

THOMPSON RIVER RANCH, FUTURE FILINGS
TRANSPORTATION IMPACT STUDY

JOHNSTOWN, COLORADO

(NOVEMBER 2020)
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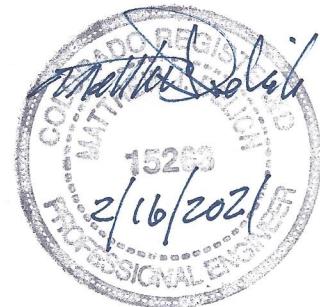
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Project #2069

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I. INTRODUCTION

This Transportation Impact Study (TIS) addresses the capacity, geometric, and control requirements for the proposed Thompson River Ranch and future filings. The Thompson River Ranch is located west of Larimer County Road 3 (LCR3) and north of Larimer County Road 18 (LCR18) in Johnstown, Colorado.

During the course of the analysis, numerous contacts were made with the project developer (Oakwood Homes) and the Town of Johnstown (Planning Department and Traffic Engineering Consultant). This study generally conforms to the format set forth in the Johnstown TIS Guidelines. Scoping discussions and email exchanges with the Charles Buck, Johnstown Traffic Engineering Consultant have occurred. The study involved the following steps:

- Collect physical, traffic, and development data;
- Perform trip generation, trip distribution, and trip assignment;
- Determine peak hour traffic volumes;
- Conduct capacity and operational level of service analyses on key intersections;
- Analyze signal warrants;

The following intersections, as agreed to in the scoping discussions, were addressed in this traffic study: SE Frontage Road/River Ranch, LCR18/LCR3, LCR3/River Ranch, and the Site Access intersections. The scope of this TIS was discussed through an email exchange.

This is a revision of the “Thompson River Ranch, Future Filings TIS” dated November 2020. It addresses Town staff comments and inclusion of Filings 12, 13, and 15 in the short range (2025) future.

II. EXISTING CONDITIONS

The location of Thompson River Ranch is shown in Figure 1. It is important that a thorough understanding of the existing conditions be presented.

Land Use

Land uses in the area are primarily residential, agricultural, or open. There are residential uses to the west and north of the site. The Thompson River Ranch is a developing residential area. The center of Johnstown lies to the southeast of the proposed Thompson River Ranch site.

Streets

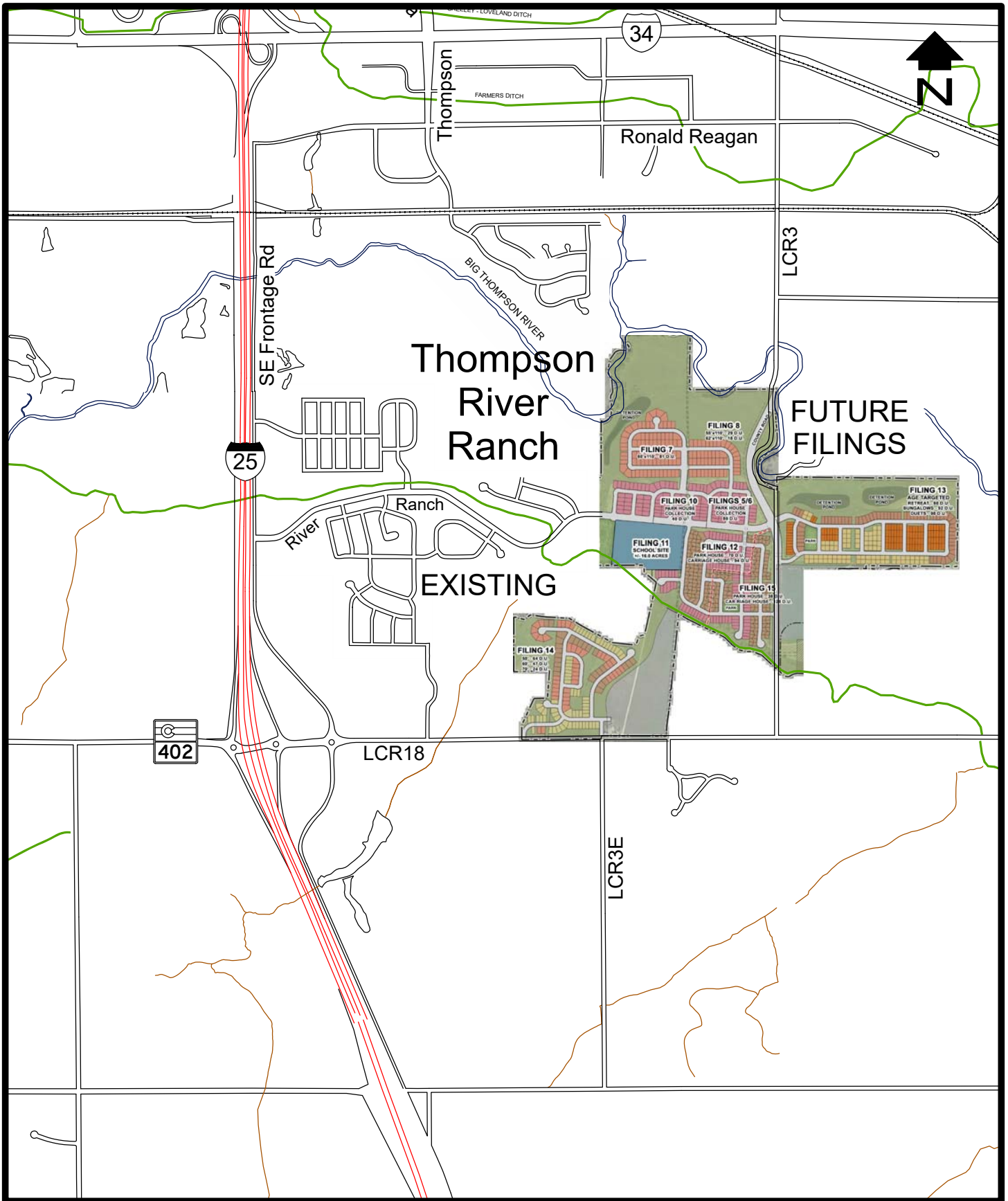
The primary streets near Thompson River Ranch are the I-25 SE Frontage Road, Larimer County Road 3 (LCR3), Larimer County Road 18 (LCR18), and River Ranch Parkway. The existing geometry at the SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections is shown in Figure 2.

The SE Frontage Road of Interstate 25 is a two-lane road. At the SE Frontage Road/River Ranch intersection, the SE Frontage Road has a southbound left-turn lane, one through lane in each direction, and a northbound right-turn lane. The SE Frontage Road/River Ranch intersection has stop sign control on River Ranch Parkway. The posted speed is 55 mph.

Larimer County Road 3 (High Plains Boulevard) is classified as a Regionally Significant Corridor – Major Arterial on the Johnstown Transportation Plan. North of LCR18, LCR3 has a gravel surface and minimal rural cross section. At the LCR18/LCR3 intersection, the southbound approach is a single lane. The LCR18/LCR3 intersection has stop sign control on the LCR3. At the LCR3/River Ranch intersection, the northbound and southbound approaches are in single lanes. The LCR3/River Ranch intersection has stop sign control on the River Ranch Parkway.

Larimer County Road 18 is classified as a Regionally Significant Corridor – Major Arterial on the Johnstown Transportation Plan. East of I-25, LCR18 has a paved surface and minimal two-lane rural cross section. At the LCR18/LCR3 intersection, both eastbound and westbound approaches have single lanes. The posted speed is 55 mph.

River Ranch Parkway is an east/west street, designated as a collector. River Ranch Parkway has a two-lane cross section with bicycle lanes. At the SE Frontage Road/River Ranch intersection, River Ranch Parkway has separate westbound left-turn and right-turn lanes. At the LCR3/River Ranch intersection, River Ranch Parkway has separate eastbound left-turn and right-turn lanes.

