		SBT	752	755	-3	0%
3	SR 87 & Bonita St	NBT	1370	1371	-1	0%
		SBT	1061	1061	0	0%
4	SR 87 & SR 260	NBT	731	728	3	0%
		NBR	777	774	3	0%
		NBL	53	53	0	0%
		SBT	491	494	-3	-1%
		SBR	157	157	0	0%
		SBL	266	268	-2	-1%
		EBT	311	312	-1	0%
		EBR	87	87	0	0%
		EBL	269	269	0	0%
		WBT	213	214	-1	0%
		WBR	297	296	1	0%
		WBL	625	623	2	0%
5	SR 87 & Malibu Dr	NBT	862	863	-1	0%
		SBT	741	747	-6	-1%
6	SR 87 & Forest Dr	NBT	755	760	-5	-1%
		SBT	692	693	-1	0%
7	SR 260 & Payson Village Access	EBT	1134	1131	3	0%
		WBT	762	761	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	996	995	1	0%
		WBT	640	639	1	0%
9	SR 260 & Tyler Pkwy	EBT	1172	1169	3	0%
		WBT	643	643	0	0%
	Total		18696	18699		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 3)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1089	1086	3	0%
		SBT	513	514	-1	0%
2	SR 87 & Main St	NBT	1240	1236	4	0%
		SBT	751	755	-4	-1%
3	SR 87 & Bonita St	NBT	1373	1371	2	0%
		SBT	1066	1061	5	0%
4	SR 87 & SR 260	NBT	729	728	1	0%
		NBR	771	774	-3	0%
		NBL	53	53	0	0%
		SBT	486	494	-8	-2%
		SBR	159	157	2	1%
		SBL	264	268	-4	-1%
		EBT	316	312	4	1%
		EBR	85	87	-2	-2%
		EBL	268	269	-1	0%
		WBT	215	214	1	0%
		WBR	297	296	1	0%
		WBL	628	623	5	1%
5	SR 87 & Malibu Dr	NBT	867	863	4	0%
		SBT	740	747	-7	-1%
6	SR 87 & Forest Dr	NBT	762	760	2	0%
		SBT	692	693	-1	0%
7	SR 260 & Payson Village Access	EBT	1132	1131	1	0%
		WBT	768	761	7	1%
8	SR 260 & Manzanita/Granite Dells	EBT	994	995	-1	0%
		WBT	642	639	3	0%
9	SR 260 & Tyler Pkwy	EBT	1171	1169	2	0%
		WBT	646	643	3	0%
	Total		18717	18699		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 4)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1085	1086	-1	0%
		SBT	515	514	1	0%
2	SR 87 & Main St	NBT	1241	1236	5	0%
		SBT	755	755	0	0%
3	SR 87 & Bonita St	NBT	1370	1371	-1	0%
		SBT	1057	1061	-4	0%
4	SR 87 & SR 260	NBT	722	728	-6	-1%
		NBR	783	774	9	1%
		NBL	49	53	-4	-8%
		SBT	488	494	-6	-1%
		SBR	157	157	0	0%
		SBL	266	268	-2	-1%
		EBT	313	312	1	0%
		EBR	86	87	-1	-1%
		EBL	269	269	0	0%
		WBT	216	214	2	1%
		WBR	297	296	1	0%
		WBL	623	623	0	0%
5	SR 87 & Malibu Dr	NBT	857	863	-6	-1%
		SBT	745	747	-2	0%
6	SR 87 & Forest Dr	NBT	758	760	-2	0%
		SBT	694	693	1	0%
7	SR 260 & Payson Village Access	EBT	1134	1131	3	0%
		WBT	762	761	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	997	995	2	0%
		WBT	638	639	-1	0%
9	SR 260 & Tyler Pkwy	EBT	1172	1169	3	0%
		WBT	643	643	0	0%
	Total		18692	18699		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 5)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1086	1086	0	0%
		SBT	515	514	1	0%
2	SR 87 & Main St	NBT	1242	1236	6	0%
		SBT	753	755	-2	0%
3	SR 87 & Bonita St	NBT	1373	1371	2	0%
		SBT	1061	1061	0	0%
4	SR 87 & SR 260	NBT	725	728	-3	0%
		NBR	785	774	11	1%
		NBL	50	53	-3	-6%
		SBT	494	494	0	0%
		SBR	158	157	1	1%
		SBL	268	268	0	0%
		EBT	311	312	-1	0%
		EBR	87	87	0	0%
		EBL	269	269	0	0%
		WBT	213	214	-1	0%
		WBR	296	296	0	0%
		WBL	622	623	-1	0%
5	SR 87 & Malibu Dr	NBT	862	863	-1	0%
		SBT	746	747	-1	0%
6	SR 87 & Forest Dr	NBT	759	760	-1	0%
		SBT	693	693	0	0%
7	SR 260 & Payson Village Access	EBT	1138	1131	7	1%
		WBT	760	761	-1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	1000	995	5	1%
		WBT	638	639	-1	0%
9	SR 260 & Tyler Pkwy	EBT	1172	1169	3	0%
		WBT	643	643	0	0%
	Total		18719	18699		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 6)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1087	1086	1	0%
		SBT	515	514	1	0%
2	SR 87 & Main St	NBT	1233	1236	-3	0%
		SBT	753	755	-2	0%
3	SR 87 & Bonita St	NBT	1364	1371	-7	-1%
		SBT	1062	1061	1	0%
4	SR 87 & SR 260	NBT	730	728	2	0%
		NBR	773	774	-1	0%
		NBL	52	53	-1	-2%
		SBT	493	494	-1	0%
		SBR	158	157	1	1%
		SBL	265	268	-3	-1%
		EBT	313	312	1	0%
		EBR	87	87	0	0%
		EBL	268	269	-1	0%
		WBT	214	214	0	0%
		WBR	296	296	0	0%
		WBL	621	623	-2	0%
5	SR 87 & Malibu Dr	NBT	863	863	0	0%
		SBT	746	747	-1	0%
6	SR 87 & Forest Dr	NBT	150	760	-610	-80%
		SBT	692	693	-1	0%
7	SR 260 & Payson Village Access	EBT	1129	1131	-2	0%
		WBT	762	761	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	993	995	-2	0%
		WBT	640	639	1	0%
9	SR 260 & Tyler Pkwy	EBT	1169	1169	0	0%
		WBT	643	643	0	0%
	Total		18071	18699		**-3%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 8)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1086	1086	0	0%
		SBT	503	514	-11	-2%
2	SR 87 & Main St	NBT	1238	1236	2	0%
		SBT	733	755	-22	-3%
3	SR 87 & Bonita St	NBT	1374	1371	3	0%
		SBT	1028	1061	-33	-3%
4	SR 87 & SR 260	NBT	849	728	121	17%
		NBR	776	774	2	0%
		NBL	136	53	83	157%
		SBT	490	494	-4	-1%
		SBR	158	157	1	1%
		SBL	268	268	0	0%
		EBT	311	312	-1	0%
		EBR	87	87	0	0%
		EBL	270	269	1	0%
		WBT	201	214	-13	-6%
		WBR	278	296	-18	-6%
		WBL	589	623	-34	-5%
5	SR 87 & Malibu Dr	NBT	935	863	72	8%
		SBT	741	747	-6	-1%
6	SR 87 & Forest Dr	NBT	814	760	54	7%
		SBT	693	693	0	0%
7	SR 260 & Payson Village Access	EBT	1103	1131	-28	-2%
		WBT	762	761	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	906	995	-89	-9%
		WBT	638	639	-1	0%
9	SR 260 & Tyler Pkwy	EBT	1087	1169	-82	-7%
		WBT	644	643	1	0%
	Total		18698	18699		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 9)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	1054	1086	-32	-3%
		SBT	430	514	-84	-16%
2	SR 87 & Main St	NBT	1163	1236	-73	-6%
		SBT	687	755	-68	-9%
3	SR 87 & Bonita St	NBT	1084	1371	-287	-21%
		SBT	960	1061	-101	-10%
4	SR 87 & SR 260	NBT	581	728	-147	-20%
		NBR	623	774	-151	-20%
		NBL	40	53	-13	-25%
		SBT	416	494	-78	-16%
		SBR	132	157	-25	-16%
		SBL	222	268	-46	-17%
		EBT	287	312	-25	-8%
		EBR	80	87	-7	-8%
		EBL	250	269	-19	-7%
		WBT	199	214	-15	-7%
		WBR	272	296	-24	-8%
		WBL	589	623	-34	-5%
5	SR 87 & Malibu Dr	NBT	727	863	-136	-16%
		SBT	705	747	-42	-6%
6	SR 87 & Forest Dr	NBT	547	760	-213	-28%
		SBT	674	693	-19	-3%
7	SR 260 & Payson Village Access	EBT	951	1131	-180	-16%
		WBT	709	761	-52	-7%
8	SR 260 & Manzanita/Granite Dells	EBT	850	995	-145	-15%
		WBT	604	639	-35	-5%
9	SR 260 & Tyler Pkwy	EBT	1026	1169	-143	-12%
		WBT	644	643	1	0%
	Total		16506	18699		**-12%**

Delay Comparison - Friday

Node #	Intersection Name	Movement	Vissim Delay (Alt 2)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	13.99	14.39	-0.4	-3%
		SBT	1.77	1.93	-0.16	-8%
2	SR 87 & Main St	NBT	33.29	33.2	0.09	0%
		SBT	25.01	25.19	-0.18	-1%
3	SR 87 & Bonita St	NBT	16.6	16.96	-0.36	-2%
		SBT	14.02	14.14	-0.12	-1%
4	SR 87 & SR 260	NBT	44.62	42.96	1.66	4%
		NBR	21.95	20.83	1.12	5%
		NBL	66.39	84.93	-18.54	-22%
		SBT	34.98	36.43	-1.45	-4%
		SBR	9.04	9.78	-0.74	-8%
		SBL	61.42	62.90	-1.48	-2%
		EBT	57.78	57.16	0.62	1%
		EBR	36.12	36.19	-0.07	0%
		EBL	78.1	83.89	-5.79	-7%
		WBT	48.23	47.15	1.08	2%
		WBR	61.10	61.25	-0.15	0%
		WBL	33.59	33.49	0.1	0%
5	SR 87 & Malibu Dr	NBT	12.9	12.33	0.57	5%
		SBT	17.85	18.71	-0.86	-5%
6	SR 87 & Forest Dr	NBT	4.71	4.4	0.31	7%
		SBT	5.84	5.83	0.01	0%
7	SR 260 & Payson Village Access	EBT	13.33	13.86	-0.53	-4%
		WBT	8.33	8.55	-0.22	-3%
8	SR 260 & Manzanita/Granite Dells	EBT	19.07	19.57	-0.5	-3%
		WBT	12.74	12.97	-0.23	-2%
9	SR 260 & Tyler Pkwy	EBT	5.49	5.88	-0.39	-7%
		WBT	4.54	4.72	-0.18	-4%

Node #	Intersection Name	Movement	Vissim Delay (Alt 3)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	14.03	14.39	-0.36	-3%
		SBT	1.95	1.93	0.02	1%
2	SR 87 & Main St	NBT	32.7	33.2	-0.5	-2%
		SBT	25.58	25.19	0.39	2%
3	SR 87 & Bonita St	NBT	16.19	16.96	-0.77	-5%
		SBT	14.33	14.14	0.19	1%
4	SR 87 & SR 260	NBT	49.24	42.96	6.28	15%
		NBR	32.13	20.83	11.3	54%
		NBL	71.75	84.93	-13.18	-16%
		SBT	35.02	36.43	-1.41	-4%
		SBR	8.41	9.78	-1.37	-14%
		SBL	61.0	62.9	-1.9	-3%
		EBT	57.17	57.16	0.01	0%
		EBR	36.05	36.19	-0.14	0%
		EBL	75.61	83.89	-8.28	-10%
		WBT	48.37	47.15	1.22	3%
		WBR	61.36	61.25	0.11	0%
		WBL	37.08	33.49	3.59	11%
5	SR 87 & Malibu Dr	NBT	12.34	12.33	0.01	0%
		SBT	18.46	18.71	-0.25	-1%
6	SR 87 & Forest Dr	NBT	4.71	4.4	0.31	7%
		SBT	5.56	5.83	-0.27	-5%
7	SR 260 & Payson Village Access	EBT	13.15	13.86	-0.71	-5%
		WBT	8.34	8.55	-0.21	-2%
8	SR 260 & Manzanita/Granite Dells	EBT	19.44	19.57	-0.13	-1%
		WBT	12.97	12.97	0	0%
9	SR 260 & Tyler Pkwy	EBT	5.42	5.88	-0.46	-8%
		WBT	4.48	4.72	-0.24	-5%

Node #	Intersection Name	Movement	Vissim Delay (Alt 4)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	13.98	14.39	-0.41	-3%
		SBT	2.06	1.93	0.13	7%
2	SR 87 & Main St	NBT	33.5	33.2	0.3	1%
		SBT	25.35	25.19	0.16	1%
3	SR 87 & Bonita St	NBT	17.83	16.96	0.87	5%
		SBT	12.45	14.14	-1.69	-12%
4	SR 87 & SR 260	NBT	51.6	42.96	8.64	20%
		NBR	35.95	20.83	15.12	73%
		NBL	82.7	84.93	-2.23	-3%
		SBT	34.95	36.43	-1.48	-4%
		SBR	8.52	9.78	-1.26	-13%
		SBL	67.11	62.9	4.21	7%
		EBT	59.37	57.16	2.21	4%
		EBR	36.74	36.19	0.55	2%
		EBL	80.46	83.89	-3.43	-4%
		WBT	48.73	47.15	1.58	3%
		WBR	62.73	61.25	1.48	2%
		WBL	40.45	33.49	6.96	21%
5	SR 87 & Malibu Dr	NBT	11.89	12.33	-0.44	-4%
		SBT	18.2	18.71	-0.51	-3%
6	SR 87 & Forest Dr	NBT	4.23	4.4	-0.17	-4%
		SBT	5.78	5.83	-0.05	-1%
7	SR 260 & Payson Village Access	EBT	12.86	13.86	-1	-7%
		WBT	8.42	8.55	-0.13	-2%
8	SR 260 & Manzanita/Granite Dells	EBT	19.47	19.57	-0.1	-1%
		WBT	12.49	12.97	-0.48	-4%
9	SR 260 & Tyler Pkwy	EBT	5.56	5.88	-0.32	-5%
		WBT	4.46	4.72	-0.26	-6%

