Existing Conditions within the Study Area

Land Use & Zoning

A portion of McCarrolls East 5th Addition adjacent to Indian Trail Road is currently zoned as Residential Two Family (RTF). The remainder of the 5th Addition and the Remainder of McCarrolls East is listed as Residential Single Family. The subject property is located on a portion of Section 22, T26N R42E W.M., within the City of Spokane, Washington. The parcel numbers for the subject property are 26224.0129, 26224.0130, 26224.0127, 26225.0251, and 26221.0233. The surrounding area includes residential to the east, west, and north of the property with undeveloped land to the south of the development, zoned High Density Residential.

Existing Roadways

The overall transportation network in this area consists of urban principle arterials, collectors, and local access roads.

As shown on the site plan, the site is accessed via Indian Trail Road and Barnes Road. It is anticipated that the trips to/from the site will generally use the following roadways:

Indian Trail Road is generally a north-south two-way 2, 3 & 4-lane principle arterial that extends from Francis Avenue to Rutter Parkway. From Francis Avenue to Kathleen Avenue Indian Trail Road serves residential uses and a small commercial area with a 4-lane roadway. From Kathleen Avenue to Strong Road, Indian Trail Road serves residential uses with a three-lane roadway. From Strong Road to Barnes Road, Indian Trail Road serves commercial uses with a 4-lane roadway consisting of two southbound through lanes, a two-way-left-turn-lane, and a northbound through lane. From Barnes Road to Ridgecrest Drive Indian Trail Road serves residential uses with a 3-lane roadway. From Ridgecrest Drive to Rutter Parkway Indian Trail Road serves a mixture of residential and undeveloped land uses. The posted speed limit on Indian Trail Road is 30 MPH with the exception of a school zone located at the intersection of Indian Trail Road and Shawnee Drive where the speed limit is 20 MPH when children are present.

Barnes Road is an east-west two-way 2 & 3-lane minor arterial that extends from Madeline Court in the Ponderosa Ridge Development through Indian Trail Road and up the slope in the McCarrolls East Development. The City of Spokane Comprehensive Plan calls for the future connection of Barnes Road, to Nine Mile Road and Strong Road. Barnes Road serves a mixture of Commercial, Multi-Family and Single Family Residential uses. The posted speed limit on Barnes Road is 30 MPH

Strong Road is an east west two-way 2-lane minor arterial that extends east up the hill from Indian Trail Road onto the Five-Mile Plateau and continues east Through Five-Mile Road to Cedar Road. Strong Road generally serves residential land uses. The posted speed limit on strong road is 30 and 35 MPH.

Pacific Park Drive is an east-west two-way 2-lane collector that extends west from Indian Trail Road through the residential neighborhood to Forest Boulevard. Pacific Park Drive Serves primarily residential land uses. The Speed limit on Pacific Park Drive is 25 MPH.

Francis Avenue/ State Route 291 is an east-west, two-way 4- & 5-lane principal arterial that extends east from Nine Mile Road through Assembly Street, Indian Trail Road, A Street, Alberta Street, Ash Street, Maple Street, Monroe Street, Wall Street, Division Street, Addison Street, Nevada Street, Crestline Street, Market Street and Freya Street, as the arterial terminated at Bigelow Gulch Road. Within the study area Francis Serves a mixture of commercial and residential land uses. The speed limit on Francis Avenue is 3 0MPH.

Alberta Street is a north-south, one and two-way 2-lane arterial that extends south from Woodside Avenue through Francis Avenue and Wellesley Avenue to Driscoll Boulevard where Alberta turns into a southbound one-way street and continues to Northwest Boulevard and turns back into a two-way local access road that goes to Grace Avenue. Alberta Street generally serves residential land uses. The speed limit on Alberta Street is 30 MPH.

Ash/Maple Couplet is a north-south couplet that is comprised of 2 one-way streets that begins near Cedar Road through the following arterials: 5-mile road, Francis Avenue, Wellesley Avenue, Garland Avenue, Northwest Boulevard, Maxwell Avenue, and Boone Ave. the couplet ends at 11th Avenue. The couplet serves a mixture of Commercial Uses near intersecting arterial and residential land uses. The speed limit on the Ash/Maple couplet is 30 MPH.

Study Area Intersections

The project study area intersections were identified through discussions with the City of Spokane and WSDOT. The study encompasses the AM & PM Peak hour analysis of the following intersections:

- Indian Trail Road & Barnes Road
- Indian Trail Road & Strong Road/ Pacific Park Drive
- Indian Trail Road & Francis Avenue
- Francis Avenue & Alberta Street
- Francis Avenue & Ash Street
- Francis Avenue & Maple Street

Traffic Control and Descriptions

Indian Trail Road & Barnes Road is a signalized intersection with the following lane configuration: the eastbound approach has a right turn lane, a through lane, a left turn lane, and two receiving lanes. The westbound approach has a through-right lane, a left turn lane and a single receiving lane. The northbound approach has a right turn lane, a through lane, a left turn lane and two receiving lanes. The southbound approach has a right turn lane, a through lane, a left turn lane, and a single receiving lane. All left turns are permitted.

Indian Trail Road & Strong Road/ Pacific Park Drive is a signalized intersection with the

following lane configuration: The East and westbound approaches have a right turn lane, a left through lane, and a single receiving lane. The north and southbound approaches have a right turn lane, a through lane, a left turn lane, and a single receiving lane. All left turns are permitted.

Indian Trail Road & Francis Avenue is a signalized intersection with the following lane configuration: The eastbound approach has two through lanes, a left turn lane and two receiving lanes. The westbound approach has a channelized right turn lane, two through lanes, a two-way-left-turn lane as a spacer and two receiving lanes. All left turns are permitted.

Francis Avenue & Alberta Street is a signalized intersection with the following lane configuration: The eastbound and westbound approaches have a through-right lane, a through lane, a left turn lane, and two receiving lanes. The northbound approach has a left-through-right lane, a left turn lane, and a single receiving lane. The east and westbound left turns are permitted/protected, and the north and southbound phases are split timed.

Francis Avenue & Ash Street is a signalized intersection with the following lane configuration: The eastbound approach has a through-right lane, two through lanes, and two receiving lanes. The westbound approach has a through-right lane, a through lane, a left turn lane, and three receiving lanes. The northbound approach has two receiving lanes. The southbound approach has a right turn lane. Two through lanes, and a left turn lane.

Francis Avenue & Maple Street is a signalized intersection with the following lane configuration: the eastbound approach has a through-right lane, a through lane, a left turn lane, and two receiving lanes. The westbound approach has a through-right lane, and two receiving lanes. The northbound approach has a through-right lane, a through lane, a left-through lane, and a left turn lane. The southbound approach has three receiving lanes.

Traffic Volumes and Peak Hours of Operation

Traffic counts were collected in March 2016 Under the direction of Morrison Maierle Inc., at the following intersections:

- Indian Trail Road & Barnes Road (AM & PM)
- Indian Trail Road & Strong Road/ Pacific Park Drive (AM & PM)
- Indian Trail Road & Francis Avenue (AM & PM)
- Francis Avenue & Alberta Street (AM & PM)
- Francis Avenue & Ash Street (AM & PM)
- Francis Avenue & Maple Street (AM & PM)

Per a previous traffic study the volumes counted at these intersections on Francis Avenue were adjusted for either demand volume or as directed by the City to better model the movement through the intersections of Ash and Maple with Francis Avenue.

The peak hour from these counts are shown on Figures 3 & 4. The raw data for these counts are located in the technical appendix.

Public Transit Transportation

The Spokane Transit Authority (STA) currently provides a weekday service route to this area by Route 23T. Bus stops are located at the following intersections: Indian Trail Road & Strong Road, Indian Trail Road & Lowell Avenue.

Local Trails

There are no walking trails within the area, however all developed roadways in the area include sidewalks.

LEVEL OF SERVICE

Level of service (LOS) is an empirical premise developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles afforded to drivers who utilize the transportation network. It has been defined by the Transportation Research Board in the *2010 Highway Capacity Manual.* This document has quantified level of service into a range from "A" which indicates little, if any, vehicle delay, to "F" which indicates significant vehicle delay and traffic congestion that may lead to system breakdown due to volumes that may exceed capacity.

Signalized Intersections

For signalized intersections, research has determined that average stopped delay per vehicle is the best available measure of level of service. The following tables identify the relationships between level of service and average stopped delay per vehicle. WSDOT wants to maintain LOS D for signalized intersections, but if the LOS is already at E or F, it just needs to be maintained at E or F, and not brought back to LOS D. The Minimum Level of service for a signalized intersection is LOS E.

Level of Service Criteria and Descriptions - Signalized

LOS	Delay Range (sec)	General Description
A	10	• Very low delay at intersection. • All signal cycles clear. • No vehicles wait through more than one signal cycle.
B	10 to 20	• Operating speeds beginning to be affected by other traffic. • Short traffic delays at intersections. • Higher average intersections delays resulting from more vehicles stopping.
C	20 to 35	• Operating speeds and maneuverability closely controlled by other traffic. • Higher delays at intersections than for LOS B due to a significant number of vehicles stopping. • Not all signal cycles clear the waiting vehicles.
D	35 to 55	• Tolerable operating speeds, but long traffic delays occur at intersections • The influence of congestion is noticeable. • Many vehicles stop and the proportion of vehicles not stopping declines. • The number of signal cycle failures, for which vehicles must wait through more than one signal cycle are noticeable.
E	55 to 80	• Speeds are restricted, very long traffic delays are experienced and traffic volumes are near capacity. • Traffic flow is unstable, any interruption, no matter how minor, will cause queues to form and service to deteriorate. • Traffic signal cycle failures are frequent occurrences.
F	80	• Extreme delays resulting in long queues which may interfere with other traffic movements • Stoppages of long duration and speeds may drop to zero. • Vehicle arrival rates are greater than capacity. • Considered unacceptable by most drivers.

Unsignalized Intersections

The calculation of level of service (LOS) at an unsignalized one/two-way stop-controlled intersection is examined in the Transportation Research Board's *2010 Highway Capacity Manual*. For unsignalized intersections, level of service is based on the delay experienced by each movement and approach within the intersection. The concept of delay as presented for unsignalized intersections in the Highway Capacity Manual is based on the amount of time a vehicle must spend at the intersection. Vehicles passing straight through the intersection on the major (uncontrolled) street experience no delay at the intersection. On the other hand, vehicles which are turning left from the minor street, because they must yield the right of way to all right turning vehicles, all left turning vehicles from the major street and all through vehicles on both the minor and major streets, must spend more time at the intersection. Levels of service are assigned to individual movements within the intersection, and are based upon the delay experienced by each movement or approach.

The Transportation Research Board has determined what levels of service for unsignalized intersections should be, by designating level of service A through F, where level of service A represents a facility where no vehicle in any movement is delayed very long and level of service F which represents a facility where there is excessive delay for the average vehicle in at least one movement in the intersection. The City of Spokane and WSDOT have adopted level of service E for all unsignalized intersections within the study area.

Level of Service Criteria and Descriptions - unsignalized

LOS	Delay Range (sec)	Expected Delay to Minor Street Traffic	General Description
A	10	Little to No Delay	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in the queue.
B	10 to 15	Short Traffic Delays	• Some drivers begin to consider the delay an inconvenience • Occasionally there is more than one vehicle in the queue.
C	15 to 25	Average Traffic Delays	• Many times there is more than one vehicle in the queue. • Most drivers feel restricted, but not objectionably so.
D	25 to 35	Long Traffic Delays	• Often there is more than one vehicle in the queue. • Drivers feel quite restricted.
E	35 to 50	Very Long Traffic Delays	• Represents conditions in which, demand is near or equal capacity. • There is almost always more than one vehicle in the queue. • Drivers find the delays approaching intolerable levels.
F	50	Stop-and-Go Condition Delays Generally Longer than Acceptable	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

All level of service analyses described in this report were performed in accordance with the procedures described above. As a final note, the Highway Capacity Manual (HCM) analysis and procedures are based upon worst case conditions. Therefore, most of each weekday and the weekends will experience traffic conditions better than those described within this document, which are only for the peak hours of operation.

Existing Level of Service and Traffic Analysis

The existing levels of service at the existing intersections were calculated using the methods from the *2010 Highway Capacity Manual* as implemented in Synchro, *version 9 - Build 909.*

For the intersections of Ash Street and Maple Street with Francis Avenue, given their close proximity the level of service for these intersections utilized an alternative means of calculating level of service, per HCM. This method was used by the City of Spokane and WSDOT in a previous study of the Francis corridor. The following methodology for LOS was applied.

