Telluride Southwest Area Traffic Impact Study

Final Study Submitted , August 31, 2020

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Telluride Southwest Area
Traffic Summary

August 31, 2020
By: PST Engineering LLC

I. Executive Summary

Overview

In 2019 the Town of Telluride Town Council initiated a Conceptual Planning process to determine how to best utilize the Town-owned land in a portion of town known as the Southwest Area. Multiple public meetings and workshops were held in 2019. Based on this input, Telluride Town staff and the master planning team developed several mixed-use conceptual plans for the area. The mixed-use consists of primarily residential uses but also includes commercial/retail, and office within the same lots or buildings. This traffic study is intended to analyze the potential impacts of the increased traffic created by this future development and to provide possible solutions to help mitigate these impacts.

Pacific Avenue Intersections

The intersections along Pacific Ave appear to function well in both the AM and PM peak hours with the existing intersection configurations and have the capacity to handle additional traffic if density is added in the Southwest Area. Therefore, beyond consideration of some alternate treatment to the median at the Pacific/Tomboy/Carhenge intersection and potential bridge realignment/pedestrian improvements at Pacific/Mahoney (refer to the Southwest Neighborhood Conceptual Master Plan for more details), no other intersection specific improvements are proposed at these intersections at this time. However, potential changes in overall traffic patterns are discussed below.

West Colorado/Mahoney Roundabout and Colorado/THMS Main Entrance Intersections

The W Colorado/Mahoney (WC-M RAB) and the W Colorado/THMS main entrance appear to have traffic congestion issues during the AM peak hour when school is in session. Neither the internal circulation within the school grounds or the WC-M RAB itself appear to be the direct cause of these delays. High pedestrian crossing rates combined with heavy EB traffic on W Colorado Ave appear to create the bulk of the delays. Egress traffic leaving school and re-entering WC-M RAB also contributes to congestion.

Some possible solutions would be to increase bus ridership and carpooling, provide crossing guards or police to increase the efficiency at student crossing locations, adjusting the start of school so that it does not coincide with the peak 15 minutes of background traffic, and providing attainable housing within town limits to reduce the overall number of commuters coming into Town during the AM peak. While determining the feasibility of a grade separated crossing is beyond the scope of this study, it is a solution that could be investigated further if there were community support. However, town staff have indicated significant amounts of ground water in this area may cause challenges for an underpass.

W Colorado/Davis Intersection

The NB Davis Street leg of the W Colorado/Davis intersection is currently functioning just at or below acceptable levels of service during the PM peak hours with background traffic alone. Additional traffic will increase delays. Converting Pacific Ave to two-way traffic could help to reduce delays by offering

drivers alternate routes. However, in order to accommodate additional traffic from additional density in the Southwest Area, additional improvements should be considered. Using line striping to create a two-way left turn lane on the western leg of W Colorado Ave could be a short-term, low cost solution. This could allow time for feasibility investigations into and design of longer-term improvements, such as a mini roundabout.

President's Day Weekend Analysis & Observations

Traffic to and from the Carhenge Lot did increase substantially. However, with significantly less background traffic on W Colorado Ave and similar levels of traffic on the Pacific Ave intersections, traffic congestion did not appear to be a concern.

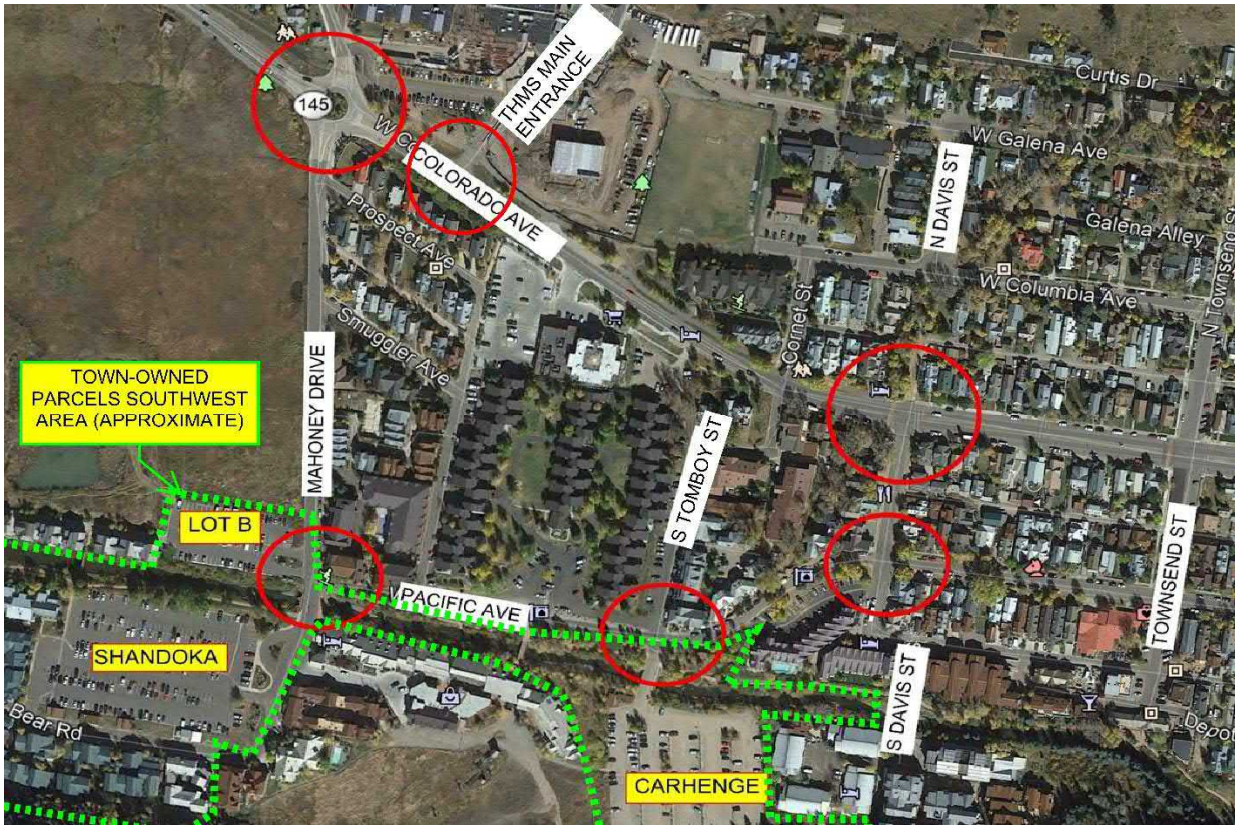
Blues and Brews Festival Observations

During the observations on Friday afternoon, traffic congestion did not appear to be a concern. However, finding a parking space in the Southwest Area during a large event is challenging.

II. Study Background, Purpose, and Need

In 2019 the Town of Telluride Town Council initiated a Conceptual Planning process to determine how to best utilize the Town-owned land in a portion of town known as the Southwest Area. The approximate limits of the town-owned parcels are shown in Figure 1 below. The Southwest area houses a significant portion of Telluride's full-time population and work force. It also provides public parking for workers, visitors, and skiers. Multiple public meetings and workshops were held in 2019 where residents voiced their desire for the area to be developed with a range of uses such as retail, commercial, office, housing, rentals, and private condos. Based on the public input and current workforce housing shortages, Telluride Town staff and the master planning team developed several conceptual plans for the area. This traffic study is intended to analyze the potential impacts of the increased traffic created by this future development and to provide possible solutions to help mitigate these impacts. The study limits and primary intersections in this area are shown below in Figure 1.

Figure 1 – Location Map/Study Area



III. *Existing Roadways, Intersections, and Pedestrian Facilities*

W Colorado Avenue has a posted speed limit of 35mph, which decreases to 25mph on the section just west of the W Colorado Ave/Mahoney Dr roundabout (WC-M RAB). East of the WC-M RAB, the speed limit on all town streets is 15mph. A brief description of each road is provided below:

- West Colorado Avenue – There are two distinct sections of W Colorado Avenue, one west of the WC-M RAB which is a two-lane town road fairly rural in character with one lane of traffic in each direction. This section provides the connection to SH 145, the only access point in to and out of the Town of Telluride. East of the WC-M RAB, the road continues to be two-lanes but with more of an urban character. The road widens to three lanes with a striped center median east of Davis Street. This median is primarily used for short-term parking and loading/unloading operations. W Colorado Ave extends east to First Street.
- Mahoney Drive – A two lane street with one lane of traffic in each direction and parking on only the east side. It is bounded by open space/wetlands on the west side which limits the ability for future widening. As Pacific Ave is currently one-way eastbound, Mahoney is the primary access route into the Southwest Area and south of Pacific Ave it is the only access point to/from Shandoka.
- Pacific Avenue – A one-way street in the eastbound direction between Mahoney Dr and Davis St. There is no on-street parking between Mahoney Dr and S Tomboy St, and parking on the north side between S Tomboy St and Davis St. There is also a heavily used gravel shared use path ("The River Trail") along the San Miguel River that runs parallel to Pacific Ave.
- South Tomboy Street – A two-lane street with one lane of traffic in each direction. There is parallel parking on the east side and perpendicular parking on private property on the west side. In an attempt to limit traffic to/from W Colorado Ave to/from the Carhenge parking lot, there is a median island restricting turn movements at the intersection of Pacific Ave and South Tomboy Street.
- Davis Street – A two-lane street with one lane of traffic in each direction and parking on both sides. With Pacific Ave one-way eastbound and the median at Tomboy, most traffic exiting the Carhenge Parking lot uses Davis Street.
- Pedestrian Facilities (Sidewalks, River Trails, Cross-walks, etc) – This traffic study is part of a larger master planning study for the Southwest area prepared by DHM Design. As part of their scope, DHM inventoried existing pedestrian facilities and circulation patterns and proposed possible improvements. Refer to the Southwest Neighborhood Conceptual Master Plan for additional information.

A brief description and figures for each intersection are included below:

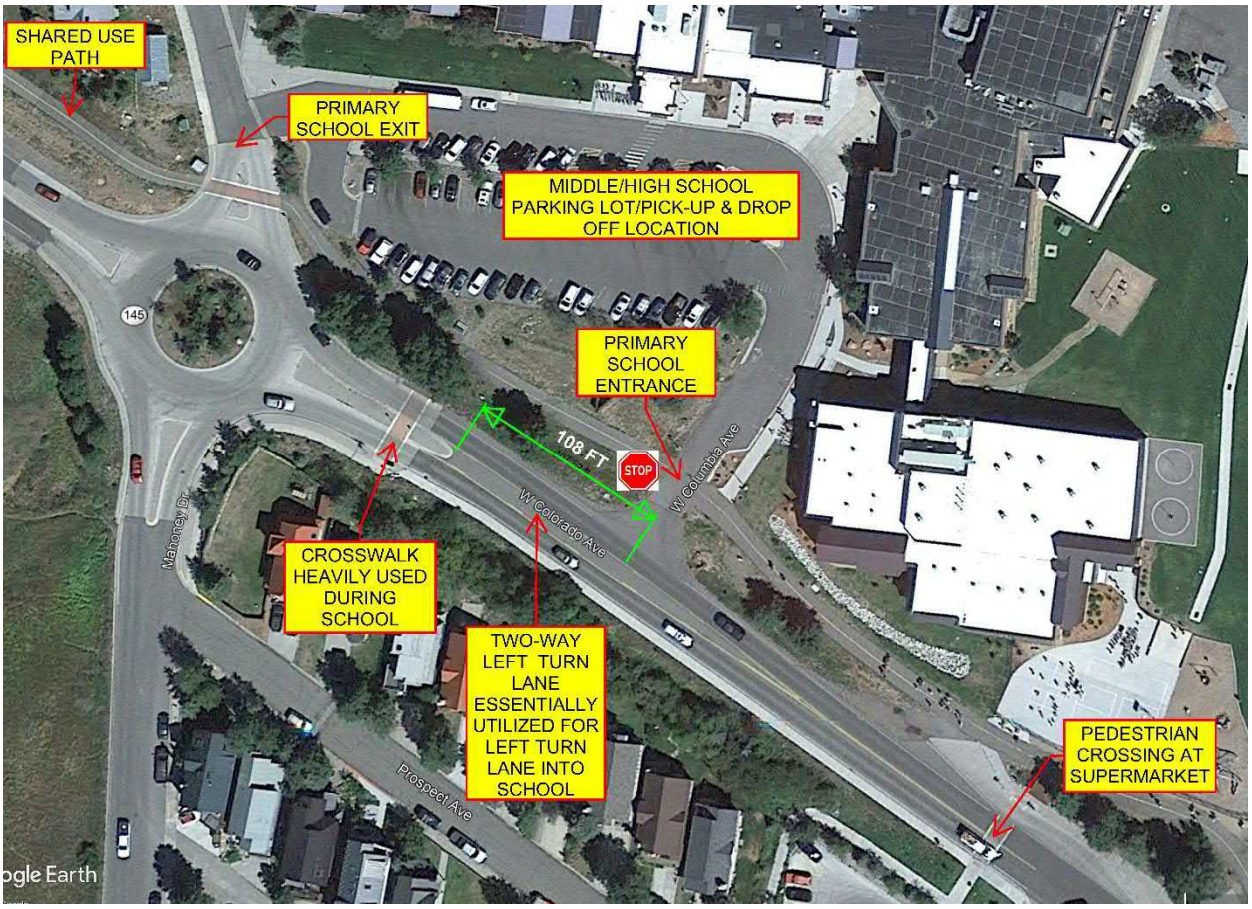
W Colorado Ave/Mahoney Drive (WC-M RAB)

This intersection is a single lane round-a-bout, with one approach lane in each direction. Butcher Creek Drive, the northern leg of this intersection, serves as the primary exit for the Telluride Middle-High School. A significant number of pedestrian crossings occur at the pedestrian cross-walk located between this intersection and the W Colorado Ave/THMS main entrance intersection.