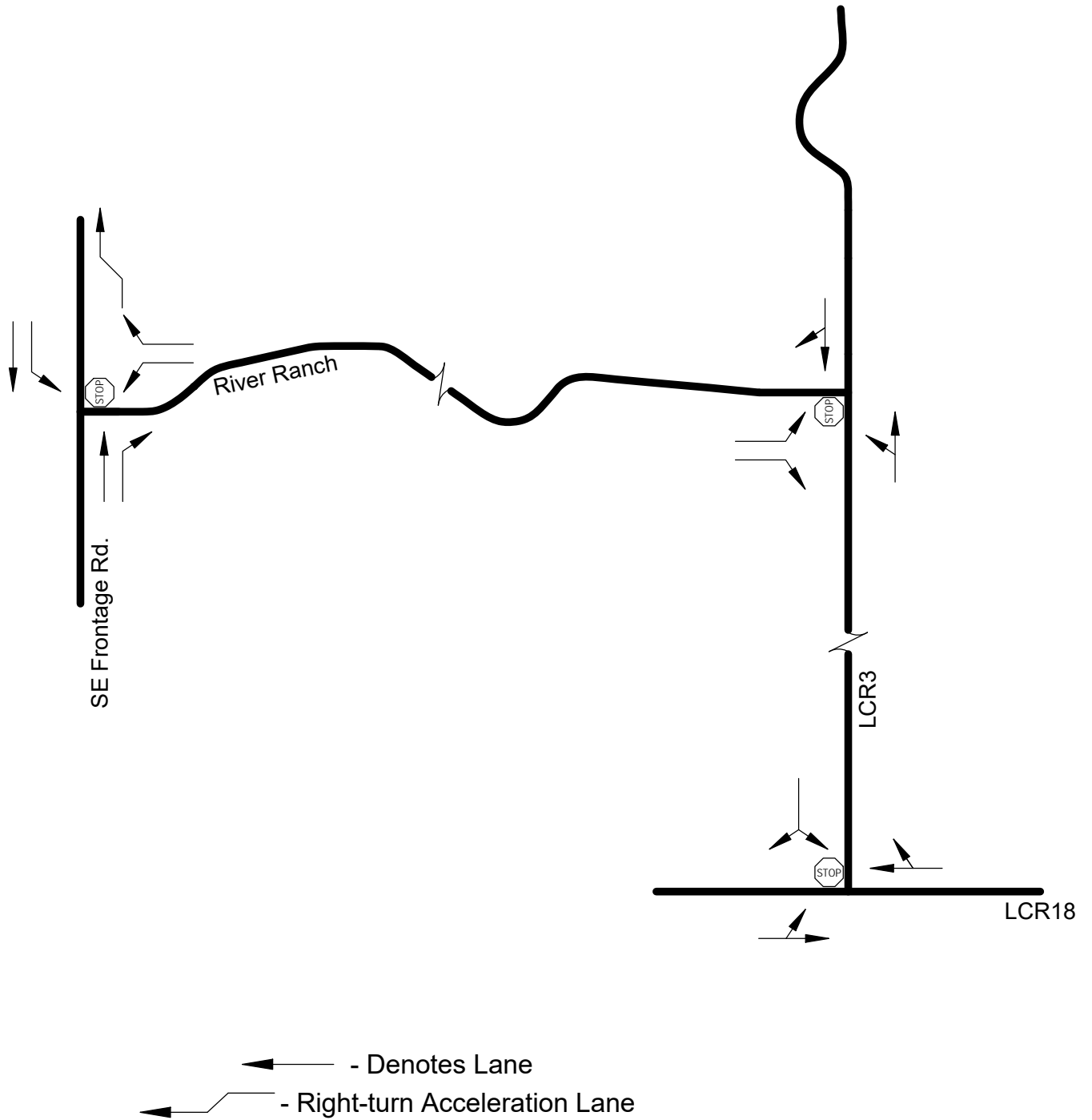


SCALE: 1"=2000'

SITE LOCATION

Figure 1





EXISTING INTERSECTION GEOMETRY

Figure 2

There are no pedestrian facilities along any of the external roads in this area. There are pedestrian facilities within the existing Thompson River Ranch. Based upon casual observation, there is little pedestrian or bicycle activity along the SE Frontage Road, LCR3, or LCR18.

Existing Traffic

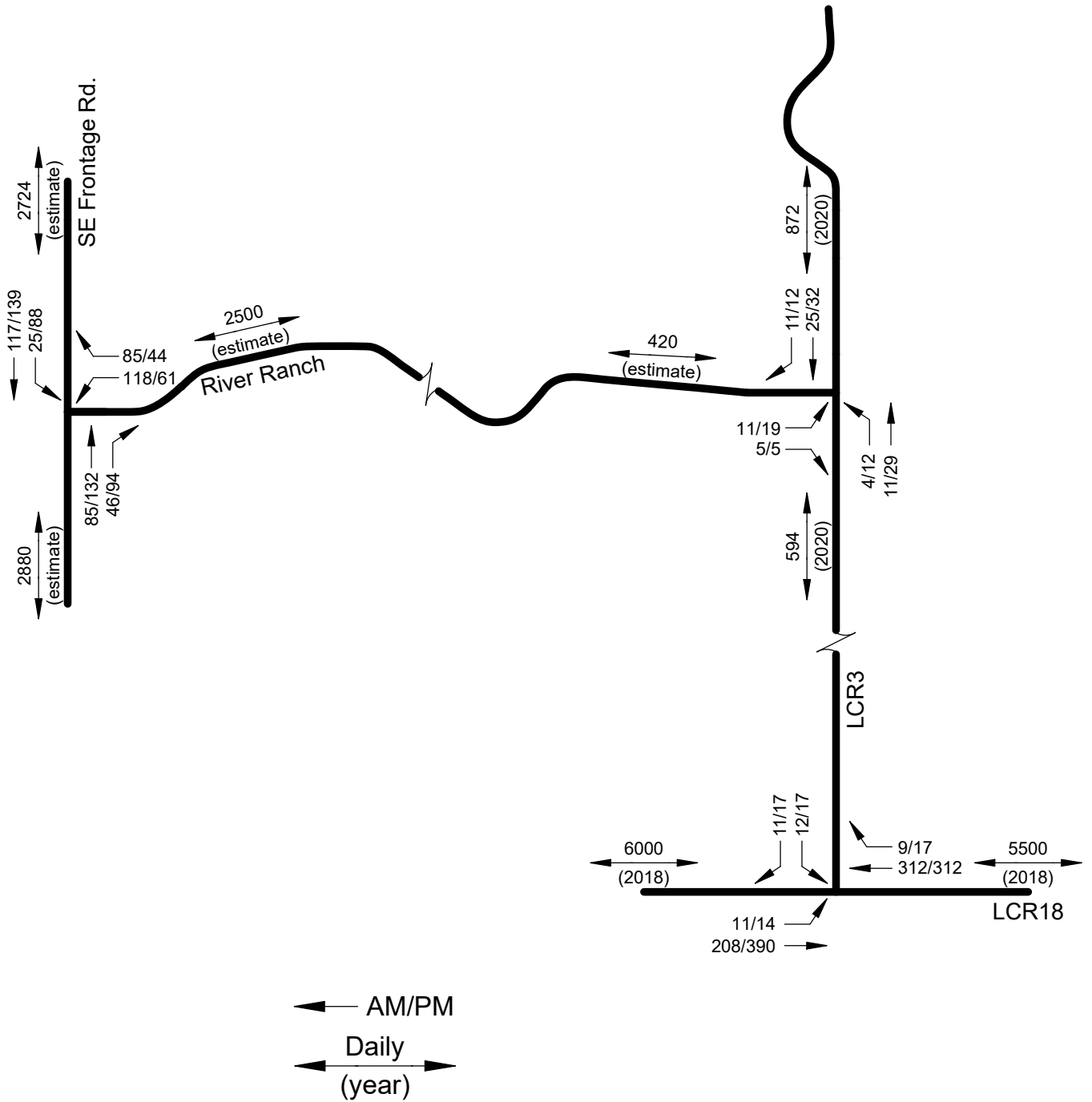
Figure 3 shows the recent peak hour traffic counts at the SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections. Raw peak hour traffic count data is provided in Appendix A. The peak hour counts were obtained in September 2020. Also shown on Figure 3 is recent daily traffic on the LCR3 and LCR18. There is also an estimate of the daily traffic on the SE Frontage Road. Since traffic at the LCR18/LCR3 and LCR3/River Ranch intersections was counted on different days, the traffic volumes were averaged/balanced and are shown in Figure 4.

Existing Operation

The SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections were evaluated using techniques provided in the 2016 Highway Capacity Manual. Using the morning and afternoon peak hour traffic shown in Figure 4, the peak hour operation is shown in Table 1. Calculation forms are provided in Appendix B. The SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections are currently operating acceptably with existing control and geometry in the morning and afternoon peak hours. Acceptable operation is defined as level of service (LOS) D or better, overall, during the peak hours. At stop sign controlled intersections, minor street left turns may operate at LOS E/F during the peak hours. This is considered to be normal in urban areas during the peak hours. A description of level of service for unsignalized intersections from the 2016 Highway Capacity Manual is also provided in Appendix B.

