

TO: Engineering Services
Development Services

FROM: Bill White
Christopher Reich, P.E.

DATE: August 2, 2013

JOB NO.: 5132.003

RE: Hutton Elementary School Redevelopment, Trip Generation and Design Study

CC: Jodi Kittel, Spokane Public Schools



8/2/2013

Urgent For Review Please Comment Please Reply For Your Use

This memorandum summarizes the trip generation, distribution, and design study performed for Hutton Elementary School redevelopment project in Spokane, Washington. The study was performed to support the SEPA (State Environmental Policy Act) application and permitting process, as administered and enforced by City of Spokane engineering and development service officials. Please review this information and call our office with questions or comments.

1. PROJECT DESCRIPTION

Spokane Public School (SPS) officials are continuing to improve facilities via the 2009 to 2015 capital project bond approved by voters. Hutton Elementary has been programed for “modernization and renovation” by year 2015, which generally includes redevelopment and improvement of the principal/historical school building with reconstruction of ancillary classroom wings. The project also includes the development of new parking and drop off accommodations to improve traffic circulation upon adjacent streets. The project will initiate in year 2014 with completion projected by fall of 2015.

As shown in attached Figure 1, Hutton Elementary is located between 24th Avenue and Plateau Road west of Arthur Street in south Spokane. According to site visits and the aerial shown by Figure 2, the school currently has no on-site parking accommodations with only one off street pull-out lane, approximately 190 feet in length, provided for bus activities located along Plateau Road west of Arthur Street. Staff, bus, parents, and visitors park their vehicles, or stage pick-up and drop-off activities, curbside along 24th Avenue and Plateau Road adjacent to the school.

There are currently up to six buses that can visit the site during the morning and afternoon school generator hours. Three of these are fixed route buses that access Hutton Elementary daily, with two additional buses that can be used for “overload” situations (i.e. students from neighboring schools that are full). The final bus is used to support the express program and does not operate when other bus activities occur.

Roadways adjacent to the school can become congested, especially with poor weather conditions, due to the conflicts that develop between staff, bus, parent, and visitor activities during the typical generator hours, occurring 8:30 to 9:30 AM and 2:30 to 3:30 PM, as the majority of children are dropped-off and then picked-up for school. The streets are simply not wide enough to handle the complexity and intensity of these overlapping activities during the peak generator hours. As such,

several design enhancements have been developed for adjacent streets and the school site to help better accommodate future traffic activities.

Attached [Figure 3](#) provides a concept site plan. The plan shows the development of approximately 50 to 54 parking spaces provided in three lots located on-site, as accessed by two new driveways on 24th Avenue and two new driveways on Plateau Road. The provision of on-site parking removes staff, visitors, and some parents from adjacent roadways.

Two parent pullout lanes (i.e. drop-off/pick-up zones), totaling about 250 feet in length, would be developed along 24th Avenue and two parent pull-out lanes, totaling about 300 feet in length, would be developed along Plateau Road. These pull-out lanes would accommodate between 25 and 30 staging vehicles located outside of arterial through/travel lanes, which helps reduce traffic conflicts on roadways.

Finally, two additional bus zones, totaling about 120 and 200 feet respectively, would be developed along Plateau Road. The latter relocates the current and principal bus zone west of Arthur Street, separating principal bus activities from parent, visitor, and staff vehicle activities; accommodating the three set route buses and the two potential overload buses. The smaller bus zone proposed adjacent to the school would accommodate two buses for intellectual or developmentally disabled program being incorporated into Hutton Elementary following school construction, and also for the express program at this bus would arrive and depart outside normal drop and pick-up times.

Note that some modification to site details can be expected throughout the formal design process, as only a concept site plan has been developed for Hutton School. However, SPS officials have confirmed that parking and drop off areas are principally limited to the size and location details shown, due to site constraints, and that only building design details may change throughout the coming months. As such, there is no site plan changes expected that could measurably change the results or conclusions of this traffic study.

The enrollment of Hutton was 484 students for the 2012/13 school year, and this base attendance is not anticipated to change soon. However, in the last 10-15 years, the school has experienced an enrollment higher than this. Therefore the school is being redeveloped to handle an enrollment high of 550-580 students similar to the historic highs, which would accommodate new school programs plus any unusual student growth. Thus, while trip generation is not expected to vary significantly in the immediate future, this study was developed to forecast an increase by up to 14 percent if attendance levels of 580 students were to occur for the elementary school.

2. EXISTING TRAFFIC DATA

Turn movement, parking/staging, and pedestrian crossing counts were performed on either May 14th or May 21st, 2013, which are both Tuesdays, while school was in session. Counts were performed between 8:30 to 9:30 AM and 2:30 to 3:30 PM to address the arrival and departure activities of staff, buses, parents, and visitors during the peak generator hours of the school (school starts at 9:00 AM and releases at 3:00 PM). The peak generator hour is the timeframe in which trips generated by the school are highest throughout the weekday. The generators hours of an elementary school may, but typically do not, coincide with the AM and PM peak hours of the work commute (i.e. work rush hours) within the Spokane area.

Turn Movement Counts

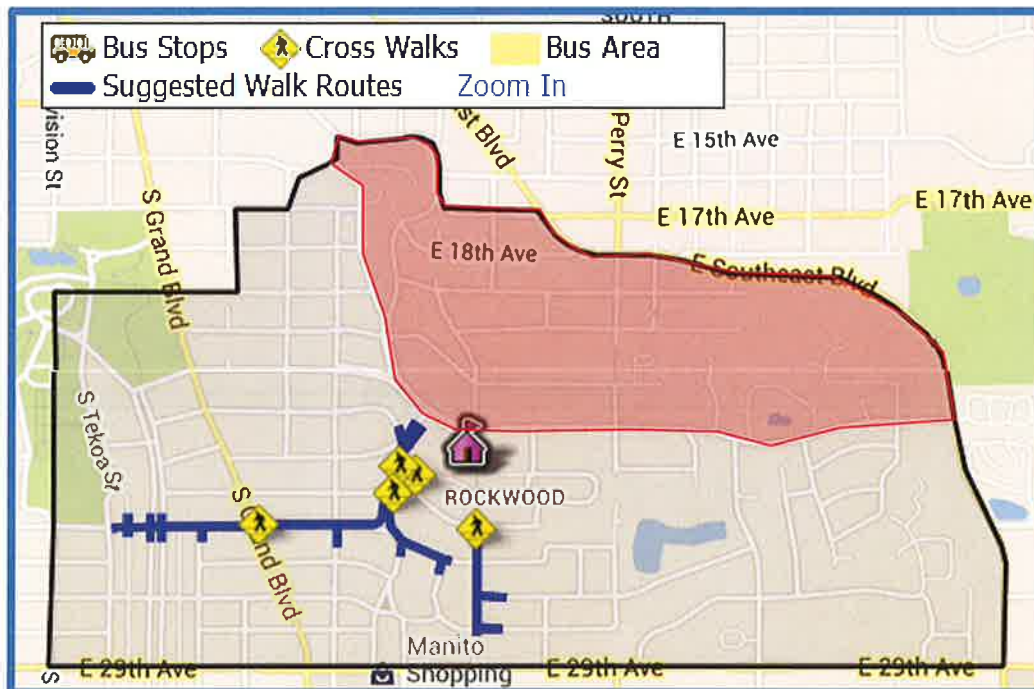
Turn movement counts were performed for the intersections of 24th Avenue/Plateau Road and Arthur Street/Plateau Road, as the majority of approaching and departing staff, bus, parent, and visitor trips travel through these intersections en-route to/from the school. School trip ends were

observed and distinguished from through trips on Plateau Road to develop turning movements for the Ivory Street/Plateau Road intersection. [Figure 4](#) and [Figure 5](#) shows intersection turn movement counts for the AM and PM peak generator hours of the school.

Shown in [Figure 6](#) are the current off-site distribution patterns of project trips, as identified from counts. Consistent travel patterns were noted for approaching and departing traffic with little deviation calculated between peak generator hours. Turn movement counts indicate the following distribution patterns are prevalent during peak generator hours:

- ◇ **28 percent** of trips approach/depart the school via 23rd Avenue, Plateau Road, and Garfield Road converging to/from the north of the 24th Avenue/Plateau Road intersection.
- ◇ **27 percent** of trips approach/depart the school via 24th Avenue and Garfield Road converging to/from the west of the 24th Avenue/Plateau Road intersection.
- ◇ **40 percent** of trips approach/depart the school via Arthur Street extending south from the Arthur Street/Plateau Road.
- ◇ Up to **5 percent** of trips approach/depart via Ivory Street north of Plateau Road.

Note that Rockwood Boulevard was being repaved while counts were performed for the school, with access limited on the arterial to primarily local trip ends. Aligned 500 feet to the north, Rockwood Boulevard is a *collector arterial* that does provide a potential approach and access to about 1/4th of the Hutton Elementary attendance basin, as shown below, connecting to the school area via Garfield Road and Ivory Street. However, the impact of paving is expected to have only a moderate impact on travel patterns within the context of the study area addressed for this study for the reasons described below.



Hutton Elementary School Primary Attendance Area

As it regards distribution to/from the north, the paving of Rockwood may somewhat impact the northerly distribution of trips as travel patterns shift to access the school via alternative travel routes. However, a cursory evaluation indicates that trip distribution is generally appropriate within the immediate vicinity of the school, as identified through counts, as no approach/departure out of

context with area served (meaning the distributions seem appropriate within the context of available approach routes compared with attendance area served). The adjustment of travel may occur outside of the focus area of this report, for instance trips may shift between Garfield Road, Plateau Road, and 23rd Avenue aligned north of the 24th Avenue/Plateau Road study intersection, but minimal change to distributions is expected upon streets adjacent to the school. Thus, no modification was made to the immediate distribution of trips.

As it regards the distribution of northerly trips between Garfield Road and Ivory Street to access Rockwood Boulevard, Garfield Road was confirmed through counts to provide the primary link and approach to/from Rockwood Boulevard over Ivory Street. Garfield Road has dedicated right-of-way available for obvious use by the general public for commute purposes. In contrast, although Ivory Street has been dedicated as public right-of-way, the paved connection of the street between Rockwood Pines Road and Plateau Road has been encroached upon by private homeowners; appearing to be a narrow private access and driveway to the general public. As a result, the roadway is seldom used by most parents and visitors of the school, again as evidenced from counts. No shift from these current distributions is expected unless the roadway was improved to appropriate street standard widths. A picture of Ivory Street from Rockwood Pines Road is shown below.



