Spitzenburg Apartment Complex Traffic Impact Analysis

City of College Place
Walla Walla County, Washington

Prepared for:
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October 2, 2018
PBS Project 67234.000

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Date: 2018.10.02 14:00:55 -07'00'

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1 EXECUTIVE SUMMARY

1.1 Purpose and Scope

The purpose of this study is to determine the impacts of traffic generated by the Spitzenburg Apartment Complex development. The project site, shown on the vicinity map (Figure 1), is located at 942 NE Spitzenburg Street in the City of College Place, Washington (City). This study will determine whether mitigation is required to keep the roadways operating safely and at capacity levels acceptable under the current level of service standards. Particularly, the NE Spitzenburg and Myra Road intersection will be evaluated for the need of additional traffic control. This report documents the findings and conclusions of a traffic impact analysis (TIA) conducted for the proposed site plan (Figure 2) application for property located in the City.

1.2 Findings

The findings of this traffic impact analysis are listed below:

Traffic volumes in the study area will continue to increase with or without the project. A background 2.0 percent annual growth rate is applied to the studied intersections.

In total, the Spitzenburg Apartment complex is estimated to generate 266 average weekday trips, including 20 trips during the AM peak hour and 25 trips during the PM peak hour.

The 2013–2017 collision history at the study intersections was reviewed; no collisions were identified.

The Spitzenburg Apartment Complex development includes proposed curb ramps and sidewalks to allow for pedestrian access within the complex. Sidewalk frontage improvements to NE Spitzenburg Street are proposed with this project.

All sidewalks and curb ramps constructed for the Spitzenburg Apartment Complex development should be designed to meet current ADA requirements.

No bike lanes or multi-use trails are on Spitzenburg Street, as is typical of a local street. Myra Road has a multi-use path accessible at the adjacent signalized intersections (Rose Street and C Street). Bicycle trips from this site will have easy access to the Whitman Drive trail and other bicycle facilities from the low volume local streets in the vicinity.

Site accesses do not currently exist, so sight distance measurements are not presently possible. All proposed site entrances along NE Spitzenburg Street should be designed in accordance with the recommendations of Chapter 9.5.3 of the American Association of State Highway and Transportation Officials' (AASHTO) *Geometric Design* (see References).

The Myra Road and Spitzenburg Street intersection was evaluated for operational performance based on level of service (LOS) and volume-to-capacity (v/c) ratio. The intersection operates within the applicable LOS standard during all analysis scenarios, both without and with the project trips, and no mitigation is merited.

1.3 Recommendations

This traffic impact analysis supports the following recommendations.

Design all sidewalks, curb ramps, and driveways associated with the project to comply with current ADA regulations.

Design the proposed driveway access points consistent with AASHTO intersection sight distance Case B guidelines.

Do not install objects within the sight distance triangles that would block drivers' view when exiting at any site access point.

2 INTRODUCTION

The purpose of this study is to determine the impacts of the traffic generated by the Spitzenburg Apartment Complex project on the surrounding roadway infrastructure. The project site is shown on the vicinity map (Figure 1). This study will determine if mitigation is required to keep the roadways operating safely and at capacity levels acceptable under the current level of service standards. This report documents the findings and conclusions of a traffic impact analysis (TIA) conducted for the proposed site plan (Figure 2) application for property located in the City of College Place, Washington (City).

2.1 Scope of Study

This study documents the existing and proposed conditions, traffic data, safety analysis, and intersection operations in accordance with the requirements of the City.

After consultation with City staff, the following intersection was identified for analysis:

- Myra Road and Spitzenburg Street

This TIA is prepared for submission to the City of College Place. The traffic-related issues addressed in this report include:

- Existing traffic conditions
- Background growth including in-process projects sending trips through the studied intersection
- Proposed site-generated traffic volumes and their distribution
- Build-out year (2020) conditions without and with the project
- Capacity analysis of the existing and future conditions for weekday AM and PM peak hours
- Safety analysis of the existing and future conditions
- Recommendations for mitigation of traffic impacts and conclusions

2.2 Existing Conditions

The existing infrastructure and operational traffic conditions in the study area were documented. Roadway conditions were studied to confirm that the roadway is currently operating in a safe and efficient manner.

2.3 Existing Infrastructure

2.3.1 Land Uses

The land uses surrounding the site are documented to help identify the site location and provide reference for any discussion of conditions that might impact the adjacent properties. The land uses surrounding the site are shown in Table 1.

Table 1. Land Uses Around the Site

North of Site	
Zoning	CG
Description	General Commercial
Existing Use	Nursery

West of Site	
Zoning	R-60
Description	Single Family Residential
Existing Use	Residential

SITE

East of Site	
Zoning	RM
Description	Multiple Family Residential
Existing Use	Residential

South of Site	
Zoning	RM
Description	Multiple Family Residential
Existing Use	Residential

2.3.2 Existing Roadways

The existing arterial roadway providing access to the site is NE Spitzenburg Street. Data was gathered on this and other roadways in the study area to inform operations analysis of the existing roadway system. The pertinent information regarding the study area roadways is tabulated in Table 2.

Table 2. Existing Roadway Information

Roadway Name	Classification	Speed Limit	Lane Configuration		
			Lanes	Sidewalks	Bike Lanes
NE Spitzenburg Street	Local Street	25*	2	Partial	No
NE Myra Road	Minor Arterial	35	4	Yes	No

* Assumed

2.3.3 Major Intersections and Traffic Control

The following intersection was reviewed in the study area:

- Myra Road and Spitzenburg Street

The information shown in Table 3 was gathered and is relevant to the intersection operations analysis noted above. Table 3 presents the existing geometrics and traffic control at the study intersections.

Table 3. Major Intersections: Existing Lanes and Traffic Controls

Intersection	***NE Spitzenburg Street/NE Myra Road***			
Leg	**NB**	**SB**	**WB**	**EB**
Control	Unc.	Unc.	N/A	Stop
Number of Lanes	5	4	N/A	2

Stop = Stop controlled leg of intersection
Unc. = Uncontrolled leg approaching intersection – does not stop or yield

The project area is defined as the vicinity of the site encompassed by the study intersections. The operation of the intersections can be controlled by signing, roundabouts, or signalization. Table 3 refers to the type of control and number of approach lanes for each leg of each intersection. The existing lane configurations and traffic controls for all intersections are shown in Figure 3.

2.4 Traffic Volumes

Existing traffic volume data are the basis for the analysis of the capacity and safety of the roadway. In-process traffic is the traffic generated by approved projects that have yet to be completed; the trips from in-process developments are considered additional to the existing traffic volumes. Background traffic growth was estimated for the two-year design horizon of 2020.

2.4.1 Existing Traffic

Traffic volume data was gathered from various sources for the site vicinity for the weekday AM peak hour (7:00–9:00 AM) and the weekday PM peak hour (4:00–6:00 PM). PBS collected the data on September 13, 2018. No complications such as roadway detours or school late starts were noted to affect the data. Copies of the count data used are provided in Appendix A.

2.4.2 Background Traffic

Historically, the cities in Walla Walla County have experienced a modest growth in traffic of approximately one to two percent per year. This report used two percent as a conservative estimate.

Trips from the following in-process projects were used to estimate the background traffic.

- Blue Mountain Mall
- Whitman Crossings
- Village at Fort Walla Walla (phase 1)
- Central College Place Planning Study

3 PROPOSED CONDITIONS

The proposed development will add traffic to the roadway system. Where the project is located, the size of the project, and when it will be completed are all important elements that need to be considered to determine the impacts of this development on safety and capacity. It is also important to examine how the project will operate with the existing transportation system, estimate how much new traffic it will generate, and predict where traffic generated by the site will be distributed. Furthermore, this section will address any funded infrastructure changes planned by other agencies or developers. All of these elements are important in assessing the traffic impacts of this project.

3.1 Project Description

This proposal will develop an approximately 1.55-acre site to construct the Spitzenburg Multifamily Apartment Complex located in the City of College Place, Washington. The development will occupy two parcels, identified as 350725523755 and 350725523754 on Walla Walla County records, which are currently designated as "Multifamily Residential." The current site plan proposes five separate 8-plex apartment buildings spread out over the two parcels. The development is anticipated to be completed in 2020. This report analyzes the traffic impacts generated by the completed development as required by the City of College Place. See Figure 1 for the vicinity map and Figure 2 for the preliminary site plan.

3.2 Access

Properly configured access points are essential to allow for the safe and orderly movement of traffic in and out of a site. Site access is important to the success of the proposed apartment complex. A site plan provided by the client shows one proposed access point; a two-way lane that services residents to and from the apartment complex onto NE Spitzenburg Street. There are no proposed turn pockets or turning restrictions regarding the access points. See Figure 2 for more details.

3.3 Trip Generation and Distribution

The following sections rely on data provided in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* (see References section).

3.3.1 Proposed Trip Generation

The ITE *Trip Generation Manual* was used to develop the trip generation estimates for the Spitzenburg Multifamily Apartment Complex. Based off the proposed site plan, Apartment (Land Use Code 220) was used to determine the trip generation for the development, with number of dwelling units as the independent variable. The detailed trip generation calculations are in Appendix D, and the trips are summarized in Table 4.

Table 4. Net New Trip Generation for Spitzenburg Apartment Complex

Land Use (ITE Code)	Apartment (220)	
Independent Variable	Dwelling Units	
Size	40	
Average Weekday Trips (ADT)	266	
Peak Hour Trips	**AM Peak Hour (7:00–9:00 AM)**	**PM Peak Hour (4:00–6:00 PM)**
In	4	16
Out	16	9
Total Trips	20	25

3.3.2 Proposed Trip Distribution

The proposed distribution of new (primary) trips is based on a review of the land uses within the study area, on proration of different distributions for the various proposed land uses, and on engineering judgment. Site-generated trips were estimated to distribute as 60 percent to or from the north on Myra Road and 40 percent to and from the south on Myra Road.

The distribution pattern and assignment of site-generated trips are shown in Figure 9.

4 INTERSECTION OPERATIONS AND ROADWAY CAPACITY ANALYSES

4.1 Operations Description

Traffic operations are assessed in terms of level of service (LOS), a concept developed by transportation engineers to qualify the level of operation of intersections and roadways (*Highway Capacity Manual*). LOS measures are classified in grades A through F, indicating a range of operation. LOS A signifies the best level of operation, while F represents the worst.

LOS at unsignalized intersections is quantified in terms of average delay per vehicle. LOS A reflects full freedom of operation for a driver, while LOS F represents operational failure. The criteria are based on the theory of gap acceptance for side street stop-controlled approaches. A detailed description of LOS criteria is provided in Appendix E.

The volume-to-capacity (v/c) ratio quantifies the portion of the theoretical capacity consumed by traffic demand volume. A v/c ratio of zero (0.00) reflects none of the capacity is consumed and all the capacity is fully available. A v/c ratio of one (1.00) reflects all the capacity is consumed and represents operational failure. The v/c ratio can be calculated for an intersection approach lane or for a signalized intersection as a whole, with the latter calculation aggregating the v/c ratios of the critical movements.

4.2 Operation Standards

The City of College Place considers LOS D in the peak hour the minimum acceptable operation, except LOS E is considered acceptable at unsignalized intersections that do not meet signal warrants or where a signal is not desired.

4.3 Analysis Methodology

Traffic impacts were estimated to determine the extent of change in traffic conditions caused by the development of this project. In order to make this determination, the following assumptions were employed:

- The proposed development will be completed and fully occupied in 2019.
- The peak hour factor (PHF) for the overall intersection, as calculated from the count data, was applied for all analysis scenarios. This is a conservative assumption since, with future increases in traffic volume, 15-minute peaks tend to spread or smooth over the hour-long analysis period.
- Existing background traffic on the study area roadways will grow by 2.0 percent per year along the Myra Road corridor.
- All approved in-process trips at study area intersections were included in the background traffic volumes. This is a conservative assumption since it is unlikely all the projects will be fully occupied within the study period. Some sources of the in-process project trips only reported PM peak hour trips. As this appears to be the critical time period, it should not compromise the analysis, findings, or recommendations.
- Background traffic volumes on the surrounding street system have been determined prior to adding the traffic impacts of the proposed project. This was done to establish a baseline for measurement of the project impacts at the time of its development. Background traffic volume estimates were prepared for a two-year design horizon.
- As noted previously, trip generation estimates for the project were prepared for the weekday AM and PM peak hours on the surrounding street system.

- Cumulative traffic impacts of the proposed project were determined by superimposing the project-generated traffic onto the background weekday AM and PM peak traffic at all studied intersections.
- The LOS for all signalized and stop-controlled intersections was calculated with Trafficware's Synchro Version 9 software based on HCM 2010 methodologies.

LOS calculation reports for the study area intersections are provided in Appendix F. The key analysis findings are listed in the following tables.

4.4 Level of Service Analyses

4.4.1 2018 Existing Conditions

Table 5. Estimated 2018 Level of Service for Existing Conditions for Study Area Intersections

INTERSECTION *(critical lane group)*	**AM Peak Hour**			**PM Peak Hour**		
	LOS	***Delay (sec/veh)***	***v/c***	***LOS***	***Delay (sec/veh)***	***v/c***
NE Spitzenburg Street/NE Myra Road (eastbound left)	C	15.4	0.121	C	16.8	0.105

N/A = not available from Synchro reports

As shown in Table 5, all studied intersections currently operate at an acceptable LOS during the weekday AM and PM peak hours.

4.4.2 2020 Future Conditions without Project

Table 6. Estimated 2020 Level of Service without Project Level for Study Area Intersections

INTERSECTION *(critical lane group)*	**AM Peak Hour**			**PM Peak Hour**		
	LOS	***Delay (sec/veh)***	***v/c***	***LOS***	***Delay (sec/veh)***	***v/c***
NE Spitzenburg Street/NE Myra Road (eastbound left)	C	16	0.145	C	20.3	0.136

N/A = not available from Synchro reports

As shown in Table 6, all studied intersections currently operate at an acceptable LOS during the weekday AM and PM peak hours.

4.4.3 2020 Future Conditions with Project

Table 7. Estimated 2020 Level of Service with Project for Study Area Intersections

INTERSECTION *(critical lane group)*	**AM Peak Hour**			**PM Peak Hour**		
	LOS	***Delay (sec/veh)***	***v/c***	***LOS***	***Delay (sec/veh)***	***v/c***
NE Spitzenburg Street/NE Myra Road	C	16.4	0.188	C	21.7	0.178

N/A = not available from Synchro reports

As shown in Table 7, all studied intersections currently operate at an acceptable LOS during the weekday AM and PM peak hours.

4.5 Queue and Blocking Analysis

The Synchro 2010 LOS analysis for the intersection provides queue length measurements for the approaches. The eastbound, stop-controlled approach is estimated as less than one vehicle in the year 2020, AM and PM peak hours, with project traffic. The queue length in the northbound left turn on Myra Road was almost zero (0.1 vehicles) for the same periods. Thus, no queueing or blocked driveways or intersections.

5 SAFETY ANALYSIS

5.1 Left-Turn Storage Analysis

The existing two-way left-turn (TWLTL) provides a left turn lane on Myra Road. The LOS analysis did not show the need or any benefit of for a left turn lane on Spitzenburg Street at Myra Road.

5.2 Right-Turn Treatment Analysis

The criteria for the analysis of right-turn lanes at uncontrolled intersection legs are based on the Washington State Department of Transportation (WSDOT) *Design Manual*, Right-Turn Lane Guidelines (Exhibit 1310-11), which notes:

> Right-turn movements influence intersection capacity even though there is not conflict between right-turning vehicles and opposing traffic. Right-turn lanes might be needed to maintain efficient intersection operation. Use the following to determine when to *consider* right-turn lanes at unsignalized intersections:
>
> - For two-lane roadways and for multilane roadways with a posted speed of 45 mph or above, when recommended by Exhibit 1310-11.

The speeds of all uncontrolled roadways at study area intersections are all 35 mph and below. The right turn volume is less than 40 in the peak hour and the peak hour approach volume is less than 300, thus no right-turn lane analysis is recommended based on the *WSDOT Design Manual* Right-Turn Lane Guidelines.

5.3 Collision Analysis

Collision data from the study area was obtained from WSDOT for the five-year period spanning from January 2013 through December 2017. The collision history shows no collisions at the NE Spitzenburg Street/NE Myra Road intersection during the five-year period, therefore no further review is recommended.