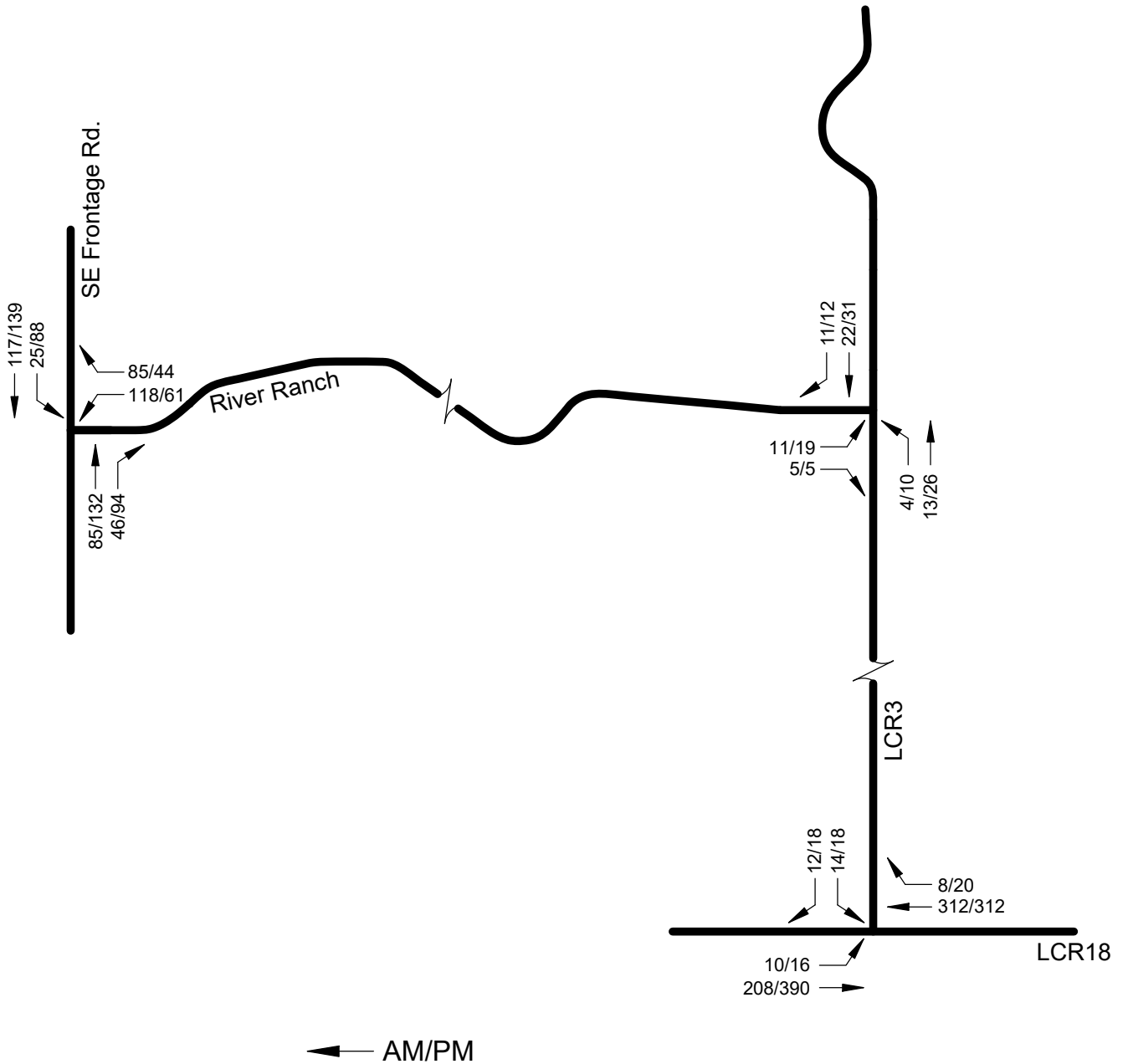
Paving

Based upon the daily traffic counts, LCR3 should be paved. As part of the paving, the bridge over the Big Thompson River should be improved. Given the future improvements to LCR3 as the "I-25 Parallel Arterial," the eventual four-lane cross section should be taken into consideration. Clearly, constructing the future cross section is not the responsibility of this or other future developments along it. However, the interim design and right-of-way must take this into consideration. North of LCR18, there is a one lane bridge over an irrigation ditch. This bridge should be widened to accommodate two-way traffic.



RECENT DAILY AND PEAK HOUR TRAFFIC

Figure 3



AVERAGED/BALANCED RECENT PEAK HOUR TRAFFIC

Figure 4

**TABLE 1
Current Peak Hour Operation**

Intersection	Movement	Level of Service	
		AM	PM
SE Frontage Road/River Ranch (stop sign)	WB LT	B	B
	WB RT	A	A
	WB APPROACH	B	B
	SB LT	A	A
	OVERALL	A	A
LCR18/LCR3 (stop sign)	SB LT/RT	B	B
	EB LT/T	A	A
	OVERALL	A	A
LCR3/River Ranch (stop sign)	EB LT	A	A
	EB RT	A	A
	EB APPROACH	A	A
	NB LT/T	A	A
	OVERALL	A	A

III. PROPOSED DEVELOPMENT

Thompson River Ranch is a residential development, located west of Larimer County Road 3 (LCR3) and north of Larimer County Road 18 (LCR18) in Johnstown. Figure 5 shows the site plan for the future filings of the Thompson River Ranch. Filings 12, 13, and 15 of the Thompson River Ranch (short range future) consists of 330 single family dwelling units and 250 senior adult housing detached. Figure 5 shows the overall site plan of the remaining Thompson River Ranch development. Filings 5, 6, and 10 are currently under construction. There are approximately 70 dwelling units left to be built. The school site, assumed to be a K-8 school, will be operational in 2021. Filings 7 and 8 to the north have approximately 128 dwelling units planned. These filings and the school site are all assumed to be constructed for the short range (2025) future year. Beyond Filings 12, 13, and 15, Filing 14 will have a total of 135 dwelling units (long range future). This TIS analyzes the short range (2025) future for Filings 12, 13, and 15 and the long range (2040) future for the full development of the remaining Filing 14 of the Thompson River Ranch.

Trip Generation

Trip generation is important in considering the impact of a development such as this upon the existing and proposed street system. A compilation of trip generation information contain in Trip Generation, 10th Edition, ITE was used to estimate the trips that would be generated by the proposed/expected uses at the Thompson River Ranch, Future Filings site. A trip is defined as a one-way vehicle movement from origin to destination. Table 2 shows the expected trip generation on a daily and peak hour basis for development of Filings 12, 13, and 15 and for development of Future Filing 14. The trip generation of Filings 12, 13, and 15 of the Thompson River Ranch development (short range future) resulted in 4,294 daily trip ends, 321 morning peak hour trip ends, and 414 afternoon peak hour trip ends. The trip generation of Future Filing 14 of the Thompson River Ranch development resulted in 1,242 daily trip ends, 96 morning peak hour trip ends, and 128 afternoon peak hour trip ends. Full build-out of the total Future Filings of the Thompson River Ranch development (long range future) resulted in 5,536 daily trip ends, 417 morning peak hour trip ends, and 542 afternoon peak hour trip ends.