Ivory Street, Looking South from Rockwood Pines Road (Source: Google Street View)

Six buses were noted during counts, again with three being fixed route buses and the others assumed with express or “overload” activities (the express bus did operate outside the arrival/departure times of other buses). The current bus route includes northbound travel from 29th Avenue via Arthur Street, turning and dropping or picking up students within the Plateau Road pull-out lane, and then proceeding west on 24th Avenue to Grand Boulevard.

Street Parking

Figure 7 shows parking and staging utilization counts performed for the PM peak generator hour only. From this figure, “count” refers to the number of vehicles parking or staging along adjacent streets while “capacity” denotes additional areas where additional vehicles could have parked or staged. The count was performed at about 2:50 PM as parents were still arriving and staging at the school, thus distributions were reconciled factoring in empty parking areas in addition to counts. The current distribution of trips adjacent to the site is described as follows:

- ◇ **28 percent** parked or staged on 24th Avenue east of Plateau Road.
- ◇ **39 percent** parked or staged on Plateau Road west of Arthur Street, including buses.
- ◇ **33 percent** parked or staged on Plateau Road east of Arthur Street.

Note the PM peak hour was the focus of parking evaluations because parents tend to park on adjacent streets, waiting to pick up students following the release of school. Conversely, students are more frequently dropped off in the morning en-route to work or other locations; thus, there is very little wait/park time associated with morning activities.

Student Pedestrians

Figure 8 shows student pedestrian counts performed for the single crossing of 24th Avenue and dual crossings of Plateau Road at marked locations. The counts reflect the crossing activities of all pedestrians, students and parents, with students comprising 85 to 90 percent of count totals. As shown, a total of 138 pedestrians were counted at all crossings leading to/from the school during the AM peak generator hour with 239 counted during the PM peak generator hour. This indicates that between approximately 25 and 45 percent of students walk to/from the school between peak generator hours (assumes 90% of pedestrians are students and current enrollment of 484 students). Counts are higher in the PM peak generator hour because many students are simply dropped off by parents in the morning, and then walk home in the afternoon while parents are at work.

3. TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

As indicated, future trip generation was estimated for up to a 580 student elementary school, which represents the maximum capacity of Hutton Elementary following project completion. Trip generation was forecast according to the methodologies outlined within the Institute of Transportation Engineers, *Trip Generation Manual* (9th Edition, 2012). ITE Land Use code 520, Elementary School, was used in the analysis as based on rates that equate trip generation to the number of current or projected students. A summary of this trip generation is shown on Table 1 for the AM and PM peak generator hours.

Table 1. Hutton Elementary School – Trip Generation Projections, 550 Student Capacity						
Daily Trip Totals	AM Generator Hour			PM Generator Hour		
	Inbound	Out	Total	In	Out	Total
750 trips	144	117	261	73	89	162

As shown, the school would generate 750 trips during the typical weekday at full capacity of 550 students. Approximately 261 trips would be generated during the AM peak generator hour and 162 trips during the PM peak generator hour.

Note up to eight buses would travel to/from the school during peak generator hours; including three fixed route buses, two potential “overload” buses, one express bus, and two buses for the disabled program.

Trip Distribution and Assignment

The off-site distribution of trips was based on the traffic information previously discussed. Approximately **28 percent** of school trips are expected to/from the north and **27 percent** to/from the south of the 24th Avenue/Plateau Road intersection. Approximately **40 percent** of trips are expected to/from Arthur Street south of Plateau Road. Finally, up to **5 percent** of trips are

expected to/from the Ivory Street connection to Rockwood Pines Road, and by extension Rockwood Boulevard. These represent the off-site distribution of trips to/from study intersections.

The immediate distribution of site trips adjacent to the school is expected to shift somewhat to reflect the availability of new parking and staging areas. A summary of these capacities/tallies are shown on [Figure 9](#), with the distribution on adjacent streets projected as:

- ◇ **44 percent** of vehicles are expected within parking lots or staging areas located along or accessed off 24th Avenue east of Plateau Road.
- ◇ **43 percent** of vehicles are expected within parking lots or staging areas located along or accessed off Plateau Road west of Arthur Street, including 3 smaller buses.
- ◇ **13 percent** of vehicles parked or staged on Plateau Road east of Arthur Street, including 3 large buses.

Project trips were then assigned to the street network, as based on the off-site and adjacent distribution patterns discussed above. The resulting trip assignments are shown on [Figure 10](#) for the AM peak generator hour and [Figure 11](#) for the PM peak generator hour.

Note the relocation of bus lanes will require that the three fixed route and two potential “overload” buses approach the site via the Ivory Street connection to Rockwood Pines Road and beyond to Rockwood Boulevard. These fixed route bus trips are reflected in red from the figures noted above, as this represents the consistent and typical change in bus travel patterns (“overload” bus activities would not occur consistently and are not shown). The route shows the buses assigned to the southbound right turn from Ivory Street at Plateau Road, stop within the pullout lane on Plateau, and then leave turning southbound at Arthur Street.

4. DESIGN CONSIDERATIONS

This section discusses design details that should be considered while reviewing the SEPA application, as it pertains to the adequate and safe mobility of traffic.

Study Intersections

Both study intersections, and focal points for approaching and departing school traffic, are uncontrolled without yield or stop signs. Field observations indicate that neither intersection appears to have operational issues equating to what might be considered poor levels-of-service, as defined by the industry and the Highway Capacity Manual (TRB, 2012).

However with that said, a number of “near misses”, in terms of potential vehicle-to-vehicle collisions, were observed at the 24th Avenue/Plateau Road intersection as parents were unaware or neglectful of how traffic should function at the uncontrolled intersection. Many parents failed to yield right-of-way and “rushed” to beat others through the intersection, traveling at higher speeds than appropriate, cutting off other drivers in the process. In one instance, a parent was busy attempting to beat another to the intersection, missing and neglectful of the crossing guards attempting to shepherd a group of children across 24th Avenue. Thus, for the safety of all road-users a two or four-way stop is recommended for consideration at the intersection by City staff.

Warrants regarding the installation of stop signs for minor approaches, or for an all-way stop are discussed within the *Manual on Uniform Traffic Control Devices for Streets and Highways* (US DOT FWA, 9th Edition, 2009). A cursory review indicates warrants would not likely be met as traffic and pedestrian volumes seem to fall below the 8 hour thresholds that should persist during the typical day in order to justify stop signs. However, the warrant does continue to indicate other criteria can be used to justify stop sign installation; such as when “*The need to control vehicle/pedestrian conflicts near*

locations that generate high pedestrian volumes.” Thus, it is upon this basis and field observations that stop-sign installation is recommended for the intersection.

Ivory Street Access

The three fixed route buses would likely use Ivory Street to approach the school due to the relocation of the bus zone east of Arthur Street on Plateau Road. As indicated, the paved connection of Ivory Street is narrow between Rockwood Pines Road and Plateau Road with a paved section at one location of near 20 feet. The three smaller buses would use Arthur Street to access a separate designated drop-off area located west of Arthur Road.

A review of local and national design standards was performed to determine whether this roadway is sufficient to support two-way traffic from a capacity perspective, as an increase of use is possible via school redevelopment and the relocation of the bus lane. This review was performed using the *City of Spokane Street Standards* (Engineering Services web, 2006 document) and the guidelines provided within A Policy on Geometric Design of Highways and Streets (AASHTO, 6th Edition 2011), also known as the AASHTO “Greenbook”.

As shown below, the City has a minimum curb-to-curb pavement width requirement of 27 feet for a local access street with restricted parking according to Table 17H.010-1.

	MINIMUM RIGHT-OF-WAY WIDTH ¹		MINIMUM STREET WIDTH
	Sidewalks in ROW	Sidewalks on Easements	Curb to Curb
ARTERIAL			
Principal	6 lane – 110’ 4 lane – 90’	NA	Varies ²
Minor	4 lane- 102’ 2 lane- 75’	NA	Varies ²
Collector	65’	NA	40’
LOCAL ACCESS			
Commercial	65’	55’	40’
Residential Standard	60’	50’	36’
Residential Low Density ³	56’	46’	32’
Residential Restricted Parking ^{3,4}	51’	41’	27’
Hillside Development ^{4,5}	40’	35’	27’
CUL-DE-SAC (radius)	56’	51’	50’
ALLEY ⁶	20’	20’	12’

Street Widths (Source: City of Spokane Street Standard, 2006)

In contrast, Table 5-5 of the AASHTO “Greenbook” indicates a paved section of 18 feet can be sufficient for roadways supporting less than 400 vehicles per day with a speed of under 30 mph. This table is shown below. Peak hour volumes for the roadway are projected at less than 30 vehicles per hour, which equates to a range of between 250 to 350 vehicles per hour using standard K factors of between 8 and 12 daily vehicles per peak hour vehicle.

Table 5-5. Minimum Width of Traveled Way and Shoulders

Metric					U.S. Customary				
Design Speed (km/h)	Minimum Width of Traveled Way (m) for Specified Design Volume (veh/day)				Design Speed (mph)	Minimum Width of Traveled Way (ft) for Specified Design Volume (veh/day)			
	under 400	400 to 1500	1500 to 2000	over 2000		under 400	400 to 1500	1500 to 2000	over 2000
20	5.4	6.0 ^a	6.0	6.6	15	18	20 ^a	20	22
30	5.4	6.0 ^a	6.6	7.2 ^b	20	18	20 ^a	22	24 ^b
40	5.4	6.0 ^a	6.6	7.2 ^b	25	18	20 ^a	22	24 ^b
50	5.4	6.0 ^a	6.6	7.2 ^b	30	18	20 ^a	22	24 ^b
60	5.4	6.0 ^a	6.6	7.2 ^b	40	18	20 ^a	22	24 ^b
70	6.0	6.6	6.6	7.2 ^b	45	20	22	22	24 ^b
80	6.0	6.6	6.6	7.2 ^b	50	20	22	22	24 ^b
90	6.6	6.6	7.2 ^b	7.2 ^b	55	22	22	24 ^b	24 ^b
100	6.6	6.6	7.2 ^b	7.2 ^b	60	22	22	24 ^b	24 ^b
					65	22	22	24 ^b	24 ^b
All speeds	Width of graded shoulder on each side of the road (m)				All speeds	Width of graded shoulder on each side of the road (ft)			
	0.6	1.5 ^{a,c}	1.8	2.4		2	5 ^{a,c}	6	8

^a For roads in mountainous terrain with design volume of 400 to 600 veh/day, use 5.4-m [18-ft] traveled way width and 0.6-m [2-ft] shoulder width.