5.4 Transit, Pedestrian, and Bicycle Facilities

Walla Walla County transit service currently is provided in the Walla Walla City Center and is not within walking distance of the proposed development. This existing transit service will not be extended with the project.

The Spitzenburg Apartment Complex development includes proposed curb ramps and sidewalks to allow for pedestrian access within the complex. Sidewalk frontage improvements to NE Spitzenburg Street are proposed with this project.

All sidewalks and curb ramps constructed for the Spitzenburg Apartment Complex development should be designed to meet current ADA requirements.

No bike lanes or multi-use trails are on Spitzenburg Street, nor should be expected as local street. Myra Road has a multi-use path accessible at the adjacent signalized intersections (Rose Street and C Street). Bicycle trips from this site will have easy access to the Whitman Drive trail and other bicycle facilities from the low volume local streets in the vicinity.

5.5 Site Distance at Sight Access Locations

The site accesses do not currently exist, so sight distance measurements are not presently possible. All proposed site entrances along NE Spitzenburg Street should all be designed in accordance with Chapter 9.5.3 of AASHTO's *A Policy on Geometric Design of Highways and Streets*, Sixth Edition (2011).

6 STUDY FINDINGS

The findings of this TIA are listed below:

6.1 Future Traffic Volumes Increase

Traffic volumes in the study area vicinity will continue to increase with or without the project. A background 2.0 percent annual growth rate is applied along the Myra Road corridor.

6.2 Trip Generation

The Spitzenburg Apartment complex is estimated to generate 266 average weekday trips, 20 AM peak hour trips, and 25 PM peak hour trips.

6.3 Collision Analysis

The 2013–2017 collision history at the study intersections was reviewed; no collisions were identified.

6.4 Transit, Pedestrian, and Bicycle Facilities

The Spitzenburg Apartment complex will install frontage improvements on Spitzenburg Street to meet ADA and City of College Place standards. No off-site improvements were identified.

6.5 Driveway Sight Distance

Site accesses do not currently exist, so sight distance measurements are not presently possible. All proposed site entrances along NE Spitzenburg Street should all be designed in accordance with the recommendations of Chapter 9.5.3 of the AASHTO *Geometric Design* (see References).

6.6 Intersection Performance

The Myra Road and Spitzenburg Street intersection was evaluated for traffic operational performance based on LOS and v/c ratio. The intersection operates within the applicable LOS standard during all analysis scenarios, both without and with the project trips, and no mitigation is merited.

7 RECOMMENDATIONS

7.1 Accessibility

Assure all sidewalks and curb ramps constructed with the project are ADA compliant. The traffic impact analysis did not identify any off-site public improvements.

7.2 Driveway Sight Lines

Design the proposed driveway access points consistent with AASHTO sight distance guidelines.

Install no objects within the sight distance triangles that would block exiting drivers' view at the access points.

8 REFERENCES

American Association of State Highway and Transportation Officials (AASHTO). (2011). *A Policy on the Geometric Design of Highways and Streets*, 6th Edition.

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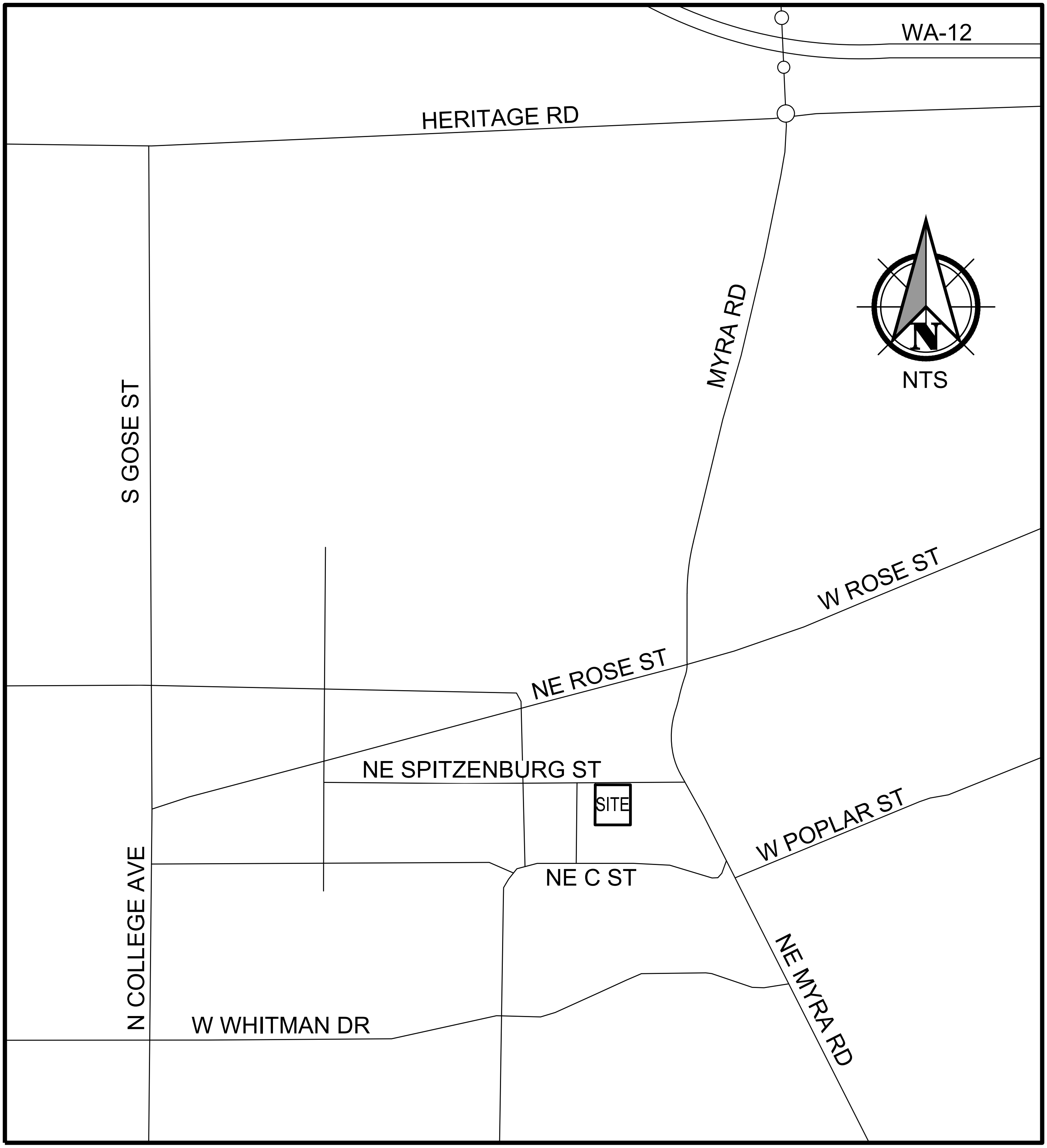
Figures



PBS

Vicinity Map

Spitzenburg Apartment Complex

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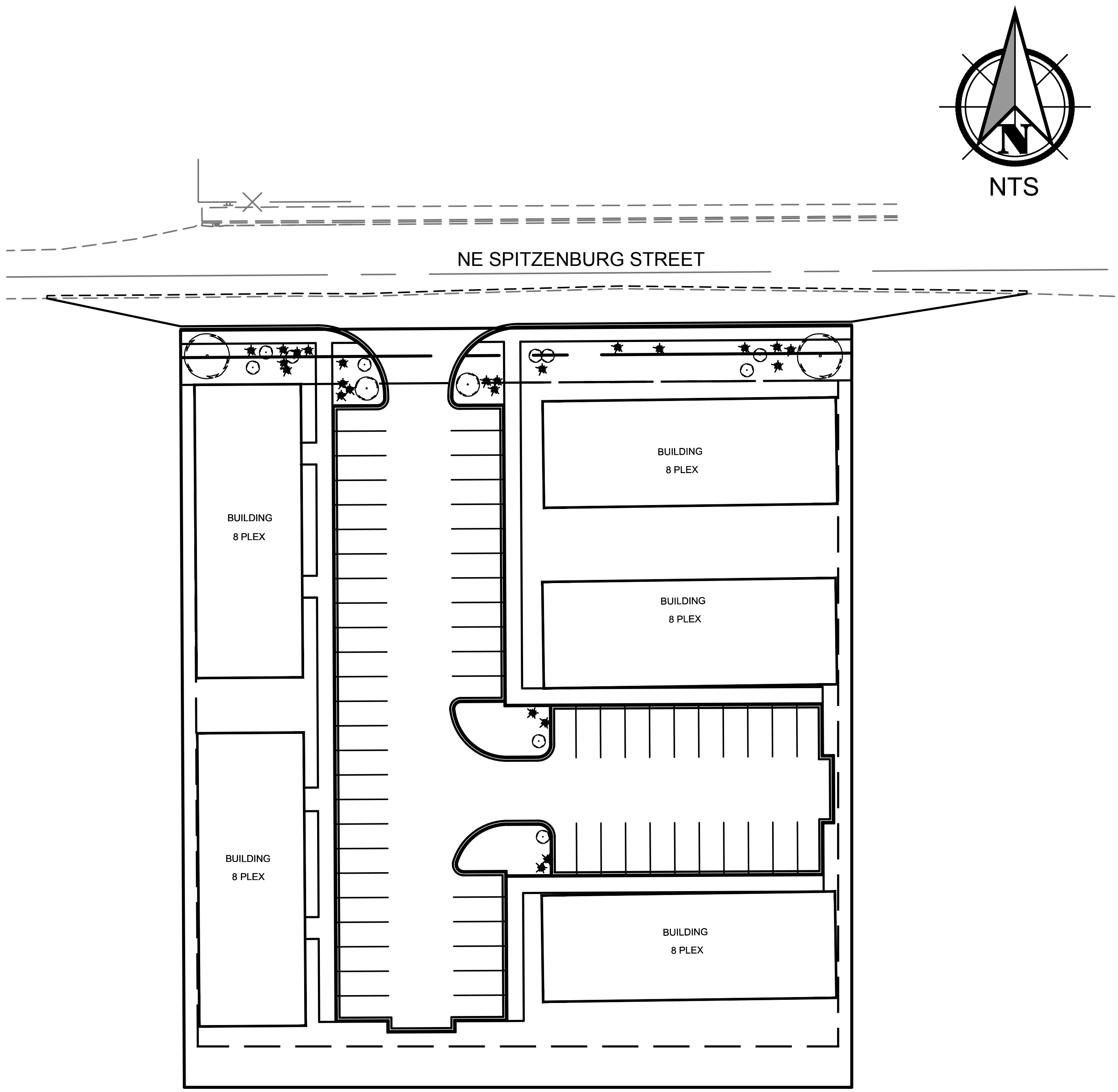
FIGURE
1



Site Plan

Spitzenburg Apartment Complex

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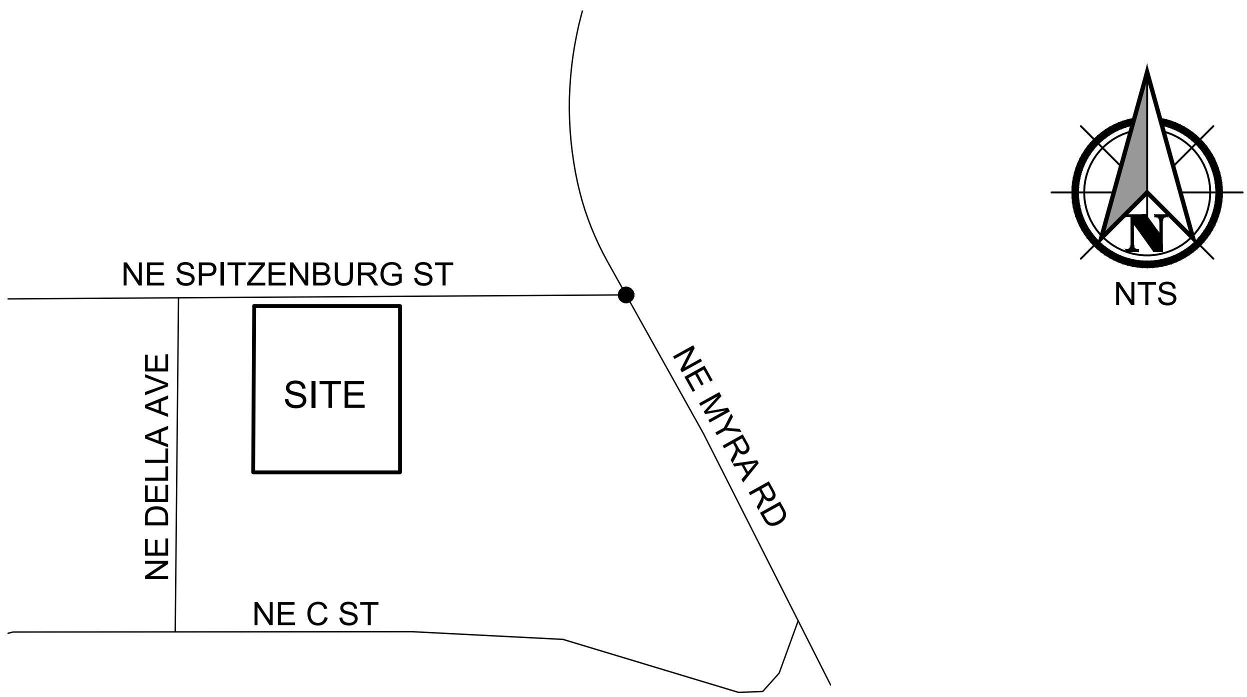
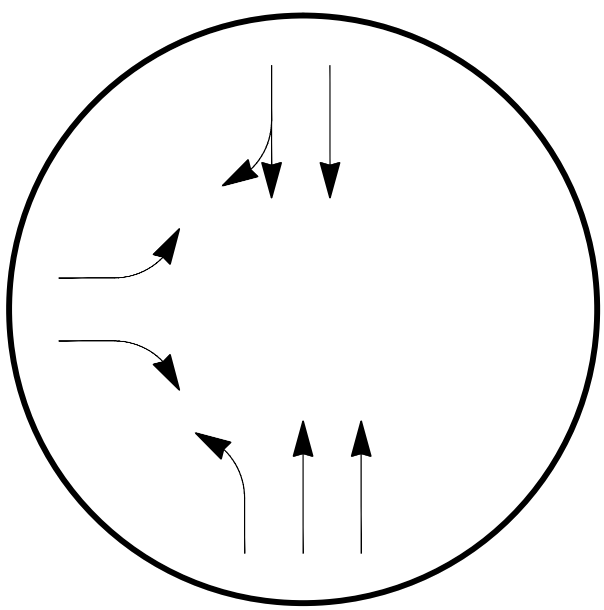
67234.000