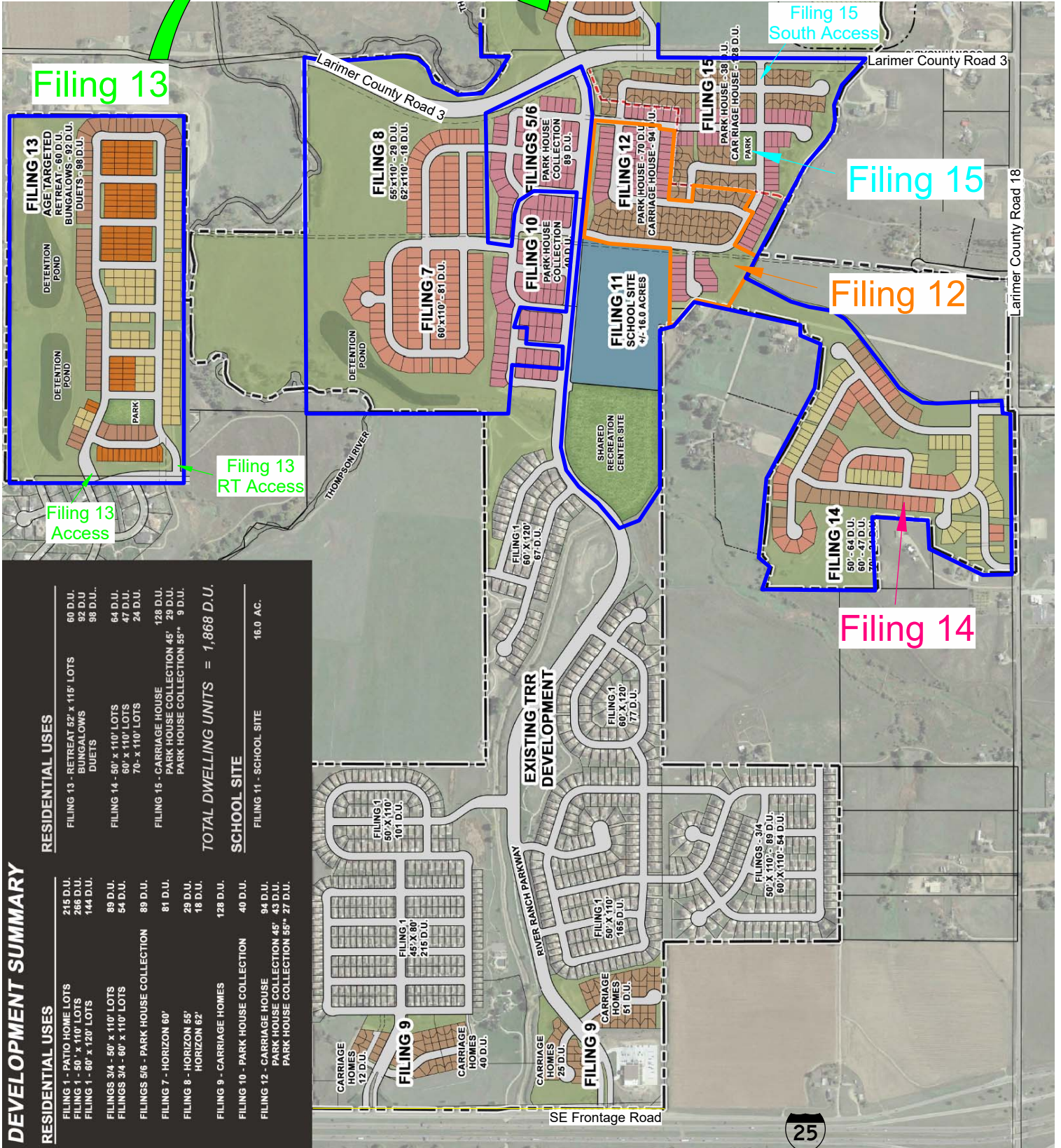
Trip Distribution

Trip distribution for the Thompson River Ranch was based on existing/future travel patterns, land uses in the area, consideration of trip attractions/productions in the area, and engineering judgment. This trip distribution was modified from that used for the original Thompson River Ranch subdivision TIS based upon the recent traffic counts and the more eastern location of the parcels. Figure 6 shows the trip distribution for the short range (2025) and long range (2040) analysis futures.



SCALE: 1"=1000'

— Unbuilt portions of Thompson River Ranch



DEVELOPMENT SUMMARY

RESIDENTIAL USES

- FILING 1 - PATIO HOME LOTS 215 D.U.
- FILING 1 - 50' x 110' LOTS 266 D.U.
- FILING 1 - 60' x 120' LOTS 144 D.U.
- FILINGS 3/4 - 50' x 110' LOTS 89 D.U.
- FILINGS 3/4 - 60' x 110' LOTS 54 D.U.
- FILINGS 5/6 - PARK HOUSE COLLECTION 89 D.U.
- FILING 7 - HORIZON 60' 81 D.U.
- FILING 8 - HORIZON 55' 29 D.U.
- FILING 8 - HORIZON 62' 18 D.U.
- FILING 9 - CARRIAGE HOMES 128 D.U.
- FILING 10 - PARK HOUSE COLLECTION 40 D.U.
- FILING 12 - CARRIAGE HOUSE PARK HOUSE COLLECTION 45' 34 D.U.
- FILING 12 - CARRIAGE HOUSE PARK HOUSE COLLECTION 55' 27 D.U.

RESIDENTIAL USES

- FILING 13 - RETREAT 82' x 115' LOTS BUNGALOWS DUETS 60 D.U.
- FILING 13 - RETREAT 82' x 115' LOTS BUNGALOWS DUETS 86 D.U.
- FILING 14 - 50' x 110' LOTS 64 D.U.
- FILING 14 - 60' x 140' LOTS 47 D.U.
- FILING 14 - 70' x 110' LOTS 24 D.U.
- FILING 15 - CARRIAGE HOUSE PARK HOUSE COLLECTION 45' 28 D.U.
- FILING 15 - CARRIAGE HOUSE PARK HOUSE COLLECTION 55' 9 D.U.

TOTAL DWELLING UNITS = 1,868 D.U.

SCHOOL SITE

- FILING 11 - SCHOOL SITE 16.0 AC.

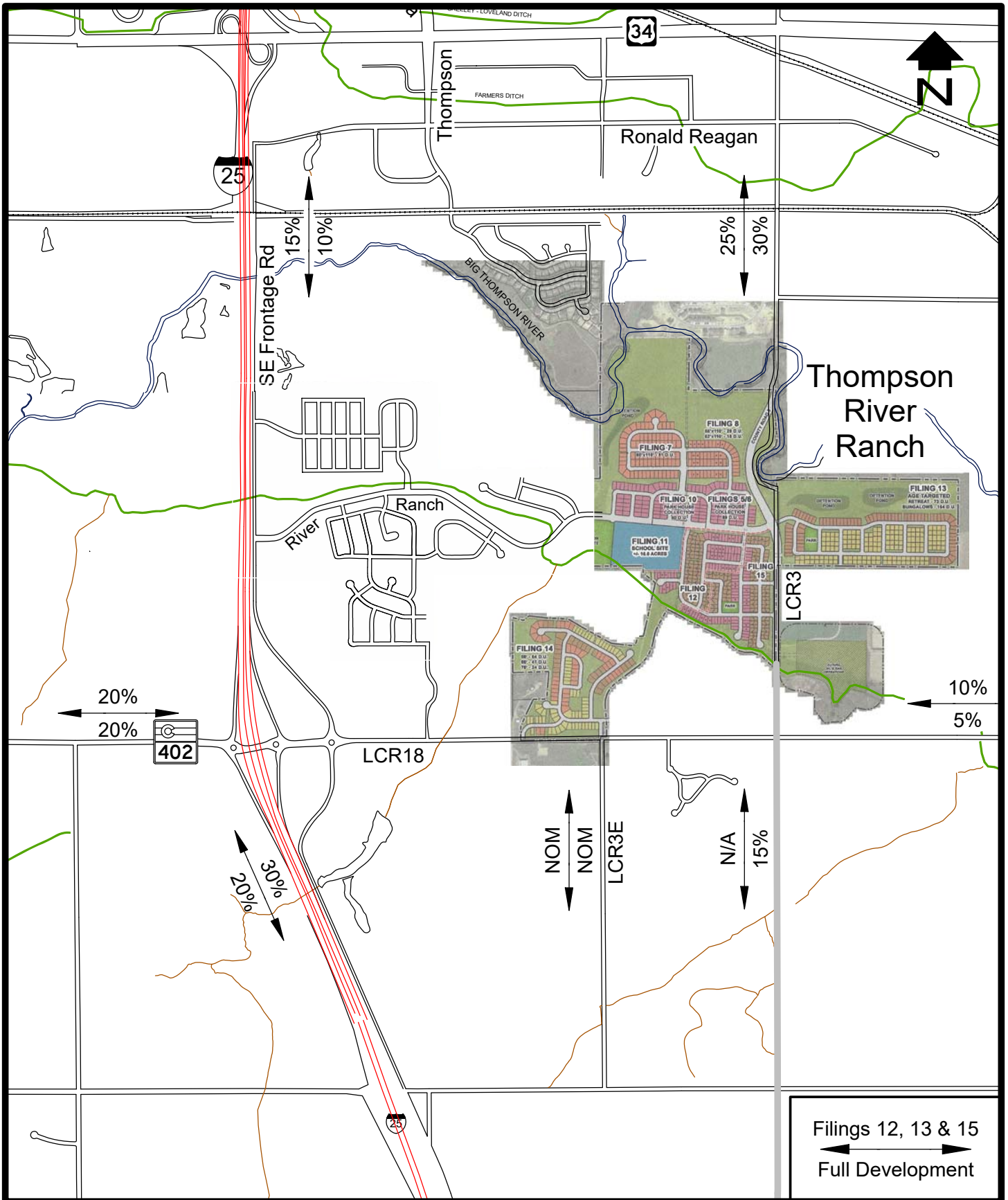
SITE PLAN

Figure 5



**TABLE 2
Trip Generation**

Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
Short Range (2025) Filings 12, 13, and 15												
210	Filing 12 - Single Family	164 D.U.	EQ	1508	EQ	30	EQ	89	EQ	99	EQ	58
251	Filing 13 - Senior Adult Housing Detached	250 D.U.	EQ	1260	EQ	27	EQ	55	EQ	60	EQ	38
210	Filing 15 - Single Family	166 D.U.	EQ	1526	EQ	30	EQ	90	EQ	100	EQ	59
Subtotal				4294		87		234		259		155
Future Filing 14												
210	Filing 14 - Single Family	135 D.U.	EQ	1242	EQ	24	EQ	72	EQ	81	EQ	47
Total				5536		111		306		340		202



TRIP DISTRIBUTION

Figure 6

Background Traffic Projections

Figure 7 shows the short range (2025) background daily and peak hour traffic projections. Background traffic projections for the short range (2025) future horizon were obtained by reviewing the North Front Range Regional Transportation Plan and various traffic studies prepared for this area of Johnstown/Larimer County. Traffic volumes on the SE Frontage Road and LCR3 were increased by approximately 1.5 percent per year. Traffic volumes on the LCR18 were increased by approximately 3.0 percent per year. The remaining dwelling units from the existing Thompson River Ranch, Filings 5, 6, and 10 were included in the short range (2025) background traffic projections. The school site and future Filings 7 and 8 were also included. "The Ridge at Johnstown Master Traffic Study," dated September 9, 2020 was submitted to Johnstown. It is not known if The Ridge at Johnstown has any phasing of development. Therefore, this project was only included in the long range (2040) future.