^b Where the width of the traveled way is shown as 7.2 m [24 ft], the width may remain at 6.6 m [22 ft] on reconstructed highways where there is no crash pattern suggesting the need for widening.

^c May be adjusted to achieve a minimum roadway width of 9 m [30 ft] for design speeds greater than 60 km/h [40 mph].

Minimum Traveled Way Widths (Source: AASHTO Greenbook, 6th Edition 2011)

The conclusion of this review is the Ivory Street paved section between Rockwood Pines Road and Plateau Road is narrow according to City Standards, but use can be supported for less than 400 vehicles per day according to the AASHTO Greenbook. Options to mitigate this issue could include, but not necessarily limited to:

- ◇ Develop a half cul-de-sac or hammer-head beyond/east of the pull-out lane for busses to turn around and access the bus zone.
- ◇ Widen Ivory Street to a minimum curb-to-curb pavement width of 27 feet for the operation of two-way traffic, including buses.
- ◇ Enforce southbound-one way restrictions so the roadway allows for the unconflicted operation of one direction traffic.
- ◇ Keep the bus zone located west of Arthur Street on Plateau Road, keeping buses located on their current travel route.

Ivory Street Turn Movements

A review of turning templates was performed to determine whether buses could safely turn onto Ivory Street and negotiate horizontal curves without significantly encroaching upon oncoming travel lanes. Figure 12 through Figure 15 show the results of this review for various sections of Ivory Street between Rockwood Boulevard and Plateau Road. This review was performed using AutoTurn software, which bases turn movements on AASHTO Greenbook templates for a typical single-unit bus with 40 foot length.

As shown, the analysis confirms that buses can safely negotiate the majority of Ivory Street between Rockwood Boulevard and Plateau Road, as no encroachment is noted onto opposing travel lanes. The exception noted is the section of Ivory Street between Rockwood Pines Road and Plateau Road, where some travel into the oncoming lane is necessary due to the narrow street section. Thus, only the narrow section of Ivory Street is of concern from a traffic design perspective.

5. SUMMARY AND CONCLUSIONS

This memorandum was developed to support the SEPA application and permitting process for Hutton Elementary School, as a function of a “modernization and renovation” project proposed by SPS officials for construction by the fall of 2015. Trip generation and assignment projections are provided assuming the redevelopment of the school to accommodate up to 580 students at full student spacing and technology standards. Also provided are limited design recommendations to improve circulation approaching and departing the site.

At full capacity, the school will generate 750 weekday trips during the typical weekday with 261 trips generated during the AM peak generator hour and 162 trips during the PM peak generator hour. Approximately 28 percent of school trips are expected to/from the north and 27 percent to/from the south of the 24th Avenue/Plateau Road intersection. Approximately 40 percent of trips are expected to/from Arthur Street south of Plateau Road. Finally, up to 5 percent of trips are expected to/from the Ivory Street connection to Rockwood Pines Road, and by extension Rockwood Boulevard. It is projected that 44 percent of vehicles will park or stage in areas located along, or as accessed off 24th Avenue; 43 percent will park or stage off or along Plateau Road west of Arthur Street (including three buses); and 13 percent of vehicles park or stage on Plateau Road east of Arthur Street (including 3 buses with potential for two more buses during “overload” situations).

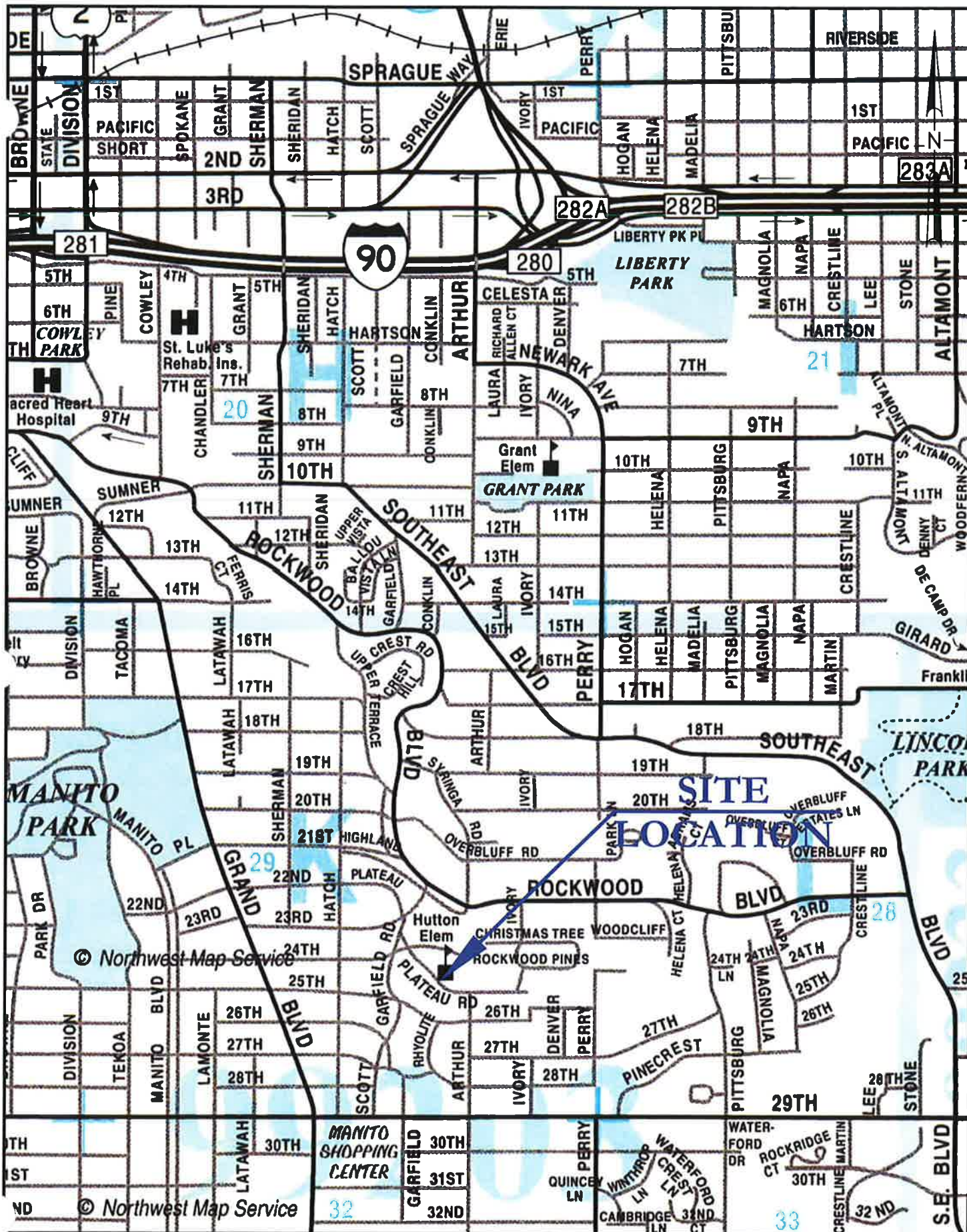
Overall, site designs should improve traffic operations on adjacent streets. Currently all parents, staff, visitors, and buses park and/or stage on 24th Avenue and Plateau Road directly adjacent to the school, resulting in congestion during school peak generator hours. With proposed design, 50 to 54 parking stalls will be provided on-site so staff and visitors do not have to park on adjacent streets. Standard buses would drop-off or pick-up students on Plateau Road east of Arthur Street, separating parent and bus activities. Finally, pull out lanes will be provided to better accommodate drop-off and pick-up activities out of the way of street traffic.


A cursory design review was performed to assure safe and adequate access to the school as a result of access changes proposed by SPS officials. The observation of intersection conditions lead to some concern regarding the safe operation of the 24th Avenue/Plateau Road intersection, as parents do not employ safe practices in travel through this unsignalized intersection. In addition, the Ivory Street connection between Rockwood Pines Road and Plateau Boulevard is narrow compared with City standards; although the AASHTO Greenbook indicates the paved width is acceptable given the low volume and reduced speed conditions.

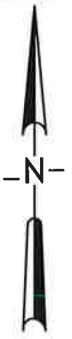
No other design issues were noted. However, given the issues identified above, the following recommendations have been provided with this study:


- 1) Petition the City to develop a two-or four way stop at the 24th Avenue/Plateau Road intersection.
- 2) If SPS officials wish to maintain the bus pullout at the proposed location west of Arthur Street, options to mitigate pavement width deficiencies include:
 - ◇ Develop a half cul-de-sac or hammer-head to allow busses to turn around and access the bus zone on Plateau Road.
 - ◇ Widen Ivory Street to the City standard 27 feet for the operation of two-way traffic.
 - ◇ Enforce one way restrictions to allow for the operation of southbound traffic only.

No further recommendations are provided. We hope this sufficiently supports the SEPA permit and application process. Please feel free to call with questions and/or comments.