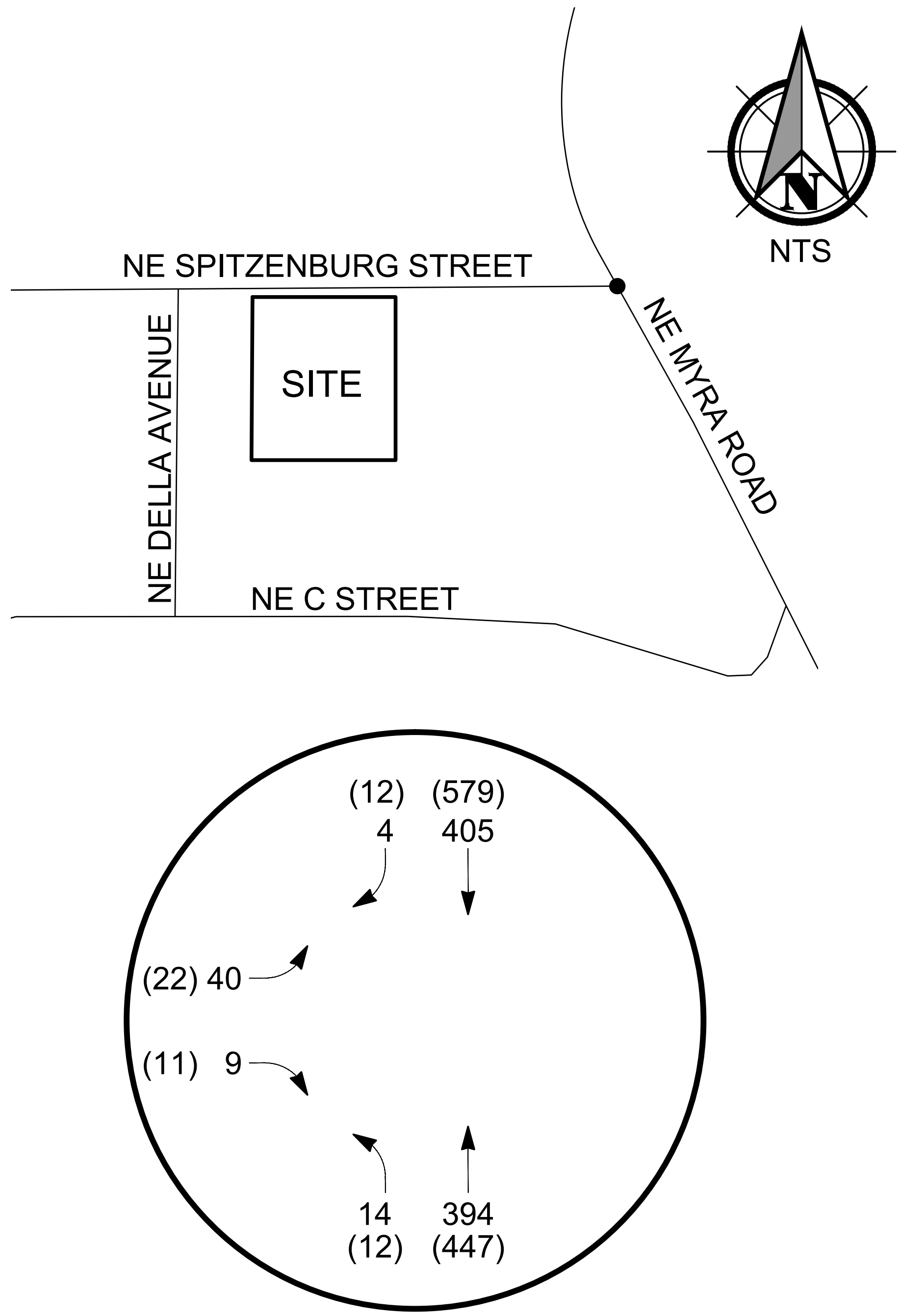
FIGURE
2





NE SPITZENBURG STREET /
NE MYRA ROAD

PBS	**Existing Lane Configurations and Traffic Controls** **Spitzenburg Apartment Complex**	SEP 2018 67234.000 FIGURE **3**



NE SPITZENBURG STREET /
NE MYRA ROAD

LEGEND

XXX	AM PEAK HOUR (7:30 AM - 8:30 AM)
(XXX)	PM PEAK HOUR (4:30 PM - 5:30 PM)

PBS

2018 Existing Volumes

Spitzenburg Apartment Complex

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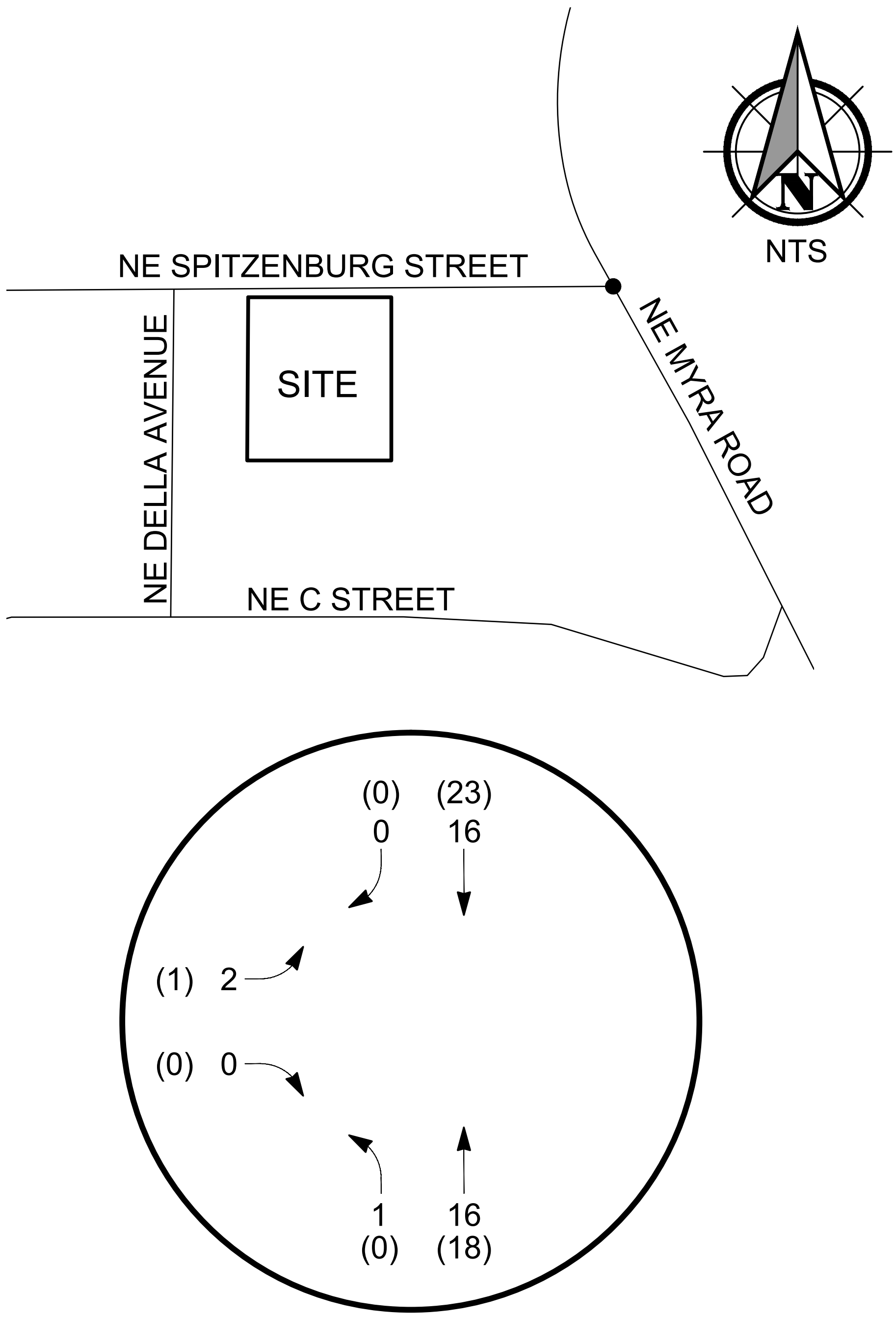
67234.000

FIGURE
4



NE SPITZENBURG STREET /
NE MYRA ROAD

LEGEND

XXX	AM PEAK HOUR (7:30 AM - 8:30 AM)
(XXX)	PM PEAK HOUR (4:30 PM - 5:30 PM)

PBS

2018 - 2020 Background Growth

Spitzenburg Apartment Complex

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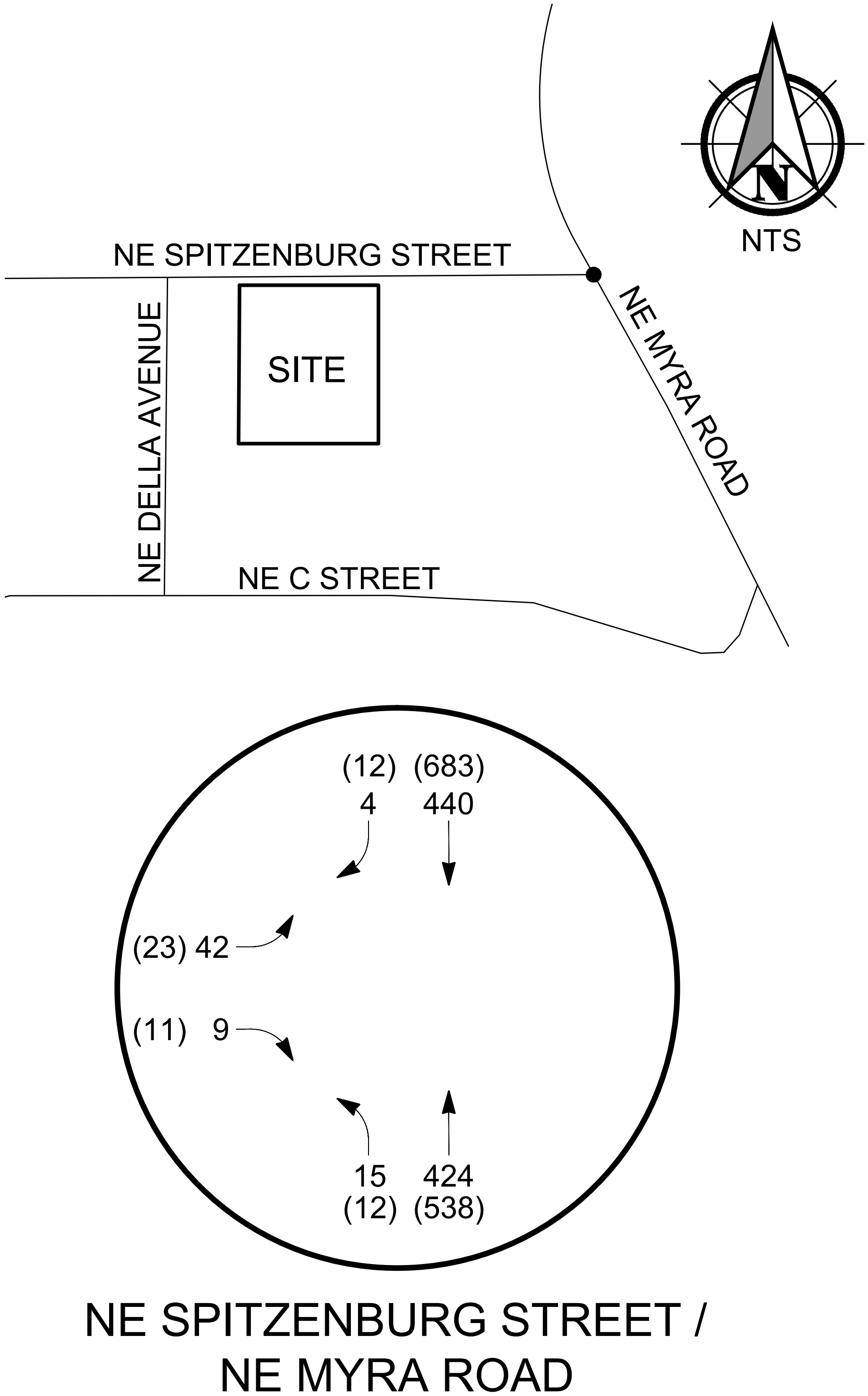
67234.000

FIGURE
5



LEGEND

XXX	AM PEAK HOUR (7:30 AM - 8:30 AM)
(XXX)	PM PEAK HOUR (4:30 PM - 5:30 PM)

PBS

2020 Without Project Volumes

Spitzenburg Apartment Complex

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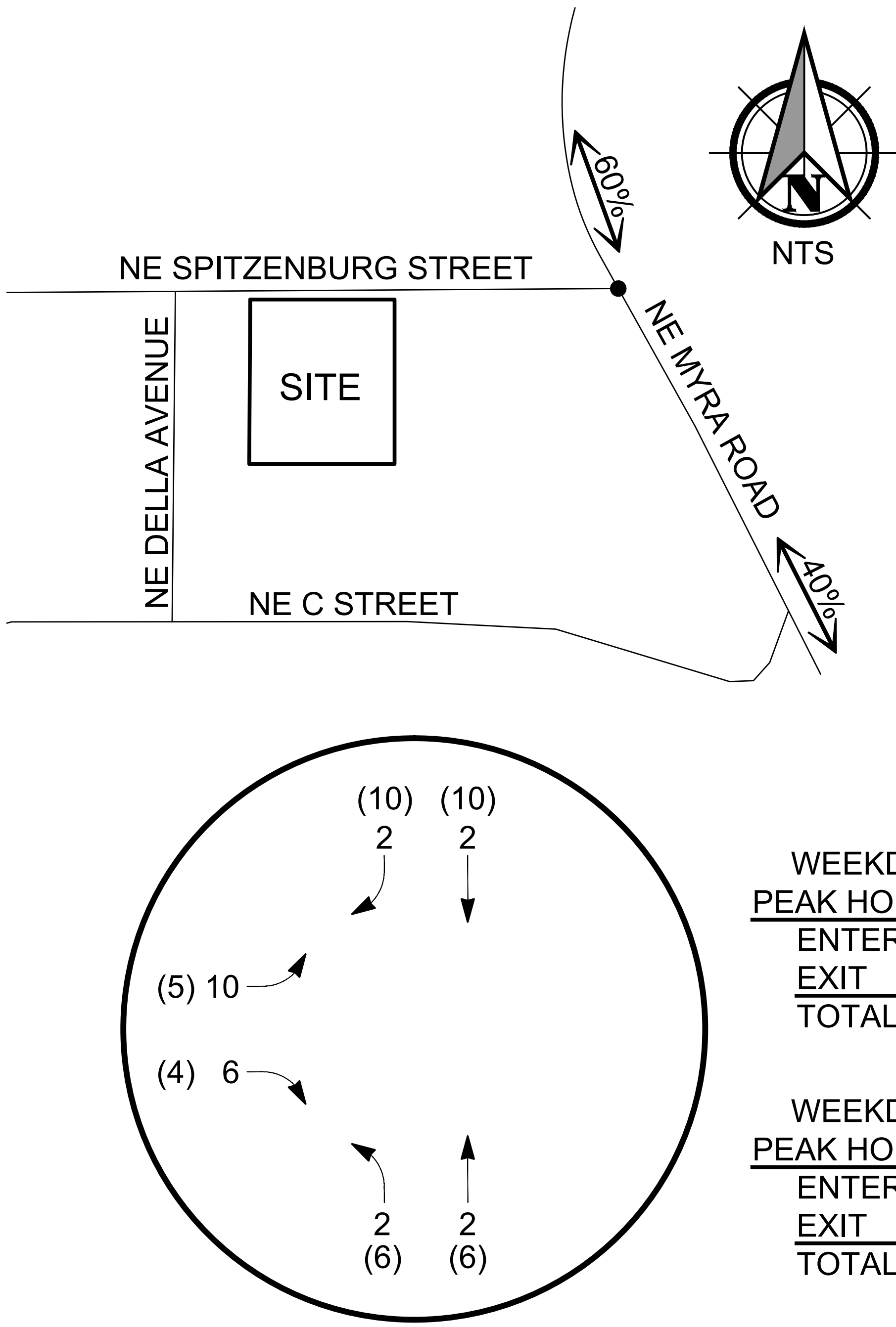
67234.000

FIGURE
6



WEEKDAY AM
PEAK HOUR TRIPS

ENTER	4
EXIT	16
TOTAL	20

WEEKDAY PM
PEAK HOUR TRIPS

ENTER	16
EXIT	9
TOTAL	25

NE SPITZENBURG STREET /
NE MYRA ROAD

LEGEND

XXX	AM PEAK HOUR (7:30 AM - 8:30 AM)
(XXX)	PM PEAK HOUR (4:30 PM - 5:30 PM)

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Trip Distribution and Trip Assignment