Simtraffic, version 9.1 -build 910, was utilized. The methodology is the creation of a performance report that averages five runs of the peak hour and the stop delay/veh/mvmt is then averaged into "All" as in all of the movements within the intersection. From this value, the LOS delay range can be applied and LOS assigned. It is noted that this methodology given its random number generation, does not follow a linear logic of adding vehicles and having a larger delay, but is reasonable under the industry standards of traffic modeling and recommended by HCM 2010 for closely spaced intersections or areas where overall demand exceeds capacity. This methodology was applied to Maple & Ash Streets intersections with Francis Avenue, for all scenarios.

The existing levels of service for the intersections within the study area are summarized on the following table. The existing traffic volumes used for this report are shown on Figures 3 & 4.

Table 1 - Existing Intersections Levels of Service – Figures 3 & 4

INTERSECTION	(S)ignalized (U)nsignalized	AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Barnes Road	S	18.1	B	14.8	B
Indian Trail Road & Strong Road/ Pacific Park Dr.	S	9.7	A	18.9	B
Indian Trail Road & Francis Avenue	S	12.3	B	7.9	A
Francis Avenue & Alberta Street	S	36.4	D	32.2	C
Francis Avenue & Ash Street	S	12.8	B	17.3	B
Francis Avenue & Maple Street	S	12.0	B	68.5	E

The City of Spokane have established level of service E as the minimum acceptable level for signalized and unsignalized intersections, While WSDOT has established Level of Service D as the minimum acceptable level of service for signalized intersections. Any signalized intersection operating below LOS D should be maintained at the existing level of service.

As shown in Table 1 all intersections are currently functioning at acceptable levels of service.

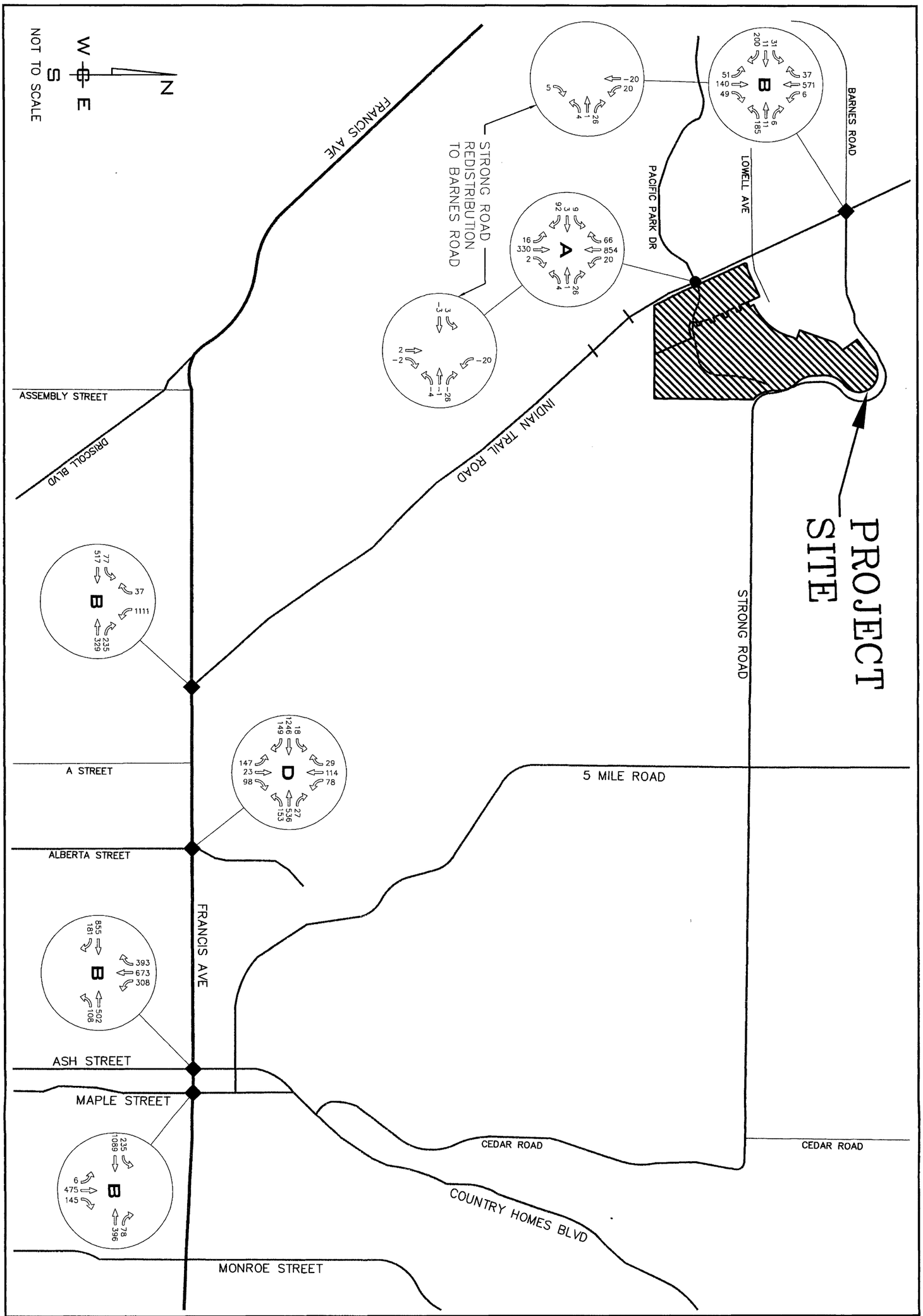

FIGURE 3

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2016 AM TRAFFIC VOLUMES & LOS

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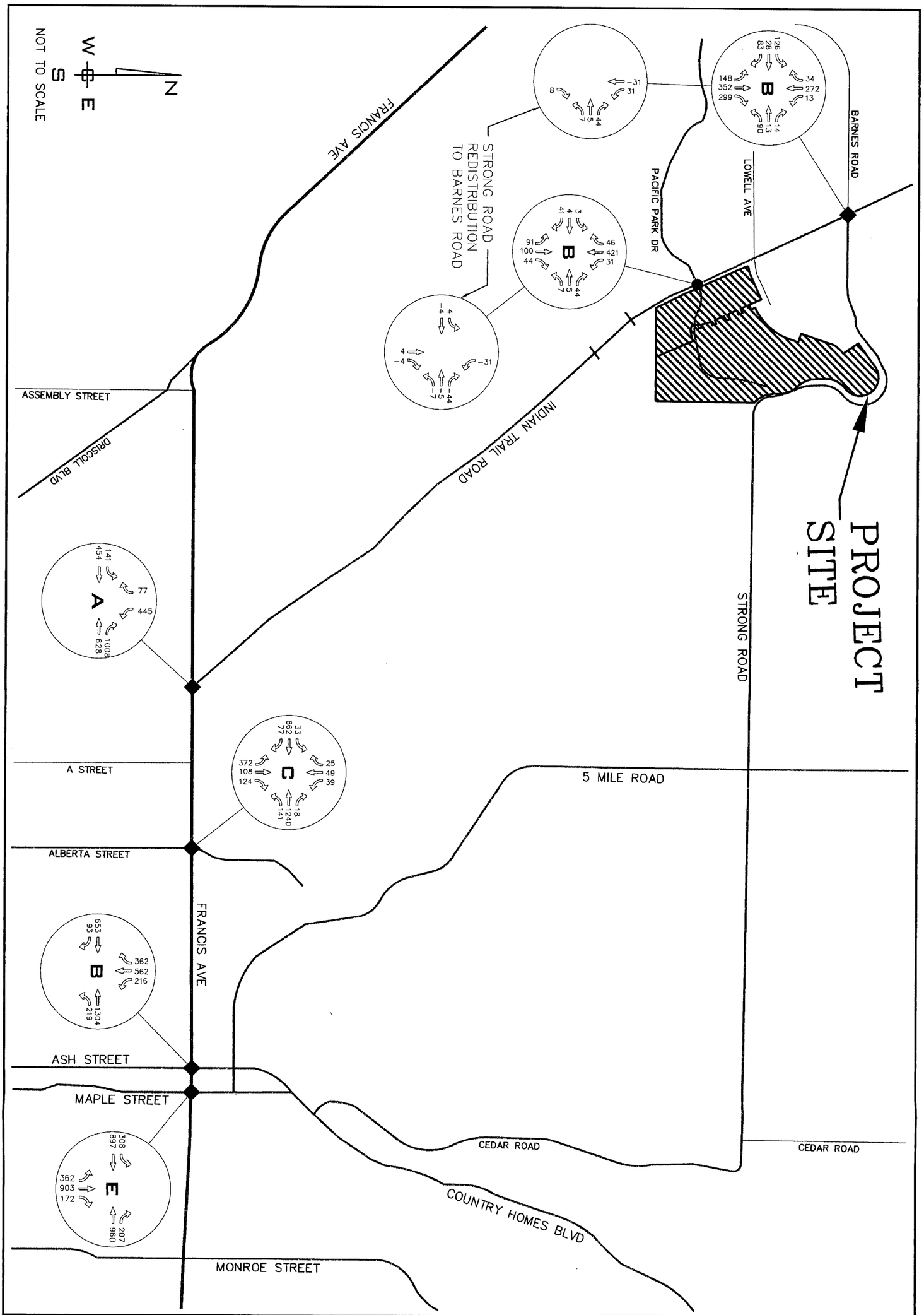

FIGURE 4

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2016 PM TRAFFIC VOLUMES & LOS

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BACKGROUND TRAFFIC GROWTH & BACKGROUND PROJECTS

Background Traffic Growth

Background traffic growth is an anticipated increase in traffic volume from year to year. As the existing land uses that surround a transportation facility mature, an increase in traffic results and may be due to either an increase in drivers per household or a household's purchase of an additional vehicle. Many things can cause an increase in the traffic volumes of a facility. The objective of the background traffic growth rate is to anticipate what the traffic volumes may be in the future. The background traffic growth rate for an area or street is determined by means of physical counts collected by local governmental agencies. The counts are compared on a yearly basis and a rate of increase is calculated from the data.

The background growth rate was determined to be 0.5% per year. Based on a five-year build out, compounded annually, the total increase in traffic rate is anticipated to be 1.025.

Background Project Traffic

In addition to the increase in background growth, background projects that have already been platted and unbuilt are vested before this project and have been included in the future year scenarios. The following projects have been scoped by the City of Spokane, the Background projects are sorted by their Traffic Analysis Zone (TAZ) location.

Table 2 - Background Projects – Figures 5, 6 & 7

TAZ	Background Project	MFDU	SFDU	TFDU	Total SFDU
79	Hunts Pointe*		183	48	231
	Windhaven First Addition		286		286
	Ponderosa 3rd Addition		12		12
	Ponderosa 4th Addition		25		25
80	Diamond Rock Apartments	96			
	Replat McCarrolls Addition Phase 2		13		13
	McCarrolls East 3rd Addition		10		10
	McCarrolls East 4th Addition		15		15
	McCarrolls East platted remainder		7	28	35
	Woodridge		7		7
81	Estates at Rocky Ridge		15		15
	Westwinds PUD		19		19

Since the traffic from all of these background projects are not currently included in the existing traffic counts/volumes, the AM & PM trips anticipated from these developments are added to the future projected traffic volumes. Please see the anticipated increase of traffic due to the build out of these background projects per intersection on Figure 5 & 6

As the Hunts Pointe development was Background to McCarroll East, has not been platted and the preliminary plat at the time of this writing is expired and they will need to complete a traffic study to meet concurrency the trips of Hunts Pointe are added in a separate scenario.