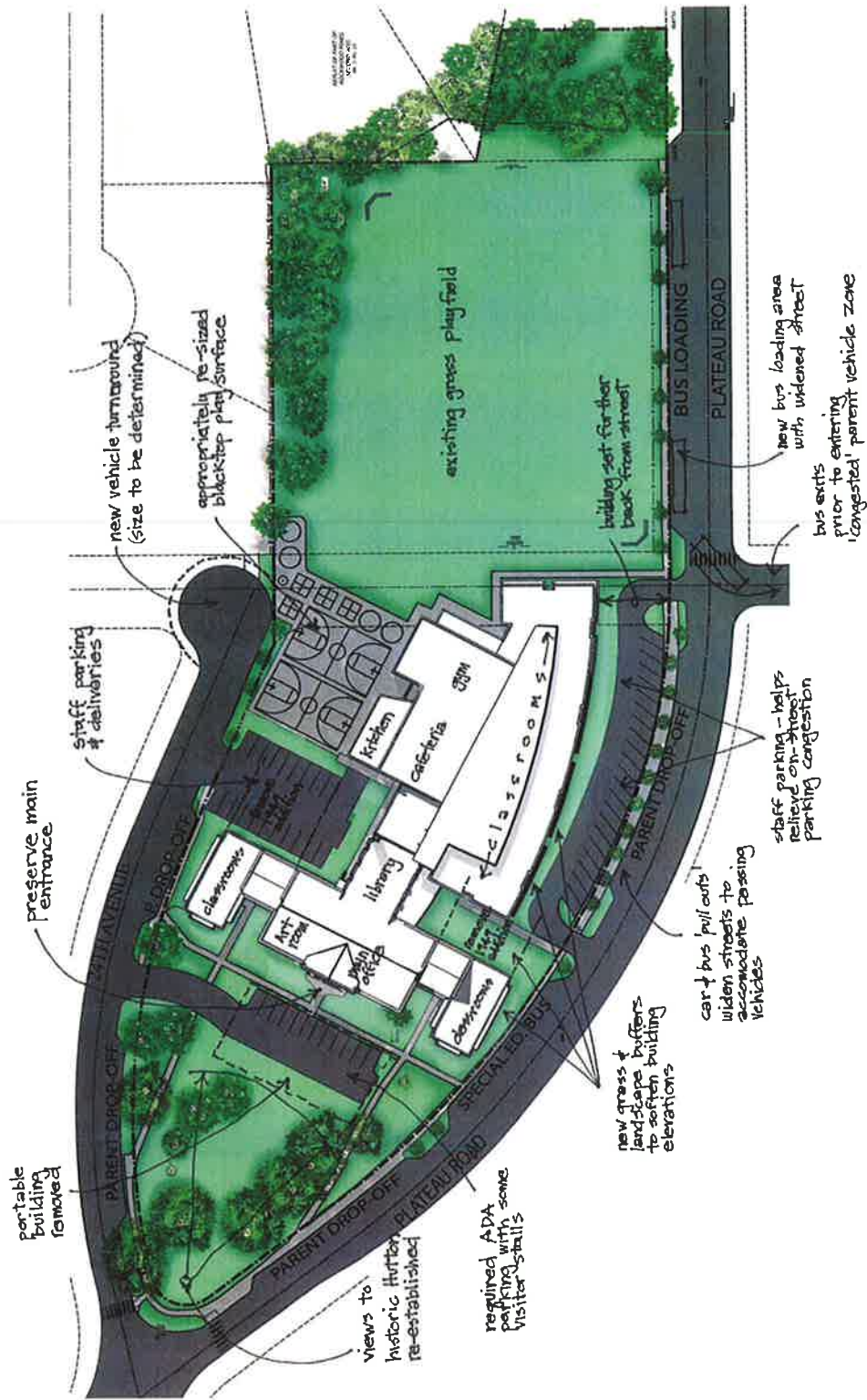
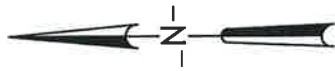


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	COPYRIGHT © MORRISON MAIERLE, INC., 2013			SITE LOCATION	FIGURE NUMBER FIG. 1



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			CHK'D BY: <u>CJR</u>	SPOKANE WASHINGTON		FIGURE NUMBER
COPYRIGHT © MORRISON-MAIERLE, INC., 2013			APPR BY: <u>CJR</u>	EXISTING SITE (SOURCE: GOOGLE EARTH)		FIG. 2
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SPOKANE PUBLIC SCHOOLS
HUTTON ELEMENTARY



SITE PLAN STUDY



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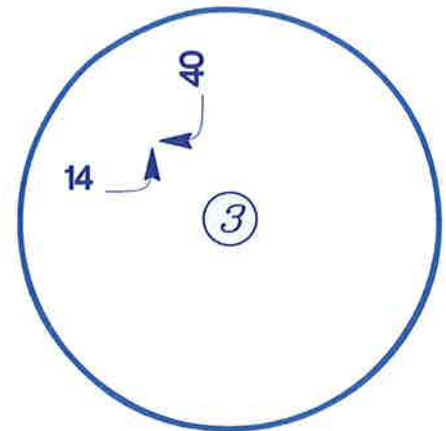
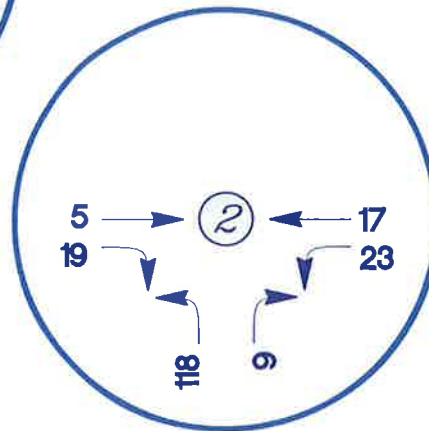
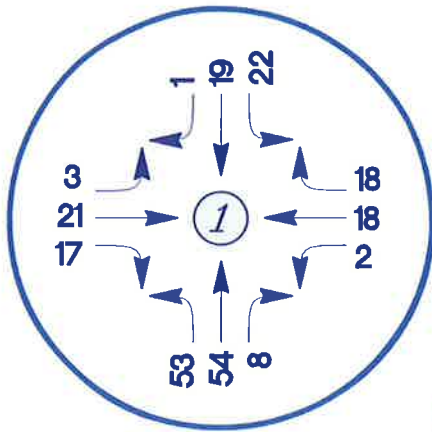
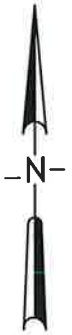
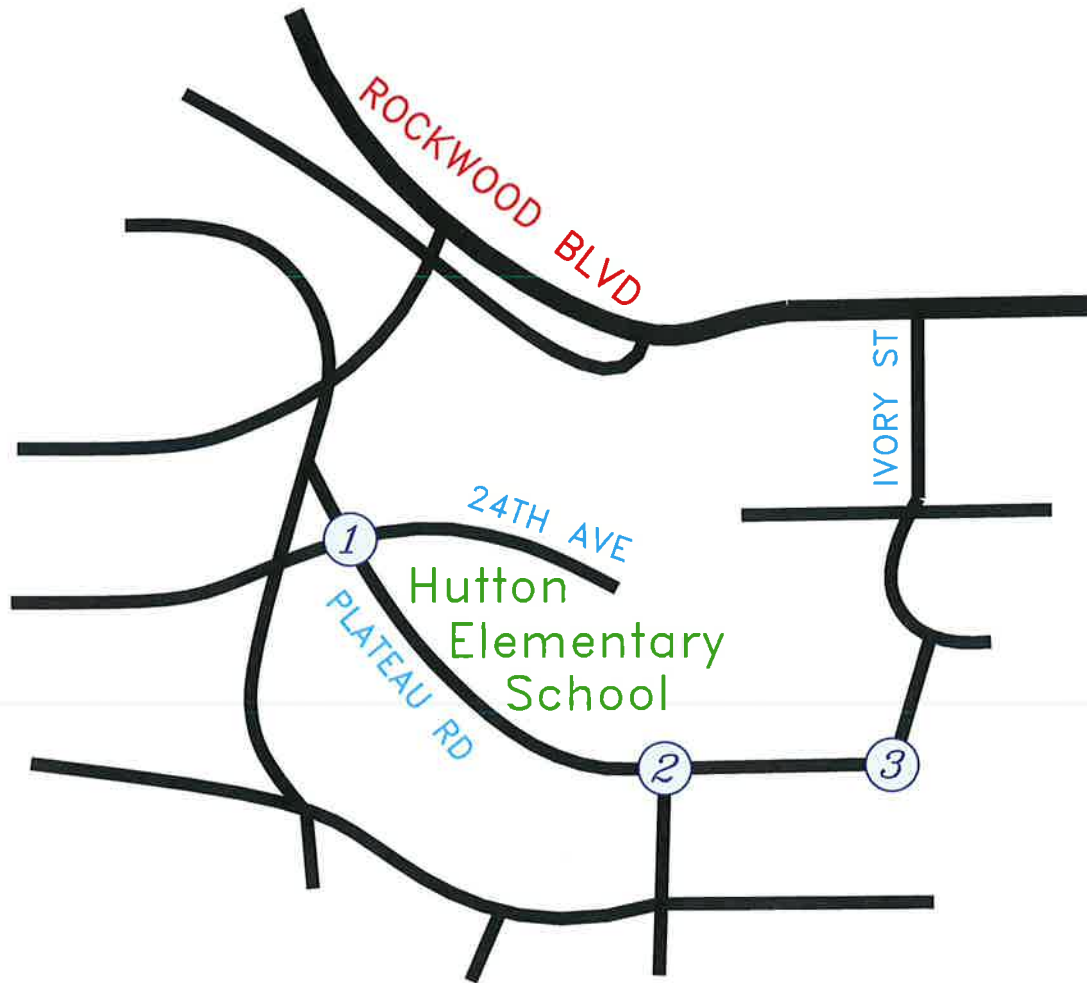
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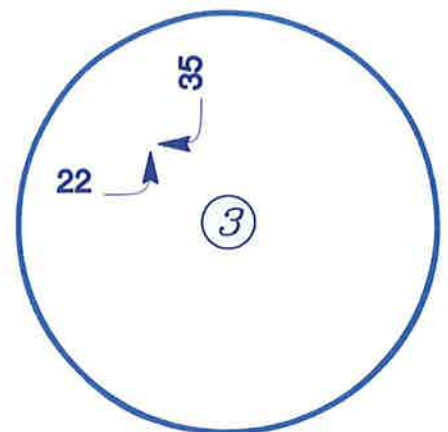
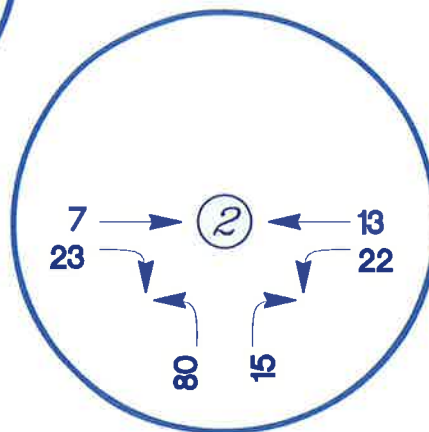
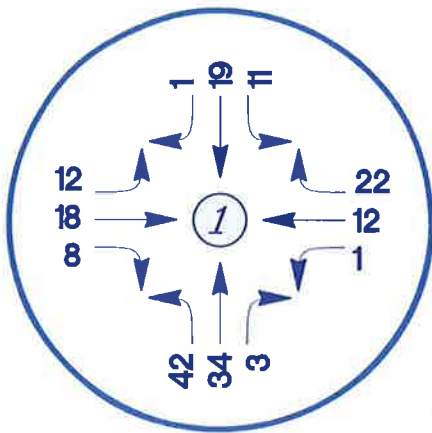
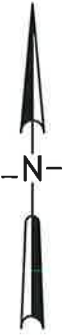
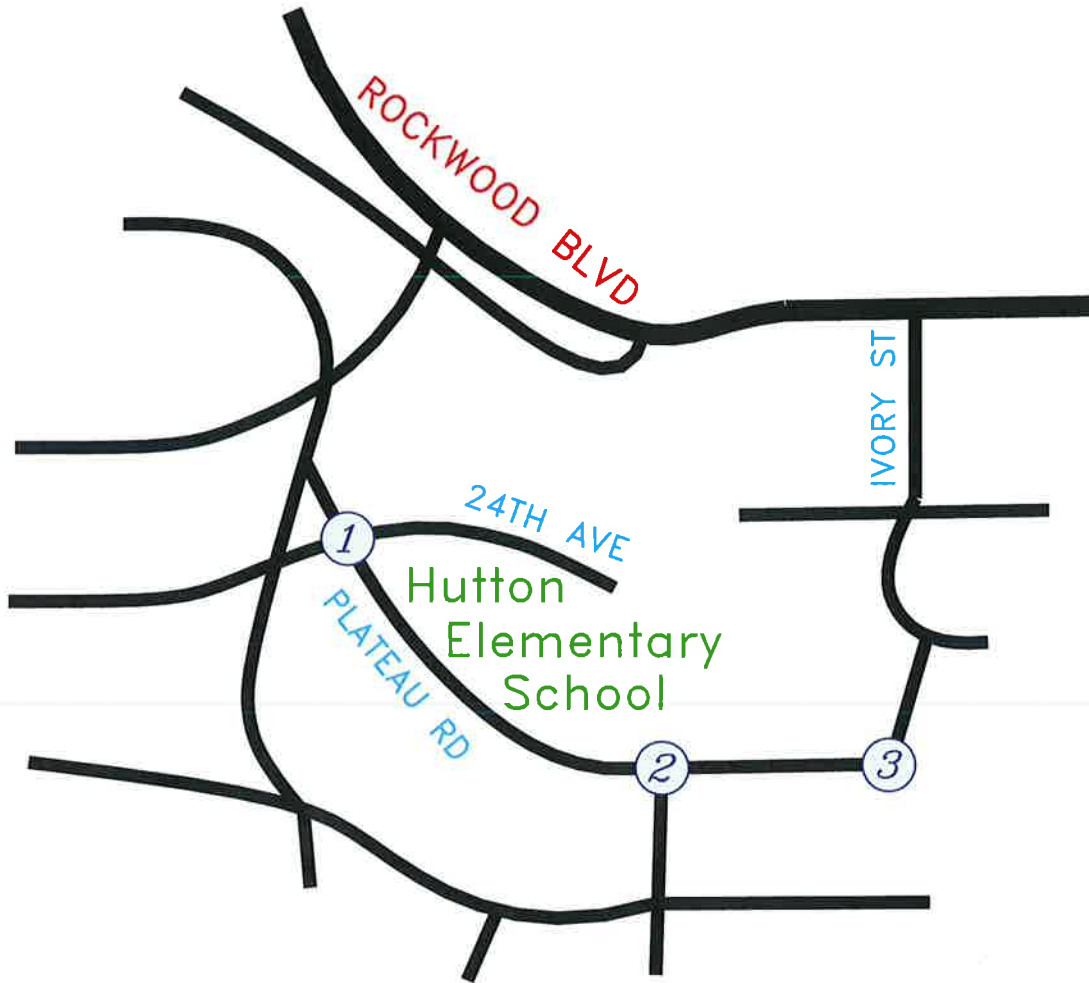
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PROJECT NO.
07/2013