Spitzenburg Apartment Complex

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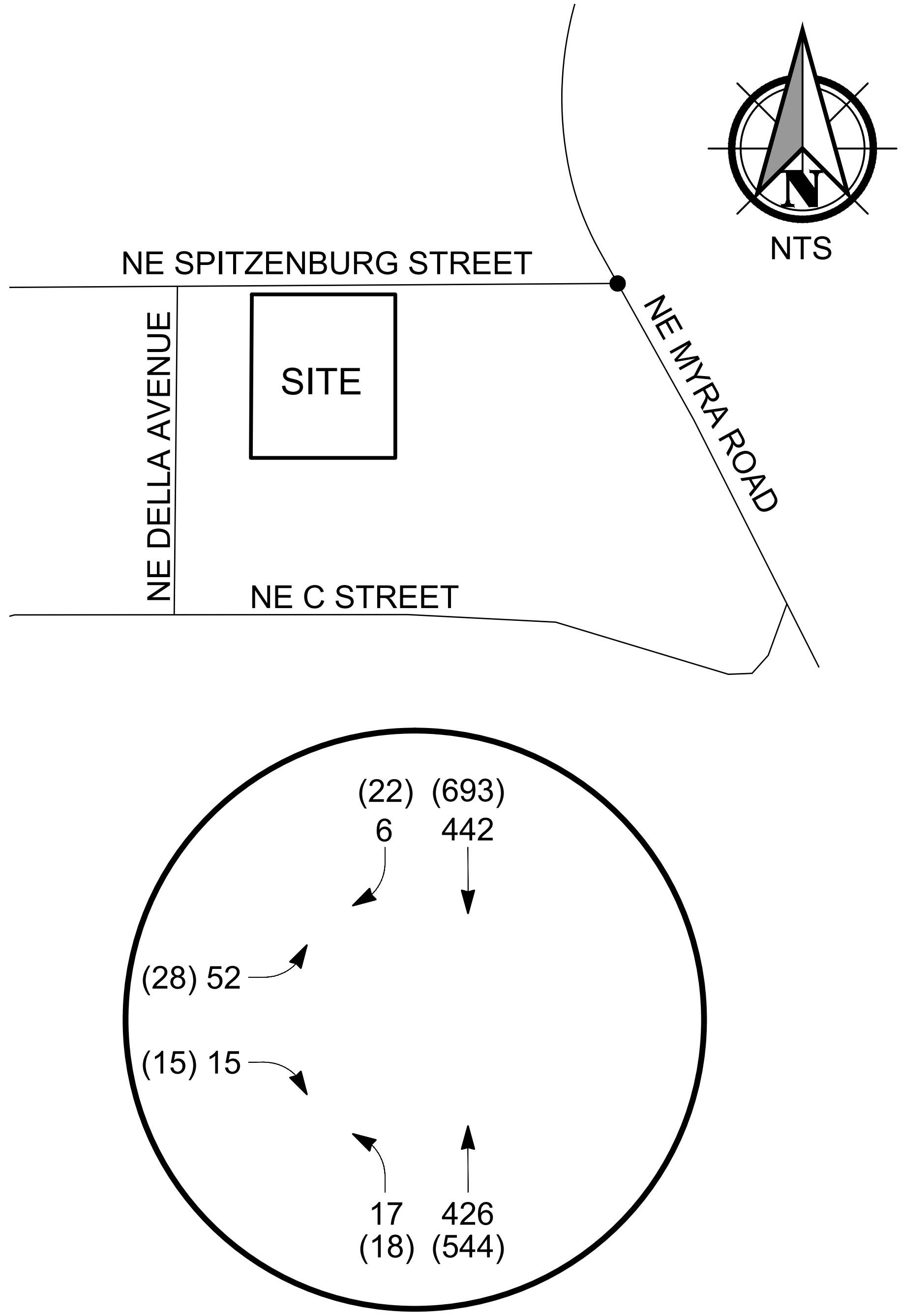
67234.000
FIGURE
7



NE SPITZENBURG STREET /
NE MYRA ROAD

LEGEND

XXX	AM PEAK HOUR (7:30 AM - 8:30 AM)
(XXX)	PM PEAK HOUR (4:30 PM - 5:30 PM)

PBS

2020 With Project Volumes

Spitzenburg Apartment Complex

SEP 2018
67234.000

FIGURE
8

Appendix A

Traffic Counts

VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 7:00 A to 7:15 A

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

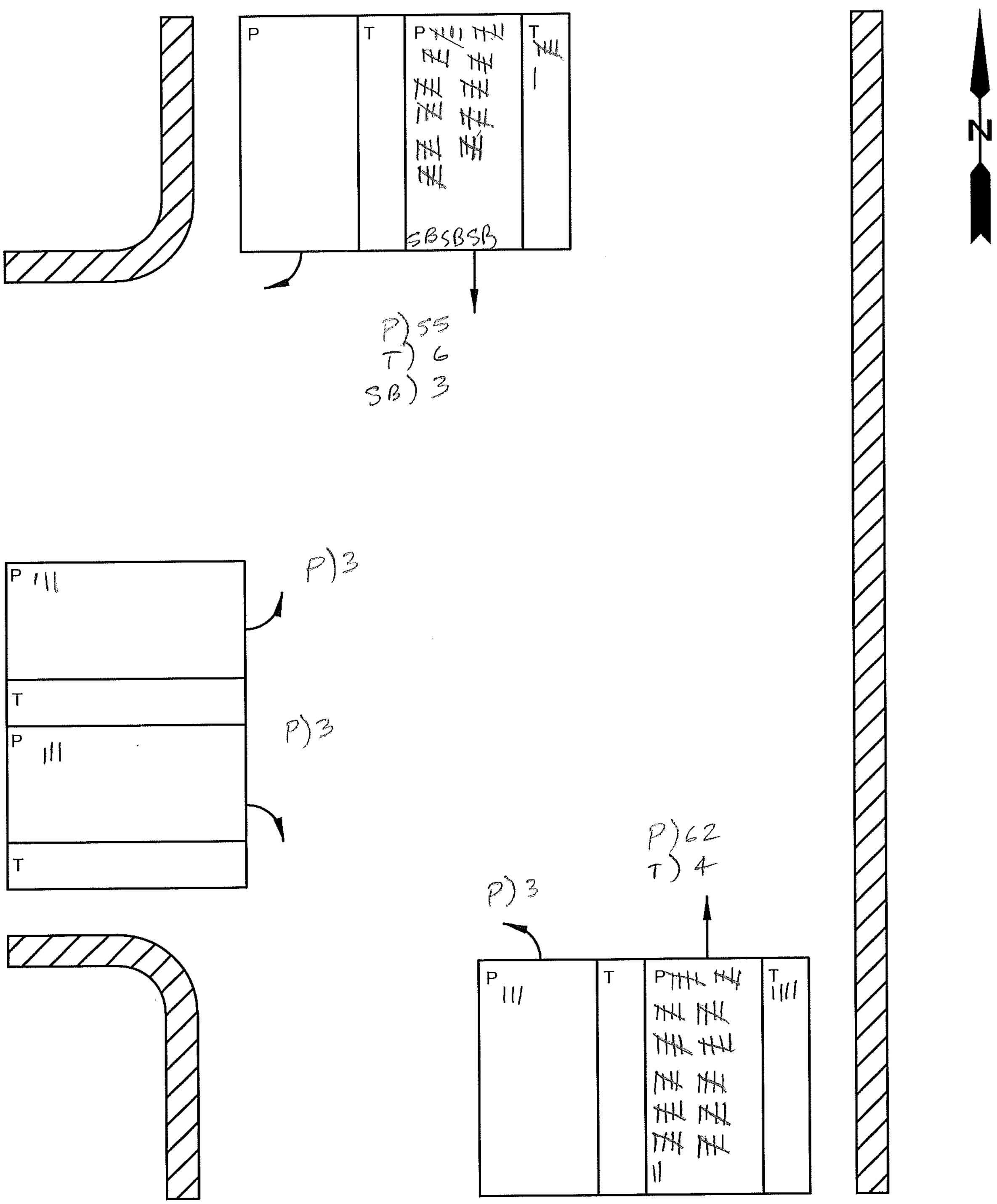
E/W Street SPITZENBURG AVE

Weather 55°, PT. SUNNY

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 7:15A to 7:30A

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

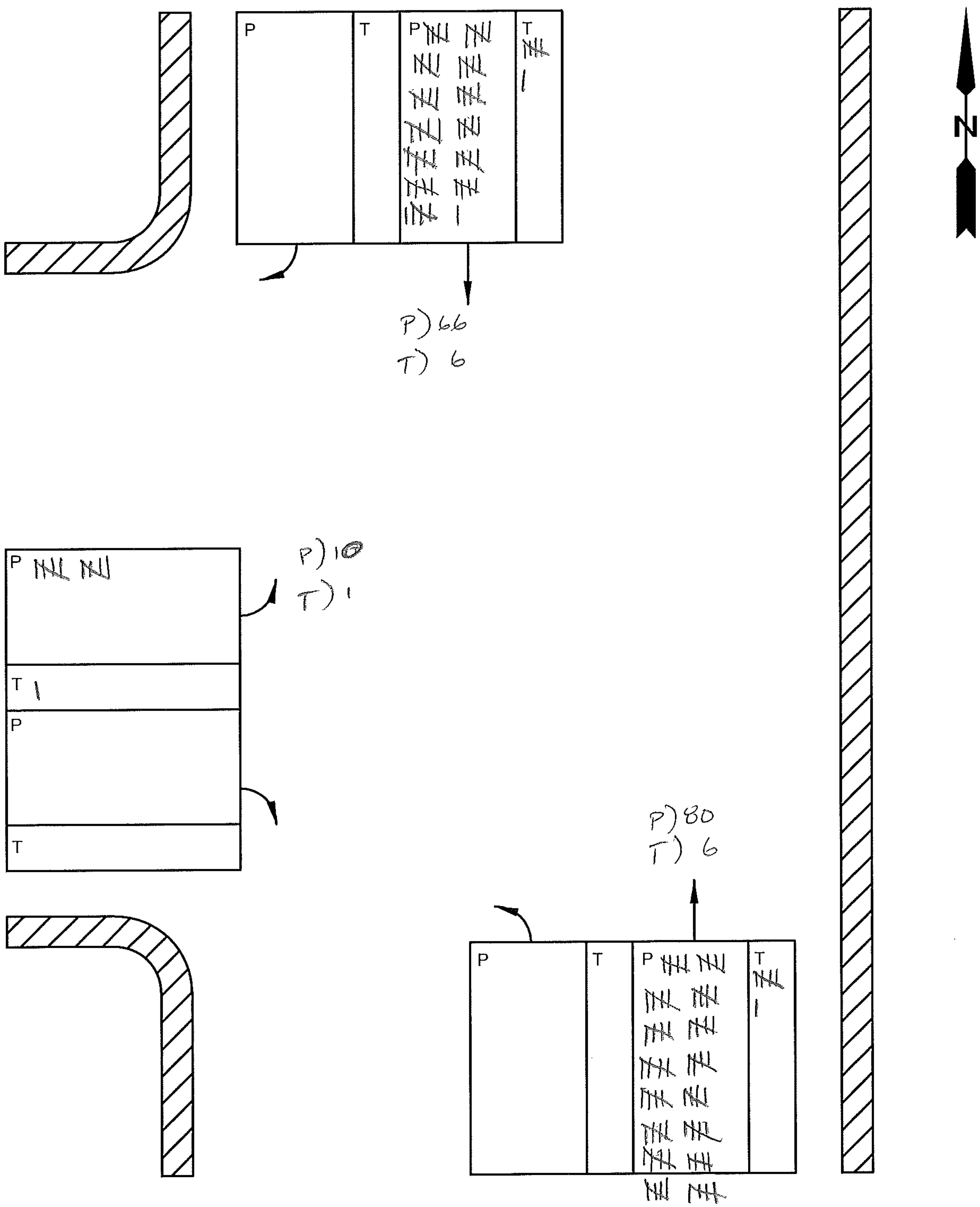
E/W Street SPITZENBURG AVE

Weather 55°, PT. SUNNY

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 7:30A to 7:45A

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

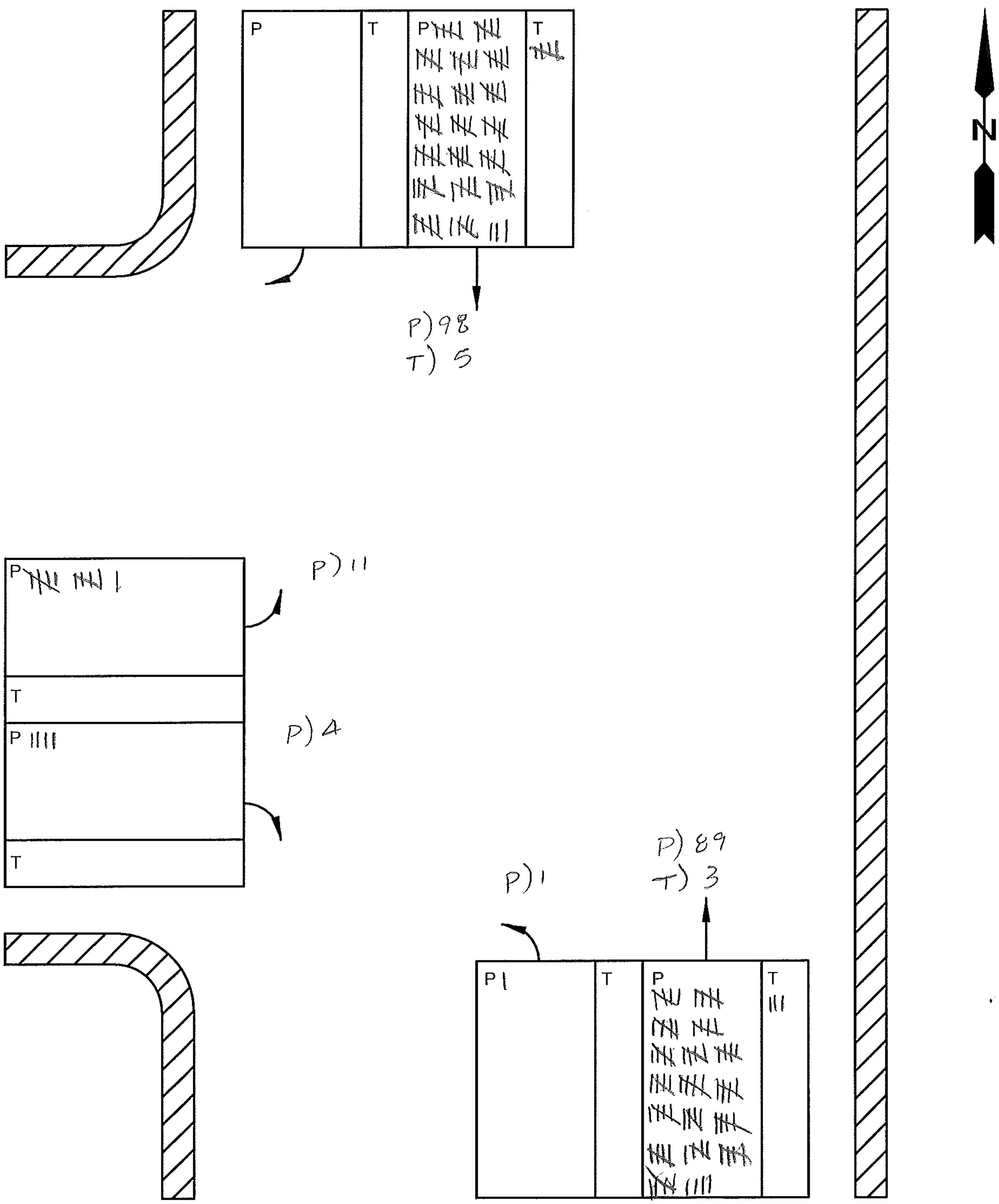
E/W Street SPITZENBURG AVE

Weather 55°, PT SUNNY

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 7:45A to 8:00 A

N/S Street MYRA RD.