For the long range (2040) future, the site generated traffic volumes from various properties in the area (specifically The Ridge) were used in addition to a general increase in background traffic. In addition to this, a technical memorandum for the I-25 Parallel Arterial Technical Advisory Committee, prepared by Michael Baker International, was reviewed for traffic volume projections and the traffic projections at the LCR18/LCR3 intersection were used/considered. Figure 8 shows the long range (2040) background peak hour traffic at the key intersections.

Trip Assignment

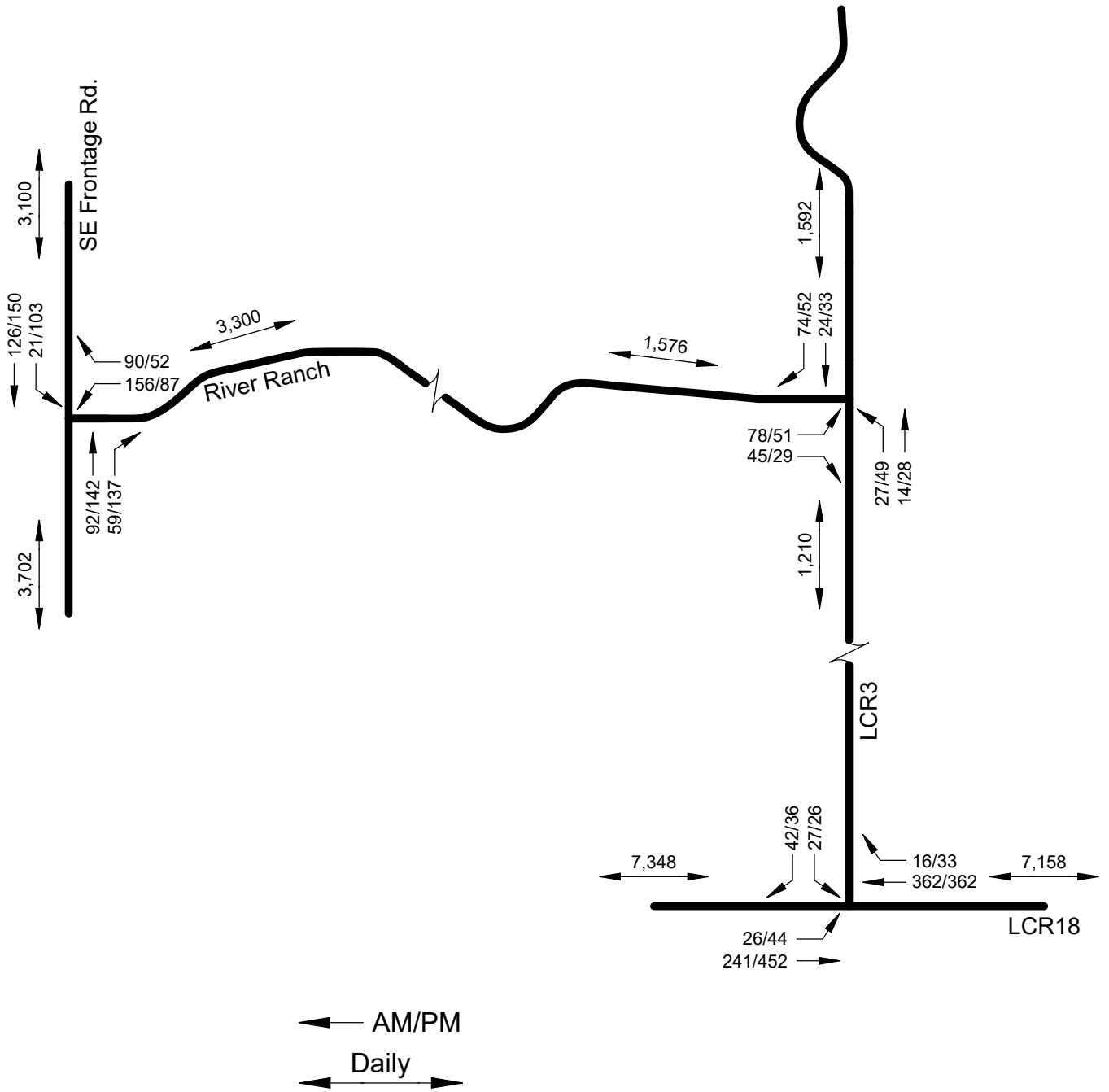
Trip assignment is how the generated and distributed trips are expected to be loaded on the street system. The assigned trips are the resultant of the trip distribution process. Figure 9 shows the site generated daily and peak hour traffic for Filings 12, 13, and 15. Figure 10 shows the full development of Filings 12, 13, 14 and 15 of the Thompson River Ranch site generated daily and peak hour traffic.

Total Traffic

The traffic volumes generated by the two levels of development for the Thompson River Ranch were added to the background traffic volumes to produce the total traffic volume forecasts for the short range (2025) future and the long range (2040) future horizon. Figures 11 and 12 respectively shows the short range (2025) total and the long range (2040) total future daily and peak hour traffic at the key intersections.