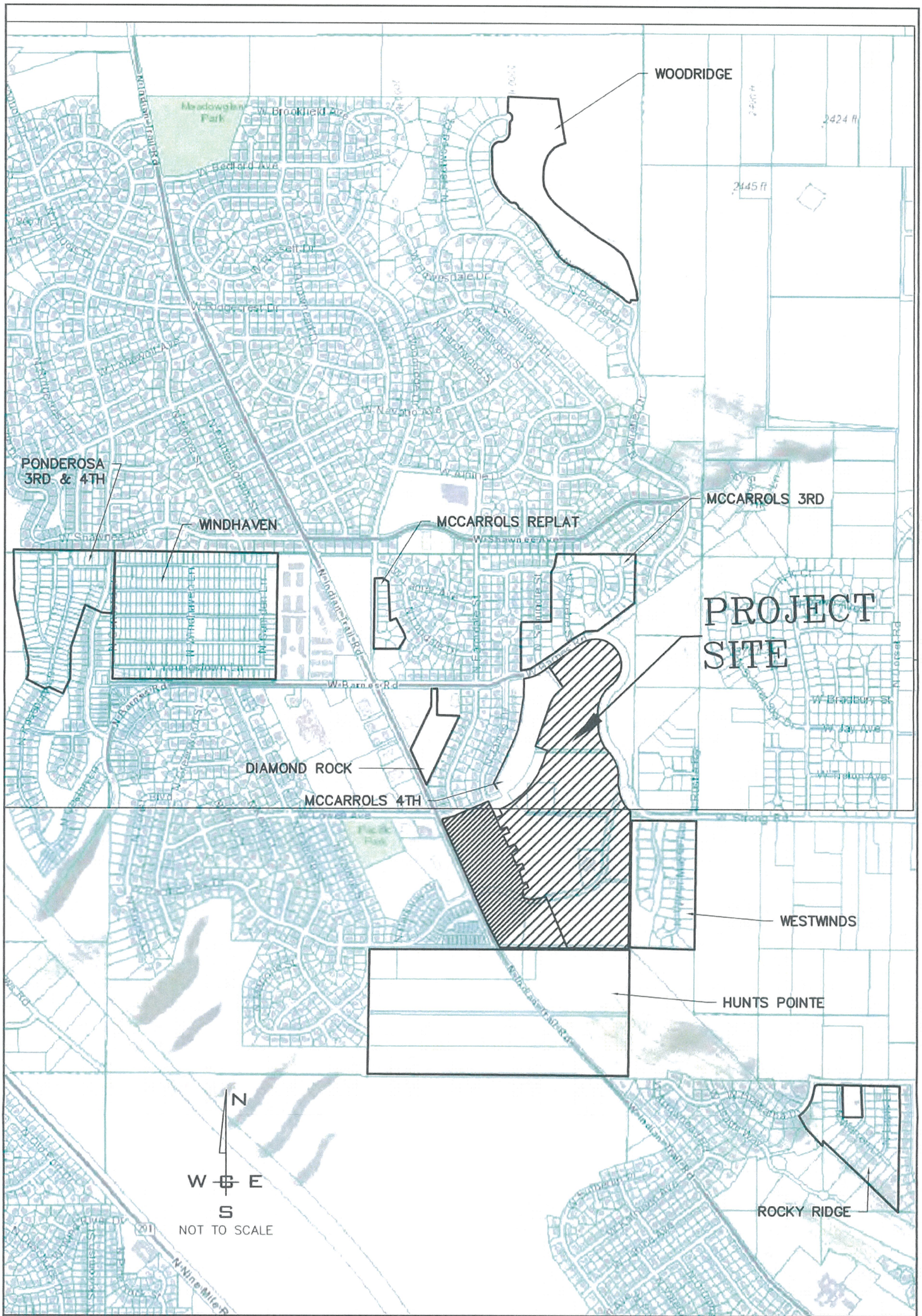

FIGURE 5

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

BACKGROUND PROJECT LOCATIONS

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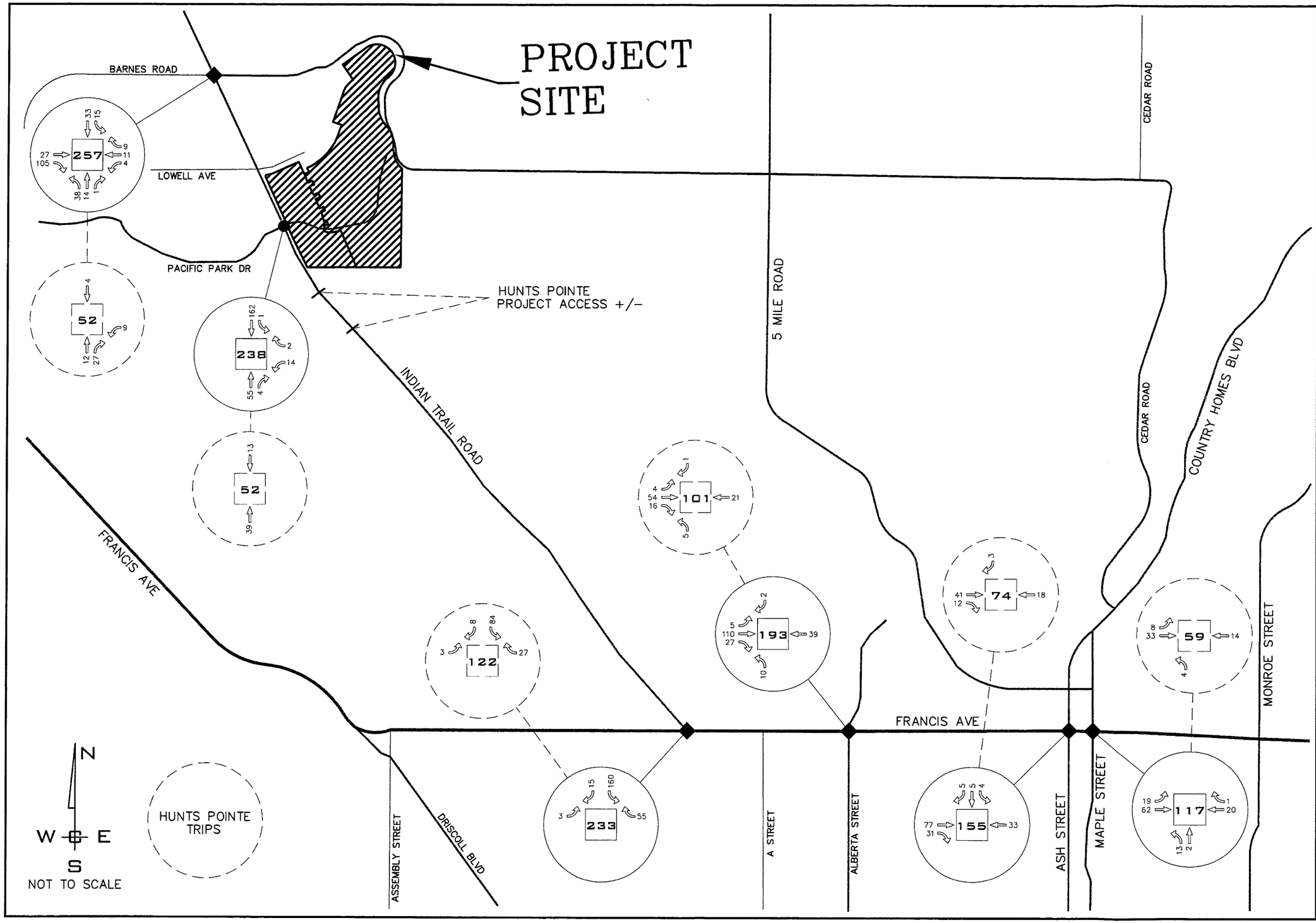

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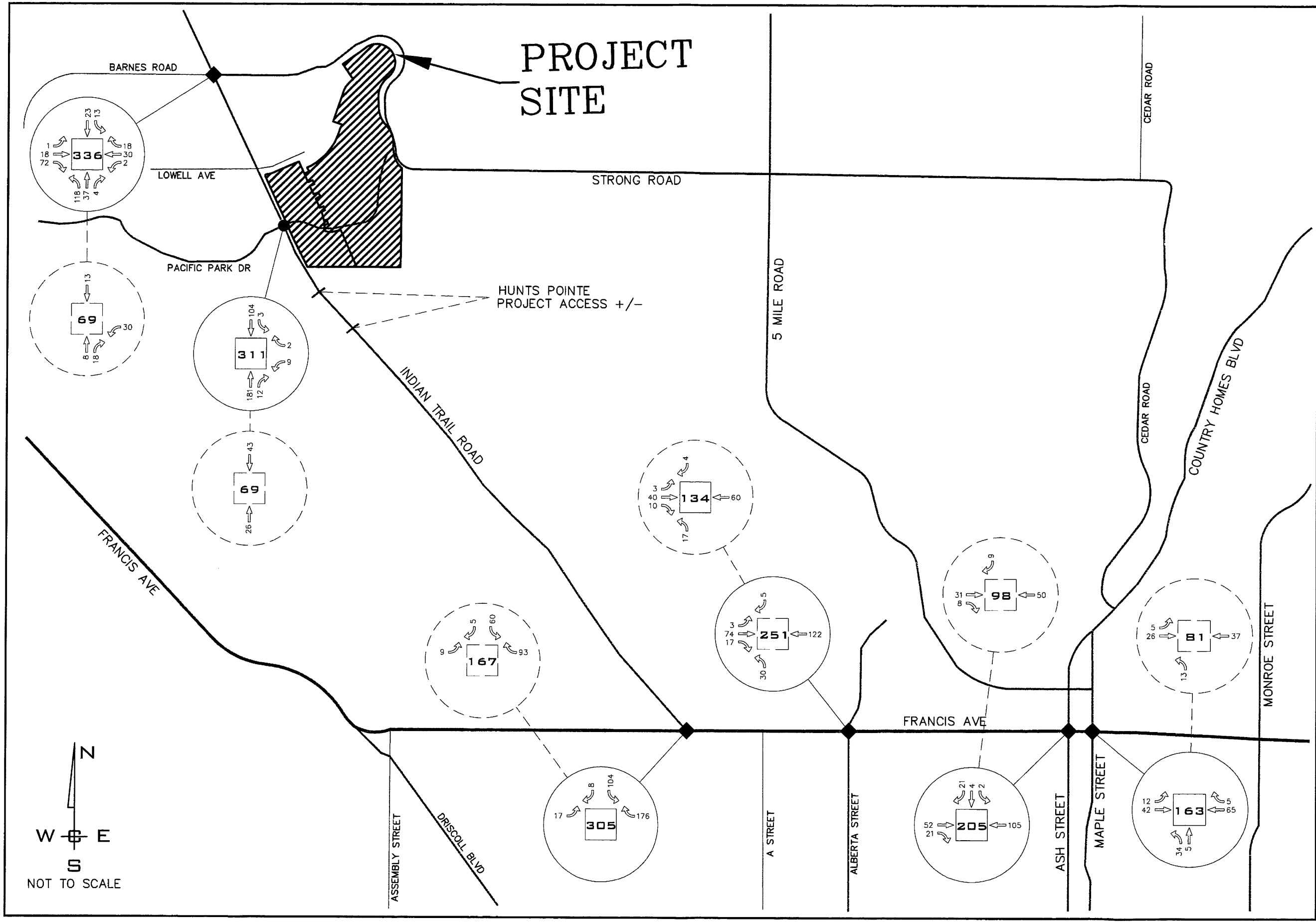
TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

AM BACKGROUND TRIPS

FIGURE
6



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TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

PM BACKGROUND TRIPS

FIGURE
7

As noted earlier, trip generation rates for the AM and PM peak hours are determined by the use of the *Trip Generation Manual, 9th Edition* published by the Institute of Transportation Engineers (ITE). The purpose of the *Trip Generation Manual* is to compile and quantify empirical data into trip generation rates for specific land uses within the US, UK and Canada.

For the proposed 112 dwelling units of McCarrolls East 5th Addition and the anticipated 203 dwelling units of the Remainder of McCarrolls East a total of 315 dwelling units are to be considered for analysis, Land Use Code (LUC) 210 Single Family Detached was used to establish the number of potential trips generated by the land use. The trip generation rates and the anticipated number of AM & PM peak hour trips for the land use of the proposed project are shown on Table 3.

Table 3-Trip Generation Rates for LUC # 210 – Single Family Detached – Figures 8 & 9

Dwelling Units	AM Peak Hour Trips			PM Peak Hour Trips		
	Vol. @ 0.75 per Unit	Directional Distribution		Vol. @ 1.00 per Unit	Directional Distribution	
		25% In	75% Out		63% In	37% Out
112	84	21	63	112	70	42
203	153	38	115	203	128	75
315	**237**	**59**	**178**	**315**	**198**	**117**

Average Daily Trip Ends (ADT)		
Units	Rate	ADT
112	9.52	1,067
203	9.52	1,933
315	**-**	**3,000**

As shown in Table 4, the proposed land use of the development is anticipated to generate 237 trips in the AM peak hour with 59 trips entering the site and 178 trips exiting the site. In the PM, peak hour, the land use of the proposed project is anticipated to generate 315 trips with 198 trips entering the site and 117 trips exiting the site. The land use of the proposed project is anticipated to generate 3,000 average daily trips to/from the project.