Date 9/12/2019 Day WEDS

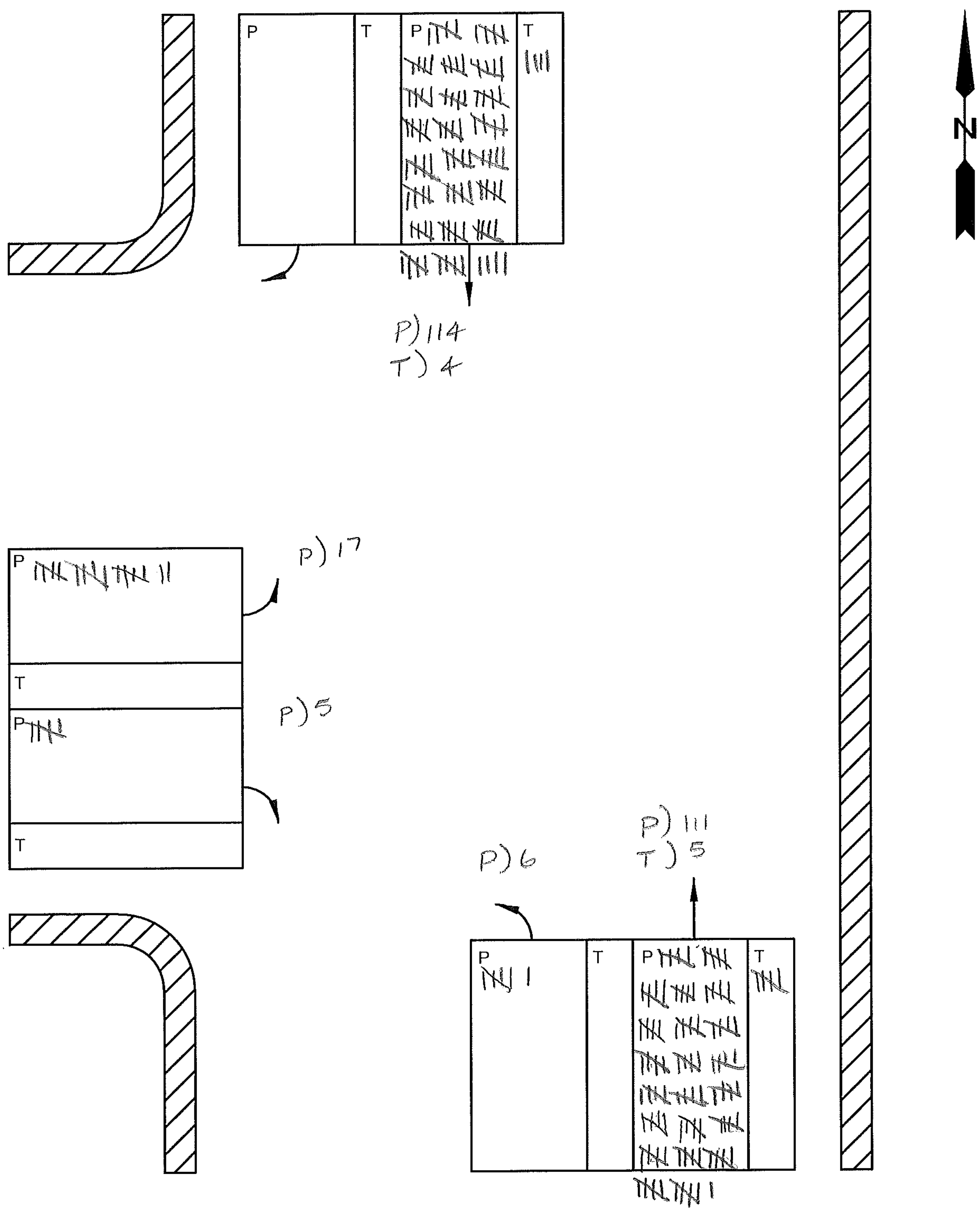
E/W Street SPITZENBURG AVE

Weather 55°, PT. SUNNY

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 8:00A to 8:15A

N/S Street MYRA RD

Date 9/12 Day WEDS

E/W Street SPITZENBURG AVE

Weather 55°, PT. SUNNY

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).

P	T	P	T

P) 3

P) 97
T) 5

N

P
T
P
T

P) 6

P) 90
T) 5

P) 3

P	T	P	T

VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

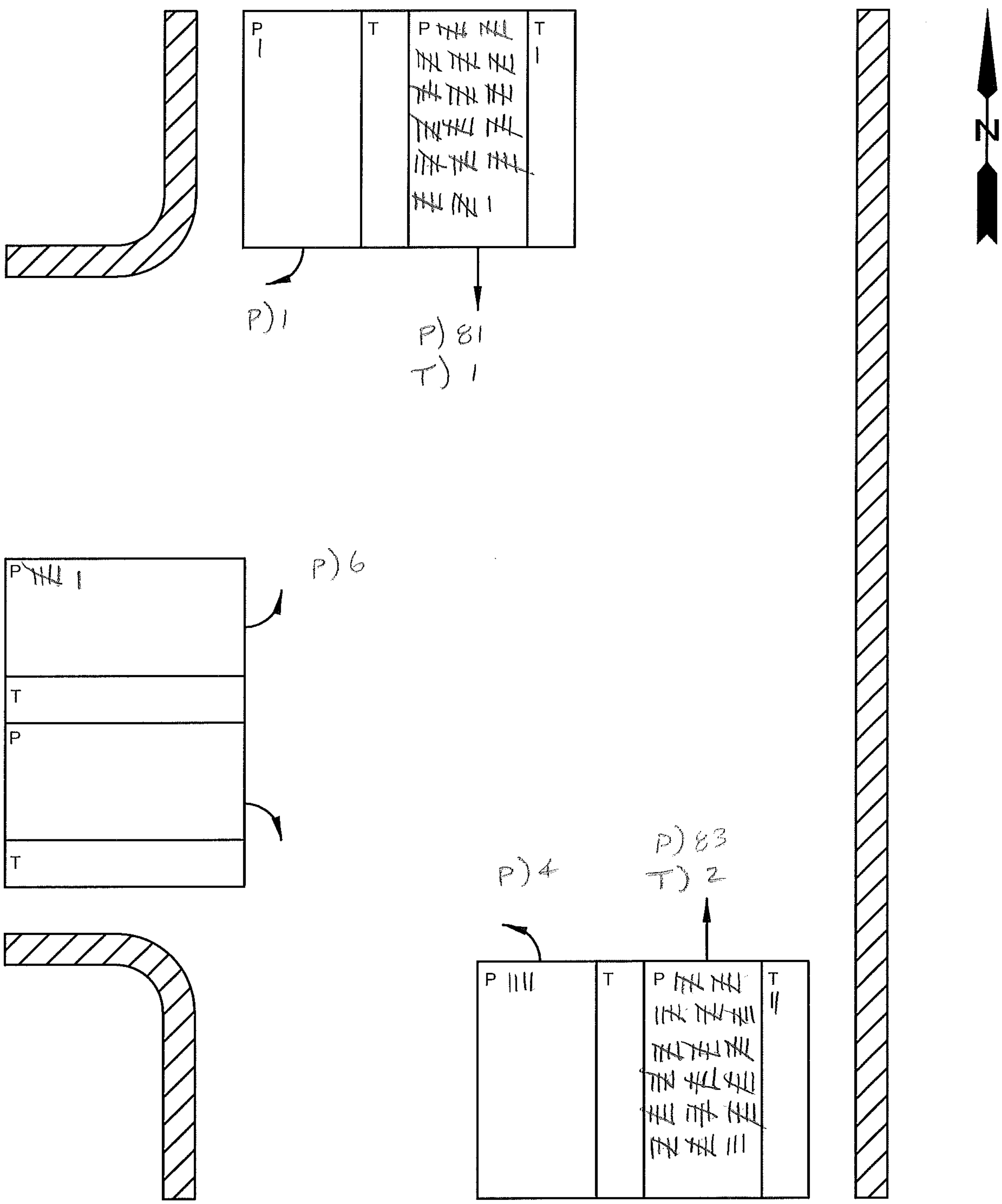
Time 8:15 to 8:30

N/S Street MYRA RD. Date 9/12/2018 Day WEDS

E/W Street SPITZENBURG AVE Weather 60°, PT. SUNNY

P = passenger cars, stationwagons, motorcycles, pick-up trucks. Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 8:30 to 8:45

N/S Street MYRA RD.

Date 9/12/2018 Day WEDS

E/W Street SPITZENBURG AVE

Weather 60°, PT. SUNNY

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).

North approach: P | T | P | T

P) 87
T) 8

West approach: P | B | T | P || | T

P) 6
B) 1 (DIAL-A-RIDE ± 12 PASSENGER)

P) 2

South approach: P ||| | T | P | T

P) 3

P) 68
T) 5

N

VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

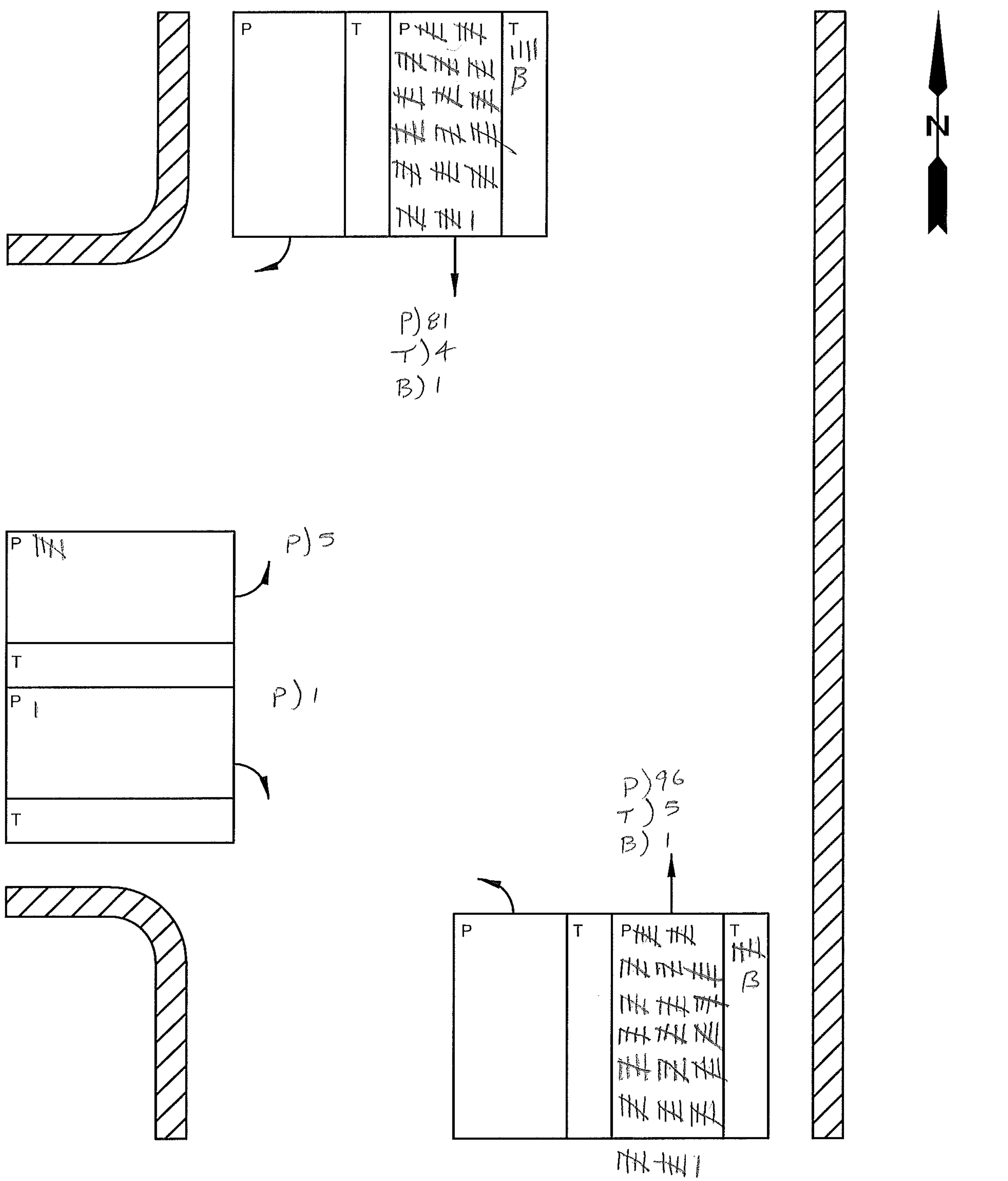
Time 8:45 A to 9:00 A

N/S Street MYRA RD. Date 9/12/2018 Day WEDS

E/W Street SPITZENBURG AVE Weather 60°, PT CLOUDY

P = passenger cars, stationwagons, motorcycles, pick-up trucks. Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 4:00 P to 4:15 P