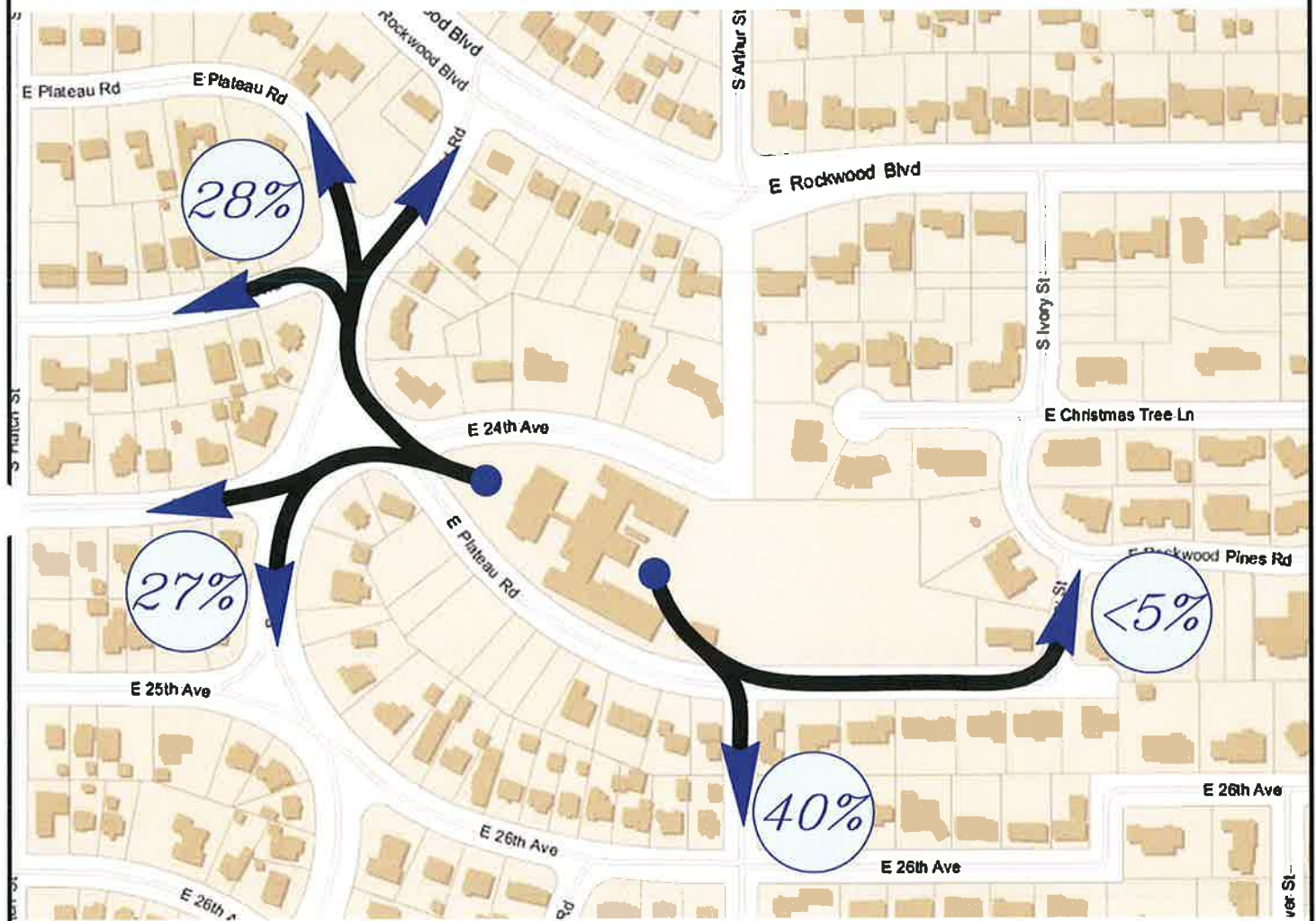
PRELIMINARY SITE PLAN
(SOURCE: MMEC ARCHITECTS)