Node #	Intersection Name	Movement	Vissim Delay (Alt 5)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	13.67	14.39	-0.72	-5%
		SBT	1.95	1.93	0.02	1%
2	SR 87 & Main St	NBT	32.71	33.2	-0.49	-1%
		SBT	25.19	25.19	0	0%
3	SR 87 & Bonita St	NBT	24.87	16.96	7.91	47%
		SBT	13.11	14.14	-1.03	-7%
4	SR 87 & SR 260	NBT	52.10	42.96	9.14	21%
		NBR	26.16	20.83	5.33	26%
		NBL	71.94	84.93	-12.99	-15%
		SBT	34	36.43	-2.43	-7%
		SBR	9.21	9.78	-0.57	-6%
		SBL	61	62.9	-1.9	-3%
		EBT	57.08	57.16	-0.08	0%
		EBR	33.83	36.19	-2.36	-7%
		EBL	73.12	83.89	-10.77	-13%
		WBT	47.74	47.15	0.59	1%
		WBR	59.19	61.25	-2.06	-3%
		WBL	40.02	33.49	6.53	19%
5	SR 87 & Malibu Dr	NBT	12.4	12.33	0.07	1%
		SBT	18.01	18.71	-0.7	-4%
6	SR 87 & Forest Dr	NBT	4.52	4.4	0.12	3%
		SBT	5.61	5.83	-0.22	-4%
7	SR 260 & Payson Village Access	EBT	13.46	13.86	-0.4	-3%
		WBT	8.18	8.55	-0.37	-4%
8	SR 260 & Manzanita/Granite Dells	EBT	19.47	19.57	-0.1	-1%
		WBT	12.99	12.97	0.02	0%
9	SR 260 & Tyler Pkwy	EBT	5.63	5.88	-0.25	-4%
		WBT	4.42	4.72	-0.3	-6%

Node #	Intersection Name	Movement	Vissim Delay (Alt 6)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	13.06	14.39	-1.33	-9%
		SBT	1.68	1.93	-0.25	-13%
2	SR 87 & Main St	NBT	33.5	33.2	0.3	1%
		SBT	25.14	25.19	-0.05	0%
3	SR 87 & Bonita St	NBT	16.95	16.96	-0.01	0%
		SBT	13.96	14.14	-0.18	-1%
4	SR 87 & SR 260	NBT	42.59	42.96	-0.37	-1%
		NBR	21.68	20.83	0.85	4%
		NBL	68.5	84.93	-16.43	-19%
		SBT	35.52	36.43	-0.91	-2%
		SBR	8.98	9.78	-0.8	-8%
		SBL	62.9	62.9	0	0%
		EBT	54.9	57.16	-2.26	-4%
		EBR	33.82	36.19	-2.37	-7%
		EBL	76.02	83.89	-7.87	-9%
		WBT	46.91	47.15	-0.24	-1%
		WBR	60.11	61.25	-1.14	-2%
		WBL	28.79	33.49	-4.7	-14%
5	SR 87 & Malibu Dr	NBT	15.92	12.33	3.59	29%
		SBT	18.83	18.71	0.12	1%
6	SR 87 & Forest Dr	NBT	3.9	4.4	-0.5	-11%
		SBT	6.08	5.83	0.25	4%
7	SR 260 & Payson Village Access	EBT	13.11	13.86	-0.75	-5%
		WBT	8.08	8.55	-0.47	-5%
8	SR 260 & Manzanita/Granite Dells	EBT	19.64	19.57	0.07	0%
		WBT	12.98	12.97	0.01	0%
9	SR 260 & Tyler Pkwy	EBT	5.75	5.88	-0.13	-2%
		WBT	4.43	4.72	-0.29	-6%

Node #	Intersection Name	Movement	Vissim Delay (Alt 8)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	13.42	14.39	-0.97	-7%
		SBT	1.85	1.93	-0.08	-4%
2	SR 87 & Main St	NBT	32.77	33.2	-0.43	-1%
		SBT	24.64	25.19	-0.55	-2%
3	SR 87 & Bonita St	NBT	16.57	16.96	-0.39	-2%
		SBT	13.45	14.14	-0.69	-5%
4	SR 87 & SR 260	NBT	47.01	42.96	4.05	9%
		NBR	25.68	20.83	4.85	23%
		NBL	85.38	84.93	0.45	1%
		SBT	38.33	36.43	1.9	5%
		SBR	10.53	9.78	0.75	8%
		SBL	62.22	62.9	-0.68	-1%
		EBT	59.12	57.16	1.96	3%
		EBR	36.8	36.19	0.61	2%
		EBL	82.2	83.89	-1.69	-2%
		WBT	50.49	47.15	3.34	7%
		WBR	61.41	61.25	0.16	0%
		WBL	36.86	33.49	3.37	10%
5	SR 87 & Malibu Dr	NBT	12.84	12.33	0.51	4%
		SBT	18.61	18.71	-0.1	-1%
6	SR 87 & Forest Dr	NBT	4.51	4.4	0.11	2%
		SBT	5.67	5.83	-0.16	-3%
7	SR 260 & Payson Village Access	EBT	6.69	13.86	-7.17	-52%
		WBT	4.3	8.55	-4.25	-50%
8	SR 260 & Manzanita/Granite Dells	EBT	16.32	19.57	-3.25	-17%
		WBT	12.82	12.97	-0.15	-1%
9	SR 260 & Tyler Pkwy	EBT	5.4	5.88	-0.45	-8%
		WBT	4.27	4.72	-0.45	-10%

Node #	Intersection Name	Movement	Vissim Delay (Alt 9)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	13.31	14.39	-1.08	-8%
		SBT	1.91	1.93	-0.02	-1%
2	SR 87 & Main St	NBT	33.54	33.2	0.34	1%
		SBT	25.88	25.19	0.69	3%
3	SR 87 & Bonita St	NBT	15.52	16.96	-1.44	-8%
		SBT	12.67	14.14	-1.47	-10%
4	SR 87 & SR 260	NBT	41.33	42.96	-1.63	-4%
		NBR	17.51	20.83	-3.32	-16%
		NBL	66.34	84.93	-18.59	-22%
		SBT	34.92	36.43	-1.51	-4%
		SBR	10.32	9.78	0.54	6%
		SBL	57.99	62.9	-4.91	-8%
		EBT	54.59	57.16	-2.57	-4%
		EBR	32.27	36.19	-3.92	-11%
		EBL	67.87	83.89	-16.02	-19%
		WBT	45.97	47.15	-1.18	-3%
		WBR	55.62	61.25	-5.63	-9%
		WBL	29.39	33.49	-4.1	-12%
5	SR 87 & Malibu Dr	NBT	11.91	12.33	-0.42	-3%
		SBT	29.34	18.71	10.63	57%
6	SR 87 & Forest Dr	NBT	4.17	4.4	-0.23	-5%
		SBT	14.4	5.83	8.57	147%
7	SR 260 & Payson Village Access	EBT	13.23	13.86	-0.63	-5%
		WBT	8.02	8.55	-0.53	-6%
8	SR 260 & Manzanita/Granite Dells	EBT	18.83	19.57	-0.74	-4%
		WBT	12.56	12.97	-0.41	-3%
9	SR 260 & Tyler Pkwy	EBT	5.37	5.88	-0.51	-9%
		WBT	4.5	4.72	-0.22	-5%

Travel Time - Friday

Travel Time (sec)

Alt 2

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	273.0	286.3	260.5	280.6	-7.6	-3%
Southbound SR 87 from SR 260	1.2	198.4	200.3	193.6	202.0	-3.6	-2%
Westbound SR 260 approach to SR 87	1.2	191.1	201.7	183.0	190.9	0.2	0%
Eastbound SR 260 from SR 87	1.2	165.6	173.2	161.6	165.8	-0.2	0%

Alt 3

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	276.6	317.2	252.9	280.6	-4.0	-1%
Southbound SR 87 from SR 260	1.2	199.8	206.8	196.5	202.0	-2.2	-1%
Westbound SR 260 approach to SR 87	1.2	193.1	201.6	181.6	190.9	2.2	1%
Eastbound SR 260 from SR 87	1.2	165.6	168.0	162.6	165.8	-0.2	0%

Alt 4

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	303.0	452.5	270.4	280.6	22.4	8%
Southbound SR 87 from SR 260	1.2	197.5	202.8	192.7	202.0	-4.5	-2%
Westbound SR 260 approach to SR 87	1.2	192.9	203.8	182.7	190.9	2.0	1%
Eastbound SR 260 from SR 87	1.2	169.8	173.6	166.8	165.8	4.0	2%

Alt 5

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	341.8	441.7	299.2	280.6	61.2	22%
Southbound SR 87 from SR 260	1.2	198.2	205.9	191.1	202.0	-3.8	-2%
Westbound SR 260 approach to SR 87	1.2	192.9	201.3	183.3	190.9	2.0	1%
Eastbound SR 260 from SR 87	1.2	171.3	176.1	167.4	165.8	5.5	3%

Alt 6

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	274.0	295.1	260.9	280.6	-6.6	-2%
Southbound SR 87 from SR 260	1.2	199.0	203.2	193.2	202.0	-3.0	-1%
Westbound SR 260 approach to SR 87	1.2	187.6	195.5	177.5	190.9	-3.3	-2%
Eastbound SR 260 from SR 87	1.2	165.5	168.9	161.5	165.8	-0.3	0%

Alt 8

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	287.4	333.8	262.6	280.6	6.8	2%
Southbound SR 87 from SR 260	1.2	197.7	204.2	190.3	202.0	-4.3	-2%
Westbound SR 260 approach to SR 87	1.2	189.7	200.6	177.7	190.9	-1.2	-1%
Eastbound SR 260 from SR 87	1.2	157.5	166.9	152.9	165.8	-8.3	-5%

Alt 9

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	268.3	287.9	258.1	280.6	-12.3	-4%
Southbound SR 87 from SR 260	1.2	198.1	204.1	189.6	202.0	-3.9	-2%
Westbound SR 260 approach to SR 87	1.2	187.2	195.2	177.9	190.9	-3.7	-2%
Eastbound SR 260 from SR 87	1.2	166.0	171.6	162.9	165.8	0.2	0%