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

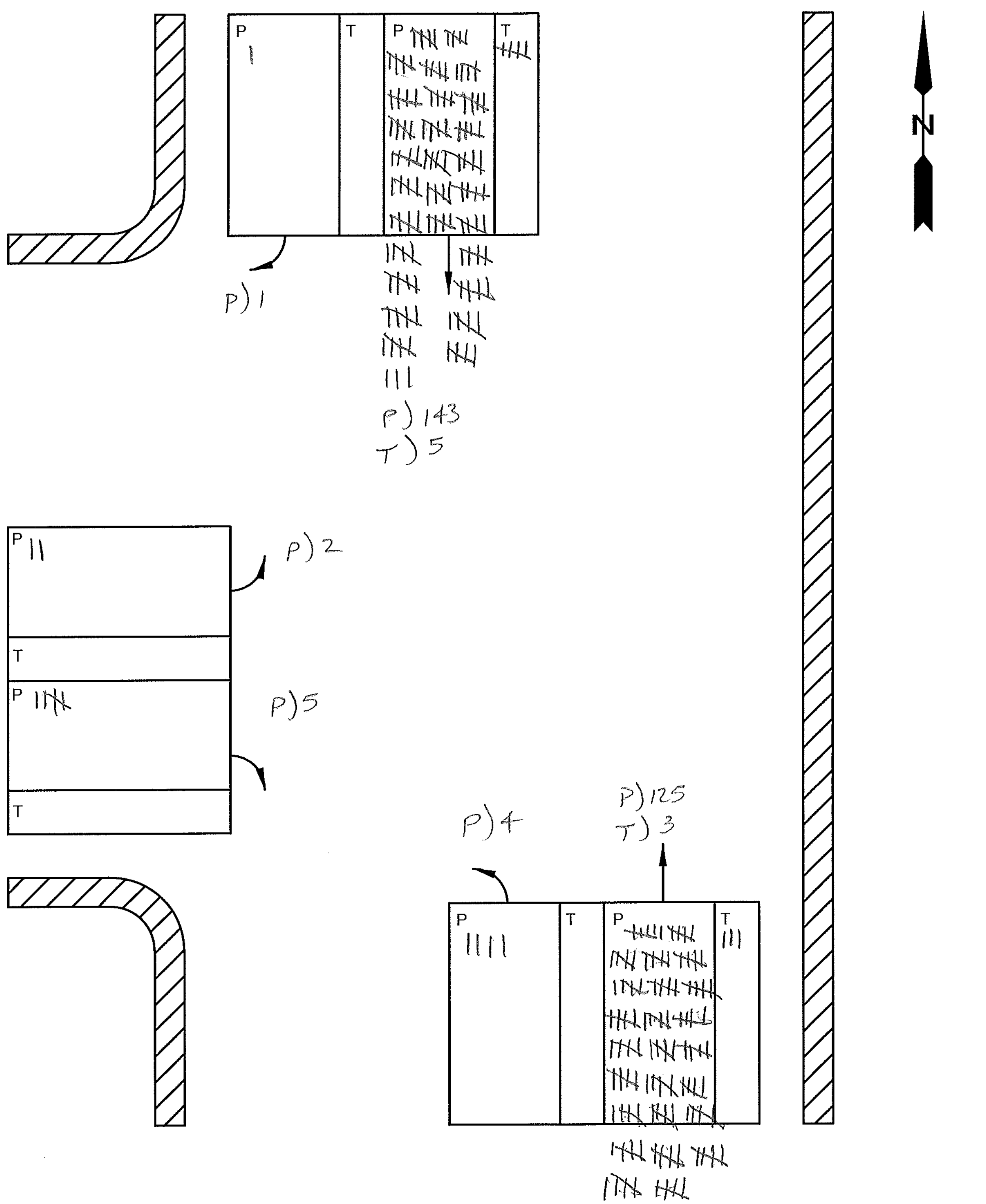
E/W Street SPITZENBURG AVE

Weather 70°, MOSTLY SUNNY

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 4:15 P to 4:30 P

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

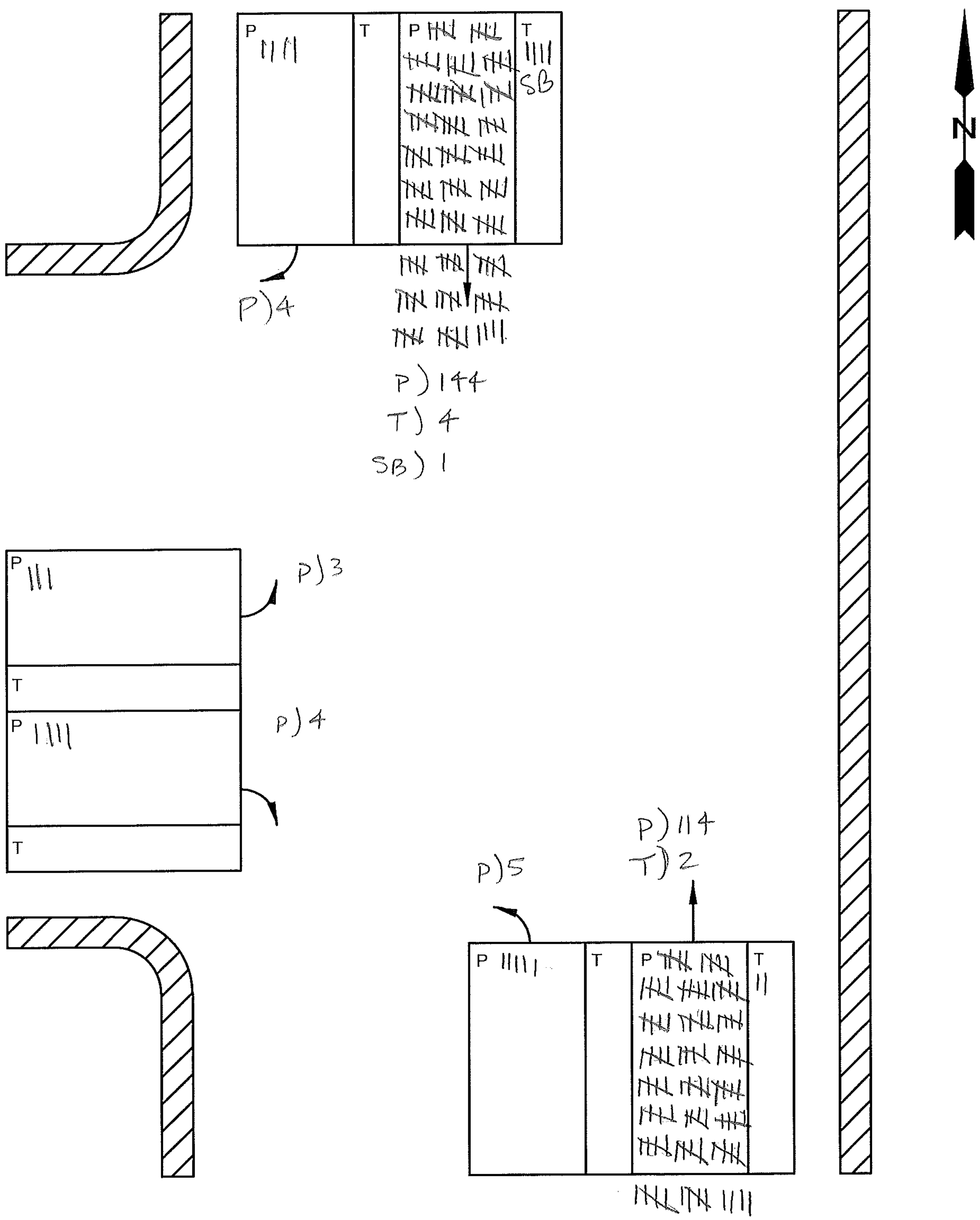
E/W Street SPITZENBURG AVE

Weather 70°, MOSTLY SUNNY

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 4:30 P to 4:45 P

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

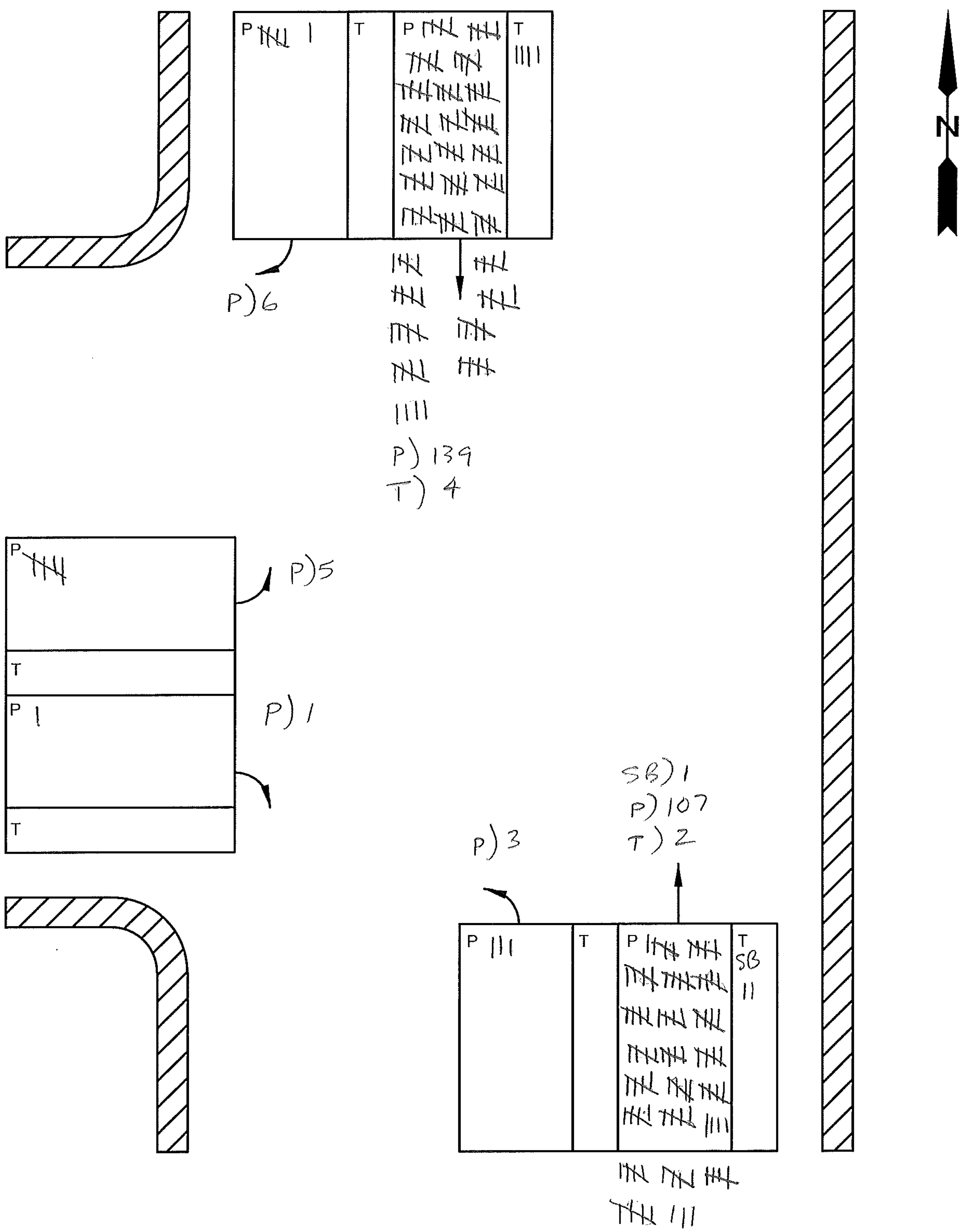
E/W Street SPITZENBURG AVE

Weather

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 4:45 P to 5:00 P

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

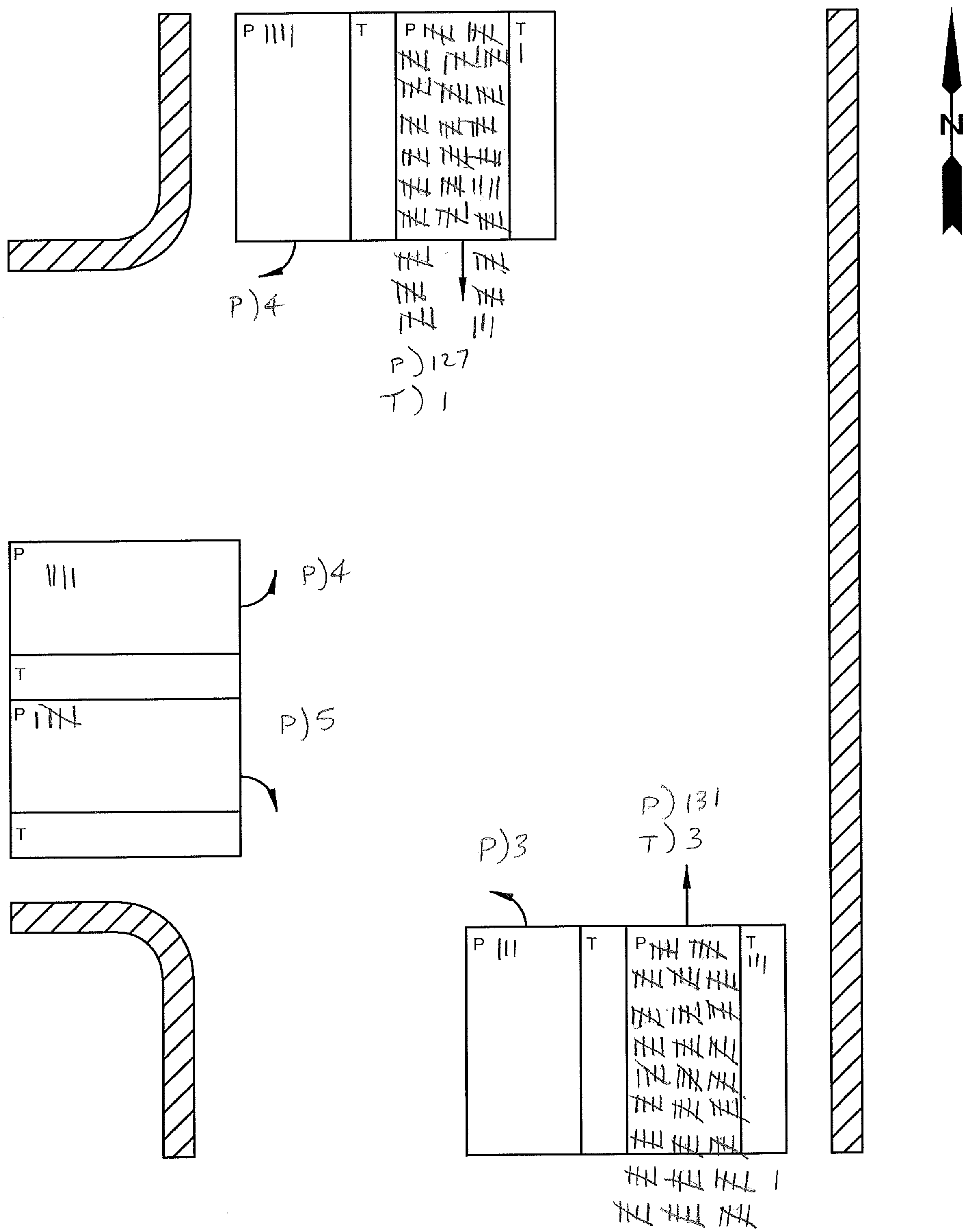
E/W Street SPITZENBURG AVE

Weather

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 5:00 P to 5:15 P

N/S Street MYRA RD.