FIGURE NUMBER
FIG. 3





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		Phone: (406) 442-3050 Fax: (406) 442-7862	APPR. BY: <u>CJR</u> DATE: <u>07/2013</u>			EXISTING TRAFFIC VOLUMES PM PEAK GENERATOR HOUR
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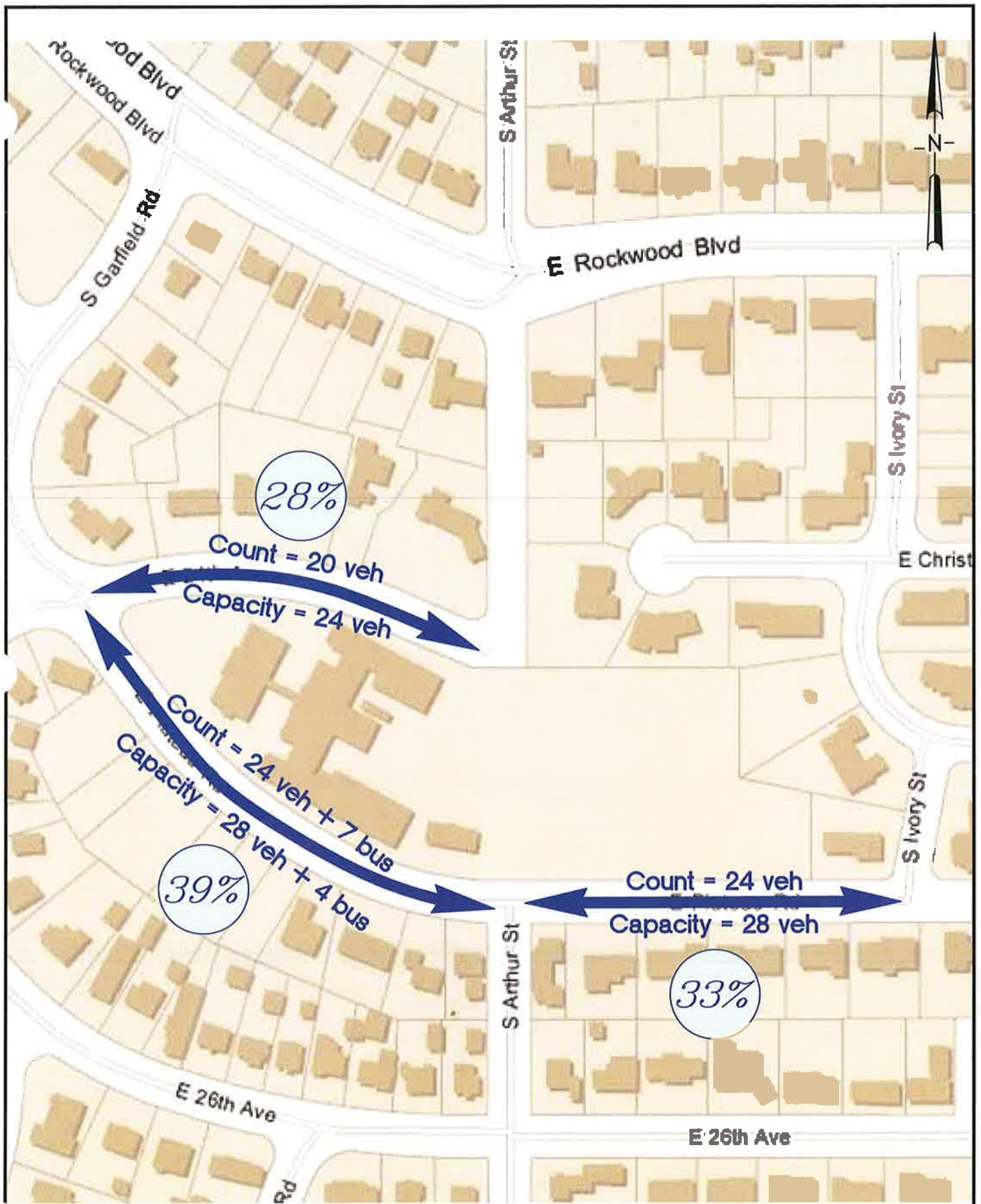
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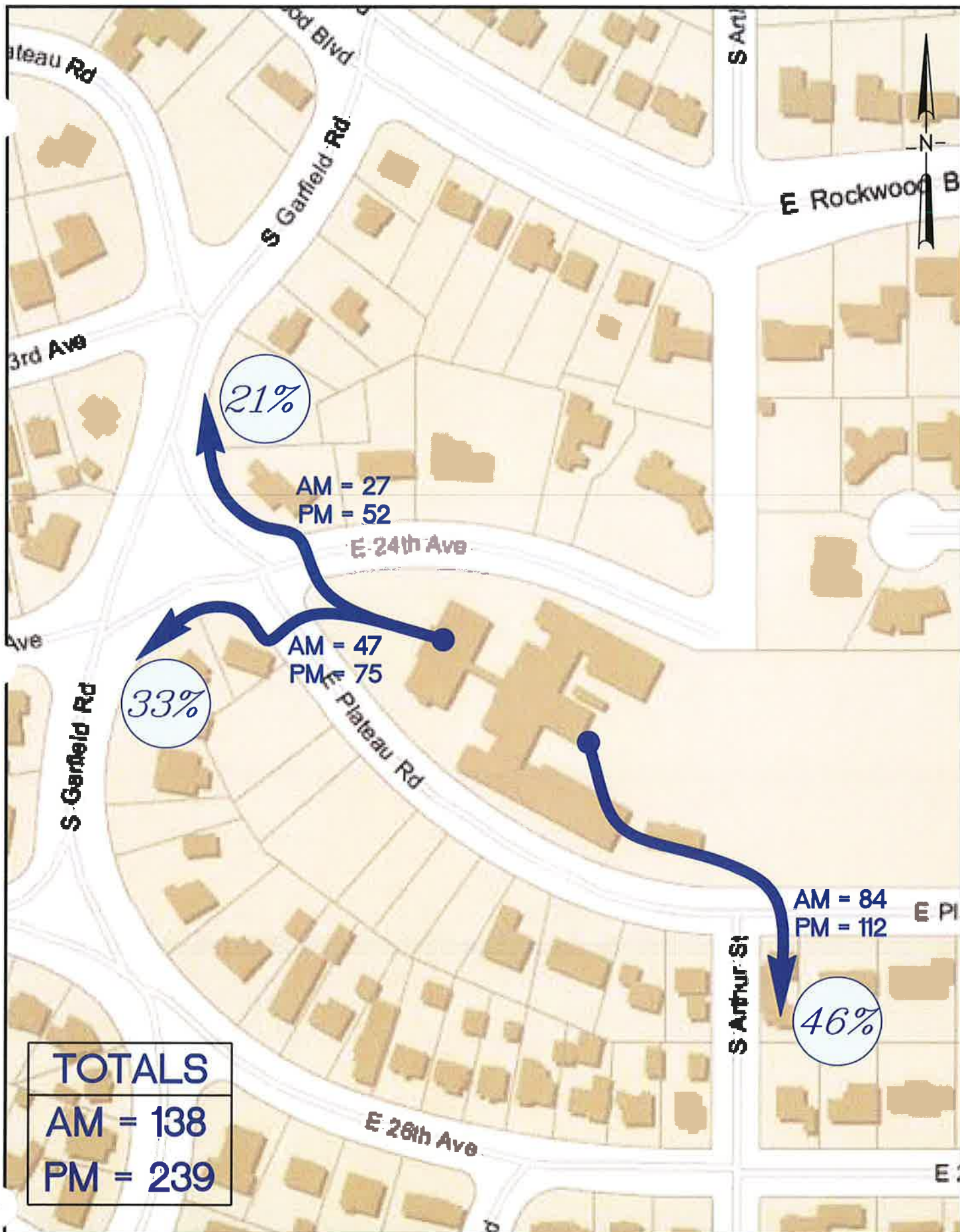
PROJECT NO.
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CURRENT TRIP DISTRIBUTION PATTERNS
AM & PM PEAK GENERATOR HOURS

FIGURE NUMBER
FIG. 6

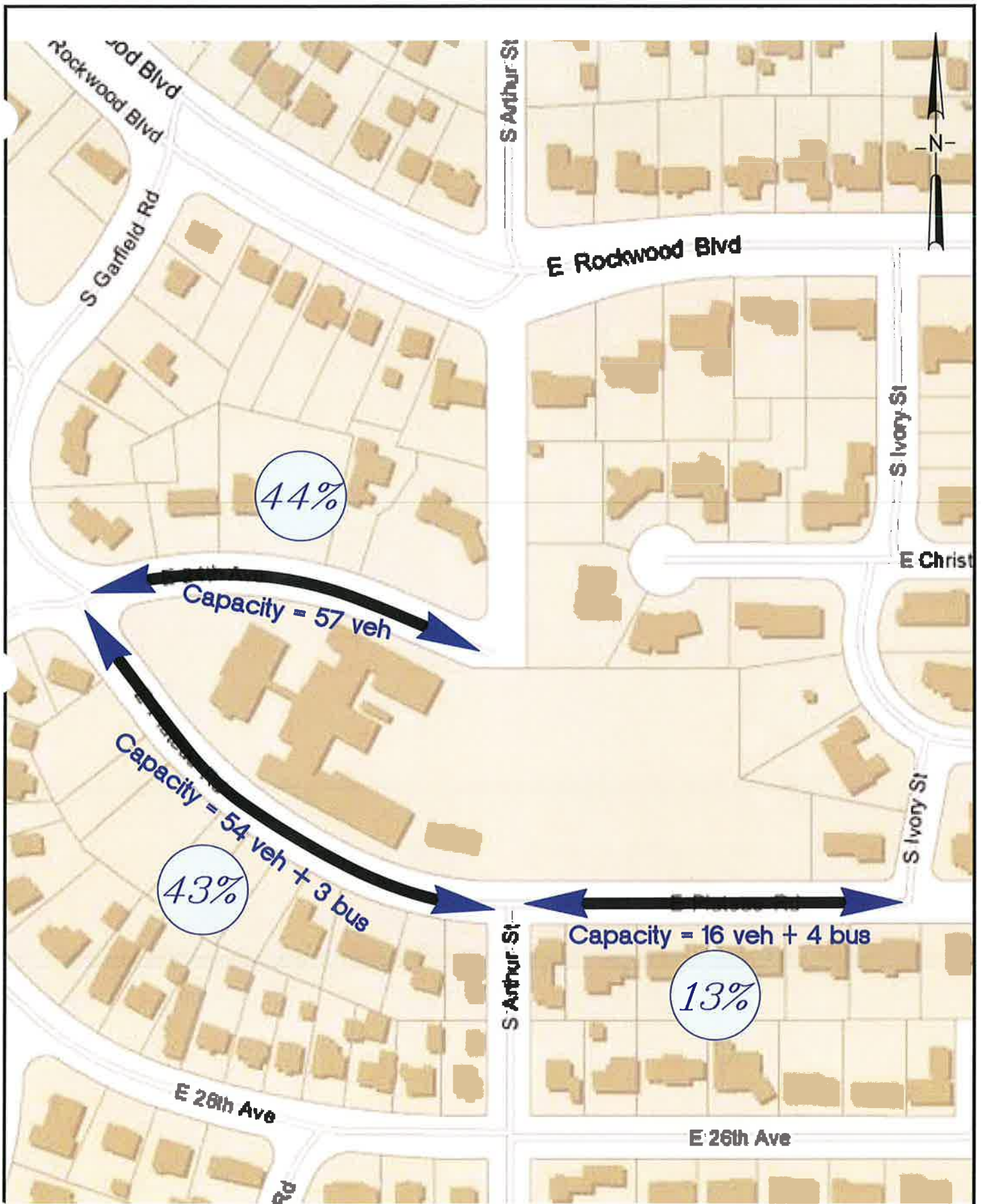



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			SPOKANE WASHINGTON		PARKING COUNTS & CAPACITY PM PEAK GENERATOR HOUR	