Volume Comparison - Sunday

Node #	Intersection Name	Movement	Vissim Volume (Alt 2)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1167	1173	-6	-1%
2	SR 87 & Main St	NBT	967	968	-1	0%
		SBT	1472	1479	-7	0%
3	SR 87 & Bonita St	NBT	1128	1142	-14	-1%
		SBT	1624	1638	-14	-1%
4	SR 87 & SR 260	NBT	698	713	-15	-2%
		NBR	500	506	-6	-1%
		NBL	36	36	0	0%
		SBT	729	756	-27	-4%
		SBR	137	142	-5	-4%
		SBL	332	346	-14	-4%
		EBT	142	140	2	1%
		EBR	61	61	0	0%
		EBL	160	163	-3	-2%
		WBT	137	138	-1	-1%
		WBR	267	270	-3	-1%
		WBL	939	934	5	1%
5	SR 87 & Malibu Dr	NBT	903	922	-19	-2%
		SBT	992	1029	-37	-4%
6	SR 87 & Forest Dr	NBT	784	811	-27	-3%
		SBT	1027	1063	-36	-3%
7	SR 260 & Payson Village Access	EBT	837	853	-16	-2%
		WBT	1101	1103	-2	0%
8	SR 260 & Manzanita/Granite Dells	EBT	741	755	-14	-2%
		WBT	1042	1050	-8	-1%
9	SR 260 & Tyler Pkwy	EBT	826	827	-1	0%
		WBT	1119	1119	0	0%
	Total		20619	20888		**-1%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 3)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1163	1173	-10	-1%
2	SR 87 & Main St	NBT	969	968	1	0%
		SBT	1470	1479	-9	-1%
3	SR 87 & Bonita St	NBT	1127	1142	-15	-1%
		SBT	1617	1638	-21	-1%
4	SR 87 & SR 260	NBT	697	713	-16	-2%
		NBR	499	506	-7	-1%
		NBL	36	36	0	0%
		SBT	732	756	-24	-3%
		SBR	138	142	-4	-3%
		SBL	334	346	-12	-3%
		EBT	141	140	1	1%
		EBR	61	61	0	0%
		EBL	162	163	-1	-1%
		WBT	134	138	-4	-3%
		WBR	263	270	-7	-3%
		WBL	928	934	-6	-1%
5	SR 87 & Malibu Dr	NBT	894	922	-28	-3%
		SBT	1002	1029	-27	-3%
6	SR 87 & Forest Dr	NBT	781	811	-30	-4%
		SBT	1045	1063	-18	-2%
7	SR 260 & Payson Village Access	EBT	841	853	-12	-1%
		WBT	1074	1103	-29	-3%
8	SR 260 & Manzanita/Granite Dells	EBT	743	755	-12	-2%
		WBT	1013	1050	-37	-4%
9	SR 260 & Tyler Pkwy	EBT	819	827	-8	-1%
		WBT	1118	1119	-1	0%
	Total		20552	20888		**-2%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 4)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1117	1173	-56	-5%
2	SR 87 & Main St	NBT	937	968	-31	-3%
		SBT	1399	1479	-80	-5%
3	SR 87 & Bonita St	NBT	1090	1142	-52	-5%
		SBT	1550	1638	-88	-5%
4	SR 87 & SR 260	NBT	669	713	-44	-6%
		NBR	486	506	-20	-4%
		NBL	40	36	4	11%
		SBT	714	756	-42	-6%
		SBR	134	142	-8	-6%
		SBL	328	346	-18	-5%
		EBT	141	140	1	1%
		EBR	61	61	0	0%
		EBL	161	163	-2	-1%
		WBT	127	138	-11	-8%
		WBR	248	270	-22	-8%
		WBL	880	934	-54	-6%
5	SR 87 & Malibu Dr	NBT	868	922	-54	-6%
		SBT	984	1029	-45	-4%
6	SR 87 & Forest Dr	NBT	759	811	-52	-6%
		SBT	1022	1063	-41	-4%
7	SR 260 & Payson Village Access	EBT	818	853	-35	-4%
		WBT	993	1103	-110	-10%
8	SR 260 & Manzanita/Granite Dells	EBT	723	755	-32	-4%
		WBT	976	1050	-74	-7%
9	SR 260 & Tyler Pkwy	EBT	776	827	-51	-6%
		WBT	1103	1119	-16	-1%
	Total		19855	20888		**-5%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 5)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1169	1173	-4	0%
2	SR 87 & Main St	NBT	968	968	0	0%
		SBT	1485	1479	6	0%
3	SR 87 & Bonita St	NBT	1143	1142	1	0%
		SBT	1636	1638	-2	0%
4	SR 87 & SR 260	NBT	708	713	-5	-1%
		NBR	517	506	11	2%
		NBL	43	36	7	19%
		SBT	750	756	-6	-1%
		SBR	141	142	-1	-1%
		SBL	348	346	2	1%
		EBT	142	140	2	1%
		EBR	61	61	0	0%
		EBL	161	163	-2	-1%
		WBT	138	138	0	0%
		WBR	274	270	4	1%
		WBL	933	934	-1	0%
5	SR 87 & Malibu Dr	NBT	924	922	2	0%
		SBT	1028	1029	-1	0%
6	SR 87 & Forest Dr	NBT	803	811	-8	-1%
		SBT	1062	1063	-1	0%
7	SR 260 & Payson Village Access	EBT	864	853	11	1%
		WBT	1104	1103	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	752	755	-3	0%
		WBT	1049	1050	-1	0%
9	SR 260 & Tyler Pkwy	EBT	831	827	4	0%
		WBT	1119	1119	0	0%
	Total		20904	20888		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 6)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1177	1173	4	0%
2	SR 87 & Main St	NBT	967	968	-1	0%
		SBT	1486	1479	7	0%
3	SR 87 & Bonita St	NBT	1136	1142	-6	-1%
		SBT	1639	1638	1	0%
4	SR 87 & SR 260	NBT	710	713	-3	0%
		NBR	507	506	1	0%
		NBL	36	36	0	0%
		SBT	746	756	-10	-1%
		SBR	142	142	0	0%
		SBL	344	346	-2	-1%
		EBT	143	140	3	2%
		EBR	61	61	0	0%
		EBL	161	163	-2	-1%
		WBT	139	138	1	1%
		WBR	273	270	3	1%
		WBL	939	934	5	1%
5	SR 87 & Malibu Dr	NBT	926	922	4	0%
		SBT	1017	1029	-12	-1%
6	SR 87 & Forest Dr	NBT	813	811	2	0%
		SBT	1050	1063	-13	-1%
7	SR 260 & Payson Village Access	EBT	853	853	0	0%
		WBT	1101	1103	-2	0%
8	SR 260 & Manzanita/Granite Dells	EBT	751	755	-4	-1%
		WBT	1062	1050	12	1%
9	SR 260 & Tyler Pkwy	EBT	828	827	1	0%
		WBT	1120	1119	1	0%
	Total		20878	20888		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 8)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1112	1173	-61	-5%
2	SR 87 & Main St	NBT	972	968	4	0%
		SBT	1401	1479	-78	-5%
3	SR 87 & Bonita St	NBT	1120	1142	-22	-2%
		SBT	1549	1638	-89	-5%
4	SR 87 & SR 260	NBT	805	713	92	13%
		NBR	497	506	-9	-2%
		NBL	95	36	59	164%
		SBT	737	756	-19	-3%
		SBR	140	142	-2	-1%
		SBL	337	346	-9	-3%
		EBT	142	140	2	1%
		EBR	61	61	0	0%
		EBL	162	163	-1	-1%
		WBT	121	138	-17	-12%
		WBR	232	270	-38	-14%
		WBL	852	934	-82	-9%
5	SR 87 & Malibu Dr	NBT	961	922	39	4%
		SBT	1013	1029	-16	-2%
6	SR 87 & Forest Dr	NBT	833	811	22	3%
		SBT	1048	1063	-15	-1%
7	SR 260 & Payson Village Access	EBT	837	853	-16	-2%
		WBT	1159	1103	56	5%
8	SR 260 & Manzanita/Granite Dells	EBT	683	755	-72	-10%
		WBT	1060	1050	10	1%
9	SR 260 & Tyler Pkwy	EBT	776	827	-51	-6%
		WBT	1118	1119	-1	0%
	Total		20574	20888		**-2%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 9)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	751	751	0	0%
		SBT	1076	1173	-97	-8%
2	SR 87 & Main St	NBT	967	968	-1	0%
		SBT	1445	1479	-34	-2%
3	SR 87 & Bonita St	NBT	983	1142	-159	-14%
		SBT	1584	1638	-54	-3%
4	SR 87 & SR 260	NBT	630	713	-83	-12%
		NBR	446	506	-60	-12%
		NBL	30	36	-6	-17%
		SBT	646	756	-110	-15%
		SBR	121	142	-21	-15%
		SBL	289	346	-57	-16%
		EBT	141	140	1	1%
		EBR	61	61	0	0%
		EBL	162	163	-1	-1%
		WBT	145	138	7	5%
		WBR	282	270	12	4%
		WBL	994	934	60	6%
5	SR 87 & Malibu Dr	NBT	861	922	-61	-7%
		SBT	1030	1029	1	0%
6	SR 87 & Forest Dr	NBT	695	811	-116	-14%
		SBT	1062	1063	-1	0%
7	SR 260 & Payson Village Access	EBT	759	853	-94	-11%
		WBT	1159	1103	56	5%
8	SR 260 & Manzanita/Granite Dells	EBT	679	755	-76	-10%
		WBT	1071	1050	21	2%
9	SR 260 & Tyler Pkwy	EBT	776	827	-51	-6%
		WBT	1120	1119	1	0%
	Total		19965	20888		**-4%**

Delay Comparison - Sunday

Node #	Intersection Name	Movement	Vissim Delay (Alt 2)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	16.98	16.63	0.35	2%
		SBT	5.98	4.98	1	20%
2	SR 87 & Main St	NBT	23.19	23.13	0.06	0%
		SBT	22.62	22.51	0.11	0%
3	SR 87 & Bonita St	NBT	11.31	10.67	0.64	6%
		SBT	11.37	11.66	-0.29	-2%
4	SR 87 & SR 260	NBT	44.49	41.49	3.00	7%
		NBR	11.63	11.71	-0.08	-1%
		NBL	67.56	73.62	-6.06	-8%
		SBT	35.39	37.23	-1.84	-5%
		SBR	7.88	8.6	-0.72	-8%
		SBL	62.66	62.03	0.63	1%
		EBT	56.81	59.61	-2.80	-5%
		EBR	23.03	26.11	-3.08	-12%
		EBL	69.56	61	8.56	14%
		WBT	43.98	44.78	-0.80	-2%
		WBR	27.56	29.08	-1.52	-5%
		WBL	98.78	103.04	-4.26	-4%
5	SR 87 & Malibu Dr	NBT	17.44	11.91	5.53	46%
		SBT	18.45	19.29	-0.84	-4%
6	SR 87 & Forest Dr	NBT	5.27	4.57	0.70	15%
		SBT	14.17	7.8	6.37	82%
7	SR 260 & Payson Village Access	EBT	10.53	10.67	-0.14	-1%
		WBT	80.41	88.45	-8.04	-9%
8	SR 260 & Manzanita/Granite Dells	EBT	17.18	17.92	-0.74	-4%
		WBT	21.22	24.82	-3.60	-15%
9	SR 260 & Tyler Pkwy	EBT	5.56	5.41	0.15	3%
		WBT	5.92	6.03	-0.11	-2%

Node #	Intersection Name	Movement	Vissim Delay (Alt 3)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	16.43	16.63	-0.2	-1%
		SBT	5.44	4.98	0.46	9%
2	SR 87 & Main St	NBT	23.5	23.13	0.37	2%
		SBT	21.83	22.51	-0.68	-3%
3	SR 87 & Bonita St	NBT	11.82	10.67	1.15	11%
		SBT	11.75	11.66	0.09	1%
4	SR 87 & SR 260	NBT	44.58	41.49	3.09	7%
		NBR	13.76	11.71	2.05	18%
		NBL	64.85	73.62	-8.77	-12%
		SBT	35.2	37.23	-2.03	-5%
		SBR	7.79	8.60	-0.81	-9%
		SBL	67.37	62.03	5.34	9%
		EBT	56.13	59.61	-3.48	-6%
		EBR	25.14	26.11	-0.97	-4%
		EBL	66.72	61.0	5.72	9%
		WBT	46.28	44.78	1.5	3%
		WBR	27.63	29.08	-1.45	-5%
		WBL	100.32	103.04	-2.72	-3%
5	SR 87 & Malibu Dr	NBT	16.94	11.91	5.03	42%
		SBT	18.42	19.29	-0.87	-5%
6	SR 87 & Forest Dr	NBT	4.26	4.57	-0.31	-7%
		SBT	7.98	7.8	0.18	2%
7	SR 260 & Payson Village Access	EBT	10.28	10.67	-0.39	-4%
		WBT	90.82	88.45	2.37	3%
8	SR 260 & Manzanita/Granite Dells	EBT	16.84	17.92	-1.08	-6%
		WBT	31.42	24.82	6.6	27%
9	SR 260 & Tyler Pkwy	EBT	5.6	5.41	0.19	4%
		WBT	5.84	6.03	-0.19	-3%

Node #	Intersection Name	Movement	Vissim Delay (Alt 4)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	16.67	16.63	0.04	0%
		SBT	5.85	4.98	0.87	17%
2	SR 87 & Main St	NBT	27.38	23.13	4.25	18%
		SBT	22.44	22.51	-0.07	0%
3	SR 87 & Bonita St	NBT	19.34	10.67	8.67	81%
		SBT	11.05	11.66	-0.61	-5%
4	SR 87 & SR 260	NBT	60.45	41.49	18.96	46%
		NBR	32.68	11.71	20.97	179%
		NBL	72.14	73.62	-1.48	-2%
		SBT	36.5	37.23	-0.73	-2%
		SBR	8.59	8.6	-0.01	0%
		SBL	92.98	62.03	30.95	50%
		EBT	57.56	59.61	-2.05	-3%
		EBR	23.58	26.11	-2.53	-10%
		EBL	76.15	61	15.15	25%
		WBT	51.84	44.78	7.06	16%
		WBR	51.51	29.08	22.43	77%
		WBL	103.29	103.04	0.25	0%
5	SR 87 & Malibu Dr	NBT	32.91	11.91	21	176%
		SBT	30.91	19.29	11.62	60%
6	SR 87 & Forest Dr	NBT	4.91	4.57	0.34	7%
		SBT	20.87	7.8	13.07	168%
7	SR 260 & Payson Village Access	EBT	9.67	10.67	-1	-9%
		WBT	99.78	88.45	11.33	13%
8	SR 260 & Manzanita/Granite Dells	EBT	16.92	17.92	-1	-6%
		WBT	50.05	24.82	25.23	102%
9	SR 260 & Tyler Pkwy	EBT	5.52	5.41	0.11	2%
		WBT	5.81	6.03	-0.22	-4%

Node #	Intersection Name	Movement	Vissim Delay (Alt 5)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	16.28	16.63	-0.35	-2%
		SBT	5.44	4.98	0.46	9%
2	SR 87 & Main St	NBT	22.96	23.13	-0.17	-1%
		SBT	21.59	22.51	-0.92	-4%
3	SR 87 & Bonita St	NBT	11.26	10.67	0.59	6%
		SBT	11.33	11.66	-0.33	-3%
4	SR 87 & SR 260	NBT	47.43	41.49	5.94	14%
		NBR	23.32	11.71	11.61	99%
		NBL	68.76	73.62	-4.86	-7%
		SBT	36.32	37.23	-0.91	-2%
		SBR	8.9	8.6	0.3	3%
		SBL	62.59	62.03	0.56	1%
		EBT	57.06	59.61	-2.55	-4%
		EBR	23.1	26.11	-3.01	-12%
		EBL	63.26	61	2.26	4%
		WBT	45.21	44.78	0.43	1%
		WBR	31.57	29.08	2.49	9%
		WBL	101.33	103.04	-1.71	-2%
5	SR 87 & Malibu Dr	NBT	11.34	11.91	-0.57	-5%
		SBT	19.41	19.29	0.12	1%
6	SR 87 & Forest Dr	NBT	4.41	4.57	-0.16	-4%
		SBT	6.48	7.8	-1.32	-17%
7	SR 260 & Payson Village Access	EBT	10.51	10.67	-0.16	-1%
		WBT	88.89	88.45	0.44	0%
8	SR 260 & Manzanita/Granite Dells	EBT	18.42	17.92	0.5	3%
		WBT	29.6	24.82	4.78	19%
9	SR 260 & Tyler Pkwy	EBT	5.48	5.41	0.07	1%
		WBT	5.79	6.03	-0.24	-4%

Node #	Intersection Name	Movement	Vissim Delay (Alt 6)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	15.95	16.63	-0.68	-4%
		SBT	4.83	4.98	-0.15	-3%
2	SR 87 & Main St	NBT	22.97	23.13	-0.16	-1%
		SBT	22.04	22.51	-0.47	-2%
3	SR 87 & Bonita St	NBT	11.39	10.67	0.72	7%
		SBT	12.07	11.66	0.41	4%
4	SR 87 & SR 260	NBT	40.7	41.49	-0.79	-2%
		NBR	12.54	11.71	0.83	7%
		NBL	66.92	73.62	-6.7	-9%
		SBT	36.77	37.23	-0.46	-1%
		SBR	8.61	8.6	0.01	0%
		SBL	62.77	62.03	0.74	1%
		EBT	57.23	59.61	-2.38	-4%
		EBR	25.26	26.11	-0.85	-3%
		EBL	59.49	61	-1.51	-2%
		WBT	41.92	44.78	-2.86	-6%
		WBR	23.11	29.08	-5.97	-21%
		WBL	99.41	103.04	-3.63	-4%
5	SR 87 & Malibu Dr	NBT	11.65	11.91	-0.26	-2%
		SBT	18.67	19.29	-0.62	-3%
6	SR 87 & Forest Dr	NBT	4.97	4.57	0.4	9%
		SBT	6.46	7.8	-1.34	-17%
7	SR 260 & Payson Village Access	EBT	10.4	10.67	-0.27	-3%
		WBT	79.97	88.45	-8.48	-10%
8	SR 260 & Manzanita/Granite Dells	EBT	17.14	17.92	-0.78	-4%
		WBT	27.45	24.82	2.63	11%
9	SR 260 & Tyler Pkwy	EBT	5.36	5.41	-0.05	-1%
		WBT	5.99	6.03	-0.04	-1%