W Colorado Ave/THMS Main Entrance

This intersection is a 3-leg intersection with a stop sign on the THMS main entrance. The northern leg of this intersection serves as the primary entrance to the Telluride Middle-High School. There is a left turn pocket on the eastbound leg of W Colorado Ave. A significant number of pedestrian crossings occur at the pedestrian cross-walk located between this intersection and the WC-M RAB and at the pedestrian cross-walk to the east in front of the supermarket.

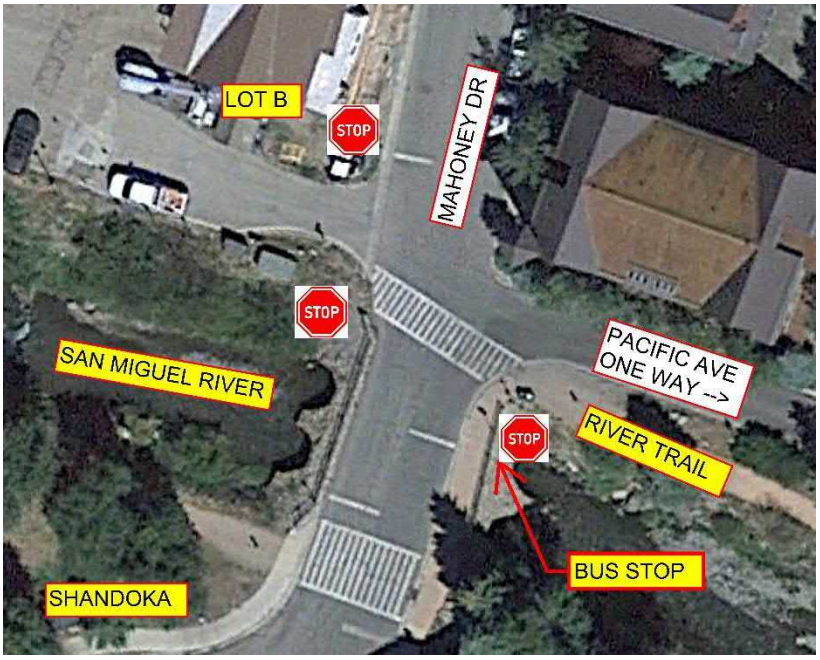
Figure 2 – W Colorado Ave/Mahoney & W Colorado Ave/THMS Main Entrance



Pacific Avenue /Mahoney Drive

This intersection is a 3-way stop controlled intersection, with stop signs on all approaches except the eastern leg of Pacific Ave which is one-way eastbound. There is a significant amount of pedestrian, bicycle, and skier activity at this location as the Galloping Goose Public Transit stops here and the bridge provides a connection between the town and several hiking/biking trails. This is the only vehicular access to the Shandoka and Virginia Placer parcels.

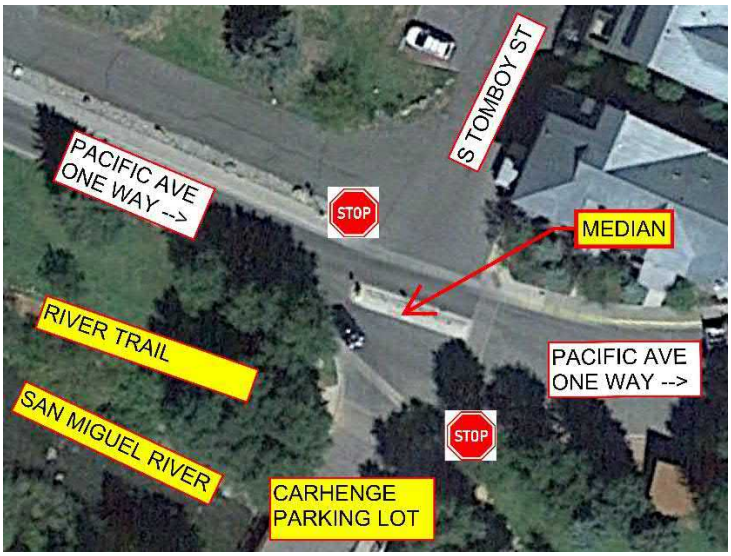
Figure 3- Pacific Ave/Mahoney Dr



Pacific Avenue/South Tomboy Street

This intersection is a two-way stop sign controlled intersection, with stop signs on the northbound and southbound approaches. Pacific is one-way eastbound and is free-flowing. This intersection provides the only vehicular access to the Carhenge parking lot, the only substantial public parking lot in Telluride. As a result, there is a significant amount of pedestrian, bicycle, and skier activity at this location.

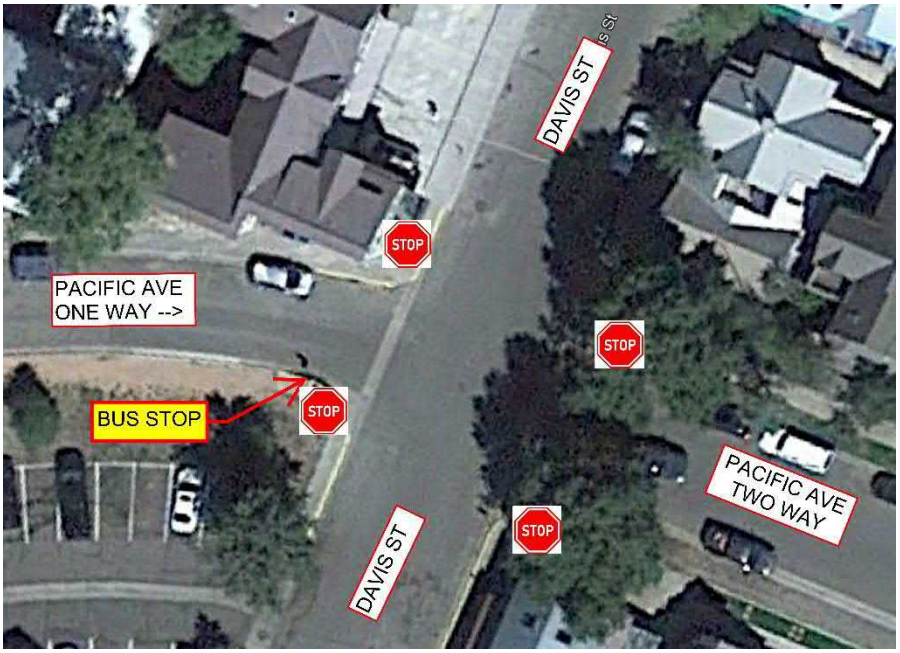
Figure 4- Pacific Ave/S Tomboy St



Pacific Avenue/Davis Street

This intersection is a 4-way stop controlled intersection, with stop signs on all approaches. Pacific Ave is one-way eastbound west of this intersection and two-way traffic east of this intersection. There is a significant amount of pedestrian, bicycle, and skier activity at this location as the trolley stops here and many people use Pacific Ave for access to the ski area and downtown from the Carhenge parking lot.

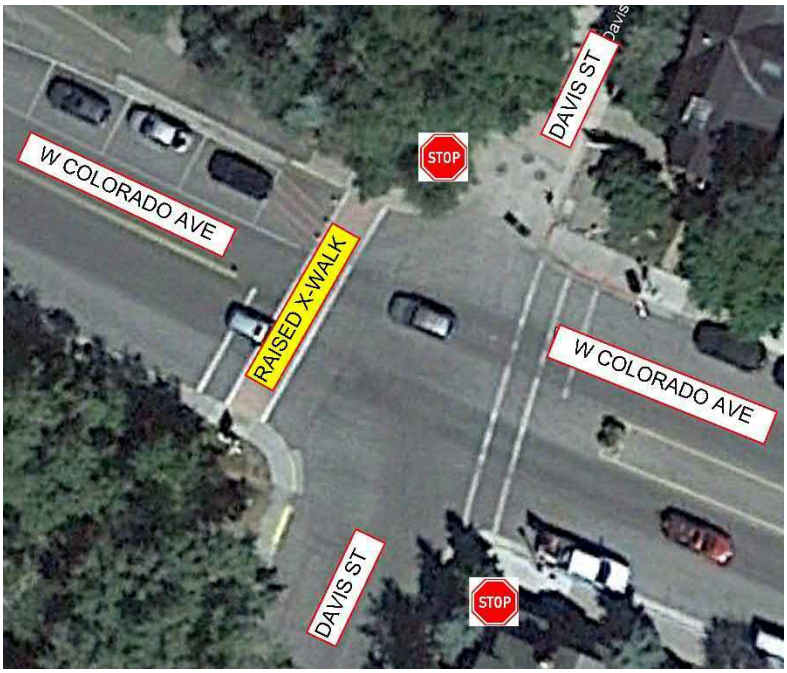
Figure 5- Pacific Ave/Davis St



W Colorado Avenue/Davis Street

This intersection is a 2-way stop controlled intersection, with stop signs on the northbound and southbound approaches. The southbound leg of Davis Street is lightly used. However, since Pacific Ave is one-way eastbound, the northbound leg sees relatively high volumes. Additionally, there is a raised pedestrian cross-walk located just west of this intersection that sees a fair amount of pedestrian use and though it is not an official stop, the Galloping Goose stops at this intersection.

Figure 6- W Colorado Ave/Davis St



IV. Existing Traffic Volumes - Summer

Counts for this study were conducted during both the summer and the winter season. The first phase of this study focused on the summer analysis as discussed in this section. Winter counts and analyses will be discussed in later sections of this study.

Counts for this study were conducted using video cameras. The cameras were set up from approximately 7am to 7pm for one day at each intersection between August 7th and August 13th, 2019. The videos were then observed in the office, and pedestrian, bicycle, and vehicle volumes were recorded in 15-minute increments during the typical peak hour volumes of 7am-9am and 4pm-6pm. From this data, the 1-hour AM peak and 1-hour PM peak were established.

The Lot B parcel was under construction during the counts. Therefore, the August traffic counts represented mostly construction traffic as the parking lot was not being used to its full potential. Based

on the existing Shandoka and Carhenge parking lot traffic generation rates (as explained in detail in Section V) and the splits for the Shandoka parcels, existing Lot B background traffic was estimated and added to the background traffic map, disregarding the count data that was comprised of almost exclusively construction traffic. The volumes added are shown in Table 0 below:

Table 0 - Lot B Existing Trip Generation

		AM			PM		
Land Use	Parking Spaces	Peak Hour	In	Out	Peak Hour	In	Out
Lot B Mixed-Use Parking Spaces (from rates in Table 3B (Shandoka))	45	20	9	12	25	11	15
Lot B Commuter/Visitor Parking Spaces (from rates in Table 4B (Carhenge))	45	10	5	5	9	2	7
Total	90	30	14	16	34	13	21

Additionally, North Davis Street was closed for construction during the counts. In looking at the *Lift 7 Subarea Plan Traffic Memorandum*, dated September 24, 2007 by LSC Transportation Consultants, Inc. the 2007 traffic counts show only 5 cars entering and 0 cars exiting North Davis in the AM peak hour and only 2 cars entering and 2 cars exiting in the PM peak hour. Based on a comparison of 2007 and 2019 aerial imagery, it does not appear that any significant development or road network changes occurred in this area. Therefore, to be conservative, the numbers from the 2007 counts were doubled for the 2019 background condition.

After the adjustments explained above, the corresponding background traffic volumes for August 2019 are shown in Attachment A. For typical level of service analysis at each intersection, if a bicyclist crosses an intersection in a cross-walk like a pedestrian, then they are counted as a pedestrian. And if a bicyclist flows through an intersection like a vehicle, then they are counted as a vehicle. The data shown in Attachment A shows the pedestrian crossing volumes (including bicycles that act like pedestrians) in green and purple and the yellow and grey indicate the number of vehicles (including bicycles that interact with an intersection in the same manner as a car). The August counts were taken to coincide with the peak summer tourist season. Therefore, no seasonal adjustment factors were used.

V. Trip Generation Rates

Typically, the Institute of Transportation Engineer's Trip Generation Manuals are used to estimate project traffic. Table 1A summarizes the ITE generation rates for Multi-family housing:

Table 1A - ITE Trip Generation Manual, 10th Edition

		AM			PM			Daily		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out	Daily	In	Out
221 - Multi-family Housing (Mid-Rise)	Dwelling Units	0.36	26.0%	74.0%	0.44	61.0%	39.0%	5.44	50.0%	50.0%
General Urban/Suburban		adjacent, is higher			adjacent, is higher					

Table 1B is a summary of estimated trips generated by the existing housing at Shandoka and Virginia Placer based on the Table 1 ITE rates:

Table 1B - ITE Trip Generation

		AM			PM			Daily		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out	Daily	In	Out
221 - Multi-family Housing (Mid-Rise)	198	71	19	53	87	53	34	1077	539	539
Note: This is 134 units at Shandoka and 64 units in Virginia Placer.										

However, in this instance there is only one-way in and one-way out over the Mahoney Drive bridge, the area served by the bridge consists of primarily multi-family housing with some commercial/retail uses (which is similar to the theoretical master plan land use mix), and we have actual count data. Therefore, Table 2A below shows the trip generation based on the traffic counts and Table 2B shows the generation rates associated with these counts:

Table 2A - Mahoney Bridge Count data

		AM			PM		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Existing Shandoka and Virginia Placer Multi-Family Housing Units w/ some Commercial	198	135	57	78	169	72	97
Note: This is 134 units at Shandoka and 64 units in Virginia Placer.							