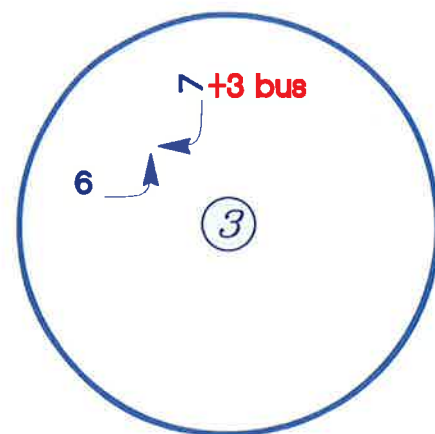
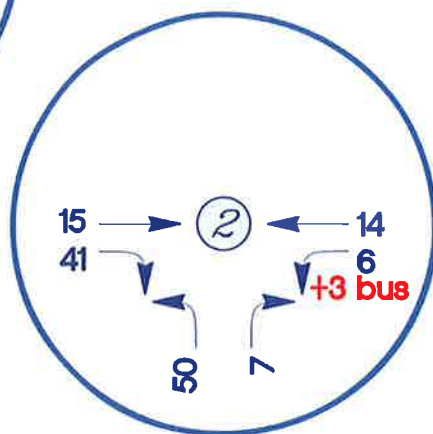
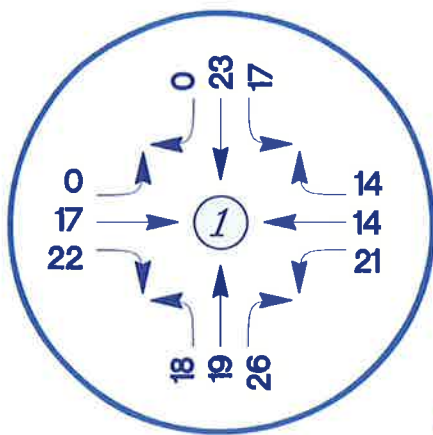
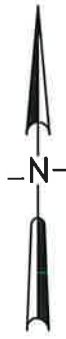
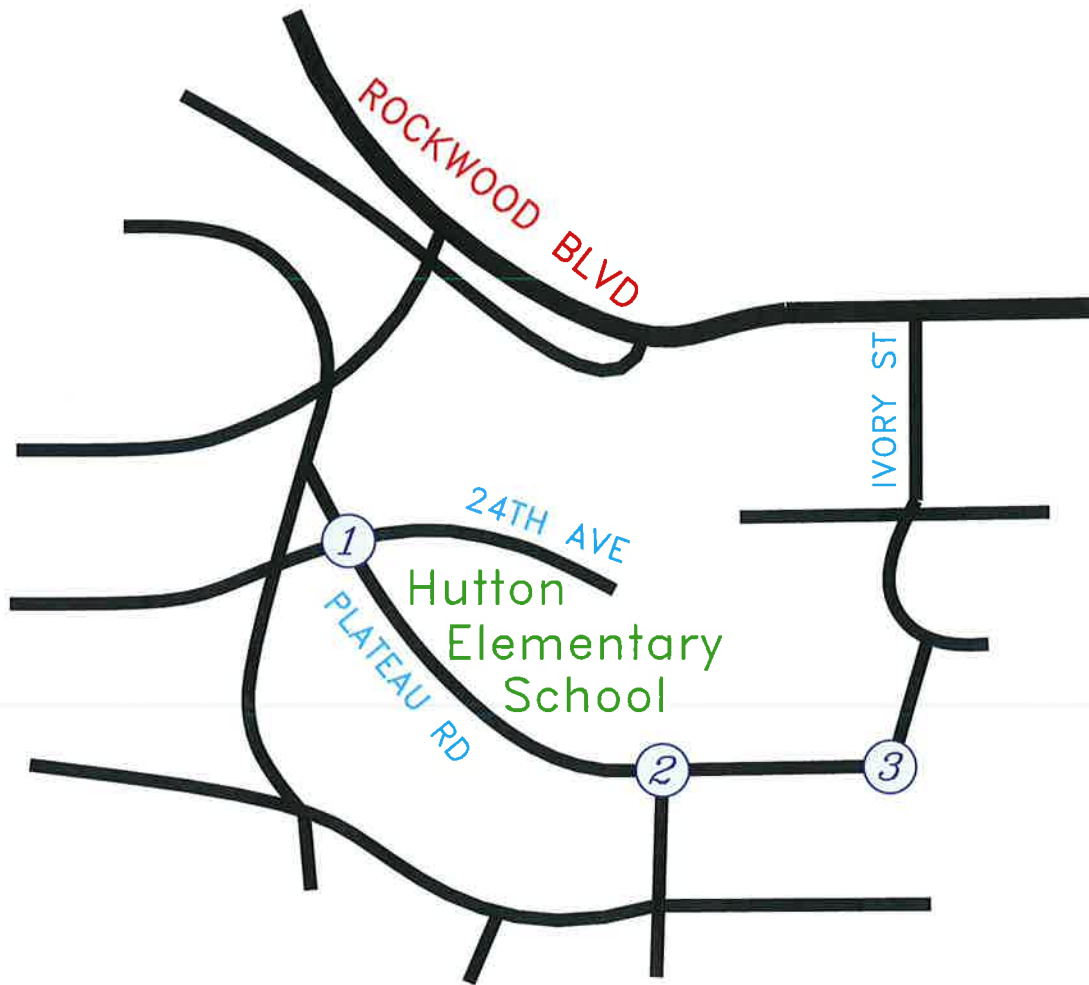


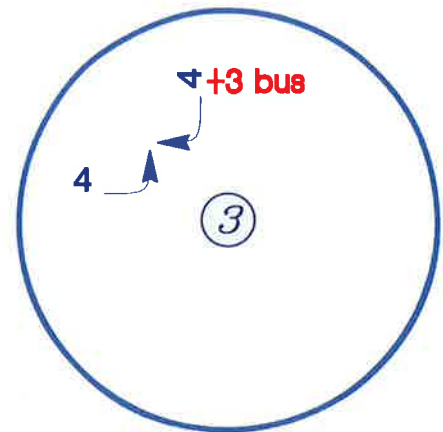
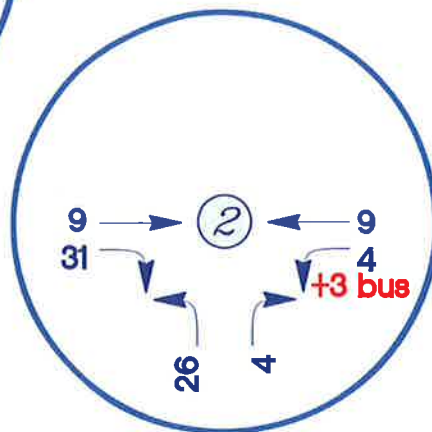
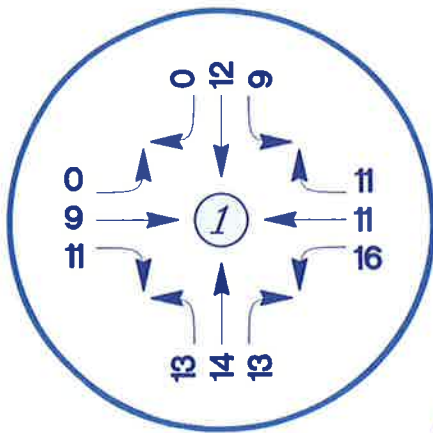
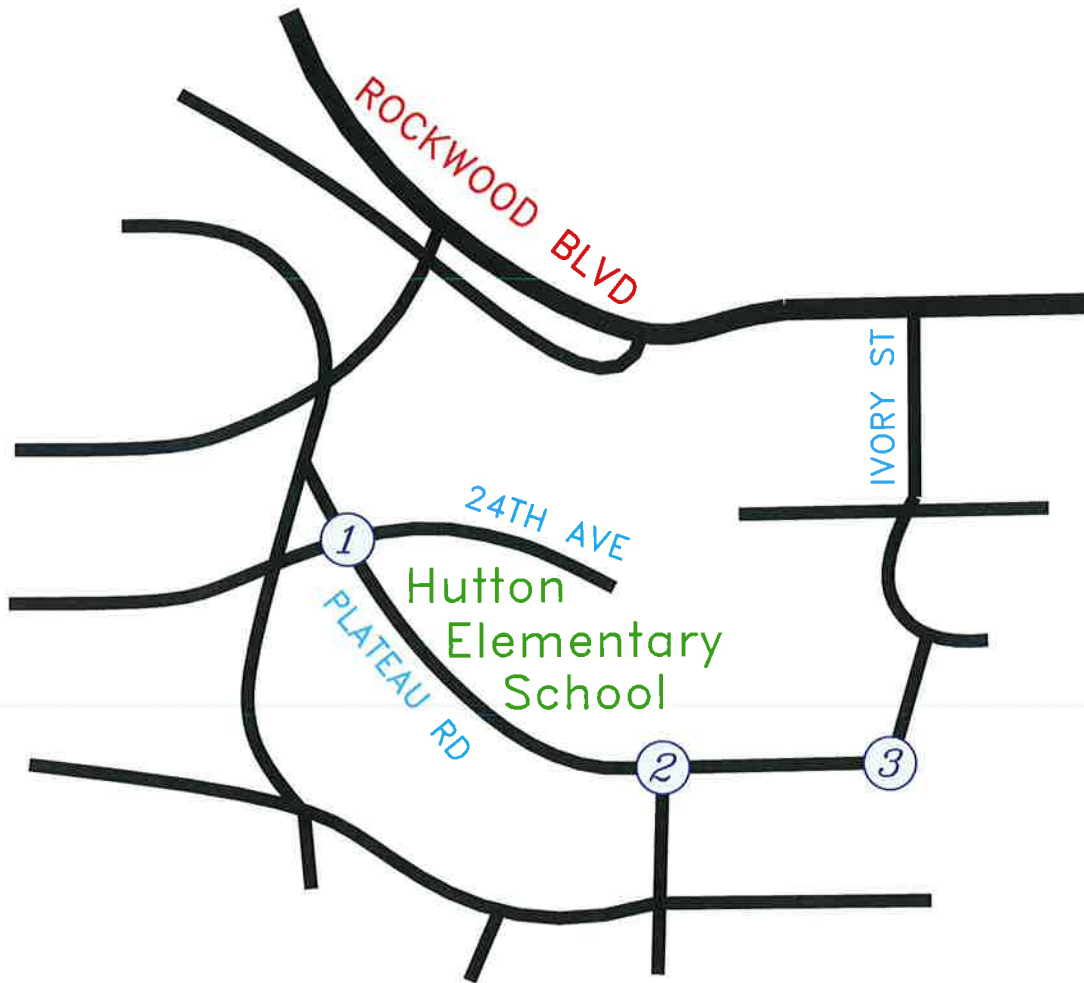
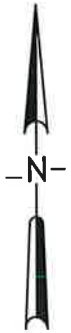
 MORRISON MAIERLE, INC. <i>An Employee-Owned Company</i>	<i>Engineers Surveyors Scientists Planners</i>	1 Engineering Place Helena MT 59602 Phone: (406) 442-3050 Fax: (406) 442-7862	DRAWN BY: <u>WDW</u>	HUTTON ELEMENTARY SCHOOL TRIP GENERATION STUDY SPOKANE WASHINGTON		PROJECT NO. 5128.004
			CHK'D. BY: <u>CJR</u>			APPR. BY: <u>CJR</u>
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	FORECAST PARKING CAPACITY			FIGURE NUMBER FIG. 9