Trip Distribution

The trip distribution of the project is anticipated to follow the distribution established with TAZ 30 (from SRTC), which is: 7% to/from the north via Indian Trail Road, 6% to/from the West via Barnes Road, 30% to/from the east via Barnes Road and the Five-Mile Plateau, 2% to/from the West via Lowell Avenue, 2% to/from the west via Pacific Park Drive, 53% to/from the south via Indian Trail Road where 5% to/from the west via Francis Avenue, 4% to/from the south via A Street, 6% to/from the south via Alberta Street, 18% to/from the south via the Maple/Ash Street Couplet, 7% to/from the north via the Maple/Ash Street Couplet, and 13% of trips to/from the east via Francis Avenue.

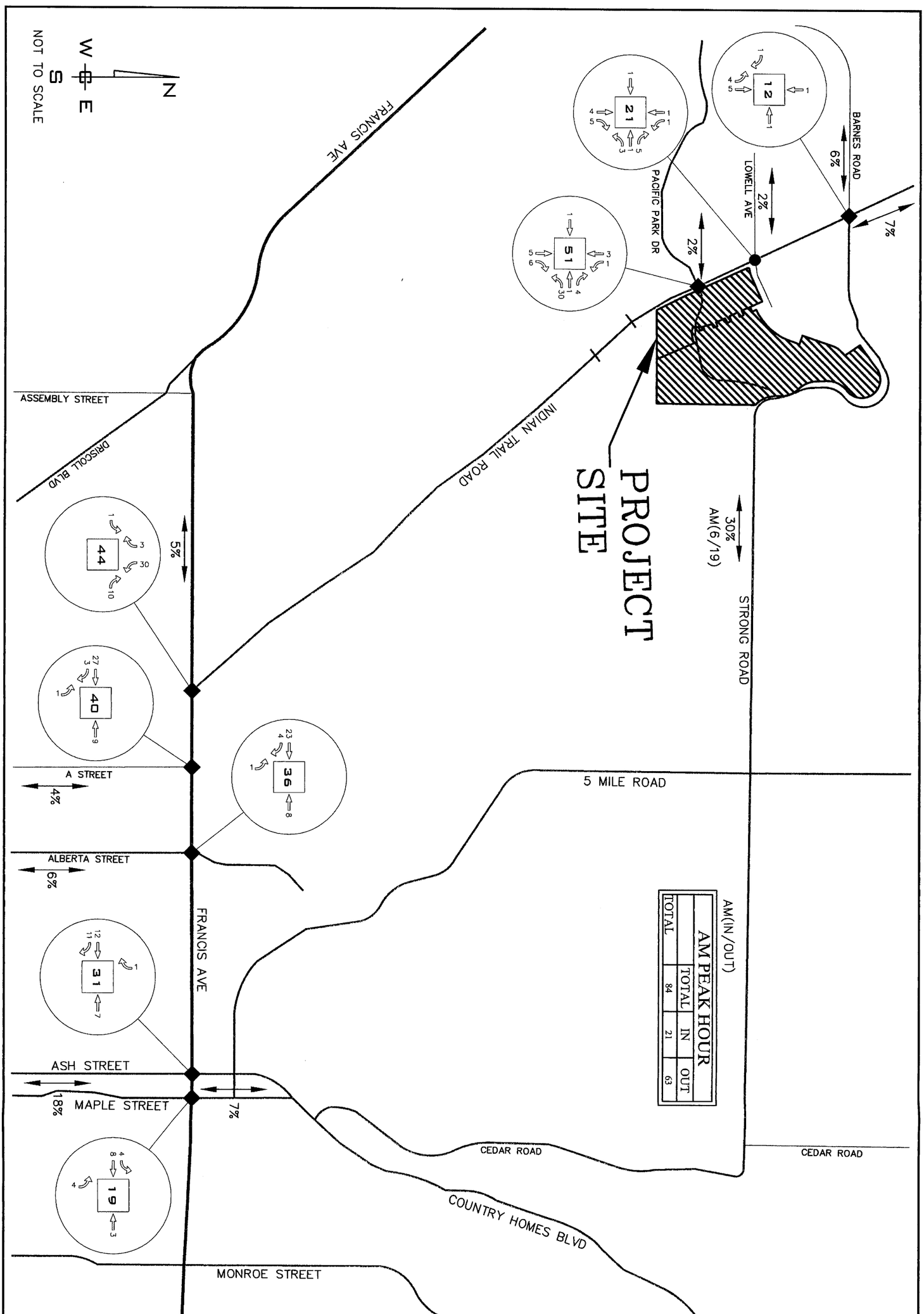

FIGURE 8

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

AM 5TH ADDITION TRIP DISTRIBUTION

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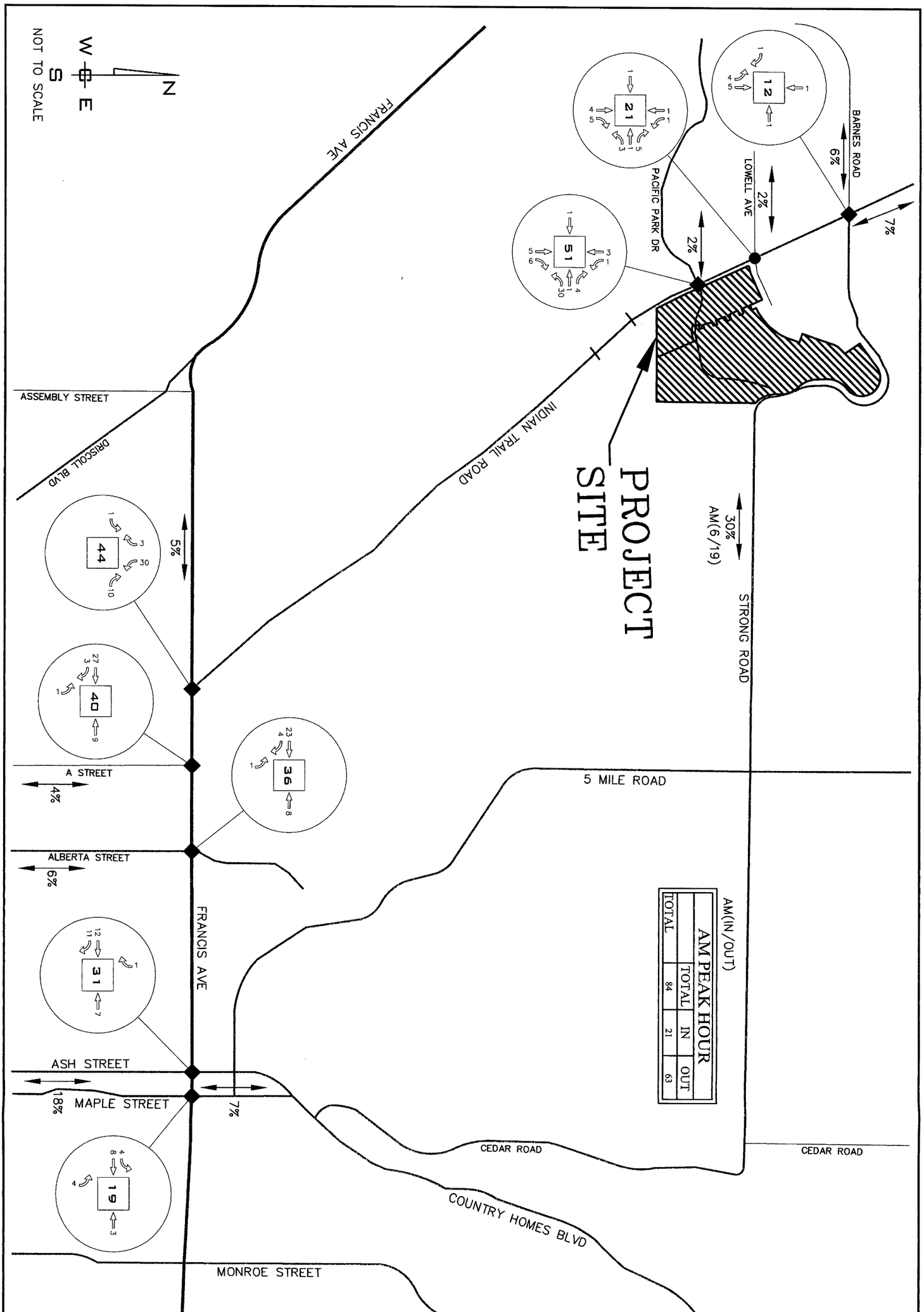

FIGURE 8

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

AM 5TH ADDITION TRIP DISTRIBUTION

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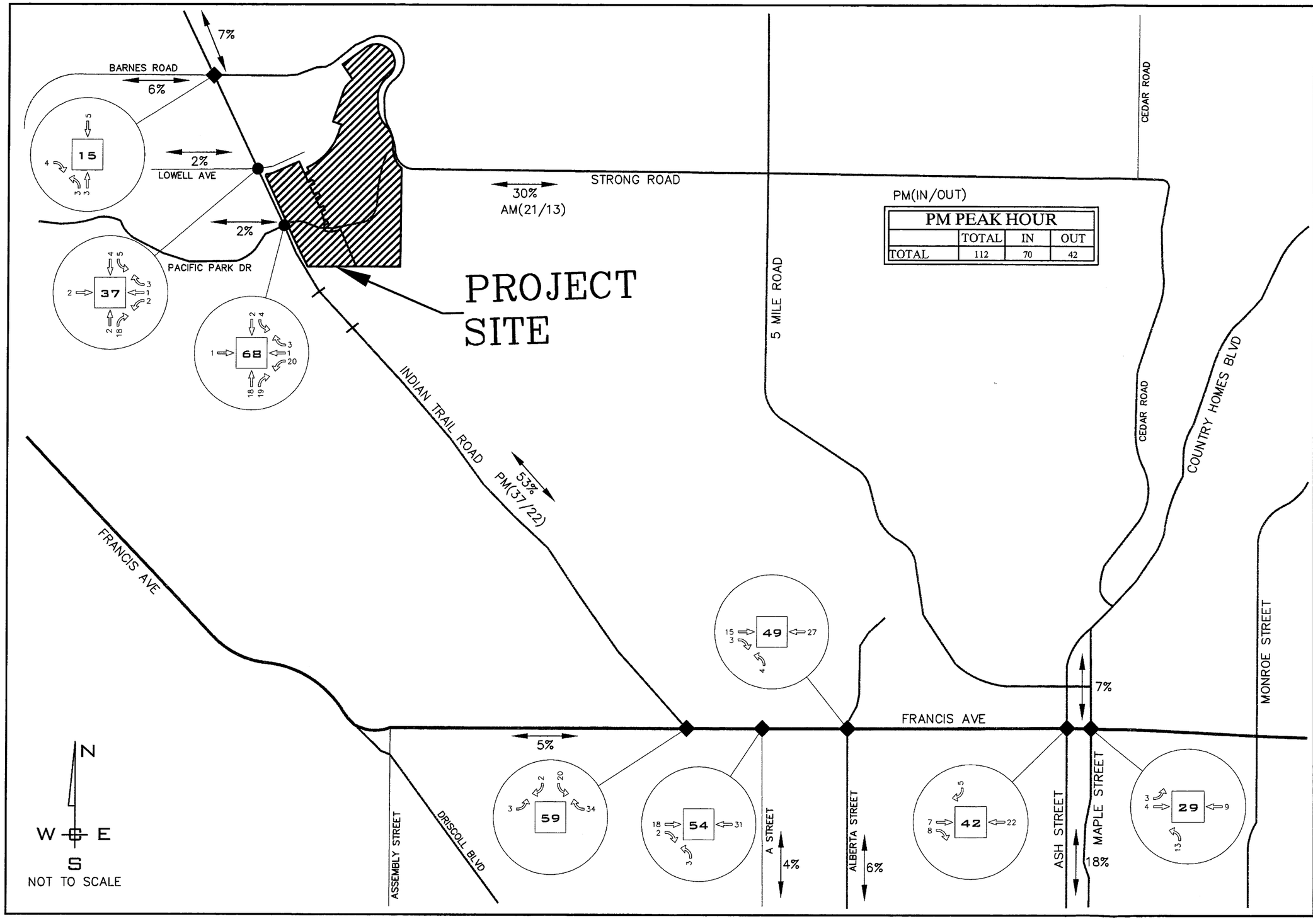

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TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

PM 5TH ADDITION TRIP DISTRIBUTION

FIGURE
9

Year 2017 with the Project, with the Vested Background Projects

This scenario assumes that the development has moved forward and the background projects have been completed. The traffic volumes for this condition include the traffic volumes shown on Figures 12 & 13 and adds the project trips as shown on Figures 8 & 9. Please see Figures 14 & 15 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 5- Year 2017 Levels of Service, with the Project, with the Background Projects – Figures 14 & 15

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour Delay (sec)	AM Peak Hour LOS	PM Peak Hour Delay (sec)	PM Peak Hour LOS
Indian Trail Road & Barnes Road	S	25.0	C	17.4	B
Indian Trail Road & Strong Road/ Pacific Park Dr	S	**81.3**	**F**	50.3	D
• Adjust Signal Timing		(18.5)	(B)	(28.6)	(C)
Indian Trail Road & Francis Avenue	S	16.1	B	9.5	A
Francis Avenue & Alberta Street	S	53.6	D	42.9	D
Francis Avenue & Ash Street	S	14.9	B	20.3	C
• Adjust Timing		(17.4)	(B)	(20.8)	(C)
Francis Avenue & Maple Street	S	11.0	B	66.5	E
• Add WB Right Turn Lane, adjust Timing		(11.4)	(B)	(48.2)	(D)

The City of Spokane has established level of service E as the minimum acceptable level for signalized and unsignalized intersections, While WSDOT has established Level of Service D as the minimum acceptable level of service for signalized intersections. Any signalized intersection operating below LOS D should be maintained at the existing level of service.