Table 2B - Generation Rates from Mahoney Bridge August Traffic Counts

		AM			PM		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Existing Shandoka and Virginia Placer Multi-Family Housing Units w/ some Commercial	Dwelling Units	0.68	42.2%	57.8%	0.85	42.6%	57.4%

When comparing Table 1A to Table 2B, the generation rates for the 198 existing units based on traffic counts are higher than the rates predicted by the ITE Manual. This is likely due to the commercial uses and public works facilities currently located in Shandoka. Since this study is at the Master Planning level and specific uses are not yet defined, the more conservative generation rates based on the count data will be used for future traffic projections in this study. Using conservative numbers will allow for increased flexibility when the mix of actual land uses are determined, since the mix of residential and commercial has yet to be finalized.

Additionally, since the number of vehicles coming to and going from an isolated site is directly tied to the number of parking spaces, not necessarily the number of units, parking spaces were chosen as the more appropriate independent variable. Table 3A shows the trip generation based on the traffic counts and Table 3B shows the generation rates per parking space associated with the traffic counts:

Table 3A - Mahoney Bridge Count data

		AM			PM		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Existing Shandoka Mixed Use Parking Spaces	348	135	57	78	169	72	97

Note: This is 300 parking spaces at Shandoka and 48 at Virginia Placer. There are some private lots as well, so this is conservative.

Table 3B - Generation Rates from Mahoney Bridge Aug Counts

		AM			PM		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Existing Shandoka Mixed Use Parking Spaces	Parking Spaces	0.39	42.2%	57.8%	0.49	42.6%	57.4%

Note: This is 300 parking spaces at Shandoka and 48 at Virginia Placer. There are some private lots as well, so this is conservative.

The rates shown in Table 3B are the rates that will be used to project future development traffic created by additional mixed-use development in the Southwest Area Plan throughout this study.

There is not a land use in the ITE Manual that coincides with a commuter/visitor parking area such as the Carhenge Lot. Therefore, generation rates will be calculated from the collected traffic counts at the Tomboy Bridge. Table 4A below shows the trip generation based on the traffic counts and Table 4B shows the generation rates associated with the traffic counts:

Table 4A - Tomboy Bridge Count data

		AM			PM		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Existing Carhenge Commuter/Visitor Parking Spaces	288	64	35	29	56	13	43

Table 4B - Generation Rates from Tomboy Bridge August Counts

		AM			PM		
Land Use Code	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Existing Carhenge Commuter/Visitor Parking Spaces	Parking Spaces	0.22	54.7%	45.3%	0.19	23.2%	76.8%

The rates shown in Table 4B are the rates that will be used to project future development traffic created by any parking areas to be utilized as commuter/visitor spaces in the Southwest Area Plan throughout this study.

VI. Trip Generation

Several different concepts were developed for the Telluride Southwest Area Plan. To be conservative, the concept plan with the highest density was chosen to estimate future traffic.

A. Shandoka and Virginia Placer Parcels

If the highest density plan were advanced, residential units, commercial units, overall parking spaces, and overall residents in these areas would increase significantly. A fair amount of the additional parking would be provided for the additional residents. With the highest density plan one possible option that has been discussed is relocating the visitor/commuter parking that is currently located in Carhenge to Shandoka. For the purposes of the analyses in this traffic study, this parking space relocation has been assumed. To project the total traffic that these changes would generate, we will consider the following:

1. The existing 348 spaces will continue to serve residential units. These generation rates are accounted for in the background traffic count data.
2. 288 of the proposed spaces would serve to replace the 288 spaces for visitors and commuters lost at the Carhenge Lot (rounded up to 300).
3. The remaining 467 additional parking spaces would serve as parking for additional residential and commercial units.

Therefore, based on these assumptions, the additional traffic that would be added to the background traffic during the peak hours by the Shandoka and Virginia Placer parcels is shown in Table 5:

Table 5 -Shandoka and VP Additional Trip Generation

		AM			PM		
Land Use	Independent Variable	Peak Hour	In	Out	Peak Hour	In	Out
Additional Shandoka Mixed-Use Parking Spaces (from rates in Table 3B)	400	155	66	90	194	83	111
Commuter/Visitor Parking Spaces Relocated from Carhenge (from rates in Table 4B)	300	67	36	30	58	14	45
Additional Virginia Placer Mixed-Use Parking Spaces (from rates in Table 3B)	67	26	11	39	33	14	19
Existing Shandoka Traffic	348	135	57	78	169	72	97
Total Proposed Shandoka & VP Traffic	1115	383	170	237	454	182	272
Increase in Traffic at Shandoka/VP	767	248	113	159	285	110	175
% Increase		284%	298%	303%	269%	253%	280%

B. Carhenge Parcels

As discussed above, in the most conservative scenario used for this traffic analysis, the visitor/commuter parking that is currently located in Carhenge could potentially be relocated to Shandoka. In this scenario, the parking would be replaced with 250 mixed-use units with 250 parking spaces. To project the total traffic that these changes could generate, we will consider the following:

1. The existing 288 spaces for visitors and commuters would be relocated to Shandoka.
2. The proposed 250 spaces would serve the new 250 mixed-use units at Carhenge.
3. The difference in the traffic generated by the 250 residential spaces vs the existing 288 commuter/visitor spaces will represent the overall traffic increase into and out of the Carhenge Lot as a result of the proposed changes.

Therefore, based on these assumptions, the additional traffic to be added to the background traffic at the Carhenge lot is shown in Table 6:

Table 6 -Carhenge Additional Trip Generation Summary

Land Use	Independent Variable	AM			PM		
		Hour	In	Out	Hour	In	Out
Proposed Carhenge Mixed-Use Parking Spaces (from rates in Table 3B)	250	97	41	56	121	52	70
Less Existing Traffic							
Existing Carhenge Commuter/Visitor Parking Spaces (from counts)	288	64	35	29	56	13	43
Increase in Traffic at Carhenge		33	6	27	65	39	27
% Increase		152%	117%	193%	217%	398%	162%

C. Lot B Parcels

The parking space count in Lot B of approximately 90 spaces would remain essentially unchanged, with the residential unit count increasing from 16 to 35 +/-. This will only result in a nominal increase in traffic over what was estimated for the existing condition (See Section IV for details on Lot B background traffic estimates). Therefore, no future adjustments have been made to the Lot B traffic volumes.

VII. Project Trip Distribution and Assignment

The Town has requested several different traffic circulation scenarios be analyzed within this study. These are outlined below. Existing split information from the traffic counts along with assumptions based on travel time calculations were used to predict likely splits for the additional density traffic for each of the various scenarios. Based on preliminary intersection analysis results, the northbound movement at the Davis Street/W Colorado Ave intersection is the only intersection of the five that were analyzed with this study that currently has excessive delays. Any additional traffic on this leg increases these delays. Therefore, the re-distribution of traffic for each scenario focuses on how much traffic will utilize the NB leg of this intersection.

A. Existing Configuration (Pacific Ave One-way Eastbound)

With the one-way eastbound configuration of Pacific Ave, the Carhenge traffic will have no other alternative but to exit to the east with much of this traffic ending up at the Davis/W Colorado intersection. However, Shandoka and Lot B traffic has the option to head north on Mahoney Drive to avoid the Davis/W Colorado intersection. Through an iterative process of approximate travel time scenarios from the Mahoney/Pacific intersection to the Davis/W Colorado intersection, a reasonable estimated split for Shandoka and Lot B parcel traffic would be approximately 70% to the north and 30% to the east during the AM peak and 100% to the north and 0% to the east in the PM peak. Note it is unlikely 100% will actually go north, however this scenario demonstrates the highest level of

service that can be achieved on the NB leg of Davis/W Colorado with Pacific one-way EB and shows the most conservative impacts to the WC-M RAB. The resulting trip assignments for a combination of August 2019 Background traffic and the additional density traffic are shown in Attachment B.

B. Pacific Ave One-way Westbound

With the one-way westbound configuration of Pacific Ave, the Carhenge, Shandoka, and Lot B traffic will have no other alternative but to exit north on Mahoney to the WC-M RAB. This will remove some traffic from the Davis/W Colorado intersection. Additionally, other background traffic (not associated with Shandoka, Lot B, or Carhenge) will now have the option to head west on Pacific Ave and north on Mahoney in lieu of making a left from NB Davis to WB W Colorado at the Davis/W Colorado intersection. However, some of this benefit will be offset by the increased traffic heading eastbound on W Colorado Ave thru the W Colorado/Davis intersection (since much of the Southwest area has no choice but to go west on Pacific Ave even if they are trying to go east towards town), which will make it more difficult to make a NB to WB left turn at Davis/W Colorado.

Through an iterative process of approximate travel time scenarios from the intersection of Davis/the alley (between Pacific and W Colorado) to the Grocery Store, a reasonable estimated split for the existing left turning traffic wanting to head west would be approximately 50% to the north to the Davis/W Colorado intersection and 50% to the west via Pacific and Mahoney during the AM peak and 30% to the north and 70% to the west in the PM peak (70% seemed like a reasonable maximum as tourist traffic would not know to avoid this left turn movement). The resulting trip assignments for a combination of August 2019 Background and additional density traffic are shown in Attachment C.

C. Pacific Ave Two-way

With the two-way westbound configuration of Pacific Ave, the Carhenge, Shandoka, and Lot B traffic will have the option to exit to the north or the east. Since much of this traffic will be locals that will know to avoid the NB to WB left turn movement at Davis/W Colorado, all traffic that is eventually heading WB on W Colorado to SH 145 was routed north to the WC-M RAB, similar to the Pacific Ave One-way WB option. However, 50% of the estimated right turning traffic will head east on Pacific to go into town. This alleviates some of the additional through traffic on W Colorado EB that had no other alternative in the Pacific One-way WB option but to use W Colorado EB, resulting in an improved level of service at the Davis/W Colorado intersection.

Additionally, other background traffic (not associated with Shandoka, Lot B, or Carhenge) has the option to head west on Pacific Ave and north on Mahoney in lieu of making a left from NB Davis to WB W Colorado at the Davis/W Colorado intersection. Through an iterative process of approximate travel time scenarios from the intersection of Davis/the alley (between Pacific and W Colorado) to the Grocery Store, a reasonable estimated split for the existing left turning traffic wanting to head west would be approximately 50% to the north to Davis/W Colorado intersection and 50% to the

west via Pacific and Mahoney during the AM peak and 30% to the north and 70% to the west in the PM peak (70% seemed like a reasonable max as tourist traffic would not know to avoid this left turn movement). These splits are identical to the Pacific one-way WB option.

One final benefit would be that vehicles traveling from downtown to the Southwest Area could use Pacific Ave in lieu of W Colorado Ave. Potentially reducing vehicle congestion on the 600 and 700 blocks of W Colorado Ave.

The resulting trip assignments for a combination of August 2019 Background and the additional density traffic are shown in Attachment D.

VIII. Intersection Analysis – Summer Season

Per the request of Town Staff, the following scenarios were analyzed:

1. August 2019 Background Traffic with the existing road configuration (Pacific Ave one-way eastbound). These traffic volumes are shown in Attachment A.
2. August 2019 Background plus additional density traffic with the existing road configuration (Pacific Ave one-way eastbound). These traffic volumes are shown in Attachment B.
3. August 2019 Background plus additional density traffic with Pacific Ave one-way westbound. These traffic volumes are shown in Attachment C.
4. August 2019 Background plus additional density traffic with Pacific Ave two-way. These traffic volumes are shown in Attachment D.

Synchro traffic software (Version 10) was used to analyze each intersection for each of the requested scenarios. The minimum acceptable levels of service were taken from the 2018 CDOT Roadway Design Guide, and are shown below in Figure 7:

Figure 7: CDOT Level of Service Requirements

Functional Class	Appropriate Level of Service for Specified Combinations of Area and Terrain Type			
	Rural Level	Rural Rolling	Rural Mountainous	Urban and Suburban
Freeway	B	B	C	C or D
Arterial	B	B	C	C or D
Collector	C	C	D	D
Local	D	D	D	D
Note: While this table provides guidance, engineers should strive to provide the most practical level of service for the conditions/facility.				