Node #	Intersection Name	Movement	Vissim Delay (Alt 8)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	16.4	16.63	-0.23	-1%
		SBT	6.09	4.98	1.11	22%
2	SR 87 & Main St	NBT	22.98	23.13	-0.15	-1%
		SBT	22.39	22.51	-0.12	-1%
3	SR 87 & Bonita St	NBT	12.18	10.67	1.51	14%
		SBT	11.66	11.66	0	0%
4	SR 87 & SR 260	NBT	46.82	41.49	5.33	13%
		NBR	14.37	11.71	2.66	23%
		NBL	73.98	73.62	0.36	0%
		SBT	38.8	37.23	1.57	4%
		SBR	9.05	8.6	0.45	5%
		SBL	70.29	62.03	8.26	13%
		EBT	57.98	59.61	-1.63	-3%
		EBR	23.93	26.11	-2.18	-8%
		EBL	73.32	61	12.32	20%
		WBT	52.45	44.78	7.67	17%
		WBR	25.92	29.08	-3.16	-11%
		WBL	80.34	103.04	-22.7	-22%
5	SR 87 & Malibu Dr	NBT	19.29	11.91	7.38	62%
		SBT	19.33	19.29	0.04	0%
6	SR 87 & Forest Dr	NBT	4.8	4.57	0.23	5%
		SBT	8.39	7.8	0.59	8%
7	SR 260 & Payson Village Access	EBT	4.55	10.67	-6.12	-57%
		WBT	15.8	88.45	-72.65	-82%
8	SR 260 & Manzanita/Granite Dells	EBT	16.5	17.92	-1.42	-8%
		WBT	13.68	24.82	-11.14	-45%
9	SR 260 & Tyler Pkwy	EBT	5.51	5.41	0.1	2%
		WBT	5.7	6.03	-0.33	-5%

Node #	Intersection Name	Movement	Vissim Delay (Alt 9)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	15.63	16.63	-1	-6%
		SBT	6.07	4.98	1.09	22%
2	SR 87 & Main St	NBT	22.42	23.13	-0.71	-3%
		SBT	21.54	22.51	-0.97	-4%
3	SR 87 & Bonita St	NBT	10.93	10.67	0.26	2%
		SBT	10.92	11.66	-0.74	-6%
4	SR 87 & SR 260	NBT	38.29	41.49	-3.2	-8%
		NBR	10.23	11.71	-1.48	-13%
		NBL	61.1	73.62	-12.52	-17%
		SBT	35.27	37.23	-1.96	-5%
		SBR	7.94	8.6	-0.66	-8%
		SBL	55.88	62.03	-6.15	-10%
		EBT	53.58	59.61	-6.03	-10%
		EBR	22.17	26.11	-3.94	-15%
		EBL	55.55	61	-5.45	-9%
		WBT	41.69	44.78	-3.09	-7%
		WBR	24.65	29.08	-4.43	-15%
		WBL	90.42	103.04	-12.62	-12%
5	SR 87 & Malibu Dr	NBT	10.76	11.91	-1.15	-10%
		SBT	17.28	19.29	-2.01	-10%
6	SR 87 & Forest Dr	NBT	4.19	4.57	-0.38	-8%
		SBT	6.4	7.8	-1.4	-18%
7	SR 260 & Payson Village Access	EBT	10.31	10.67	-0.36	-3%
		WBT	56.17	88.45	-32.28	-36%
8	SR 260 & Manzanita/Granite Dells	EBT	15.89	17.92	-2.03	-11%
		WBT	18.5	24.82	-6.32	-25%
9	SR 260 & Tyler Pkwy	EBT	5.35	5.41	-0.06	-1%
		WBT	5.68	6.03	-0.35	-6%

Travel Time - Sunday

Travel Time (sec)

Alt 2

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	236.6	253.2	224.5	235.8	0.8	0%
Southbound SR 87 from SR 260	1.2	208.8	217.5	201.5	157.8	51.0	32%
Westbound SR 260 approach to SR 87	1.2	328.4	405.6	222.0	290.3	38.1	13%
Eastbound SR 260 from SR 87	1.2	156.4	161.0	151.9	205.9	-49.5	-24%

Alt 3

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	235.8	253.1	221.4	235.8	0.0	0%
Southbound SR 87 from SR 260	1.2	208.8	217.5	201.5	157.8	51.0	32%
Westbound SR 260 approach to SR 87	1.2	328.4	405.6	222.0	290.3	38.1	13%
Eastbound SR 260 from SR 87	1.2	156.9	161.8	151.4	205.9	-49.0	-24%

Alt 4

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	261.3	489.4	224.1	235.8	25.5	11%
Southbound SR 87 from SR 260	1.2	203.8	207.7	193.9	157.8	46.0	29%
Westbound SR 260 approach to SR 87	1.2	411.3	511.0	296.1	290.3	121.0	42%
Eastbound SR 260 from SR 87	1.2	162.8	168.0	156.0	205.9	-43.1	-21%

Alt 5

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	263.3	283.2	245.3	235.8	27.5	12%
Southbound SR 87 from SR 260	1.2	203.9	210.3	197.1	157.8	46.1	29%
Westbound SR 260 approach to SR 87	1.2	356.3	416.3	274.3	290.3	66.0	23%
Eastbound SR 260 from SR 87	1.2	157.3	166.5	149.1	205.9	-48.6	-24%

Alt 6

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	236.4	244.9	224.0	235.8	0.6	0%
Southbound SR 87 from SR 260	1.2	208.5	218.0	202.9	157.8	50.7	32%
Westbound SR 260 approach to SR 87	1.2	336.2	402.4	217.2	290.3	45.9	16%
Eastbound SR 260 from SR 87	1.2	158.4	160.6	156.1	205.9	-47.5	-23%

Alt 8

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	243.1	271.5	227.4	235.8	7.3	3%
Southbound SR 87 from SR 260	1.2	204.6	210.5	199.7	157.8	46.8	30%
Westbound SR 260 approach to SR 87	1.2	209.6	270.6	186.1	290.3	-80.7	-28%
Eastbound SR 260 from SR 87	1.2	153.3	160.9	148.5	205.9	-52.6	-26%

Alt 9

Route	Segment Length	VISSIM (AVE)	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	231.1	242.3	219.3	235.8	-4.7	-2%
Southbound SR 87 from SR 260	1.2	200.3	162.5	154.9	157.8	42.5	27%
Westbound SR 260 approach to SR 87	1.2	273.0	395.1	204.3	290.3	-17.3	-6%
Eastbound SR 260 from SR 87	1.2	157.6	162.5	154.9	205.9	-48.3	-23%

Volume Comparison - Thursday

Node #	Intersection Name	Movement	Vissim Volume (Alt 2)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	578	576	2	0%
2	SR 87 & Main St	NBT	938	937	1	0%
		SBT	825	821	4	0%
3	SR 87 & Bonita St	NBT	1215	1214	1	0%
		SBT	1088	1080	8	-1%
4	SR 87 & SR 260	NBT	675	687	-12	2%
		NBR	677	649	28	-4%
		NBL	59	60	-1	2%
		SBT	607	597	10	-2%
		SBR	117	117	0	0%
		SBL	222	219	3	-1%
		EBT	195	194	1	-1%
		EBR	74	74	0	0%
		EBL	156	156	0	0%
		WBT	182	182	0	0%
		WBR	266	262	4	-2%
		WBL	598	605	-7	1%
5	SR 87 & Malibu Dr	NBT	817	811	6	-1%
		SBT	813	801	12	-1%
6	SR 87 & Forest Dr	NBT	717	703	14	-2%
		SBT	766	767	-1	0%
7	SR 260 & Payson Village Access	EBT	869	846	23	-3%
		WBT	745	745	0	0%
8	SR 260 & Manzanita/Granite Dells	EBT	765	750	15	-2%
		WBT	678	680	-2	0%
9	SR 260 & Tyler Pkwy	EBT	750	742	8	-1%
		WBT	618	619	-1	0%
Total			16665	16549		**1%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 3)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	580	576	4	1%
2	SR 87 & Main St	NBT	939	937	2	0%
		SBT	825	821	4	0%
3	SR 87 & Bonita St	NBT	1217	1214	3	0%
		SBT	1086	1080	6	1%
4	SR 87 & SR 260	NBT	680	687	-7	-1%
		NBR	679	649	30	5%
		NBL	60	60	0	0%
		SBT	607	597	10	2%
		SBR	117	117	0	0%
		SBL	221	219	2	1%
		EBT	194	194	0	0%
		EBR	74	74	0	0%
		EBL	154	156	-2	-1%
		WBT	181	182	-1	-1%
		WBR	265	262	3	1%
		WBL	598	605	-7	-1%
5	SR 87 & Malibu Dr	NBT	813	811	2	0%
		SBT	810	801	9	1%
6	SR 87 & Forest Dr	NBT	716	703	13	2%
		SBT	765	767	-2	0%
7	SR 260 & Payson Village Access	EBT	867	846	21	2%
		WBT	746	745	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	767	750	17	2%
		WBT	679	680	-1	0%
9	SR 260 & Tyler Pkwy	EBT	750	742	8	1%
		WBT	618	619	-1	0%
Total			16663	16549		**1%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 4)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	570	576	-6	-1%
2	SR 87 & Main St	NBT	921	937	-16	-2%
		SBT	813	821	-8	-1%
3	SR 87 & Bonita St	NBT	1180	1214	-34	-3%
		SBT	1073	1080	-7	-1%
4	SR 87 & SR 260	NBT	665	687	-22	-3%
		NBR	633	649	-16	-2%
		NBL	58	60	-2	-3%
		SBT	600	597	3	1%
		SBR	116	117	-1	-1%
		SBL	218	219	-1	0%
		EBT	192	194	-2	-1%
		EBR	73	74	-1	-1%
		EBL	156	156	0	0%
		WBT	175	182	-7	-4%
		WBR	250	262	-12	-5%
		WBL	586	605	-19	-3%
5	SR 87 & Malibu Dr	NBT	785	811	-26	-3%
		SBT	804	801	3	0%
6	SR 87 & Forest Dr	NBT	686	703	-17	-2%
		SBT	766	767	-1	0%
7	SR 260 & Payson Village Access	EBT	835	846	-11	-1%
		WBT	716	745	-29	-4%
8	SR 260 & Manzanita/Granite Dells	EBT	738	750	-12	-2%
		WBT	664	680	-16	-2%
9	SR 260 & Tyler Pkwy	EBT	728	742	-14	-2%
		WBT	620	619	1	0%
Total			16276	16549		**-2%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 5)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	573	576	-3	-1%
2	SR 87 & Main St	NBT	939	937	2	0%
		SBT	816	821	-5	-1%
3	SR 87 & Bonita St	NBT	1217	1214	3	0%
		SBT	1065	1080	-15	-1%
4	SR 87 & SR 260	NBT	681	687	-6	-1%
		NBR	678	649	29	4%
		NBL	59	60	-1	-2%
		SBT	609	597	12	2%
		SBR	117	117	0	0%
		SBL	219	219	0	0%
		EBT	192	194	-2	-1%
		EBR	73	74	-1	-1%
		EBL	157	156	1	1%
		WBT	173	182	-9	-5%
		WBR	254	262	-8	-3%
		WBL	575	605	-30	-5%
5	SR 87 & Malibu Dr	NBT	809	811	-2	0%
		SBT	812	801	11	1%
6	SR 87 & Forest Dr	NBT	712	703	9	1%
		SBT	766	767	-1	0%
7	SR 260 & Payson Village Access	EBT	862	846	16	2%
		WBT	701	745	-44	-6%
8	SR 260 & Manzanita/Granite Dells	EBT	755	750	5	1%
		WBT	637	680	-43	-6%
9	SR 260 & Tyler Pkwy	EBT	739	742	-3	0%
		WBT	618	619	-1	0%
Total			16463	16549		**-1%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 6)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	579	576	3	1%
2	SR 87 & Main St	NBT	937	937	0	0%
		SBT	829	821	8	1%
3	SR 87 & Bonita St	NBT	1215	1214	1	0%
		SBT	1092	1080	12	1%
4	SR 87 & SR 260	NBT	698	687	11	2%
		NBR	657	649	8	1%
		NBL	61	60	1	2%
		SBT	605	597	8	1%
		SBR	117	117	0	0%
		SBL	221	219	2	1%
		EBT	193	194	-1	-1%
		EBR	74	74	0	0%
		EBL	157	156	1	1%
		WBT	178	182	-4	-2%
		WBR	264	262	2	1%
		WBL	605	605	0	0%
5	SR 87 & Malibu Dr	NBT	638	811	-173	-21%
		SBT	814	801	13	2%
6	SR 87 & Forest Dr	NBT	585	703	-118	-17%
		SBT	765	767	-2	0%
7	SR 260 & Payson Village Access	EBT	851	846	5	1%
		WBT	744	745	-1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	754	750	4	1%
		WBT	680	680	0	0%
9	SR 260 & Tyler Pkwy	EBT	746	742	4	1%
		WBT	620	619	1	0%
Total			16334	16549		**-1%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 8)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	560	576	-16	-3%
2	SR 87 & Main St	NBT	941	937	4	0%
		SBT	800	821	-21	-3%
3	SR 87 & Bonita St	NBT	1213	1214	-1	0%
		SBT	1048	1080	-32	-3%
4	SR 87 & SR 260	NBT	792	687	105	15%
		NBR	676	649	27	4%
		NBL	133	60	73	122%
		SBT	612	597	15	3%
		SBR	118	117	1	1%
		SBL	219	219	0	0%
		EBT	191	194	-3	-2%
		EBR	73	74	-1	-1%
		EBL	156	156	0	0%
		WBT	165	182	-17	-9%
		WBR	245	262	-17	-6%
		WBL	558	605	-47	-8%
5	SR 87 & Malibu Dr	NBT	795	811	-16	-2%
		SBT	810	801	9	1%
6	SR 87 & Forest Dr	NBT	705	703	2	0%
		SBT	765	767	-2	0%
7	SR 260 & Payson Village Access	EBT	866	846	20	2%
		WBT	746	745	1	0%
8	SR 260 & Manzanita/Granite Dells	EBT	714	750	-36	-5%
		WBT	681	680	1	0%
9	SR 260 & Tyler Pkwy	EBT	714	742	-28	-4%
		WBT	617	619	-2	0%
Total			16568	16549		**0%**