Date 9/12/2018 Day WEDS

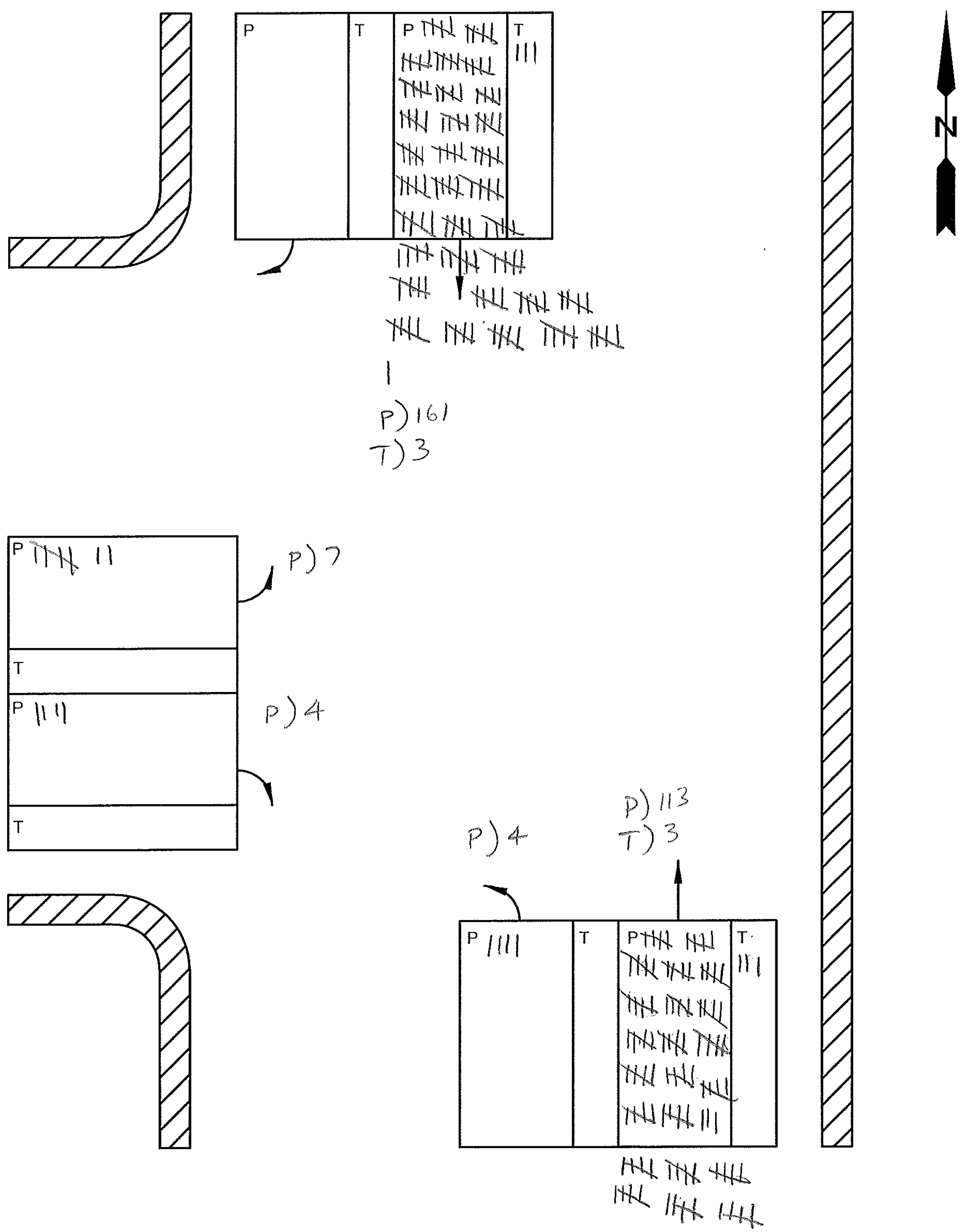
E/W Street SPITZENBURG AVE

Weather

Observer MARK WENDOVER

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 5:15 P to 5:30 P

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

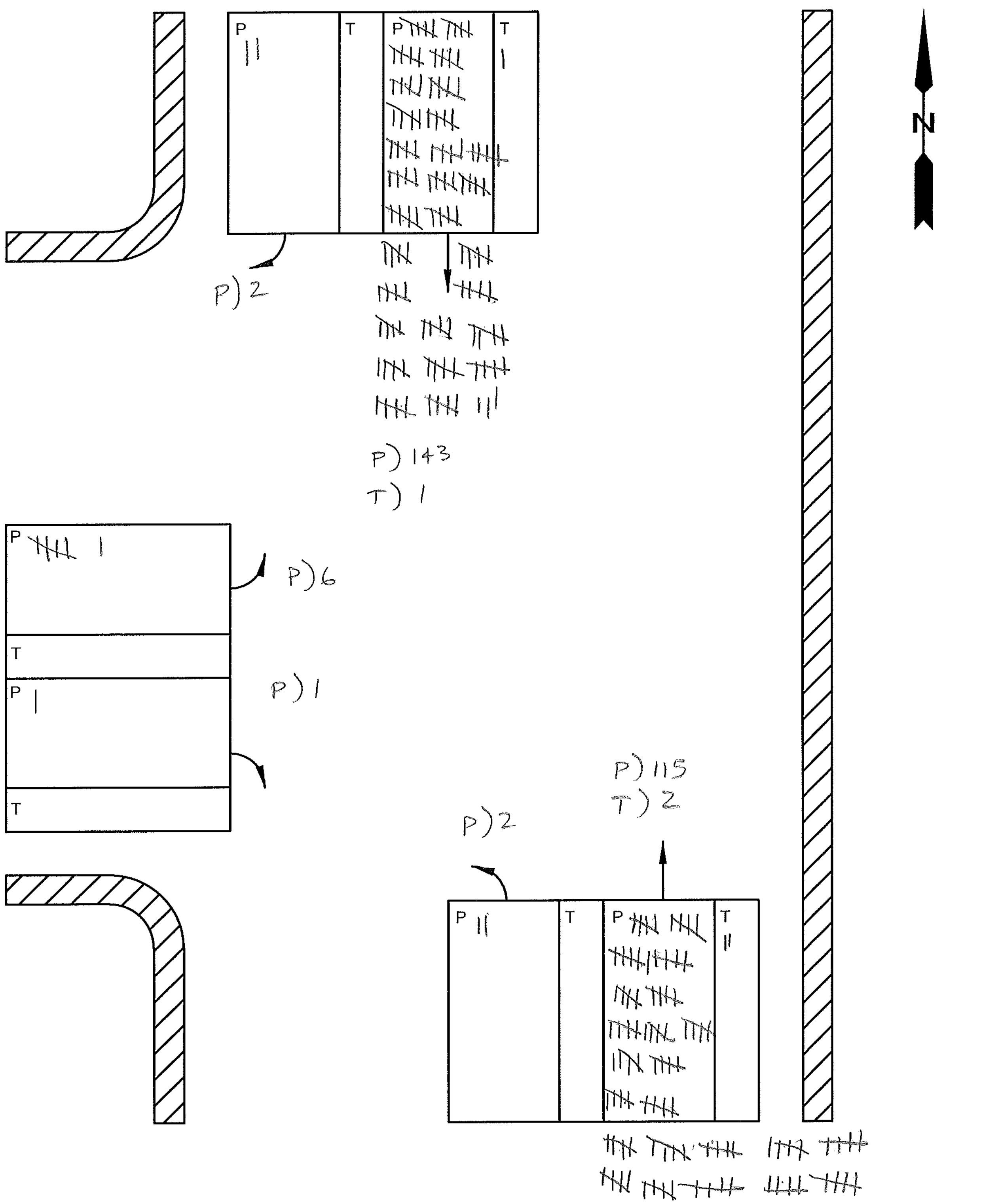
E/W Street SPITZENBURG AVE

Weather

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 5:30 P to 5:45 P

N/S Street MYRA RD

Date 9/12/2018 Day WEDS

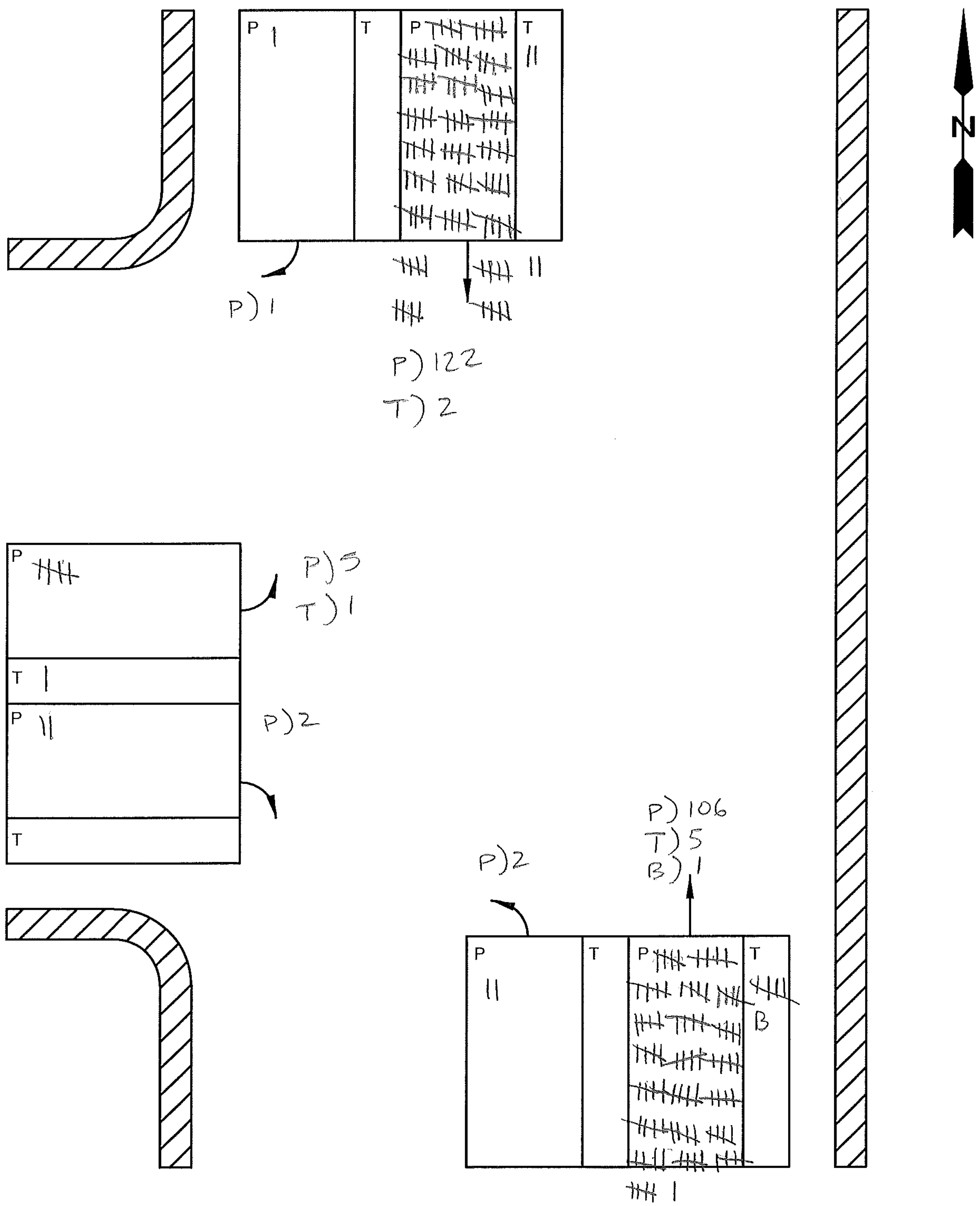
E/W Street SPITZENBURG AVE

Weather

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



VEHICLE TURNING MOVEMENT COUNT

THREE-APPROACH FIELD SHEET

Time 5:45 P to 6:00 P

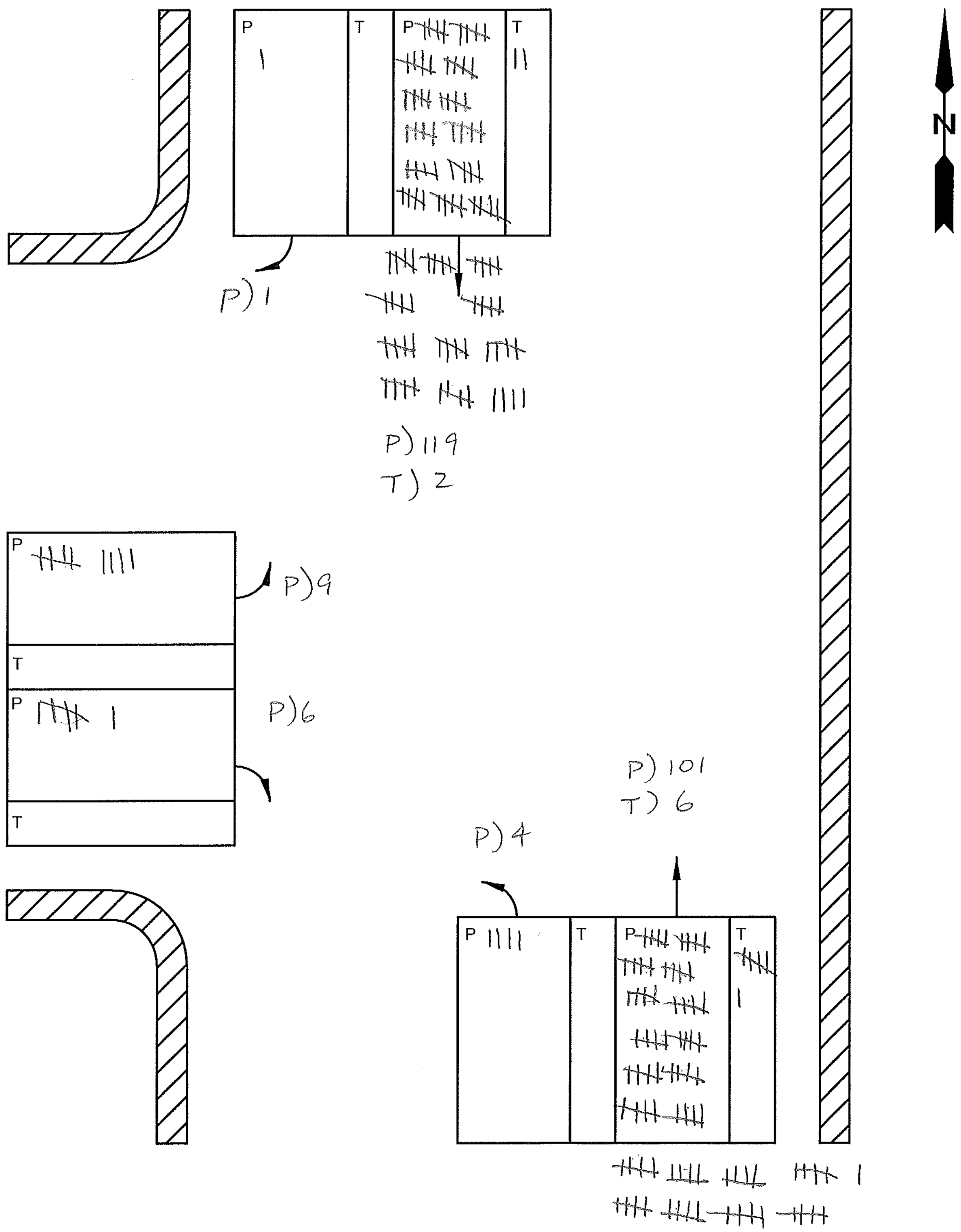
N/S Street MYRA RD. Date 9/12/2018 Day WEDS

E/W Street SPITZENBURG AVE Weather

P = passenger cars, stationwagons, motorcycles, pick-up trucks.

Observer MARK WENDOVER

T = other trucks. (Record any school bus as SB; other buses as B).



Appendix B
Trip Generation Calculations

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

PBS Engineering and Environmental

General			
Land Use Code	Apartment		
Independent Variable	Dwelling Units		
Size (X)		40.00	
ITE Land Use Code		220	

Date:	Analyst:	Project:
5/21/2018	JAM	Sirmon Apt Complex
		College Place WA

	In	Out	Total
Average Weekday	133	133	266
New Trips	133	133	266
AM Peak Hour for ac	4	16	20
New Trips	4	16	20
PM peak hour for adj	16	9	25
New Trips	16	9	25

Sirmon Apartment Complex, 40 units

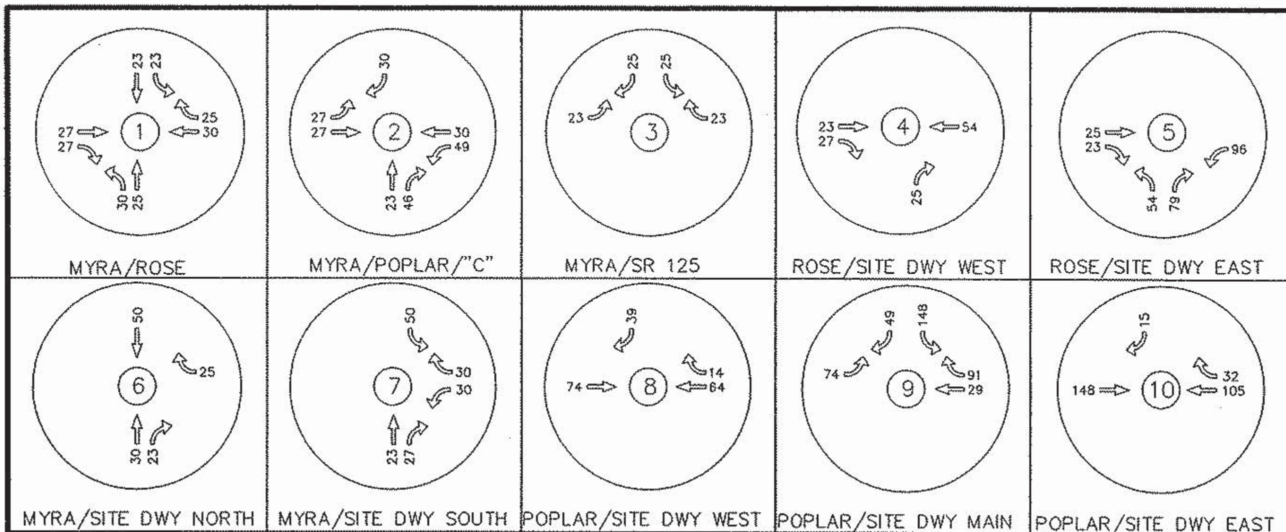
Analysis Period	Weekday		
Average Rate	**Rate**		**Trips**
	6.65		266
Entering / Exiting			
% entering	50%		133
% exiting	50%		133
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		133	133
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		133	133

	AM Peak Hour for adjacent street		
Average Rate	**Rate**		**Trips**
	0.51		20
Entering / Exiting			
% entering	20%		4
% exiting	80%		16
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		4	16
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		4	16

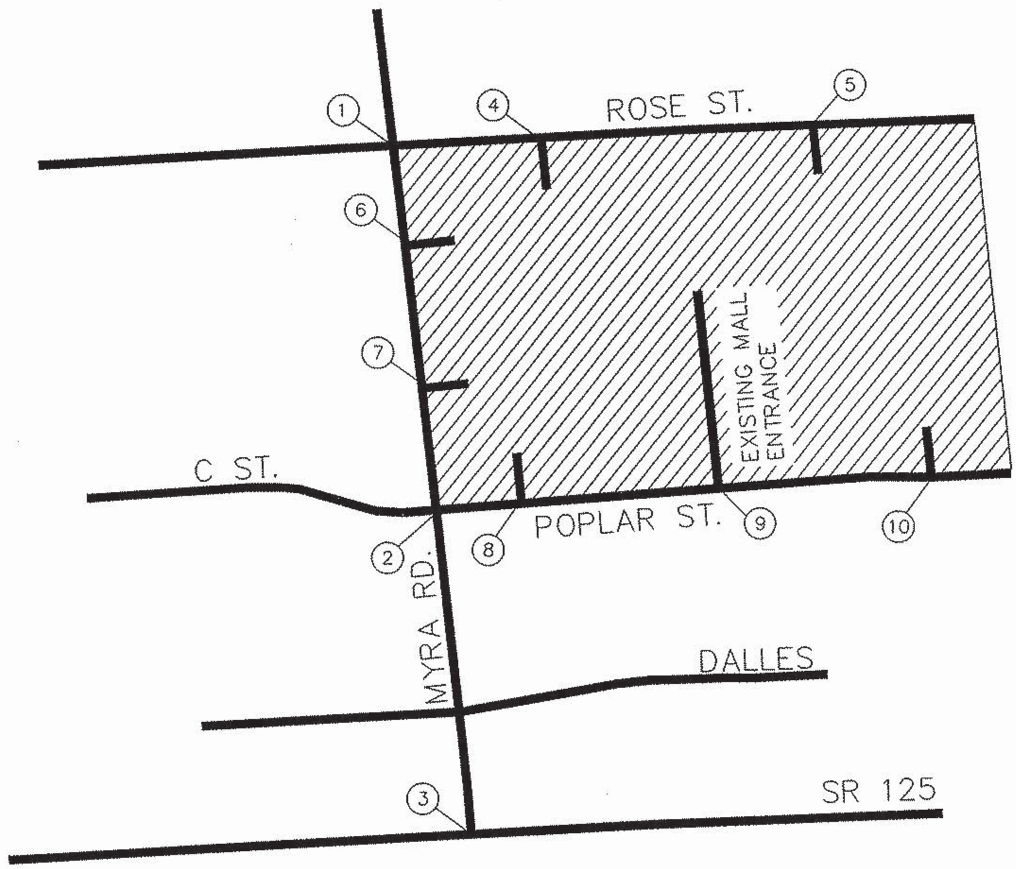
Analysis Period	PM peak hour for adjacent street		
Average Rate	**Rate**		**Trips**
	0.62		25
Entering / Exiting			
% entering	65%		16
% exiting	35%		9
New Trips			
% internal			
% pass-by			
		In	Out
Total Trips		16	9
Internal Trips		0	0
Pass-By Trips		0	0
New Trips		16	9