Table 2-2 Guidelines for Selection of Design Levels of Service Characteristics by Highway Type

If the level of service drops below a D for any movement, that movement has been highlighted. The analysis results for these scenarios are shown below in Table 7A through 10B:

For the Existing Configuration (Pacific One-way EB) with Summer Background Traffic only:

Table 7A: AM Peak Hour LOS - Background August 2019 Traffic - Exist Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	8.1			4.8			5.4			4			6.8
	A			A			A			A			A
Mahoney/Pacific /Lot B	7.6			7.6			7.2			7.7			7.5
	A			A			A			A			A
Pacific/Tomboy/ Carhenge	7.4			7.1			6.7			7.4			7.3
	A			A			A			A			A
Pacific/Davis	7.8			6.9			7.2			7.5			7.6
	A			A			A			A			A
Davis/Colorado Ave	0.1			0.5			20.6			16.3			1.9
	A			A			C			C			A

Table 7B: PM Peak Hour LOS - Background August 2019 Traffic - Exist Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	6			7.8			4.3			6.0			7
	A			A			A			A			A
Mahoney/Pacific /Lot B	7.7			7.8			7.3			8			7.7
	A			A			A			A			A
Pacific/Tomboy/ Carhenge	7.3			7.2			6.9			7.3			7.2
	A			A			A			A			A
Pacific/Davis	7.7			7.4			7.4			7.6			7.6
	A			A			A			A			A
Davis/Colorado Ave	0.1			0.2			39.8			21			5.7
	A			A			E			C			A

Existing Configuration (Pacific One-way EB) with Summer Background plus Additional Density Traffic:

Table 8A: AM Peak Hour LOS - Background August 2019 & Additional Density Traffic Ex Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	10.4			6			7.4			4.7			8.5
	B			A			A			A			A
Mahoney/Pacific /Lot B	8.2			8.3			8.7			9			8.8
	A			A			A			A			A
Pacific/Tomboy/ Carhenge	7.8			7.2			6.9			7.6			7.6
	A			A			A			A			A
Pacific/Davis	8.3			6.9			7.3			7.7			8
	A			A			A			A			A
Davis/Colorado Ave	0.1			0.4			38.9			22.2			4.3
	A			A			E			C			A

Table 8B: PM Peak Hour LOS - Background August 2019 & Additional Density Traffic Ex Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	7.8			13.1			7.5			8.2			10.2
	A			B			A			A			B
Mahoney/Pacific /Lot B	8.8			8.7			10			10.1			9.9
	A			A			B			B			A
Pacific/Tomboy/ Carhenge	7			7.2			6.9			7.3			7
	A			A			A			A			A
Pacific/Davis	7.5			7.4			7.4			7.6			7.5
	A			A			A			A			A
Davis/Colorado Ave	0.1			0.2			148.5			30.1			17.2
	A			A			F			D			C

Revised Configuration (Pacific One-way WB) with Summer Background plus Additional Density Traffic:

Table 9A: AM Peak Hour LOS - Background August 2019 & Additional Density Traffic - Pacific 1-way WB

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	9.8			5.4			10.9			6.1			9
	A			A			B			A			A
Mahoney/Pacific /Lot B	8.6			8.5			9.8			8.8			9.2
	A			A			A			A			A
Pacific/Tomboy/ Carhenge	NA			7.8			7.7			6.9			7.7
	NA			A			A			A			A
Pacific/Davis	NA			7.2			7			7.2			7.2
	NA			A			A			A			A
Davis/Colorado Ave	0.1			1.6			37.8			28.7			2.6
	A			A			E			D			A

Table 9B: PM Peak Hour LOS - Background August 2019 & Additional Density Traffic - Pacific 1-way WB

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	7.2			14.1			12.2			8.3			11.4
	A			B			B			A			B
Mahoney/Pacific /Lot B	9.2			10.1			11.2			9.7			10.4
	A			B			B			A			B
Pacific/Tomboy/ Carhenge	NA			8.4			8			7.1			8.3
	NA			A			A			A			A
Pacific/Davis	NA			7.8			7.4			7.9			7.8
	NA			A			A			A			A
Davis/Colorado Ave	0.1			1.2			60			43.5			3.8
	A			A			F			E			A

Revised Configuration (Pacific Two-way) with Background plus Additional Density Traffic:

Table 10A: AM Peak Hour LOS - Background August 2019 & Additional Density Traffic - Pacific 2-way

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	9.3			6.2			10.1			4.8			8.6
	A			A			B			A			A
Mahoney/Pacific /Lot B	8.6			8.6			9.5			8.9			9.1
	A			A			A			A			A
Pacific/Tomboy/ Carhenge	7.8			7.8			7.6			7.5			7.8
	A			A			A			A			A
Pacific/Davis	8.3			7.2			7.4			7.6			7.9
	A			A			A			A			A
Davis/Colorado Ave	0.1			1.5			27.7			24.9			2.5
	A			A			D			C			A

Table 10B: PM Peak Hour LOS - Background August 2019 & Additional Density Traffic - Pacific 2-way

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	6.8			13.2			9.1			8.0			10.1
	A			B			A			A			B
Mahoney/Pacific /Lot B	9.2			10.3			10.9			10			10.4
	A			B			B			A			B
Pacific/Tomboy/ Carhenge	7.8			8.5			7.9			7.6			8.2
	A			A			A			A			A
Pacific/Davis	8.5			7.9			7.7			8.4			8.3
	A			A			A			A			A
Davis/Colorado Ave	0.1			1.2			42.4			39.4			4
	A			A			E			E			A

Summary of Summer Analysis:

As shown in the tables above, all intersections function at acceptable levels of service for all scenarios and for all movements with the exception of the Davis/W Colorado intersection. These failures are due to the high volumes of thru traffic on W Colorado Avenue making the left turns off of the side streets difficult to execute. Of the scenarios presented, the Pacific Avenue two-way option shows the best performance for this intersection without any additional road improvements. This scenario provides vehicles an alternative to the challenging NB Davis to WB W Colorado left turn movement, but still allows traffic from the SW Area to utilize Pacific to go into town (thereby reducing the amount of increase in traffic on W Colorado EB that inevitably conflicts with the NB Davis to WB W Colorado left turning traffic).

In addition to level of service results, the pros and cons of each option are as follows:

Existing Configuration (Pacific One-way EB):

Pros:

1. Resident survey indicated strong preference for one-way to be maintained on Pacific.
2. Existing traffic pattern maintained (no re-routing of traffic onto other streets, such as Mahoney).

Cons:

1. Limits connectivity options for SW area residents (one-way streets reduce options).
2. Results in worst level of service with or without additional improvements at Davis/W Colorado.

Pacific One-way WB:

Pros:

1. Resident survey indicated strong preference for one-way to be maintained on Pacific.
2. Provides motorist an alternative route to avoid the left at Davis/W Colorado.

Cons:

1. Limits connectivity options for SW area residents (one-way streets reduce options).
2. Increases traffic on Mahoney Drive.
3. Galloping Goose routes and stops would have to be reconfigured (they are currently on the opposite side of the road).
4. While the computer model shows acceptable levels of service at the WC-M RAB, there are congestion issues near this location when school is in session (see winter counts section later in this report).

Pacific Two-way:

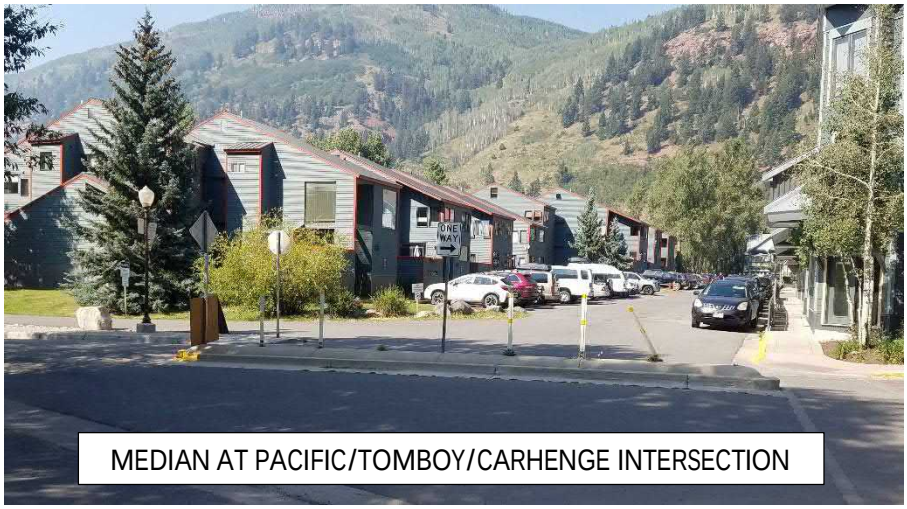
Pros:

1. Provides the best connectivity, and the most options to motorists with an alternate route to avoid the left at Davis/W Colorado.

2. Provides best level of service with or without additional improvements at Davis/W Colorado.

Cons:

1. Resident survey indicated strong preference for one-way to be maintained on Pacific.
2. Requires most significant widening of Pacific (more hardscape, increased impacts to park, etc).



MEDIAN AT PACIFIC/TOMBOY/CARHENGE INTERSECTION

One additional note on the Pacific/Tomboy/Carhenge intersection. The usefulness/necessity of the existing median within this intersection has come into question. The median deters most, but not all users from exiting north on Tomboy (approximately 88% comply during the February 2020 counts and 82% complied during the August 2019 counts). With the relatively low traffic volumes on Pacific Ave, the median does not appear to create an immediate safety hazard. However, there may be other treatments that are more effective/desirable. It is difficult to predict how many people would continue north on Tomboy if this median were removed and this would likely raise concerns among some residents along S Tomboy St. However, if the Davis/W Colorado intersection were improved to better accommodate left turning vehicles, motorists would be more likely to continue to use Davis/W Colorado.

IX. Blues and Brews Traffic Observations

VEHICLES PARKED ON BOTH SIDES OF MAHONEY DR DURING BLUES & BREWS

The scope of the traffic study included traffic observations during the Telluride Blues and Brews Music Festival. The 2019 festival took place from Friday September 13th through Sunday September 15th. It was a sold-out festival with a maximum daily attendance of around 9,000 patrons. Based on discussions with the Town Parks and Recreation staff, Friday afternoon was chosen as an appropriate time to do the observations.

Our traffic engineer arrived on site around 11:00am. The parking spaces (both on and off-street) within the Southwest Area were already full and the festival staff had begun parking patrons alongside W Colorado Ave, starting just west of the WC-M RAB and working their way west. Since the festival staff monitored the parking situation in the Southwest Area, they were aware that there was no remaining parking available and were actively informing arriving festival patrons. This helped to prevent many patrons from entering the Southwest Area looking for a parking space.

Our engineer parked near the festival check in location and proceeded on foot to each of the five primary study intersections (excluding the school entrance). He observed traffic at each location for approximately 15-25 minutes during two separate time periods: 1) between noon and 2pm and 2) between 3pm and 5pm.

Traffic on W Colorado Avenue was steady, but there were no real issues to report at these intersections. The left turn from NB Davis Ave to WB W Colorado Ave was the movement with the most noticeable delay, as anticipated from viewing the August counts. The intersections along Pacific Ave were relatively quiet. There was moderate pedestrian and bicycle activity on and adjacent to Pacific, but vehicular traffic was generally light. There were no apparent issues to report on any of the Pacific Ave intersections, other than multiple bicycles traveling the wrong direction on Pacific Ave. However, with the relatively light vehicular traffic and slow vehicular speeds, these bicyclists didn't cause any major issues that afternoon.

Based on these observations, patrons likely either arrived earlier in the morning, the evening before, or they trickled in over this duration without causing any major traffic congestion.

Parking concerns were mentioned during the traffic focused public meeting. While parking is a separate issue from traffic and not included in the scope of this study, our engineer did walk around the Southwest Area and make some general observations. With the exception of a handful of spaces opening up and getting filled here and there, the Carhenge lot was completely full the entire afternoon. The Carhenge Lot doesn't have line striping, but was parked fairly efficiently. The Shandoka Lot had approximately 37 empty parking spaces at 12:40am. By 5:20pm, this number was down to 10 empty spaces. The signage at the entrance to the Shandoka Lot was somewhat confusing , one temporary sign said "No Event Parking" while the permanent sign had a supplemental sign that said "No Event Parking After 7pm." Additionally, it

EVENT SIGNAGE AT SHANDOKA LOT

appeared that all on-street parking was essentially full along Mahoney, Pacific, and Davis. Mahoney was parked on both the east and west sides to help accommodate event traffic. In summary, unless a resident of the Southwest Area had a reserved spot, it would have been difficult to find an empty parking space that afternoon.

X. Existing Traffic Volumes – Winter School Day

As school was out of session during the summer counts, counts were conducted during a typical winter school day using video cameras. The cameras were set up for 24 hours from approximately 11am Tuesday February 11th, 2020 to 11am Wednesday February 12th, 2020 at the WC-M RAB and the W Colorado Ave/THMS main entrance. The videos were then observed in the office, and pedestrian, bicycle, and vehicle volumes were tabulated in 15-minute increments between 7:15 – 8:45am (school begins at 8:15am) and from 12:45-2:30pm (Tuesday the schools have early dismissal time of 1:56pm). The peak hours of traffic were found to be 7:30 – 8:30am and 1:15 – 2:15pm.

In comparing the August 2019 counts to the February 2020 counts at the WC-M RAB, there was approximately 20% more traffic during the winter AM peak hour and peak 15-minutes. Additionally, the AM peak hour shifted from 8:00-9:00am in summer to 7:30-8:30am in the winter when school was in session. However, the peak 15 minutes remained between 8:00-8:15am.

The corresponding background traffic volumes for a typical February 2020 school day are shown in Attachment E.

XI. Intersection Analysis – Typical Winter School Day

Synchro traffic software (Version 10) was used to analyze each intersection for each of the requested scenarios. The minimum acceptable levels of service were taken from the 2018 CDOT Roadway Design Guide, and are shown previously in Figure 7. If the level of service drops below a D for any movement, that movement has been highlighted.