Node #	Intersection Name	Movement	Vissim Volume (Alt 9)	Calibrated Model Volume	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	655	655	0	0%
		SBT	512	576	-64	-11%
2	SR 87 & Main St	NBT	939	937	2	0%
		SBT	791	821	-30	-4%
3	SR 87 & Bonita St	NBT	997	1214	-217	-18%
		SBT	1047	1080	-33	-3%
4	SR 87 & SR 260	NBT	578	687	-109	-16%
		NBR	572	649	-77	-12%
		NBL	50	60	-10	-17%
		SBT	558	597	-39	-7%
		SBR	108	117	-9	-8%
		SBL	201	219	-18	-8%
		EBT	192	194	-2	-1%
		EBR	74	74	0	0%
		EBL	157	156	1	1%
		WBT	180	182	-2	-1%
		WBR	265	262	3	1%
		WBL	602	605	-3	0%
5	SR 87 & Malibu Dr	NBT	743	811	-68	-8%
		SBT	815	801	14	2%
6	SR 87 & Forest Dr	NBT	577	703	-126	-18%
		SBT	766	767	-1	0%
7	SR 260 & Payson Village Access	EBT	770	846	-76	-9%
		WBT	745	745	0	0%
8	SR 260 & Manzanita/Granite Dells	EBT	689	750	-61	-8%
		WBT	679	680	-1	0%
9	SR 260 & Tyler Pkwy	EBT	694	742	-48	-6%
		WBT	618	619	-1	0%
Total			15574	16549		**-6%**

Delay Comparison - Thursday

Node #	Intersection Name	Movement	Vissim Delay (Alt 2)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	10.58	10.81	-0.23	-2%
		SBT	2.41	2.39	0.02	1%
2	SR 87 & Main St	NBT	21.78	21.92	-0.14	-1%
		SBT	20.65	20.65	0	0%
3	SR 87 & Bonita St	NBT	13.78	14.10	-0.32	-2%
		SBT	13.94	14.86	-0.92	-6%
4	SR 87 & SR 260	NBT	39.02	36.21	2.81	8%
		NBR	19.30	15.07	4.23	28%
		NBL	62.57	68.03	-5.46	-8%
		SBT	33.58	34.93	-1.35	-4%
		SBR	7.91	7.81	0.1	1%
		SBL	53.08	53.37	-0.29	-1%
		EBT	51.61	53.58	-1.97	-4%
		EBR	24.32	23.8	0.52	2%
		EBL	56.9	57.65	-0.75	-1%
		WBT	42.52	43.89	-1.37	-3%
		WBR	23.78	23.08	0.7	3%
		WBL	51.06	53.08	-2.02	-4%
5	SR 87 & Malibu Dr	NBT	10.27	10.65	-0.38	-4%
		SBT	15.63	15.49	0.14	1%
6	SR 87 & Forest Dr	NBT	3.78	3.66	0.12	3%
		SBT	5.73	5.32	0.41	8%
7	SR 260 & Payson Village Access	EBT	10.33	10.45	-0.12	-1%
		WBT	7.51	7.30	0.21	3%
8	SR 260 & Manzanita/Granite Dells	EBT	14.61	14.22	0.39	3%
		WBT	11.84	11.80	0.04	0%
9	SR 260 & Tyler Pkwy	EBT	6.36	6.01	0.35	6%
		WBT	5.89	5.69	0.2	4%

Node #	Intersection Name	Movement	Vissim Delay (Alt 3)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	10.76	10.81	-0.05	0%
		SBT	2.61	2.39	0.22	9%
2	SR 87 & Main St	NBT	21.62	21.92	-0.3	-1%
		SBT	19.92	20.65	-0.73	-4%
3	SR 87 & Bonita St	NBT	13.16	14.10	-0.94	-7%
		SBT	15.27	14.86	0.41	3%
4	SR 87 & SR 260	NBT	37.43	36.21	1.22	3%
		NBR	17.98	15.07	2.91	19%
		NBL	60.62	68.03	-7.41	-11%
		SBT	33.85	34.93	-1.08	-3%
		SBR	7.13	7.81	-0.68	-9%
		SBL	54.95	53.37	1.58	3%
		EBT	53.36	53.58	-0.22	0%
		EBR	24.66	23.8	0.86	4%
		EBL	57.73	57.65	0.08	0%
		WBT	44.48	43.89	0.59	1%
		WBR	24	23.08	0.92	4%
		WBL	53.14	53.08	0.06	0%
5	SR 87 & Malibu Dr	NBT	10.14	10.65	-0.51	-5%
		SBT	15.79	15.49	0.3	2%
6	SR 87 & Forest Dr	NBT	3.63	3.66	-0.03	-1%
		SBT	5.79	5.32	0.47	9%
7	SR 260 & Payson Village Access	EBT	10.33	10.45	-0.12	-1%
		WBT	7.20	7.30	-0.1	-1%
8	SR 260 & Manzanita/Granite Dells	EBT	13.84	14.22	-0.38	-3%
		WBT	11.90	11.80	0.1	1%
9	SR 260 & Tyler Pkwy	EBT	6.13	6.01	0.12	2%
		WBT	5.71	5.69	0.02	0%

Node #	Intersection Name	Movement	Vissim Delay (Alt 4)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	10.56	10.81	-0.25	-2%
		SBT	2.72	2.39	0.33	14%
2	SR 87 & Main St	NBT	25.47	21.92	3.55	16%
		SBT	20.79	20.65	0.14	1%
3	SR 87 & Bonita St	NBT	19.59	14.10	5.49	39%
		SBT	15.06	14.86	0.2	1%
4	SR 87 & SR 260	NBT	49.89	36.21	13.68	38%
		NBR	27.95	15.07	12.88	85%
		NBL	65.26	68.03	-2.77	-4%
		SBT	32.9	34.93	-2.03	-6%
		SBR	6.27	7.81	-1.54	-20%
		SBL	65.61	53.37	12.24	23%
		EBT	52.26	53.58	-1.32	-2%
		EBR	24.51	23.80	0.71	3%
		EBL	64.75	57.65	7.1	12%
		WBT	44.97	43.89	1.08	2%
		WBR	35.35	23.08	12.27	53%
		WBL	53.95	53.08	0.87	2%
5	SR 87 & Malibu Dr	NBT	26.64	10.65	15.99	150%
		SBT	15.64	15.49	0.15	1%
6	SR 87 & Forest Dr	NBT	3.67	3.66	0.01	0%
		SBT	6.26	5.32	0.94	18%
7	SR 260 & Payson Village Access	EBT	9.84	10.45	-0.61	-6%
		WBT	16.42	7.30	9.12	125%
8	SR 260 & Manzanita/Granite Dells	EBT	13.91	14.22	-0.31	-2%
		WBT	17.04	11.8	5.24	44%
9	SR 260 & Tyler Pkwy	EBT	6.42	6.01	0.41	7%
		WBT	5.76	5.69	0.07	1%

Node #	Intersection Name	Movement	Vissim Delay (Alt 5)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	10.19	10.81	-0.62	-6%
		SBT	2.25	2.39	-0.14	-6%
2	SR 87 & Main St	NBT	21.33	21.92	-0.59	-3%
		SBT	20.02	20.65	-0.63	-3%
3	SR 87 & Bonita St	NBT	13.32	14.10	-0.78	-6%
		SBT	15.04	14.86	0.18	1%
4	SR 87 & SR 260	NBT	38.01	36.21	1.8	5%
		NBR	26.74	15.07	11.67	77%
		NBL	56.41	68.03	-11.62	-17%
		SBT	34.11	34.93	-0.82	-2%
		SBR	7.33	7.81	-0.48	-6%
		SBL	50.84	53.37	-2.53	-5%
		EBT	48.86	53.58	-4.72	-9%
		EBR	22.47	23.8	-1.33	-6%
		EBL	55.02	57.65	-2.63	-5%
		WBT	42.25	43.89	-1.64	-4%
		WBR	24.58	23.08	1.5	6%
		WBL	50.6	53.08	-2.48	-5%
5	SR 87 & Malibu Dr	NBT	10.02	10.65	-0.63	-6%
		SBT	15.09	15.49	-0.4	-3%
6	SR 87 & Forest Dr	NBT	3.69	3.66	0.03	1%
		SBT	4.8	5.32	-0.52	-10%
7	SR 260 & Payson Village Access	EBT	12.14	10.45	1.69	16%
		WBT	7.33	7.30	0.03	0%
8	SR 260 & Manzanita/Granite Dells	EBT	15.65	14.22	1.43	10%
		WBT	30.29	11.80	18.49	157%
9	SR 260 & Tyler Pkwy	EBT	6.34	6.01	0.33	5%
		WBT	6.01	5.69	0.32	6%

Node #	Intersection Name	Movement	Vissim Delay (Alt 6)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	11.20	10.81	0.39	4%
		SBT	2.92	2.39	0.53	22%
2	SR 87 & Main St	NBT	21.94	21.92	0.02	0%
		SBT	20.22	20.65	-0.43	-2%
3	SR 87 & Bonita St	NBT	13.22	14.10	-0.88	-6%
		SBT	14.54	14.86	-0.32	-2%
4	SR 87 & SR 260	NBT	35.88	36.21	-0.33	-1%
		NBR	15.18	15.07	0.11	1%
		NBL	60.36	68.03	-7.67	-11%
		SBT	34.42	34.93	-0.51	-1%
		SBR	7.75	7.81	-0.06	-1%
		SBL	53.84	53.37	0.47	1%
		EBT	52.29	53.58	-1.29	-2%
		EBR	24.25	23.8	0.45	2%
		EBL	56.16	57.65	-1.49	-3%
		WBT	41.87	43.89	-2.02	-5%
		WBR	18.49	23.08	-4.59	-20%
		WBL	52.7	53.08	-0.38	-1%
5	SR 87 & Malibu Dr	NBT	9.32	10.65	-1.33	-12%
		SBT	14.68	15.49	-0.81	-5%
6	SR 87 & Forest Dr	NBT	4.09	3.66	0.43	12%
		SBT	8.15	5.32	2.83	53%
7	SR 260 & Payson Village Access	EBT	10.30	10.45	-0.15	-1%
		WBT	7.28	7.30	-0.02	0%
8	SR 260 & Manzanita/Granite Dells	EBT	13.52	14.22	-0.7	-5%
		WBT	11.79	11.8	-0.01	0%
9	SR 260 & Tyler Pkwy	EBT	6.54	6.01	0.53	9%
		WBT	5.71	5.69	0.02	0%

Node #	Intersection Name	Movement	Vissim Delay (Alt 8)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	10.02	10.81	-0.79	-7%
		SBT	2.45	2.39	0.06	3%
2	SR 87 & Main St	NBT	20.81	21.92	-1.11	-5%
		SBT	20.42	20.65	-0.23	-1%
3	SR 87 & Bonita St	NBT	13.59	14.10	-0.51	-4%
		SBT	14.67	14.86	-0.19	-1%
4	SR 87 & SR 260	NBT	43.22	36.21	7.01	19%
		NBR	24.73	15.07	9.66	64%
		NBL	71.55	68.03	3.52	5%
		SBT	36.7	34.93	1.75	5%
		SBR	8.16	7.81	0.35	4%
		SBL	55.96	53.37	2.59	5%
		EBT	53.69	53.58	0.11	0%
		EBR	23.23	23.8	-0.57	-2%
		EBL	58.15	57.65	0.5	1%
		WBT	45.33	43.89	1.44	3%
		WBR	25.13	23.08	2.05	9%
		WBL	53.07	53.08	-0.01	0%
5	SR 87 & Malibu Dr	NBT	9.8	10.65	-0.85	-8%
		SBT	15.26	15.49	-0.23	-1%
6	SR 87 & Forest Dr	NBT	3.82	3.66	0.16	4%
		SBT	5.07	5.32	-0.25	-5%
7	SR 260 & Payson Village Access	EBT	5.88	10.45	-4.57	-44%
		WBT	2.83	7.3	-4.47	-61%
8	SR 260 & Manzanita/Granite Dells	EBT	14.61	14.22	0.39	3%
		WBT	11.6	11.8	-0.2	-2%
9	SR 260 & Tyler Pkwy	EBT	6.0	6.01	-0.01	0%
		WBT	5.84	5.69	0.15	3%