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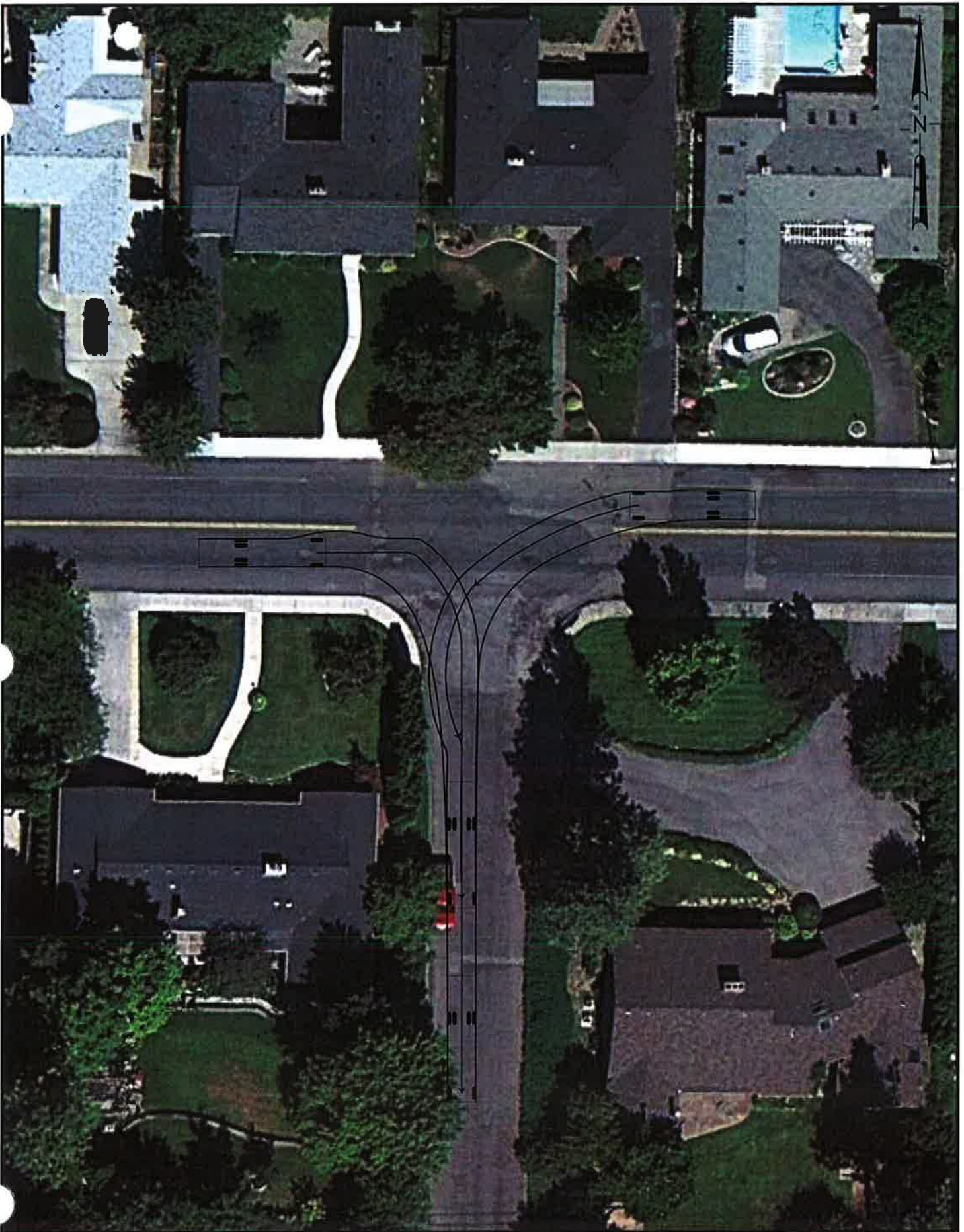
HUTTON ELEMENTARY SCHOOL
TRIP GENERATION STUDY
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FORECAST TRIP ASSIGNMENTS
PM PEAK GENERATOR HOUR

FIGURE NUMBER

FIG. 11



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SPOKANE WASHINGTON


PROJECT NO.
5128.004

DESIGN VEHICLE ANALYSIS
ROCKWOOD BLVD & IVORY ST


FIGURE NUMBER
FIG. 12

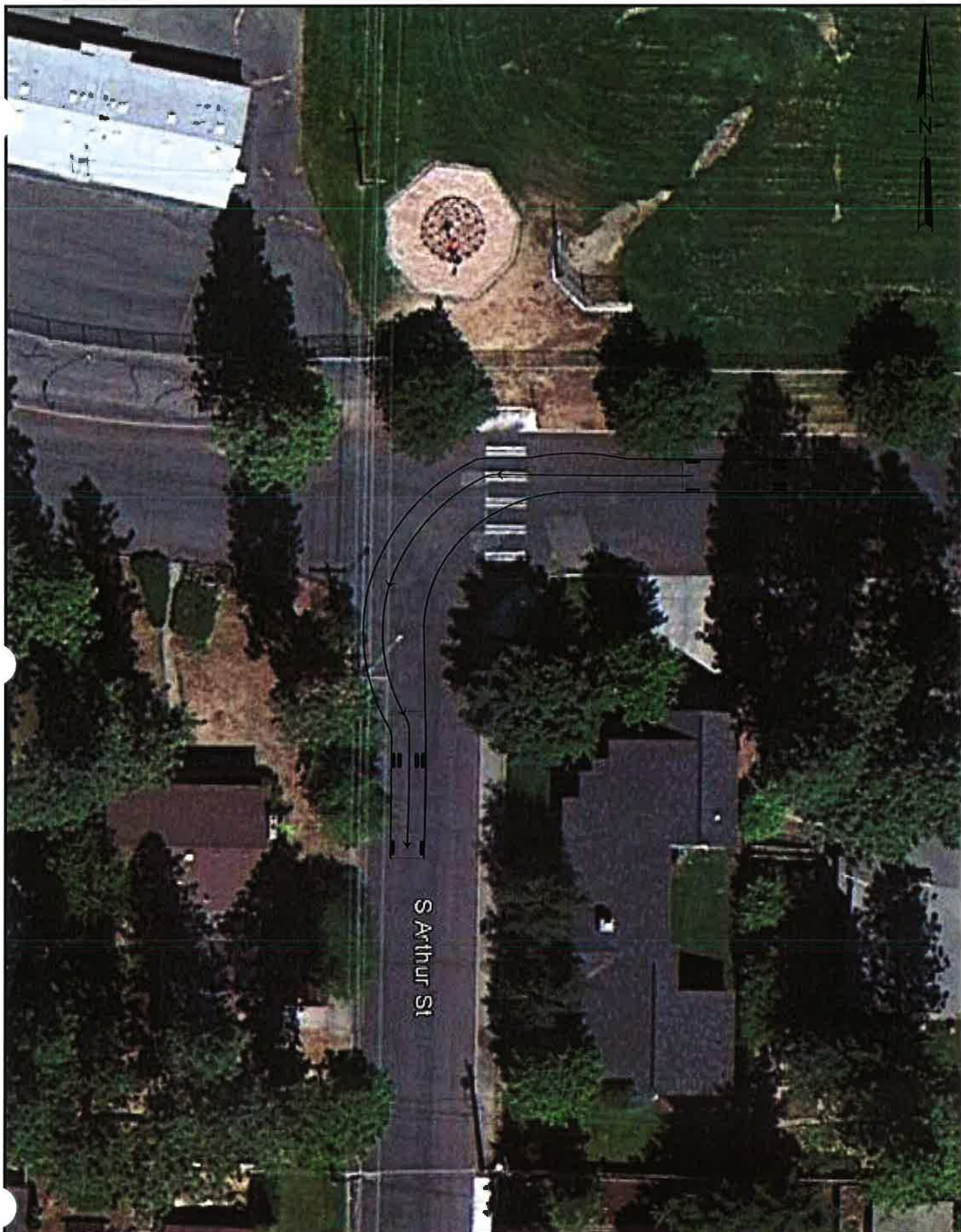



Ivory St

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			SPOKANE WASHINGTON		FIGURE NUMBER FIG. 13
<small>C:\Users\bwhite\Documents\MMI Projects\5132003 - Hutton Elementary Circulation\HuttonGraphics.dwg Plotted by bill white on Jul/11/2013</small>			DESIGN VEHICLE ANALYSIS IVORY ST HORIZONTAL CURVE AT ROCKWOOD		



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<small>C:\Users\white\Documents\MMI Projects\5132003 - Hutton Elementary Circulation\HuttonGraphics.dwg Plotted by bill white on Jul/11/2013</small>			DATE: <u>07/2013</u>		



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		DESIGN VEHICLE ANALYSIS ARTHUR STREET AT PLATEAU ROAD	FIGURE NUMBER FIG. 15	