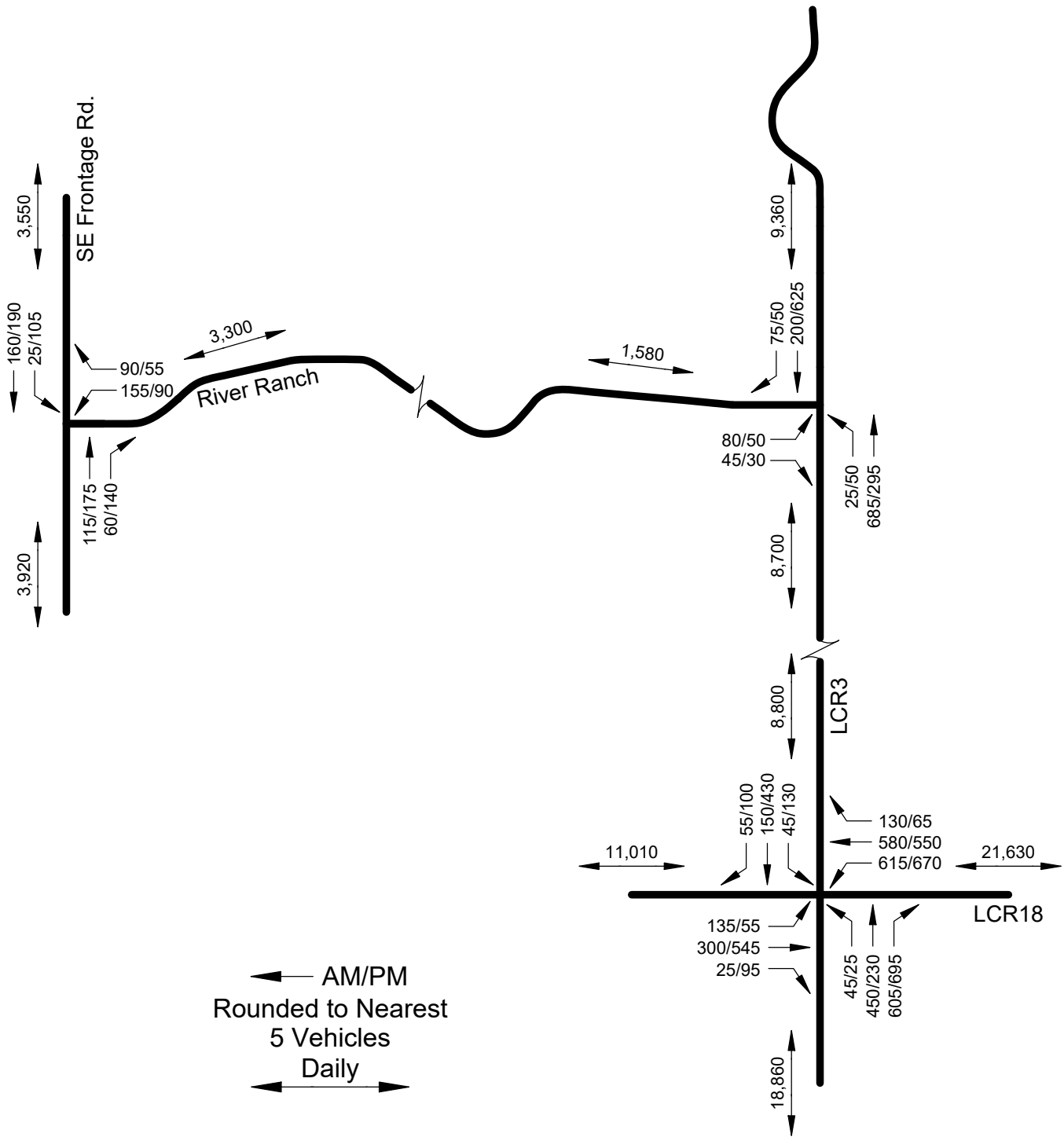
Signal Warrants

As a matter of policy, traffic signals are not installed at any location unless warrants are met according to the Manual on Uniform Traffic Control Devices. For the roads in the vicinity of the Thompson River Ranch development, four hour and/or eight hour signal