Table 11A: AM Peak Hour LOS - Background Winter 2020 Traffic - Exist Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	13.8			5.2			7.2			7.4			10
	B			A			A			A			B
W Colorado Ave/THMS Main Entrance	9.6	0	NA	0			NA			NA			1.5
	A	A	NA	A			NA			NA			A

Table 11B: PM Peak Hour LOS - Background Winter 2020 Traffic Exist Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
W Colorado Ave/Mahoney	5.5			5.3			4.3			5.1			5.3
	A			A			A			A			A
W Colorado Ave/THMS Main Entrance	8.7	0	NA	0			NA			17.6			0.2
	A	A	NA	A			NA			C			A

As shown in Tables 11A and 11B, both the WC-M RAB and the Telluride High School/Middle School (THMS) main entrance intersections function at acceptable levels of service according to the Synchro analysis. During the PM peak, the video footage generally agrees with the findings of the computer model. However, for the hundreds of commuters heading into town on the W Colorado Ave at 8:00am and creeping along in start and stop traffic as they approach the WC-M RAB, the computer model results may come as a bit of a surprise. In watching the video footage there is obvious traffic congestion during the AM peak hour. However, the WC-M RAB itself does not appear to be causing the bulk of the delays. There appear to be several other contributing factors (several of which are difficult to replicate in a computer model) such as:

1) All traffic must come to and exit Telluride on W Colorado Ave, this creates a bottle neck.
2) W Colorado Ave has a posted speed of 35mph, reducing to 25mph before the WC-M RAB (actual travel speeds are likely faster), and then reducing again to 15mph after the WC-M RAB. This speed differential results in the faster vehicles on W Colorado Ave becoming more consolidated as they approach the WC-M RAB. This creates smaller gaps between traffic heading EB through the WC-M RAB and makes it more difficult for vehicles attempting to enter the WC-M RAB from other directions. This consolidation of traffic also amplifies any delays encountered, such as a vehicle stopping to allow a student to cross the road.
3) The school start time coincides with the peak 15 minutes of commuter traffic. This has the obvious advantage of allowing parents to drop their children off on their way to work without having to make a special trip, but has a negative impact on overall traffic flow.
4) The circulation patterns of the school require parents coming from the east to drive through the WC-M RAB, drop off their children, then drive through the WC-M RAB a second time if they want to continue to town.
5) Several times during the peak 30 minutes of traffic (7:45-8:15am), traffic east of the THMS main entrance came to a standstill and backed up beyond the THMS main entrance and at times all the way through the WC-M RAB. These backups ranged from a few seconds to one as long as 45 seconds. The camera set up at the school entrance was angled towards the WC-M RAB. Therefore, we could not positively identify what was causing these backups. We intended to observe school traffic one morning in March, but with the Coronavirus Pandemic, this was not feasible. Some possible causes include vehicles looking for parking spaces downtown and EB vehicles on W Colorado Ave attempting to make left turns across traffic onto side streets.

However, in speaking with David Ballode of Uncompahgre Engineering, heavy student crossing in front of the grocery store is likely one of the main contributors. David indicated that there are many students in the grocery store at 8:00am on a school day.

6) The two-way left turn lane between the roundabout and the THMS main entrance only provides about 100' of stacking. Several times during the peak 30 minutes (7:45-8:15am) the capacity of this turn lane was exceeded and left turning traffic temporarily blocked through traffic which subsequently brought the WC-M RAB circulation to a standstill.
7) The pedestrian crossing between the WC-M RAB and the THMS main entrance is used heavily (approximately 40 crossings) during the peak 30 minutes (7:45-8:15am). While the pedestrian crossings were input into the traffic software, human behavior is sometimes difficult to replicate in a computer model and the resulting simulation does not appear to accurately reflect the interruptions caused by these crossings.
8) While the camera angle did not allow direct viewing of the THMS internal traffic circulation, there were no instances during the AM peak hour where traffic in the THMS parking lot backed up to W Colorado Ave. Therefore, the internal circulation in the school driveways/parking areas does not appear to be directly causing delays on W Colorado Ave.

Possible solutions to each of these items are presented below in the same numeric order:

1) The topography around Telluride precludes any feasible solution to this constraint.
2) With the amount of pedestrian and bicycle activity on W Colorado Ave, a low speed limit is justified and should be maintained.
3) As mentioned above, the peak 15 minutes of school traffic coincides with the peak 15 minutes of background traffic from 8:00-8:15am. This would likely be a controversial proposal, but the school start time could be shifted earlier to avoid the peak hour of background traffic. For example, according to the August 2019 counts (when school was not in session) there was 40% less traffic from 7:30-7:45am versus the 8:00-8:15am peak.
4) In looking at the existing layout of the school, a route to town from the current drop-off/pick-up location could potentially be provided behind the school. However, it would likely be controversial to route 100 plus vehicles through the surrounding residential neighborhoods. Additionally, if a significant portion of this traffic needed to cross or get back on to W Colorado Ave, there is currently not a good location to the east for making a left turn back onto W Colorado Ave or for crossing W Colorado Ave.
5) If student crossings to and from the grocery store are creating significant delays, crossing guards or police officers could be stationed at this location to create more order and efficiency. Another possible solution would be a grade separated crossing, such as an underpass. However, further investigations would be necessary to determine if an underpass would be feasible and if there were community support. In discussions with the town staff, they indicated significant amounts of ground water in this area may cause challenges for an underpass.

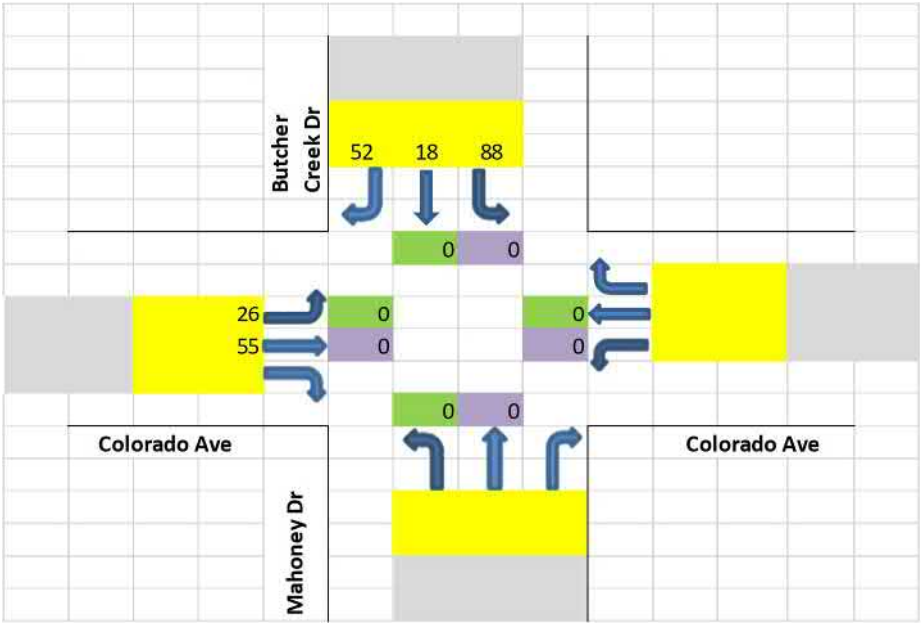
6) This would require the school entrance to be relocated farther east away from the RAB. While this may be feasible within the boundaries of the school owned property, it would require significant reconfiguration of the school site and substantial funds to construct. Another possible option would be to have a police officer at the W Colorado Ave/THMS main entrance intersection during the AM peak hour to stop WB traffic to allow EB left turns as necessary to prevent backups.
7) This pedestrian crossing location is essential for students who walk to school from the Southwest Area. Ideally, this crossing would be east of the school entrance. However, unless fencing were installed to prevent pedestrian crossings between the WC-M RAB and the school entrance, students would almost certainly continue to cross here even if the cross-walk were removed as people generally take the shortest path available.
8) We were unable to view the internal school circulation. However, it did not appear to impact traffic flow through the W Colorado/THMS main entrance intersection, at least on the day of the video recording. If this ever becomes an issue, creating longer stacking lengths and/or staff assistance with orderly drop-off operations would be worth investigating.

Other possible options not mentioned above:

1. Encourage more students to walk or ride the bus.
2. Many working families cannot afford to live in Telluride. Therefore, they live outside of town and commute, adding to the AM peak hour congestion. Increasing housing stock within town limits would allow more people to live in town and walk or bike to work and school, potentially reducing both the AM and PM peak hour volumes to and from town.

As mentioned above, when school is in session the RAB sees approximately 20% more traffic in the AM peak than when school is not in session. Therefore, for the AM peak hour, we've re-analyzed the WC-M RAB for each scenario (Pacific One-way EB, Pacific One-way WB, and Pacific Two-way) with the additional school traffic and additional density traffic added to the August 2019 counts. Figure 8 shows the approximate additional traffic generated by the school based on the summer and winter count data:

Figure 8: Approximate Additional Traffic Generated by School



The resulting WC-M RAB traffic volumes are shown in Attachment F and the Synchro traffic software results are summarized below:

Table 12: AM Peak Hour LOS - W Colorado/Mahoney RAB - BG Aug 2019 + Addtl Density Traffic + School Traffic

	EB			WB			NB			SB			Overall
Scenario	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
Ex Configuration (Pacific 1-way EB)	D			A			B			B			C
	25.1			7.8			11.1			10.6			16.1
Pacific 1-way WB	C			A			C			B			C
	21.9			8.5			21.4			21.9			17
Pacific 2-way	C			A			C			B			C
	21.7			8.6			17.1			11.5			16

As shown in Table 12, the overall performance of the intersection drops to a LOS C and several movements drop to LOS C or D. As discussed above, the computer model likely does not capture some of the traffic issues near the WC-M RAB. These issues are likely to be amplified with any addition of traffic to the AM peak hour. Therefore, the actual performance may be worse than what is shown. However, these results are useful in reinforcing the fact that eventually the performance of the WC-M RAB will begin to decline, particularly in the AM peak hour. Therefore, the performance of other intersections such as W Colorado/Davis should be improved to potentially relieve pressure at the WC-M RAB and to allow for re-distribution of traffic whenever possible. This also illustrates the potential benefits of providing drivers with options, which would be achieved with improvements such as converting Pacific Ave to two-way traffic.

Additionally, note that this analysis does not include any potential reductions in incoming traffic on W Colorado Ave if more workforce housing were provided within the town limits. It is difficult to predict how many people who are currently living outside of town and commuting would move to town, but it is reasonable to assume that some would. If new housing were provided in town, it could also reduce sprawl outside of town limits and slow the increase of commuter traffic volumes on W Colorado Ave.

XII. Existing Traffic Volumes – President's Day Weekend

The President's Day weekend is one of the biggest ski weekends across the country. Therefore, counts were conducted to verify what type of impact this skier traffic has on the overall traffic flow in the Southwest Area. Video cameras were set up for 24 hours at each intersection between Friday February 14th, 2020 and Sunday February 16th, 2020. The intersections recorded included Pacific Ave/Mahoney Dr, Pacific Ave/S Tomboy St, Pacific Ave/Davis St, and W Colorado Ave/Davis St. The videos were then observed in the office, and pedestrian, bicycle, and vehicle volumes were recorded in 15-minute increments during the typical peak volumes between 8am-9:45am and 3:30pm-5:30pm. The peak hours of traffic were found to be 8:30 – 9:30am and 3:30 – 4:30pm.

By the time the February 2020 counts were conducted, the construction in Lot B was completed and North Davis Street was re-opened. Therefore, the counts did not require the adjustments necessary for the summer counts. The corresponding background traffic volumes for a typical February 2020 school day are shown in Attachment G.

As expected, winter traffic to and from the Carhenge parking lot increased over the summer volumes as illustrated in the table below:

Table 13: Carhenge Lot Traffic - Peak Hours

	AM In	PM Out
Aug 2019 Counts	45	25
Winter 2020 Counts	88	73
% Increase	96%	192%

However, overall traffic volumes at most intersections were generally similar or lower in the winter peak hours versus the summer peak hours, except at Pacific/Tomboy/Carhenge. The results are summarized below:

Table 14: Total Traffic at Each Intersection - Peak Hours

	Mahoney/Pacific/ Lot B		Pacific/Tomboy/ Carhenge		Pacific/Davis		Davis/Colorado		Overall Traffic	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Aug 2019 Counts	203	272	159	139	205	207	752	991	1319	1609
Winter 2020 Counts	207	226	173	171	72	215	299	664	751	1276
% Increase/Decrease	2%	-17%	9%	23%	-65%	4%	-60%	-33%	-43%	-21%

XIII. Intersection Analysis – President's Day Ski Weekend

Table 15A: AM Peak Hour LOS - Background Traffic President's Day Weekend Feb 2020 - Exist Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
Mahoney/Pacific /Lot B	7.6			NA			7.1			8.2			7.9
	A			NA			A			A			A
Pacific/Tomboy/ Carhenge	7.3			0			6.9			7.6			7.3
	A			NA			A			A			A
Pacific/Davis	7.5			7			7			7.3			7.3
	A			A			A			A			A
Davis/Colorado Ave	0			0.2			12.5			11			1.4
	A			A			B			B			A

Table 15B: PM Peak Hour LOS - Background Traffic President's Day Weekend Feb 2020 - Exist Configuration

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
Mahoney/Pacific /Lot B	7.6			6.9			7.4			7.9			7.7
	A			A			A			A			A
Pacific/Tomboy/ Carhenge	7.5			7.2			6.9			7.5			7.2
	A			A			A			A			A
Pacific/Davis	8.1			7.2			0.2			7.6			7.8
	A			A			A			A			A
Davis/Colorado Ave	0			0.2			26			0			4.7
	A			A			D			A			A

As shown in Tables 15A and 15B, all analyzed intersections function at acceptable levels of service during the AM and PM peak according to the Synchro analysis. If you compare these results to those presented in Tables 7A and 7B for the August 2019 Background Traffic, you will find they are similar. With the exception of the Davis/W Colorado intersection, all movements for all intersections function at a LOS A. As the traffic volumes in the winter months are either similar or lower than the summer counts and the levels of service do not change, no additional analyses will be performed using the President's Day weekend counts.

XIV. Potential Improvements

When the traffic associated with the theoretical additional density in the Southwest Area is added to the August 2019 background volumes, the left turns off of Davis onto W Colorado still function below acceptable levels of service for all scenarios analyzed. Additionally, when school is in session, there are existing traffic issues at and around the WC-M RAB, supporting the need for other acceptable routes. Therefore, potential improvements to the W Colorado/Davis intersection have been investigated as follows:

1. Provide a dedicated NB left/thru and a dedicated NB right turn lane and stripe in a two-way left turn lane (TWLTL) on W Colorado Avenue. This lane could be provided on both approaches to the intersection or at a minimum at the west approach to the intersection.
2. Retrofit this intersection with a mini roundabout.