Appendix C

In-Process Trips



PM PEAK HOUR TRIP ASSIGNMENT



PROJECT	TOTAL	ENTER	EXIT
TOTAL NEW TRIPS	1293	621	672
*PASS-BY TRIPS	345	166	179
NEW NET PROJECT TRIPS	948	455	493

*Capped based on Year 2009 Background Volumes

NORTH
NOT TO SCALE

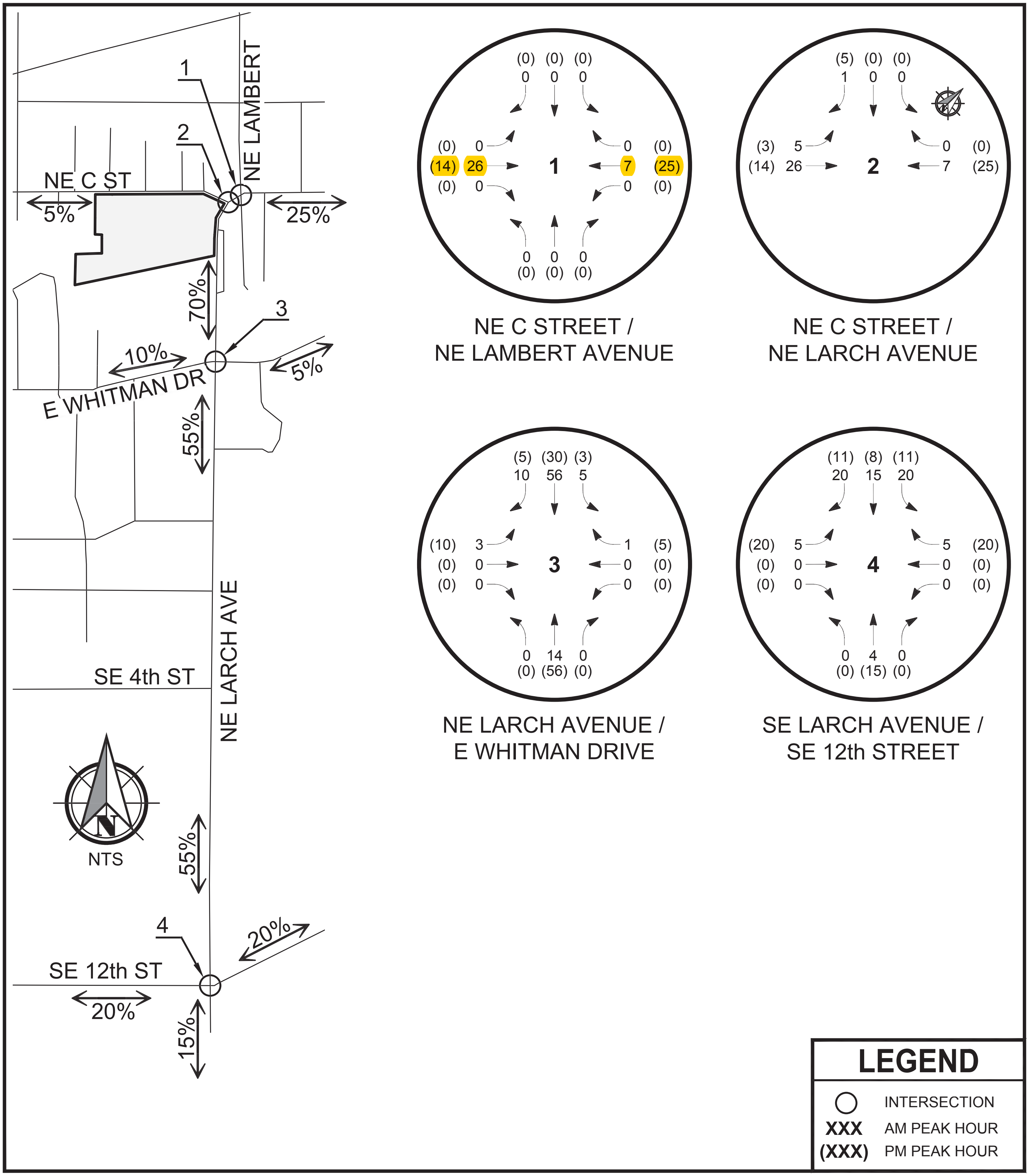
CLC ASSOCIATES
12730 E MIRABEAU PKWY
SUITE 100
SPOKANE VALLEY
WASHINGTON 99216
P 509 458 6840
F 509 458 6844
CLCASSOC.COM
ARCHITECTURE
ENGINEERING PLANNING
LANDSCAPE ARCHITECTURE
LAND SURVEYING

BLUE MOUNTAIN MALL
WALLA WALLA, WA

TRAFFIC IMPACT ANALYSIS
PROJECT NO. 06-0206

FIGURE 11

2009 NET NEW PROJECT TRIPS



PBS

Project Trip Distribution and Trip Assignment

Central College Place Planning Study - Traffic Study

APRIL 2018
67136.000

FIGURE
6

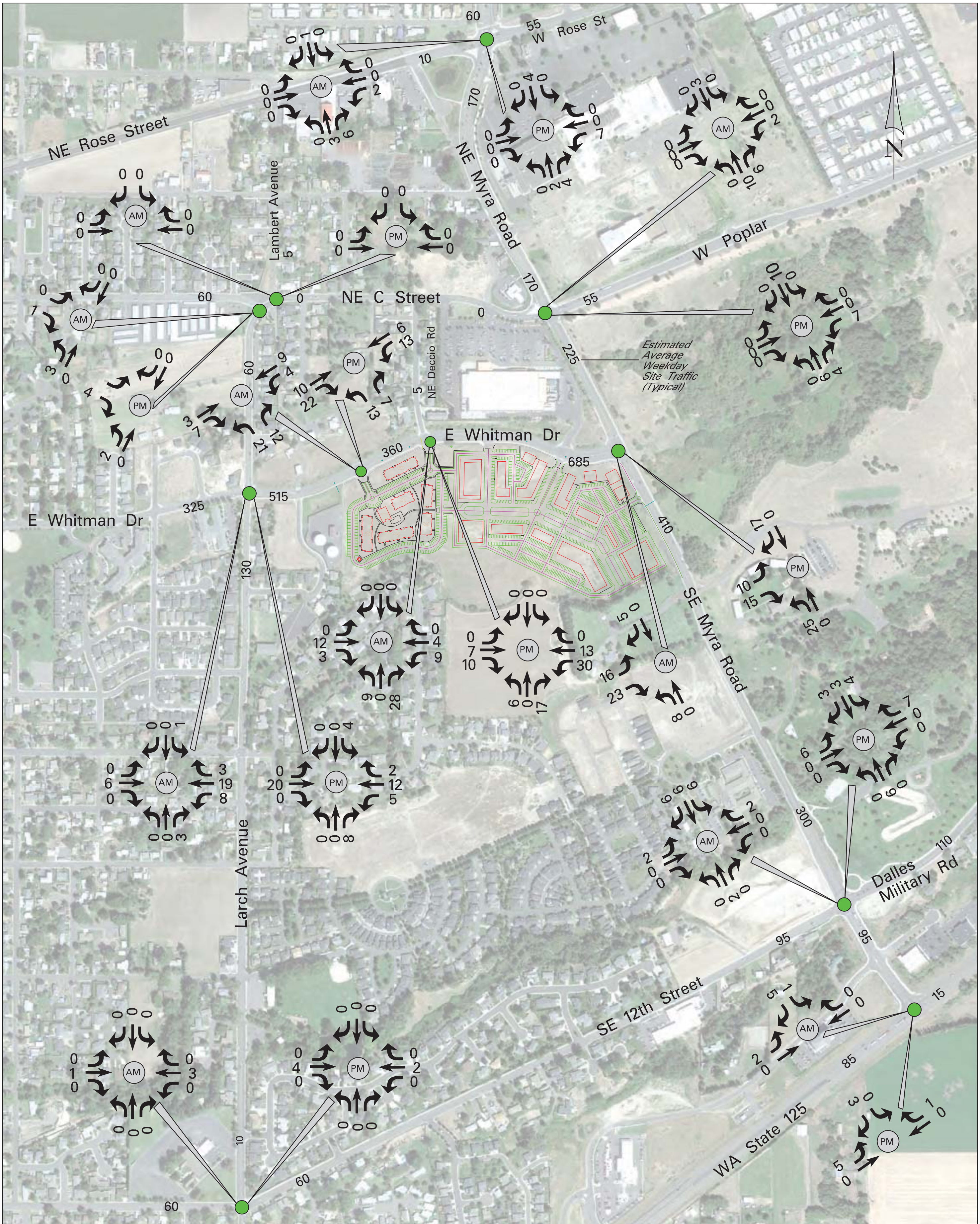
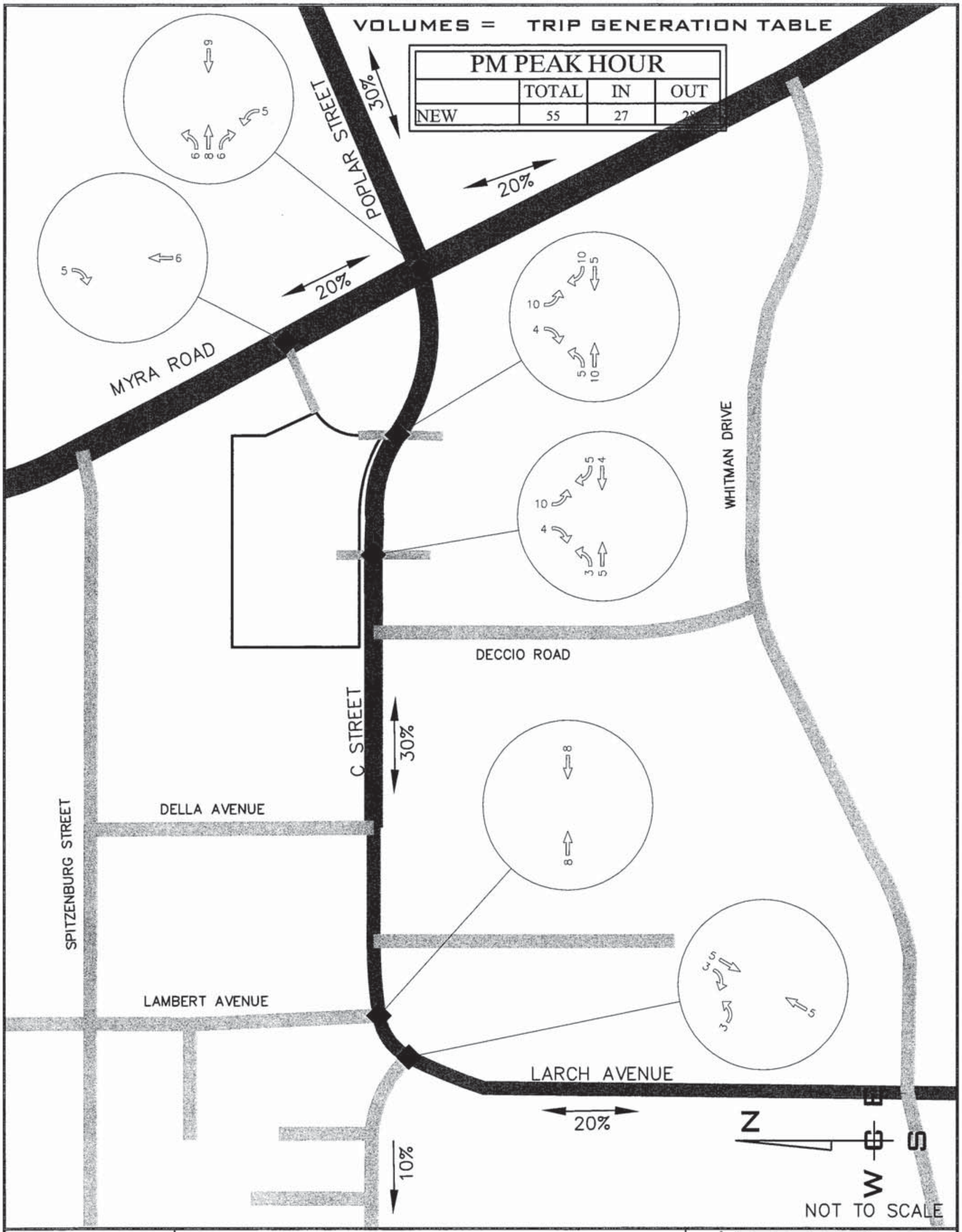


Figure 5. Phase 1 Development Site Traffic Assignment



PM PEAK HOUR			
	TOTAL	IN	OUT
NEW	55	27	28

PROJ #: 16-1621 DATE: 12/16/16 DRAWN: BNG APPROVED: TRW	TRAFFIC IMPACT ANALYSIS **WHITMAN CROSSINGS** MYRA ROAD & C STREET COLLEGE PLACE, WASHINGTON	WCE WHIPPLE CONSULTING ENGINEERS CIVIL AND TRANSPORTATION ENGINEERING 2528 NORTH SULLIVAN ROAD SPOKANE VALLEY, WASHINGTON 99216 PH: 509-893-2617 FAX: 509-926-0227
FIGURE 5	PM PROJECT TRIP DISTRIBUTION	

Appendix D
Level of Service Calculations

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	4	14	394	405	4
Future Vol, veh/h	40	4	14	394	405	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	43	4	15	428	440	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	687	222	445	0	-	0
Stage 1	442	-	-	-	-	-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	381	782	1112	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	376	782	1112	-	-	-
Mov Cap-2 Maneuver	376	-	-	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	763	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.4	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	395	-	-
HCM Lane V/C Ratio	0.014	-	0.121	-	-
HCM Control Delay (s)	8.3	-	15.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection						
Int Delay, s/veh	0.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	11	12	447	579	12
Future Vol, veh/h	22	11	12	447	579	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	24	12	13	486	629	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	905	321	642	0	-	0
Stage 1	636	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	276	675	939	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	272	675	939	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	742	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	939	-	340	-	-
HCM Lane V/C Ratio	0.014	-	0.105	-	-
HCM Control Delay (s)	8.9	-	16.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	15	17	426	442	6
Future Vol, veh/h	52	15	17	426	442	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	57	16	18	463	480	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	752	243	487	0	-	0
Stage 1	484	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	346	758	1072	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	340	758	1072	-	-	-
Mov Cap-2 Maneuver	340	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	740	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1072	-	388	-	-
HCM Lane V/C Ratio	0.017	-	0.188	-	-
HCM Control Delay (s)	8.4	-	16.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Intersection						
Int Delay, s/veh	1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	9	15	424	440	4
Future Vol, veh/h	42	9	15	424	440	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	46	10	16	461	478	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	743	241	483	0	-	0
Stage 1	480	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	351	760	1076	-	-	-
Stage 1	588	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	346	760	1076	-	-	-
Mov Cap-2 Maneuver	346	-	-	-	-	-
Stage 1	588	-	-	-	-	-
Stage 2	746	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1076	-	383	-	-
HCM Lane V/C Ratio	0.015	-	0.145	-	-
HCM Control Delay (s)	8.4	-	16	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection						
Int Delay, s/veh	0.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	15	18	544	693	22
Future Vol, veh/h	28	15	18	544	693	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	30	16	20	591	753	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1100	389	777	0	-	0
Stage 1	765	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	206	610	835	-	-	-
Stage 1	420	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	201	610	835	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	420	-	-	-	-	-
Stage 2	680	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.7	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	835	-	262	-	-
HCM Lane V/C Ratio	0.023	-	0.178	-	-
HCM Control Delay (s)	9.4	-	21.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	11	12	538	683	12
Future Vol, veh/h	23	11	12	538	683	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	5	2
Mvmt Flow	25	12	13	585	742	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1067	378	755	0	-	0
Stage 1	749	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	217	620	851	-	-	-
Stage 1	428	-	-	-	-	-
Stage 2	710	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	214	620	851	-	-	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	428	-	-	-	-	-
Stage 2	699	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.3	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	851	-	272	-	-
HCM Lane V/C Ratio	0.015	-	0.136	-	-
HCM Control Delay (s)	9.3	-	20.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-