As shown on Table 5 with the development, and the connection of Barnes Road to the Five-Mile Plateau, we anticipate that the intersection of Indian Trail Road & Strong Road/Pacific Park Drive will fall below an acceptable level of service. As well as the intersection of Francis Avenue & Maple Street.

The intersection of Indian Trail Road & Strong Road/ Pacific Park Drive can be brought back to an acceptable level of service by adjusting the signal timing, equal to the cycle length of the signal at Indian Trail Road & Barnes Road.

Although in this analysis of the Maple Street & Francis Avenue, the Level of Service is at LOS E is the same as the existing condition. The same improvement and signal timing has been applied as the previous "without project" scenario

Based upon this analysis it is anticipated that the impact of the proposed project will not be an unreasonable adjustment to signal timing and that the collected traffic impact fee funds of each lot may be applied to the improvement at Francis Avenue & Maple Street.

PROJECT SITE

BARNES ROAD
6%
7%
2%
LOWELL AVE
2%
PACIFIC PARK DR
STRONG ROAD
30%
AM(18/53)
INDIAN TRAIL ROAD
53%
AM(20/61)
5 MILE ROAD
CEDAR ROAD
CEDAR ROAD
COUNTRY HOMES BLVD
MONROE STREET
FRANCIS AVE
FRANCIS AVE
5%
7%
ASSEMBLY STREET
DRISCOLL BLVD
A STREET
4%
ALBERTA STREET
6%
ASH STREET
MAPLE STREET
18%

AM(IN/OUT)

AM PEAK HOUR			
	TOTAL	IN	OUT
TOTAL	153	38	115

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PROJ #: 16-1604
DATE: 11/03/16
DRAWN: RMA
APPROVED: TRW

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

AM REMAINDER TRIP DISTRIBUTION

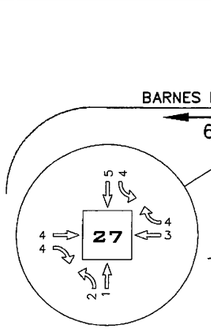
FIGURE
10

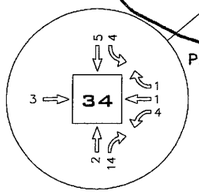
PROJECT SITE

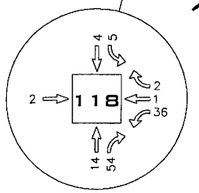
BARNES ROAD
6%
7%
2%
LOWELL AVE
2%
PACIFIC PARK DR
STRONG ROAD
30%
PM(38/23)
5 MILE ROAD
CEDAR ROAD
CEDAR ROAD
COUNTRY HOMES BLVD
INDIAN TRAIL ROAD
53%
PM(68/40)
FRANCIS AVE
ASSEMBLY STREET
DRISCOLL BLVD
5%
FRANCIS AVE
A STREET
4%
ALBERTA STREET
6%
ASH STREET
MAPLE STREET
18%
7%
MONROE STREET

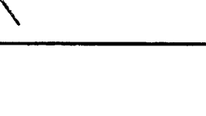
PM(IN/OUT)

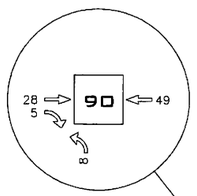
PM PEAK HOUR			
	TOTAL	IN	OUT
TOTAL	203	128	75

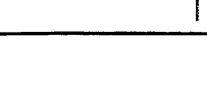












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TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

PM REMAINDER TRIP DISTRIBUTION

FIGURE
11

FUTURE YEAR TRAFFIC IMPACT ANALYSIS

Future Year Traffic Impact Analysis

Level of service calculations for the Years 2017 and 2021 conditions assumed that the existing traffic volumes as shown on Figures 3 & 4 experience an increase above the 2016 volumes at the established background rate. Two scenarios were examined for the year 2017, the buildout year for the 5th Addition, the first scenario assumes that the development has not moved forward and analyzes the scoped intersections with the background growth rate and the platted background project trips. The second scenario assumes the same, but adds the project trips. For the year 2021 three scenarios were examined. The first scenario assumes that the development has not moved forward and analyzes the scoped intersections with the background growth rate and the platted background project trips. The second scenario assumes the same, but adds the project trips. The third scenario adds the Hunts Pointe project to the Second Scenario. These scenarios will allow a determination to be made of what the future conditions may be with and without the project.

Year 2017 without the Project, with the Vested Background Projects

This scenario assumes that the development has not moved forward and the background projects have been completed. The traffic volumes for this condition include the existing traffic, as shown on Figures 3 & 4 multiplied by the background growth rate, and the traffic from the background projects as shown on Figures 6 & 7. Please see Figures 12 & 13 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 4- Year 2017 Levels of Service, without the Project, with the Vested Background Projects – Figures 12 & 13

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Barnes Road	S	24.7	C	17.3	B
Indian Trail Road & Strong Road/ Pacific Park Dr.	S	20.7	C	37.6	D
Indian Trail Road & Francis Avenue	S	14.4	B	9.3	A
Francis Avenue & Alberta Street	S	32.3	C	40.7	D
Francis Avenue & Ash Street • Adjust Timing	S	15.0 (14.5)	B (B)	17.8 (20.4)	B (C)
Francis Avenue & Maple Street • Add WB Right Turn Lane, adjust Timing	S	11.0 (11.3)	B (B)	**81.7** (49.7)	**F** (D)

The City of Spokane has established level of service E as the minimum acceptable level for signalized and unsignalized intersections, While WSDOT has established Level of Service D as the minimum acceptable level of service for signalized intersections. Any signalized intersection operating below LOS D should be maintained at the existing level of service. With the platted background projects and the Barnes Road connection to Five-Mile Road the intersection of Francis Avenue & Maple Street is anticipated to fall below an acceptable level of service. The intersection of Francis Avenue & Maple Street can be brought back to an acceptable level of service by installing a westbound right turn lane at the intersection and adjusting the timing of the two couplet intersections.

We therefore recommend that the City of Spokane include the anticipated improvement on the City's Transportation Improvement Plan (TIP).

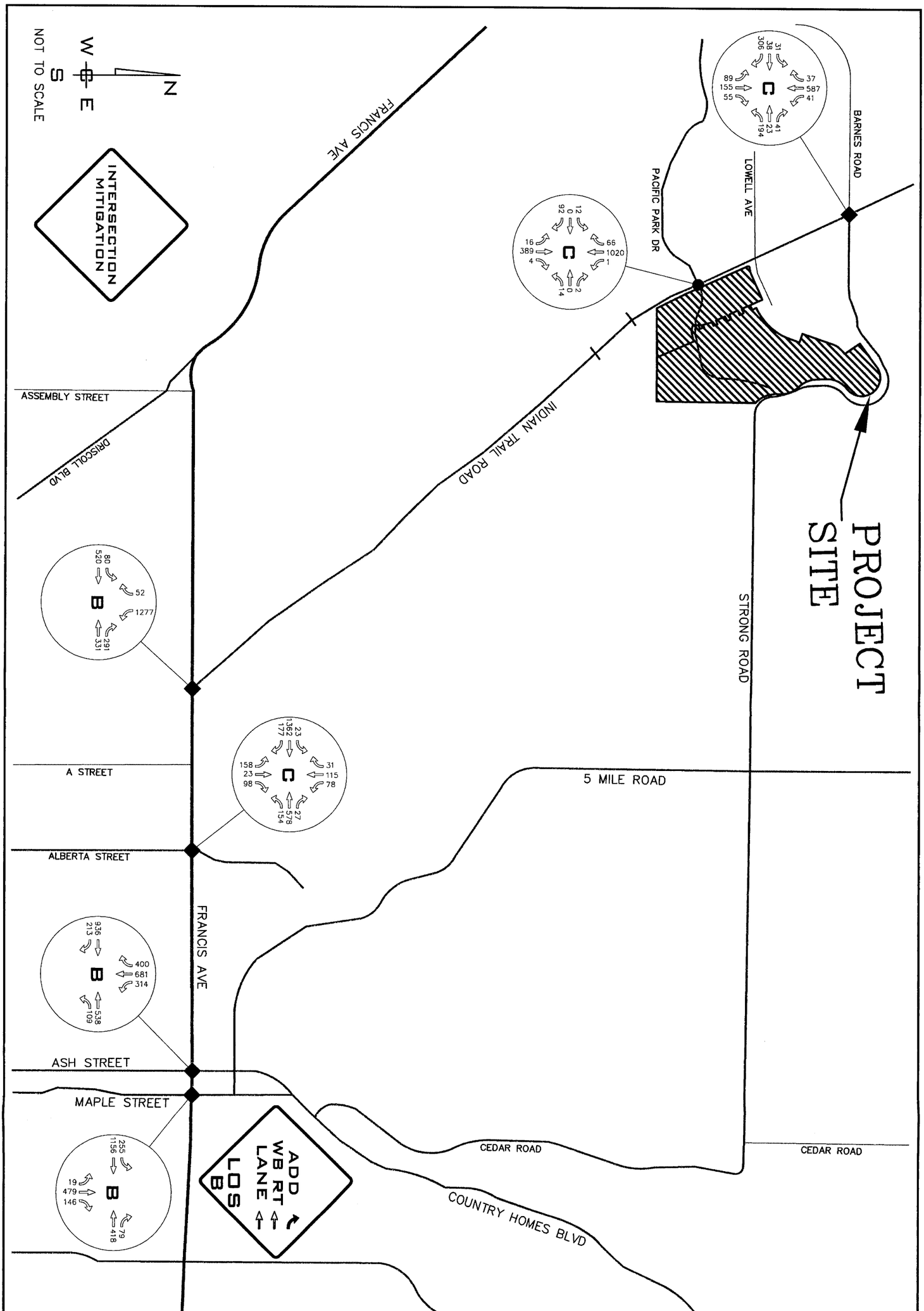

FIGURE 12

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2017 AM VOL. W-O PROJECT & LOS