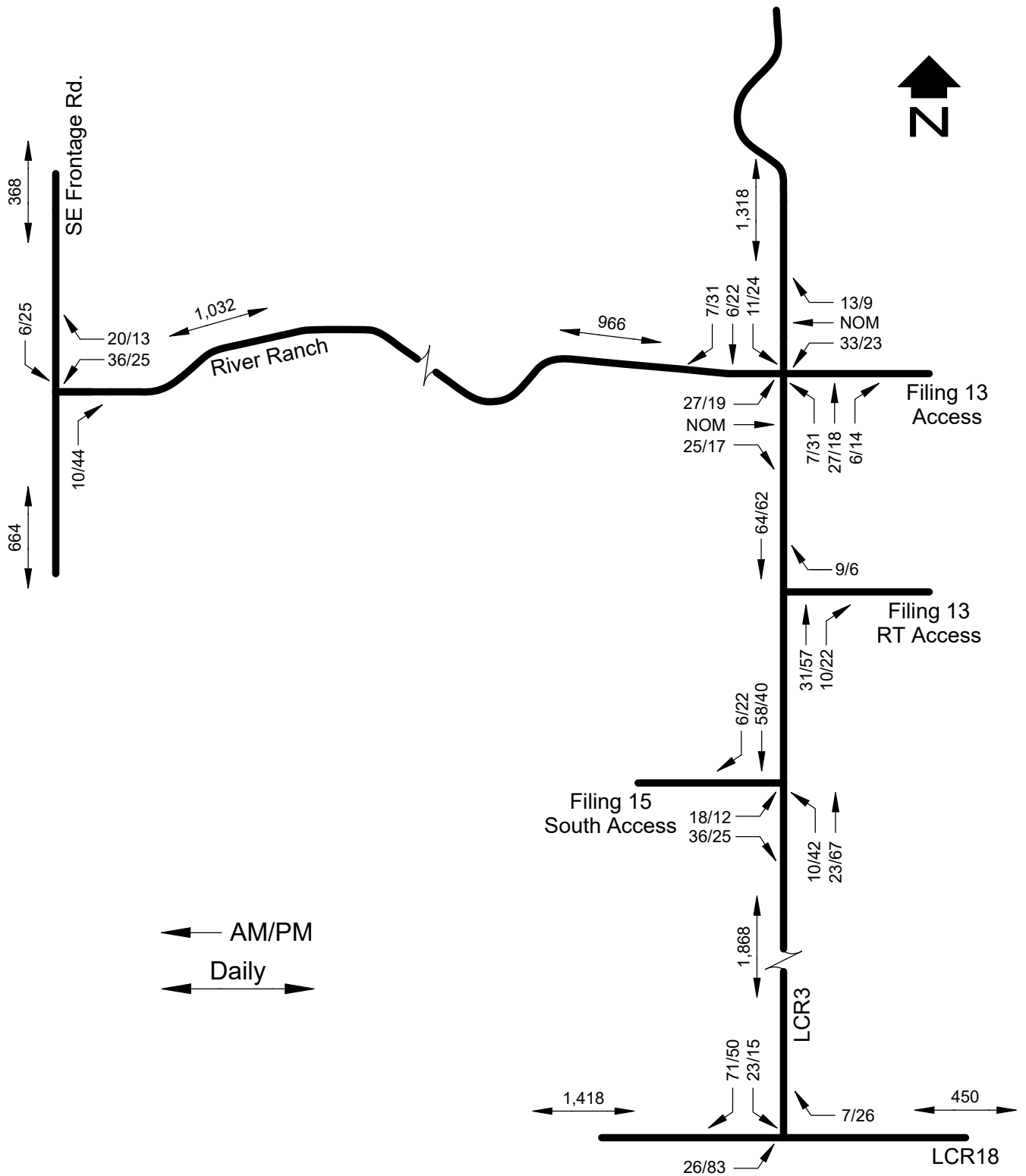
SHORT RANGE (2025) BACKGROUND DAILY AND PEAK HOUR TRAFFIC

Figure 7



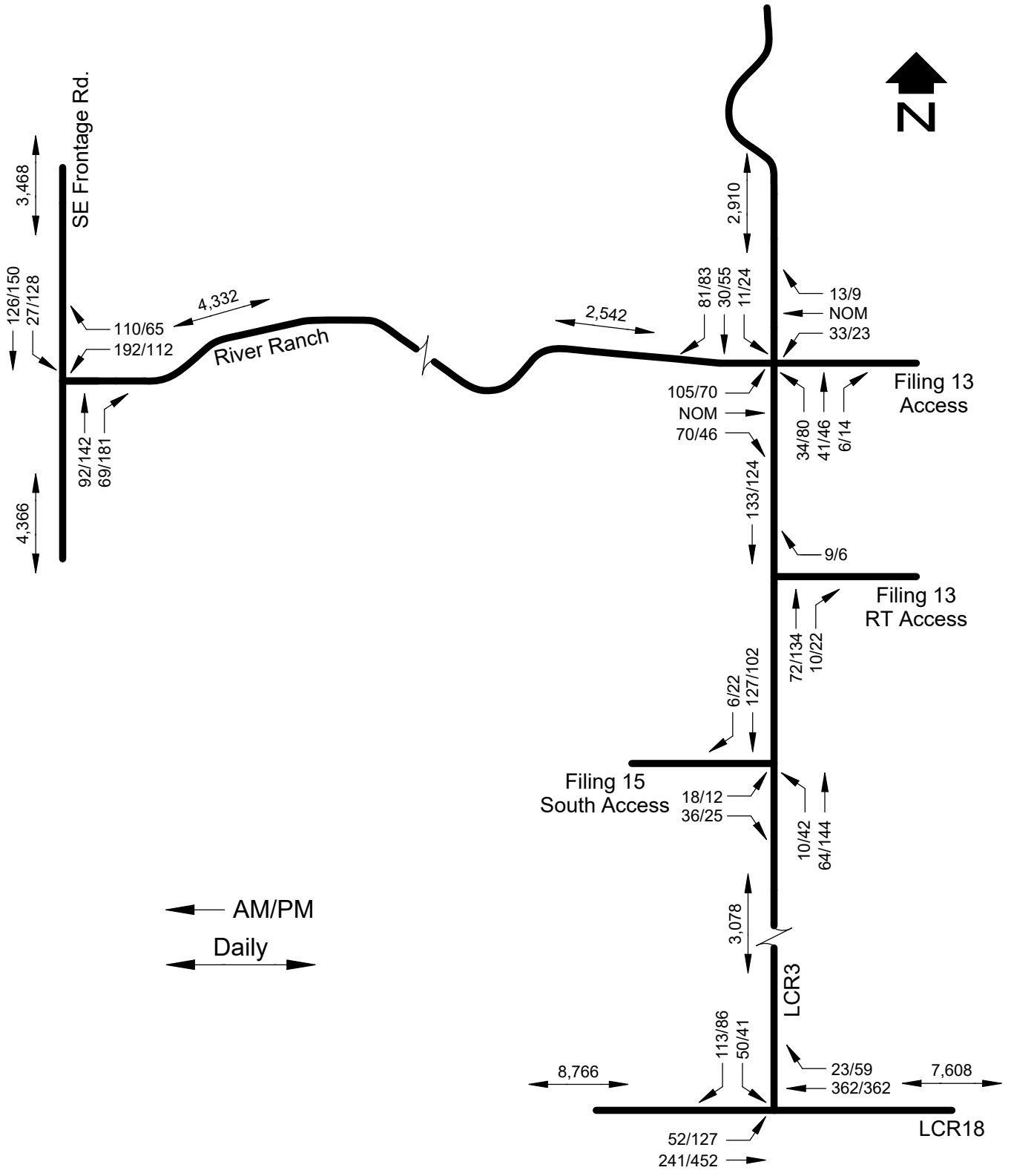
LONG RANGE (2040) BACKGROUND DAILY AND PEAK HOUR TRAFFIC

Figure 8



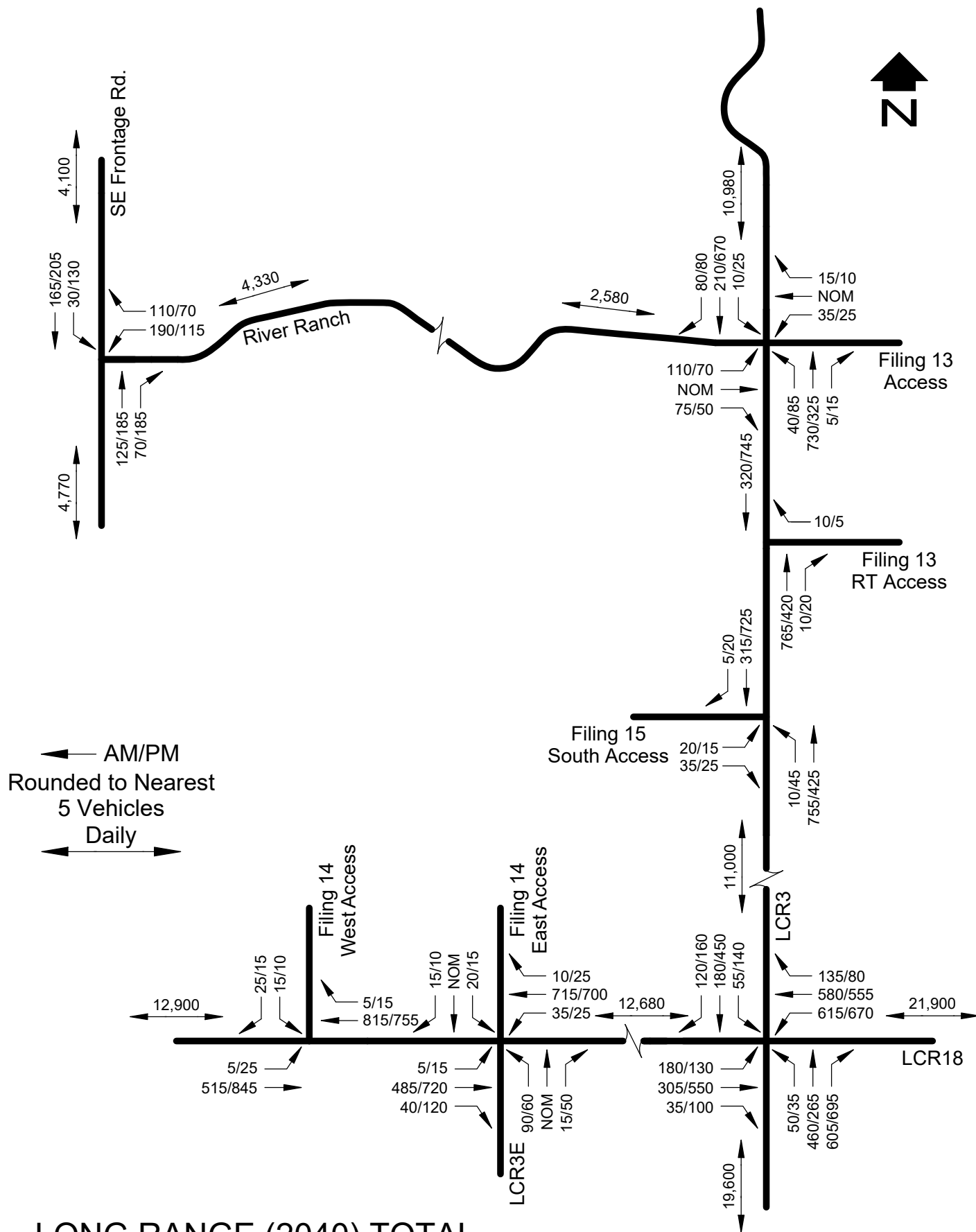
SHORT RANGE (2025) SITE
 GENERATED (FILINGS 12, 13 & 15)
 DAILY AND PEAK HOUR TRAFFIC

Figure 9



SHORT RANGE (2025) TOTAL DAILY AND PEAK HOUR TRAFFIC

Figure 11



LONG RANGE (2040) TOTAL DAILY AND PEAK HOUR TRAFFIC

Figure 12

warrants are applicable. These warrants require much data and are applied when the traffic is actually on the area road system. It is acknowledged that peak hour signal warrants should not be applied, but since the peak hour forecasts are readily available in a traffic impact study, it is reasonable to use them to estimate whether other signal warrants may be met. If peak hour signal warrants will not be met at a given intersection, it is reasonable to conclude that it is not likely that other signal warrants would be met. If peak hour signal warrants are met, it merely indicates that further evaluation should occur in the future as the development occurs. However, a judgment can be made that some intersections will likely meet other signal warrants.

Based upon the long range (2040) background and total peak hour traffic (Figures 8 and 12), the peak hour signal warrant will likely be met in the morning and afternoon peak hours at the LCR18/LCR3 stop sign controlled intersection. Based on the peak hour signal warrant, it is likely that other volume based signal warrants would likely met at this intersection. A peak hour signal warrant for the LCR18/LCR3 intersection is provided in Appendix C. Based upon the long range (2040) total peak hour traffic (Figure 12), the peak hour signal warrant will likely be met in the morning and afternoon peak hours at the LCR3/River Ranch stop sign controlled intersection. Based on the peak hour volumes, other volume based signal warrants might not be met at this intersection. Traffic volumes should be monitored at this intersection. A peak hour signal warrant for the LCR3/River Ranch intersection is provided in Appendix C.

Geometry

Figure 13 shows the short range (2025) geometry at the key intersections. The existing and required lane lengths are shown on Figure 13. The geometry at the LCR3/River Ranch intersection will be required when this intersection is open to public traffic. With the development of Filings 12, 14 and 15, the geometry at the SE Frontage Road/River Ranch intersection will remain as it exists today. From available aerial photography, the southbound left-turn deceleration lane is approximately 520 feet long including bay taper. Prior to the reconfiguration of the I-25/SH402 overpass, the northbound right-turn deceleration lane was approximately 665 feet long including bay taper. During construction of the I-25/SH402 overpass, the northbound right-turn deceleration lane was approximately 340 feet long including bay taper. Currently, the northbound right-turn deceleration lane is approximately 700 feet long including bay taper. Prior to the reconfiguration of the I-25/SH402 overpass, there was a northbound right-turn acceleration lane that was approximately 530 feet long including bay taper. That acceleration lane no longer exists. According to the State Highway Access Code, auxiliary lanes on Frontage Roads should provide for the deceleration length or acceleration length. The existing auxiliary lanes meet these criteria.

As an arterial street, LCR3 will have center left-turn lanes at all public street intersections. However, the “Johnstown Transportation Master Plan” provides for an “initial phase” cross section for arterial streets. Given the short range (2025) traffic forecasts (Figure 11) on LCR18 and LCR3, the need for auxiliary lanes was evaluated

using criteria in the State Highway Access Code (SHAC). At both the LCR18/LCR3 and LCR3/River Ranch intersections, left-turn lanes are required. In addition to this, a southbound right-turn lane will be required at the LCR3/River Ranch intersection.

Figure 14 shows the long range (2040) geometry at the key intersections. The required lane lengths are shown on Figure 14. The long range (2040) geometry was developed based upon the SHAC and the operation of the key intersections. According to the Johnstown Transportation Plan, LCR3 is classified as a four-lane arterial street. However, based upon the long range (2040) forecasted traffic volumes, a two-lane arterial street may be adequate. It is not known when the volumes on LCR3 (I-25 Parallel Arterial) will be reached. It is a function of future development and external forces. As such, developments along it (including Thompson River Ranch) should provide for right-of-way along it.

Operation Analysis

Operation analyses were performed at the SE Frontage Road/River Ranch, LCR18/LCR3, LCR3/River Ranch, and the Site Access intersections. The operations analyses were conducted for the short range future, reflecting a year 2025 condition, and for the long range future, reflecting a year 2040 condition. The operation at the key intersections in the long range future should be used for planning purposes.