These potential improvements are illustrated in Attachments H & I.

The resulting levels of service at the Davis/W Colorado intersection are shown in Tables 16 and 17 for each of these scenarios:

Table 16: PM Peak Hour LOS - BG Aug 2019 & Additional Density Traffic - Davis & W Colorado TWLTL

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
Ex Config (Pacific one-way EB)	0.1			0.2			29.6			18.4			3.6
	A			A			D			C			A
Pacific one-way WB)	0.1			0.9			20.6			21			1.7
	A			A			C			C			A
Pacific two-way	0.1			1.2			19.2			21.6			2.2
	A			A			C			C			A

Table 17: PM Peak Hour LOS - BG Aug 2019 & Additional Density Traffic - Davis & W Colorado Mini RAB

	EB			WB			NB			SB			Overall
Intersection	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	Intersection
Ex Config (Pacific one-way EB)	6.2			9			6			5.7			7.6
	A			A			A			A			A
Pacific one-way WB)	7.6			8			5.3			5.3			7.7
	A			A			A			A			A
Pacific two-way	7.1			7.9			5.3			5.3			7.4
	A			A			A			A			A

As shown in the tables, improvement option #1 (TWLTL) and #2 (Mini RAB) will provide acceptable levels of service for all movements. However, note that it can be difficult to predict exactly how traffic will react to a roundabout or in this case a mini roundabout. Additionally, conflicts outside of the footprint of the roundabout can influence the actual perceived performance of the roundabout as is the case with

the WC-M RAB. Therefore, while a mini roundabout will likely provide an improvement over existing conditions, the levels of service produced by the program may be somewhat optimistic. A list of pros and cons for each option are provided below:

TWLT:

Pros:

1. Line striping changes are relatively inexpensive.
2. Brings levels of service up to acceptable standards with additional density traffic volumes.
3. Additional maintenance is limited to re-striping.
4. No right-of-way impacts.
5. No loss of parking.

Cons:

1. Does not provide as high of levels of service as Mini RAB option.
2. If W Colorado Avenue traffic continues to grow, not much additional capacity.
3. No real traffic calming benefits.

Mini RAB:

Pros:

1. Provides traffic calming.
2. Significantly higher levels of service for side streets.
3. Provides areas for landscaping/public art. Has the potential to reduce overall hardscape.
4. Minimal to no right-of-way impacts (generally appears to fit within existing curb line).
5. Shorter crossing distance for pedestrians. Pedestrians waiting at curb ramps are also more visible to motorists as they are not behind parked cars.

Cons:

1. Significantly more expensive of the two options.
2. Impacts on drainage need to be closely considered. This could have significant impact on overall cost.
3. Trucks will need to drive directly over central island. This may be confusing to truck drivers and other motorists at first.
4. Loss of parking.
5. Snow removal will be more intensive.
6. Landscaped areas may require more maintenance.

One additional note, members of the public expressed concerns about the grade of the southern leg of Davis St as it approaches W Colorado Ave, particularly in winter conditions. If improvements at this intersection are investigated further, potential grade adjustments on this leg of Davis should be evaluated.

XV. Conclusions & Recommendations

Pacific Avenue Intersections

The intersections along Pacific Ave appear to function well in both the AM and PM peak hours with the existing intersection configurations and have the capacity to handle additional traffic if density is added in the Southwest Area. Therefore, beyond consideration of some alternate treatment to the median at the Pacific/Tomboy/Carhenge intersection and potential bridge realignment/pedestrian improvements at Pacific/Mahoney (refer to the Southwest Neighborhood Conceptual Master Plan for more details), no other intersection specific improvements are proposed at these intersections at this time.

West Colorado/Mahoney Roundabout and Colorado/THMS Main Entrance Intersections

The W Colorado/Mahoney (WC-M RAB) and the W Colorado/THMS main entrance appear to have traffic congestion issues during the AM peak hour when school is in session. Neither the internal circulation within the school grounds or the WC-M RAB itself appear to be the direct cause of these delays. High pedestrian crossing rates combined with heavy EB traffic on W Colorado Ave appear to create the bulk of the delays. Egress traffic leaving school and re-entering WC-M RAB also contributes to congestion.

Some possible solutions would be to increase bus ridership and carpooling, provide crossing guards or police to increase the efficiency at student crossing locations, adjusting the start of school so that it does not coincide with the peak 15 minutes of background traffic, and providing attainable housing within town limits to reduce the overall number of commuters coming into Town during the AM peak. While determining the feasibility of a grade separated crossing is beyond the scope of this study, it is a solution that could be investigated further if there were community support. However, town staff have indicated significant amounts of ground water in this area may cause challenges for an underpass.

W Colorado/Davis Intersection

The NB Davis Street leg of the W Colorado/Davis intersection is currently functioning just at or below acceptable levels of service during the PM peak hours with background traffic alone. Additional traffic will increase delays. Converting Pacific Ave to two-way traffic could help to reduce delays by offering drivers alternate routes. However, in order to accommodate additional traffic from additional density in the Southwest Area, additional improvements should be considered. Using line striping to create a two-way left turn lane on the western leg of W Colorado Ave could be a short-term, low cost solution. This could allow time for feasibility investigations into and design of longer-term improvements, such as a mini roundabout.

President's Day Weekend Analysis & Observations

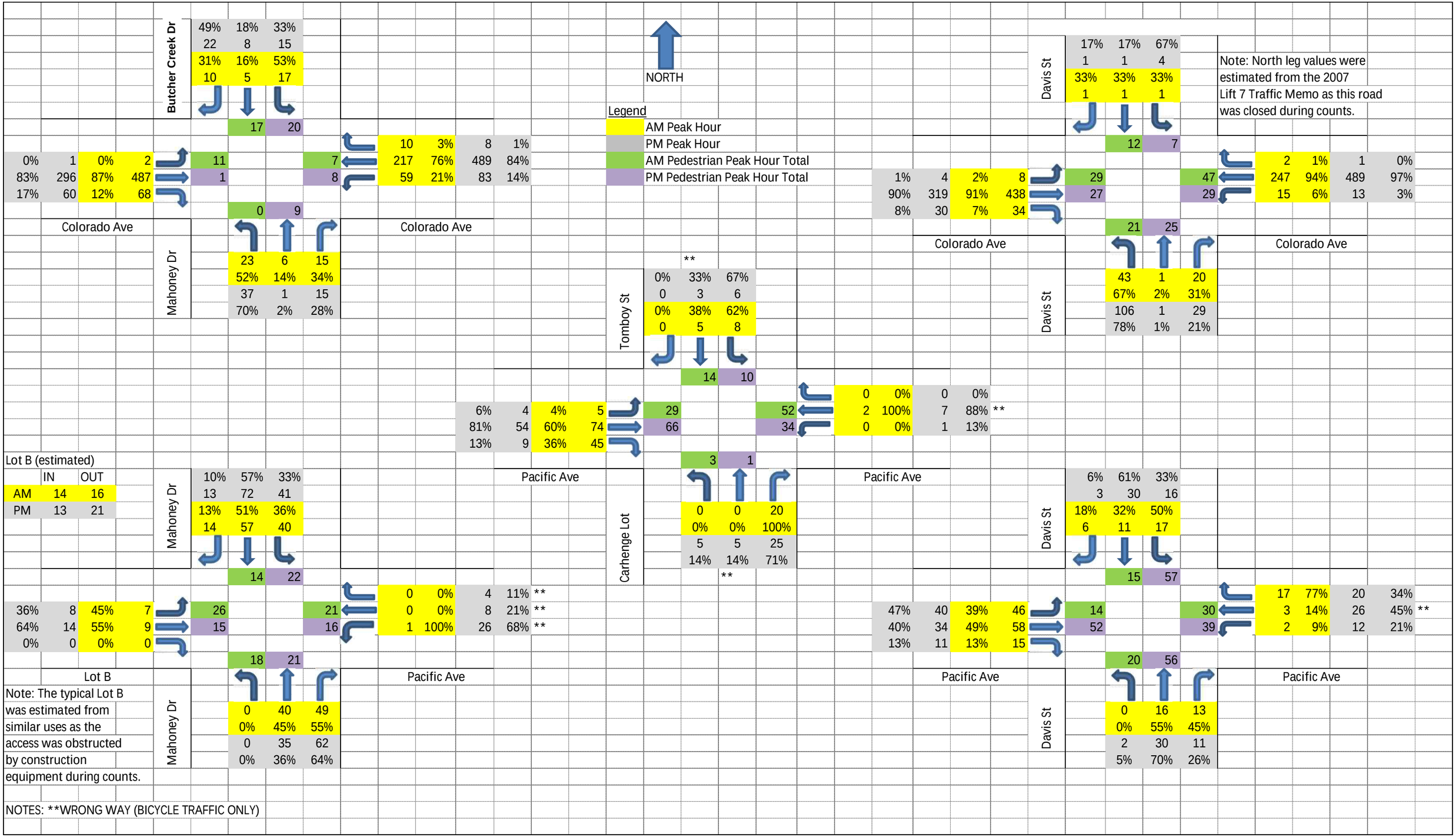
Traffic to and from the Carhenge Lot did increase substantially. However, with significantly less background traffic on W Colorado Ave and similar levels of traffic on the Pacific Ave intersections, traffic congestion did not appear to be a concern.

Blues and Brews Festival Observations

During the observations on Friday afternoon, traffic congestion did not appear to be a concern. However, finding a parking space in the Southwest Area during a large event is challenging.

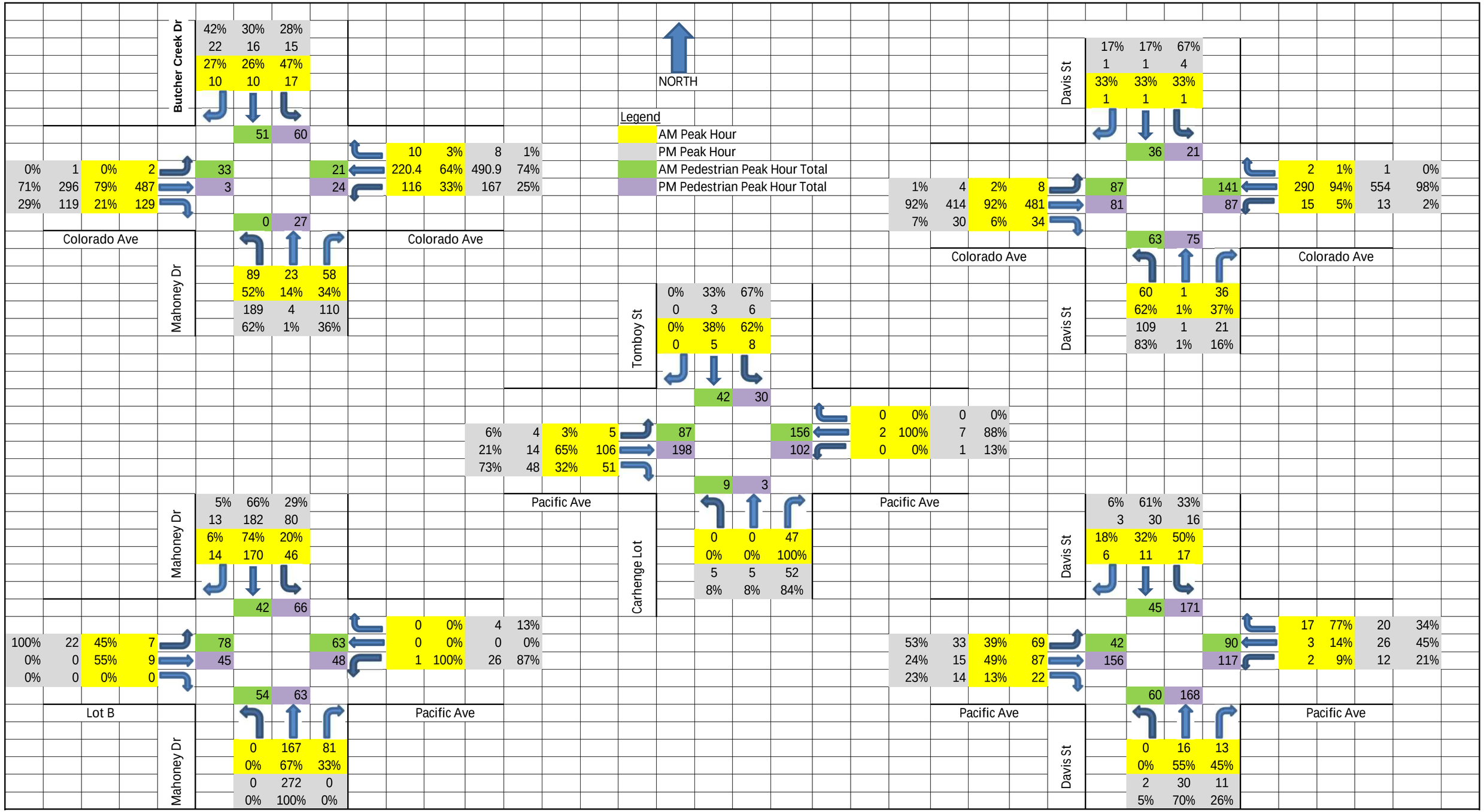
ATTACHMENT A - BACKGROUND TRAFFIC AUGUST 2019