PROJ #: 16-1604
DATE: 11/03/16
DRAWN: RMA
APPROVED: TRW

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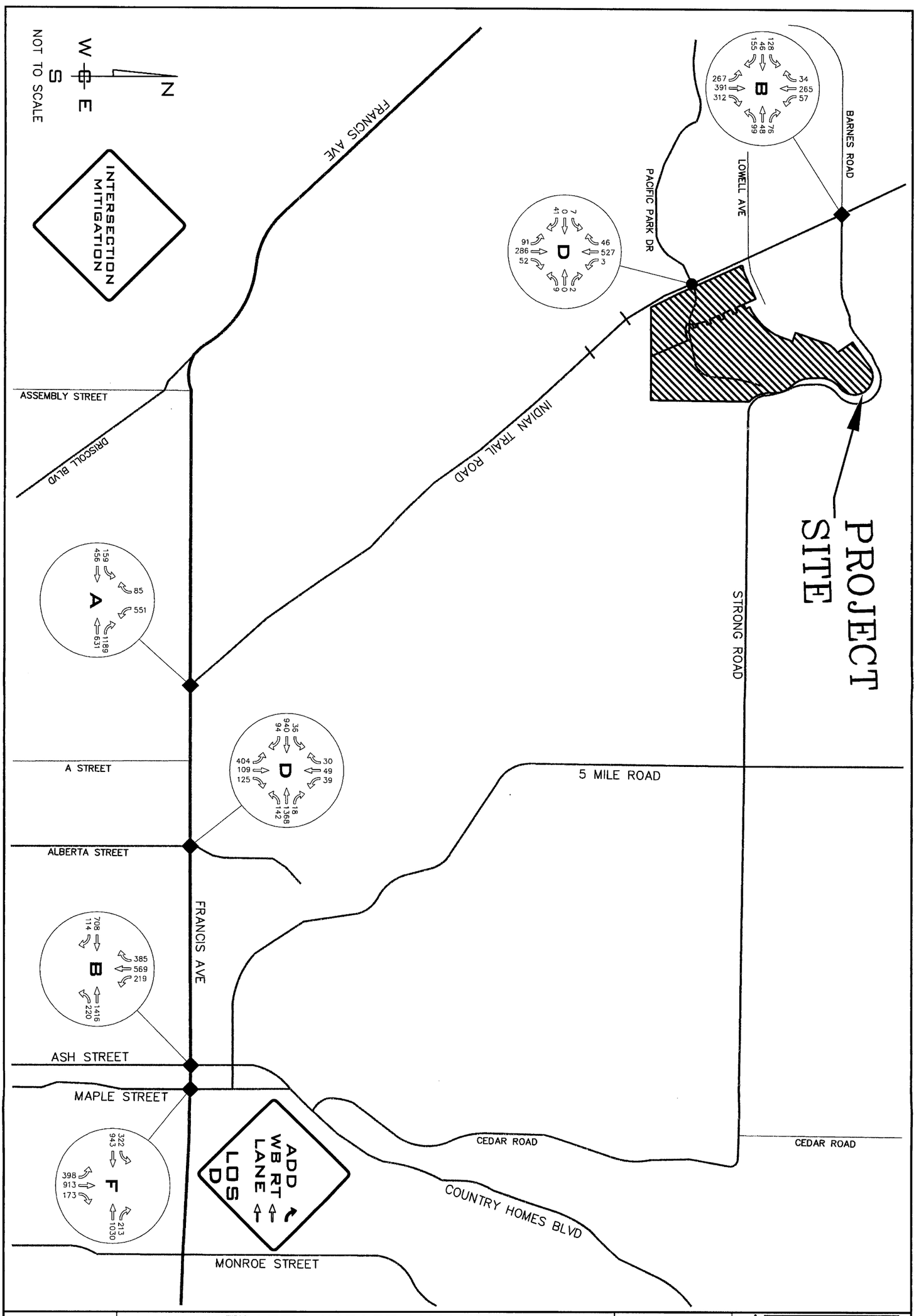

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2017 PM VOL. W-O PROJECT & LOS

FIGURE 13

PROJ #: 16-1604
DATE: 11/03/16
DRAWN: RMA
APPROVED: TRW

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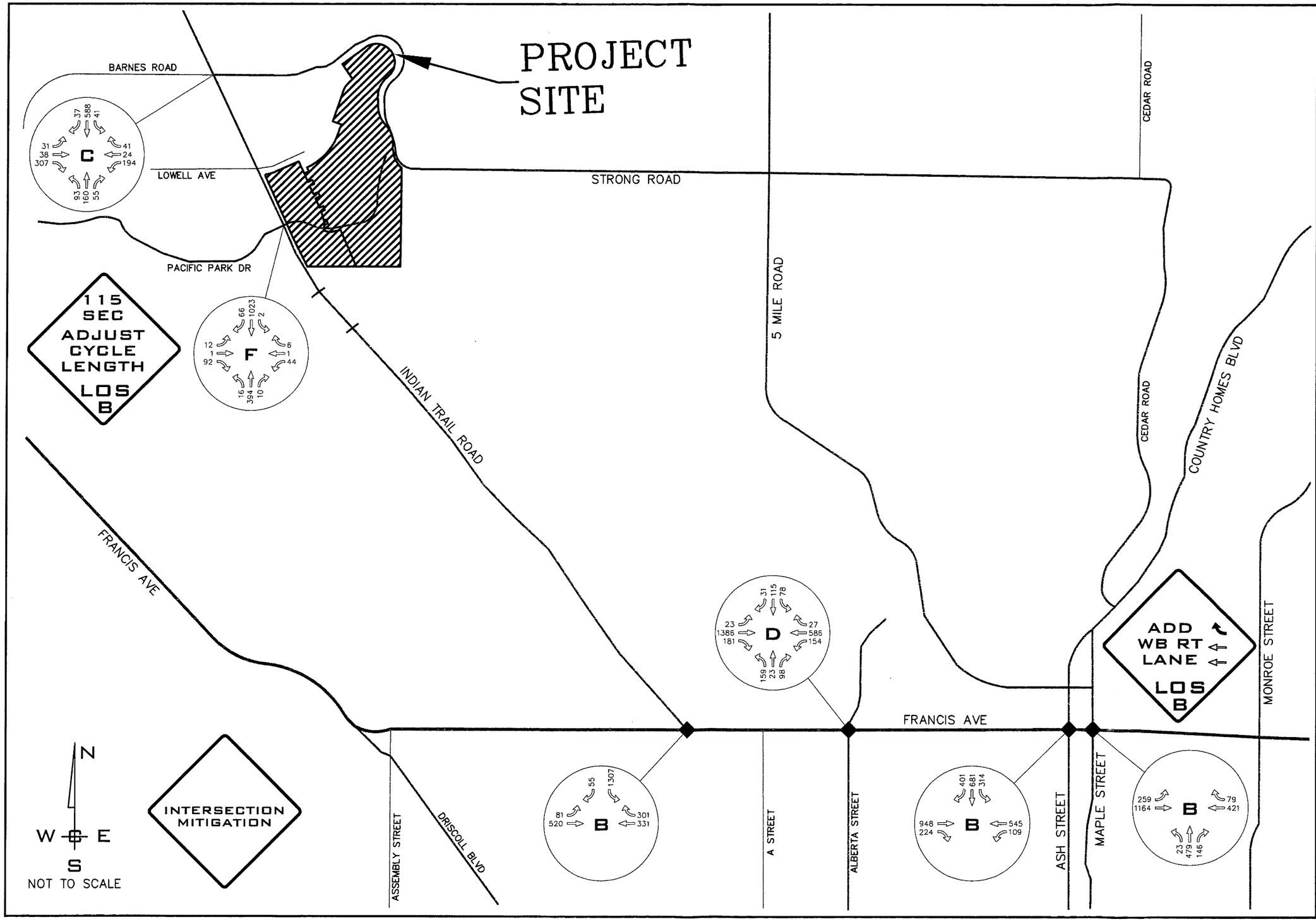

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2017 AM VOL. W- PROJECT & LOS

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FIGURE
14

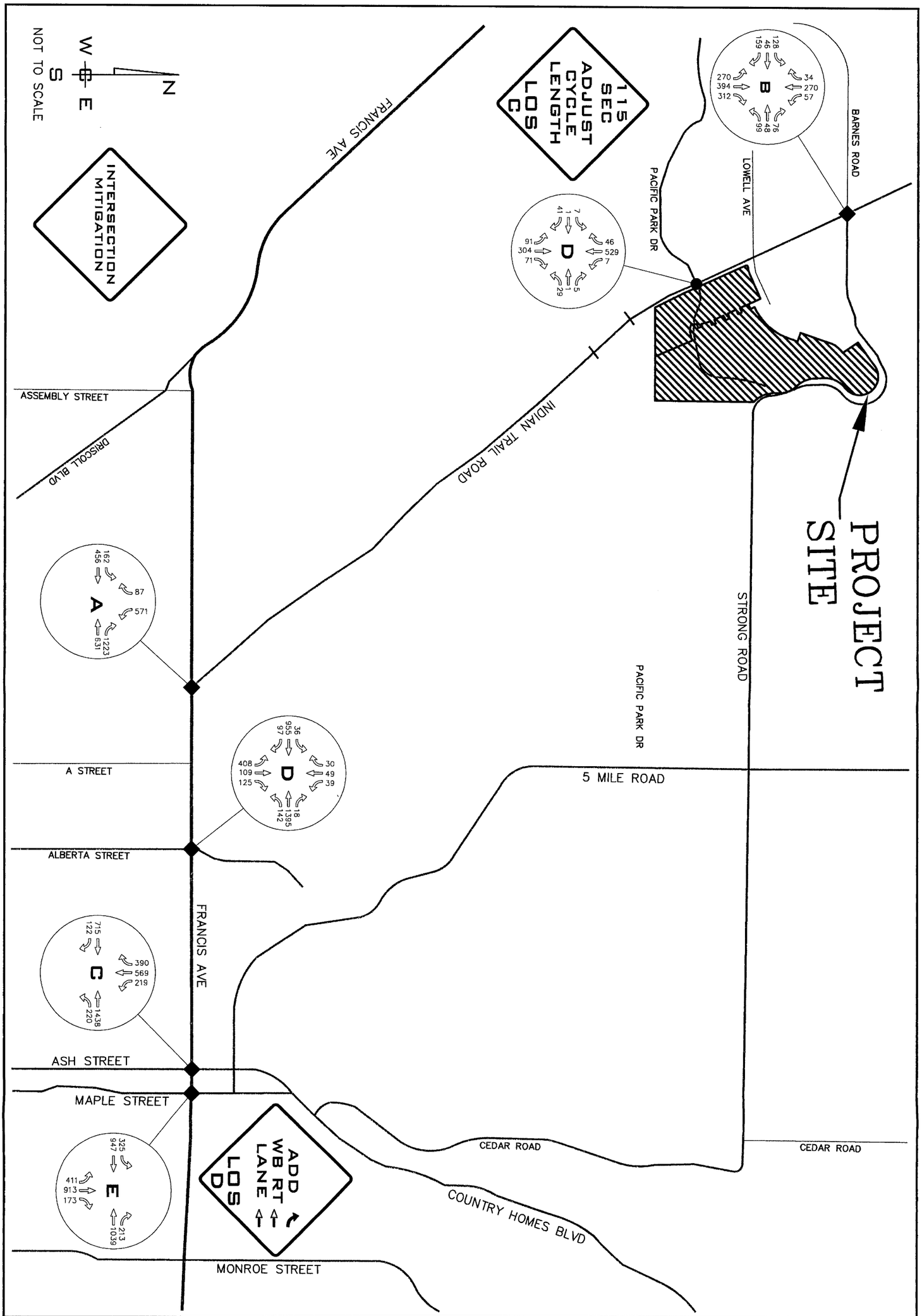

FIGURE 15

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2017 PM VOL. W- PROJECT & LOS

PROJ #: 16-1604
DATE: 11/03/16
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Year 2021 without the Project, with the Vested Background Projects
This scenario assumes that the development has not moved forward and the background projects have been completed. The traffic volumes for this condition include the existing traffic, as shown on Figures 3 & 4 multiplied by the background growth rate, and the traffic from the background projects as shown on Figures 6 & 7. Please see Figures 16 & 17 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 6- Year 2021 Levels of Service, without the Project, with the Vested Background Projects – Figures 16 & 17

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Barnes Road	S	25.5	C	17.5	B
Indian Trail Road & Strong Road/ Pacific Park Dr.	S	23.1	C	42.5	D
Indian Trail Road & Francis Avenue	S	16.1	B	9.5	A
Francis Avenue & Alberta Street	S	54.5	D	43.4	D
Francis Avenue & Ash Street • Adjust Timing	S	14.2 (16.1)	B (B)	14.7 (20.6)	B (C)
Francis Avenue & Maple Street • Add WB Right Turn Lane, adjust Timing	S	11.5 (11.3)	B (B)	**95.8** (75.6)	**F** (E)

The City of Spokane has established level of service E as the minimum acceptable level for signalized and unsignalized intersections, While WSDOT has established Level of Service D as the minimum acceptable level of service for signalized intersections. Any signalized intersection operating below LOS D should be maintained at the existing level of service.

With the platted background projects and the Barnes Road connection to Five-mile Road the intersection of Francis Avenue & Maple Street is anticipated to fall below an acceptable level of service. The intersection of Francis Avenue & Maple Street can be brought back to an acceptable level of service by installing a westbound right turn lane at the intersection.

We therefore recommend that the City of Spokane include the anticipated improvement on the City's Transportation Improvement Plan (TIP).