Node #	Intersection Name	Movement	Vissim Delay (Alt 9)	Calibrated Model Delay	Difference	% Difference
1	SR 87 & Green Valley Pkwy	NBT	9.50	10.81	-1.31	-12%
		SBT	2.20	2.39	-0.19	-8%
2	SR 87 & Main St	NBT	20.54	21.92	-1.38	-6%
		SBT	20.18	20.65	-0.47	-2%
3	SR 87 & Bonita St	NBT	13.54	14.10	-0.56	-4%
		SBT	14.34	14.86	-0.52	-3%
4	SR 87 & SR 260	NBT	35.32	36.21	-0.89	-2%
		NBR	14.82	15.07	-0.25	-2%
		NBL	53.93	68.03	-14.10	-21%
		SBT	33.13	34.93	-1.80	-5%
		SBR	6.75	7.81	-1.06	-14%
		SBL	49.11	53.37	-4.26	-8%
		EBT	48.27	53.58	-5.31	-10%
		EBR	21.80	23.8	-2.00	-8%
		EBL	51.59	57.65	-6.06	-11%
		WBT	40.00	43.89	-3.89	-9%
		WBR	20.45	23.08	-2.63	-11%
		WBL	48.85	53.08	-4.23	-8%
5	SR 87 & Malibu Dr	NBT	9.76	10.65	-0.89	-8%
		SBT	14.64	15.49	-0.85	-5%
6	SR 87 & Forest Dr	NBT	2.97	3.66	-0.69	-19%
		SBT	5.17	5.32	-0.15	-3%
7	SR 260 & Payson Village Access	EBT	10.01	10.45	-0.44	-4%
		WBT	7.25	7.3	-0.05	-1%
8	SR 260 & Manzanita/Granite Dells	EBT	13.15	14.22	-1.07	-8%
		WBT	11.65	11.8	-0.15	-1%
9	SR 260 & Tyler Pkwy	EBT	6.21	6.01	0.20	3%
		WBT	5.68	5.69	-0.01	0%

Travel Time - Thursday

Travel Time (sec)

Alt 2

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	235.7	255.2	221.5	280.6	-44.9	-16%
Southbound SR 87 from SR 260	1.2	193.8	199.0	187.6	202.0	-8.2	-4%
Westbound SR 260 approach to SR 87	1.2	180.0	190.6	171.1	190.9	-10.9	-6%
Eastbound SR 260 from SR 87	1.2	157.44	159.63	154.04	165.8	-8.4	-5%

Alt 3

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	235.7	250.1	225.2	280.6	-44.9	-16%
Southbound SR 87 from SR 260	1.2	196.0	205.8	190.6	202.0	-6.0	-3%
Westbound SR 260 approach to SR 87	1.2	181.4	190.8	172.4	190.9	-9.5	-5%
Eastbound SR 260 from SR 87	1.2	157.05	161.44	151.09	165.8	-8.8	-5%

Alt 4

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	265.3	539.2	223.6	280.6	-15.3	-5%
Southbound SR 87 from SR 260	1.2	198.1	202.8	192.4	202.0	-3.9	-2%
Westbound SR 260 approach to SR 87	1.2	191.6	277.8	175.3	190.9	0.7	0%
Eastbound SR 260 from SR 87	1.2	159.15	162.01	156.22	165.8	-6.7	-4%

Alt 5

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	231.0	249.8	218.9	280.6	-49.6	-18%
Southbound SR 87 from SR 260	1.2	196.2	202.0	191.6	202.0	-5.8	-3%
Westbound SR 260 approach to SR 87	1.2	200.2	379.2	173.2	190.9	9.3	5%
Eastbound SR 260 from SR 87	1.2	167.90	225.35	158.42	165.8	2.1	1%

Alt 6

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	233.8	245.8	221.9	280.6	-46.8	-17%
Southbound SR 87 from SR 260	1.2	196.5	203.9	188.6	202.0	-5.5	-3%
Westbound SR 260 approach to SR 87	1.2	177.7	185.5	171.3	190.9	-13.2	-7%
Eastbound SR 260 from SR 87	1.2	154.91	161.57	152.02	165.8	-10.9	-7%

Alt 8

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	240.9	261.5	226.8	280.6	-39.7	-14%
Southbound SR 87 from SR 260	1.2	194.2	198.0	189.3	202.0	-7.8	-4%
Westbound SR 260 approach to SR 87	1.2	177.3	184.7	169.7	190.9	-13.6	-7%
Eastbound SR 260 from SR 87	1.2	152.25	157.88	144.11	165.8	-13.6	-8%

Alt 9

Route	Segment Length	VISSIM	VISSIM (MAX)	VISSIM (MIN)	Calibrated Model	Difference	% Difference
Northbound SR 87 approach to SR 260	1.2	226.6	233.8	217.0	280.6	-54.0	-19%
Southbound SR 87 from SR 260	1.2	194.3	203.9	187.2	202.0	-7.7	-4%
Westbound SR 260 approach to SR 87	1.2	177.2	184.8	171.5	190.9	-13.7	-7%
Eastbound SR 260 from SR 87	1.2	156.57	160.03	153.61	165.8	-9.3	-6%

APPENDIX D

Selected Town of Payson Right-of-Way Deeds

RESOLUTION NO. 1743

A RESOLUTION OF THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON, ARIZONA, ACCEPTING TITLE TO CERTAIN REAL PROPERTY DESCRIBED IN THE SPECIAL WARRANTY DEED ATTACHED HERETO AS EXHIBIT "1", PERTAINING TO THE ROAD IMPROVEMENT PROJECT LOCATED AT THE INTERSECTION OF STATE ROUTES 260 AND 87.

WHEREAS, A.R.S. § 9-240 authorizes the Town to improve the streets within it; and

WHEREAS, A.R.S. § 9-241 provides that the Town of Payson may receive real property necessary or proper to carry out the purposes of the municipal corporation, within or without its limits; and

WHEREAS, certain real property described on Exhibit "1" attached hereto has been offered to the Town of Payson by Walgreen Arizona Drug Company; and

WHEREAS, said real property is located within the corporate limits of the Town of Payson,

NOW, THEREFORE, THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON, ARIZONA, DO HEREBY RESOLVE AS FOLLOWS:

Section 1. That the Town of Payson does hereby accept ownership of and receive those certain real property interests set forth in Exhibit "1" attached hereto and incorporated herein as though set forth in full at this point, subject to the approval of the Town Attorney, issuance of a satisfactory title report, and issuance of a title insurance policy in favor of the Town.

Section 2. That the Town of Payson shall perform any and all other acts necessary or appropriate to the taking of title to the said real property and to the use and control thereof, including, but not limited to, the acceptance and recordation of the Special Warranty Deed attached hereto as Exhibit "1", and the maintenance of said real property.

PASSED AND ADOPTED BY THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON this 14th day of November, 2002, by the following vote:

AYES 7 NOES 0 ABSTENTIONS 0 ABSENT 0

Kenneth P. Murphy, Mayor

ATTEST:

for Silvia Smith, Town Clerk
Chief Deputy

APPROVED AS TO FORM:

Samuel I. Streichman, Town Attorney

Prepared by Town of Payson Legal Department
SIS:drs November 6, 2002 (10:56AM)
C:\MyFiles\Resolutions\1743 Accepting Warranty Deed from Walgreen re Longhorn Rd.wpd

NOV 14 '02 Item No. E.1.e*

11,203

Gila County, AZ
Linda Haught Ortega, Recorder
11/19/2002
02:32PM
Doc Code: WD

Doc Id: 2002-018192
Receipt #: 9003
Rec Fee: 11.00

TOWN OF PAYSON

When Recorded, Return To:

Town Clerk
Town of Payson, Arizona
303 N. Beeline Hwy.
Payson, AZ 85541

Gila County, AZ WD

2002-018192
Page: 1 of 5
11/19/2002 02:32P
11.00

SPECIAL WARRANTY DEED

For the consideration of Ten Dollars, and other valuable considerations, WALGREEN ARIZONA DRUG CO., an Arizona corporation, Grantor, does hereby convey to the TOWN OF PAYSON, an Arizona municipal corporation, Grantee, that certain real property situated in Gila County, Arizona, more particularly described on Exhibit "A" attached hereto and incorporated herein by this reference, subject to current taxes and other assessments, reservations in patents, and all easements, rights-of-way, encumbrances, liens, covenants, conditions, restrictions, obligations and liabilities as may appear of record.

Grantor warrants the title against all acts of Grantor and no other, subject to the matters above set forth.

EXEMPT under A.R.S. § 11-1134(A)(3).

DATED this 22nd day of October, 2002.

WALGREEN ARIZONA DRUG CO.,
an Arizona corporation

RS.
RGH

By: _____

Its: Vice President

(See Res. No. 1743)

STATE OF ILLINOIS)
)ss.
County of Lake)

On this the 22nd day of October, 2002, before me, the undersigned Notary Public in and for said County and State, personally appeared Allan M. Resnick, the Vice President of WALGREEN ARIZONA DRUG CO., an Arizona corporation, on behalf of the corporation.

WITNESS my hand and official seal.

Barbara A Byrne
Notary Public

My Commission Expires:

_____

OFFICIAL SEAL
BARBARA A BYRNE
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES: 10/23/05

Gila County, AZ WD
2002-018192
Page: 3 of 5
11/19/2002 02:32P
11.00

ACCEPTANCE

The Town of Payson, Arizona, a municipal corporation, hereby accepts the foregoing grant for right-of-way purposes.

Town of Payson, an Arizona municipal corporation

By: _____

Attest:

_____
Chief Deputy Town Clerk

Exhibit "A"

LEGAL DESCRIPTION
OF
RIGHT-OF-WAY DEDICATION

BEING A PORTION OF THE NORTHWEST QUARTER OF SECTION 3, TOWNSHIP 10 NORTH, RANGE 10 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, GILA COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE INTERSECTION OF LONGHORN ROAD AND STATE ROUTE NO. 87(BEELINE HIGHWAY);

THENCE SOUTH 01°37'13" WEST, ALONG THE MONUMENT LINE OF SAID STATE ROUTE NO. 87, A DISTANCE OF 40.25 FEET;

THENCE DEPARTING SAID MONUMENT LINE, NORTH 88°22'47" WEST, A DISTANCE OF 100.00 FEET TO THE **POINT OF BEGINNING;**

THENCE SOUTH 01°37'13" WEST, A DISTANCE OF 3.17 FEET;

THENCE NORTH 88°01'47" WEST, A DISTANCE OF 167.69 FEET;

THENCE SOUTH 52°17'43" WEST, A DISTANCE OF 17.72 FEET;

THENCE NORTH 82°41'54" WEST, A DISTANCE OF 28.89 FEET;

THENCE NORTH 11°13'00" EAST, A DISTANCE OF 33.92 FEET TO THE POINT OF CURVATURE FOR A NON-TANGENT CURVE, CONCAVE SOUTHWESTERLY, HAVING A RADIAL BEARING OF NORTH 09°50'49" EAST, AND A RADIUS OF 770.00 FEET;

THENCE SOUTHEASTERLY ALONG THE ARC OF SAID CURVE, THROUGH A CENTRAL ANGLE OF 02°58'25", AN ARC LENGTH OF 39.96 FEET TO THE POINT OF CURVATURE FOR A REVERSE CURVE, HAVING A RADIUS OF 850.00 FEET;

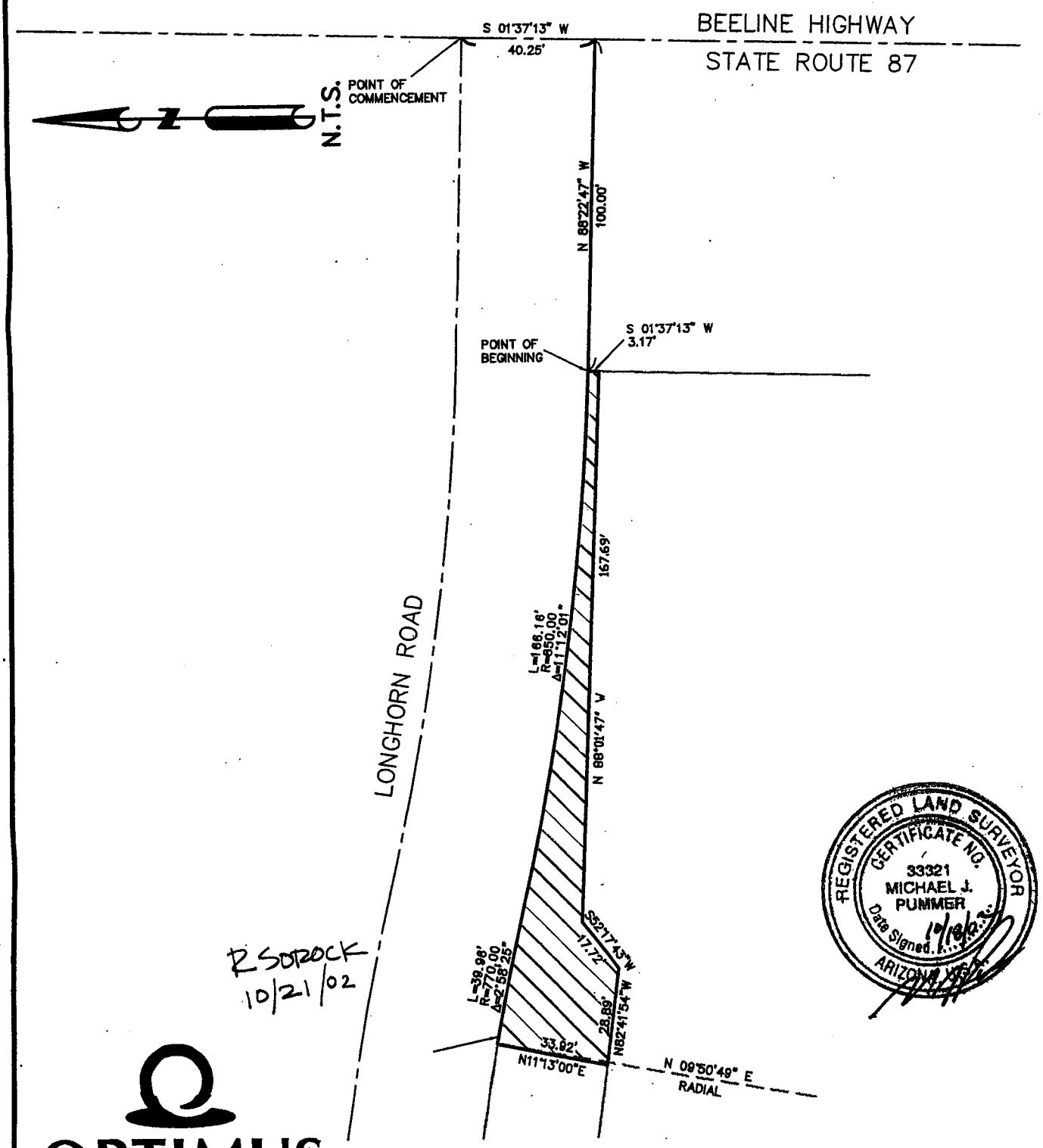
THENCE SOUTHEASTERLY ALONG THE ARC OF SAID CURVE, THROUGH A CENTRAL ANGLE OF 11°12'01", AN ARC LENGTH OF 166.16 FEET TO THE **POINT OF BEGINNING.**

CONTAINING 2,596 SQUARE FEET OR 0.06 ACRES MORE OR LESS.