ONE WAY PACIFIC EB

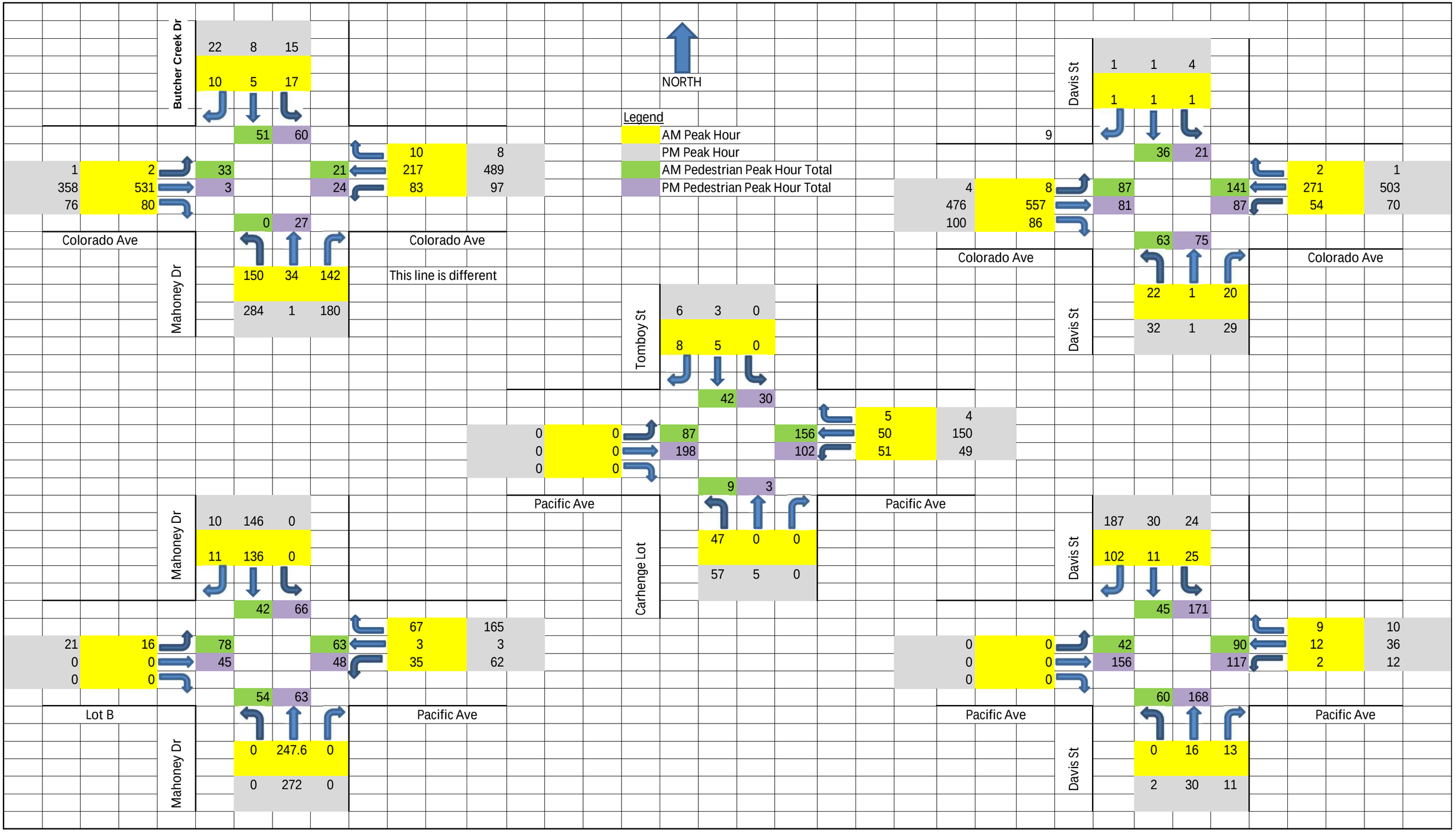


ATTACHMENT B -

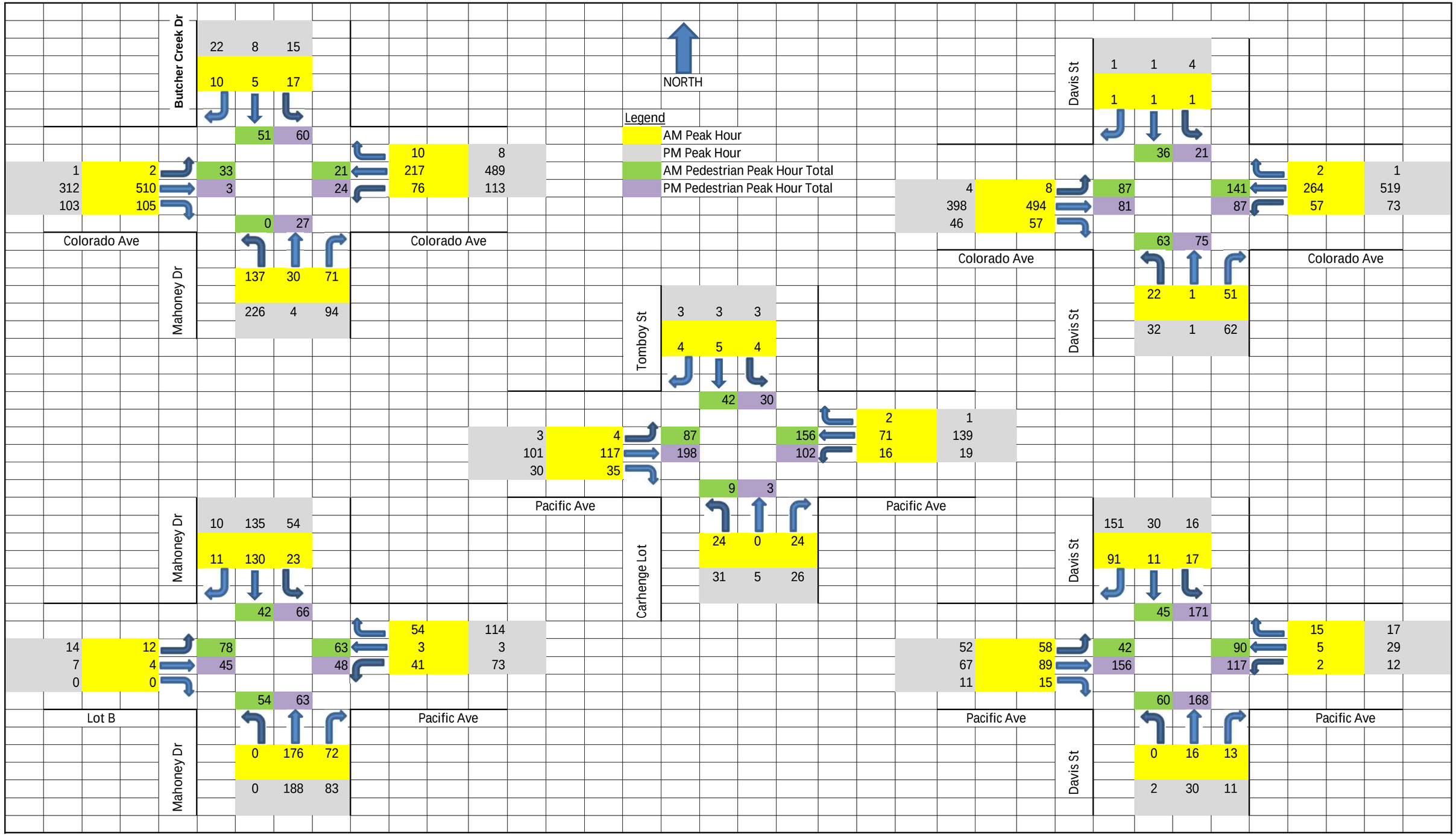
BACKGROUND PLUS ADDTL DENSITY TRAFFIC AUGUST 2019 (ONE-WAY PACIFIC EB)



ATTACHMENT C -
BACKGROUND PLUS ADDTL DENSITY TRAFFIC AUGUST 2019 (ONE-WAY PACIFIC WB)

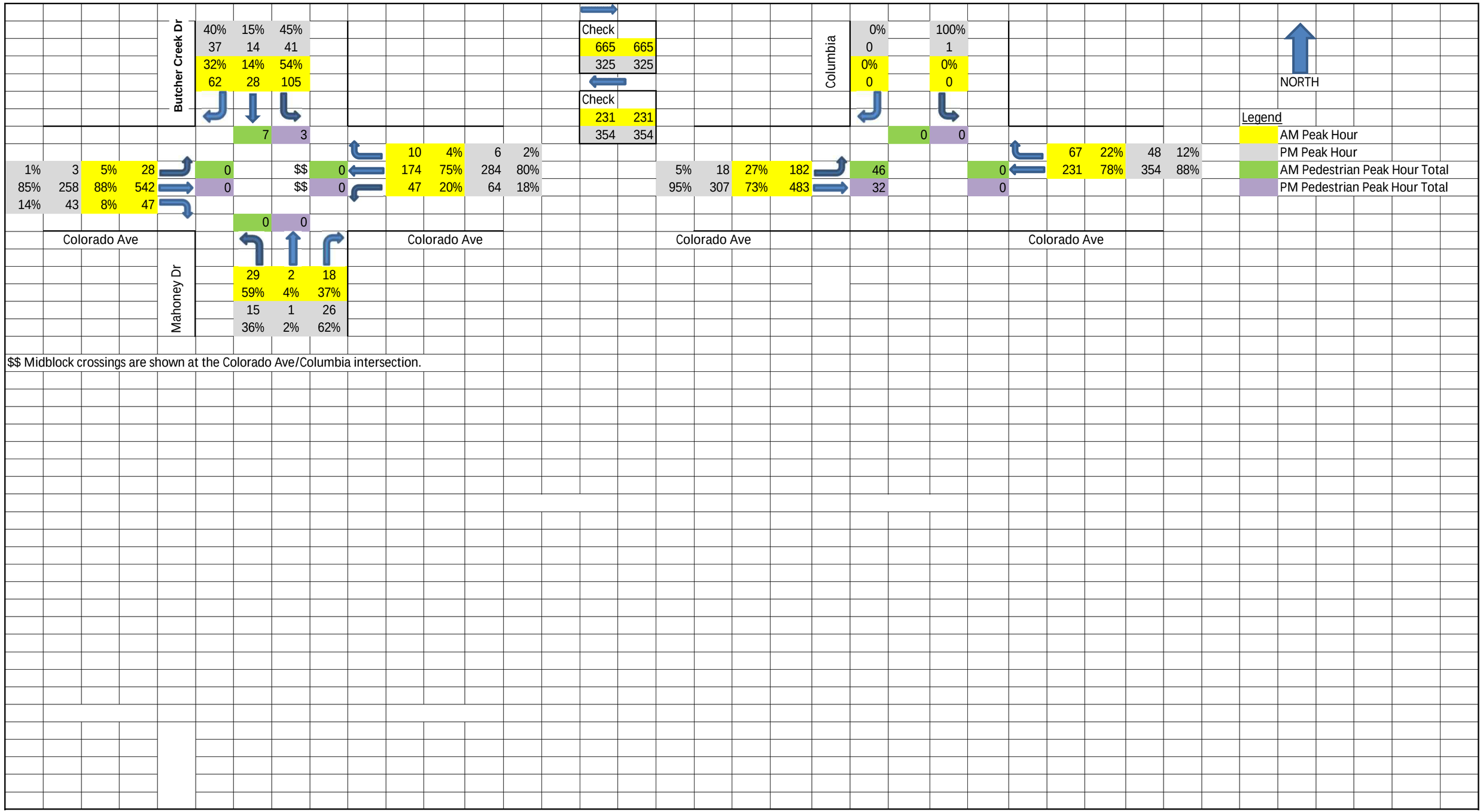


ATTACHMENT D -
BACKGROUND PLUS ADDTL DENSITY TRAFFIC AUGUST 2019 (TWO-WAY PACIFIC)