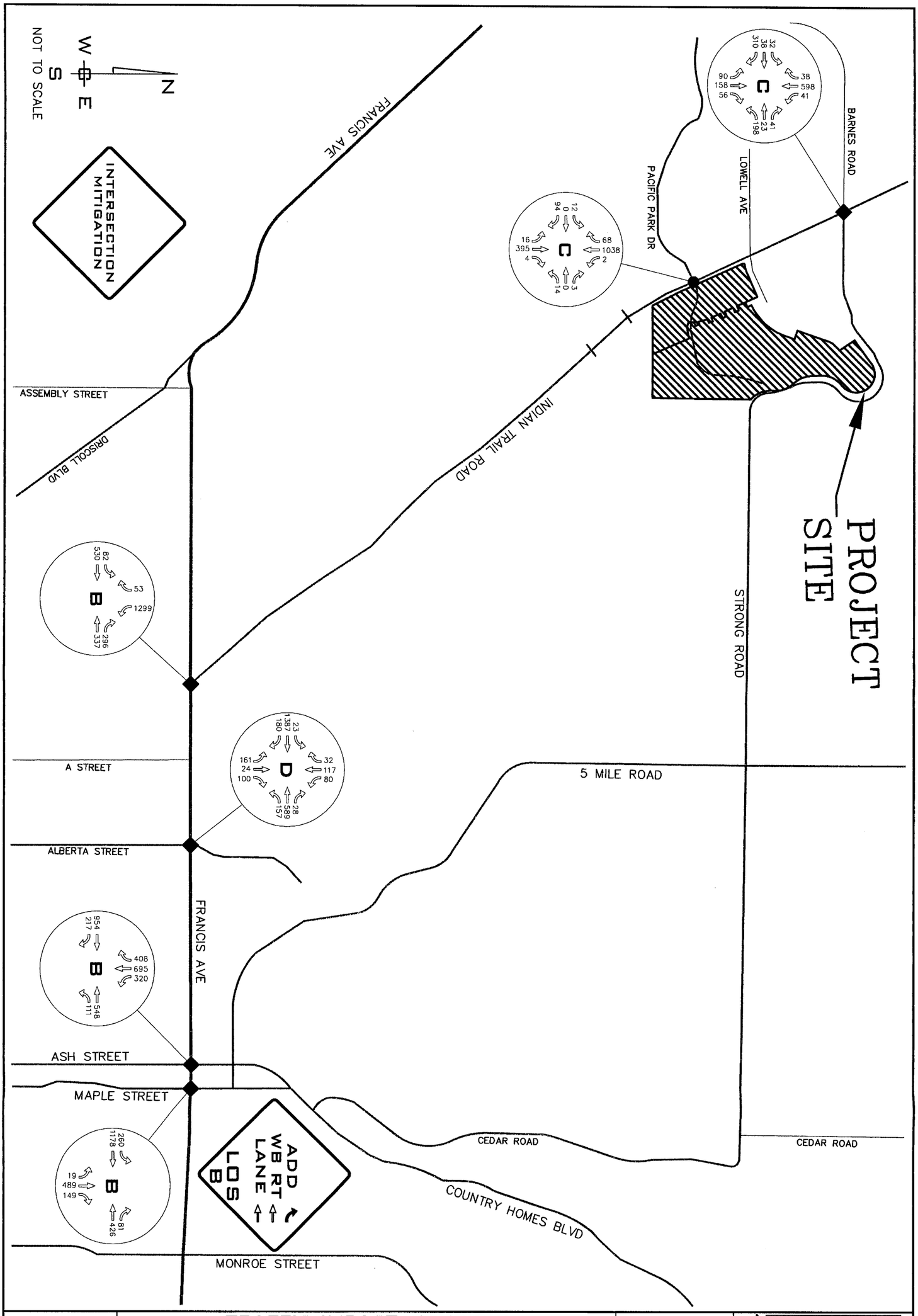

FIGURE 16

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2021 AM VOL. W-O PROJECT & LOS

PROJ #: 16-1604
DATE: 11/03/16
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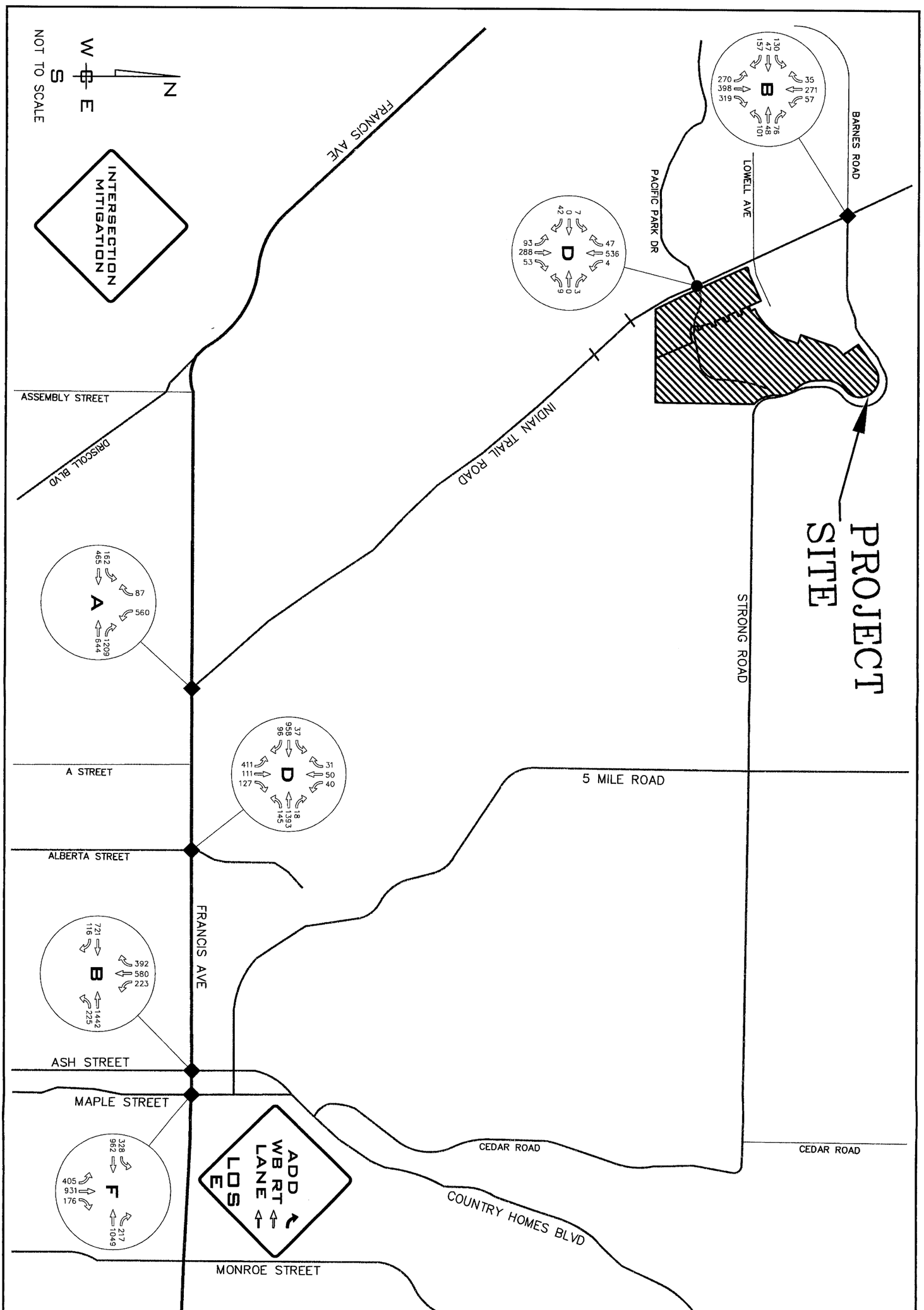

FIGURE 17

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2021 PM VOL. W-O PROJECT & LOS

PROJ #: 16-1604
DATE: 11/03/16
DRAWN: RMA
APPROVED: TRW

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Year 2021 with the Project, with the Vested Background Projects

This scenario assumes that the development has moved forward and the background projects have been completed. The traffic volumes for this condition include the traffic volumes shown on Figures 12 & 13 and adds the project trips as shown on Figures 8 through 11. Please see Figures 18 & 19 for the traffic volumes used for this scenario. A summary of the level of service results are shown in the following table.

Table 7- Year 2021 Levels of Service, with the Project, with the Background Projects – Figures 18 & 19

INTERSECTION (S)ignalized (U)nsignalized		AM Peak Hour		PM Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Indian Trail Road & Barnes Road	S	25.8	C	17.8	B
Indian Trail Road & Strong Road/ Pacific Park Dr. • Adjust Signal Timing	S	**112.5** (42.6)	**F** (D)	**98.0** (39.3)	**F** (D)
Indian Trail Road & Francis Avenue	S	19.8	B	10.3	B
Francis Avenue & Alberta Street	S	**64.9** (53.3)	**E** (D)	51.4 (51.4)	D (D)
Francis Avenue & Ash Street	S	20.1 (22.1)	C (C)	15.7 (25.8)	B (C)
Francis Avenue & Maple Street • Add WB Right Turn Lane	S	11.6 (11.8)	B (B)	77.9 (66.9)	E (E)

The City of Spokane have established level of service E as the minimum acceptable level for signalized and unsignalized intersections, While WSDOT has established Level of Service D as the minimum acceptable level of service for signalized intersections. Any signalized intersection operating below LOS D should be maintained at the existing level of service.

As shown on Table 5 with the development, and the connection of Barnes Road to the Five-Mile Plateau, we anticipate that the intersection of Indian Trail Road & Strong Road/Pacific Park Drive will fall below an acceptable level of service. As well as the intersections of Francis Avenue & Alberta Street and Francis Avenue & Maple Street.

As previously discussed the intersection of Francis Avenue & Maple Street can be brought back to an acceptable level of service by adding a westbound right turn lane. The intersections of Indian Trail Road & Strong Road/ Pacific Park Drive and Francis Avenue & Alberta Street can be brought back to an acceptable level of service by adjusting the signal timing.

Based upon this analysis it is anticipated that the impact of the proposed project will not be an unreasonable adjustment to signal timing and that the collected traffic impact fee funds of each lot may be applied to the improvement at Francis Avenue & Maple Street.

TRAFFIC IMPACT FEE

As the property, is within the City of Spokane, a voluntary impact fee for the City of Spokane is considered here. The City of Spokane code has established transportation impact fees under Spokane Municipal Code Title 17 Chapter 17D.030. The proposed project is to be within the Northwest Service area and as such is subject to the current Impact Fee Schedule. Tables 8 & 9 calculates the anticipated Impact fee for the proposed project.

Table 8 – Phase 1 – Proposed Land Use Impact Fee

Land Use	LUC	Quantity Units	Unit of Measure	Fee per unit	Fee
McCarrolls East 5th Addition	210	112	Dwelling	$749.20	83,910.40

Table 9 – Phase 2 – Proposed Land Use Impact Fee

Land Use	LUC	Quantity Units	Unit of Measure	Fee per unit	Fee
McCarrolls East Remainder	210	203	Dwelling	$749.20	152,087.60

As shown in Tables 8 and Table 9, the proposed project under the current fee schedule is anticipated to generate an impact fee of **$83,910.40** for the 5th Addition and of **$152,087.60** for remainder of the plat. Traffic impact fees are to be due at the time of building permit.