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
33321
MICHAEL J.
PUMMER
Date Signed 10/18/02
ARIZONA U.S.A.

Subject: RIGHT-OF-WAY DEDICATION EXHIBIT

Job No: 021005



R SOTOCK
10/21/02

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
33321
MICHAEL J.
PUMMER
Date Signed 10/8/02
ARIZONA U.S.A.

OPTIMUS
CIVIL DESIGN GROUP
2323 E. MAGNOLIA STREET
SUITE 107
PHOENIX, AZ 85034
PH: (602) 286-9300 FAX: (602) 286-9400

H:\021005\SURVEY\ROW DED EXHB.DWG

Prepared By: MJP **Date:** 10/08/02 **Sheet No:** 1 **Of** 1

Gila County, AZ
Linda Haught Ortega, Recorder
01/24/2003
12:49PM
Doc Code: RESL

Doc Id: 2003-001253
Receipt #: 10711
Rec Fee: 17.00

FIRST AMERICAN TITLE RECORDING

WHEN RECORDED MAIL TO:

Town Clerk
Town of Payson, Arizona
303 N. Beeline Hwy.
Payson, AZ 85541

Gila County, AZ RESL

2003-001253
Page: 1 of 9
01/24/2003 12:49P
17.00

336-4048099

RESOLUTION

This Resolution by the Town of Payson is authorization of that certain Deed between Payson Hotel Innvestors, L.L.C. and the Town of Payson,

Said Deed recorded November 19, 2002 as 2002-018191.

2003-001253
Page: 2 of 9
01/24/2003 12:49P
Gila County, AZ RESL 17.00

RESOLUTION NO. 1744

A RESOLUTION OF THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON, ARIZONA, ACCEPTING TITLE TO CERTAIN REAL PROPERTY DESCRIBED IN THE SPECIAL WARRANTY DEED ATTACHED HERETO AS EXHIBIT "1", PERTAINING TO THE ROAD IMPROVEMENT PROJECT LOCATED AT THE INTERSECTION OF STATE ROUTES 260 AND 87.

WHEREAS, A.R.S. § 9-240 authorizes the Town to improve the streets within it; and

WHEREAS, A.R.S. § 9-241 provides that the Town of Payson may receive real property necessary or proper to carry out the purposes of the municipal corporation, within or without its limits; and

WHEREAS, certain real property described on Exhibit "1" attached hereto has been offered to the Town of Payson by Payson Hotel Innvestors, L.L.C.; and

WHEREAS, said real property is located within the corporate limits of the Town of Payson,

NOW, THEREFORE, THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON, ARIZONA, DO HEREBY RESOLVE AS FOLLOWS:

Section 1. That the Town of Payson does hereby accept ownership of and receive those certain real property interests set forth in Exhibit "1" attached hereto and incorporated herein as though set forth in full at this point, subject to the approval of the Town Attorney, issuance of a satisfactory title report and issuance of a title insurance policy in favor of the Town.

Section 2. That the Town of Payson shall perform any and all other acts necessary or appropriate to the taking of title to the said real property and to the use and control thereof, including, but not limited to, the acceptance and recordation of the Special Warranty Deed attached hereto as Exhibit "1", and the maintenance of said real property.

PASSED AND ADOPTED BY THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON this 14th day of November, 2002, by the following vote:

AYES 7 NOES 0 ABSTENTIONS 0 ABSENT 0

Kenneth P. Murphy, Mayor

ATTEST:

Silvia Smith, Town Clerk

APPROVED AS TO FORM:

Samuel I. Streichman, Town Attorney

Prepared by Town of Payson Legal Department
SIS:drs November 6, 2002 (11:03AM)
C:\MyFiles\Resolutions\1744 Accepting Warranty Deed from Payson Hotel Innvestors re Longhorn Rd.wpd

NOV 14 '02 Item No. E.1.f*

2003-001253
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01/24/2003 12:49P
Gila County, AZ RESL 17.00

STATE OF ARIZONA
COUNTY OF GILA } ss
TOWN OF PAYSON

I, Silvia Smith, Town Clerk of the Town of Payson, Arizona, do hereby certify that the above foregoing is a true and correct copy of Resolution No. 1744 passed and adopted by the Common Council of the Town of Payson, Arizona.

WITNESS MY HAND AND THE SEAL OF THE TOWN OF PAYSON, ARIZONA.

This the 19th day of November, 2002

Town Clerk - Town of Payson, Arizona

2003-001253
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01/24/2003 12:49P
Gila County, AZ RESL 17.00

RESOLUTION NO. 1744

A RESOLUTION OF THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON, ARIZONA, ACCEPTING TITLE TO CERTAIN REAL PROPERTY DESCRIBED IN THE SPECIAL WARRANTY DEED ATTACHED HERETO AS EXHIBIT "1", PERTAINING TO THE ROAD IMPROVEMENT PROJECT LOCATED AT THE INTERSECTION OF STATE ROUTES 260 AND 87.

WHEREAS, A.R.S. § 9-240 authorizes the Town to improve the streets within it; and

WHEREAS, A.R.S. § 9-241 provides that the Town of Payson may receive real property necessary or proper to carry out the purposes of the municipal corporation, within or without its limits; and

WHEREAS, certain real property described on Exhibit "1" attached hereto has been offered to the Town of Payson by Payson Hotel Innvestors, L.L.C.; and

WHEREAS, said real property is located within the corporate limits of the Town of Payson,

NOW, THEREFORE, THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON, ARIZONA, DO HEREBY RESOLVE AS FOLLOWS:

Section 1. That the Town of Payson does hereby accept ownership of and receive those certain real property interests set forth in Exhibit "1" attached hereto and incorporated herein as though set forth in full at this point, subject to the approval of the Town Attorney, issuance of a satisfactory title report and issuance of a title insurance policy in favor of the Town.

Section 2. That the Town of Payson shall perform any and all other acts necessary or appropriate to the taking of title to the said real property and to the use and control thereof, including, but not limited to, the acceptance and recordation of the Special Warranty Deed attached hereto as Exhibit "1", and the maintenance of said real property.

PASSED AND ADOPTED BY THE MAYOR AND COMMON COUNCIL OF THE TOWN OF PAYSON this 14th day of November, 2002, by the following vote:

AYES 7 NOES 0 ABSTENTIONS 0 ABSENT 0

Kenneth P. Murphy, Mayor

ATTEST:

APPROVED AS TO FORM:

When Recorded, Return To:

Town Clerk
Town of Payson, Arizona
303 N. Beeline Hwy.
Payson, AZ 85541

Gila County, AZ RESL

2003-001253
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01/24/2003 12:49P
17.00

SPECIAL WARRANTY DEED

For the consideration of Ten Dollars, and other valuable considerations, PAYSON HOTEL INNVESTORS, LLC, Grantor, does hereby convey to the TOWN OF PAYSON, an Arizona municipal corporation, Grantee, that certain real property situated in Gila County, Arizona, more particularly described on Exhibit "A" attached hereto and incorporated herein by this reference, subject to current taxes and other assessments, reservations in patents, and all easements, rights-of-way, encumbrances, liens, covenants, conditions, restrictions, obligations and liabilities as may appear of record.

Grantor warrants the title against all acts of Grantor and no other, subject to the matters above set forth.

EXEMPT under A.R.S. § 11-1134(A)(3).

DATED this 21ST day of OCTOBER, 2002.

PAYSON HOTEL INNVESTORS, LLC

By: John G. Thompson

Its: MANAGING MEMBER

STATE OF Arizona)
)ss.
County of Maricopa)

On this the 21ST day of OCTOBER, 2002, before me, the undersigned Notary Public in and for said County and State, personally appeared JOHN A. STAECRAFT, the MANAGING MEMBER of PAYSON HOTEL INNVESTORS, LLC.

WITNESS my hand and official seal.

Patti L. Owen
Notary Public

My Commission Expires:

OFFICIAL SEAL
PATTI L. OWEN
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires June 13, 2005

ACCEPTANCE

The Town of Payson, Arizona, a municipal corporation, hereby accepts the foregoing grant for right-of-way purposes.

Town of Payson, an Arizona municipal corporation

By: _____

Attest:

_____
Chief Deputy Town Clerk

"Exhibit A"

LEGAL DESCRIPTION
OF
RIGHT-OF-WAY DEDICATION

BEING A PORTION OF THE NORTHWEST QUARTER OF SECTION 3, TOWNSHIP 10 NORTH, RANGE 10 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, GILA COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE INTERSECTION OF LONGHORN ROAD AND STATE ROUTE NO. 87(BEELINE HIGHWAY);

THENCE SOUTH 01°37'13" WEST, ALONG THE MONUMENT LINE OF SAID STATE ROUTE NO. 87, A DISTANCE OF 17.32 FEET;

THENCE DEPARTING SAID MONUMENT LINE, NORTH 88°22'47" WEST, A DISTANCE OF 304.49 FEET TO THE **POINT OF BEGINNING**;

THENCE SOUTH 11°13'00" WEST, A DISTANCE OF 33.92 FEET;

THENCE NORTH 82°41'54" WEST, A DISTANCE OF 30.39 FEET;

THENCE NORTH 37°43'21" WEST, A DISTANCE OF 18.35 FEET;

THENCE NORTH 85°39'35" WEST, A DISTANCE OF 34.08 FEET;

THENCE NORTH 81°20'39" WEST, A DISTANCE OF 114.62 FEET;

THENCE NORTH 00°02'02" EAST, A DISTANCE OF 6.45 FEET;

THENCE SOUTH 89°57'58" EAST, A DISTANCE OF 64.05 FEET TO THE POINT OF CURVATURE FOR A TANGENT CURVE, CONCAVE SOUTHWESTERLY HAVING A RADIUS OF 770.00 FEET;

THENCE SOUTHEASTERLY ALONG THE ARC OF SAID CURVE, THROUGH A CENTRAL ANGLE OF 09°48'44", AN ARC LENGTH OF 131.87 FEET TO THE **POINT OF BEGINNING**.

CONTAINING 3,904 SQUARE FEET OR 0.09 ACRES MORE OR LESS.

Gila County, AZ RESL
2003-001253
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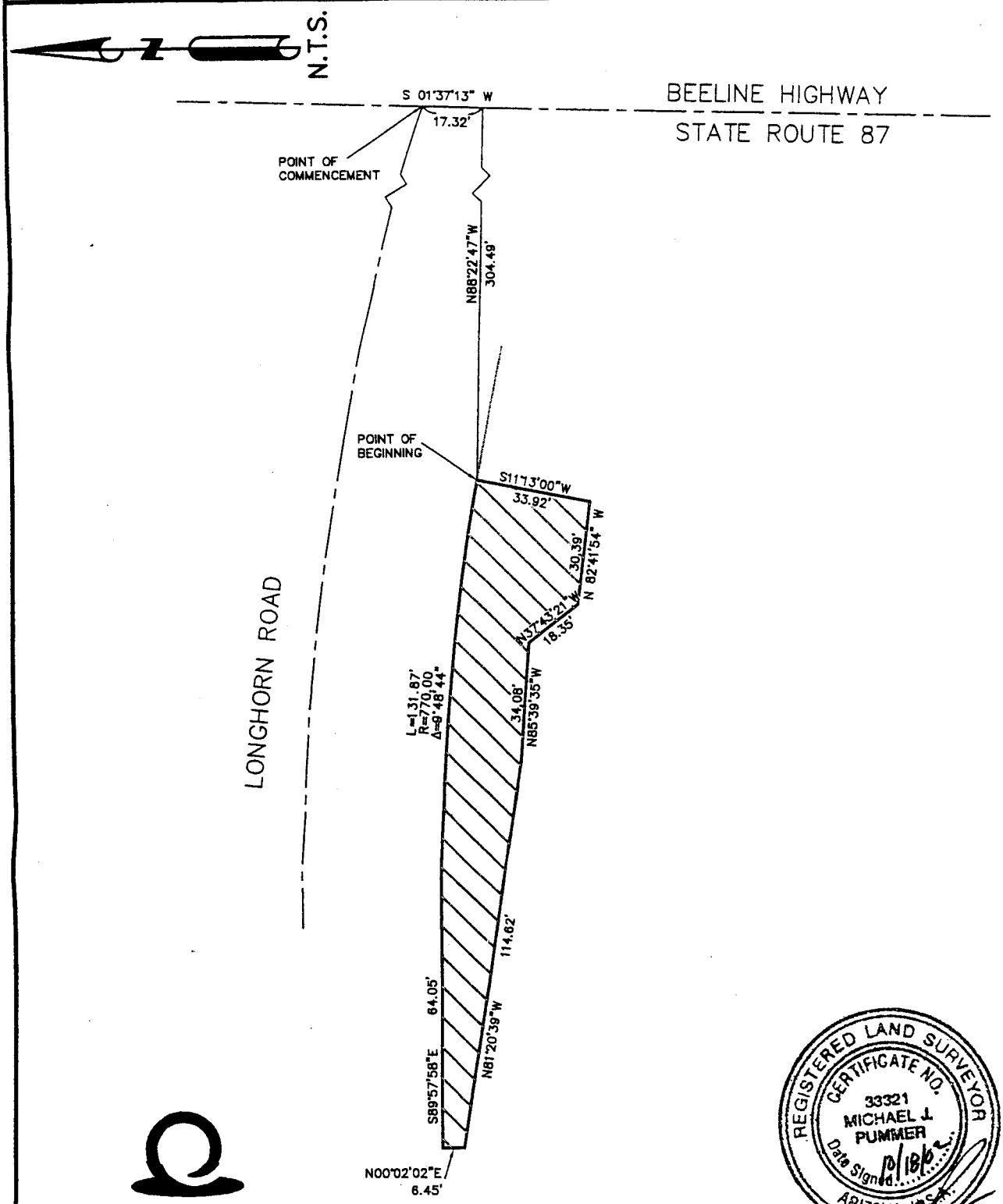
01/24/2003 12:49P
17.00

Subject: RIGHT-OF-WAY DEDICATION EXHIBIT

Job No: 021005



REGISTERED LAND SURVEYOR
CERTIFICATE NO.
33321
MICHAEL J.
PUMMER
Date Signed 10/18/02
ARIZONA U.S.A.