Using the short range (2025) background peak hour traffic volumes (Figure 7), the SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections operates as indicated in Table 3. Calculation forms for these analyses are provided in Appendix D. The SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections will operate acceptably during the peak hours.

Table 4 shows the long range (2040) background peak hour operation at the SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections (Figure 8). Calculation forms are provided in Appendix E.

Using the traffic volumes shown in Figure 11, the key intersections operate in the short range (2025) total condition as indicated in Table 5. Calculation forms are provided in Appendix F. The SE Frontage Road/River Ranch, LCR18/LCR3, LCR3/River Ranch-Filing 13 Access, LCR3/Filing 13 RT Access, and LCR3/Filing 15 South Access intersections will operate acceptably during the peak hours.

Table 6 shows the long range (2040) total peak hour operation at the SE Frontage Road/River Ranch, LCR18/LCR3, LCR3/River Ranch-Filing 13 Access, LCR3/Filing 13 RT Access, LCR3/Filing 15 South Access, LCR18/LCR3E-Filing 14 East Access, and LCR18/Filing 14 West Access intersections (Figure 12). Calculation forms for these analyses are provided in Appendix G. Given the four-lane arterial classification and the forecasted volumes on LCR3, the minor street legs at the LCR3/River Ranch intersection may experience significant delays as a two-way stop

TABLE 3
Short Range (2025) Background Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
SE Frontage Road/River Ranch (stop sign)	WB LT	B	B
	WB RT	A	A
	WB APPROACH	B	B
	SB LT	A	A
	OVERALL	A	A
LCR18/LCR3 (stop sign)	SB LT	C	C
	SB RT	B	B
	SB OVERALL	B	B
	EB LT	A	A
	OVERALL	A	A
LCR3/River Ranch (stop sign)	EB LT	A	B
	EB RT	A	A
	EB APPROACH	A	A
	NB LT	A	A
	OVERALL	A	A

TABLE 4
Long Range (2040) Background Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
SE Frontage Road/River Ranch (stop sign)	WB LT	B	C
	WB RT	A	A
	WB APPROACH	B	B
	SB LT	A	A
	OVERALL	A	A
LCR18/LCR3 (signal)	EB LT	C	C
	EB T	D	D
	EB RT	C	C
	EB APPROACH	D	D
	WB LT	D	D
	WB T	C	C
	WB RT	C	B
	WB APPROACH	D	C
	NB LT	B	B
	NB T	B	C
	NB RT	B	C
	NB APPROACH	B	C
	SB LT	B	B
	SB T	B	C
	SB RT	B	B
	SB APPROACH	B	C
OVERALL	C	C	
LCR3/River Ranch (stop sign)	EB LT	C	C
	EB RT	A	B
	EB APPROACH	B	C
	NB LT	A	A
	OVERALL	A	A

TABLE 5
Short Range (2025) Total Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
SE Frontage Road/River Ranch (stop sign)	WB LT	B	C
	WB RT	A	A
	WB APPROACH	B	B
	SB LT	A	A
	OVERALL	A	A
LCR18/LCR3 (stop sign)	SB LT	C	D
	SB RT	B	B
	SB OVERALL	B	C
	EB LT	A	A
	OVERALL	A	A
LCR3/River Ranch-Filing 13 Access (stop sign)	EB LT	B	B
	EB T/RT	A	A
	EB APPROACH	B	B
	WB LT	B	B
	WB T/RT	A	A
	WB APPROACH	B	B
	NB LT	A	A
	SB LT	A	A
OVERALL	A	A	
LCR3/Filing 13 RT Access (RT-in/RT-out)	SB RT	A	A
LCR3/Filing 15 South Access (stop sign)	EB LT/RT	A	A
	NB LT	A	A
	OVERALL	A	A

TABLE 6
Long Range (2040) Total Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
SE Frontage Road/River Ranch (stop sign)	WB LT	B	C
	WB RT	A	A
	WB APPROACH	B	C
	SB LT	A	A
	OVERALL	A	A
LCR18/LCR3 (signal)	EB LT	C	C
	EB T	D	D
	EB RT	C	C
	EB APPROACH	D	D
	WB LT	D	D
	WB T	C	C
	WB RT	C	A
	WB APPROACH	D	C
	NB LT	B	B
	NB T	B	C
	NB RT	B	C
	NB APPROACH	B	C
	SB LT	B	B
	SB T	B	C
	SB RT	B	B
SB APPROACH	B	C	
OVERALL	C	C	
LCR3/River Ranch-Filing 13 Access (stop sign)	EB LT	C	F (51.9 secs)
	EB T/RT	A	B
	EB APPROACH	C	D
	WB LT	D	D
	WB T/RT	B	A
	WB APPROACH	C	C
	NB LT	A	A
	SB LT	A	A
OVERALL	A	A	
LCR3/River Ranch-Filing 13 Access (two-lane roundabout)	EB LT/T/RT	A	A
	WB LT/T/RT	A	A
	NB LT/T	B	A
	NB T/RT	A	A
	NB APPROACH	B	A
	SB LT/T	A	A
	SB T/RT	A	A
	SB APPROACH	A	A
OVERALL	A	A	

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TABLE 6			
Long Range (2040) Total Peak Hour Operation			
Intersection	Movement	Level of Service	
		AM	PM
LCR3/Filing 13 RT Access (RT-in/RT-out)	SB RT	B	A
LCR3/Filing 15 South Access (stop sign)	EB LT/RT	B	C
	NB LT	A	A
	OVERALL	A	A
LCR18/LCR3E-Filing 14 East Access (stop sign)	NB LT	E (39.8 secs)	F (56.4 secs)
	NB T/RT	B	B
	NB APPROACH	E (35.5 secs)	E (35.9 secs)
	SB LT	D	E (39.2 secs)
	SB T/RT	B	B
	SB APPROACH	C	D
	EB LT	A	A
	WB LT	A	A
	OVERALL	A	A
LCR18/Filing 14 West Access (stop sign)	SB LT/RT	C	C
	EB LT	A	A
	OVERALL	A	A

sign controlled intersection. Therefore, the LCR3/River Ranch intersection was also analyzed as a two-lane roundabout as a potential alternative control. Although this intersection meets peak hour signal warrants, signal analysis was not performed due to the relatively low volumes on River Ranch Parkway. The traffic forecasts at the LCR18/LCR3E-Filing 14 East Access and LCR18/Filing 14 West Access intersections were developed using the forecasts from “The Ridge at Johnstown Master Traffic Study” dated September 9, 2020.

Pedestrian/Bicycle Facilities

It is assumed that there will be pedestrian facilities (sidewalks/paths) along all streets within Thompson River Ranch. They will connect to existing and future pedestrian facilities within the Thompson River Ranch subdivision. These facilities will provide safe pedestrian areas within the Thompson River Ranch subdivision. Currently, there are no sidewalks along the SE Frontage Road, LCR18, and LCR3. As Johnstown becomes more urban in the future, it is expected that there will be sidewalks along the existing and future streets. Most of the streets within Thompson River Ranch are considered to be local streets. Therefore, defined bike lanes are not required. There are existing bike lanes along River Ranch Parkway and the SE Frontage Road. As LCR18 and LCR3 are improved, bicycle lanes should be incorporated in the street cross sections.

IV. CONCLUSIONS

This study assessed the impacts of Thompson River Ranch, Future Filings on the street system in the vicinity of the proposed development in the short range (2025) and long range (2040) futures. As a result of this analysis, the following is concluded:

- The development of the Thompson River Ranch, Future Filings is feasible from a traffic engineering standpoint. The trip generation of 12, 13, and 15 of the Thompson River Ranch development (short range future) resulted in 4,294 daily trip ends, 321 morning peak hour trip ends, and 414 afternoon peak hour trip ends. Full build-out of the Thompson River Ranch development (long range future) resulted in 5,536 daily trip ends, 417 morning peak hour trip ends, and 542 afternoon peak hour trip ends.
- Given the existing traffic volumes, LCR3 should be paved. This will involve improvement of the bridge over the Big Thompson River and the bridge over an irrigation ditch.
- Currently, the SE Frontage Road/River Ranch, LCR18/LCR3, and LCR3/River Ranch intersections operate acceptably with existing control and geometry.
- None of the stop sign controlled intersections are likely to meet signal warrants in the short range (2025) future. Based upon the long range (2040) background and total peak hour traffic, the peak hour signal warrant will likely be met in the morning and afternoon peak hours at the LCR18/LCR3 intersection.
- In the short range (2025) future, given development of the Thompson River Ranch, Filings 12, 13, and 15 and an increase in background traffic, the key intersections will operate acceptably with the existing/recommended geometry and existing control.
- It is recommended that the geometry at the SE Frontage Road/River Ranch intersection remain as is. The short range (2025) and long range (2040) geometry is shown in Figures 13 and 14, respectively.