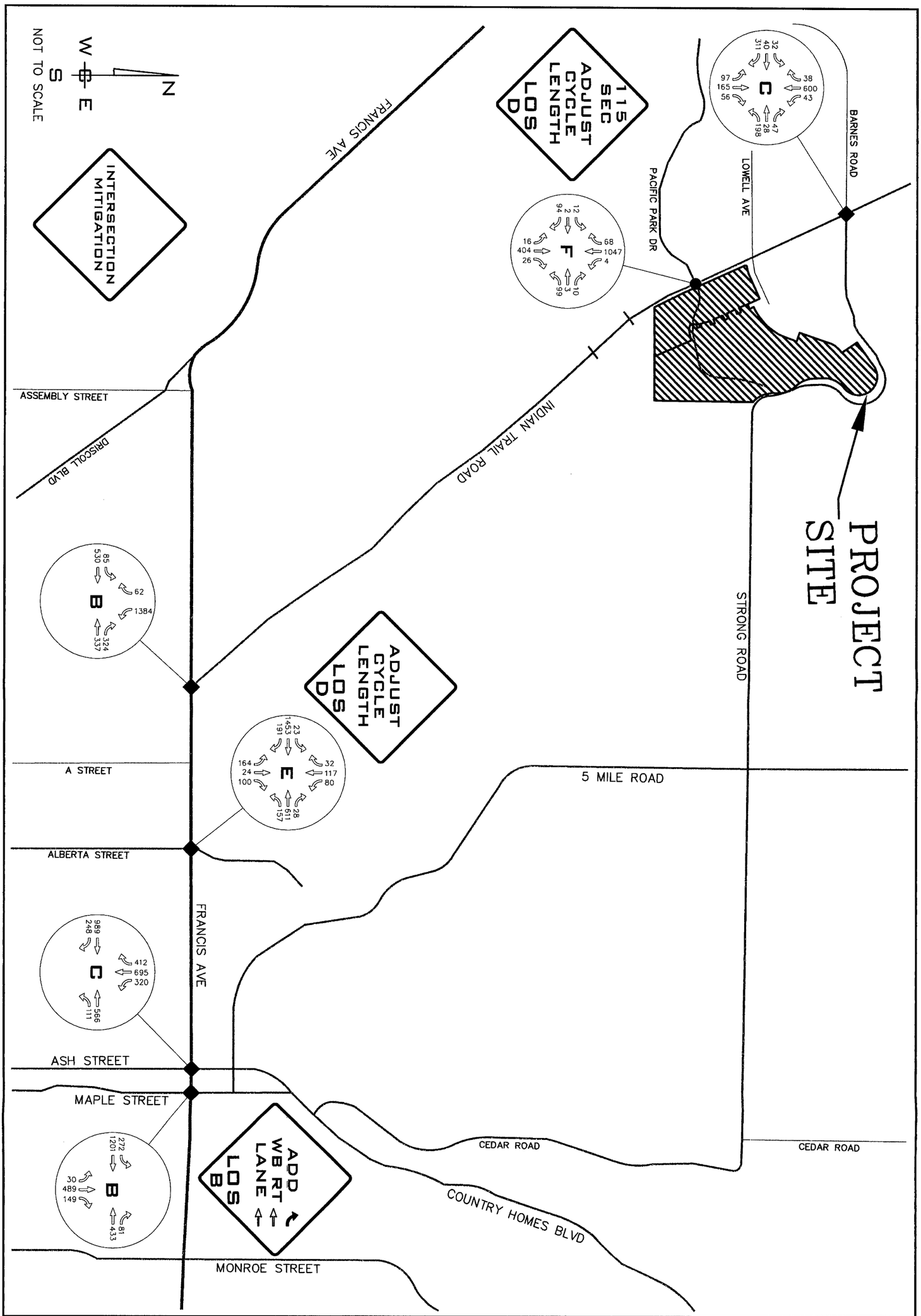

FIGURE 18

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2021 AM VOL. W- PROJECT & LOS

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PROJECT SITE

BARNES ROAD

LOWELL AVE

PACIFIC PARK DR

STRONG ROAD

5 MILE ROAD

CEDAR ROAD

INDIAN TRAIL ROAD

FRANCIS AVE

ASSEMBLY STREET

DRISCOLL BLVD

A STREET

ALBERTA STREET

ASH STREET

MAPLE STREET

MONROE STREET

COUNTRY HOMES BLVD

B: 35, 281, 61, 80, 51, 101, 275, 402, 319, 130, 51, 165

F: 47, 542, 13, 8, 2, 65, 93, 320, 126, 7, 3, 42

115 SEC ADJUST CYCLE LENGTH LOS D

ADJUST CYCLE LENGTH LOS D

D: 31, 50, 40, 18, 1469, 145, 423, 111, 127, 37, 1001, 104

B: 93, 616, 1305, 644, 171, 465

B: 406, 580, 223, 1504, 225, 742, 138

ADD WB RT LANE LOS E

E: 336, 975, 217, 1075, 441, 931, 176

INTERSECTION MITIGATION

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TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2021 PM VOL. W- PROJECT & LOS

FIGURE
19

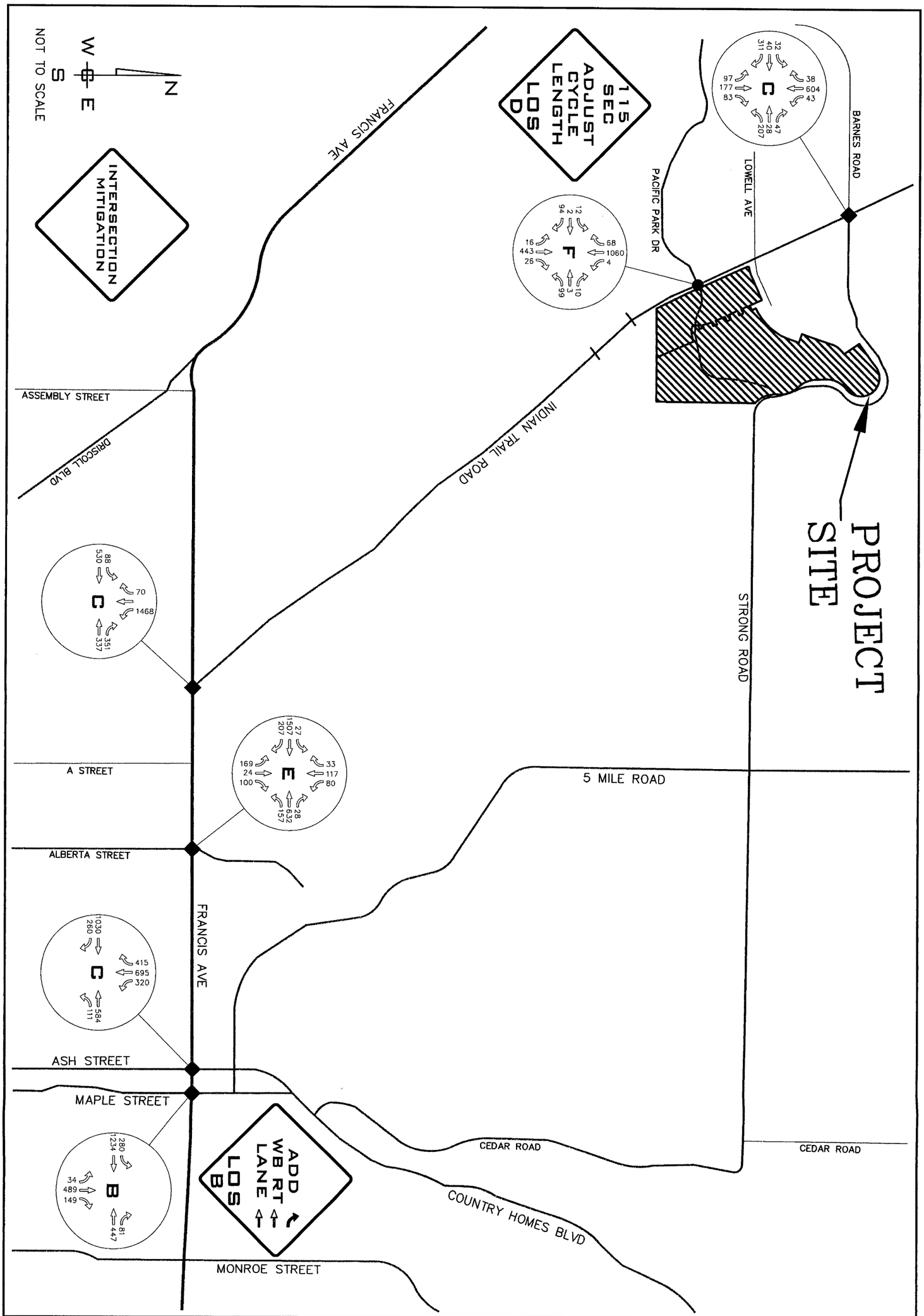

FIGURE 20	TRAFFIC IMPACT ANALYSIS **McCARROLLS EAST** 8510 N INDIAN TRAIL ROAD SPOKANE, WASHINGTON 2021 AM VOL. W- PROJECT/HUNTSPOINTE & LOS	PROJ #: 16-1604 DATE: 11/03/16 DRAWN: RMA APPROVED: TRW	WCE WHIPPLE CONSULTING ENGINEERS CIVIL, STRUCTURAL AND TRANSPORTATION ENGINEERING 2528 NORTH SULLIVAN ROAD SPOKANE VALLEY, WASHINGTON 99216 PH: 509-893-2617 FAX: 509-926-0227

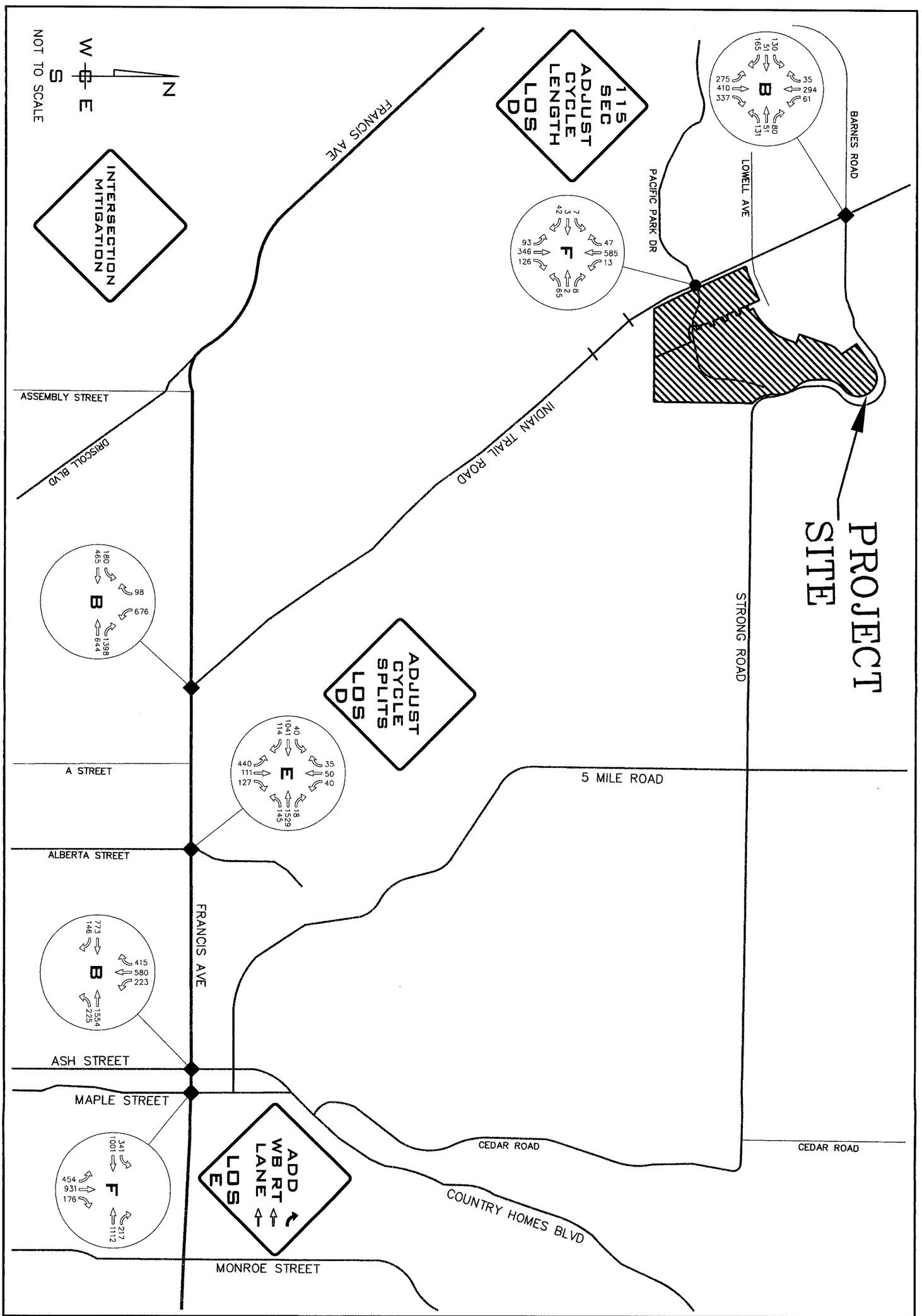

FIGURE 21

TRAFFIC IMPACT ANALYSIS
McCARROLLS EAST
8510 N INDIAN TRAIL ROAD
SPOKANE, WASHINGTON

2021 PM VOL. W- PROJECT/HUNTSPOINTE & LOS

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