OPTIMUS
CIVIL DESIGN GROUP
2323 E. MAGNOLIA STREET
SUITE 107
PHOENIX, AZ 85034
PH: (602) 286-9300 FAX: (602) 286-9400

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Gila County, AZ RESL

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Prepared By: MJP **Date:** 10/18/02 **Sheet No:** 1 **Of** 1

APPENDIX E

Cost Estimates

Arizona Department of Transportation

Estimated Engineering Construction Cost

Itemized Estimate

Project Number: 260 GI 250.0 / SCOPE021

Location: SR 87 - SR 260 INTERSECTION STUDY

November 03, 2020

Version: PHASE ONE ESTIMATE

Alternative: 0

MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS

Item No	Item Description	Unit	Quantity	Unit Price	Amount
9240103	MISCELLANEOUS WORK (CAMERA /SWITCH POE LINE CORDS)	L.SUM	1	$60.00	$60
9240108	MISCELLANEOUS WORK (VIDEO DETECTION INSTALLATION-SIX CAMERA)	L.SUM	1	$74,524.32	$74,524
9240109	MISCELLANEOUS WORK (CRADLEBOARD LINE CORD)	L.SUM	1	$20.00	$20
9240111	MISCELLANEOUS WORK (CAT5E SHIELDED UV RATED CABLE)	L.FT.	4,000	$0.27	$1,080
9240119	MISCELLANEOUS WORK (RADAR DETECTION)	EACH	9	$36,479.00	$328,311
9240120	MISCELLANEOUS WORK (CAMBIUM PTP670 RADIOS)	EACH	12	$2,776.17	$33,314
9240121	MISCELLANEOUS WORK (TRAFFIC MANAGEMENT PROGRAM LICENSES)	EACH	9	$1,800.00	$16,200
9240122	MISCELLANEOUS WORK (MOXA MANAGED SWITCH EDS-G516E-4GSFP-T)	EACH	8	$1,481.25	$11,850
9240126	MISCELLANEOUS WORK (CABINET POWER STRIPS)	L.SUM	1	$90.00	$90
9240127	MISCELLANEOUS WORK (BOSCH MIC7100 CAMERA)	EACH	3	$4,748.25	$14,245
9240131	MISCELLANEOUS WORK (CAMBIUM LPU GROUNDING KITS)	EACH	12	$358.42	$4,301
9240133	MISCELLANEOUS WORK (CRADLEPOINT MODEM IBR1700)	EACH	2	$1,065.18	$2,130
9240134	MISCELLANEOUS WORK (TRAVEL TIME DEVICES)	EACH	3	$4,200.00	$12,600
9240135	MISCELLANEOUS WORK (CRADLEPOINT ANTENNA 5-IN-1 GPS-GLOSNASS)	EACH	2	$327.99	$656
9240136	MISCELLANEOUS WORK (ROUTER, POWER SUPPLY, ANTENNA)	EACH	1	$1,100.00	$1,100
9240171	MISCELLANEOUS WORK (BOSCH DCA ADAPTER PLATE)	EACH	3	$200.03	$600
9240172	MISCELLANEOUS WORK (BOSCH POE INJECTOR)	EACH	3	$172.78	$518
9240173	MISCELLANEOUS WORK (REMOVE AND RELOCATE UPS WITH NEW FOUNDATION)	EACH	2	$3,700.00	$7,400
9240174	MISCELLANEOUS WORK (REMOVE AND RELOCATE CABINET WITH NEW FOUNDATON)	EACH	2	$4,700.00	$9,400
9240175	MISCELLANEOUS WORK (MOXA SWITCH POWER SUPPLY S8VKGO3024)	EACH	8	$60.08	$481
9240176	MISCELLANEOUS WORK (REMOVE AND RELOCATE METER PEDESTAL)	EACH	1	$1,000.00	$1,000
9240177	MISCELLANEOUS WORK (ASTRO-BRAC CLAMP KIT 96" CABLE)	EACH	3	$98.79	$296
9240178	MISCELLANEOUS WORK (ASTRO-BRAC 58" GUSSETED TUBE)	EACH	3	$36.81	$110
9240179	MISCELLANEOUS WORK (CRADLEPOINT POWER SUPPLY)	EACH	2	$57.39	$115
9240187	MISCELLANEOUS WORK (ETHERNET PATCH CABLE 1 METER)	EACH	50	$1.42	$71
	MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS SUBTOTAL				**$520,473**
934XX01	MISCELLANEOUS WORK (10%)	COST	10%		$52,047
				SUBTOTAL	**$572,520**
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC (10%)	COST	10%		$57,252
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (1%)	COST	1%		$5,725
				SUBTOTAL	**$635,498**
901XX01	MOBILIZATION (10%)	COST	10%		$63,550

Arizona Department of Transportation

Estimated Engineering Construction Cost

Itemized Estimate

Project Number: 260 GI 250.0 / SCOPE021

Location: SR 87 - SR 260 INTERSECTION STUDY

November 03, 2020

Version: PHASE ONE ESTIMATE

Alternative: 0

MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS

Item No	Item Description	Unit	Quantity	Unit Price	Amount
925XX01	CONSTRUCTION SURVEYING AND LAYOUT (1%)	COST	1%		$6,355
				SUBTOTAL	$705,402
951X001	CONSTRUCTION ENGINEERING	COST	15%		$105,810
951X002	CONTINGENCY	COST	5%		$35,270
970Z020	PUBLIC RELATIONS	L.SUM	1	$15,000.00	$15,000
				MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS	$861,483

OTHER COST (ICAP & PARTS TAX)

Item No	Item Description	Unit	Quantity	Unit Price	Amount
	ICAP (9.9%)	L.SUM	1	$87,267.00	$87,267
	RADIO PARTS TAX@9.18%	L.SUM	1	$9,064.13	$9,064
				OTHER COST	$96,331

Summary

Section	Total
MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS	$861,000
OTHER COST (ICAP & PARTS TAX)	$96,000
Total Project Cost	**$957,000**

Arizona Department of Transportation

Estimated Engineering Construction Cost

Itemized Estimate

Project Number: 260 GI 250.0 / SCOPE028

Location: SR 87 - SR 260 INTERSECTION STUDY (PHASE 2)

November 10, 2020

Version: SECOND RIGHT TURN LANE

Alternative: 0

PAVEMENT ITEMS

Item No	Item Description	Unit	Quantity	Unit Price	Amount
2050001	GRADING ROADWAY FOR PAVEMENT	SQ.YD.	9,055	$7.00	$63,385
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	2,766	$60.00	$165,960
4090006	ASPHALTIC CONCRETE (MISCELLANEOUS STRUCTURAL) (SPECIAL MIX)	TON	3,517	$165.00	$580,305
				PAVEMENT ITEMS	**$809,650**

MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS

2020025	REMOVAL OF CONCRETE SIDEWALKS, DRIVEWAYS AND SLABS	SQ.FT.	17,200	$3.00	$51,600
2020052	REMOVE (EXISTING RAILING)	L.FT.	52	$35.00	$1,820
2020155	REMOVE (SIGNS, POSTS AND FOUNDATIONS)	EACH	54	$110.00	$5,940
2030401	DRAINAGE EXCAVATION	CU.YD.	17,370	$20.00	$347,400
5012524	STORM DRAIN PIPE, 24"	L.FT.	900	$70.00	$63,000
5012530	STORM DRAIN PIPE, 30"	L.FT.	75	$100.00	$7,500
5030023	CONCRETE CATCH BASIN (C-15.20) ONE 7.5' WING, H=8' OR LESS	EACH	6	$6,000.00	$36,000
5041996	DRAINAGE STRUCTURE (HEADWALL)	EACH	1	$2,000.00	$2,000
5050001	MANHOLE (C-18.10) (NO. 1) (FOR PIPES 6" TO 36")	EACH	2	$5,000.00	$10,000
6060148	CANTILEVER SIGN STRUCTURE (RELOCATE EXISTING CANTILEVER SIGN STRUCTURE)	EACH	1	$8,000.00	$8,000
6060245	FOUNDATION FOR CANTILEVER SIGN STRUCTURE (34' ARM)	EACH	1	$9,000.00	$9,000
6070055	SIGN POST (PERFORATED) (2 1/2 S)	L.FT.	150	$12.00	$1,800
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	15	$200.00	$3,000
6080005	REGULATORY, WARNING, OR MARKER SIGN PANEL	SQ.FT.	300	$25.00	$7,500
6110200	METAL HANDRAIL (MODIFIED MAG. DET 145)	L.FT.	52	$45.00	$2,340
7015042	TEMPORARY PAINTED MARKING (STRIPE)	L.FT.	910	$1.00	$910
7080121	PERMANENT PAVEMENT MARKING (PAINTED SYMBOL) (ARROW)	EACH	7	$50.00	$350
7080221	PERMANENT PAVEMENT MARKING (PAINTED LEGEND) (ONLY)	EACH	4	$30.00	$120
7090001	DUAL COMPONENT PAVEMENT MARKING (WHITE EPOXY)	L.FT.	910	$1.00	$910
7090010	DUAL COMPONENT PAVEMENT LEGEND	EACH	7	$250.00	$1,750
7090012	DUAL COMPONENT PAVEMENT SYMBOL	EACH	4	$250.00	$1,000
7310110	POLE (TYPE J)	EACH	1	$3,800.00	$3,800
7310190	POLE (TYPE W POLE)	EACH	2	$5,000.00	$10,000
7310195	POST (PEDESTRIAN PUSH BUTTON)	EACH	4	$550.00	$2,200
7310200	POLE FOUNDATION (TYPE A)	EACH	1	$500.00	$500
7310371	POLE FOUNDATION (TYPE W) (STANDARD BASE)	EACH	2	$4,000.00	$8,000
7310390	PEDESTRIAN PUSH BUTTON POST FOUNDATION	EACH	4	$325.00	$1,300
7310580	MAST ARM (35 FT.) (TAPERED)	EACH	1	$1,500.00	$1,500
7310640	MAST ARM (65 FT.) (TAPERED)	EACH	2	$5,000.00	$10,000
7320050	ELECTRICAL CONDUIT (2") (PVC)	L.FT.	51	$7.50	$382
7320060	ELECTRICAL CONDUIT (2 1/2") (PVC)	L.FT.	12	$500.00	$6,000

Arizona Department of Transportation

Estimated Engineering Construction Cost

Itemized Estimate

Project Number: 260 GI 250.0 / SCOPE028

Location: SR 87 - SR 260 INTERSECTION STUDY (PHASE 2)

November 10, 2020

Version: SECOND RIGHT TURN LANE

Alternative: 0

MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS

7320070	ELECTRICAL CONDUIT (3") (PVC)	L.FT.	10	$500.00	$5,000
7320420	PULL BOX (NO. 7)	EACH	5	$625.00	$3,125
7320495	CONDUCTOR (NO. 14)	L.FT.	4,200	$0.90	$3,780
7320770	FIBER OPTIC CABLE	L.FT.	2,800	$3.00	$8,400
7330060	TRAFFIC SIGNAL FACE (TYPE F)	EACH	2	$550.00	$1,100
7330220	PEDESTRIAN PUSH BUTTON	EACH	4	$250.00	$1,000
7350300	COMMUNICATION CABLE	L.FT.	1,000	$0.25	$250
7360111	LUMINAIRE (HORIIZONTAL MOUNT) (LED TYPE 25L) (240 VOLT)	EACH	7	$650.00	$4,550
8050003	SEEDING (CLASS II)	ACRE	2	$3,000.00	$6,000
9080081	CONCRETE CURB AND GUTTER (C-05.10) (TYPE G)	L.FT.	1,878	$28.00	$52,584
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	15,200	$6.00	$91,200
9080296	CONCRETE SIDEWALK RAMP (DETECTABLE WARNING STRIP)	EACH	6	$500.00	$3,000
9080298	CONCRETE SIDEWALK RAMP	EACH	20	$2,000.00	$40,000
9080512	SCUPPER (MAG DET. 206-2)	EACH	3	$3,000.00	$9,000
9130010	RIPRAP (GROUTED) (6" DIA.)	CU.YD.	115	$200.00	$23,000
9140121	RETAINING WALL (REINFORCED CONCRETE)	SQ.FT.	1,894	$60.00	$113,640
9210011	MEDIAN PAVING	SQ.YD.	60	$80.00	$4,800
9240127	MISCELLANEOUS WORK (REMOVE AND RELOCATE BUSINESS SIGNS)	EACH	4	$1,200.00	$4,800
9240136	MISCELLANEOUS WORK (ROUTER, POWER SUPPLY, ANTENNA)	EACH	1	$1,100.00	$1,100
9240173	MISCELLANEOUS WORK (REMOVE AND RELOCATE UPS WITH NEW FOUNDATION)	EACH	2	$3,700.00	$7,400
9240174	MISCELLANEOUS WORK (REMOVE AND RELOCATE CABINET WITH NEW FOUNDATON)	EACH	2	$4,700.00	$9,400
9240176	MISCELLANEOUS WORK (REMOVE AND RELOCATE METER PEDESTAL)	EACH	1	$1,000.00	$1,000
				MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS	**$999,752**

ICAP

Item No	Item Description	Unit	Quantity	Unit Price	Amount
	ICAP (9.9%)	L.SUM	1	$179,131.00	$179,131
				ICAP	**$179,131**

Summary

Section	Total
PAVEMENT ITEMS	$810,000
MISCELLANEOUS & TRAFFIC SIGNAL AND CONNECTIVITY ITEMS	$1,000,000
ICAP	$179,000
Total Project Cost	**$1,989,000**