ATTACHMENT E -

FEBRUARY 2020 COUNTS - BACKGROUND TRAFFIC SCHOOL IN SESSION

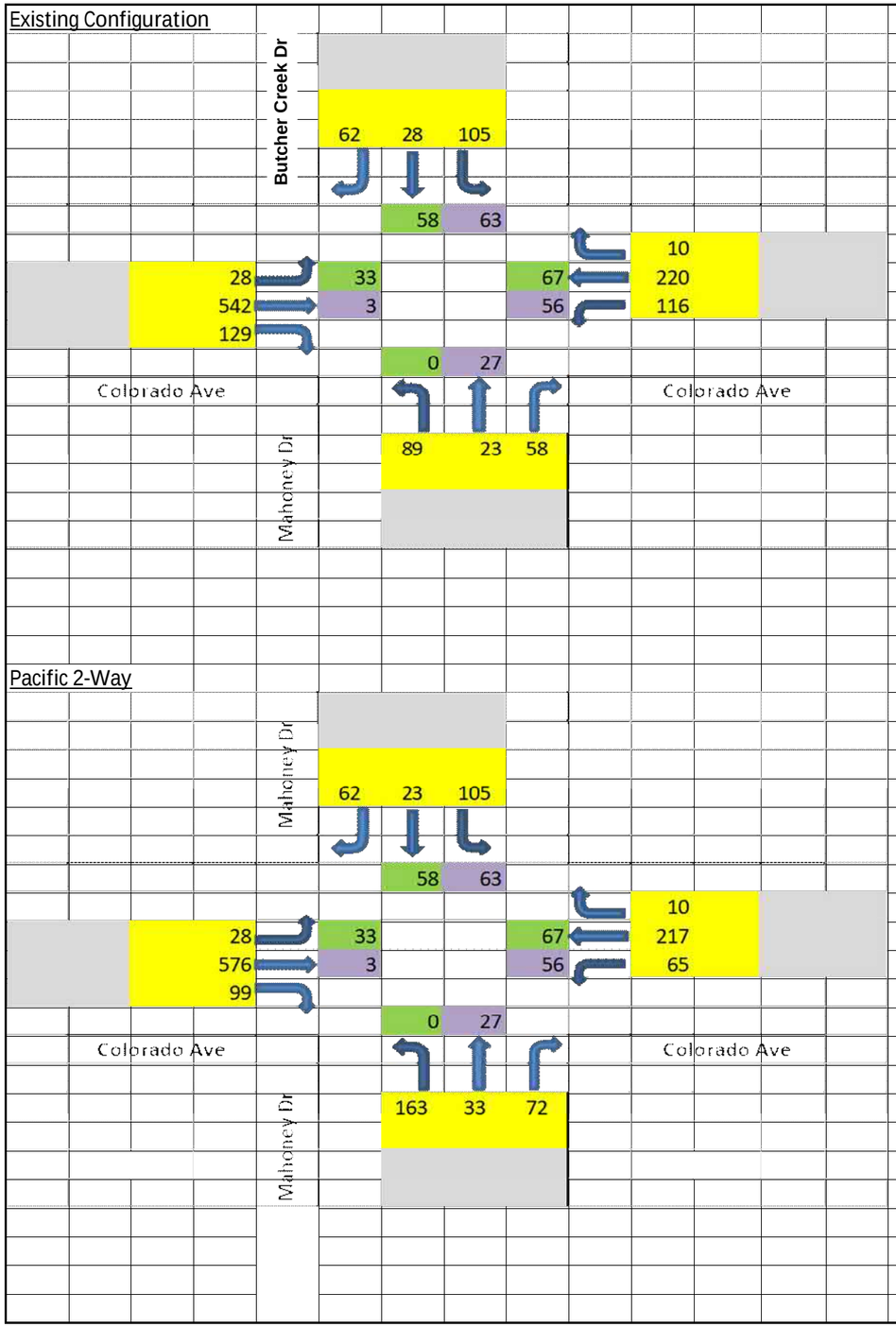


$$ Midblock crossings are shown at the Colorado Ave/Columbia intersection.

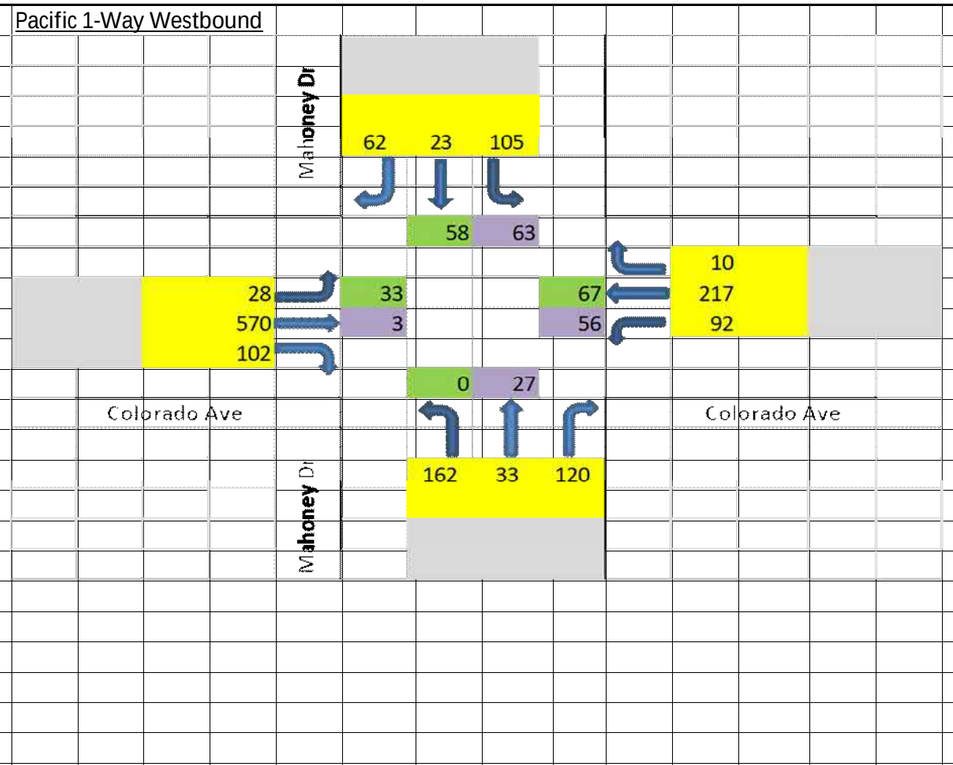
ATTACHMENT F -

BACKGROUND PLUS ADDTL DENSITY PLUS SCHOOL TRAFFIC AUGUST 2019

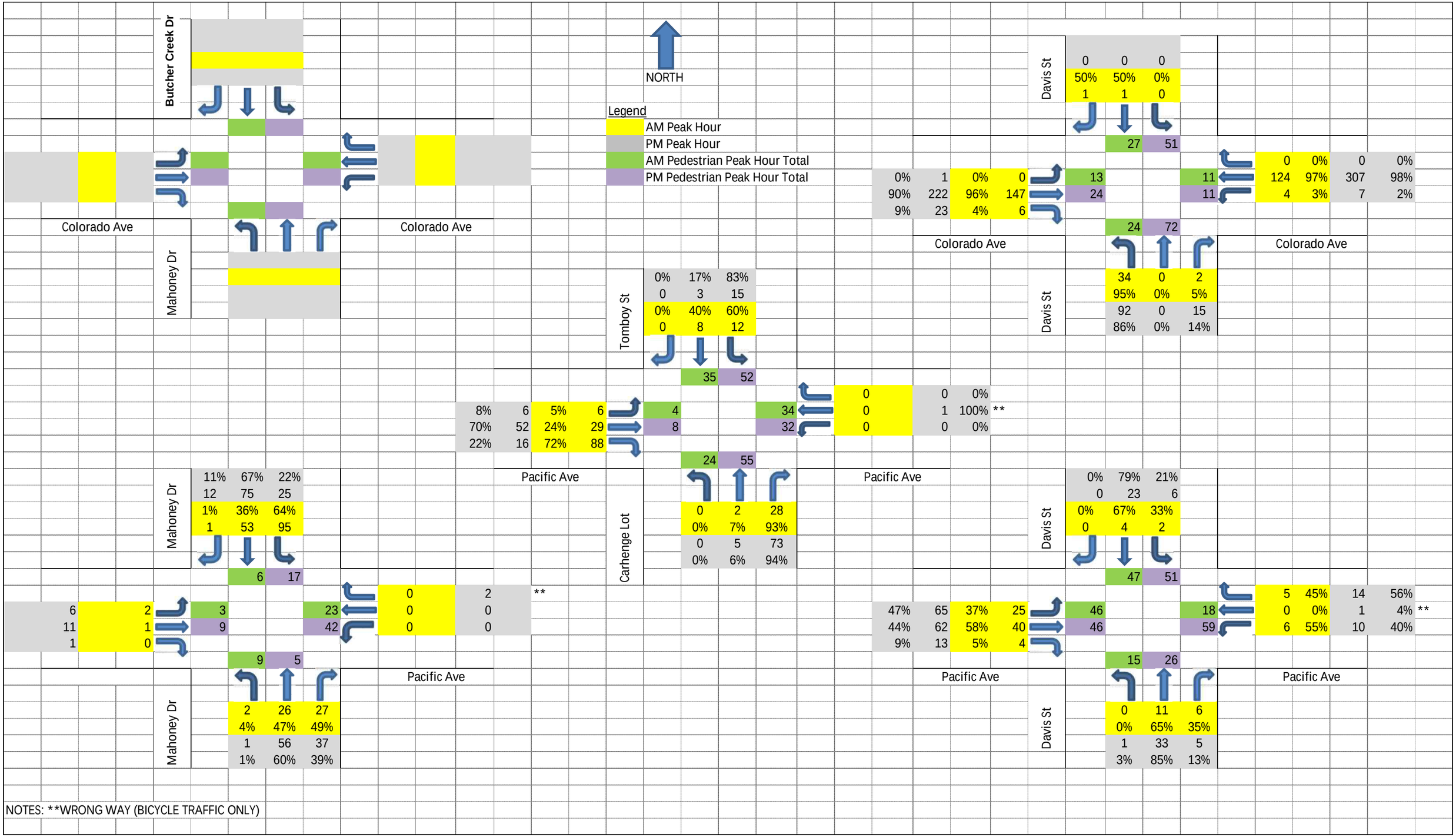
Existing Configuration



Pacific 1-Way Westbound



ATTACHMENT G -
BACKGROUND TRAFFIC FEBRUARY 2020 PRESIDENT'S DAY WEEKEND



NOTES: **WRONG WAY (BICYCLE TRAFFIC ONLY)

Attachment H

FOR REVIEW ONLY

PST Engineering LLC
150 Rockpoint Drive
Suite F
Durango, CO 81301
970-235-1072
ENGINEERING

SHEET 1 OF 1

TELLURIDE SOUTHWEST
NEIGHBORHOOD
MASTER PLAN
DAVIS/COLORADO
CONCEPTUAL
TWO-WAY LEFT TURN LANE

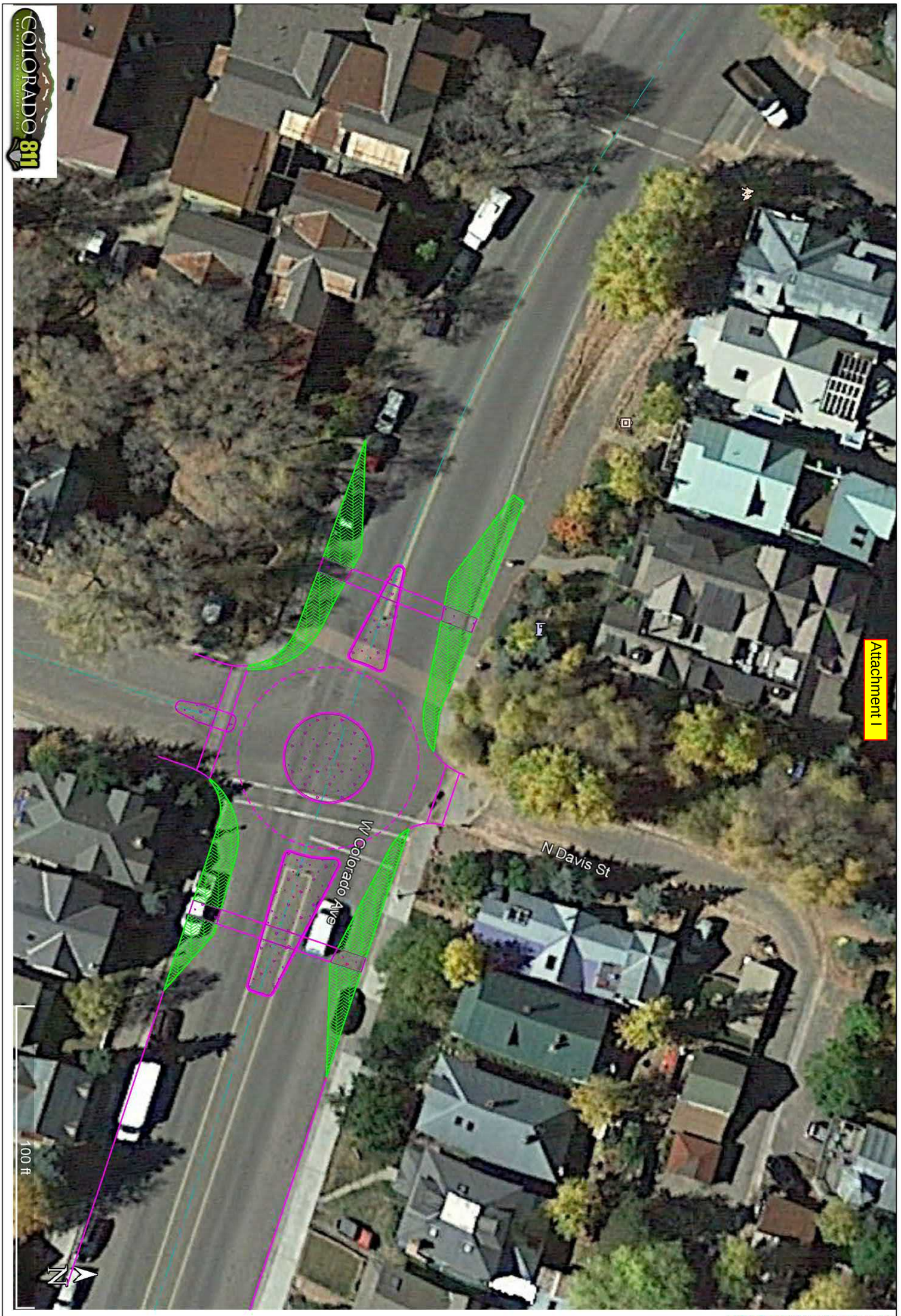
REVISIONS:

#	Date	Description	Sheet

Date: 3-31-20
Drawn By: SDP
Chkd By:

File Path: SFILES

COLORADO 811
KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.



Attachment I

FOR REVIEW ONLY

Date: 3/31/20
Drawn By: SDP
Chkd By:

REVISIONS:

#	Date	Description	Sheet

TELLURIDE SOUTHWEST NEIGHBORHOOD MASTER PLAN DAVIS/COLORADO CONCEPTUAL MINI ROUNDABOUT

PST Engineering LLC
150 Rockpoint Drive
Suite F
Durango, CO 81301
970-235-1072

SHEET

1 OF 1

File Path: $FILEAS